BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

Application of NEVADA POWER COMPANY d/b/a NV Energy and SIERRA PACIFIC POWER COMPANY d/b/a NV Energy, seeking approval to add 1,001 MW of renewable power purchase agreements and 100 MW of energy storage capacity, among other items, as part of their joint 2019-2038 integrated resource plan, for the three year Action Plan period 2019-2021, and the Energy Supply Plan period 2019-2021	Docket No. 18-06___

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NARRATIVE
DEMAND SIDE PLAN

NARRATIVE

DEMAND SIDE PLAN

Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy

2018 Joint Integrated Resource Plan

(2019-2038)

Demand Side Plan

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Section 1. Overview and Request for Approval

This joint integrated resource plan spans the 20-year period from January 2019 through December 2038. The proposed Demand Side Management Plan ("DSM Plan" or "Demand Side Plan") focuses on the three-year action plan period, January 2019 through December 2021 ("Action Plan"). The DSM Plan represents an expansion of program activity relative to the previously approved DSM Plans and meets a statewide energy savings target of 1.1 percent on average over the three year action plan period. The incremental investment represented by the proposed DSM Plan has a total resource cost ("TRC") benefits-to-cost ratio of 2.15 and will bring a net benefit of $296 million to the communities served by the Companies. The Companies also present a modified TRC that considers non-energy benefits. The non-energy benefits TRC ("NTRC") ratio for the DSM Plan is 2.42.

Table DSM-1: Statewide Target

Nevada Power Company	**2019**	**2020**	**2021**
Budget	$49,800,000	$50,200,000	$50,600,000
Retail Sales (kWh)	20,272,610,000	20,487,236,000	20,780,182,000
1.1% Target (kWh)	222,998,710	225,359,596	228,582,002
Energy Savings Target (kWh)	266,879,500	258,421,300	260,498,100
% Energy Savings to Retail Sales	**1.32%**	**1.26%**	**1.25%**
Sierra Pacific Power Company	**2019**	**2020**	**2021**
Budget	$14,800,000	$15,500,000	$16,100,000
Retail Sales (kWh)	9,071,001,000	9,338,156,000	9,613,733,000
1.1% Target (kWh)	99,781,011	102,719,716	105,751,063
Energy Savings Target (kWh)	79,530,500	81,697,000	85,963,400
% Energy Savings to Retail Sales	**0.88%**	**0.87%**	**0.89%**
NV Energy Statewide	**2019**	**2020**	**2021**
Budget	$64,600,000	$65,700,000	$66,700,000
Retail Sales (kWh)	29,343,611,000	29,825,392,000	30,393,915,000
1.1% Target (kWh)	322,779,721	328,079,312	334,333,065
Energy Savings Target (kWh)	346,410,000	340,118,300	346,461,500
% Energy Savings to Retail Sales	**1.18%**	**1.14%**	**1.14%**

Overview of the Plan

The DSM Plan is organized in seven sections. Section 1 presents the request for approval of the DSM Plan, as well as the compliance items and directives for which the Companies are requesting the Commission find the Companies in compliance. Section 1 also includes a roadmap to the Commission's regulations that apply to this DSM Plan. The roadmap indicates the parts of this filing that fulfill the requirements specified by each section of the applicable regulations. Section 2 provides a summary of DSM activities for year 2017 and a summary of DSM performance for prior years. Section 3 provides the program year budgets and targets for 2018. Section 4 presents the DSM Plan for the 2019 - 2021 Action Plan period. Sections 5 through 7 provide the program

data sheets for each of the proposed programs. The DSM Technical Appendices provide key supporting data including, descriptions of the Company's cost-benefits model, summary spreadsheets used to determine replacement revenues, Measurement and Verification ("M&V") reports and other supporting material.

In compliance with the Commission's direction, concurrent with the filing of this DSM Plan, the Companies have provided to the Commission's Regulatory Operations Staff ("Staff") and the Bureau of Consumer Protection ("BCP") all supporting information and data in executable format upon which it relied to develop cost-benefit calculations ("Workpapers").[1] The Workpapers include all spreadsheets and calculations prepared by the Companies in support of the filing, as well as by any outside M&V contractors and consultants, in executable and manipulative format.

2017 Legislative Changes

In response to new legislation passed through Senate Bill 150 ("SB 150") and Assembly Bill 223 ("AB 223") by the 2017 Nevada Legislature, the Companies are proposing additional programs to:

- Increase annual energy savings to achieve on a joint basis an average of 1.1 percent of the weather normalized retail sales statewide over the three-year action plan period;
- Add measures and programs totaling at least 5 percent of the total annual expenditures that are directed towards low income customers; and
- Achieve plan-level cost-effectiveness.

The Companies are also continuing their implementation strategies, which integrate energy efficiency and demand response programs by customer segment. Nevada Power and Sierra are proposing integrated sets of services designed to maintain a practical budget, optimize energy and demand savings, and increase participation, while using a more personalized and customized approach. The programs have been bundled into the following offerings: 1) Home Services; 2) Business Services; and 3) Outreach and Product Development. Budgets, savings, and cost-effectiveness have been presented at the program level to provide the same level of transparency as in prior year filings.

Requests for Specific Approval - DSM Plan

The Companies request that pursuant to NRS § 704.751 and NAC § 704.934(4), the Commission approve the DSM Plans as part of the Companies' Action Plan. The Companies are requesting specific acceptance of the budgets and energy savings for the DSM Plans for the 2019-2021 Action Plan period as presented in Tables DSM-2A through DSM-2C and DSM-12A through 12C.

Pursuant to NAC § 704.9524(4)(b), the Company also requests that the Commission review and approve the M&V reports for program year 2017 provided in Technical Appendix DSM-1 through DSM-22 for the DSM programs delivered in the 2017 program year.

[1] *See*, Ordering Paragraph 11 in the Commission's Order issued December 24, 2012 in Docket Nos. 12-06052 and 12-06053.

Table DSM-2A: Nevada Power Company Proposed 2019-2021 Budget

Budget	2019	2020	2021
Energy Education	$500,000	$500,000	$500,000
Energy Reports	$1,200,000	$1,200,000	$1,200,000
Energy Assessments	$2,500,000	$2,500,000	$2,500,000
Program Development	$200,000	$300,000	$300,000
Subtotal - Outreach & Program Development	**$4,400,000**	**$4,500,000**	**$4,500,000**
Residential Lighting	$2,000,000	$1,600,000	$1,000,000
Pool Pumps	$1,000,000	$1,200,000	$1,200,000
Low Income	$2,000,000	$2,000,000	$2,000,000
Residential Air Conditioning	$7,000,000	$7,000,000	$7,000,000
Direct Install	$500,000	$500,000	$500,000
Residential Demand Response - Manage	$7,300,000	$7,500,000	$7,700,000
Residential Demand Response - Build	$7,000,000	$7,100,000	$7,300,000
Subtotal - Home Services	**$26,800,000**	**$26,900,000**	**$26,700,000**
Schools Program	$1,600,000	$1,700,000	$1,700,000
Commercial Services	$14,500,000	$14,500,000	$15,000,000
Commercial Demand Response Program - Manage	$800,000	$900,000	$1,000,000
Commercial Demand Response Program - Build	$1,700,000	$1,700,000	$1,700,000
Subtotal - Business Services	**$18,600,000**	**$18,800,000**	**$19,400,000**
Total DSM Programs	**$49,800,000**	**$50,200,000**	**$50,600,000**

Table DSM-2B: Sierra Pacific Power Company Proposed 2019-2021 Budget

Budget	2019	2020	2021
Energy Education	$400,000	$400,000	$400,000
Energy Reports	$575,000	$675,000	$775,000
Energy Assessments	$1,125,000	$1,375,000	$1,375,000
Program Development	$50,000	$100,000	$100,000
Subtotal - Education	**$2,150,000**	**$2,550,000**	**$2,650,000**
Residential Lighting	$1,100,000	$800,000	$600,000
Low Income	$600,000	$700,000	$700,000
Residential AC Program	$600,000	$500,000	$500,000
Direct Install	$150,000	$150,000	$150,000
Residential Demand Response - Manage	$800,000	$900,000	$1,100,000
Residential Demand Response - Build	$2,500,000	$2,600,000	$2,700,000
Subtotal - Residential	**$5,750,000**	**$5,650,000**	**$5,750,000**
Schools Program	$600,000	$600,000	$600,000
Commercial Services	$5,000,000	$5,300,000	$5,600,000
Commercial Demand Response Program - Manage	$400,000	$500,000	$600,000
Commercial Demand Response Program - Build	$900,000	$900,000	$900,000
Subtotal - Commercial	**$6,900,000**	**$7,300,000**	**$7,700,000**
Total DSM Programs	**$14,800,000**	**$15,500,000**	**$16,100,000**

Table DSM-2C: Combined Proposed 2019-2021 Budget

Budget	2019	2020	2021
Energy Education	$900,000	$900,000	$900,000
Energy Reports	$1,775,000	$1,875,000	$1,975,000
Energy Assessments	$3,625,000	$3,875,000	$3,875,000
Program Development	$250,000	$400,000	$400,000
Subtotal - Education	**$6,550,000**	**$7,050,000**	**$7,150,000**
Residential Lighting	$3,100,000	$2,400,000	$1,600,000
Pool Pumps	$1,000,000	$1,200,000	$1,200,000
Low Income	$2,600,000	$2,700,000	$2,700,000
Residential AC Program	$7,600,000	$7,500,000	$7,500,000
Direct Install	$650,000	$650,000	$650,000
Residential Demand Response - Manage	$8,100,000	$8,400,000	$8,800,000
Residential Demand Response - Build	$9,500,000	$9,700,000	$10,000,000
Subtotal - Residential	**$32,550,000**	**$32,550,000**	**$32,450,000**
Schools Program	$2,200,000	$2,300,000	$2,300,000
Commercial Services	$19,500,000	$19,800,000	$20,600,000
Commercial Demand Response Program - Manage	$1,200,000	$1,400,000	$1,600,000
Commercial Demand Response Program - Build	$2,600,000	$2,600,000	$2,600,000
Subtotal - Commercial	**$25,500,000**	**$26,100,000**	**$27,100,000**
Total DSM Programs	**$64,600,000**	**$65,700,000**	**$66,700,000**

Regulations, Compliance Items and Directives

Nevada Power and Sierra request that the Commission find that Companies have satisfied the items listed under Requirements in Table DSM-3.

Table DSM-3: DSM IRP Requirements Cross-Reference

Regulatory Requirement	Subsection	Requirement	Location of Provided Data
NAC 704.922	1b	Description of inputs to model used in developing resource plan.	DSM Narrative Section 4 Technical Appendix DSM-2 and Program Data Sheets
NAC 704.922	2b	Descriptions of all data inputs to the models used in developing the resource plan.	Work papers served on Staff and BCP concurrently with filing
NAC 704.922	2f	The final results derived from the models.	DSM Narrative Section 4 and Program Data Sheets
NAC 704.934	1	As part of a resource plan a utility must file a Demand Side plan	DSM Narrative and Technical Appendix
NAC 704.934	2a	End-uses for programs for conservation and demand management.	DSM Narrative and Program Data Sheets
NAC 704.934	2b	Assessment of savings attributable to technically feasible programs.	DSM Narrative Section 4 and Program Data Sheets
NAC 704.934	2c	Assessment of technically feasible programs to determine which will produce benefits in peak demand or energy consumption.	DSM Narrative Section 4 and Program Data Sheets
NAC 704.934	3	Consideration of new technologies withe potential impact of advances in digital technology and computer information systems.	DSM Narrative Section 4 and Program Data Sheets
NAC 704.934	4	Include in its demand side plan an energy efficiency program for residential customers which reduces the consumption of electricity or any fossil fuel. The energy efficiency program must include, without limitation, the use of new solar thermal energy sources.	DSM Narrative and Program Data Sheets
NAC 704.934	5	Tables for each approved DSM programs showing planned and achieved reduction in kW and kWh and costs (results table).	DSM Narrative Section 4, and Program Data Sheets
NAC 704.934	5a	Estimate of reduction in peak demand, energy consumption and average life	DSM Narrative Sections and Program Data Sheets
NAC 704.934	5b	Savings in costs of transmission and distribution.	DSM Narrative Section 4
NAC 704.934	5c	Assessment of impact on utility's load shapes of each proposed and exiting program for conservation and demand management	DSM Narrative Section 4
NAC 704.934	5d	Projected expenses for educational programs.	Program Data Sheet for Energy Education
NAC 704.934	6	Provide life cycle costs utilizing the Total Resource Cost test	DSM Narrative Section 4
NAC 704.934	7	Summary of 2017 Results (results table)	DSM Narrative Section 2
NAC 704.9489	1d	Timetable for acquisitions of options for programs for conservation and demand management.	Program Data Sheets
NAC 704.9489	1f	A section describing any plans of the utility to acquire additional modeling instruments.	The Company is not proposing to acquire new modeling instruments.
NAC 704.9489	1g	A section for the utility's program for conservation and demand management, including:	
NAC 704.9489	1g1	A description of continued planning efforts.	Action Plan, Sections 5-7. (Demand Side Plan Programs)
NAC 704.9489	1g2	A plan to carry out and continue selected measures for conservation and demand management that have been identified as desirable.	Action Plan, Sections 5-7. (Demand Side Plan Programs)
NAC 704.9489	1g3	Any impacts of imputed debt calculations associated with energy efficiency contracts in the preferred plan.	Action Plan, Sections 5-7. (Demand Side Plan Programs)
NAC 704.9489	1h4	Any impacts of imputed debt calculations associated with renewable energy contracts or energy efficiency contracts in the preferred plan.	Action Plan, Sections 5-7. (Demand Side Plan Programs)
NAC 704.9489	3	Requires that "the action plan must contain a budget for planned expenditures suitable for comparing planned and achieved expenditures. Expenses must be listed in a format that is consistent with the categories and periods to be presented in subsequent filings. The budget must be organized in the following categories:	
NAC 704.9489	3b	Conservation and demand management.	Action Plan, Section 5-7. (Demand Side Plan Programs)
NAC 704.952		Sessions for reviewing plans with Staff and BCP.	Technical Appendix DSM-1
NAC 704.9522	1	Measurement and verification protocol for energy efficiency measures.	DSM Narrative Section 4, Technical Appendix DSM-4 and Program Data Sheets
NAC 704.9522	2	Include M&V reports for 2017 by Program for review and approval by Commission.	Technical Appendix DSM 5 - DSM 20

Table DSM-3: DSM IRP Requirements Cross-Reference - Continued

Docket Nos. 10-10024 and 10-10025		Calculation of expected lost revenues generated by the portfolio broken down by individual programs.	Section 4 of DSM Narrative
Docket Nos. 12-06052 and 12-06053		Provide to Staff and BCP at time of Filing all information and all supporting data upon which it relies to develop benefit/cost calculations related to DSM programs and lost revenue calculations for DSM programs.	Work papers served on Staff and BCP concurrently with filing
Docket Nos. 12-06052 and 12-06053		NV Energy shall include a discussion of, and support for, the development of load shapes (energy savings profiles).	Section 4 of DSM Narrative, Program Data Sheets, Technical Appendices DSM 5-DSM 20
Docket Nos. 12-06052 and 12-06053		NV Energy shall include documentation for all incremental cost calculations.	Section 4 of DSM Narrative, Program Data Sheets, Technical Appendices DSM 5-DSM 20
Docket Nos. 12-06052 and 12-06053		NV Energy shall utilize the measure life as presented in the latest Measurement and Verification reports unless documentation is provided to support a changed measure life.	Section 4 of DSM Narrative, Program Data Sheets, Technical Appendices DSM 5-DSM 20
Docket Nos. 12-06052 and 12-06053		NV Energy shall provide a discussion of, and support for, rebates and incentives offered for each appropriate program."	Section 4 of DSM Narrative, Program Data Sheets, Technical Appendices DSM 5-DSM 20
Docket Nos. 12-06052 and 12-06053		NV Energy shall include, for those programs that do not have an installed unit such as a refrigerator or pool pump but instead utilize an aggregate measure, a detailed discussion explaining and supporting the development of the aggregate measure."	Section 4 of Narrative, Program Data Sheets
Docket Nos. 12-06052 and 12-06053		NV Energy shall provide deemed savings on a per unit measure basis and present changes in Measurement and Verification verified deemed savings including the reasons behind the changes to future savings.	Section 4 of Narrative, Program Data Sheets
Docket Nos. 12-06052 and 12-06053		NV Energy shall present in its Demand Response data sheets, a residential section, a commercial section and a combined program section.	Sections 6 and 7: Demand Response Program Data Sheet
Docket Nos. 14-07007 and 14-07008		NV Energy shall confer with Staff and BCP to develop a revised Low Income program.	The testimony of Anita Hart
Docket Nos. 14-07007 and 14-07008		NV Energy shall within 90 days meet and confer with Staff and other interested parties to develop a definition for a pilot and the treatment of lost revenues for pilots and file the result with the Commission.	The testimony of Anita Hart
Docket Nos. 14-07007 and 14-07008		Companies shall provide a more detailed analysis of the program costs and kWh/KW savings for each company's respective Demand Response programs in future annual Demand Side Management update reports and Demand Side Plan section of triennial Integrated Resource Plan filings to include the breakout between optimization and demand events and between the build and manage components.	Sections 6 and 7: Demand Response Program - Program Data Sheet
Docket Nos. 15-06065 and 15-07004		Non-Profit Grants should be reported under Commercial Services Program.	Commercial Program Data Sheet
Docket Nos. 16-07007 and 16-07001		The signatories agree that Nevada Power will report in its 2018 Integrated Resource Plan on its assessment of the interactions between demand response and photo-voltaic systems.	The testimony of Anita Hart

Section 2. Program Year 2017 and Prior Year Results

The results for program year 2017 provided valuable lessons that informed the design process for the DSM portfolio of programs for the 2019-2021 Action Plan period. The lessons learned from the performance of programs in past years are important, and have been integrated into the Company's feedback and improvement process. This process is performed continuously during the program year, is used to implement corrective actions where appropriate, and forms a basis for program enhancements in future years. The lessons learned and the associated program enhancements are discussed in the program data sheets.

Summary of Program Year 2017 Results

Nevada Power Company
In program year 2017, Nevada Power surpassed its energy savings targets and fell short of its demand savings targets. Expenditures remained within the approved budget. Total verified energy savings for the 2017 program were 191,057,956 kWh (129.4 percent of the target of 147,597,000 kWh). The demand savings totaled 247,720 kW (94.8 percent of the target of 261,426 kW). Total DSM portfolio expenditures were $39,390,297 (91.6 percent of the budget of $43,000,000, includes recapture funds).

Table DSM-4A provides a summary of financial results. Table DSM-5A provides a summary of the demand and energy savings for program year 2017 as well as an Effective Useful Life ("EUL") tabulation. Table DSM-6A presents results of the financial analysis in the form of the TRC test for each program and at the portfolio level for program year 2017. The TRC values were calculated using the PortfolioPro financial modeling program. Section 4 of this DSM Narrative provides a description of the PortfolioPro model and lists the key inputs used for the financial analysis.

Notable among the program results were the savings achieved through the Commercial Services program, Schools program and the Commercial Demand Response – Manage program. Each of these programs significantly exceeded its targeted energy savings for 2017. Residential Air Conditioning, Residential Demand Response – Manage, Residential Demand Response – Build and Commercial Demand Response - Build programs fell short of targeted energy savings.

Sierra Pacific Power Company
In 2017, Sierra surpassed both its energy savings targets and demand savings targets. Expenditures remained within the approved budget. Total verified energy savings for the 2017 program were 56,366,537 kWh (142.3 percent of the target of 39,601,000 kWh). The demand savings totaled 25,325 kW (112.2 percent of the target of 22,581 kW). Total DSM portfolio expenditures were $10,960,177 (93.7 percent of the budget of $11,700,000).

Table DSM-4B provides a summary of financial results. Table DSM-5B provides a summary of the demand and energy savings for program year 2017 as well as EUL tabulations. Table DSM-6B presents results of the financial analysis in the form of the TRC test for each program and at the portfolio level for program year 2017. The TRC values were calculated using the PortfolioPro

financial modeling program. Section 4 of this DSM Narrative provides a description of the PortfolioPro model and lists the key inputs used for the financial analysis.

Notable among the program results were the savings achieved through the Residential Demand Response – Manage program, Schools program and Commercial Services program. Each of these programs significantly exceeded its targeted energy savings for 2017. Residential Demand Response – Build, Commercial Demand Response – Manage and Commercial Demand Response - Build programs fell short of targeted energy savings.

Statewide Results

Together, in 2017, the Companies surpassed the statewide energy savings targets and fell short of its demand savings targets. Expenditures remained within the approved budget. Total verified energy savings for the 2017 program were 247,424,493 kWh (132.2 percent of the target of 187,198,000 kWh). The demand savings totaled 273,045 kW (96.1 percent of the target of 284,007 kW). Total DSM portfolio expenditures were $50,350,474 (92.0 percent of the budget of $54,700,000, includes recapture funds).

Table DSM-4C provides a summary of the statewide financial results. Table DSM-5C provides a summary of the demand and energy savings for program year 2017 as well as EUL. Table DSM-6C presents results of the financial analysis in the form of the TRC test for each program and at the portfolio level for program year 2017. The TRC values were calculated using the PortfolioPro financial modeling program. Section 4 of this DSM Narrative provides a description of the PortfolioPro model and lists the key inputs used for the financial analysis.

Notable among the program results were the savings achieved through the Commercial Services program, Schools program and the Commercial Demand Response – Manage program. Each of these programs significantly exceeded its targeted energy savings for 2017. Residential Air Conditioning, Residential Demand Response – Manage, Residential Demand Response – Build and Commercial Demand Response - Build programs fell short of targeted energy savings.

Table DSM-4A: 2017 Nevada Power Company Financial Results

Programs	2017 Approved Budget	2017 Actual Expenditures	Variance from Approved Budget (%)
Energy Education	$400,000	$400,567	0.1%
Energy Reports	$1,200,000	$943,606	(21.4%)
Energy Assessments	$3,500,000	$2,222,104	(36.5%)
Program Development	$400,000	$334,268	(16.4%)
Education Services Total	**$5,500,000**	**$3,900,544**	**(29.1%)**
Residential Air Conditioning	$7,000,000	$6,237,363	(10.9%)
Residential Demand Response - Manage	$7,600,000	$5,852,210	(23.0%)
Residential Demand Response - Build	$7,500,000	$7,016,381	(6.4%)
Residential Services Total	**$22,100,000**	**$19,105,955**	**(13.5%)**
Schools	$1,600,000	$1,402,427	(12.3%)
Commercial Services	$11,150,000	$12,439,622	11.6%
Commercial Demand Response - Manage	$1,150,000	$895,044	(22.2%)
Commercial Demand Response - Build	$1,500,000	$1,470,947	(1.9%)
Market Potential Study		$175,758	0.0%
Commercial Services Total	**$15,400,000**	**$16,383,798**	**6.4%**
Total DSM Programs	**$43,000,000**	**$39,390,297**	**(8.4%)**

Note: Includes recapture funds

Table DSM-4B: 2017 Sierra Pacific Power Company Financial Results

Programs	2017 Approved Budget	2017 Actual Expenditures	Variance from Approved Budget (%)
Energy Education	$300,000	$282,156	(5.9%)
Energy Reports	$700,000	$597,572	(14.6%)
Energy Assessments	$1,700,000	$1,224,157	(28.0%)
Program Development	$100,000	$54,055	(45.9%)
Education Services Total	**$2,800,000**	**$2,157,940**	**(22.9%)**
Residential Demand Response - Manage	$500,000	$448,643	(10.3%)
Residential Demand Response - Build	$2,200,000	$2,428,553	10.4%
Residential Services Total	**$2,700,000**	**$2,877,196**	**6.6%**
Schools	$400,000	$361,400	(9.7%)
Commercial Services	$4,600,000	$4,425,553	(3.8%)
Commercial Demand Response - Manage	$450,000	$261,775	(41.8%)
Commercial Demand Response - Build	$750,000	$801,004	6.8%
Market Potential Study		$75,309	0.0%
Commercial Services Total	**$6,200,000**	**$5,925,041**	**(4.4%)**
Total DSM Programs	**$11,700,000**	**$10,960,177**	**(6.3%)**

Table DSM-4C 2017 NV Energy Financial Results

Programs	2017 Approved Budget	2017 Actual Expenditures	Variance from Approved Budget (%)
Energy Education	$700,000	$682,723	(2.5%)
Energy Reports	$1,900,000	$1,541,178	(18.9%)
Energy Assessments	$5,200,000	$3,446,261	(33.7%)
Program Development	$500,000	$388,323	(22.3%)
Education Services Total	**$8,300,000**	**$6,058,484**	**(27.0%)**
Residential Air Conditioning	$7,000,000	$6,237,363	(10.9%)
Residential Demand Response - Manage	$8,100,000	$6,300,853	(22.2%)
Residential Demand Response - Build	$9,700,000	$9,444,934	(2.6%)
Residential Services Total	**$24,800,000**	**$21,983,151**	**(11.4%)**
Schools	$2,000,000	$1,763,827	(11.8%)
Commercial Services	$15,750,000	$16,865,175	7.1%
Commercial Demand Response - Manage	$1,600,000	$1,156,819	(27.7%)
Commercial Demand Response - Build	$2,250,000	$2,271,951	1.0%
Market Potential Study	$0	$251,067	0.0%
Commercial Services Total	**$21,600,000**	**$22,308,839**	**3.3%**
Total DSM Programs	**$54,700,000**	**$50,350,474**	**(8.0%)**

Table DSM-5A: 2017 Nevada Power Company Demand and Energy Saving Results

	Demand kW			Energy kWh				
Programs	Target	Verified Demand Savings	Variance Over (Under) %	Target	Verified Energy Savings	Variance Over (Under) %	EUL	Lifetime savings
Residential Air Conditioning	7,125	5,267	(26.1%)	13,300,000	10,937,357	(17.8%)	13.0	142,185,641
Residential Demand Response - Manage	189,044	180,890	(4.3%)	21,982,000	19,753,922	(10.1%)	4.0	79,015,688
Residential Demand Response - Build	23,000	23,590	2.6%	4,535,000	3,659,813	(19.3%)	10.0	36,598,130
Residential Services Total	**219,169**	**209,747**	**(4.3%)**	**39,817,000**	**34,351,092**	**(13.7%)**	**9.0**	**257,799,459**
Schools	505	2,749	444.4%	10,660,000	12,542,061	17.7%	12.5	156,148,659
Commercial Services	9,568	15,798	65.1%	90,000,000	135,176,397	50.2%	11.7	1,581,563,845
Commercial Demand Response - Manage	27,184	16,529	(39.2%)	4,420,000	7,677,895	73.7%	5.0	38,389,475
Commercial Demand Response - Build	5,000	2,897	(42.1%)	2,700,000	1,310,511	(51.5%)	10.0	13,105,110
Commercial Service Total	**42,257**	**37,973**	**11.3%**	**107,780,000**	**156,706,864**	**45.4%**	**9.8**	**1,789,207,089**
Total DSM	**261,426**	**247,720**	**(5.2%)**	**147,597,000**	**191,057,956**	**29.4%**	**18.8**	**2,047,006,548**

Table DSM-5B: 2017 Sierra Pacific Power Company Demand and Energy Savings Results

Programs	Demand kW			Energy kWh				
	Target	Verified Demand Savings	Variance Over (Under) %	Target	Verified Energy Savings	Variance Over (Under) %	EUL	Lifetime savings
Residential Demand Response - Manage	7,419	7,373	(0.6%)	1,004,000	1,188,915	18.4%	8.00	9,511,320
Residential Demand Response - Build	7,000	6,503	(7.1%)	1,272,000	761,727	(40.1%)	10.00	7,617,270
Residential Services Total	**14,419**	**13,876**	**(3.8%)**	**2,276,000**	**1,950,642**	**(14.3%)**	**9.00**	**17,128,590**
Schools	314	471	50.0%	2,500,000	3,253,549	30.1%	15.00	48,803,235
Commercial Services	4,648	7,000	50.6%	34,000,000	50,803,353	49.4%	12.70	645,202,583
Commercial Demand Response - Manage	1,200	2,405	100.4%	375,000	130,440	(65.2%)	9.00	1,173,960
Commercial Demand Response - Build	2,000	1,573	(21.3%)	450,000	228,553	(49.2%)	10.00	2,285,530
Commercial Service Total	**8,162**	**11,449**	**40.3%**	**37,325,000**	**54,415,895**	**45.8%**	**11.68**	**697,465,308**
Total DSM	**22,581**	**25,325**	**12.2%**	**39,601,000**	**56,366,537**	**42.3%**	**20.68**	**714,593,898**

Table DSM-5C: 2017 Combined Demand and Energy Savings Results

Programs	Demand kW			Energy kWh				
	Target	Verified Demand Savings	Variance Over (Under) %	Target	Verified Energy Savings	Variance Over (Under) %	EUL	Lifetime savings
Residential Air Conditioning	7,125	5,267	(26.1%)	13,300,000	10,937,357	(17.8%)	13.0	142,185,641
Residential Demand Response - Manage	196,463	188,263	(4.2%)	22,986,000	20,942,837	(8.9%)	6.0	88,527,008
Residential Demand Response - Build	30,000	30,093	0.3%	5,807,000	4,421,540	(23.9%)	10.0	44,215,400
Residential Services Total	**233,588**	**223,623**	**(4.3%)**	**42,093,000**	**36,301,734**	**(13.8%)**	**9.7**	**274,928,049**
Schools	819	3,220	293.2%	13,160,000	15,795,610	20.0%	13.7	204,951,894
Commercial Services	14,216	22,798	60.4%	124,000,000	185,979,750	50.0%	12.2	2,226,766,428
Commercial Demand Response - Manage	28,384	18,934	(33.3%)	4,795,000	7,808,335	62.8%	7.0	39,563,435
Commercial Demand Response - Build	7,000	4,470	(36.1%)	3,150,000	1,539,064	(51.1%)	10.0	15,390,640
Commercial Service Total	**50,419**	**49,422**	**2.0%**	**145,105,000**	**211,122,759**	**45.5%**	**10.7**	**2,486,672,397**
Total DSM	**284,007**	**273,045**	**(3.9%)**	**187,198,000**	**247,424,493**	**32.2%**	**20.4**	**2,761,600,446**

Table DSM-6A: 2017 Nevada Power Company TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$0	$400,567	($400,567)	N/A
Energy Reports	$0	$943,606	($943,606)	N/A
Energy Assessments	$0	$2,222,104	($2,222,104)	N/A
Program Development	$0	$334,268	($334,268)	N/A
Educational Services Total	**$0**	**$3,900,544**	**($3,900,544)**	**0.00**
Residential Air Conditioning	$7,983,614	$6,866,816	$1,116,798	1.16
Residential Demand Response - Manage	$77,128,883	$15,273,101	$61,855,782	5.05
Residential Demand Response - Build	$24,670,721	$10,290,440	$14,380,281	2.19
Residential Services Total	**$109,783,218**	**$32,430,357**	**$77,352,861**	**3.39**
Schools	$4,920,860	$3,847,462	$1,073,398	1.28
Commercial Services	$42,224,524	$27,498,960	$14,725,564	1.54
Commercial Demand Response - Manage	$9,631,153	$3,853,614	$5,777,539	2.50
Commercial Demand Response - Build	$5,265,979	$3,192,642	$2,073,337	1.65
Commercial Service Total	**$62,042,516**	**$38,392,678**	**$23,649,838**	**1.62**
Total DSM Programs	**$171,825,734**	**$74,723,579**	**$97,102,155**	**2.30**

Table DSM-6B: 2017 Sierra Pacific Power Company TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$0	$282,156	($282,156)	N/A
Energy Reports	$0	$597,572	($597,572)	N/A
Energy Assessments	$0	$1,224,157	($1,224,157)	N/A
Program Development	$0	$54,055	($54,055)	N/A
Educational Services Total	**$0**	**$2,157,940**	**($2,157,940)**	**0.00**
Residential Demand Response - Manage	$8,968,677	$3,147,995	$5,820,682	2.85
Residential Demand Response - Build	$8,548,548	$5,017,349	$3,531,199	1.70
Residential Services Total	**$17,517,225**	**$8,165,344**	**$9,351,881**	**2.15**
Schools	$1,497,636	$586,925	$910,711	2.55
Commercial Services	$17,261,018	$9,185,304	$8,075,714	1.88
Commercial Demand Response - Manage	$2,738,636	$1,853,707	$884,929	1.48
Commercial Demand Response - Build	$4,744,422	$3,634,633	$1,109,789	1.31
Commercial Service Total	**$26,241,712**	**$15,260,569**	**$10,981,143**	**1.72**
Total DSM Programs	**$43,758,937**	**$25,583,853**	**$18,175,084**	**1.71**

Table DSM-6C: 2017 Combined TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$0	$682,723	($682,723)	N/A
Energy Reports	$0	$1,541,178	($1,541,178)	N/A
Energy Assessments	$0	$3,446,261	($3,446,261)	N/A
Program Development	$0	$388,323	($388,323)	N/A
Educational Services Total	**$0**	**$6,058,484**	**($6,058,484)**	**0.00**
Residential Air Conditioning	$7,983,614	$6,866,816	$1,116,798	1.16
Residential Demand Response - Manage	$86,097,560	$18,421,096	$67,676,464	4.67
Residential Demand Response - Build	$33,219,269	$15,307,789	$17,911,480	2.17
Residential Services Total	**$127,300,443**	**$40,595,701**	**$86,704,742**	**3.14**
Schools	$6,418,496	$4,434,387	$1,984,109	1.45
Commercial Services	$59,485,542	$36,684,264	$22,801,278	1.62
Commercial Demand Response - Manage	$12,369,789	$5,707,321	$6,662,468	2.17
Commercial Demand Response - Build	$10,010,401	$6,827,275	$3,183,126	1.47
Commercial Service Total	**$88,284,228**	**$53,653,247**	**$34,630,981**	**1.65**
Total DSM Programs	**$215,584,671**	**$100,307,432**	**$115,277,239**	**2.15**

Tables DSM-7A, DSM-7B and DSM-7C summarize the budget and participant results for 2017 for the Energy Education, Energy Report and Energy Assessment programs.

Table DSM-7A: 2017 Nevada Power Company Non-Energy Results

Program	Program Budget			Paticipants		
	Approved	Actual	Variance	Target	Achieved	Variance
Energy Education	$400,000	$400,567	0.1%	32,600	78,523	140.9%
Energy Reports	$1,200,000	$943,606	(21.4%)	130,000	176,499	35.8%
Energy Assessments	$3,500,000	$2,222,104	(36.5%)	6,000	6,285	4.8%
Total	**$5,100,000**	**$3,566,277**	**(30.1%)**	**168,600**	**261,307**	**55.0%**

Table DSM-7B: 2017 Sierra Pacific Power Company Non-Energy Results

Program	Program Budget			Paticipants		
	Approved	Actual	Variance	Target	Achieved	Variance
Energy Education	$300,000	$282,156	(5.9%)	23,000	36,668	59.4%
Energy Reports	$700,000	$597,572	(14.6%)	65,000	93,989	44.6%
Energy Assessments	$1,700,000	$1,224,157	(28.0%)	4,000	3,133	(21.7%)
Total	**$2,700,000**	**$2,103,885**	**(22.1%)**	**92,000**	**133,790**	**45.4%**

Table DSM-7C: 2017 Combined Non-Energy Results

Program	Program Budget			Paticipants		
	Approved	Actual	Variance	Target	Achieved	Variance
Energy Education	$700,000	$682,723	(2.5%)	55,600	115,191	107.2%
Energy Reports	$1,900,000	$1,541,178	(18.9%)	195,000	270,488	38.7%
Energy Assessments	$5,200,000	$3,446,261	(33.7%)	10,000	9,418	(5.8%)
Total	**$7,800,000**	**$5,670,162**	**(27.3%)**	**260,600**	**395,097**	**51.6%**

Tables DSM-8A, DSM-8B and DSM-8C provide an estimate of the reduction in emissions that will be realized by energy efficiency measures installed in 2017 over the lifetime of those measures.

Table DSM-8A: 2017 Nevada Power Company Lifetime Environmental Benefits

Programs	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Residential Air Conditioning	9,953	99,751,758	55,452	4,266	0	27,015	1,422	7,109,282
Residential Demand Response - Manage	5,531	55,434,246	30,816	2,370	0	15,013	790	3,950,784
Residential Demand Response - Build	2,562	25,675,784	14,273	1,098	0	6,954	366	1,829,907
Residential Services Total	**18,046**	**180,861,788**	**100,542**	**7,734**	**0**	**48,982**	**2,578**	**12,889,973**
Schools	10,930	109,547,654	60,898	4,684	0	29,668	1,561	7,807,433
Commercial Services	110,709	1,109,561,931	616,810	47,447	0	300,497	15,816	79,078,192
Commercial Demand Response - Manage	2,687	26,932,520	14,972	1,152	0	7,294	384	1,919,474
Commercial Demand Response - Build	917	9,194,021	5,111	393	0	2,490	131	655,256
Commercial Services Total	**125,244**	**1,255,236,126**	**697,791**	**53,676**	**0**	**339,949**	**17,892**	**89,460,354**
Total DSM Programs	**143,290**	**1,436,097,914**	**798,333**	**61,410**	**0**	**388,931**	**20,470**	**102,350,327**

Table DSM-8B: 2017 Sierra Pacific Power Company Lifetime Environmental Benefits

Programs	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Residential Demand Response - Manage	3,424	6,806,586	8,085	380	0	4,946	95	3,386,030
Residential Demand Response - Build	2,742	5,451,147	6,475	305	0	3,961	76	2,711,748
Residential Services Total	**6,166**	**12,257,733**	**14,559**	**685**	**0**	**8,907**	**171**	**6,097,778**
Schools	17,569	34,925,059	41,483	1,952	0	25,378	488	17,373,952
Commercial Services	232,273	461,726,325	548,422	25,808	0	335,505	6,452	229,692,120
Commercial Demand Response - Manage	423	840,121	998	47	0	610	12	417,930
Commercial Demand Response - Build	823	1,635,594	1,943	91	0	1,188	23	813,649
Commercial Services Total	**251,088**	**499,127,098**	**592,846**	**27,899**	**0**	**362,682**	**6,975**	**248,297,650**
Total DSM Programs	**257,254**	**511,384,831**	**607,405**	**28,584**	**0**	**371,589**	**7,146**	**254,395,428**

Table DSM-8C: 2017 Combined Lifetime Environmental Benefits

Programs	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Residential Air Conditioning	9,953	99,751,758	55,452	4,266	0	27,015	1,422	7,109,282
Residential Demand Response - Manage	8,955	62,240,832	38,901	2,751	0	19,959	885	7,336,814
Residential Demand Response - Build	5,304	31,126,931	20,748	1,403	0	10,915	442	4,541,655
Residential Services Total	**24,212**	**193,119,521**	**115,101**	**8,419**	**0**	**57,889**	**2,749**	**18,987,751**
Schools	28,500	144,472,713	102,381	6,637	0	55,046	2,050	25,181,385
Commercial Services	342,982	1,571,288,256	1,165,232	73,255	0	636,002	22,268	308,770,312
Commercial Demand Response - Manage	3,110	27,772,641	15,970	1,199	0	7,904	396	2,337,404
Commercial Demand Response - Build	1,740	10,829,615	7,054	485	0	3,678	154	1,468,904
Commercial Services Total	**376,332**	**1,754,363,224**	**1,290,636**	**81,575**	**0**	**702,631**	**24,867**	**337,758,004**
Total DSM Programs	**400,544**	**1,947,482,745**	**1,405,737**	**89,994**	**0**	**760,520**	**27,616**	**356,745,755**

Summary of Prior Program Years

The energy savings, demand savings, annual expenditures and the percentage of the Companies' sales for DSM programs since 2005 are provided in Tables DSM-9A, DSM-9B and DSM-9C.

Table DSM-9A: Nevada Power Company Historical Performance

Nevada Power DSM Portfolio	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Efficiency Programs Energy Savings (MWh)	67,467	145,320	193,406	303,325	332,596	238,759	219,414	144,276	129,564	162,781	170,615	137,991	158,656
Demand Response Energy Savings (MWh)	0	193	484	1,440	3,220	2,217	1,303	2,131	9,654	15,742	26,917	26,403	32,402
Energy Efficiency Programs Peak Reduction (MW)	18	41	28	64	50	32	34	24	23	29	28	25	24
Demand Response Peak Reduction Available (MW)	13	20	41	80	120	148	138	154	179	189	206	217	224
Energy Efficiency Expenditures ($000)	$8,499	$17,116	$16,463	$32,876	$32,106	$23,769	$26,028	$22,651	$19,342	$26,900	$22,004	$24,459	$24,156
Demand Response Expenditures ($000)	$2,976	$3,378	$6,703	$11,331	$15,504	$14,953	$12,835	$10,695	$15,030	$14,850	$14,161	$13,851	$15,235
DSM Energy Savings as % of Sales	0.34%	0.69%	0.89%	1.41%	1.58%	1.15%	1.06%	0.68%	0.67%	0.89%	0.91%	0.76%	0.93%

Table DSM-9B: Sierra Pacific Power Company Historical Performance

Sierra DSM Portfolio	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Efficiency Programs Energy Savings (MWh)	70,328	59,518	103,936	102,806	62,899	57,474	36,065	37,950	52,404	47,402	59,497	54,057
Demand Response Energy Savings (MWh)	0	0	0	0	0	0	18	32	273	969	1,623	2,310
Energy Efficiency Programs Peak Reduction (MW)	10	8	14	15	9	8	6	5	8	7	9	7
Demand Response Peak Reduction Available (MW)	0	0	0	0	0	0	0	0	3	9	11	18
Energy Efficiency Expenditures ($000)	$4,513	$4,103	$8,371	$9,853	$7,570	$6,189	$5,319	$4,391	$5,986	$6,505	$7,766	$7,020
Demand Response Expenditures ($000)	$0	$0	$0	$0	$85	$118	$3	$627	$1,139	$2,834	$2,914	$3,940
DSM Energy Savings as % of Sales	0.86%	0.72%	1.29%	1.35%	0.83%	0.75%	0.45%	0.47%	0.65%	0.59%	0.73%	0.65%

Table DSM-9C: Combined Company Historical Performance

Combined DSM Portfolio	2005*	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Efficiency Programs Energy Savings (MWh)	67,467	215,648	252,925	407,261	435,402	301,658	276,888	180,342	167,514	215,185	218,017	197,488	212,713
Demand Response Energy Savings (MWh)	0	193	484	1,440	3,220	2,217	1,303	2,149	9,686	16,015	27,886	28,026	34,712
Energy Efficiency Programs Peak Reduction (MW)	18	49	42	79	59	40	39	29	30	36	37	32	31
Demand Response Peak Reduction Available (MW)	13	20	41	80	120	148	138	154	182	198	217	235	242
Energy Efficiency Expenditures ($000)	$8,499	$21,630	$20,566	$41,246	$41,959	$31,339	$32,217	$27,970	$23,733	$32,886	$28,509	$32,225	$31,176
Demand Response Expenditures ($000)	$2,976	$3,378	$6,703	$11,331	$15,504	$15,038	$12,953	$10,698	$15,657	$15,989	$16,995	$16,765	$19,175
DSM Energy Savings as % of Sales	0.34%	0.77%	0.80%	1.35%	1.47%	0.99%	0.91%	0.57%	0.57%	0.77%	0.75%	0.75%	0.79%

* Nevada Power Company results, Sierra Pacific Power results began in 2006

Section 3. The 2018 Program Year Targets

Tables DSM-10A, DSM-10B and DSM-10C provide the scope and scale of the DSM portfolio approved by the Commission for delivery in 2018.[2] These tables are presented for context and to bridge the gap between the historical and planned year.

Table DSM-10A: 2018 Nevada Power Company Budget and Targets

Budget	Budget($)	Demand Savings (kW)	Annual Energy Savings (kWh)
Energy Education	$350,000	N/A	N/A
Energy Reports	$970,000	N/A	N/A
Energy Assessments	$2,200,000	N/A	N/A
Program Development	$330,000	N/A	N/A
Education Services Total	**$3,850,000**	**N/A**	**N/A**
Residential Air Conditioning	$6,400,000	7,125	13,300,000
Residential Demand Response - Manage	$6,300,000	204,482	23,413,735
Residential Demand Response - Build	$7,000,000	25,000	4,000,000
Residential Services Total	**$19,700,000**	**236,607**	**40,713,735**
Schools	$1,400,000	505	10,660,000
Commercial Services	$11,150,000	9,568	90,000,000
Commercial Demand Response - Manage	$900,000	22,427	8,988,406
Commercial Demand Response - Build	$1,500,000	5,000	1,000,000
Market Potential Study			
Commercial Services Total	**$14,950,000**	**37,500**	**110,648,406**
Total DSM Programs	**$38,500,000**	**274,107**	**151,362,141**

Table DSM-10B: 2018 Sierra Pacific Power Company Budget and Targets

Budget	Budget($)	Demand Savings (kW)	Annual Energy Savings (kWh)
Energy Education	$300,000	N/A	N/A
Energy Reports	$700,000	N/A	N/A
Energy Assessments	$1,700,000	N/A	N/A
Program Development	$100,000	N/A	N/A
Education Services Total	**$2,800,000**	**0**	**0**
Residential Demand Response - Manage	$800,000	13,877	1,950,641
Residential Demand Response - Build	$2,200,000	6,000	848,000
Residential Services Total	**$3,000,000**	**19,877**	**2,798,641**
Schools	$400,000	314	2,500,000
Commercial Services	$4,600,000	4,648	34,000,000
Commercial Demand Response - Manage	$600,000	6,347	358,994
Commercial Demand Response - Build	$800,000	2,000	565,000
Market Potential Study			
Commercial Services Total	**$6,400,000**	**13,309**	**37,423,994**
Total DSM Programs	**$12,200,000**	**33,186**	**40,222,635**

[2] See the Commission's Order in Nevada Power's and Sierra's 2017 Annual DSM Update Reports, Combined Docket Nos. 17-06043 and 17-06044, Order issued October 13, 2017.

Table DSM-10C: 2018 Combined Budget and Targets

Budget	Budget($)	Demand Savings (kW)	Annual Energy Savings (kWh)
Energy Education	$650,000	N/A	N/A
Energy Reports	$1,670,000	N/A	N/A
Energy Assessments	$3,900,000	N/A	N/A
Program Development	$430,000	N/A	N/A
Education Services Total	**$6,650,000**	**N/A**	**N/A**
Residential Air Conditioning	$6,400,000	7,125	13,300,000
Residential Demand Response - Manage	$7,100,000	218,359	25,364,376
Residential Demand Response - Build	$9,200,000	31,000	4,848,000
Residential Services Total	**$22,700,000**	**256,484**	**43,512,376**
Schools	$1,800,000	819	13,160,000
Commercial Services	$15,750,000	14,216	124,000,000
Commercial Demand Response - Manage	$1,500,000	28,774	9,347,400
Commercial Demand Response - Build	$2,300,000	7,000	1,565,000
Market Potential Study			
Commercial Services Total	**$21,350,000**	**50,809**	**148,072,400**
Total DSM Programs	**$50,700,000**	**307,293**	**191,584,776**

Section 4. The 2019-2021 Action Plan Period

The Planning Process

The DSM planning process for the IRP starts with three steps: data gathering, preliminary evaluations and plan development. The following paragraphs briefly describe each of these steps.

1. **Data Gathering** - The primary input for this first step is an evaluation of the performance of current DSM programs. The primary source of data for this evaluation is the M&V reports prepared by a third party independent evaluator. These reports provide a comprehensive analysis of each Company's effectiveness in meeting energy and demand savings targets for each program. Other inputs include market potential, market transformation and net-to-gross ("NTG") studies, service concepts and proposals gathered at conferences, discussions with vendors, data gathered through industry literature, periodic formal requests for information along with input from the DSM Collaborative.

2. **Preliminary Evaluation** - In this step, each of the products and services identified in the information gathering process are screened to determine if they are cost effective, feasible in the marketplace and likely to be adopted by customers. The financial analysis includes five industry-developed and Commission-approved tests. The Companies placed the most weight on the TRC results.

3. **Plan Development**. – The portfolios of DSM programs by Company were carefully developed by examining market potential and having extensive discussions with implementation contractors and vendors. Developing plans is complicated by the fact that the Companies must examine not only what is the feasible level of energy savings in the present market conditions, but also what is annual sustainable year over year. This means that potential performance of each program must be thoroughly examined for each of the next three years of the Action Plan period.

When designing the DSM Plan and determining energy savings targets, the Companies consider the following factors: 1) achievable level of energy savings at Nevada Power and Sierra individually; 2) rate impacts; 3) participation impacts; 4) system benefits; and 5) non-energy benefits.

Achievable Level of Energy Savings

The Companies conducted a new market potential study, which identifies various levels of savings potential. The "technical potential" is the theoretical upper limit of efficiency potential, assuming that customers adopt all feasible measures regardless of their cost or customer preference. This is considered unachievable and represents the upper limit of savings. The "economic potential" is described as the technical potential of those technologies, measures and practices that are cost-effective when compared to supply side alternatives. "Market potential" and "maximum achievable potential" refine the economic potential analysis by applying customer participation

rates that account for market barriers, customer awareness and attitudes, program maturity, and recent program history. More specifically:

- Market Potential maintains current levels of participation for mature programs, but uses higher levels of participation where additional opportunity was identified (e.g., residential cooling). It also includes new measures, such as light-emitting diode or "LED" lighting, using market adoption rates based on secondary research.

- Maximum Achievable Potential used secondary research on customer attitudes to accelerate market adoption by 50 percent for residential customers and by 40 percent for nonresidential customers. This assumes higher participation levels could be achieved with a combination of reduced market barriers: increased utility spending, and use of customer-preferred delivery mechanisms. Participation is capped at 85 percent to reflect a small subset of the population who will not participate in DSM programs.

The current potential study was designed specifically for Nevada, and its results are highly dependent upon unique characteristics of Nevadans, Nevada Power and Sierra.

Rate Impacts

The Companies have thoughtfully prepared a DSM Plan focused on balancing the long-term benefits of energy savings with the short-term impacts on rates (and customer bills). The Commission is required to consider the rate impact of a DSM portfolio to customers, as provided in NRS § 704.785(2) as follows:

> *When considering whether to approve an energy efficiency or conservation program proposed by an electric utility as part of a plan filed pursuant to NRS 704.741, the Commission shall consider the effect of any recovery by the electric utility pursuant to this section on the rates of the customers of the electric utility.*

Participation Impacts

The Companies have also been mindful of the tradeoff between a portfolio of programs designed to have a high level of customer participation with smaller amounts of individual savings potential compared to a smaller set of larger customers who are more likely to provide high levels of energy savings. If the DSM Plan had been designed solely on the perspective of maximizing energy savings, the portfolio of programs proposed would have been heavily weighted on the smaller subset of large customers with highest energy savings potential. The Companies chose to use a design approach that provides products and services for all customer segments and still achieves a significant increase in energy savings.

System and Non-Energy Benefits

The Companies also considered both system and non-energy benefits when designing the DSM Plan. The Companies have been offering DSM programs for many years; however in 2016, a fundamental shift was made in the implementation processes, away from soloed energy efficiency and demand response programs to fully integrated programs designed to optimize energy and demand savings. In addition to direct bill savings for participants, all customers benefit from the implementation of energy efficiency and demand response programs. The DSM portfolios presented have the ability to flatten the system load shape and improve the system load factor. This effect is driven by two primary factors: permanent peak demand savings and dispatchable peak demand savings. Permanent peak demand savings are derived from the coincident peak demand savings from energy efficiency programs. Programs such as the Commercial Services programs have a significant impact on system peak demand. Dispatchable peak demand savings are derived from the residential and commercial demand response programs. Demand response events avoid the purchase of expensive peak market energy and provide substantial savings for all customers.

With respect to electricity grid benefits, the demand response program is currently used for 10-minute operating reserves. It can also be strategically dispatched by location to reduce congestion on the distribution system or in response to a distribution system emergency. The system can operate in much the same fashion as a supply-side peaking resource but also provides an added suite of customer, environmental and locational dispatch benefits. Growth of demand response resources and distributed energy resource operational capabilities will allow the Companies to more easily accommodate an ever increasing amount of renewable energy on the grid.

Non-Energy Benefits

Beyond energy and demand savings there are many benefits that are difficult to quantify without an extensive and costly study. These benefits are often referred to as non-energy benefits. These include but are not limited to, increase in on-time energy bill payments, job creation/economic development, water infrastructure, broad health effects, neighborhood impacts, increased comfort, improved maintenance, higher productivity, along with improved health, and indoor/outdoor air quality.

In addition to the criteria above, the Companies conducted a number of DSM Collaborative workshops with representatives from the Staff, the BCP, and other key stakeholders such as the Southwest Energy Efficiency Project (“SWEEP”), National Resource Defense Council (“NRDC”), the Governor’s Office of Energy and Southwest Gas Corporation. Major topics of discussion included but were not limited to 2017 program results, new directives from legislation passed in 2017, the portfolio of programs to be presented in the 2019-2021 DSM Plans, market potential study, low-income programs and income qualifications, non-energy benefits and cost-effectiveness analysis. The feedback and areas of consensus were incorporated into the development of the DSM Plans.

As a final step, a financial analysis was performed for each program in the plans. The hourly marginal avoided energy costs as determined by PROMOD for the IRP resource case are used as an input to determine the final cost-effectiveness ratios for each program. This final financial test was performed to ensure the portfolio of programs remain cost effective with the updated avoided costs.

DSM Program Selection Process

Separate DSM Plans for Nevada Power and for Sierra were developed side-by-side, with the goal to achieve or exceed a statewide energy savings goal of an average of 1.1 percent of weather normalized retails sales over the three year Action Plan period. In addition the results of the recently conducted market potential, net-to-gross and market transformation studies were used to make informed decisions on projects and project designs. The following describes the logic that was followed in developing the set of programs within each of the DSM Plans.

The Companies started with the 2018 portfolio of programs for Nevada Power and Sierra already approved by the Commission, and worked with interested stakeholders to optimize the DSM product offerings and meet a 1.1 percent energy savings goal statewide. In determining the mix of programs within the DSM Plans, the Companies were guided by the results of the Market Potential Study, supplemented with the legislatively mandated low-income program.

Hundreds of energy efficiency and demand response measures by sector, segments and end use were evaluated in the Market Potential Study, from which they were able to determine that a relatively small number of measures account for the majority of savings in 2019-2021. In 2019, the following measures account for 70 percent of market potential savings: commercial lighting, residential smart thermostats, residential central air conditioning ("AC") (replace on burnout and retrofit), home energy reports, and residential LED lighting. The pattern is fairly consistent across years, with the exception of residential LEDs, where the 2020 EISA standard causes savings to shift to the baseline. With the exception of residential lighting and at Sierra a residential AC retrofit program, the Companies are currently implementing programs that incorporate the top energy savings measures. The process of identifying the top savings measures was then applied at the company and sector level. This allowed the identification of gaps compared to current set of programs, which were in the residential sector. As a result, the Nevada Power portfolio was expanded to include a residential lighting program, a pool pumps program and expanded list of measures in the residential air conditioning program. At Sierra the proposed portfolio adds a residential AC program and a residential lighting program. The study also identified a greater potential for energy savings in the commercial sector. The DSM Plans presented have expanded Commercial Services programs at both Companies to more accurately reflect the market potential.

The Companies are supportive of recent legislation that expand their DSM offerings to low-income customers. The Companies looked closely at low-income programs being conducted by other utilities and/or state agencies to design a program that compliments rather than competes with current low-income programs in Nevada. There are several funding sources already support bill assistance and weatherization in Nevada, including the Universal Energy Charge. Thus the Companies have designed a program that fills a gap by replacing older inefficient electric appliances with new Energy Star® appliances.

The Companies are also continuing their implementation strategies, which integrate energy efficiency and demand response programs by customer segment. Nevada Power and Sierra are proposing integrated sets of services designed to maintain a practical budget, optimize energy and

demand savings, and increase participation while using a more personalized and customized approach. All programs have been bundled into one of the following offerings: 1) Outreach and Product Development; 2) Home Services; and 3) Business Services. Budgets, savings, and cost-effectiveness have been presented at the program level to provide the same level of transparency as in prior filings.

The portfolios of DSM programs presented in the plans provide tools that enable customers to manage their energy usage and thus the magnitude of their bills, reduce system peak demands, save energy, reduce greenhouse gasses and other environmental pollutants, and create jobs. Benefits also include 1) saving water, 3) providing an alternative for operating reserves, 4) acting as insurance for electric system events, 5) providing net dollar benefits to communities, and 6) providing more comfortable living environments.

Table DSM-11A: Nevada Power Company 2019-2021 DSM Plan Budget Table

Budget	2019 Plan	2020 Plan	2021 Plan
Energy Education	$500,000	$500,000	$500,000
Energy Reports	$1,200,000	$1,200,000	$1,200,000
Energy Assessments	$2,500,000	$2,500,000	$2,500,000
Program Development	$200,000	$300,000	$300,000
Subtotal - Outreach & Program Development	**$4,400,000**	**$4,500,000**	**$4,500,000**
Residential Lighting	$2,000,000	$1,600,000	$1,000,000
Pool Pumps	$1,000,000	$1,200,000	$1,200,000
Low Income	$2,000,000	$2,000,000	$2,000,000
Residential Air Conditioning	$7,000,000	$7,000,000	$7,000,000
Direct Install	$500,000	$500,000	$500,000
Residential Demand Response - Manage	$7,300,000	$7,500,000	$7,700,000
Residential Demand Response - Build	$7,000,000	$7,100,000	$7,300,000
Subtotal - Home Services	**$26,800,000**	**$26,900,000**	**$26,700,000**
Schools Program	$1,600,000	$1,700,000	$1,700,000
Commercial Services	$14,500,000	$14,500,000	$15,000,000
Commercial Demand Response Program - Manage	$800,000	$900,000	$1,000,000
Commercial Demand Response Program - Build	$1,700,000	$1,700,000	$1,700,000
Subtotal - Business Services	**$18,600,000**	**$18,800,000**	**$19,400,000**
Total DSM Programs	**$49,800,000**	**$50,200,000**	**$50,600,000**

Table DSM-11B: Sierra Pacific Power Company 2019-2021 DSM Plan Budget Table

Budget	2019 Plan	2020 Plan	2021 Plan
Energy Education	$400,000	$400,000	$400,000
Energy Reports	$575,000	$675,000	$775,000
Energy Assessments	$1,125,000	$1,375,000	$1,375,000
Program Development	$50,000	$100,000	$100,000
Subtotal - Outreach & Program Development	**$2,150,000**	**$2,550,000**	**$2,650,000**
Residential Lighting	$1,100,000	$800,000	$600,000
Low Income	$600,000	$700,000	$700,000
Residential Air Conditioning	$600,000	$500,000	$500,000
Direct Install	$150,000	$150,000	$150,000
Residential Demand Response - Manage	$800,000	$900,000	$1,100,000
Residential Demand Response - Build	$2,500,000	$2,600,000	$2,700,000
Subtotal - Home Services	**$5,750,000**	**$5,650,000**	**$5,750,000**
Schools Program	$600,000	$600,000	$600,000
Commercial Services	$5,000,000	$5,300,000	$5,600,000
Commercial Demand Response Program - Manage	$400,000	$500,000	$600,000
Commercial Demand Response Program - Build	$900,000	$900,000	$900,000
Subtotal - Business Services	**$6,900,000**	**$7,300,000**	**$7,700,000**
Total DSM Programs	**$14,800,000**	**$15,500,000**	**$16,100,000**

Table DSM-11C: Combined 2019-2021 DSM Plan Budget Table

Budget	2019 Plan	2020 Plan	2021 Plan
Energy Education	$900,000	$900,000	$900,000
Energy Reports	$1,775,000	$1,875,000	$1,975,000
Energy Assessments	$3,625,000	$3,875,000	$3,875,000
Program Development	$250,000	$400,000	$400,000
Subtotal - Outreach & Program Development	**$6,550,000**	**$7,050,000**	**$7,150,000**
Residential Lighting	$3,100,000	$2,400,000	$1,600,000
Pool Pumps	$1,000,000	$1,200,000	$1,200,000
Low Income	$2,600,000	$2,700,000	$2,700,000
Residential Air Conditioning	$7,600,000	$7,500,000	$7,500,000
Direct Install	$650,000	$650,000	$650,000
Residential Demand Response - Manage	$8,100,000	$8,400,000	$8,800,000
Residential Demand Response - Build	$9,500,000	$9,700,000	$10,000,000
Subtotal - Home Services	**$32,550,000**	**$32,550,000**	**$32,450,000**
Schools Program	$2,200,000	$2,300,000	$2,300,000
Commercial Services	$19,500,000	$19,800,000	$20,600,000
Commercial Demand Response Program - Manage	$1,200,000	$1,400,000	$1,600,000
Commercial Demand Response Program - Build	$2,600,000	$2,600,000	$2,600,000
Subtotal - Business Services	**$25,500,000**	**$26,100,000**	**$27,100,000**
Total DSM Programs	**$64,600,000**	**$65,700,000**	**$66,700,000**

Table DSM-12A: 2019-2021 Nevada Power Company Energy and Demand Savings

Program	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)
Year	**2019**		**2020**		**2021**	
Energy Education	110	1,155,000	110	1,155,000	110	1,155,000
Energy Reports	1,500	13,300,000	1,500	13,300,000	1,500	13,300,000
Energy Assessments	300	2,700,000	300	2,700,000	300	2,700,000
Program Development	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal - Outreach & Program Development	**1,910**	**17,155,000**	**1,910**	**17,155,000**	**1,910**	**17,155,000**
Residential Lighting	1,200	10,675,000	950	8,536,800	600	5,313,600
Pool Pumps	600	5,310,000	700	6,490,000	700	6,490,000
Low Income	160	1,435,000	160	1,435,000	160	1,435,000
Residential Air Conditioning	1,500	13,543,000	1,500	13,543,000	1,500	13,543,000
Direct Install	110	1,000,000	110	1,000,000	110	1,000,000
Residential Demand Response - Manage	TBD	27,413,700	TBD	27,413,700	TBD	27,413,700
Residential Demand Response - Build	28,000	3,600,200	28,000	3,600,200	28,000	3,600,200
Subtotal - Home Services	**31,570**	**62,976,900**	**31,420**	**62,018,700**	**31,070**	**58,795,500**
Schools Program	1,650	14,500,000	1,750	15,500,000	1,750	15,500,000
Commercial Services	18,000	161,100,000	17,400	152,600,000	18,000	157,900,000
Commercial Demand Response Program - Manage	TBD	10,147,600	TBD	10,147,600	TBD	10,147,600
Commercial Demand Response Program - Build	4,000	1,000,000	4,000	1,000,000	4,000	1,000,000
Subtotal - Business Services	**23,650**	**186,747,600**	**23,150**	**179,247,600**	**23,750**	**184,547,600**
Total DSM Programs	**57,130**	**266,879,500**	**56,480**	**258,421,300**	**56,730**	**260,498,100**

Table DSM-12B: 2019-2021 Sierra Pacific Power Company Energy and Demand Savings

Program	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)
Year	**2019**		**2020**		**2021**	
Energy Education	90	866,600	90	866,600	90	866,600
Energy Reports	850	7,800,000	1,000	8,900,000	1,250	11,300,000
Energy Assessments	130	1,200,000	150	1,300,000	150	1,300,000
Program Development	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal - Outreach & Program Development	**1,070**	**9,866,600**	**1,240**	**11,066,600**	**1,490**	**13,466,600**
Residential Lighting	650	5,877,800	450	4,038,000	300	2,804,400
Low Income	40	367,700	55	483,000	55	483,000
Residential Air Conditioning	110	998,000	90	789,000	90	789,000
Direct Install	45	400,000	45	400,000	45	400,000
Residential Demand Response - Manage	TBD	2,784,600	TBD	2,784,600	TBD	2,784,600
Residential Demand Response - Build	6,000	909,100	6,000	909,100	6,000	909,100
Subtotal - Home Services	**6,845**	**11,337,200**	**6,640**	**9,403,700**	**6,490**	**8,170,100**
Schools Program	525	4,600,000	500	4,300,000	500	4,300,000
Commercial Services	6,000	52,600,000	6,350	55,800,000	6,725	58,900,000
Commercial Demand Response Program - Manage	TBD	626,700	TBD	626,700	TBD	626,700
Commercial Demand Response Program - Build	2,000	500,000	2,000	500,000	2,000	500,000
Subtotal - Business Services	**8,525**	**58,326,700**	**8,850**	**61,226,700**	**9,225**	**64,326,700**
Total DSM Programs	**16,440**	**79,530,500**	**16,730**	**81,697,000**	**17,205**	**85,963,400**

Table DSM-12C: 2019-2021 Combined Energy and Demand Savings

Program	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)	Demand Savings (kW)	Annual Energy Savings (kWh)
Year	**2019**		**2020**		**2021**	
Energy Education	200	2,021,600	200	2,021,600	200	2,021,600
Energy Reports	2,350	21,100,000	2,500	22,200,000	2,750	24,600,000
Energy Assessments	430	3,900,000	450	4,000,000	450	4,000,000
Program Development						
Subtotal - Outreach & Program Development	**2,980**	**27,021,600**	**3,150**	**28,221,600**	**3,400**	**30,621,600**
Residential Lighting	1,850	16,552,800	1,400	12,574,800	900	8,118,000
Pool Pumps	600	5,310,000	700	6,490,000	700	6,490,000
Low Income	200	1,802,700	215	1,918,000	215	1,918,000
Residential Air Conditioning	1,610	14,541,000	1,590	14,332,000	1,590	14,332,000
Direct Install	155	1,400,000	155	1,400,000	155	1,400,000
Residential Demand Response - Manage	TBD	30,198,300	TBD	30,198,300	TBD	30,198,300
Residential Demand Response - Build	34,000	4,509,300	34,000	4,509,300	34,000	4,509,300
Subtotal - Home Services	**38,415**	**74,314,100**	**38,060**	**71,422,400**	**37,560**	**66,965,600**
Schools Program	2,175	19,100,000	2,250	19,800,000	2,250	19,800,000
Commercial Services	24,000	213,700,000	23,750	208,400,000	24,725	216,800,000
Commercial Demand Response Program - Manage	TBD	10,774,300	TBD	10,774,300	TBD	10,774,300
Commercial Demand Response Program - Build	6,000	1,500,000	6,000	1,500,000	6,000	1,500,000
Subtotal - Business Services	**32,175**	**245,074,300**	**32,000**	**240,474,300**	**32,975**	**248,874,300**
Total DSM Programs	**73,570**	**346,410,000**	**73,210**	**340,118,300**	**73,935**	**346,461,500**

Table DSM-13A: 2019-2021 Nevada Power Company TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$280,635	$1,190,174	($909,539)	0.24
Energy Reports	$7,451,199	$2,856,417	$4,594,782	2.61
Energy Assessments	$835,564	$5,950,869	($5,115,305)	0.14
Program Development	N/A	N/A	N/A	N/A
Subtotal - Outreach & Program Development	**$8,567,398**	**$9,997,460**	**($1,430,062)**	**0.86**
Residential Lighting	$7,876,752	$3,508,835	$4,367,917	2.24
Pool Pumps	$5,906,496	$2,318,952	$3,587,544	2.55
Low Income	$1,253,520	$5,312,936	($4,059,416)	0.24
Residential Air Conditioning	$32,465,400	$28,962,305	$3,503,095	1.12
Direct Install	$409,627	$1,190,174	($780,547)	0.34
Residential Demand Response - Manage	$97,224,604	$14,550,920	$82,673,684	6.68
Residential Demand Response - Build	$79,868,419	$30,476,816	$49,391,603	2.62
Subtotal - Home Services	**$225,004,818**	**$86,320,938**	**$138,683,880**	**2.61**
Schools Program	$17,418,857	$11,169,647	$6,249,210	1.56
Commercial Services	$146,510,707	$79,039,392	$67,471,315	1.85
Commercial Demand Response Program - Manage	$13,338,910	$2,501,403	$10,837,507	5.33
Commercial Demand Response Program - Build	$11,106,841	$5,745,029	$5,361,812	1.93
Subtotal - Business Services	**$188,375,315**	**$98,455,471**	**$89,919,844**	**1.91**
Total DSM Programs	**$421,947,531**	**$194,773,869**	**$227,173,662**	**2.17**

Table DSM-13B: 2019-2021 Sierra Pacific Power Company TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$234,315	$990,600	($756,285)	0.24
Energy Reports	$5,887,764	$1,661,016	$4,226,748	3.54
Energy Assessments	$455,899	$3,185,394	($2,729,495)	0.14
Program Development	N/A	N/A	N/A	N/A
Subtotal - Outreach & Program Development	**$6,577,978**	**$5,837,010**	**$740,968**	**1.13**
Residential Lighting	$4,764,453	$2,041,646	$2,722,807	2.33
Low Income	$401,998	$1,814,958	($1,412,960)	0.22
Residential Air Conditioning	$800,953	$2,763,056	($1,962,103)	0.29
Direct Install	$163,220	$371,476	($208,256)	0.44
Residential Demand Response - Manage	$17,091,395	$2,853,354	$14,238,041	5.60
Residential Demand Response - Build	$22,612,124	$12,300,898	$10,311,226	1.84
Subtotal - Home Services	**$45,834,143**	**$22,145,388**	**$23,688,755**	**2.07**
Schools Program	$6,237,091	$2,216,527	$4,020,564	2.81
Commercial Services	$58,457,555	$26,270,969	$32,186,586	2.23
Commercial Demand Response Program - Manage	$5,875,867	$1,573,863	$4,302,004	3.73
Commercial Demand Response Program - Build	$7,226,423	$3,798,561	$3,427,862	1.90
Subtotal - Business Services	**$77,796,936**	**$33,859,920**	**$43,937,016**	**2.30**
Total DSM Programs	**$130,209,057**	**$61,842,318**	**$68,366,739**	**2.11**

Table DSM-13C: 2019-2021 Combined TRC Benefits/Costs Results

Program	Benefits	Costs	Net Benefits	TRC B/C Ratio
Energy Education	$514,950	$2,180,774	($1,665,824)	0.24
Energy Reports	$13,338,963	$4,517,433	$8,821,530	2.95
Energy Assessments	$1,291,463	$9,136,263	($7,844,800)	0.14
Program Development	N/A	N/A	N/A	N/A
Subtotal - Outreach & Program Development	**$15,145,376**	**$15,834,470**	**($689,094)**	**0.96**
Residential Lighting	$12,641,205	$5,550,481	$7,090,724	2.28
Pool Pumps	$5,906,496	$2,318,952	$3,587,544	2.55
Low Income	$1,655,518	$7,127,894	($5,472,376)	0.23
Residential Air Conditioning	$33,266,353	$31,725,361	$1,540,992	1.05
Direct Install	$572,847	$1,561,650	($988,803)	0.37
Residential Demand Response - Manage	$114,315,999	$17,404,274	$96,911,725	6.57
Residential Demand Response - Build	$102,480,543	$42,777,714	$59,702,829	2.40
Subtotal - Home Services	**$270,838,961**	**$108,466,326**	**$162,372,635**	**2.50**
Schools Program	$23,655,948	$13,386,174	$10,269,774	1.77
Commercial Services	$204,968,262	$105,310,361	$99,657,901	1.95
Commercial Demand Response Program - Manage	$19,214,777	$4,075,266	$15,139,511	4.71
Commercial Demand Response Program - Build	$18,333,264	$9,543,590	$8,789,674	1.92
Subtotal - Business Services	**$266,172,251**	**$132,315,391**	**$133,856,860**	**2.01**
Total DSM Programs	**$552,156,588**	**$256,616,187**	**$295,540,401**	**2.15**

Table DSM-14A: Nevada Power Company Lifetime Environmental Benefits

Program	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Energy Education	243	2,430,905	1,351	104	0	658	35	173,250
Energy Reports	2,793	27,992,244	15,561	1,197	0	7,581	399	1,995,000
Energy Assessments	567	5,682,636	3,159	243	0	1,539	81	405,000
Subtotal - Outreach & Program Development	**3,603**	**36,105,785**	**20,071**	**1,544**	**0**	**9,778**	**515**	**2,573,250**
Residential Lighting	1,717	17,206,040	9,565	736	0	4,660	245	1,226,270
Pool Pumps	1,280	12,831,532	7,133	549	0	3,475	183	914,500
Low Income	301	3,020,216	1,679	129	0	818	43	215,250
Residential Air Conditioning	12,797	128,255,440	71,298	5,484	0	34,735	1,828	9,140,732
Direct Install	210	2,104,680	1,170	90	0	570	30	150,000
Residential Demand Response - Manage	11,288	113,131,312	62,890	4,838	0	30,639	1,613	8,062,839
Residential Demand Response - Build	3,318	33,253,053	18,486	1,422	0	9,006	474	2,369,937
Subtotal - Home Services	**30,911**	**309,802,273**	**172,220**	**13,248**	**0**	**83,902**	**4,416**	**22,079,528**
Schools Program	14,115	141,468,634	78,643	6,049	0	38,313	2,016	10,082,433
Commercial Services	143,721	1,440,417,627	800,734	61,595	0	390,101	20,532	102,658,192
Commercial Demand Response Program - Manage	4,818	48,289,971	26,845	2,065	0	13,078	688	3,441,614
Commercial Demand Response Program - Build	1,127	11,298,701	6,281	483	0	3,060	161	805,256
Subtotal - Business Services	**163,782**	**1,641,474,932**	**912,502**	**70,192**	**0**	**444,552**	**23,397**	**116,987,494**
Total DSM Programs	**198,296**	**1,987,382,990**	**1,104,794**	**84,984**	**0**	**538,233**	**28,328**	**141,640,272**

Table DSM-14B: Sierra Pacific Power Company Lifetime Environmental Benefits

Program	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Energy Education	936	1,860,495	2,210	104	0	1,352	26	925,529
Energy Reports	10,080	20,037,640	23,800	1,120	0	14,560	280	9,968,000
Energy Assessments	1,368	2,719,394	3,230	152	0	1,976	38	1,352,800
Subtotal - Outreach & Program Development	**12,384**	**24,617,529**	**29,240**	**1,376**	**-**	**17,888**	**344**	**12,246,329**
Residential Lighting	4,579	9,102,957	10,812	509	0	6,615	127	4,528,391
Low Income	480	954,436	1,134	53	0	694	13	474,797
Residential Air Conditioning	927	1,843,463	2,190	103	0	1,340	26	917,056
Direct Install	432	858,756	1,020	48	0	624	12	427,200
Residential Demand Response - Manage	6,431	12,784,816	15,185	715	0	9,290	179	6,359,983
Residential Demand Response - Build	3,724	7,402,885	8,793	414	0	5,379	103	3,682,667
Subtotal - Home Services	**16,574**	**32,947,312**	**39,134**	**1,842**	**0**	**23,941**	**460**	**16,390,094**
Schools Program	22,321	44,371,375	52,703	2,480	0	32,242	620	22,073,152
Commercial Services	292,501	581,451,224	690,627	32,500	0	422,501	8,125	289,250,920
Commercial Demand Response Program - Manage	1,099	2,185,577	2,596	122	0	1,588	31	1,087,245
Commercial Demand Response Program - Build	1,363	2,709,039	3,218	151	0	1,968	38	1,347,649
Subtotal - Business Services	**317,284**	**630,717,214**	**749,144**	**35,254**	**0**	**458,300**	**8,813**	**313,758,965**
Total DSM Programs	**346,243**	**688,282,055**	**817,517**	**38,471**	**0**	**500,128**	**9,618**	**342,395,388**

Table DSM-14C: Combined Lifetime Environmental Benefits

Program	Sulfur Dioxide (lbs)	Carbon Dioxide (lbs)	Carbon Monoxide (lbs)	Particulate Matter (lbs)	Volatile Organic Compounds (lbs)	Nitrogen Oxides (lbs)	Heavy Metals (lbs)	Water Savings (Gallons)
Energy Education	1,178	4,291,400	3,561	208	0	2,010	61	1,098,779
Energy Reports	12,873	48,029,884	39,361	2,317	0	22,141	679	11,963,000
Energy Assessments	1,935	8,402,030	6,389	395	0	3,515	119	1,757,800
Subtotal - Outreach & Program Development	**15,986**	**60,723,314**	**49,311**	**2,920**	**0**	**27,666**	**859**	**14,819,579**
Residential Lighting	6,296	26,308,996	20,377	1,245	0	11,274	372	5,754,661
Pool Pumps	1,280	12,831,532	7,133	549	0	3,475	183	914,500
Low Income	781	3,974,652	2,813	182	0	1,511	56	690,047
Residential Air Conditioning	13,724	130,098,902	73,487	5,587	0	36,074	1,854	10,057,788
Direct Install	642	2,963,436	2,190	138	0	1,194	42	577,200
Residential Demand Response - Manage	17,719	125,916,128	78,075	5,552	0	39,929	1,791	14,422,822
Residential Demand Response - Build	7,042	40,655,938	27,278	1,836	0	14,385	577	6,052,603
Subtotal - Home Services	**47,486**	**342,749,584**	**211,354**	**15,089**	**0**	**107,843**	**4,876**	**38,469,622**
Schools Program	36,437	185,840,009	131,346	8,530	0	70,555	2,637	32,155,585
Commercial Services	436,222	2,021,868,851	1,491,361	94,095	0	812,602	28,657	391,909,112
Commercial Demand Response Program - Manage	5,918	50,475,548	29,441	2,187	0	14,666	719	4,528,859
Commercial Demand Response Program - Build	2,490	14,007,740	9,499	635	0	5,028	199	2,152,904
Subtotal - Business Services	**481,067**	**2,272,192,147**	**1,661,646**	**105,446**	**0**	**902,852**	**32,211**	**430,746,460**
Total DSM Programs	**544,539**	**2,675,665,045**	**1,922,311**	**123,456**	**0**	**1,038,361**	**37,946**	**484,035,661**

Estimated NRS § 704.785 Revenue Requirement for DSM Plan[3]

The Commission's June 23, 2015 Order in Docket No. 14-10118 resulted in a new regulation modifying the lost revenue adjustment mechanism ("LRAM"). The regulation replaced the Energy Efficiency Implementation Rate ("EEIR") calculations, which were based on measured and verified energy savings, with a new value to be included with the Energy Efficiency Program Rate ("EEPR"). The value of the disincentive offset calculated under the new regulation is determined by multiplying the annual expenditures in the each of company's energy efficiency and conservation programs by that company's authorized overall rate of return, grossed up for taxes.

The Companies employed the revised approved LRAM methodology in calculating the estimated NRS § 704.785 revenue requirement for 2019-2021 period in this filing. The computations underlying the revised the new regulation multiplier methodology values for each program are provided in Technical Appendix DSM-2.

Table DSM-15A: Nevada Power Company Revenue Multiplier Methodology

NPC Programs 2019-2021	2019 Plan Budget	2019 Multiplier Value	2020 Plan Budget	2020 Multiplier Value	2021 Plan Budget	2021 Multiplier Value
Energy Education	$500,000	$46,000	$500,000	$46,000	$500,000	$46,000
Energy Reports	$1,200,000	$110,400	$1,200,000	$110,400	$1,200,000	$110,400
Energy Assessments	$2,500,000	$230,000	$2,500,000	$230,000	$2,500,000	$230,000
Program Development	$200,000	$18,400	$300,000	$27,600	$300,000	$27,600
Subtotal - Outreach & Program Development	**$4,400,000**	**$404,800**	**$4,500,000**	**$414,000**	**$4,500,000**	**$414,000**
Residential Lighting	$2,000,000	$184,000	$1,600,000	$147,200	$1,000,000	$92,000
Pool Pumps	$1,000,000	$92,000	$1,200,000	$110,400	$1,200,000	$110,400
Low Income	$2,000,000	$184,000	$2,000,000	$184,000	$2,000,000	$184,000
Residential Air Conditioning	$7,000,000	$644,000	$7,000,000	$644,000	$7,000,000	$644,000
Direct Install	$500,000	$46,000	$500,000	$46,000	$500,000	$46,000
Residential Demand Response - Manage	$7,300,000	$671,600	$7,500,000	$690,000	$7,700,000	$708,400
Residential Demand Response - Build	$7,000,000	$644,000	$7,100,000	$653,200	$7,300,000	$671,600
Subtotal - Home Services	**$26,800,000**	**$2,465,600**	**$26,900,000**	**$2,474,800**	**$26,700,000**	**$2,456,400**
Schools Program	$1,600,000	$147,200	$1,700,000	$156,400	$1,700,000	$156,400
Commercial Services	$14,500,000	$1,334,000	$14,500,000	$1,334,000	$15,000,000	$1,380,000
Commercial Demand Response Program - Manage	$800,000	$73,600	$900,000	$82,800	$1,000,000	$92,000
Commercial Demand Response Program - Build	$1,700,000	$156,400	$1,700,000	$156,400	$1,700,000	$156,400
Subtotal - Business Services	**$18,600,000**	**$1,711,200**	**$18,800,000**	**$1,729,600**	**$19,400,000**	**$1,784,800**
Total Demand Side	**$49,800,000**	**$4,581,600**	**$50,200,000**	**$4,618,400**	**$50,600,000**	**$4,655,200**

[3] For the purpose of this DSM Narrative, the "NRS 704.785 Revenue Requirement" refers to the energy efficiency implementation rate revenue requirement.

Table DSM-15B: Sierra Pacific Power Company Revenue Multiplier Methodology

SPPC Programs 2019-2021	2019 Preferred Plan Budget	2019 Multiplier Value	2020 Preferred Plan Budget	2020 Multiplier Value	2021 Preferred Plan Budget	2021 Multiplier Value
Energy Education	$400,000	$31,533	$400,000	$31,533	$400,000	$31,533
Energy Reports	$575,000	$45,328	$675,000	$53,211	$775,000	$61,094
Energy Assessments	$1,125,000	$88,685	$1,375,000	$108,393	$1,375,000	$108,393
Program Development	$50,000	$3,942	$100,000	$7,883	$100,000	$7,883
Subtotal - Outreach & Program Development	**$2,150,000**	**$169,488**	**$2,550,000**	**$201,020**	**$2,650,000**	**$208,903**
Residential Lighting	$1,100,000	$86,715	$800,000	$63,065	$600,000	$47,299
Low Income	$600,000	$47,299	$700,000	$55,182	$700,000	$55,182
Residential Air Conditioning	$600,000	$47,299	$500,000	$39,416	$500,000	$39,416
Direct Install	$150,000	$11,825	$150,000	$11,825	$150,000	$11,825
Residential Demand Response - Manage	$800,000	$63,065	$900,000	$70,948	$1,100,000	$86,715
Residential Demand Response - Build	$2,500,000	$197,079	$2,600,000	$204,962	$2,700,000	$212,845
Subtotal - Home Services	**$5,750,000**	**$453,281**	**$5,650,000**	**$445,398**	**$5,750,000**	**$453,281**
Schools Program	$600,000	$47,299	$600,000	$47,299	$600,000	$47,299
Commercial Services	$5,000,000	$394,158	$5,300,000	$417,807	$5,600,000	$441,456
Commercial Demand Response Program - Manage	$400,000	$31,533	$500,000	$39,416	$600,000	$47,299
Commercial Demand Response Program - Build	$900,000	$70,948	$900,000	$70,948	$900,000	$70,948
Subtotal - Business Services	**$6,900,000**	**$543,937**	**$7,300,000**	**$575,470**	**$7,700,000**	**$607,003**
Total Demand Side	**$14,800,000**	**$1,166,706**	**$15,500,000**	**$1,221,888**	**$16,100,000**	**$1,269,187**

Table DSM-15C: Combined Revenue Multiplier Methodology

Combined Programs 2019-2021	2019 Plan Budget	2019 Multiplier Value	2020 Plan Budget	2020 Multiplier Value	2021 Plan Budget	2021 Multiplier Value
Energy Education	$900,000	$77,533	$900,000	$77,533	$900,000	$77,533
Energy Reports	$1,775,000	$155,728	$1,875,000	$163,611	$1,975,000	$171,494
Energy Assessments	$3,625,000	$318,685	$3,875,000	$338,393	$3,875,000	$338,393
Program Development	$250,000	$22,342	$400,000	$35,483	$400,000	$35,483
Subtotal - Outreach & Program Development	**$6,550,000**	**$574,288**	**$7,050,000**	**$615,020**	**$7,150,000**	**$622,903**
Residential Lighting	$3,100,000	$270,715	$2,400,000	$210,265	$1,600,000	$139,299
Pool Pumps	$1,000,000	$92,000	$1,200,000	$110,400	$1,200,000	$110,400
Low Income	$2,600,000	$231,299	$2,700,000	$239,182	$2,700,000	$239,182
Residential Air Conditioning	$7,600,000	$691,299	$7,500,000	$683,416	$7,500,000	$683,416
Direct Install	$650,000	$57,825	$650,000	$57,825	$650,000	$57,825
Residential Demand Response - Manage	$8,100,000	$734,665	$8,400,000	$760,948	$8,800,000	$795,115
Residential Demand Response - Build	$9,500,000	$841,079	$9,700,000	$858,162	$10,000,000	$884,445
Subtotal - Home Services	**$32,550,000**	**$2,918,881**	**$32,550,000**	**$2,920,198**	**$32,450,000**	**$2,909,681**
Schools Program	$2,200,000	$194,499	$2,300,000	$203,699	$2,300,000	$203,699
Commercial Services	$19,500,000	$1,728,158	$19,800,000	$1,751,807	$20,600,000	$1,821,456
Commercial Demand Response Program - Manage	$1,200,000	$105,133	$1,400,000	$122,216	$1,600,000	$139,299
Commercial Demand Response Program - Build	$2,600,000	$227,348	$2,600,000	$227,348	$2,600,000	$227,348
Subtotal - Business Services	**$25,500,000**	**$2,255,137**	**$26,100,000**	**$2,305,070**	**$27,100,000**	**$2,391,803**
Total Demand Side	**$64,600,000**	**$5,748,306**	**$65,700,000**	**$5,840,288**	**$66,700,000**	**$5,924,387**

Economic Impact

DSM programs create and maintain both direct and indirect jobs and economic investment. DSM programs engage contractors and other service providers who deliver the programs. DSM programs may encourage new firms to join the marketplace or existing firms to expand their size to accommodate an increase in work enabled by rebate and incentive programs. For some contractors, the rebate and incentive programs enable them to perform work that would not have been performed absent the DSM program, thus offsetting the need for layoffs. The DSM programs impact the entire supply chain from manufacturers to wholesalers and distributors to retailers and those who specify equipment.

In addition, dollars saved by residential and commercial customers are available to be reinvested into the community. Residential customers may take the savings from their utility bills and spend them in local restaurants or with retailers, or use them to perform additional work on their homes. Commercial customers who participate in programs may have higher profit margins and can afford to expand their businesses, hire additional employees, and perform additional work on their facilities. In the case of schools, utility savings can be used to offset budget shortfalls. For each indirect job created by the program, additional dollars are available for reinvestment in the community generating further economic benefits for all citizens. The Report from the Executive Office of the President Council of Economic Advisers: "Estimates of Job Creation From the American Recovery and Reinvestment Act of 2009" dated May 2009 estimates one job is created for each $92,000 spent.[4]. Contractor employment is calculated as Budget (or Expenditures) less 15 percent for Utility Administration divided by $92,000. Employing this formula for the Companies' portfolio for the 2019-2021 program years, the Plan is estimated to create 1,391 jobs in Nevada Power's territory and 429 in Sierra's service territory.

Table DSM-16A: 2019-2021 Nevada Power Company Jobs Created

Program	Jobs
Energy Education	14
Energy Reports	33
Energy Assessments	69
Program Development	7
Residential Lighting	43
Pool Pumps	31
Low Income	55
Direct Install	194
Residential Air Conditioning	14
Residential Demand Response - Manage	208
Residential Demand Response - Build	198
Schools Program	46
Commercial Services	407
Commercial Demand Response Program - Manage	25
Commercial Demand Response Program - Build	47
Total	**1,391**

[4] Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009. Executive Office of the President, Council of Economic Advisers. May 2009.

Table DSM-16B: 2019-2021 Sierra Pacific Power Company Jobs Created

Program	Jobs
Energy Education	11
Energy Reports	19
Energy Assessments	36
Program Development	2
Residential Lighting	23
Direct Install	18
Low Income	15
Residential Air Conditioning	4
Residential Demand Response - Manage	26
Residential Demand Response - Build	72
Schools Program	17
Commercial Services	147
Commercial Demand Response Program - Manage	14
Commercial Demand Response Program - Build	25
Total	**429**

Table DSM-16C: 2019-2021 Combined Jobs Created

Program	Jobs
Energy Education	25
Energy Reports	52
Energy Assessments	105
Program Development	10
Residential Lighting	66
Pool Pumps	31
Low Income	70
Direct Install	213
Residential Air Conditioning	18
Residential Demand Response - Manage	234
Residential Demand Response - Build	270
Schools Program	63
Commercial Services	553
Commercial Demand Response Program - Manage	39
Commercial Demand Response Program - Build	72
Total	**1,820**

The Role of Collaboration in Reviewing the DSM Programs

The demand side planning process benefits from collaboration with a range of participants through the DSM Collaborative. The Commission Orders in both Docket No. 01-7004 (Sierra) and Docket No. 01-7016 (Nevada Power) required that Sierra, Nevada Power and all interveners and other interested parties:

> *"Work collaboratively to develop a list of feasible projects, to determine the appropriate cost/benefit test(s), to determine the projects that should be proposed as either trial or full, to determine the appropriate amount that should be spent on demand-side projects, staff, rebates, etc., and to discuss and resolve any such matters that the parties deem appropriate."*

In compliance with this directive, the Companies instituted a collaborative process through which interested parties are invited to contribute to, review and make recommendations regarding the utilities conservation and energy management programs.

The Companies have worked with Staff, NRDC, SWEEP, GOE, the BCP and other participants in the Collaborative to ensure that the format presented in this filing meets the needs of the intervening parties, and to recommend which DSM programs should be introduced, continued and cancelled. The Collaborative also makes suggestions for continuous improvement during the implementation of DSM programs.

Since the filing of each company's 2017 DSM Update Reports Collaborative meetings were held on the following dates: September 14, 2017 and December 11, 2017, March 12, 2018, and May 11, 2018. Meeting presentations are provided as Technical Appendix DSM-3.

Potential DSM Programs

One function of the Collaborative is to provide input on new potential programs to be considered for the 2019-2021 Action Plan period. SWEEP and NRDC were particularly helpful in providing a list of potential measures and programs being implemented by other utilities. In addition, implementation contractors frequently propose new programs. These proposals often have the added benefit of contractors who have performed a market assessment and propose programs with good market potential. Table DSM-16 provides a list of programs proposed and considered for inclusion in the 2019-2021 Action Plan period.

Table DSM-17: DSM Programs Considered

ADOPTED		
Energy Education	South/North	The program data sheet contains a comprehensive analysis of the program.
Energy Reports	South/North	The program data sheet contains a comprehensive analysis of the program.
Energy Assessments	South/North	The program data sheet contains a comprehensive analysis of the program.
Direct Install	South/North	The program data sheet contains a comprehensive analysis of the program.
Program Development	South/North	The program data sheet contains a comprehensive analysis of the program.
Residential Lighting	South/North	The program data sheet contains a comprehensive analysis of the program.
Pool Pumps	South	The program data sheet contains a comprehensive analysis of the program.
Low Income	South/North	The program data sheet contains a comprehensive analysis of the program.
Residential Air Conditioning	South/North	The program data sheet contains a comprehensive analysis of the program.
Residential Demand Response - Manage	South/North	The program data sheet contains a comprehensive analysis of the program.
Residential Demand Response - Build	South/North	The program data sheet contains a comprehensive analysis of the program.
Schools Program	South/North	The program data sheet contains a comprehensive analysis of the program.
Commercial Services	South/North	The program data sheet contains a comprehensive analysis of the program.
Commercial Demand Response Program - Manage	South/North	The program data sheet contains a comprehensive analysis of the program.
Commercial Demand Response Program - Build	South/North	The program data sheet contains a comprehensive analysis of the program.
ADDED TO EXISTING PROGRAM		
Split system heat pumps	South/North	Added to Residential Air Conditioning
NOT ADOPTED		
Marketplace	South/North	This concept needs further investigation
Residential New Construction Program	South/North	Nevada has one of the highest if not the highest percentages of Energy Star homes in the nation. Not cost effective
Commercial mid-stream buy down	South/North	Not cost effective.

The Impact of New Technologies

NAC § 704.934(3) provides as follows:

> *"In creating its demand side plan, a utility shall consider the impact of applicable new technologies on current and future demand side options. The consideration of new technologies must include, without limitation, consideration of the potential impact of advances in digital technology and computer information systems."*

Consideration of new technologies regularly occurs through several mechanisms:

Industry collaboration and learning

The Companies are active participants in the energy conservation and efficiency community, through the DSM Collaborative, industry conferences, and special meetings. New technologies ranging from advanced lighting to the potential for whole-house programs are discussed at most meetings of the DSM Collaborative. The Companies are also active in industry conservation and efficiency associations such as SWEEP, the Peak Load Management Alliance ("PLMA"), the Association of Energy Service Professionals ("AESP"), and the American Council for an Energy Efficient Economy ("ACEEE"), and ESource. Webinars, teleconferences and annual meetings of these organizations feature technical innovation as a major topics. Company staff attended individual conferences and meetings, often as invited speakers.

Internal process improvements

The Demand Response Management System ("DRMS") is an enterprise software system that manages a wide range of demand response program business processes such as: customer enrollment, device management, device provisioning, workforce management related to device installation and service, demand response event and dispatch management, event notifications, event forecasting, and a wide range of reporting functions. It functions as the system of record for customers participating in demand response programs. DRMS also is integrated with a number of other major enterprise systems such as the Meter Data Management System; the Regional Network Interface; the customer billing system (Banner), and load forecasting and tracking (PI) systems.

Program Development

The Companies conduct program development trials to explore promising new technologies. Advances in electronics, computing, and communications play a strong role in these trials, which are described in more detail in the individual program data sheets included in this plan. These activities are performed jointly at Nevada Power and Sierra, and with others to leverage available resources.

New Database and Communications Capabilities

Enhancements made to the Companies' MyAccount web portal now allow online enrollment in PowerShift program, along with installation date scheduling. These projects were tested and fully implemented in 2017, and have increased the adoption rate and reduced the marketing cost for the PowerShift programs.

Overview of Financial Model - PortfolioPro

The Companies utilize the PortfolioPro model (created by the Cadmus Group) to determine the cost effectiveness of each program evaluated in this filing. The PortfolioPro model is based on the California Standard Practice Manual and follows generally accepted industry practices for evaluating the cost effectiveness of DSM programs. This model has been employed by the Companies for determining the cost effectiveness of DSM programs since 2006. The PortfolioPro model is reviewed and enhanced every year for more accuracy and to simplify its use by parties (including Staff or BCP) who wish to perform parallel analyses of programs. A list of updates and enhancements that were implemented for the financial modeling process for 2018 is provided at the end of this section.

From a societal vantage point, DSM programs that improve energy efficiency are beneficial as long as their costs are justified by their economic worth. However, the benefits of DSM programs may accrue differently to different stakeholders. Cost-benefit analysis based on avoided costs has been widely used in the energy sector to assess the cost-effectiveness (or net benefits) of DSM relative to conventional supply alternatives. When calculating the benefits of DSM, analysts begin with avoided costs and make adjustments for administrative as well as other costs associated with participating in DSM programs. Depending on the perspective taken in the analysis, competing views about benefits can emerge. Five basic cost-benefit tests are generally used for comparing demand and supply management alternatives, each representing a measure of cost-effectiveness from unique perspectives:

- TRC
- Rate Impact Measure ("RIM")
- Utility-Cost Test ("UCT")
- Participant Cost Test ("PCT")
- Societal Cost Test ("SCT")

The Companies calculate and present the standard five benefit-cost test ratios along with the resulting ratio from a modified version of the TRC test, labeled NTRC, that incorporate a percentage adder for non-energy benefits (10 percent adder for non-low-income programs, 15 percent for programs that have a mix of low-income and non-low-income participants and 25 percent for low-income programs). The results for the TRC test are summarized in Tables DSM-13A, DSM-13B and DSM-13C. The results from each of the other tests are provided at the end of each program data sheet in Sections 5 through 7.

Table DSM-18 summarizes the potential benefits, the relevant costs, and how each is allocated for each of the five perspectives and the non-energy benefits test NTRC. Each assessment begins with the benefits of DSM, measured by the Companies' avoided cost, and subtracts the costs associated with the program (such as equipment, labor, and overhead). From a TRC perspective, an energy efficiency measure fails if the net benefits are negative, meaning that the costs of achieving the savings outweigh the value of the achieved savings. Often a program may pass one test while failing others.

Table DSM-18: Elements of Cost Effectiveness Tests

	Elements	NTRC	TRC	RIM	UCT	PCT	SCT
Benefits	Avoided Energy Costs	√	√	√	√		√
	Avoided Generation Capacity Costs	√	√	√	√		√
	Avoided T&D Capacity Costs	√	√	√	√		√
	Bill Reductions - Primary Fuel (Electricity)					√	
	Conservation "Adder" or Externalities (Environmental)						√
	Non Energy Benefits	√					√
	Indirect Fuel Benefits (e.g. Gas)	√	√				√
	Rebates					√	
Costs	Implementation Costs	√	√	√	√		√
	Direct Customer Costs	√	√			√	√
	Utility Program Administration & M&V	√	√	√	√		√
	Lost Revenues			√			

The TRC test is employed to evaluate the effect of DSM on total outlays for utility services for both participants and non-participants. It also has been defined as a test of not "least cost" but "most value."[5]

The effect of energy efficiency programs on utility rates is inferred by the RIM test. The RIM test, also known as the non-participant or "no-loser" test, recognizes the potential for lost revenues and the need for non-participants to subsidize participants through higher utility rates. The test emphasizes the distributional (equity) effects of DSM. According to this test, demand-side options should be implemented only when the result increases the utility's revenue requirement by an amount less than the increase in revenue requirement associated with various supply-side options. Determination of actual rate impacts provides a more direct measure of equity in demand side management investment decisions.

The UCT emphasizes the employment of utility resources to test cost-effectiveness. According to this test, demand-side options should be implemented when the utility's portion of demand side management costs are justified by the value of acquired conservation resources. This test does not take into account lost sales resulting from DSM.

[5] Beecher, Janice A, Avoided Cost: An Essential Concept for Integrated Resource Planning, Center for Urban Policy and the Environment, Indiana University-Purdue University, Indianapolis, 1998.

The PCT evaluates whether customers are sufficiently motivated to participate in demand-side management programs by virtue of the net benefits of participation.

Finally, the SCT is a measure of complete societal benefits of demand-side management including indirect benefits such as those arising from avoided environmental externalities such as emissions.

A more detailed description of the PortfolioPro model and a user guide are provided in Technical Appendix DSM-1. The basic financial inputs to the PortfolioPro model are provided in Tables DSM-19A and DSM-19B.

Table DSM-19A: Nevada Power Company PortfolioPro Basic Inputs

Nevada Power	Financial Data
Discount Rate	8.09%
Rate Escalator	0.00%
Inflation Rate (T&D)	2.00%
Line Loss - Energy	3.82%
Line Loss - Demand	7.60%
T&D Avoided Capacity Cost $/MW	$52,295
Environmental Adder	10.00%
Electric Rate - Commercial ($/kWh)	$0.08
Electric Rate - Residential ($/kWh)	$0.12
Gas Rate - Commerical ($/therm)	$0.68
Gas Rate - Residential ($/therm)	$0.66

Table DSM-19B: Sierra Pacific Power Company PortfolioPro Basic Inputs

Sierra Pacific Power	Financial Data
Discount Rate	6.65%
Rate Escalator	0.00%
Inflation Rate (T&D)	2.00%
Line Loss - Energy	6.30%
Line Loss - Demand	14.31%
T&D Avoided Capacity Cost $/MW	$60,702
Environmental Adder	10.00%
Electric Rate - Commercial ($/kWh)	$0.07
Electric Rate - Residential ($/kWh)	$0.10
Gas Rate - Commerical ($/therm)	$0.46
Gas Rate - Residential ($/therm)	$0.43

Updates and Enhancements for Financial Modeling Implemented in 2018

- The value of avoiding the Companies' operating reserve was included for all programs for 2018. When the DSM program is executed, both demand and the reserve requirement

associated with that demand are avoided.[6] The reduction in reserve requirement is accounted for in the modeling process by increasing the demand savings by 12 percent for Nevada Power and 15 percent for Sierra.

- The determination of what constitutes a rebate (transfer payment) or an incentive was made based on the guidelines set forth in the clarification issued by the California Public Utilities Commission ("CPUC) to the California Standard Practice Manual memo[7] resulting in several adjustments. The adjustments that were made are discussed in more detail in the subsection titled *Incentives and Rebates* presented later in this section.

- The value of avoided transmission and distribution ("T&D") costs is updated to more accurately represent the cost of avoided investment in T&D and to better align with the values used in other jurisdictions. More details are presented in the subsection titled *Assessment of Savings in Transmission and Distribution Costs* presented later in this section.

Net-to-Gross, Freeridership and Spillover Rates

The Commission approved the results of the 2016 Net-To Gross Study in Docket Nos. 16-07001 and 16-07007.[8] An update to the 2016 study which can be found in Technical Appendix DSM-22, was completed in preparation of this filing for new and redesigned programs. The applicable NTG are provided in Tables DSM-20A and DSM-20B. Definitions of freerider, spillover and NTG are as follows:

Freerider - A freerider refers to a program participant who would have done some amount of the program-rebated energy efficient improvement if the program had not been offered.

Spillover – Participant-like spillover refers to the situation where a customer installed equipment through the program in the past year and then installed additional efficient equipment of the same type due to program influences.

Net-to-Gross Ratio - The NTG ratio (also commonly referred to as NTG factor) is the ratio of net program-attributable savings over program gross savings. The ratio calculated includes program freeriders and program-induced spillover is shown below.

NTG ratio= (1 – freeridership rate) + spillover rate.

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6 *See*, Bush and Eto, Estimation of Avoided Costs for Electric Utility Demand-Side Planning, page 492 http://emp.lbl.gov/sites/all/files/Enrgy-srcs-avoid-cost-DS-plan.pdf

7 http://www.cpuc.ca.gov/NR/rdonlyres/58129C08-C0EC-4C0F-926C-327F1A710537/0/ClarificationofSeveralCostConceptsinCPUCDemandSideCostEffectivenessTestsFinal.pdf

8 Order Issued February 16, 2017, Docket Nos. 16-07001 and 16-07007.

Table DSM-20A: Nevada Power Company Net-to-Gross Ratios[9]

Program	2017	2019	2020	2021
Energy Education		100.0%	100.0%	100.0%
Energy Reports		100.0%	100.0%	100.0%
Energy Assessments		100.0%	100.0%	100.0%
Residential Lighting		60.0%	60.0%	60.0%
Pool Pumps		70.0%	70.0%	70.0%
Low Income		100.0%	100.0%	100.0%
Residential Air Conditioning	91.0%	82.0%	82.0%	82.0%
Direct Install		85.0%	85.0%	85.0%
Residential Demand Response - Manage	100.0%	100.0%	100.0%	100.0%
Residential Demand Response - Build	100.0%	100.0%	100.0%	100.0%
Schools Program	82.0%	82.0%	82.0%	82.0%
Commercial Services	89.0%	90.0%	90.0%	90.0%
Commercial Demand Response Program - Manage	100.0%	100.0%	100.0%	100.0%
Commercial Demand Response Program - Build	100.0%	100.0%	100.0%	100.0%

Table DSM-20B: Sierra Pacific Power Company Net-to-Gross Ratios[10]

Program	2017	2019	2020	2021
Energy Education		100.0%	100.0%	100.0%
Energy Reports		100.0%	100.0%	100.0%
Energy Assessments		100.0%	100.0%	100.0%
Residential Lighting		55.0%	55.0%	55.0%
Low Income		100.0%	100.0%	100.0%
Residential Air Conditioning		82.0%	82.0%	82.0%
Direct Install		85.0%	85.0%	85.0%
Residential Demand Response - Manage	100.0%	100.0%	100.0%	100.0%
Residential Demand Response - Build	100.0%	100.0%	100.0%	100.0%
Schools Program	83.0%	83.0%	83.0%	83.0%
Commercial Services	72.0%	74.0%	74.0%	74.0%
Commercial Demand Response Program - Manage	100.0%	100.0%	100.0%	100.0%
Commercial Demand Response Program - Build	100.0%	100.0%	100.0%	100.0%

Assessment of Savings in Transmission and Distribution Costs

The methodology for quantifying T&D capital investment savings generated by DSM energy and demand savings is based on the last approved marginal cost study filed in Nevada Power's and Sierra's most recent General Rate Cases (Docket No. 17-06003 and Docket No. 16-06006 respectively). Energy efficiency investments, unlike other on-site measures, create permanent reductions in customer demand that allow for the quantification of capacity cost savings. The adopted process values this permanent and ongoing effect of energy efficiency measures by

[9] 2018 NTG Update Draft Report, May 9, 2018, Tetra Tech[9].

[10] 2018 NTG Update Draft Report: May 9, 2018, Tetra Tech [10].

identifying the savings resulting from deferring T&D capital investments over the useful life of the investments.

The 2018 annual revenue requirement for the marginal cost of transmission and distribution facilities, not accounting for the distribution facilities beyond distribution substations, is $52.30 per kilowatt at Nevada Power and $60.70 per kilowatt at Sierra, which is the first year used for analysis in the PortfolioPro cost/benefit model in this filing. In the past, the Companies have utilized 25 percent of this value when performing cost-effectiveness analysis. It has since been observed that this value is significantly smaller than value used by other utilities[11] ($31/kW to $132/kW) and therefore underestimates avoided T&D costs. Therefore the Companies removed the 0.25 multiplier to bring the avoided T&D value into a range consistent with other jurisdictions. Nevada Power made an improvement to the marginal cost methodology it uses to bring the results in alignment with other utilities. Due to the large expense and complications involved, the Companies did not conduct an engineering study of the avoided T&D costs, an alternative methodology for determining T&D costs for DSM programs.

The PortfolioPro model calculates peak demand savings for each year of a measure's useful life. That value is then multiplied by the annual T&D revenue requirement per kW to determine the annual avoided T&D value. The revenue requirement is escalated in each year by applying cost construction escalator index. The T&D savings is then computed by determining the present worth of the revenue requirement for each year over the expected useful life of that measure.

Impacts on Peak Demand and Load Shape

The combined effect of the proposed DSM portfolio will be a flattening of the system load shape and an improvement in system load factor. This effect is driven by two primary factors.

- Permanent peak demand savings are derived from the coincident peak demand savings from energy efficiency programs. Programs such as the Commercial Services programs have a significant impact on system peak demand. Cumulative peak demand savings from the energy efficiency measures for 2019-2021 are estimated to be 0.4 percent of the "unimpacted" system load forecast both Sierra and Nevada Power on average over the three-year action plan period. This translates into approximately 24.1 MW at Sierra and 71.3 MW at Nevada Power on a peak summer day at the conclusion of 2021, as presented in Tables DSM-12A and DSM-12B. The "unimpacted" system load forecast is the load forecast in the absence of permanent and dispatchable peak demand savings from the DSM programs.

- Dispatchable peak demand savings are derived from the Residential and Commercial Demand Response Programs. The cumulative installed dispatchable portion of peak demand savings in the DSM Plan is projected to add 24 MW at Sierra and 96 MW at Nevada Power on a peak day at the end of the action-plan period, see Tables DSM-12A and DSM-12B. In addition to the incrementally installed Demand Response capacities

[11] See Best Practices in Energy Efficiency Program Screening, Synapse Energy Economic, Inc., July 23, 2015, pp. 26

during the action plan period, the Companies also manage over 20 MW at Sierra and 227 MW at Nevada Power of residential and commercial Demand Response as presented in Tables DSM-10A and DSM-10B. Therefore, peak demand savings for the demand response measures for 2019-2021 are estimated to be 0.8 percent at Sierra and 1.8 percent at Nevada Power of the "unimpacted" system load forecast.

Energy Savings Curves

The energy savings provided by DSM programs can be represented by an energy savings curve, which is an array of 8,760 points, each corresponding to a specific hour of the year.[12] The value of each of the 8,760 points is the fraction of annual energy savings expected to occur in the corresponding hour; the values of the 8,760 points in any given energy savings curve sum to unity (*i.e.*, 1.00). For example, for an energy efficiency measure that provides constant and uninterrupted savings during every hour of the year,[13] each of the 8,760 numbers in its energy savings curve has the value of $^{1}/_{8760}$. This "flat" curve, or "constant-savings" curve, is provided as an example because the sum of its 8,760 elements is obviously equal to unity (*i.e.*, 8,760 times $^{1}/_{8760}$ = 1.00).

Energy savings curves are an integral component of the M&V reports. There, the energy savings curves are utilized for the determination of monthly energy savings per rate class, and monthly critical peak demand savings per rate class. The appendix of every M&V report includes monthly savings tables for kWh savings and critical peak kW savings. Also included in the appendix of every M&V report is a detailed discussion of the general methodology for identifying and utilizing appropriate energy savings curves to generate the monthly savings tables for kWh savings and critical peak kW savings. Finally, within the main body of every M&V report is a discussion of the development of the specific energy savings curves that are utilized for that particular program.

The energy savings curves utilized in M&V analyses are also employed in performing the PortfolioPro financial analyses for each program. The M&V contractor provides program-level curves that are used as inputs for the PortfolioPro financial analyses. The program-level energy savings curve is the weighted average of the various measure-specific or site-specific curves that were employed in the M&V analyses of the program's specific measures or projects. The weights assigned to measure-specific or project-specific curves are provided by verified *ex post* annual energy savings per measure or project. In other words, a given program-level curve is appropriately weighted by using *ex post* verified savings determinations from M&V analyses.

In total, the M&V analyses utilize more than 100 different energy savings curves that are either measure-specific or site-specific. Sources of energy savings curves include the following:

- Most residential sector energy savings curves are developed from primary data from Nevada customers (*i.e.*, M&V data collected during the evaluation of the Companies' residential programs). M&V data collection may include operation schedules, home envelope characteristics, and monthly usage bills from program participants. The

[12] 365 days per year, multiplied by 24 hours per day, is 8,760 hours per year.

[13] For example, an LED exit sign installed in unconditioned space provides constant and uninterrupted savings during every hour of the year, and thus is represented in a flat or constant savings curve.

residential lighting curve was developed based on two recent metering studies conducted in California.

- Energy savings curves for the nonresidential sector incorporate primary data from Nevada customers (*i.e.*, M&V data collected while evaluating the Companies' nonresidential programs). Certain nonresidential curves also incorporate data derived from the California Commercial End Use Survey ("CEUS").[14]

- For the commercial retrofit and commercial new construction programs, energy savings curves represent a blend of primary data and CEUS data. For example, if the M&V sample for the measure category "Interior Lighting, Lodging Sector" represents 77 percent of energy savings for that measure category, then the energy savings curve for "Interior Lighting, Lodging Sector" has 77 percent of its weight from primary data from Nevada customers and 23 percent of its weight from CEUS. All nonresidential interior lighting curves incorporate a Heating and Cooling Interaction Factor ("HCIF") (*i.e.*, for interior lighting only, nonresidential lighting curves are moderately influenced by the seasonal impacts of efficient luminaires, which produce less heat by operating at relatively low temperatures.

The M&V contractor provides numerous quality-control checks to ensure that each of the energy savings curves used in M&V analyses is reasonable and appropriate at the measure level, site level and program level. The M&V contractor also provides a robust Excel-based platform for disaggregating each program's annual energy savings into 8,760 hourly bins per year, then tabulating the per-rate class monthly kWh and critical peak kW savings that are provided in each M&V report. As described above, these tabulations feed into the creation of program-level energy savings curves that the M&V contractor provides for program analysis, load forecasting and resource planning.

Incremental Cost

This section discusses how incremental costs, which are used in the financial analysis of each program, are determined. The first step in determining incremental costs is to determine the measure cost. Measure cost is the cost of the equipment that is promoted by a particular DSM program. The second step is to determine what alternative action is available for the customer at the time the customer makes a decision to adopt the measure promoted by the DSM program. With these two pieces of information the incremental cost can be determined.

> *Incremental measure cost refers to the difference in cost between a program-sponsored product and an established baseline model of that product (established by codes and standards or by "standard practice"). Energy efficiency cost-*

[14] The CEUS study is a comprehensive end-use energy study for the nonresidential sector. As described on the CEUS web site hosted by the California Energy Commission, the CEUS survey is a comprehensive study of commercial sector energy use, primarily designed to support the state's energy demand forecasting activities. CEUS data are publicly available and used by various states other than California. More information regarding the CEUS study can be found on the CA Energy Commission's web site: http://www.energy.ca.gov/ceus/.

> *effectiveness tests generally use this incremental measure cost, rather than the full equipment cost, because it represents the additional cost that a customer will incur for the energy-efficient product.*[15]

There are two main sources of incremental measure cost values. The first is work done by other jurisdictions. This includes work completed by agencies such as the California Public Utilities Commission and the California Energy Commission in publications such as the California Database for Energy Efficiency Resources data base ("DEER") and white papers that utilities prepare for measures not well represented in the standard data sets such as DEER or where previously developed data requires updating. Jurisdictional sources of incremental cost information include the DEER, the California investor owned utilities' workpapers, (PG&E, SCE, and SDG&E), the Michigan Statewide Energy Database, Arkansas Technical Reference Manual ("TRM"), Energy STAR, and Consortium for Energy Efficiency ("CEE"). The second source of incremental costs is the Companies and their implementation contractors.

The PortfolioPro model accepts an incremental cost for each measure entered for each program being evaluated. The manner in which incremental costs are entered in PortfolioPro is determined by the number of energy efficiency measures that are included in a program. When there are only a few measures in a program (*e.g.*, Direct Install and Home Energy Reports) each measure is included in the modeling with an incremental cost that is specific to that measure. For programs with a large number of measures, it becomes impractical to develop an incremental cost for each measure individually in the PortfolioPro model. For programs such as the Commercial Services Program, a derived unit measure is created that can include dozens of measures. Generally, the derived unit is 1,000 kWh. The incremental cost for this 1,000 kWh derived unit is created by taking the weighted average incremental cost for each of the measures that is included in the unit measure based on its individual contributions to the 1000 kWh of the derived unit. It is noted that since the derived unit incremental cost is based on the contribution of each individual measure, when the mix of measures in a program changes from year to year, the incremental cost for the derived unit will also change from year to year. The program data sheets provide program discussion of the determination of the incremental costs for each program.

Incentives and Rebates

This section provides a general description of how the Companies determine the rebate and incentive values for each of the programs. The discussion first describes the difference between an incentive and a rebate, and continues with a description of the numerous factors that are considered in determining the value for rebates and incentives. The following is an excerpt from the CPUC clarification memo on the Standard Practice Manual ("SPM")[16]. These guidelines are used in the Companies' cost-effectiveness methodology.

[15] http://www.cpuc.ca.gov/NR/rdonlyres/58129C08-C0EC-4C0F-926C-327F1A710537/0/ClarificationofSeveralCostConceptsinCPUCDemandSideCostEffectivenessTestsFinal.pdf

[16] http://www.cpuc.ca.gov/NR/rdonlyres/58129C08-C0EC-4C0F-926C-327F1A710537/0/ClarificationofSeveralCostConceptsinCPUCDemandSideCostEffectivenessTestsFinal.pdf

> The *California SPM uses the term transfer payment to describe certain demand-side program payments that result in the "transfer" of dollars from all ratepayers to participating customers through a utility program.*

To illustrate how different types of payments made by the utilities do or do not act as transfer-type payments, consider the fact that while there are a variety of utility demand-side program payments, the majority of these payments fall into one of three general categories:

Category 1: Payments or bill adjustments to participating customers for their behavior (e.g., shedding load during a demand response event),
Category 2: Payments to "upstream" (manufacturers or distributors) or "midstream" (retailers) third party entities for equipment, and
Category 3: Payments made to participating customers for equipment (e.g., direct install or rebates).

Most demand response program payments fall into Category 1, whereas most payments provided in energy efficiency and distributed generation programs fall into Categories 2 and 3. The following cases provide further discussion of how to treat these costs in the calculation of the TRC.

Case A. Rate incentives, which are bill adjustments to customers for behavior which directly and immediately result in energy savings, represent most closely the transfer-type payments described in the SPM. These payments do not appear as costs in the TRC. Demand response capacity and energy incentives fall in this category.

Case B. Payments to third parties (*e.g.*, "midstream" or "upstream" payments made directly to manufacturers, distributors, or retailers; or direct installation payments made to third parties who install equipment on a customer's site). These payments are not transferred from nonparticipating to participating customers, and per the SPM definition, they are not even technically incentives – they are part of the program administrator costs. These payments are made to actors outside the TRC "society," and they are included in the TRC costs.

Case C. Payments made by the utility directly to customers as rebates (*i.e.*, "downstream" payments). Rebates can appear similar to transfer-type payments described in Case A above. However, in the case of downstream rebates, the customer has already paid the full incremental measure cost to a retailer, so the full incremental cost of the measure has already left the TRC "society." Consequently, when the TRC cost is calculated for these "downstream" rebate programs, the full incremental costs represented by the customers' payments for the products are included as costs.

The Companies' Demand Response Program falls into "A" category, the Residential Lighting Program, Pool Pumps, and Residential AC Program belong to "B" category while the Schools and Commercial services Program fall into "C" category.

A rebate or an incentive is paid to influence a customer to become a program participant by taking the action required to justify the payment of the incentive or rebate. The optimum level of a rebate or incentive should be set at the value that results in the desired number of customers becoming program participants. Rebate or incentive amounts might need to be greater than this amount to reduce freeridership levels, as higher rebates and incentives influence additional customers to become participants who would not have participated in the absence of the higher rebate or incentive. On the other hand, a rebate or incentive that is too low would generally result in higher levels of freeridership.

Additional factors that are considered in setting rebates and incentives include payback periods, incremental costs, program or measure maturity, experience in the market place (either locally or in other states), and the nature and type of the program. It is also noted that the marketplace is constantly in flux and therefore the management of rebate and incentive levels requires adjustments to rebate and incentive levels in response to changes in the market place.

Programs are identified as either being a rebate program or an incentive program in the program data sheet for each program. The program data sheets discuss who receives the rebates or incentives paid by the program as well as the logic regarding how rebates or incentives paid for each program are determined. The rebates and incentives may be adjusted during a program year to reflect the response of the marketplace to the program and to increase the probability of the program its meeting or exceeding energy savings and cost-effectiveness goals.

Measure Life

Measure life, which in energy efficiency is also referred to as EUL, is the estimate of the median number of years that the measures installed under the program are still in place and operable.[17] Stated differently, the EUL determines how long energy savings are expected to last once an energy efficiency measure has been installed. EUL is used as an input to the PortfolioPro financial analysis model for determining the cost-benefit ratios and net benefits that can be expected to be realized based on the installation of an energy efficiency measure.

The Companies obtain EUL values from two sources. The first and primary source for EULs is the M&V report for each program. The M&V report provides the EUL for the plan year that has been evaluated in that M&V report. In preparing the M&V report the M&V evaluator generally employs one of two methodologies for determining the EUL. The first is to use industry resources such as the California DEER data base or Technical Reference Manuals from other jurisdictions. The second methodology is to use the base data collected during the evaluation of the program to determine the EUL

Secondary sources are used for the EUL for programs or measures for which no current M&V report is available, or for which there have been program changes such that the EUL from the most recent M&V report does not accurately reflect the changed character of the program or measure. For these situations the Companies employ EUL data taken from industry resources such as the

[17] California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals, April 2006

California DEER database or Technical Reference Manuals from other jurisdictions in determining the EUL.

The methodology for determining measure life for each program is described in the program data sheet for each program.

Units

All of the specific inputs for a measure are entered into PortfolioPro on a per unit basis. The per unit basis is a standard amount of a physical quantity, such as length, mass, energy, etc., and in specified multiples that are used to express magnitudes of that physical quantity. There are two different approaches used when defining a unit for entry into PortfolioPro. The first is used when there is a one-to-one relationship between each energy efficiency measure and the units that are entered in PortfolioPro. An example of a one-to-one relationship would be window film. There is no standard window and therefore the unit that would be used for window film would be a square foot of window film. The incremental cost, energy savings and rebate amount for the window film would be entered in PortfolioPro on a per square foot basis.

Some programs include measures with varying quantity and diversity characteristics, making it impractical to enter them all individually into PortfolioPro. For example, the Commercial Services Program encompasses over one hundred individual measures. In this instance, derived units are developed to represent programs with large numbers of measures, for instance on kWh or, typically 1,000 kWh basis. Lighting in the Commercial Services Program provides another good example. Instead of entering dozens of different types of lighting measures, each as an individual lighting measure, each of the measures is combined into a derived unit that is determined based on the number of each of the individual measures that are incorporated in the derived unit. The derived unit can also be applied where a number of measures are described by different units of measure. A derived unit can be derived from a mix of custom and prescriptive measure with different unit sizes (*e.g.*, square foot of window film, number of fixtures installed, Watts reduced), that would otherwise make the energy efficiency computations by units installed impractical at the program level.

It is likely that fractional units will result when derived units are employed to determine the cost effectiveness of program results. In the case of a program with a savings of 10,500 kWh and a derived unit based on 1,000 kWh there will be 10.5 units that will be entered into PortfolioPro.

The units that are employed for the cost effectiveness evaluation of each individual program are discussed in the program data sheet for that program.

Energy Savings

The energy savings discussed in this section are used for the projections of energy savings in future years, in the case of this filing primarily for the 2019-2021 Action Plan period. Energy savings for future years may be the same as those determined in an M&V report for previous years, or be a projection based on the M&V results from previous years, modified to reflect changed program

parameters, or other industry sources adjusted to reflect the specific conditions under which the measures or programs will be deployed. For some measures or programs, using only M&V verified saving from previous years without adjusting the energy savings for future years can lead to an over- or under-estimation of future energy savings.

Where there will be no significant changes in a program's measures or measure mixes in future years, historical energy savings from prior M&V reports provide a good projection of expected savings for future years. While optimal, this method for determining energy savings for future program years is only applicable for measures or programs that are static in terms of the mix measures or external factors that impact or change future energy savings. In addition when new measures or a new program are added for which measured and verified results are not available, other sources must be used to determine the deemed savings for the analysis of the program or measure.

The measure mix or features of the measures of a program can change over time. Changes can be driven by the market, updates to codes and standards, and modifications to measures made by manufacturers.

- Customers whose tastes or desires evolve over time drive changes in the marketplace. As tastes and desires evolve, the products that were purchased in large numbers in one year may not be purchased at the same level in future years.

- Lighting provides an excellent example of how changes in standards affected a program. T-12 fluorescent bulbs are no longer manufactured. Once current inventories of T-12 fluorescent bulbs were exhausted, the features of the standard T-12 fluorescent bulb was no longer the baseline measure. Therefore, M&V results that were based on the T-12 fluorescent bulb in previous years would overstate the energy savings for future years if not adjusted for the change in the baseline bulb.

- Measures change over time both in terms of price and in performance. For example, since variable speed drive motors have become less expensive over time, they are now manufactured for smaller motors. Another example is in residential lighting. While not required by federal lighting standards, lighting manufacturers have made great strides in developing cost effective high quality LED lighting. The growing penetration of solid-state lighting in the market place will impact both energy savings and customer purchasing practices.

The M&V report is the starting point for determining energy savings for measures and programs for future years. The analysis must then examine implemented or potential changes to codes and standards to adjust the energy savings per measure. The behaviors of the market place must then be forecasted to account for how the market will react to the changes in codes and standards. This analysis is simple for some programs, but can be somewhat involved for a program such as the Commercial Services program, which includes dozens of measures for which the savings per measure and the number of measures that will be accepted by the market place are evolving.

For new programs or measures for which the Companies do not have M&V results, other sources are used to project energy savings. The sources used will vary by the quality of the data available. The California DEER data base is a comprehensive collection of energy efficiency data and a good resource for this information. M&V reports, evaluation studies, and technical reference manuals from other jurisdictions also provide a good source of energy savings data. When using such third party data, the Companies utilize results that have been determined or corroborated by third party analysts whose work has generally been validated through a formal review process.

The determination of the savings for each program follows the process outlined in this discussion. The specific determination of savings is unique for each program and is provided in the program data sheet.

Program Management and Program Tracking

DSMCentral is the system of record for program management, data tracking and reporting. DSMCentral manages the data for the complete DSM program lifecycle including implementation, program performance tracking, evaluation support, and M&V activities. DSMCentral provides the pre-verified energy savings and installation dates for monthly replacement revenue forecasting and will be populated with program data on a monthly basis by either the implementation contractor or program manager.

DSMCentral has been customized. The Companies use this tool throughout the year to ensure that the planned investments provide clear value. DSMCentral also supports the evaluation, measurement, and verification activities by providing the data needed for sample selection and verification of savings data.

DSMCentral is populated on a monthly basis with customer data from the customer information system. This data is supplied by the Companies for each sector (residential and commercial) in separate files via a secure file transfer protocol. The data fields have been aligned with the business program requirements to ensure the appropriate data is provided to DSMCentral.

Implementation contractors electronically submit project data each month; program managers perform this function on a more frequent basis. The electronic submittal requires adherence to program-specific guidelines such as required fields or data formatting otherwise it will not load into DSMCentral. Program managers review the successfully loaded project data in DSMCentral and may reject or approve project data individually or by batch. With automated processes and clear terminology, DSMCentral ensures project data is accurately stored, reviewed and reported. Program management is more efficient, reporting is streamlined, and the portfolio of DSM programs can be easily and effectively managed for future growth.

Evaluation, Measurement and Verification

The Companies' M&V process is used to reliably document the savings achieved by a program and to determine whether the energy and demand savings goals for the program have been met.

The evaluation effort also provides feedback that enables the Companies to improve the effectiveness and delivery of each program in future years.

The Companies use a process that employs generally accepted industry standards and procedures for DSM M&V. This work is performed by an independent and well-recognized M&V evaluation contractor with considerable experience in applying industry standards and procedures. The Companies have committed to using best in class evaluation, M&V practices for three reasons. First, M&V provides systematic measurement of the performance of energy efficiency programs and technologies. Second, evaluation provides objective data for assessing program performance rather than relying on anecdotal evidence and personal impressions. Third, engineering methods and technical data provide valid, reliable results that provide a basis for benchmarking and comparing the Companies' energy efficiency programs against those of other utilities.

Conceptually, determining energy savings involves comparing energy use before installation of an energy conservation measure (baseline) and energy use after installation of the measure (post-installation). However, estimating savings by simply subtracting post-installation energy use from the pre-installation energy use does not account for the impacts of other factors such as differences in weather or occupancy. As a part of performing an industry standard M&V analysis, adjustments must be made for factors such as weather and usage factors. In general terms:

Savings = (Baseline energy use) - (Post-installation energy use) + Adjustments

The "adjustments" term allows energy use during the two time periods to be compared under the same set of conditions. These adjustments are generally made to restate baseline energy use or demand under post-retrofit conditions.

Following the taxonomy presented in the Model Energy Efficiency Program Impact Evaluation Guide[18], there are three major approaches for calculating estimates of energy savings and demand reductions.

A site-specific M&V approach involves (1) selecting a representative sample of customers or sites that participated in a program; (2) determining the savings for each customer or site in the sample, usually by using one or more of M&V Options defined in the International Performance Measurement and Verification Protocol[19] ("IPMVP"); and (3) applying the results of estimating the savings for the sample to the entire population in the program. The IPMVP Options that can be used are summarized in Table DSM-20.

A deemed savings approach involves using stipulated savings for energy conservation measures for which savings values are well-known and documented. For example, this approach may be acceptable for lighting retrofits for customers' spaces (*e.g.*, offices) where there is general agreement on the hours of use for such spaces.

[18] National Action Plan for Energy Efficiency. Model Energy Efficiency Program Impact Evaluation Guide. Prepared by Steven R. Schiller, Schiller Consulting, and Inc.

[19] IPMVP Volume 1 is available at www.eeperformance.org/uploads/8/6/5/0/8650231/ipmvp_volume_i__2012.pd for available through a subscription at evo-world.com.

A large-scale data analysis approach involves estimating energy savings and demand reductions by applying one or more statistical methods to measured energy consumption – which is typically utility meter billing data – and independent variable data. This approach usually (a) involves analysis of a census of program sites versus a sample and (b) does not involve onsite data collection for model calibration. However, a sample of customers or sites may be selected and visited to confirm that the energy conservation measures were properly installed and are still operating. A more detailed description of the M&V process is provided in Technical Appendix DSM-4.

Table DSM-21: IPMVP M&V Options

IPMVP Option	How Savings Are Calculated
Option A: Retrofit Isolation - Based on measured equipment performance, measured or stipulated operational factors, and annual verification of potential to perform.	Engineering calculations using short-term measured data and stipulations.
Option B: Retrofit Isolation - Based on periodic or continuous measurements taken at the device or system level.	Engineering calculations using measured data.
Option C: Whole Facilty - Based on whole-building or facility level utility meter or sub-metered data adjusted for weather and / or other factors.	Analysis of utility meter data.
Option D: Calibrated Simulation - Based on computer simulation of building or process.	Compare pre and post simulation models with calibrated measured data.

Section 5. Outreach and Program Development

Outreach is continuing its focus on achieving high levels of awareness and participation in the Companies' DSM products and services. Outreach is composed of two programs; Energy Education and Energy Reports. In addition Program Development and Energy Assessments Program are presented in this section.

The Commission noted[20] that education about energy use is a vital part of promoting awareness of energy efficiency opportunities. Education is a very significant part of the DSM portfolio because it provides a gateway for awareness that will lead customers to participate in DSM programs or undertake energy efficiency measures independent of the available DSM programs.

Overall, the Education Program focuses on achieving increased awareness and participation in the Companies' DSM programs by more closely aligning Energy Reports and Energy Assessments with the Energy Education program. The Energy Reports and Energy Assessments programs, supplement and support Energy Education by improving customers' knowledge of energy efficiency and by working as a gateway into and participation in the DSM programs.

During the Action Plan Period, Energy Reports will continue to compliment the Education Program by providing improved energy usage reports to residential customers to inform and motivate them to take actions to save energy. The Energy Assessment Program supports Energy Education by proactively educating and enrolling customers during the time of the assessment.

Program Development focuses on the assessment and testing of innovative DSM technologies and program delivery models. Program Development may span residential, commercial, industrial, or agricultural customer segments and aims to identify new methods to increase customer satisfaction and realize energy and demand savings through delivering energy services to customers.

Table DSM-22: 2019-21 Combined Outreach and Program Development Budgets

Programs	Budget($)			Demand Savings (kW)			Annual Energy Savings (kWh)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Energy Education	$900,000	$900,000	$900,000	200	200	200	2,021,600	2,021,600	2,021,600
Energy Reports	$1,775,000	$1,875,000	$1,975,000	2,350	2,500	2,750	21,100,000	22,200,000	24,600,000
Energy Assessments	$3,625,000	$3,875,000	$3,875,000	430	450	450	3,900,000	4,000,000	4,000,000
Program Development	$250,000	$400,000	$400,000	N/A	N/A	N/A	N/A	N/A	N/A
Outreach & Program Development	**$6,550,000**	**$7,050,000**	**$7,150,000**	**2,980**	**3,150**	**3,400**	**27,021,600**	**28,221,600**	**30,621,600**

[20] See pages 21 and 64 of the Commission's Order in Nevada Power's 2015 Integrated Resource Plan and Sierra's Annual DSM Update Report, consolidated Dockets Nos. 15-06065, 15-07004 and 15-08011.

Energy Education Program

The Energy Education Program ("Education Program" or "Program" in this section) is designed to educate and assist all customer segments regarding the efficient use of electricity. Residential and business customers may not be aware of the many actions they can take to improve energy efficiency and reduce their power bills. The Program focuses on making all customers aware of the various solutions available as well as offers them products and services to generate energy and demand savings.

Through the Program, residential customers are provided ways to save energy and money through a variety of channels which include, but are not limited to, presentations, media outreach, and community events. This offering will be expanded to include targeted and relevant energy education to limited-income customers. To reach commercial customers a variety of presentations and workshops are conducted, along with targeted outreach and event participation, to inform them of strategies and offerings to manage energy usage in their businesses, and how to select and maintain equipment and building upgrades for better energy efficiency.

The Companies' Energy Education Program also promotes PowerShift by NV Energy, to generate awareness and increase customer participation in the DSM programs for all customer segments. PowerShift continues to have market appeal and creates excitement among customers to apply energy efficiency in their home and business. PowerShift will continue to be implemented in years 2019-2021 to create awareness and drive participation in the multiple DSM products and services available to customers.

The 2017 results, 2018 status and 2019-2021 actions plan of both the Nevada Power and Sierra Energy Education Program are presented below

Nevada Power Company Energy Education Program

2017 Results

The Energy Education Program thrived in 2017. The program spent 100.1 percent of the combined budget and exceeded its goals. Hence, it was implemented in such a way to economically deliver outreach efforts by working with community partners, businesses, and other utilities to maximize the penetration of education activities.

Table DSM-23: 2017 Education Program Results by Component

Program Measure	Program Budget			Individuals Educated		
	Approved	Actual	Variance	Target	Achieved	Variance
Residential Customer	$200,000	$208,622	4.3%	30,000	69,740	132.5%
Commercial Customer	$100,000	$100,967	1.0%	350	4,816	1,276.0%
Building Industry Support	$100,000	$90,977	(9.0%)	2,250	3,967	76.3%
Total	$400,000	$400,566	0.1%	32,600	78,523	140.9%

Residential Customer Education Results:
Budget: The program spent 104.3 percent of the $200,000 budget on this component. The total spend was $208,622. The program slightly overspent its budget because the Company expanded the number of National Theatre for Children ("NTC") performances due to its success in educating elementary school students.

Individuals Educated: The residential program component exceeded its target by 132.5 percent. Overall, 69,740 customers were educated by this offering.

The Residential Customer Education component provided customer education through an assortment of initiatives. These initiatives included focusing on direct contact with customers at a variety of public outreach events, through the "Senior 100" pilot project designed for low income seniors, providing PowerShift energy efficiency presentations to groups of customers at a variety of educational opportunities, the EnergySmart Educator program, and NTC program.

In 2017, the program provided energy education at 104 educational opportunities. These events included live educational performances by NTC, senior focused education presentations, community outreach events, employee education was provided for the Company's large commercial customers, and through the EnergySmart Education program. Through each of these efforts the Company educated a total of 69,740 residential customers.

Many of the Company's large commercial customers invited DSM to share its PowerShift products and services with their employees. Large business customers want to help their employees become more energy efficient and save money on their power bills. The Company educated a total of 4,787 residential customers through these employee focused outreach events.

The NTC educated thousands of students and teachers in southern Nevada. This program featured "The Energized Guys", which is a live in-school performance that teaches elementary schools students about energy efficiency and renewable energy. It also featured student playbooks, teacher guides, classroom posters, and digital games and activities. The program was implemented from May 22, 2017, through December 15, 2017 and educated 29,997 students and 1,395 teachers in southern Nevada schools within the Company's service territory.

The Company continued to support the EnergySmart Education program, which is administered through the Desert Research Institute ("DRI"). This program was provided in collaboration with

Southwest Gas and the Southern Nevada Water Authority. The program is designed to train teachers on a Science, Technology, Engineering and Mathematics ("STEM") based energy efficiency and conservation curriculum. The training held for teachers in 2017 was framed through the Next Generation Science Standards ("NGSS") lens so that teachers could better understand how to tie energy efficiency lessons into their classroom standards. DRI educated 9,358 students and 28 teachers within the Company's service territory.

New in 2017, the Company created a pilot that provided an enhanced version of the in-home energy assessments to 100 seniors that requested a home energy assessment during the Senior Expo Event that took place on August 6, 2017. The pilot was named the Senior 100. The Senior 100 expected to complete 100 enhanced assessments, however exceeded its goal by 74 percent by performing 174 enhanced in-home energy assessments. The enhanced assessment included the tradition completion of the in-home energy assessment and direct install measures, as well as the assessor spending additional time with the senior while in their home to educate them about additional products and services that are available to them. The additional products and services included those provided by the Company as well as many other governmental and nonprofit organizations in southern Nevada. This pilot was designed in partnership with United Way of Southern Nevada, Rebuilding Together Southern Nevada, and Spotlight Las Vegas.

The PowerShift energy education materials distributed to our customers through our field service technicians. This group of technicians through customer interactions distributed 5,493 brochures. This group of technicians included our implementation contractors, meter field service personnel, and through a mail-out of direct install thermostat kits to customers.

Commercial Customer Education Results:
Budget: The program spent 101.0 percent of the $100,000 budget on this component. The total spend was $100,967. The program slightly overspent its budget to include a new component for small business customers that provided them with energy efficiency kits.

Individuals Educated: The commercial program component exceeded its target by 1,276 percent. Overall, 4,816 business customers were educated by this offering.

The Company provided 36 educational opportunities that delivered energy efficiency training to a variety of commercial professionals. The goal was to help business customers identify energy efficiency opportunities and highlight the energy efficiency resources available to them. The Company educated a total of 4,816 commercial customers through its commercial education component.

The Company continued to provide education through the local Chambers of Commerce. This provided an avenue to routinely interact with Chamber members and foster a strong relationship to assist them with their energy efficiency efforts. The Company educated a total of 1,636 business customers through its chamber outreach events.

In partnership with the Commercial Energy Services Program, energy education presentations were provided at eight training events in 2017. The training topics were the Commercial Energy Services Kick-off, Integrated Energy Efficiency and Demand Response, Nonprofit Agency Grants; Power Quality; Industrial and Manufacturing Energy; Healthcare Panel; Pumps, Motors and VFD's; Compressed Air; and LED Lighting and Controls, this session was given twice due to customer demand. The Company educated a total of 368 business customers through its commercial trainings.

Also new to 2017, the Energy Education Program introduced custom energy efficiency kits that were provided to 1,459 small and medium business customers in southern Nevada. The measures included in the kits provided energy and water savings, along with education about additional PowerShift products to improve their operations, improve the comfort and ambiance of their facilities, and reduce their energy costs. The measures were packaged into a white corrugated box with a custom-branded PowerShift color label and included a custom letter with a link to a survey.

Builder Industry Education Results:
Budget: The program spent 91.0 percent of the $100,000 budget on this component. The total spend was $90,977. The program slightly underspent its budget and exceeded its participant goals.

Individuals Educated: This program component exceeded its target by 76.3 percent. Overall, 3,967 customers were educated by this offering.

The Builder Industry Education program was designed to present the value of energy efficiency concepts in new construction and remodels to realtors, lenders, contractors, and builders that are in the building industry in southern Nevada. The Company educated a total of 3,967 builder industry professionals through this education component.

The Company continued its partnership with Green Builder Media in 2017 to provide webinars, in-person training and an e-book. The webinars offered training in the areas of smart home technology, building beyond net zero, 2018 International Energy Conservation Code ("IECC") codes, energy ratings, green financing, and demand-side energy management strategies. The e-book provided in-depth information about advanced building science practices, including how to optimize energy efficiency, improve indoor air quality, and enhance resiliency. The in-person trainings that took place in 2017 from Green Builder Media were the 2015 IECC training, one for commercial building and one for residential building, and Financing Options for Commercial Energy Efficiency Projects. The Company educated a total of 3,619 customers through Green Builder Media educational opportunities.

The Company partnered with Southwest Gas to provide two in-person workshops. The first class was Building Science Principles and was attended by realtors, home inspectors, electrical and mechanical engineers. The second class was Heat and Frost Insulators and also included an Infrared Thermographer Certification class. Students attending the class were comprised of home inspectors, moisture/mold remediation professionals, energy auditors/Raters, realtors, fireman, insulators,

electrical and mechanical engineers. The Company educated a total of 25 builder industry professionals through these workshops.

Lessons Learned and Recommendations

The following is a recap of lessons learned in 2017 that provide guidance for the design and delivery of the Program in future years.

- In 2017, the Company proactively searched for new educational opportunities to reach more customers. This was intended to expand awareness and introduce customers to ways to save on their power bill. The Program is committed to providing customers with engaging and effective energy education.

- The Company has been seeking feedback from customers and has learned from anecdotal conversations at events with customers that they are pleased with their participation in the DSM programs. In fact, customers themselves have invited the Company to have a representative present at an organization they belong to. This has been an exciting experience for the Company as more customers are demanding energy education. This feedback has been included in the proposed implementation design.

- The Program continued to partner with customer service at our community outreach events, which allowed customers the ability to sign up for paperless billing, equal payment, and to check any account issues. The "one-stop-shop" concept was well-received by customers. The number of customers wanting to sign up as a participant in the Residential Demand Response and Energy Assessments programs increased. The team worked together to implement a process to follow-up with customers after the community event and follow through with their requests for services. In future years, mobile electronics, such as tablets will be available at events to provide customers with the ability to sign-up for DSM programs at the time of the interaction.

- At the Senior Assistance Expo in August 2017, the Company used a coupon method to courage our senior customers to sign-up for an in-home Energy Assessment while at the event. This allowed our volunteer event team to have a one-on-one conversations with these customers to find out what their needs were and for us to explain the benefits of our products and services. This technique will be carried forward to engage customers at education events.

- Due to the positive feedback from the NTC program in the spring of 2017, the Program will increase the targeted number of students and teachers educated in future school years.

Measurement & Verification

The M&V report titled Energy Education Program was performed by ADM and is provided in the Technical Appendix DSM-5 the report provides the evaluation results of the 2017 Program.

2018 Status

The 2018 Energy Education Program is a continuation of the 2017 program efforts while incorporating the lessons learned.

The outreach events continue to be very interactive and provide a seamless, one-stop-shop experience for our customers. When appropriate, customer service representatives will continue to accompany the energy education outreach team to events to address product and service needs for the customer. When it is appropriate a DSM product and service contractor will be asked to participate in outreach events to educate the customer about the program and to set appointments with the customer when a customer is interested in becoming a participant.

The Company will continue with the National Theatre for Children to provide energy education to students and teachers in Nevada. The program launched in February of 2018 and is providing exciting, interactive, and useful education on energy efficiency and conservation that is designed to reinforce this education with their parents. The program is being implemented through live theatre performances and educational assignments that educate students and teachers. As part of the assignments, the students are providing their parents with materials designed to generate awareness of the Company's DSM products and services.

The EnergySmart Education program will begin providing STEM teacher trainings in the fall of 2018 in southern Nevada. The focus of the training will be on energy in mostly the physical sciences while highlighting and practicing the new Next Generation Science Standards and with new Green Box content added. The main areas of focus for the new content are Energy Basics, Grade 4; Energy Action Team, Grade 9-12; and additional natural gas resources.

The Company will continue with Green Builder Media to provide energy education to the builder industry. They will continue to offer webinars throughout 2018, live trainings, two guidebooks, and ongoing content promotion and viewer engagement, and email blasts.

The Company's Energy Education Program continues to leverage all communication platforms, both paid and unpaid, in support of its goal to increase awareness of its products and services to help all of its customers save energy and money. It is part of its on-going commitment to providing excellent customer service.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $500,000 and a target of educating 50,000 customers for each year of the Action Plan. The proposed Program includes the continuation of some residential and commercial components from previous implementation years, however also incorporates new initiatives designed to generate greater knowledge and understanding of how to achieve energy efficiency. Beginning in 2019, the Company plans to measure and report energy and demand

savings associated with the Energy Education Program. The proposed Program has an energy savings goal of 1,155,000 kilowatt-hours. This energy savings projection was derived from estimated energy savings seen in similar programs across the country.

The Energy Education Program will continue to focus on increasing awareness of PowerShift by NV Energy residential and commercial offerings, along with how to sign-up for specific energy-efficiency and customer service products. The Energy Education Program will be augmented by targeted outreach efforts at community and business events to further drive awareness and participation.

The implementation focuses on establishing avenues for customer education and assistance for customers. These avenues will foster opportunities for customers to glean a greater understanding of how they can be energy-efficient, incorporate measures into their home or business, and take advantage of the Company's offerings.

Customer outreach efforts will provide a variety of communication channels to reach both residential and commercial customers. This includes providing detailed information about our products and services on the Companies' website and with ways to sign up and schedule appointments with Energy Advisors. Education also includes providing print materials at outreach events, leveraging our participation in community and business gatherings, and sharing information with the media to gain greater awareness and increase participation.

Senior groups will be communicated with at specific gatherings and community centers that cater to this population. Services and avenues that reach low-income customers will also have targeted outreach initiatives to support awareness and participation efforts. These customer segments, coupled with overall residential and commercial outreach will be included in strategies to broaden and strengthen all touchpoints.

The Education Program will continue to partner with the National Theatre for Children. This brings energy education into the halls of elementary schools by reaching students and teachers, and educating them about the importance of protecting our planet and the benefits of energy efficiency.

Community partnerships are also part of the Education Program. Nevada Power will continue to partner with the Desert Research Institute and Southwest Gas on the delivery of the EnergySmart Educators Program. This is a STEM-based program. This component of the Energy Education program will be expanded to partner with Envirolution and bringing Project ReCharge to Clark County, where high school students perform their school's energy assessments and make recommendations. Envirolution is a 501 (c)(3) nonprofit organization dedicated to developing and scaling dynamic K-12 education, youth leadership development, and community outreach programs centered around energy efficiency, sustainability, and Science, Technology, Engineering and Math (STEM) career development. This further expands the current Energy Smart Educators program to now educate students on the importance of energy efficiency for all students K through 12.

The Program intends to investigate adding an additional offering by providing energy education directed to Title One Schools. This effort would take place in partnership with Southwest Gas and consist of a teacher-directed program to provide kits with energy efficiency devices for each student to install in their home. The program will focus on fourth grade teachers and students.

Additionally, the Education Program will investigate offering energy-efficiency kits to low-income residential customers. The kits will include energy saving measures for sealing leaks around doors and windows and providing LED bulbs with a higher wattage for greater efficiency.

To reach the commercial and building communities, the Company will continue to offer education about the value of energy efficiency concepts in new construction and facility remodels. This will be conducted via invitation to webinars, presentations, and in-person trainings. Additionally, e-books will be provided to customers that discuss advanced building science practices, including how to optimize energy efficiency, improve indoor air quality, and enhance resiliency.

The Commercial Customer Education Component will expand the variety of classes offered on energy efficiency for commercial customers and will partner with Southwest Gas and other stakeholders. Large and small businesses will be a focus of outreach to support awareness and participation efforts. These training sessions will provide customers and contractors with basic to mid-level knowledge of energy-saving measures and technology to help reduce consumption and lower operating costs.

The Education Program will be implemented through a variety of outreach channels and utilize various communication efforts. Through a concerted, strategic effort, it will focus on maximizing resources to obtain notable energy-efficiency awareness and participation.

M&V Plan

The Evaluation, Measurement and Verification ("EM&V") contractor will perform EM&V activities to confirm the savings realized through the energy education being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Energy Education Program. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.

- Identification of the need for *ex ante* savings measures and how their values will be developed.

- Description of how realization rates will be determined.

- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.

- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive energy efficiency kits. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who receive energy education that are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the Energy Education Program, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-education electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Companies. This comprehensive

modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Net-to-Gross, Freeridership and Spillover

This is a new program design that provides a unique and no cost service for customers. Until the completion of a future net to gross study the net-to-gross ratio for this program is set at 1.0.

Energy Savings Curves

Since energy savings curves have not been developed for the Energy Education program, the Program utilized the same curve as the Energy Reports program.

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2017. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to customers' actual energy usage for any given period, including hourly energy usage.

A new energy saving curve will be developed for Energy Education as part of the M&V process in 2019.

Incremental Costs

The incremental cost for this program has been set at zero dollars as expenditures by customers in other DSM programs will be picked up in the analysis of those other programs.

Incentives/Rebates

There are no incentives or rebates paid under this program.

Measure Life

The useful life for this Program will be determined in a future M&V report. For the purpose of this financial analysis, an estimated 1.5 years has been utilized.

Units

A unit, for the purposes of this Program, an educated customer or installed measure.

Savings

The savings for this Program will be computed on a per customer basis or per home basis based on future M&V reports.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Energy Education

2019	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$500,000	$100,000	$400,000								
Energy Education Outreach Events				$0	$0	8,830	20	176,600	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	30,000	20	600,000		$0	
Desert Research Institute Program				$0	$0	7,000	20	140,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	1,470	91	133,770		$0	
Energy Efficiency Kits - Low Income				$0	$0	700	91	63,700		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	50,000		1,155,000			

2020	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$500,000	$100,000	$400,000								
Energy Education Outreach Events				$0	$0	8,830	20	176,600	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	30,000	20	600,000		$0	
Desert Research Institute Program				$0	$0	7,000	20	140,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	1,470	91	133,770		$0	
Energy Efficiency Kits - Low Income				$0	$0	700	91	63,700		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	50,000		1,155,000			

2021	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$500,000	$100,000	$400,000								
Energy Education Outreach Events				$0	$0	8,830	20	176,600	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	30,000	20	600,000		$0	
Desert Research Institute Program				$0	$0	7,000	20	140,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	1,470	91	133,770		$0	
Energy Efficiency Kits - Low Income				$0	$0	700	91	63,700		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	50,000		1,155,000			

Name:	2019-21 Energy Education	**Last Updated:**	5/14/2018 13:29
Customer Sector:	Residential	**Avg Measure Life:**	1.50
Region :	Vegas	**Energy Savings Curve:**	Home_Energy Reports
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$322,730	$1,190,174	($867,443)	0.27	$0.285
Total Resource Cost (TRC)	$280,635	$1,190,174	($909,539)	0.24	$0.285
Utility Cost Test (UCT)	$280,635	$1,190,174	($909,539)	0.24	$0.285
Participant Cost Test (PCT)	$482,139	$0	$482,139		$0.000
Ratepayer Impact (RIM)	$280,635	$1,672,313	($1,391,678)	0.17	$0.400
Societal Cost (SCT)	$332,975	$1,190,174	($857,199)	0.28	$0.285

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$500,000	$500,000	$500,000	$1,500,000
Electric Benefits ($)	$74,035	$78,566	$84,983	$280,635
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,199,888	1,199,888	1,199,888	5,399,498
Critical Peak Hour Demand (kW)	393	393	393	589
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	233,047	233,047	233,047	1,046,946
Total On Peak Hours (%)				19.39%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Sierra Pacific Power Company Energy Education Program

2017 Results

The Energy Education Program thrived in 2017. The program spent 94.1 percent of the combined budget and exceeded its goals. Hence, it was implemented in such a way to economically deliver outreach efforts by working with community partners, businesses, and other utilities to maximize the penetration of education activities.

Table DSM-24: 2017 Program Results by Component

Program Measure	Program Budget			Individuals Educated		
	Approved	Actual	Variance	Target	Achieved	Variance
Residential Customer	$125,000	$132,887	6.3%	23,000	36,668	59.4%
Commercial Customer	$175,000	$149,270	(14.7%)	300	3,301	1,000.3%
Total	$300,000	$282,157	(5.9%)	23,300	39,969	71.5%

Residential Customer Education Results:
Budget: The program spent 106.3 percent of the $125,000 budget on this component. The total spend was $132,887. The program slightly overspent its budget because Sierra expanded the number of National Theatre for Children (NTC) performances due to its success in educating elementary school students.

Individuals Educated: The residential program component exceeded its target by 59.4 percent. Overall, 36,668 customers were educated by this offering.

The Residential Customer Education component provided customer education through an assortment of initiatives. These initiatives included focusing on direct contact with customers at a variety of public outreach events, providing PowerShift energy efficiency presentations to groups of customers at a variety of educational opportunities, the EnergySmart Educator program, and NTC program.

In 2017, the Program provided energy education at 49 educational opportunities. These events included live educational performances by NTC, senior focused education presentations, community outreach events, employee education was provided for the Company's large commercial customers, and through the EnergySmart Education program. Through each of these efforts the Company educated a total of 36,668 residential customers.

Many of the Company's large commercial customers invited DSM to share its PowerShift products and services with their employees. Large business customers want to help their employees become more energy efficient and save money on their power bills. The Company educated a total of 7,941 residential customers through these employee focused outreach events.

The NTC educated thousands of students and teachers in northern Nevada. This program featured "The Energized Guys", a live in-school performance that teaches elementary schools students about energy efficiency and renewable energy. It also featured student playbooks, teacher guides, classroom posters, and digital games and activities. The program was implemented from May 22, 2017, through December 15, 2017, and educated 8,682 students and 341 teachers in Sierra's northern Nevada service territory.

The Company continued to support the EnergySmart Education program, which is administered through DRI. This program was provided in collaboration with Southwest Gas. The program is designed to train teachers on a STEM based energy efficiency and conservation curriculum. The training held for teachers in 2017 was framed through the Next Generation Science Standards ("NGSS") lens so that teachers could better understand how to tie energy efficiency lessons into their classroom standards. DRI educated 1,268 students and 74 teachers within the Company's service territory.

The PowerShift energy education materials was distributed to our customers through our field service technicians. This group of technicians through customer interactions distributed 1,095 brochures. This group of technicians included our implementation contractors, meter field service personnel, and through a mail-out of direct install thermostat kits to customers.

Commercial Customer Education Results:
Budget: The program spent 85.2 percent of the $175,000 budget on this component. The total spend was $149,270. The program slightly underspent its budget because the Program exceeded its participant goal without spending the total amount of the budget.

Individuals Educated: This commercial program component exceeded its target by 1,000.3 percent. Overall, 3,301 business customers were educated by this offering.

The Company provided 28 educational opportunities that delivered energy efficiency training to a variety of commercial professionals. The goal was to help business customers identify energy efficiency opportunities and highlight the energy efficiency resources available to them. The Company educated a total of 3,301 commercial customers through its commercial education component.

In partnership with the Commercial Program, energy education presentations were provided at eight training events in 2017. The training topics were the Commercial Energy Services Kick-off, Integrated EE/Demand Response, Nonprofit Agency Grants; Power Quality; Industrial and Manufacturing Energy; Healthcare Panel; Pumps, Motors and VFD's; Compressed Air; and LED Lighting and Controls, this session was given twice due to customer demand. The Company educated a total of 417 business customers through its commercial trainings.

Also new to 2017, the Energy Education Program introduced custom energy efficiency kits that were shipped to 745 small and medium business customers in northern Nevada. The measures included in the kits provided energy, gas, and water savings, along with education about additional

PowerShift products to improve their operations, improve the comfort and ambiance of their facilities and reduce their energy costs. The measures were packaged into a white corrugated box with a custom-branded PowerShift color label and included a customer letter with a link to a survey.

The Company continued its partnership with Green Builder Media in 2017 to provide webinars, in-person training and an e-book. The webinars offered training in the areas of smart home technology, building beyond net zero, 2018 IECC codes, energy ratings, green financing, and demand-side energy management strategies. The e-book provided in-depth information about advanced building science practices, including how to optimize energy efficiency, improve indoor air quality, and enhance resiliency. The in-person trainings that took place in 2017 from Green Builder Media were the 2015 IECC training, one for commercial building and one for residential building, and Financing Options for Commercial Energy Efficiency Projects. The Company educated a total of 1,079 customers through Green Builder Media educational opportunities.

Lessons Learned and Recommendations

The following is a recap of lessons learned in 2017 that provide guidance for the design and delivery of the Program in future years.

- In 2017, the Company proactively searched for new educational opportunities to reach more customers. This was intended to expand awareness and introduce customers to ways to save on their power bill. The Program is committed to providing customers with engaging and effective energy education.

- The Company has been seeking feedback from customers and has learned from anecdotal conversations at events with customers that they are pleased with their participation in the DSM programs. In fact, customers themselves have invited the Company to have a representative present at an organization they belong to. This has been an exciting experience for the Company as more customers are demanding energy education. This feedback has been included in the proposed implementation design.

- The Program continued to partner with customer service at our community outreach events, which allowed customers the ability to sign up for paperless billing, equal payment, and to check any account issues. The “one-stop-shop” concept was a well-received service by customers. The Program experienced an increase in the amount of customers wanting to sign up as a participant in the Smart Thermostat and Home Energy Assessments programs. The team worked together to implement a process to follow-up with the customer after the community event and follow through with their requests for services. For future years, tablets will be available at events to provide customers with the ability to sign-up for DSM programs at the time of the interaction.

- Due to the positive customer feedback from the NTC program in the spring of 2017, the Program will increase the targeted number of students and teachers educated in future school years.

Measurement & Verification

The M&V report titled Energy Education Program was performed by ADM and is provided in the Technical Appendix DSM-6. The report provides the evaluation results of the 2017 Program.

2018 Status

The 2018 Energy Education Program is a continuation of the 2017 program efforts while incorporating the lessons learned.

The outreach events continue to be very interactive and provide a seamless, one-stop-shop experience for our customers. When appropriate, customer service representatives will continue to accompany the energy education outreach team to events to address product and service needs for the customer. When it is appropriate a DSM product and service contractor will be asked to participate in outreach events to educate the customer about the program and to set appointments with the customer when a customer is interested in becoming a participant.

The Company will continue with the National Theatre for Children to provide energy education to students and teachers in Nevada. The program launched in February of 2018 and is providing exciting, interactive, and useful education on energy efficiency and conservation that is designed to reinforce this education with their parents. The program is being implemented through live theatre performances and educational assignments that educate students and teachers. As part of the assignments, the students are providing their parents with materials designed to generate awareness of the Company's DSM products and services.

The EnergySmart Education program will begin providing STEM teacher trainings in the fall of 2018 in northern Nevada. The focus of the training will be on energy in mostly the physical sciences while highlighting and practicing the new Next Generation Science Standards and with new Green Box content added. The main areas of focus for the new content are Energy Basics, Grade 4; Energy Action Team, Grade 9-12; and additional natural gas resources.

The Company will continue with Green Builder Media to provide energy education to the commercial industry. They will continue to offer webinars throughout 2018, live trainings, two guidebooks, and ongoing content promotion and viewer engagement, and email blasts.

The Company's Energy Education Program continues to leverage all communication platforms, both paid and unpaid, in support of its goal to increase awareness of its products and services to help all of its customers save energy and money. It is part of its on-going commitment to providing excellent customer service.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program for the Action Plan Period 2019-2021 with a budget of $400,000 and a target of educating 28,000 customers for each year of the Action Plan. The proposed Program includes the continuation of some residential and commercial components from previous implementation years, however; also incorporates new initiatives designed to generate greater knowledge and understanding of how to achieve energy efficiency. Beginning in 2019, the Company plans to measure and report energy and demand savings associated with the Energy Education Program. The proposed Program has an energy savings goal of 866,600 kilowatt-hours. This energy savings projection was derived from estimated energy savings seen in similar programs across the country.

The Energy Education Program will continue to focus on increasing awareness of PowerShift by NV Energy residential and commercial offerings, along with how to sign-up for specific energy-efficiency and customer service products. The Energy Education Program will be augmented by targeted outreach efforts at community and business events to further drive awareness and participation.

The implementation focuses on establishing avenues for customer education and assistance for customers. These avenues will foster opportunities for customers to glean a greater understanding of how they can be energy-efficient, incorporate measures into their home or business, and take advantage of the Company's offerings.

Customer outreach efforts will provide a variety of communication channels to reach both residential and commercial customers. This includes providing detailed information about our products and services on the Company's website and with ways to sign up and schedule appointments with Energy Advisors. Education also includes providing print materials at outreach events, leveraging our participation in community and business gatherings, and sharing information with the media to gain greater awareness and increase participation.

Senior groups will be communicated with at specific gatherings and community centers that cater to this population. Services and avenues that reach low-income customers will also have targeted outreach initiatives to support awareness and participation efforts. These customer segments, coupled with overall residential and commercial outreach will be included in strategies to broaden and strengthen all touchpoints.

The Education Program will continue to partner with the National Theatre for Children. This brings energy education into the halls of elementary schools by reaching students and teachers, and educating them about the importance of protecting our planet and the benefits of energy efficiency.

Community partnerships are also part of the Education Program. The Company will continue to partner with the Desert Research Institute and Southwest Gas on the delivery of the EnergySmart Educators Program. This is a STEM based program. This component of the Energy Education program will be expanded to partner with Envirolution and bringing Project ReCharge to Clark

County, where high school students perform their school's energy assessments and make recommendations. This further expands the current Energy Smart Educators program to now educate students on the importance of energy efficiency for all students K through 12.

The Program intends to investigate adding an additional offering by providing energy education directed to Title One Schools. This effort would take place in partnership with Southwest Gas and consist of a teacher-directed program to provide kits with energy efficiency devices for each student to install in their home. The program will focus on fourth grade teachers and students.

Additionally, the Education Program will investigate offering energy-efficiency kits to low-income residential customers. The kits will include energy saving measures for sealing leaks around doors and windows and providing LED bulbs with a higher wattage for greater efficiency.

To reach the commercial and building communities, the Company will continue to offer education about the value of energy efficiency concepts in new construction and facility remodels. This will be conducted via invitation to webinars, presentations, and in-person trainings. Additionally, e-books will be provided to customers that discuss advanced building science practices, including how to optimize energy efficiency, improve indoor air quality, and enhance resiliency.

The Commercial Customer Education Component will expand the variety of classes offered on energy efficiency for commercial customers and will partner with Southwest Gas and other stakeholders. Large and small businesses will be a focus of outreach to support awareness and participation efforts. These training sessions will provide customers and contractors with basic to mid-level knowledge of energy-saving measures and technology to help reduce consumption and lower operating costs.

The Education Program will be implemented through a variety of outreach channels and utilize various communication efforts. Through a concerted, strategic effort, it will focus on maximizing resources to obtain notable energy-efficiency awareness and participation.

M&V Plan

The EM&V contractor will perform EM&V activities to confirm the savings realized through the Energy Education being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Energy Education Program. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.

- Identification of the need for *ex ante* savings measures and how their values will be developed.

- Description of how realization rates will be determined.

- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.

- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive energy efficiency kits. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who receive energy education that are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the Energy Education Program, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-education electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Companies. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Net-to-Gross, Freeridership and Spillover

This is a new program design that provides a unique and no cost service for customers. Until the completion of a future net to gross study the net-to-gross ratio for this program is set at 1.0.

Energy Savings Curves

Since energy savings curves have not been developed for the Energy Education program, the Program utilized the same curve as the Energy Reports program.

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2017. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to customers' actual energy usage for any given period, including hourly energy usage.

A new energy saving curve will be developed for Energy Education as part of the M&V process in 2019.

Incremental Costs

The incremental cost for this program has been set at zero dollars as expenditures by customers in other DSM programs will be picked up in the analysis of those other programs.

Incentives/Rebates

There are no incentives or rebates paid under this program.

Measure Life

The useful life for this Program will be determined in a future M&V report. For the purpose of this financial analysis, an estimated 1.5 years has been utilized.

Units

A unit, for the purposes of this Program, an educated customer or installed measure.

Savings

The savings for this Program will be computed on a per customer basis or per home basis based on future M&V reports.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Energy Education

2019	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$400,000	$80,000	$320,000								
Energy Education Outreach Events				$0	$0	10,900	20	218,000	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	8,000	20	160,000		$0	
Desert Research Institute Program				$0	$0	3,000	20	60,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	2,100	95	199,500		$0	
Energy Efficiency Kits - Low Income				$0	$0	2,000	95	190,000		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	28,000		866,600			

2020	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$400,000	$80,000	$320,000								
Energy Education Outreach Events				$0	$0	10,900	20	218,000	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	8,000	20	160,000		$0	
Desert Research Institute Program				$0	$0	3,000	20	60,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	2,100	95	199,500		$0	
Energy Efficiency Kits - Low Income				$0	$0	2,000	95	190,000		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	28,000		866,600			

2021	Total Budget	Utility & Admin M&V	Implementation Costs	Incentives	Incentive per Unit	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$400,000	$80,000	$320,000								
Energy Education Outreach Events				$0	$0	10,900	20	218,000	1.5	$0	100.0%
National Theatre for Children Program				$0	$0	8,000	20	160,000		$0	
Desert Research Institute Program				$0	$0	3,000	20	60,000		$0	
Energy Efficiency Kits- Title One Schools				$0	$0	2,100	95	199,500		$0	
Energy Efficiency Kits - Low Income				$0	$0	2,000	95	190,000		$0	
High School Education Program				$0	$0	2,000	20	40,000		$0	
Total				$0	$0	28,000		866,600			

Name:	2019-21 Energy Education	**Last Updated:**	5/14/2018 14:09
Customer Sector:	Residential	**Avg Measure Life:**	1.50
Region :	Reno	**Energy Savings Curve:**	Home_Energy Reports
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$269,463	$990,600	($721,138)	0.27	$0.294
Total Resource Cost (TRC)	$234,315	$990,600	($756,285)	0.24	$0.294
Utility Cost Test (UCT)	$234,315	$990,600	($756,285)	0.24	$0.294
Participant Cost Test (PCT)	$315,557	$0	$315,557		$0.000
Ratepayer Impact (RIM)	$234,315	$1,306,157	($1,071,842)	0.18	$0.388
Societal Cost (SCT)	$277,511	$990,600	($713,089)	0.28	$0.294

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$400,000	$400,000	$400,000	$1,200,000
Electric Benefits ($)	$59,640	$62,819	$67,497	$234,315
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	925,817	925,817	925,817	4,166,178
Critical Peak Hour Demand (kW)	299	299	299	449
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	55,318	55,318	55,318	888,888
Total On Peak Hours (%)				21.34%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Energy Reports Program

The Energy Reports Program ("Program" in this section) is comprised of two sections: Home Energy Reports ("Home Reports") and Business Energy Reports ("Business Reports"). The Program provides periodic energy usage reports to residential and business customers to inform and motivate them to take actions to save energy by using electricity more efficiently and to drive participation in other DSM programs.

Based upon two primary objectives, the Program focuses on achieving two results. First, it seeks to motivate customers to change or modify their behavior in context with similar households or businesses. Second, it seeks to provide customers with personalized information, energy-saving products and services, and practical ways to save energy and money.
The Program is administered as follows:

1. **Delivery of reports:** Customers first receive a welcome letter to introduce them to the Program followed by a series of energy reports. The reports provide updates on the energy usage behavior of that household or business in the context of similar households or businesses, and offer tips for saving energy.

2. **Ability to opt-out:** All participants have a clear and easy method for opting out of the Program if they no longer want to receive the information. Customers who chose to opt-out of the Program can do so by contacting a customer service representative or sending an email.

Both residential and business customers change how they use energy when they receive relevant insights about their energy use in a format that provokes their interest and action.

The Energy Reports Program presents customers with the most relevant suggestions likely to deliver the greatest savings. In addition to behavioral changes to reduce energy usage, the program also provides information to customers on other DSM programs spurring a broader base of customers to participate in those programs.

Nevada Power Company Energy Reports Program

2017 Results

Home Reports

In 2017 a total of six home energy reports were provided to 152,301 residential single-family customers and 24,198 low-income customers. While the annual target was 130,000 residential single-family customers, inclusive of 20,000 low-income customers, additional reports were distributed by the implementation contractor, at no additional cost.

The participants included in the Program were selected by the implementation contractor. The participant selection criteria included single-family residential customers with at least 13 months of consecutive energy consumption data and then selected the top 35 percent of highest energy consumers to participate. As a result, customers received the home energy report by hard copy and/or email.

Customers that opted to leave the Program, moved, or were no longer active accounts were then back-filled with new customers to maintain the targeted participation. Customers that opted to receive their home energy reports by email were provided electronic copies. The Company also provided participants with a series of eight energy challenges. Each energy challenge provided a specific call to action for an energy-saving behavior.

The final report delivered to customers by the implementation contractor was mailed in August 2017. The implementation contractor's contract ended officially in October 2017.

Budget: Expenditures were $482,122 which was 68.9 percent of the budget of $700,000.

The Company changed the design of the Home Reports and began delivering it internally, to leverage the newly launched online energy assessment. This new program design focused on engaging residential customers who did not interact with the Company through the online platform. The Company provided the online assessment vendor with a list of active residential customers who were not on MyAccount. These customers included both single-family and multi-family customers with at least 13 months' of consecutive energy consumption data. The new report looks just like the online assessment tool and provides customers with their energy information by appliance disaggregation, a comparison to the energy usage of similar homes, and personalized way to save energy and money. The concept behind this new design, is to reach out to customers that do not appear to receive PowerShift products and service messages, help them understand where their energy is going, and drive them to create a MyAccount where they have access to all the other products and services available to them. In fact, the title on the reports is now Home Energy Performance.

Business Reports

In July 2017, the Company selected an implementation contractor to deliver the Business Report program. The project kickoff meeting was held in August 2017 and a project plan was developed for implementing the reports. From September 2017 to November 2017, the Company developed data specifications, customer education materials, a report template and report content, and an experimental design plan.

Budget: Expenditures were $461,484 which was 92.3 percent of the budget of $500,000.

All the reported energy savings are attributed to the Home Reports, since the Business Reports were not provided to customers in 2017. In 2017, the Energy Reports focused on growing the Company's energy education outreach.

Measurement & Verification

The M&V report titled Home Energy Reports was performed by ADM and is provided in the Technical Appendix DSM-7.

Lessons Learned and Recommendations

The following is a recap of lessons learned in 2017 that provides guidance for the design and delivery of the program in the future.

- Messaging was updated throughout the year to include relevant and seasonal information to best assist customers with their energy efficiency measures. This included timely tips along with information to further educate customers about the Company's products and services.

- In 2017, the Company made a decision to bring the report in-house to give the Company leverage to the online energy assessment tool, and to reach more customers. Accordingly, steps were implemented to transition this Program and bring it in-house. These steps were taken to provide customers with an enhanced and consistent customer service experience and to provide them with timely information regarding their energy use and energy-saving tips to help them save. This gave the Company the opportunity to increase its reach to additional customers who had not received communication in prior years.

- The implementation contractor utilized data that identified customers at the 100-150 percent of the federal poverty level. The Company revised this approach to include a wider range of low-income customers based on available income information. The Company is expanding its reach to low-income customers who would benefit from receiving the report and provide them an energy efficiency education.

2018 Status

The 2018, the home reports presents a brand new program design. The 2018 Program has been expanded to include both single-family and multi-family residential customers and leverages the online energy assessment tool.

As a result of the new program design, the new treatment and control groups were established and results in new customers, including a larger group of low-income customers receiving the home report. Even though, the Program will not be calculating a TRC, verified energy and demand savings will continue to be measured.

Once the participants were selected for the new treatment groups, customers were sent notifications regarding the Program changes. In January, the Company mailed a letter to customers that were receiving the former home energy report informing them they will no longer receive the

report, since they now have 24/7 access to this information and more when they log into MyAccount. Customers were offered the opportunity to opt-in to continuing to receive the new home energy report. In February, welcome letters were mailed to the new Program participants explaining the Program and the new reports they will soon receive. Customers were offered the opportunity to opt-out of receiving the report if they did not wish to receive the report. Shortly thereafter, the newly designed energy reports were sent to approximately 130,000 households.

The Business Report is being delivered for the first time in 2018. The program, referred to as business energy performance, includes six reports mailed to small and medium business customers. The program's treatment and control groups were established to measure energy and demand savings to report in future years. The first customized energy reports were delivered to approximately 21,000 business customers in March 2018. Each participant received a postcard notifying them that soon they will receive the reports and later received a welcome letter included in the envelope with the first business energy report. The welcome letter explained how the business manager could utilize the information in the report and provided the customer with the ability to opt-out of participating.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $1,200,000 and a target of 13,300,000 kWh in 2019, and a budget of $1,200,000 and a target of 13,300,000 kWh in program year 2020, and a budget of $1,200,000 and a target of 13,300,000 kWh in program year 2021. The budgets will be broken down into two components: Home Reports for residential customers and Business Reports for small to medium commercial customers.

The Program will continue to provide periodic energy usage reports to both residential and small to medium commercial customers. The. reports will be designed to inform and motivate recipients to take actions to save energy by using electricity more efficiently, and to drive participation and cross promote other energy savings programs such as in-home energy assessments, and smart thermostats; with the end goal of offering an exceptional customer experience that will increase customer satisfaction, create customer awareness to the programs DSM offers, educate customers on their energy usage, all while motivating customers to become energy efficient.

M&V Plan

Home Reports

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Home Reports being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Home Reports. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of receiving a home report.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the Home Reports, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Business Reports

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Business Reports being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Business Reports. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of receiving a Business Report.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the Business Reports, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2016. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to the Company customers' actual energy usage for any given period, including hourly energy usage.

Incremental Costs

Incremental cost is the difference between the cost of the energy-efficient measure and the cost of the base case or baseline measure experienced by the Program participant. There are no incremental costs because there are no out of pocket costs for the customer.

Incentives/Rebates

In the case of the Energy Reports Program, there is no incremental cost because receiving the report provided by the Company does not involve any out-of-pocket expense to the customer.

Measure Life

The derived EUL for this Program is 3.50 years as presented in the M&V Report delivered in 2017. The 3.50 EUL is based on the sum of the total saving divided by the first year savings as stated in the M&V report.

Units

Unit is defined as a household receiving an energy report.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

NPC- Energy Reports

2019	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$1,200,000	$216,000	$984,000						
				383,175	34.71	13,300,000	3.5	$0.00	100.0%
Total									

NPC- Energy Reports

2020	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$1,200,000	$216,000	$984,000						
				383,175	34.71	13,300,000	3.5	$0.00	100.0%
Total									

NPC- Energy Reports

2021	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$1,200,000	$216,000	$984,000						
				383,175	34.71	13,300,000	3.5	$0.00	100.0%
Total									

Name:	2019-21 Home Energy Reports	**Last Updated:**	5/14/2018 13:27
Customer Sector:	Residential	**Avg Measure Life:**	3.50
Region :	Vegas	**Energy Savings Curve:**	Home_Energy Reports
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$8,568,879	$2,856,417	$5,712,462	3.00	$0.027
Total Resource Cost (TRC)	$7,451,199	$2,856,417	$4,594,782	2.61	$0.027
Utility Cost Test (UCT)	$7,451,199	$2,856,417	$4,594,782	2.61	$0.027
Participant Cost Test (PCT)	$12,069,507	$0	$12,069,507		$0.000
Ratepayer Impact (RIM)	$7,451,199	$14,925,924	($7,474,725)	0.50	$0.143
Societal Cost (SCT)	$8,854,432	$2,856,417	$5,998,015	3.10	$0.027

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,200,000	$1,200,000	$1,200,000	$3,600,000
Electric Benefits ($)	$853,208	$905,427	$979,383	$7,451,199
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	13,828,035	13,828,035	13,828,035	145,194,369
Critical Peak Hour Demand (kW)	4,525	4,525	4,525	13,575
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	2,685,739	2,685,739	2,685,739	28,152,746
Total On Peak Hours (%)				19.39%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data	
Discount Rate:	8.09%
Rate Escalator:	0.00%
Inflation Rate (T&D):	2.00%
Line Loss (Energy):	3.82%
Line Loss (Demand):	7.60%
Avoided T&D Capacity $/MW:	$52,295
Environmental Adder (SCT only)	10.00%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%
Electric Retail Rate ($/KWh):	$0.12
Gas Retail Rate ($/therm)	$0.66
Net-To-Gross Ratio	100.0%

Secondary Benefits	
Other Savings	$0
Scenarios:	
Measure Life	100%
Energy Savings	100%
Avoided Energy Cost	100%
Avoided Capacity Cost	100%
Incremental Measure Cost	100%

Sierra Pacific Power Company Energy Reports Program

2017 Results

Home Reports

In 2017 a total of six home energy reports were provided to 93,989 residential single-family customers. While the annual target was 65,000 additional reports were distributed by the implementation contractor, at no additional cost.

The participants included in the Program were selected by the implementation contractor. The participant selection criteria included single-family residential customers with at least 13 months of consecutive energy consumption data and then selected the top 35 percent of highest energy consumers to participate. As a result, customers received the Home Report by hard copy and/or email.

Customers that opted to leave the Program, moved, or were no longer active accounts were then back-filled with new customers to maintain the targeted participation. Customers that opted to receive their home energy reports by email were provided electronic copies. The Company also provided participants with a series of eight energy challenges. Each energy challenge provided a specific call to action for an energy-saving behavior.

The final report delivered to customers by the implementation contractor was mailed in August 2017. The contract for implementation ended officially in October 2017.

Budget: Expenditures were $521,833 which was 100.4 percent of the budget of $520,000.

The Company decided to change the design of the Home Reports and begin delivering it internally, to leverage the newly launched online energy assessment. This new Program design focused on engaging residential customers that did not interact with the Company online. The Company provided the online assessment vendor with a list of active residential customers that were not on MyAccount. These customers included both single-family and multi-family customers with at least 13 months of consecutive energy consumption data. The new report looks just like the online assessment tool and provides the customers with their energy information by appliance disaggregation, a comparison to the energy usage of similar homes, and personalized way to save energy and money. The concept behind this new design, is to reach out to customers that do not appear to receive PowerShift by NV Energy products and service messages, help them understand where their energy is going, and drive them to create a MyAccount where they have access to all the other products and services available to them. In fact, the name on the reports is now Home Energy Performance.

Business Reports

In July 2017, the Company selected an implementation contractor to deliver the Business Reports. The project kickoff meeting was held in August 2017 and a project plan was developed for implementing the reports. From September 2017 to November 2017, the Company developed data specifications, customer education materials, a report template and report content, and an experimental design plan

Budget: Expenditures were $75,739 which was 42 percent of the budget of $180,000.

All the energy saving are attributed to the Home Reports since the Business Reports were not provided to customers in 2017. In 2017, the Energy Reports have focused on growing the Company's energy education outreach rather than its former focus of attempting to document benefits through a TRC test.

Measurement & Verification

The M&V report titled Home Energy Reports was performed by ADM and is provided in the Technical Appendix DSM-8.

Lessons Learned & Recommendations

The following is a recap of lessons learned in 2017 that provides guidance for the design and delivery of the program in the future.

- Messaging was updated throughout the year to include relevant and seasonal information to best assist customers with their energy efficiency measures. This included timely tips along with information to further educate customers about the Company's products and services.

- In 2017, the Company made a decision to bring the report in-house to give the Company leverage to the online energy assessment tool, and to reach more customers. Consequently, steps were implemented to this Program and bring it in-house. These steps were taken to provide our customers with an enhanced customer service experience and to provide them with timely information regarding their energy use and energy-saving tips to help them save. This also gave the Company the opportunity to increase its reach to additional customers who were not being communicated with in prior years.

- The Company utilized data that identified customers at the 100-150 percent of the federal poverty level. The Company revised this approach to include a wider range of low-income customers based on available income information. The Company is expanding its reach to low-income customers who would benefit from receiving the report and provide them with an energy efficiency education.

2018 Status

The 2018 Energy Report Program presents a brand new program design. The 2018 Program has been expanded to include both single-family and multi-family residential customers and leverages the online energy assessment tool.

As a result of the new program design, the new treatment and control groups were established and results in new customers, including a larger group of low-income customers receiving the Home Energy Report. Even though, the Program will not be calculating a TRC, verified energy and demand savings will continue to be measured.

Once the participants were selected for the new treatment groups, customers were sent notifications regarding the Program changes. In January, the Company mailed a letter to customers that were receiving the former home energy report informing them they will no longer receive the home energy report, since they now have 24/7 access to this information and more when they log into MyAccount. Customers were offered the opportunity to opt-in to continuing to receive the new home energy report. In February, welcome letters were mailed to the new Program participants explaining the Program and the new reports they will soon receive. Customers were offered the opportunity to opt-out of receiving the report if they did not wish to receive the reports. Shortly thereafter, the newly designed energy reports were sent to approximately 65,000 households.

The Business Reports is being delivered for the first time in 2018. The Program, referred to as Business Energy Performance, includes six reports mailed to small and medium business customers. The Program's treatment and control groups were established to measure energy and demand savings to report in future years. The first customized energy reports were delivered to approximately 21,000 business customers in March 2018. Each participant received a postcard notifying them that soon they will receive the reports and later received a welcome letter included in the envelope with the first business energy report. The welcome letter explained how the business manager could utilize the information in the report and provided the customer with the ability to opt-out of participating.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $575,000 and a target of 7,800,000 kWh in 2019, and a budget of $675,000 and a target of 8,900,000 kWh in program year 2020, and a budget of $775,000 and a target of 11,300,000 kWh in program year 2021. The budgets will be broken down into two components: home energy reports for residential customers and business energy reports for small to medium commercial customers.

The Program will continue to provide periodic energy usage reports to both residential and small to medium commercial customers. The reports will be designed to inform and motivate recipients

to take actions to save energy by using electricity more efficiently, and to drive participation and cross promote other energy savings programs such as in-home Energy Assessments, and Residential Demand Response; with the end goal of offering an exceptional customer experience that will increase customer satisfaction, create customer awareness to the programs DSM offers, educate customers on their energy usage, all while motivating customers to become energy efficient.

M&V Plan

Home Reports

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Home Reports being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Home Reports. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of receiving a home report.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the Home Reports, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Business Reports

M&V Plan
The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Business Reports being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Business Reports. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

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M&V Analysis Methods

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Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2016. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to the Company customers' actual energy usage for any given period, including hourly energy usage.

Incremental Costs

Incremental cost is the difference between the cost of the energy-efficient measure and the cost of the base case or baseline measure experienced by the Program participant. In the case of Energy Reports, there is no incremental cost because receiving the report provided by the Company does not involve any out-of-pocket expense to the customer.

Incentives/Rebates

There are no incentives or rebates for the Program.

Measure Life

The derived EUL for this Program is 3.50 years as presented in the M&V Report for 2017. The 3.50 EUL is based on the sum of the total saving divided by the first year savings as stated in the M&V report.

Units

Unit is defined as a household receiving an energy report.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs” provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the ‘Financial Data’ section of the output sheet.

SPPC- Energy Reports

2019	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$575,000	$103,500	$471,500	82,697	94.32	7,800,000	3.5	$0.00	100.0%
Total									

SPPC- Energy Reports

2020	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$675,000	$121,500	$553,500	94,360	94.32	8,900,000	3.5	$0.00	100.0%
Total									

SPPC- Energy Reports

2021	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Reports	$775,000	$139,500	$635,500	119,805	94.32	11,300,000	3.5	$0.00	100.0%
Total									

Name:	2019-21 Home Energy Reports	**Last Updated:**	5/14/2018 14:11
Customer Sector:	Residential	**Avg Measure Life:**	3.50
Region :	Reno	**Energy Savings Curve:**	Home_Energy Reports
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$6,770,928	$1,661,016	$5,109,912	4.08	$0.021
Total Resource Cost (TRC)	$5,887,764	$1,661,016	$4,226,748	3.54	$0.021
Utility Cost Test (UCT)	$5,887,764	$1,661,016	$4,226,748	3.54	$0.021
Participant Cost Test (PCT)	$7,403,986	$0	$7,403,986		$0.000
Ratepayer Impact (RIM)	$5,887,764	$9,065,002	($3,177,238)	0.65	$0.115
Societal Cost (SCT)	$6,986,382	$1,661,016	$5,325,366	4.21	$0.021

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$575,000	$675,000	$775,000	$2,025,000
Electric Benefits ($)	$536,256	$644,503	$879,234	$5,887,764
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	8,324,591	9,498,633	12,060,022	104,591,361
Critical Peak Hour Demand (kW)	2,690	3,069	3,897	9,656
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	497,399	567,548	720,593	22,315,422
Total On Peak Hours (%)				21.34%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Energy Assessments Program

The Energy Assessments program ("Program" in this section) is a DSM program that provides a customized energy analysis to residential customers who want to learn more about their energy usage and how their home performs. The Program educates the customer about how they can save energy by improving the performance of their home.

The Program is comprised of three services: an online assessment, an assessment conducted in the customer's home by a certified energy advisor, and the direct installation of energy-saving measures. The Program creates a partnership between the Company and its customers by promoting the responsible use of energy with respect to environmental impacts, while educating the customer and assisting them in taking action to reduce energy consumption.

An important aspect of the Program is the customer's action plan, a set of customized energy-saving tips and recommendations prescribed for their home and how they use energy. The action plan may be used by the customer to manage energy use by upgrading appliances and changing energy use behavior. Once an action plan is developed and provided to the customer, the company can then partner with the customer in implementing the action plan over time through outreach reminders, assisting with enrollment in other relevant utility programs, or engaging the customer in behavioral engagements designed to reduce energy costs – such as emailed energy challenges, or a rewards program, which will not only result in energy savings, but increased customer satisfaction.

The three services the Program offers will ensure every customer receives the level of assistance they require. The online assessment is offered as a self-help tool that determines energy usage through disaggregation, and assists customers in reducing energy consumption through various energy-saving tips customized to their home. The in-home assessment will provide assistance to the customers needing guidance from a certified energy advisor, and the direct installation of energy saving measures in the customer's home will jump start their action plan.

The Program, as presented in this program data sheet, is designed to educate customers about their energy usage through the in-home and online energy assessments and their unique customer action plan. The direct installation of energy saving measures, and the promotion of other energy saving programs will help the customer start their energy savings, promote trust in the Company and enhance the customer experience while increasing customer satisfaction.

Nevada Power Company Energy Assessments Program

2017 Results

Budget: The Program spent 63.5 percent of the $3,500,000 budget. The total spend was $2,222,104. The Home Energy Assessments component of the Program expended $1,180,014 or

77.6 percent of the $1,520,700 budget, the Online Energy Assessments component of the Program expended $896,353 or 76.0 percent of the $1,179,300 budget, and the Direct Install component of the Program expended $145,737 or 18.2 percent of the $800,000 budget.

In 2017, the Program provided 6,285 residential home visits designed to reduce energy consumption. The Program integrated comprehensive data analytic tools, billing histories, "neighbor compare" features, weather data, customer segmentation, appliance analysis and information gathered from third-party sources. These tools provide relevant actionable analysis, which lead to unique customer action plans.

Customers benefitted from different levels of assistance and participation. Some customers were comfortable using self-help tools to determine how to reduce home energy consumption through the online assessment tool. Others were able to benefit from receiving assistance provided through the in-home assessment and the associated in-person guidance.

In the absence of this Program, customers would be required to contact private home consulting firms for inspections involving efficiency identification at a cost which characteristically includes a substantial base price as well as a per square foot charge. These charges typically increase with the comprehensive of the inspection as it pertains to items such as air leakage tests and thermal imaging of the residence.

While the Program is not designated as a low-income program, there remains a substantial interest from this customer base. The in-home assessment is utilized as a high bill identification process which supports customers in our community with limited incomes such as seniors, gap customers, veterans, and students. Offered as a no-cost program to the customer adds additional appeal, and enables low-income customers to circumvent the otherwise costly measure of procuring electricians or private entities that offer these comprehensive inspections at cost, to identify the issues in their home.

Lessons Learned and Recommendations

Integration of the direct install measure will be imperative for reaching the heightened contact goal for this Program, and to achieve the customer satisfaction response the Company intends to reach with such customer facing programs. The success of the 2017 Program can be attributed to elevated marketing through external entities which proved to be effective by utilizing mass email and media efforts. This combined with prioritizing marketing through internal call centers allowed for a substantial increase in site visits compared to the 2016 residential site visit numbers. However, in order to continue to reach additional customers beyond the 2017 effort, the value proposition of the direct installation measure will prove to be a primary contributor in reaching these expectations.

The disaggregation tool will be imperative for increasing the value of the site visit to participants by allowing a customer distinct insight into appliance usage and costs. This comprehensive

itemization for expenses will allow for a more discerning residential energy consumption view and streamline the process for customer reports following the site visit. The 2017 Program was unable to take advantage of the disaggregation element due to production delays by the providing entity, however, the tool will be utilized for the 2018 program.

Online Assessments

An improvement to the 2017 program delivery involved the Customer Digital Experience ("CDX"), a feature which allowed online sign-ups for in-home assessments. This feature aided in increased customer participation, as well as supported enhanced customer service efforts. The development and deployment of new software analytical tools was implemented as part of the CDX. This software allows customers to complete self-assessments online, which details their unique energy consumption by appliance type and consumption patterns. The software then provides recommendations based on the result of high use appliances or other lifestyle activities. It also provides neighbor comparison, weather data, and billing history.

This new assessment capability was deployed in September 2017. From September 2017 through December 2017 the online energy assessment has attained 43,169 new site visitors, 10,987 returning visitors for a total of 54,156 site visits.

In-Home Assessments

Participants in the in-home assessments are provided recommendations to directly reduce the impact of energy consumption, which include: suggestions for behavior modification, heating and cooling system maintenance, thermal bypass deficiencies, fenestration issues, water heating and water conservation efficiency, appliance efficiency, air leakage, and identifying pump system ineffectiveness.

Direct Installation

In 2017 the following energy efficient measures were directly installed by a trained certified energy advisor:

- Air Filter/Furnace Filter change out: 4 to 5 filter sizes which captures 80 percent of all filter replacement requirements are provided to customers.
- LED Lighting: Philips 7 W, 9 W, and 11 W A19.
- Photocells: GE Automatic Light Control (Model Number: 18265). The photocell is installed in each socket of indoor and outdoor lighting fixtures with rain-tight.
- Refrigerator thermometer: Go Green Refrigerator Thermometer (4 pack) (Model Number: PRF102-12-4pk or equivalent).
- Air conditioner refrigerant line insulation on outside condenser unit.

These energy efficient measures introduce the customer to low-cost solutions that can be easily implemented within their home. The value proposition of direct install as part of the Energy

Assessments Program also serves as a catalyst for the continued expansion of the program as well as promotes potential cost savings when customers make future decisions for their home regarding low-cost energy efficient products.

Measurement & Verification

The M&V report titled Energy Assessments Program was performed by ADM and is provided in the Technical Appendix DSM-9. The report provides the evaluation results of the 2017 Program.

2018 Status

In 2018, the Program continues to offer assessments designed to reduce energy consumption, save on energy bills and educate customers about their energy usage. An online tool has been built to continue enhancing the customer experience and further help customers understand and manage their energy usage. The online tool promotes other DSM programs, and provides helpful personalized saving tips for customers to act upon.

The in-home assessment is performed in the customer's home by a trained and certified energy advisor. The in-home assessment provides an individualized experience for customers desiring a higher level of assistance in understanding their home's performance and managing energy use in order to reduce costs, improve living conditions, identify potential safety concerns, and lower maintenance expenditures. The Program creates a partnership between the utility and its customers, promoting responsible use of energy with respect to environmental impacts, while enhancing the customer experience and increasing customer service.

Direct installation of a limited number of energy saving measures at the customer home has been incorporated into the Program. These measures are intended to introduce the customers to products available in the market which reduce energy consumption and the associated costs. Available direct installation measures include the following:

- Replacement of up to six incandescent or CFL light bulbs with energy efficient LED light bulbs.
- Replacement of dirty HVAC filters.
- Installation of up to two exterior photocell sensors in exterior lighting sockets.
- Installation of refrigerator thermometer, which will display refrigerator temperature.
- Installation of up to six feet of exterior air conditioning refrigerant line insulation.

The online tool is another improvement that has been fully incorporated into the Program. The online assessment is designed to assist with the following:

- Increase customer engagement and interaction.
- Gain insight into customer behaviors, preferences and needs.
- Provide innovative energy solutions to our customers.

- Shift customer behavior to adopt new DSM programs and services.
- Collect customer data to drive and support our customer intelligence strategies.
- Encourage more integration of the tool's use within the Company to expand customer dialogue and enhance customer engagement.

In 2018, the Program will be able to better focus on the customer experience. Program enhancements include increased customer interaction. An email will be sent to the customer at the time of scheduling to remind them of the time and date of their appointment, a follow-up call and/or email will take place 48 hours after the assessment has been completed. This call will verify that the customer understood the recommendations made by the energy advisor, ensure that the customer doesn't have any additional questions and give the customer a chance to leave feedback. The Program is expanding its reach to low-income customers who would benefit from receiving an in-home energy assessment, energy efficiency education, and direct installation of a limited number of energy saving measures. The Program will include a wider range of low-income customers based on available income and zip code information.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $2,500,000 and a target of 2,700,000 kWh in each year of the Action Plan. The budgets will be broken down into two components: in-home energy assessments and online energy assessments.

The Program will continue to provide in-home and online energy assessment services, with a direct install component for residential customers, the Program will target low-income customers through various processes. The Program will continue to seek pathway opportunities to cross promote other energy savings programs such as smart thermostats and air conditioning rebates; with the end goal of offering an exceptional customer experience that will increase customer satisfaction, create customer awareness to other programs the utility offers, educate customers on their energy usage, all while motivating customers to become energy efficient.

The 2019-2021 action plan will employ an outreach effort designed to ensure customer awareness around the Program and other energy saving programs. The Program will be promoted in brochures, at public events, through emails and direct mailings, cross promotions by other programs, by the Company's Contact Center, the Company's North Las Vegas office, and other promotional activities. The Company's employees will be able to enroll customers into the Program and other energy saving programs on the spot at public events; customers will be provided with energy saving tips and an appointment card at the time of enrollment. The customer will receive a 48 hours call before their appointment, if the customer does not answer the call, a voicemail will be left and the customer service representative will send the customer an email reminding them of their appointment. The technician will also contact the customer when they are 45 to 30 minutes away from the customer's home. This will not only enhance the customer's experience with the Program, but it will also ensure the customer successfully completes their appointment.

M&V Plan

In-home Assessments

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the in-home portion of the Program being implemented in the Company's service territory.

Approach

The EM&V Contractor will provide the plans for performing the M&V activities for the in-home assessments. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection

The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of receiving an in-home assessment.

M&V Analysis Methods

Data Collection Procedures

For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the in-home assessment, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Online Assessments

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the online assessments portion of the Program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Online Energy Assessments Program. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of participating in an online assessment.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the online assessment, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2016. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to the Company customers' actual energy usage for any given period, including hourly energy usage.

Incremental Costs

Incremental cost is the difference between the cost of the energy-efficient measure and the cost of the base case or baseline measure experienced by the Program participant. In the case of Energy Reports, there is no incremental cost because receiving the report provided by the Company does not involve any out-of-pocket expense to the customer.

Incentives/Rebates

There are no incentives or rebates for the Program.

Measure Life

The derived EUL for this Program is 3.50 years as presented in the M&V Report for 2017. The 3.50 EUL is based on the sum of the total saving divided by the first year savings as stated in the M&V report.

Units

Unit is defined as a residential home.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

NPC- Energy Assessments

2019	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$2,500,000	$450,000	$2,050,000						
				10,500	257.14	2,700,000	2.0	$0.00	100.0%
Total									

NPC- Energy Assessments

2020	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$2,500,000	$450,000	$2,050,000						
				10,500	257.14	2,700,000	2.0	$0.00	100.0%
Total									

NPC- Energy Assessments

2021	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$2,500,000	$450,000	$2,050,000						
				10,500	257.14	2,700,000	2.0	$0.00	100.0%
Total									

Name:	2019-21 Energy Assessments	**Last Updated:**	5/14/2018 13:31
Customer Sector:	Residential	**Avg Measure Life:**	2.00
Region :	Vegas	**Energy Savings Curve:**	Home_Energy Assessments
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$960,898	$5,950,869	($4,989,970)	0.16	$0.463
Total Resource Cost (TRC)	$835,564	$5,950,869	($5,115,305)	0.14	$0.463
Utility Cost Test (UCT)	$835,564	$5,950,869	($5,115,305)	0.14	$0.463
Participant Cost Test (PCT)	$1,484,742	$0	$1,484,742		$0.000
Ratepayer Impact (RIM)	$835,564	$7,435,611	($6,600,047)	0.11	$0.578
Societal Cost (SCT)	$992,924	$5,950,869	($4,957,945)	0.17	$0.463

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$2,500,000	$2,500,000	$2,500,000	$7,500,000
Electric Benefits ($)	$165,272	$175,631	$190,375	$835,564
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	2,807,194	2,807,194	2,807,194	16,843,165
Critical Peak Hour Demand (kW)	859	859	859	1,718
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	545,044	545,044	545,044	3,265,110
Total On Peak Hours (%)				19.39%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Sierra Pacific Power Company Energy Assessments Program

2017 Results

Budget: The Program spent 72.0 percent of the $1,700,000 budget. The total spend was $1,224,158. The Home Energy Assessments component of the Program expended $793,766 or 80.6 percent of the $984,500 budget, the Online Energy Assessments component of the Program expended $382,508 or 92.1 percent of the $415,500 budget, and the Direct Install component of the Program expended $47,884 or 16.0 percent of the $300,000 budget. In 2017, the Program provided 3,133 residential home visits designed to reduce energy consumption. The Program integrated comprehensive data analytic tools, billing histories, "neighbor compare" features, weather data, customer segmentation, appliance analysis and information gathered from third-party sources. These tools provide relevant actionable analysis, which leads to unique customer action plans.

Customers benefitted from different levels of assistance and participation. Some customers were comfortable using self-help tools to determine how to reduce home energy consumption through the online assessment tool. Others were able to benefit from receiving assistance provided through the in-home assessment and the associated in-person guidance.

In the absence of this Program, customers would be required to contact private home consulting firms for inspections involving efficiency identification at a cost which characteristically includes a substantial base price as well as a per square foot charge. These charges typically increase with the comprehensive of the inspection as it pertains to items such as air leakage tests and thermal imaging of the residence.

While the Program is not designated as a low-income program, there remains a substantial interest from this customer base. The in-home assessment is utilized as a high bill identification process which supports customers in our community with limited incomes such as seniors, gap customers, veterans, and students. Offered as a no-cost program to the customer adds additional appeal, and enables low-income customers to circumvent the otherwise costly measure of procuring electricians or private entities that offer these comprehensive inspections at cost, to identify the issues in their home.

Lessons Learned and Recommendations

Integration of the direct install measure will be imperative for reaching the heightened contact goal for this Program, and to achieve the customer satisfaction response the Company intends to reach with such customer facing programs. The success of the 2017 Program can be attributed to elevated marketing through external entities which proved to be effective by utilizing mass email and media efforts. This combined with prioritizing marketing through internal call centers allowed for a substantial increase in site visits compared to the 2016 residential site visit numbers. However, in order to continue to reach additional customers beyond the 2017 effort, the value proposition of

the direct installation measure will prove to be a primary contributor in reaching these expectations.
The disaggregation tool will be imperative for increasing the value of the site visit to participants by allowing a customer distinct insight into appliance usage and costs. This comprehensive itemization for expenses will allow for a more discerning residential energy consumption view and streamline the process for customer reports following the site visit. The 2017 Program was unable to take advantage of the disaggregation element due to production delays by the providing entity, however, the tool will be utilized for the 2018 program.

Online Assessments

An improvement to the 2017 program delivery involved the Customer Digital Experience ("CDX"), a feature which allowed online sign-ups for in-home assessments. This feature aided in increased customer participation, as well as supported enhanced customer service efforts. The development and deployment of new software analytical tools was implemented as part of the CDX. This software allows customers to complete self-assessments online, which details their unique energy consumption, by appliance type and consumption patterns. The software then provides recommendations based on the result of high use appliances or other lifestyle activities. It also provides neighbor comparison, weather data, and billing history.

This new assessment capability was deployed in September 2017. From September 2017 through December 2017 the online energy assessment has attained 43,169 new site visitors, 10,987 returning visitors for a total of 54,156 site visits.

In-Home Assessments

Participants in the in-home assessments are provided recommendations to directly reduce the impact of energy consumption, which include: suggestions for behavior modification, heating and cooling system maintenance, thermal bypass deficiencies, fenestration issues, water heating and water conservation efficiency, appliance efficiency, air leakage, and identifying pump system ineffectiveness.

Direct Installation

In 2017 the following energy efficient measures were directly installed by a trained certified energy advisor:

- Air Filter/Furnace Filter change out: 4 to 5 filter sizes which captures 80 percent of all filter replacement requirements are provided to customers.
- LED Lighting: Philips 7 W, 9 W, and 11 W A19.
- Photocells: GE Automatic Light Control (Model Number: 18265). The photocell is installed in each socket of indoor and outdoor lighting fixtures with rain-tight.
- Refrigerator thermometer: Go Green Refrigerator Thermometer (4 pack) (Model Number: PRF102-12-4pk or equivalent).

- Air conditioner refrigerant line insulation on outside condenser unit.

These energy efficient measures introduce the customer to low-cost solutions that can be easily implemented within their home. The value proposition of direct install as part of the Energy Assessments Program also serves as a catalyst for the continued expansion of the program as well as promotes potential cost savings when customers make future decisions for their home regarding low-cost energy efficient products.

Measurement & Verification

The M&V report titled Energy Assessments Program was performed by ADM and is provided in the Technical Appendix DSM-10. The report provides the evaluation results of the 2017 Program.

2018 Status

In 2018, the Program continues to offer assessments designed to reduce energy consumption, save on energy bills and educate customers about their energy usage. An online tool has been built to continue enhancing the customer experience and further help customers understand and manage their energy usage. The online tool promotes other DSM programs, and provides helpful personalized saving tips for customers to act upon.

The in-home assessment is performed in the customer's home by a trained and certified energy advisor. The in-home assessment provides an individualized experience for customers desiring a higher level of assistance in understanding their home's performance and managing energy use in order to reduce costs, improve living conditions, identify potential safety concerns, and lower maintenance expenditures. The Program creates a partnership between the utility and its customers, promoting responsible use of energy with respect to environmental impacts, while enhancing the customer experience and increasing customer service.

Direct installation of a limited number of energy saving measures at the customer home has been incorporated into the Program. These measures are intended to introduce the customers to products available in the market which reduce energy consumption and the associated costs. Available direct installation measures include the following:

- Replacement of up to six incandescent or CFL light bulbs with energy efficient LED light bulbs.
- Replacement of dirty HVAC filters.
- Installation of up to two exterior photocell sensors in exterior lighting sockets.
- Installation of refrigerator thermometer, which will display refrigerator temperature.
- Installation of up to six feet of exterior air conditioning refrigerant line insulation.

The online tool is another improvement that has been fully incorporated into the Program. The online assessment is designed to assist with the following:

- Increase customer engagement and interaction.
- Gain insight into customer behaviors, preferences and needs.
- Provide innovative energy solutions to our customers.
- Shift customer behavior to adopt new DSM programs and services.
- Collect customer data to drive and support our customer intelligence strategies.
- Encourage more integration of the tool's use within the Company to expand customer dialogue and enhance customer engagement.

In 2018, the Program will be able to better focus on the customer experience. Program enhancements include increased customer interaction. An email will be sent to the customer at the time of scheduling to remind them of the time and date of their appointment, a follow-up call and/or email will take place 48 hours after the assessment has been completed. This call will verify that the customer understood the recommendations made by the energy advisor, ensure that the customer doesn't have any additional questions and give the customer a chance to leave feedback. The Program is expanding its reach to low-income customers who would benefit from receiving an in-home energy assessment, energy efficiency education, and direct installation of a limited number of energy saving measures. The Program will include a wider range of low-income customers based on available income and zip code information.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $1,125,000 and a target of 1,200,000 kWh in 2019, and a budget of $1,375,000 and a target of 1,300,000 kWh in program year 2020, and a budget of $1,3750,000 and a target of 1,300,000 kWh in program year 2021. The budgets will be broken down into two components: in-home energy assessments and online energy assessments.

The Program will continue to provide in-home and online energy assessment services, leveraged with a direct install program for residential customers, targeting low-income customers through zip codes. The Program will continue to seek pathway opportunities to cross promote other energy savings programs such as smart thermostats and air conditioning rebates; with the end goal of offering an exceptional customer experience that will increase customer satisfaction, create customer awareness to other programs the utility offers, educate customers on their energy usage, all while motivating customers to become energy efficient.

The 2019-2021 action plan will employ an outreach effort designed to ensure customer awareness around the Program and other energy saving programs. The Program will be promoted in brochures, at public events, through emails and direct mailings, cross promotions by other programs, by the Company Contact Center, and other promotional activities. The Company's employees will be able to enroll customers into the Program and other energy saving programs on the spot at public events; customers will be provided with energy saving tips and an appointment card at the time of enrollment. The customer will receive a 48 hours call before their appointment,

if the customer does not answer the call, a voicemail will be left and the customer service representative will send the customer an email reminding them of their appointment. The technician will also contact the customer when they are 45 to 30 minutes away from the customer's home. This will not only enhance the customer's experience with the Program, but it will also ensure the customer successfully completes their appointment.

M&V Plan

In-home Assessments

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the in-home portion of the Program being implemented in the Company's service territory.

Approach

The EM&V Contractor will provide the plans for performing the M&V activities for the in-home assessments. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection

The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of receiving an in-home assessment.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the in-home assessment, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Online Assessments

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the online assessment portion of the Program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Online Energy Assessments Program. The choices for procedures that will be used to perform the M&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will deliver a survey to a random sample of customers in the treatment and control group to gather data to answer the satisfaction and attribution questions. The control group

will be surveyed to establish baseline behavior for control group participants in order to determine attribution of test group behavior of participating in an online assessment.

M&V Analysis Methods

Data Collection Procedures
For customers that are also selected for the sample, the EM&V Contractor will utilize surveys to confirm the behavior conditions that provide the expected savings estimates.

Perform Billing Data Analysis
As a method to determine the savings that result from measures implemented through the online assessment, the EM&V Contractor can use regression analysis of account billing data on electricity use for each participating customer.

Once the best model and data set for a unit is determined, the EM&V Contractor can use that model and data to calculate weather normalized baseline and post-treatment electricity use for the site. This weather normalization is performed so that the effects of changes in weather conditions are not included in the estimates of savings.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

To allocate energy, kWh, savings per month by rate class and critical peak demand, kW, savings per month by rate class for the Energy Reports Program, ADM developed a program-specific "Energy Savings Curve" from the same Residential Demand Response control group 15-minute interval meter data captured during calendar year 2016. Given that the Energy Reports Program is a behavioral program, the inherent assumption is that its Energy Savings Curve is proportional to the Company customers' actual energy usage for any given period, including hourly energy usage.

Incremental Costs

Incremental cost is the difference between the cost of the energy-efficient measure and the cost of the base case or baseline measure experienced by the Program participant. In the case of Energy Reports, there is no incremental cost because receiving the report provided by the Company does not involve any out-of-pocket expense to the customer.

Incentives/Rebates

There are no incentives or rebates for the Program.

Measure Life

The derived EUL for this Program is 3.50 years as presented in the M&V Report for 2017. The 3.50 EUL is based on the sum of the total saving divided by the first year savings as stated in the M&V report.

Units

Unit is defined as a household receiving an assessment.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

SPPC- Energy Assessments

2019	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$1,125,000	$202,500	$922,500						
				4,154	288.88	1,200,000	2.0	$0.00	100.0%
Total									

SPPC- Energy Assessments

2020	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$1,375,000	$247,500	$1,127,500						
				4,500	288.89	1,300,000	2.0	$0.00	100.0%
Total									

SPPC- Energy Assessments

2021	Total Budget	Utility & Admin M&V	Implementation Costs	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Energy Assessments	$1,375,000	$247,500	$1,127,500						
				4,500	288.89	1,300,000	2.0	$0.00	100.0%
Total									

Name:	2019-21 Energy Assessments	**Last Updated:**	5/14/2018 14:00
Customer Sector:	Commercial	**Avg Measure Life:**	2.00
Region :	Reno	**Energy Savings Curve:**	Home_Energy Assessments
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$524,284	$3,185,394	($2,661,110)	0.16	$0.492
Total Resource Cost (TRC)	$455,899	$3,185,394	($2,729,495)	0.14	$0.492
Utility Cost Test (UCT)	$455,899	$3,185,394	($2,729,495)	0.14	$0.492
Participant Cost Test (PCT)	$424,752	$0	$424,752		$0.000
Ratepayer Impact (RIM)	$455,899	$3,610,145	($3,154,246)	0.13	$0.557
Societal Cost (SCT)	$540,151	$3,185,394	($2,645,243)	0.17	$0.492

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,125,000	$1,375,000	$1,375,000	$3,875,000
Electric Benefits ($)	$82,501	$94,137	$101,147	$455,899
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,280,717	1,387,392	1,387,392	8,111,001
Critical Peak Hour Demand (kW)	414	448	448	897
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	76,523	82,897	82,897	1,730,540
Total On Peak Hours (%)				21.34%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	100.0%		

Program Development

The Program Development Program (the "Program" in this section) focuses on the assessment and testing of innovative DSM and program delivery models. The Program may span residential, commercial, industrial, or agricultural customer segments and aims to identify new methods to increase customer satisfaction and realize energy and demand savings through delivering energy services to customers that improve energy efficiency and enable demand response in an integrated offering when possible. The Program focuses on exploring new possibilities for successful DSM strategies and conducting small scale tests of emerging products or services that may enhance current programs or address new customer segments. These trials enable the evaluation of potential customer offerings. Information is gathered to determine the cost-effectiveness and customer acceptance of new technologies and services. Thus, this Program is an important tool for developing future DSM programs.

Nevada Power Company Program Development

2017 Results

Budget: $400,000

Energy and Demand: N/A

Cost effectiveness: N/A

In 2017, the Company strategically selected a number of technologies that show potential for complementing and enhancing the DSM program portfolio.

In the residential sector, these included field trials of:

- Ultra High SEER Air Conditioners; and,
- Strategic Installation of Advanced Windows Films.

In the commercial sector, these included field trials of:

- Economizer Control Retrofits for Rooftop Units ("RTUs");
- LED Lighting for Indoor Agriculture;
- (continued from the prior years) the ENBALA Trial focused on achieving fast-acting demand response resources from industrial and large commercial customers.

An engineering assessment was conducting on Advanced RTU Retrofits by examining the performance of technology that a customer had recently installed at several of their locations.

Each of these trials is discussed in turn below.

Ultra High SEER Air Conditioners

Today's variable speed compressor technology brings the air conditioning (AC) industry to new levels of energy efficiency and comfort without any need for water input requirements. Most major original equipment manufacturers now offer high efficiency ducted variable speed AC system in the U.S. With efficiencies greater than 20 seasonal energy efficiency ratio (SEER) rating for air-cooled systems, today's residential air-cooled air conditioning systems can provide up to 43 percent in additional annual energy savings as compared to the SEER 14 federal minimum unit. This is attributed to variable frequency drives, higher efficiency ratings with newer refrigerants, and programmable thermostats.

The Company has offered rebates for the replacement of working and non-working A/C and heat pump systems to more efficient ones for a number of years. In 2017, customers were incentivized in two tiers, SEER 15 and SEER 16 or above systems. However, customers received the same incentive for a SEER 16 system as a system greater than SEER 20. The existing AC and heat pump replacement measures rebate program structure is not designed to encourage adoption of ultra-high SEER-rated equipment. There is an opportunity for the Company to accelerate the local market adoption of ultra-high SEER air conditioning systems and play a valuable role in driving the adoption of innovative and sustainable technologies.

The following were identified as project objectives to be fulfilled by all sites selected for implementation.

- Evaluate energy savings of upgrading from HVAC systems less than SEER 8 to variable speed compressor HVAC systems with SEER ratings 20 and above.
- Gauge installation difference between higher SEER variable speed compressor HVAC systems and single/two-speed compressor systems.
- Assess customer experience with higher SEER variable speed compressor HVAC systems.
- Determine feasibility in providing an additional Company rebate tier that provides additional incentives for higher SEER variable speed compressor technology.

To achieve the project objectives, an assortment of manufacturers and system types and combinations were sought, including AC, heat pump, and mini-split heat pump HVAC systems. Given that the Company AC replacement rebate is only available in southern Nevada, only customers interested in the early AC or heat pump replacement measures rebate in southern Nevada were targeted. To select the most meaningful sites, only three of thirteen sites evaluated were chosen for participation in the pilot. An AC, a heat pump, and a mini-split system from two different manufactures were selected for the three single-family sites. Pre-installation energy usage is provided from at least two-year' worth of historical Company meter data, while post-installation energy usage is provided from Company meter data, along with energy monitors from two different manufactures installed at each site HVAC system.

To examine the option for a mini-split heat pump unit, customers would typically not be using these units to replace the entire central air conditioning system, but rather as supplemental heating and cooling for specific zones where it could make operating the compressor of a larger unit unnecessary for defined periods of time. In this case, potential candidates for this these systems would not be customers interested in replacing their whole house air conditioner or heat pump, thus not eligible for the AC replacement rebate under the 2017 version of the program design.

Summary of Major Findings

Throughout the 2017 pilot, recruitment for potential sites was mainly based on recommendations from the existing list of the Company's participating contractors for the AC replacement rebates. Although many sites were recommended, after evaluating them, many sites did not meet the pilot criteria. Also, three potential participants initially showed interest in the early replacement, but later decided to not move forward with any replacement.

In addition to the cost of the HVAC equipment, site A and B required increasing sizes of the return duct, and duct cleaning to accommodate the new SEER 20 air conditioner and heat pump systems. These services were determined during the initial site visit. Short electrical and refrigerant line set distances between the outdoor compressor unit and indoor condensing unit made the installation at site C not only convenient, but more cost effective. A quote for a similar ductless heat pump installation that was noted as ideal conditions from the HVAC contractor was about 50 percent more than the installation at site C. Additional installation and site factors, such as longer electrical and refrigerant line set runs, may contribute to higher installation cost that will only be discovered with receiving more HVAC contractor quotes for a variety of ductless mini-split heat pump installations.

Of the three variable speed HVAC systems installed, none of the proprietary thermostats provided demand response compatibility out-of-the-box. The ComfortNet system installed at site A and B is internet enabled, allowing for the possibility of responding to demand response requests. The Fujitsu mini-split heat pump remote thermostat at site C is not internet enabled, so an alternative internet and demand response enabled controller would be needed to allow participation in the Company's issued demand response events.

Soon after Climate Control Expert's installations of the Emerson ComfortGuard energy monitors at site A and B, it was realized the Emerson web portal did not have data export options available to users. Although the Emerson ComfortGuard system included detailed temperature and power measurements, according to Emerson engineering team the system is mostly intended for diagnostics and preventative maintenance purposes. Because of this, any data exports of the raw data values required manual request from the Emerson engineering team. On August 25, 2017, Climate Control Experts assisted with facilitating custom output reports from Emerson monthly. However, during the first data export, Emerson discovered both site A and B had commissioning issues that did not allow data to be collected. Climate Control Experts addressed issues at both sites following this discovery. On December 12, 2017, Emerson discovered another issue where

the current transformer was not communicating with the ComfortGuard gateway, which did not produce any meaningful data.

Although this pilot provided the participants free upgrades to the most efficient HVAC systems on the market, two of the three customers expressed concerns of parts availability for any future maintenance repairs. Being newer systems less commonly found in the field, advice from the HVAC contractor was needed for knowledge of the parts available for the specific manufacturer installed.

The use of existing participating contractors allowed the contractors to gain exposure and knowledge of the higher SEER variable speed equipment, which is not commonly installed. Also, the participating contractors obtained the experience of informing customers of more efficient, variable speed equipment and their benefits.

Key Recommendations

At this moment in the pilot period, recommendations include changes to improve recruitment, equipment and installation costs, demand response support, and energy monitoring.

Involving more Company participating HVAC contractors in recruiting eligible sites will provide more quotes with site specific costs such as increased return duct sizing for AC and heat pumps, and long electrical refrigerant distance for ductless mini-split heat pumps. This will help quantify and account for certain cost that are associated with each AC, heat pump, and ductless mini-split heat pump systems.

To allow for future participation in the Company issued demand response events, the market availability of internet enabled thermostats with demand response support will need to be investigated. These thermostats will need to support the three-wire DC power communication, which are typically proprietary to certain systems. Thermostats that include support for the Open Automated Demand Response (OpenADR) standard or a customer solution should be tested for viability to participate in demand response events.

Although the Emerson ComfortGuard energy monitoring system provides HVAC temperature and electrical power data points for HVAC performance, energy monitors such as the eGauge, which monitor the power in kW are sufficient. Due to the difficulties confirming proper commissioning and availability of the Emerson ComfortGuard at site A and B, it is not a good candidate for future installation of energy monitoring. Initial and ongoing cost is also an issue with ComfortGuard any new installations of ultra-high SEER HVAC equipment for the pilot should default to the eGauge energy monitoring system.

The Company will continue to pursue these recommendations into 2018 and use lessons learned about technology availability, costs, and installation issues to perform cost-effectiveness testing and develop practical program designs that could speed market adoption of these higher SEER units.

Strategic Deployment of Advanced Window Films

Windows are much less efficient than an insulated wall, and hence the bulk of summer heat gain in residential building occurs through windows. Window technology advancements have dramatically improved the performance of new windows to make them 300 percent more effective at rejecting solar heat gain than typical windows installed just 10 or 15 years ago. And yet, these older ineffective windows were used in the majority of the existing residential buildings in the Las Vegas metropolitan area.

Air conditioning loads during the summer peak are largely driven by solar heat gains. Solar heat gain increases the load leading up to a system peak; and, the load impact of demand response curtailment of air conditioning loads may be significantly reduced in conditioned spaces with a high solar heat gain. Load curtailment via thermostat under these conditions results in shorter HVAC load reductions and could create occupant comfort issues due to increased rates of heat gain. Rejecting the heat gain at the windows by retrofitting them with advance window film can be an effective method to improve comfort and the load impact of demand response events while also achieving energy savings.

The Strategic Deployment of Advanced Window Film trials consisted of targeting the west facing windows that are unshaded between 2:00 pm and 6:00 pm at the premises of residential demand response participants. A window film that rejects at least 55 percent of solar heat gain was used.

Since customers are already participating in the smart thermostat program, the pilot can measure before and after impacts during demand response events. The pilot analyzed daily demand reductions after the window film installation.

Data was collected on project impacts to analyze both kWh energy efficiency savings, and kW demand reductions as directed through the Company's residential demand response smart thermostats as well as regular demand reductions from reduced solar heat gain through the windows. Particular attention was paid to developing lessons learned from the implementation process and technology performance, intended for consideration of future integration into the Company's demand side management program portfolio.

There were 12 sites installed before the end of demand response season and 4 additional sites installed after the season ended in the 2017 pilot. All sites will continue to be evaluated through the 2018 demand response season.

Summary of Major Findings

> *Energy Efficiency*: Improvements in energy efficiency are inherent in installing window film. Since overall efficiency is more difficult to measure directly, specific measurements from billing data will be deferred to 2018 when more sites with longer data acquisition is available to improve the confidence in results.

Demand Response: The preliminary data looks encouraging but does not include the entire set of installed sites or the full DR season for most sites.

Key Recommendations

Next steps include measuring customer satisfaction impact and the following:

- Integrate an option to treat other windows in addition to those facing west;
- Enable customers to respond to outreach with an enrollment request form;
- Perform cost effectiveness scenario modeling to program design options that could include window film retrofits in association with smart thermostat installation or repair; and
- Continue to examine energy savings and review full season results during the 2018 DR season

Advanced RTU Retrofits

This effort consisted of reviewing the performance of advanced RTU retrofits at four customer locations in Las Vegas. The technology was provided by a third party vendor, Transformative Wave. RTUs were retrofitted with a variable speed drive on the fan motor, additional sensors, and remote communications. Energy savings are derived from reduced motor speeds when zone cooling requirements are moderate.

The customer engaged Transformative Wave to provide the following components:

- Catalyst Controllers
- eIQ software

Program funds were not used to assist with the technology purchase and installation; rather, the Company worked with the vendor to find locations in the southern service area that had recently adopted the technology. The vendor provided a customer who had already purchased and installed the Transformative Wave technology at four of their locations.

Summary of Major Findings

Energy Efficiency: Annual savings based on installation of the technology in August of 2016 were estimated from interval meter data.

Demand Response: Despite multiple attempts to coordinate a test of OpenADR 2.0 communications, no test of the Transformative Wave system could be completed in 2017.

Key Recommendations

Since the Company was not able to demonstrate a test of demand response event participation via the OpenADR 2.0 integration with Transformative Wave, an option to consider in the meantime is that energy efficiency incentives could be delivered through the PowerShift by NV Energy Commercial Programs. The customer could be approached in the future to further discuss participation in the Commercial DR Program; however, successful testing of the Open ADR 2.0 integration would first need to be completed.

Economizer Control Retrofits for RTUs

This trial is examining the opportunity to leverage the Company's existing Commercial DR Program smart thermostat offering for small and medium commercial customers to introduce significant energy efficiency savings via controls enhancements that will improve utilization of air-side economizers. An air-side economizer uses outdoor air to provide "free cooling". When a commercial HVAC system is calling for cooling and the air temperature outside is cooler than the indoor zone temperature it is more economical to shut off the compressor and bring in cool outside air to satisfy the cooling needs of the building. Many air-side economizers in commercial rooftop units are not functioning properly or are out of service because of various human and/or technical reasons, including a lack of direct visibility on economizer equipment operation and performance. Third party studies indicate that up to 80 percent of commercial economizers are not actually functioning, and have been disabled or not properly maintained.

The Company currently deploys smart communicating thermostats from Pelican Wireless Systems. This includes thermostats that communicate wirelessly to an internet gateway, which in turns allows remote control and data analysis. This system can be upgraded with an additional control module—the Pelican Wireless Pearl Economizer Controller—that can provide feedback to the facility manager on economizer utilization and operational condition thereby leading to energy savings at a relatively low cost. Feedback on utilization will show the facility managers how much energy savings economizers provide, highlighting the need for effective economizer maintenance and thereby facilitating more rapid repair schedules.

The Company started recruiting customers for this trial after the 2017 summer season in order to have customers installed and ready for the spring 2018 off-peak months during which the savings from "free cooling" would be the greatest. Four customers and a total of 59 controllers are participating in Nevada Power territory. This trial will continue into 2018.

LED Lighting for Indoor Agriculture

With the rapid increase in the number of indoor grow houses in Nevada, electric demand for indoor grow houses is becoming a significant concern. Grow lighting, and the cooling needed to maintain indoor grow room temperatures, make the demand per square foot much greater than almost any other type of facility. In particular, indoor grow houses select lighting based on previous experience rather than current understanding of plant biology, leading to less energy efficient

lighting. This trial is evaluating the use of energy efficient LED grow lights in an indoor grow house facility, working closely with the grower to determine the effectiveness of LED grow lighting on their crop yields as well as the potential for LED grow lighting to provide demand response.

LED grow lights reduce energy consumption though improved source efficacy, optical system efficiency, and spectral power distribution compared to traditional discharge or fluorescent lamps. Compared to high pressure sodium lamps, LED grow lights use about half the energy when driven at full, and have further reduction during growth stages that do not require the full spectrum.

Technology utilized in this trial consists of the following components:

- Grow lights from Lifted LED
- Grower's Gateway from Lifted LED
- Wireless network
- Apogee SQ-520 PAR sensors
- Sensor power supplies

The technology was purchased and installed at a customer site at the end of 2017 and schedule to support four grow cycles in 2018 with test demand response events during the summer.

ENBALA Trial

The trial with ENBALA Power Networks, Inc., ("ENBALA") aimed at utilizing the concept of smart load connectivity with GOFlex™, ENBALA's automated DSM platform. This technology was targeted for industrial advanced demand management and was designed to demonstrate an innovative process monitoring and optimization platform that delivers new insight to industrial customers about their processes, electrical energy and demand consumption patterns. The technology securely connects customer process loads to the Company's electric grid control system to support the reliability and quality of the grid, while identifying opportunities for customers to optimize processes to achieve energy savings through improved peak demand and energy management. In this approach, customers define the parameters around their involvement in advanced, real-time DSM programs to demonstrate two specific forms of automated DSM; non-disruptive demand response and dispatchable demand. This automated DSM enhances customer satisfaction and enables a wider range of customers to take part in advanced DSM programs.

The technology demonstrate how large process loads at commercial and industrial ("C&I") sites can automatically respond to a continuous or event-driven signal from the Company's DRMS without impacting operations or occupant comfort – the response will be imperceptible to the facility. Customers realize savings in their energy bills from peak management that takes advantage of the real-time measurements and sophisticated control. The trial will determine if this combination of utility and customer benefits ensures a cost-effective program from all perspectives.

In 2015, ENBALA worked collaboratively with the Company on implementation elements of the trial including customer targeting and recruitment, hardware procurement, hardware lab evaluations, and software system integration testing with the Open Automated Demand Response (OpenADR) communications protocol to enable connection with the Company's DRMS.

In 2015 and 2016, strategic outreach and recruitment focused on industrial customers. ENBALA created trial project and technology presentations and shared videos explaining the technology. Interval meter data for high potential customers was analyzed to aid in trial customer targeting and selection. The Company created a series of trial recruitment materials, performed marketing via multiple channels, and revised its recruitment approach in 2016 to work collaboratively with trade Commercial Service program trade allies. However, recruitment proved to be elusive in 2016 and 2017 due to customer availability, customer priorities, and capability to absorb the transaction costs of participating in a trial. Toward the end of 2017, a large foodservice distributor in Las Vegas agreed to participate at one location, and potentially another location as well. This customer should be installed and commissioned in the first quarter of 2018.

2018 Status

In 2018, Nevada Power will continue to monitor the trials set in motion in 2017 including:

- Strategic Installation of Advanced Windows Films;
- Economizer Control Retrofits for Rooftop Units (RTUs);
- LED Lighting for Indoor Agriculture; and
- The ENBALA Trial focused on achieving fast-acting demand response resources from industrial and large commercial customers.

Additionally, for the High SEER AC and Advanced RTU retrofit trials, 2017 lessons learned about technology availability, costs, and installation issues will be used to perform cost-effectiveness testing and to develop practical program designs that could speed market adoption of these technologies as measures within the existing DSM portfolio.

A small set of new technology trials will begin in 2018 with a focus on getting customers recruited and the technology installed.

The residential technologies include trials of:

- Improved Mechanical Ventilation – This is a trial to investigate the energy savings potential of technology and controls approaches to save energy related to whole house mechanical ventilation that has been installed by builders to ensure compliance with indoor air quality standards. New technology and controls strategies can reduce the energy consumption and waste associated with mechanical ventilation. These technologies include energy recovery ventilators, heat recovery ventilators, and simple controls installed with existing ventilators.

- Energy Efficient Air Conditioning Refrigerant Alternatives to R-22 – The most common refrigerant used in residential air conditioning, R-22, is being phased out for newly manufactured units in 2020. Supplies of R-22 to service existing equipment will start to decline and prices will start to rise over time. New alternatives to R-22 are being introduced to the market that dramatically reduce the impact of leaked refrigerant on the ozone layer and global warming. This trial will investigate and report upon the costs and energy savings to retrofit air conditioning units with alternative refrigerants such as Bluon TdX 20.
- Low cost energy monitoring sensors with diagnostics – New low cost sensors, such as those offered by Whisker Labs could reduce costs associated with M&V as well as identification of energy consuming equipment in need of inspection. This trial will examine the performance, applicability, and potential of these new low costs sensors.
- Multi-family Retrofit Package – This trial will target multi-family complexes with a package of integrated demand side management measures designed to reduce peak power consumption and save energy. The measures will be deployed in a manner designed to reduce overall equipment and installation costs thereby improving the cost effectiveness of the approach. The package includes: smart thermostats, advanced window film, and cool roof technology. If product costs allow their incorporation, phase change materials will also be tested where appropriate.

New commercial technologies prioritized for examination include:

- An engineering study of Ice Energy's IceBear 30 Thermal Energy Storage technology; and,
- A trial of small and medium commercial sized Grid-Interactive Water Heaters

2019 - 2021 Plan

The Company recommends that the Program be continued in 2019 at the budget level of $200,000. The Program will continue to strategically identify and test products and services that would complement and enhance the Company's DSM Portfolio. If approved, several trials from 2018 are planned to continue into 2019, such as the Multi-family trial and commercial Grid-Interactive Water Heaters.

Sierra Pacific Power Company Program Development

2017 Results

Budget: $100,000

Energy and Demand: N/A

Cost effectiveness: N/A

In 2017, the Company strategically selected a number of technologies that show potential for complementing and enhancing the DSM program portfolio.

In the commercial sector, these included field trials of:

- Economizer Control Retrofits for Rooftop Units (RTUs); and,
- (continued from the prior years) the ENBALA Trial focused on achieving fast-acting demand response resources from industrial and large commercial customers.

Each of these trials is discussed in turn below.

Economizer Control Retrofits for RTUs

This trial is examining the opportunity to leverage the Company's existing Commercial DR program smart thermostat offering for small and medium commercial customers to introduce significant energy efficiency savings via controls enhancements that will improve utilization of air-side economizers. An air-side economizer uses outdoor air to provide "free cooling". When a commercial HVAC system is calling for cooling and the air temperature outside is cooler than the indoor zone temperature it is more economical to shut off the compressor and bring in cool outside air to satisfy the cooling needs of the building. Many air-side economizers in commercial rooftop units are not functioning properly or are out of service because of various human and/or technical reasons, including a lack of direct visibility on economizer equipment operation and performance. Third party studies indicate that up to 80 percent of commercial economizers are not actually functioning, and have been disabled or not properly maintained.

The Company currently deploys smart communicating thermostats from Pelican Wireless Systems. This includes thermostats that communicate wirelessly to an internet gateway, which in turns allows remote control and data analysis. This system can be upgraded with an additional control module—the Pelican Wireless Pearl Economizer Controller—that can provide feedback to the facility manager on economizer utilization and operational condition thereby leading to energy savings at a relatively low cost. Feedback on utilization will show the facility managers how much energy savings economizers provide, highlighting the need for effective economizer maintenance and thereby facilitating more rapid repair schedules.

The Company started recruiting customers for this trial after the 2017 summer season in order to have customers installed and ready for the spring 2018 off-peak months during which the savings from "free cooling" would be the greatest. Two customers with a total of 21 controllers are participating in Sierra territory.

ENBALA Trial

The trial with ENBALA aimed at utilizing the concept of smart load connectivity with GOFlex™, ENBALA's automated DSM platform. This technology was targeted for industrial advanced demand management and was designed to demonstrate an innovative process monitoring and optimization platform that delivers new insight to industrial customers about their processes, electrical energy and demand consumption patterns. The technology securely connects customer process loads to the Company's electric grid control system to support the reliability and quality of the grid, while identifying opportunities for customers to optimize processes to achieve energy savings through improved peak demand and energy management. In this approach, customers define the parameters around their involvement in advanced, real-time DSM programs to demonstrate two specific forms of automated DSM; non-disruptive demand response and dispatchable demand. This automated DSM enhances customer satisfaction and enables a wider range of customers to take part in advanced DSM programs.

The technology demonstrate how large process loads at commercial and industrial ("C&I") sites can automatically respond to a continuous or event-driven signal from the Company's DRMS without impacting operations or occupant comfort – the response will be imperceptible to the facility. Customers realize savings in their energy bills from peak management that takes advantage of the real-time measurements and sophisticated control. The trial will determine if this combination of utility and customer benefits ensures a cost-effective program from all perspectives.

In 2015, ENBALA worked collaboratively with the Company on implementation elements of the trial including customer targeting and recruitment, hardware procurement, hardware lab evaluations, and software system integration testing with the OpenADR communications protocol to enable connection with the Company's DRMS.

In 2015 and 2016, strategic outreach and recruitment focused on industrial customers. ENBALA created trial project and technology presentations and shared videos explaining the technology. Interval meter data for high potential customers was analyzed to aid in trial customer targeting and selection. The Company created a series of trial recruitment materials, performed marketing via multiple channels, and revised its recruitment approach in 2016 to work collaboratively with trade Commercial Service program trade allies. However, recruitment proved to be elusive in 2016 and 2017 due to customer availability, customer priorities, and capability to absorb the transaction costs of participating in a trial. Toward the end of 2017, a large dairy agreed to participate, and in early 2018 a large printing company is close to participating.

2018 Status

In 2018, NPC will continue to monitor the trials set in motion in 2017 including:

- Economizer Control Retrofits for Rooftop Units (RTUs); and,
- The ENBALA Trial focused on achieving fast-acting demand response resources from industrial and large commercial customers.

An incremental component will include an examination and testing of new low power long range wireless communications technologies that could facilitate demand response technology deployment. This includes an examination of Narrow Band Internet of Things (NB-IoT) technology and LoRa technology. These technologies are helping to drive adoption of IoT technologies and applications.

2019 - 2021 Plan

The Company recommends that the Program be continued in 2019 at the budget level of $50,000. The Program will continue to strategically identify and test products and services that would complement and enhance the Company's DSM Portfolio.

Section 6. Home Services

A variety of residential services will be available to approximately 1,117,000 residential electric customers. Residential customers traditionally reside in single-family or multi-family homes. To address this varied set of customers, the Company will offer a bundled set of products and services targeted to reach the vast majority of the residential market and provide customers with multiple opportunities to participate.

The suite of residential programs are designed to reach thousands of customers annually. The programs will be implemented in an integrated fashion, which will allow a large numbers of customers to participate and benefit from the one or more of the products and services offered.

The portfolio of home services focuses on educating our customers on energy efficiency and providing them with simple ways to participate and encouraging them to make long-term commitments to reduce their energy usage. The proposed portfolio of home services is based on Residential Lighting, Pool Pumps, Low Income, Direct Install, Residential Air Conditioning, Residential Demand Response programs and is augmented by the educational programs; Energy Education, Energy Assessments and Energy Reports.

Table DSM-25: 2019-2021 Home Services Budgets

Programs	Budget($)			Demand Savings (kW)			Annual Energy Savings (kWh)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Residential Lighting	$3,100,000	$2,400,000	$1,600,000	1,850	1,400	900	16,552,800	12,574,800	8,118,000
Pool Pumps	$1,000,000	$1,200,000	$1,200,000	600	700	700	5,310,000	6,490,000	6,490,000
Low Income	$2,600,000	$2,700,000	$2,700,000	200	215	215	1,802,700	1,918,000	1,918,000
Residential Air Conditioning	$7,600,000	$7,500,000	$7,500,000	1,610	1,590	1,590	14,541,000	14,332,000	14,332,000
Direct Install	$650,000	$650,000	$650,000	155	155	155	1,400,000	1,400,000	1,400,000
Residential Demand Response - Manage	$8,100,000	$8,400,000	$8,800,000	TBD	TBD	TBD	30,198,300	30,198,300	30,198,300
Residential Demand Response - Build	$9,500,000	$9,700,000	$10,000,000	34,000	34,000	34,000	4,509,300	4,509,300	4,509,300
Home Services	**$32,550,000**	**$32,550,000**	**$32,450,000**	**38,415**	**38,060**	**37,560**	**74,314,100**	**71,422,400**	**66,965,600**

Residential Lighting Program

The Residential Lighting Program ("Program" in this section) will provide incentives to encourage customers to purchase and install energy efficient lighting products through an upstream model that partners with manufacturers and retailers. The Program will provide discounted pricing on high quality LEDs at participating retail locations.

Program measures will consist of ENERGY STAR®-qualified general service, reflectors and specialty LEDs. LED lamps will be available in various wattage equivalents and will be sold by participating retailers within the Company's service territory. The Company will provide incentives to manufactures for participating LEDs that will be discounted at point of purchase so customers will see immediate price reductions.

Nevada Power Company Residential Lighting Program

2019 – 2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $2,000,000 and a target of 10,675,000 kWh in 2019, a budget of $1,600,000 and a target of 8,536,800 kWh in program year 2020, and a budget of $1,000,000 and a target of 5,313,600 kWh in program year 2021. The proposed Program has a projected TRC ratio of 2.24.

The Program will provide outreach to customers in the form of multiple special events, weekly staffed in-store table tops displays and educational materials. Through the use of lighting displays and special educational material designed to aid consumers in understanding LED technology, customers will be better informed when making LED bulb buying decisions. The Program team will make store visits and will also provide formal training for store employees to equip them for providing customers with sound advice when purchasing LED lighting products. In addition, PowerShift lighting coupons will be created to promote awareness of the program in partnership with local retailers.

M&V Plan

The EM&V Contractor will perform evaluation, measurement and verification (EM&V) activities to confirm the savings realized through the Residential Lighting Program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the EM&V activities for the Residential Lighting Program. The choices for procedures that will be used to perform the EM&V activities have been informed by standard technical references, such as the Uniform Methods

Project for Determining Energy Efficiency Program Savings, the IPMVP, and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the EM&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the EM&V work, including data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of EM&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

A portion of this program will specifically target low income customers, and will contribute to the five percent of the demand side management portfolio. This will be quantified by both the direct install program and through the upstream portion of this program, by tracking the sales from retails stores that are designated as being patronized by income qualified customers.

In years 2020 and 2021 the Program will be affected by a new federal lighting standard, which is scheduled to take effect in 2020. As of January 1, 2020 it will no longer be legal to sell many halogen and incandescent light bulbs. However, according to the ACEEE[21], several factors will affect the initial implementation of the standard:

> *Rather than pre-determining the final fate of programs while the transition plays out, programs should take more of a "wait and see" approach. Program administrators should closely track market conditions in their territory and make final program decisions for 2020 in the fall of 2019, and hold off on final decisions for 2021 until the fall of 2020. By 2021, we expect that many of these transition issues will be resolved, and as the market shift to LEDs progresses throughout the country, it is likely that residential lighting programs will no longer be cost-effective beyond 2021. The residential lighting market will have transformed from an incumbent technology, largely unchanged for more than 100 years, to an entirely new technology with unprecedented speed—a major energy efficiency success story.*

ACEEE goes on to say:

> *In the near-term, utility programs can achieve savings in most states by continuing to run LED promotions and incentives for the full range of LED lamps.*

[21] ACEEE, Lights Out for Residential Lighting Programs? Not Just Yet, April 9, 2018, http://aceee.org/blog/2018/04/lights-out-residential-lighting

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Companies. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Energy Savings Curves

The energy savings curve for LEDs is the same as the curve used previously for residential CFLs. Note that there is no significant difference between LEDs and CFLs with respect to the shape of savings or the fraction of annual savings occurring during any given hour of the year. The energy savings curve for Residential Lighting (LEDs and CFLs) has the daily usage pattern taken from the KEMA 2005[22] study, and the monthly seasonality taken from the KEMA 2010 study. DEER has since updated the hourly savings curves for Residential Lighting; the "DEER 2011" update is informed by the KEMA 2010[23] study, and has an hourly curve that is essentially the same as the one from the 2005 study. The curve does not include any interactive effects with the heating or cooling systems.

Incremental Costs

Incremental cost for this Program is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Four scenarios-- new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement—were analyzed. The base cost is not the same for the four measure types. Replacement at burnout indicates that the baseline measure has failed, is close to end of life or is not functioning according to specifications. In the case of this Program, the lifetime of the baseline measure is approximately five percent of the lifetime of the LED measures. From this perspective, the baseline measure is close to end of life and therefore considered replacement at burnout. The incremental cost is therefore the difference between the

[22] KEMA Inc., CFL Metering Study Final Report, February 25, 2005, http://www.calmac.org/publications/2005_Res_CFL_Metering_Study_Final_Report.pdf

[23] KEMA Inc. and the Cadmus Group Inc., Final evaluation Report: Upstream Lighting Program Volume I, CALMAC Study ID CPU0015.01, prepared for the California Public Utilities Commission, Energy Division, February 8, 2010

measure's cost (an LED), and the baseline cost (EISA compliant halogen bulbs), reduced for the incentive paid to manufacturer.

Prior to launching, the Program team conducted an informal study to determine whether the Halogen baseline bulb is generally available and thus is the baseline measure and to determine the baseline cost. The informal study found that incandescent bulbs are still widely available, with displays prominent in the three standard big box retailers. Halogen bulbs are widely available in 60 and 100 Watt sizes. Retailers in the study (Lowes, Home Depot, and Walmart) each stocked EISA compliant halogen general purpose bulbs. Based on this result the Companies found supporting evidence that the EISA compliant halogen bulb is the baseline measure.

In addition, the Companies asked ADM Associates to perform a baseline study to validate the results of their informal study. ADM's result for both northern and southern Nevada is that EISA compliant halogen light bulbs represent the baseline for residential or general service lighting. A variety of EISA 2007 compliant halogen light bulbs are generally in stock and offered at competitive price points. In addition, at many locations 40W and 60W traditional incandescent light bulbs were in stock. At the time of this study, several retailers prominently displayed the 60W traditional incandescent light bulbs on pallets or end caps, which may indicate an effort to accelerate sell-through of remaining inventories of those bulbs. The ADM study is provided as Technical Appendix 15.

Based on these studies, the Company determined that the halogen light bulb is the baseline measure at this time.

The incremental costs for this Program are based on the following information:

- Direct input from Manufacturers on LED retail prices.
- Pricing gathered directly from retailers located in Nevada.

Incentives/Rebates

The Program incentives will be paid directly to the manufacturer based on retail sales to Nevada Power's customers. The implementation contractor will negotiate lamp discounts with manufacturers, then the manufacturers will sell their lamps to retailers at the lower incentive lamp cost. Company customers will then receive the lower prices lamps through the retailers.

The incentive structure will be based on an LED lamp sales projection, lamp retail pricing, potential lamp energy savings and the propensity of customer to purchase LED lamps. By monitoring lamp sales volume throughout the Companies territories, incentive levels can be established and adjusted to drive a higher number of lamp installations or increasing energy savings by moving incentives to higher energy savings lamps, while managing available incentive funding to better influence customer lamp purchases.

Measure Life

The useful life for this Program is 20 years as indicated in the M&V Report for 2015.

Units

A unit for this Program is a single LED lamp.

Savings

The savings figures are generally based on the product mix from the 2014 Program year in terms of wattages and types of lamps. LED lamps with the comparable baseline wattage were substituted into the product mix. The energy savings assume an HOU factor of 1.9 hours per day. The baseline used to determine the energy savings is the halogen light bulb. For the baseline halogen bulbs, the DOE IRL standards apply to the reflector and specialty halogen bulbs and the EISA standards apply to the standard lighting, Type 'A' omni directional halogen bulbs.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The input and output sheets for the 2019-2021 Action Plan period are provided. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Residential Lighting NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$2,000,000	$362,500	$700,000								
General Service LED				$625,000	$2.50	250,000	26.36	6,590,000	20.00	2.69	60.0%
Reflector LED				$312,500	$2.50	125,000	32.68	4,085,000	20.00	0.90	
Total				$937,500		375,000		10,675,000			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Residential Lighting NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$1,600,000	$287,500	$570,000								
General Service LED				$462,500	$2.50	185,000	26.36	4,876,600	20.00	2.69	60.0%
Reflector LED				$280,000	$2.50	112,000	32.68	3,660,160	20.00	0.90	
Total				$742,500		297,000		8,536,760			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Residential Lighting NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$1,000,000	$190,000	$360,000								
General Service LED				$225,000	$2.50	90,000	26.36	2,372,400	20.00	2.69	60.0%
Reflector LED				$225,000	$2.50	90,000	32.68	2,941,200	20.00	0.90	
Total				$450,000		180,000		5,313,600			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Name:	2019-21 Residential Lighting	**Last Updated:**	5/14/2018 13:44
Customer Sector:	Residential	**Avg Measure Life:**	20.00
Region :	Vegas	**Energy Savings Curve:**	Residential_Lighting
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$9,058,265	$3,508,835	$5,549,430	2.58	$0.027
Total Resource Cost (TRC)	$7,876,752	$3,508,835	$4,367,917	2.24	$0.027
Utility Cost Test (UCT)	$7,876,752	$3,711,370	$4,165,382	2.12	$0.029
Participant Cost Test (PCT)	$26,753,734	$1,382,472	$25,371,261	19.35	$0.006
Ratepayer Impact (RIM)	$7,876,752	$18,731,592	($10,854,840)	0.42	$0.144
Societal Cost (SCT)	$9,647,024	$3,508,835	$6,138,189	2.75	$0.027

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$2,000,000	$1,600,000	$1,000,000	$4,600,000
Electric Benefits ($)	$213,727	$187,313	$129,953	$7,876,752
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	6,659,288	5,325,410	3,314,735	305,988,660
Critical Peak Hour Demand (kW)	656	525	327	1,507
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	512,371	409,742	255,039	23,512,884
Total On Peak Hours (%)				7.68%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	60.0%		

Sierra Pacific Power Company Residential Lighting Program

2019- 2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $1,100,000 and a target of 5,877,800 kWh in 2019, a budget of $800,000 and a target of 4,038,000 kWh in program year 2020, and a budget of $600,000 and a target of 2,804,000 kWh in program year 2021. The proposed Program has a projected TRC ratio of 2.33.

The program will provide outreach to customers in the form of multiple special events, weekly staffed in-store table tops displays and educational materials. Through the use of lighting displays and special educational material designed to aid consumers in understanding of LED technology, customers will be better able to make informed bulb buying decisions. The Program team will make store visits and will also provide formal training events for store employees of to equip them for providing customers with sound advice when purchasing LED lighting products. In addition, PowerShift lighting coupons will be created to promote awareness of the program in partnership with local retailers.

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Residential Lighting Program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the EM&V activities for the Residential Lighting Program. The choices for procedures that will be used to perform the EM&V activities have been informed by standard technical references, such as the Uniform Methods Project for Determining Energy Efficiency Program Savings, the IPMVP, and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the EM&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the EM&V work, including data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of EM&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

A portion of this program will specifically target low income customers, and will contribute to the five percent of the demand side management portfolio. This will be quantified by both the direct install program and through the upstream portion of this program, by tracking the sales from retails stores that are designated as being patronized by income qualified customers.

In years 2020 and 2021 the Program will be affected by a new federal lighting standard, which is scheduled to take effect in 2020. As of January 1, 2020 it will no longer be legal to sell many halogen and incandescent light bulbs. However, according to the ACEEE[24], several factors will affect the initial implementation of the standard:

> *Rather than pre-determining the final fate of programs while the transition plays out, programs should take more of a "wait and see" approach. Program administrators should closely track market conditions in their territory and make final program decisions for 2020 in the fall of 2019, and hold off on final decisions for 2021 until the fall of 2020. By 2021, we expect that many of these transition issues will be resolved, and as the market shift to LEDs progresses throughout the country, it is likely that residential lighting programs will no longer be cost-effective beyond 2021. The residential lighting market will have transformed from an incumbent technology, largely unchanged for more than 100 years, to an entirely new technology with unprecedented speed—a major energy efficiency success story.*

ACEEE goes on to say:

> *In the near-term, utility programs can achieve savings in most states by continuing to run LED promotions and incentives for the full range of LED lamps.*

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software. A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

[24] ACEEE, Lights Out for Residential Lighting Programs? Not Just Yet, April 9, 2018, http://aceee.org/blog/2018/04/lights-out-residential-lighting

Energy Savings Curves

The energy savings curve for LEDs is the same as the curve used previously for residential CFLs. Note that there is no significant difference between LEDs and CFLs with respect to the shape of savings or the fraction of annual savings occurring during any given hour of the year. The energy savings curve for Residential Lighting (LEDs and CFLs) has the daily usage pattern taken from the KEMA 2005[25] study, and the monthly seasonality taken from the KEMA 2010 study. DEER has since updated the hourly savings curves for Residential Lighting; the "DEER 2011" update is informed by the KEMA 2010[26] study, and has an hourly curve that is essentially the same as the one from the 2005 study. The curve does not include any interactive effects with the heating or cooling systems.

Incremental Costs

Incremental cost for this Program is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Four scenarios-- new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement—were analyzed. The base cost is not the same for the four measure types. Replacement at burnout indicates that the baseline measure has failed, is close to end of life or is not functioning according to specifications. In the case of this Program, the lifetime of the baseline measure is approximately five percent of the lifetime of the LED measures. From this perspective, the baseline measure is close to end of life and therefore considered replacement at burnout. The incremental cost is therefore the difference between the measure's cost (an LED), and the baseline cost (EISA compliant halogen bulbs), reduced for the incentive paid to manufacturer.

Prior to launching, the Program team conducted an informal study to determine whether the Halogen baseline bulb is generally available and thus is the baseline measure and to determine the baseline cost. The informal study found that incandescent bulbs are still widely available, with displays prominent in the three standard big box retailers. Halogen bulbs are widely available in 60 and 100 Watt sizes. Retailers in the study (Lowes, Home Depot, and Walmart) each stocked EISA compliant halogen general purpose bulbs. Based on this result the Companies found supporting evidence that the EISA compliant halogen bulb is the baseline measure.

In addition, the Companies asked ADM Associates to perform a baseline study to validate the results of their informal study. ADM's result for both northern and southern Nevada is that EISA compliant halogen light bulbs represent the baseline for residential or general service lighting. A variety of EISA 2007 compliant halogen light bulbs are generally in stock and offered at competitive price

[25] KEMA Inc., CFL Metering Study Final Report, February 25, 2005, http://www.calmac.org/publications/2005_Res_CFL_Metering_Study_Final_Report.pdf

[26] KEMA Inc. and the Cadmus Group Inc., Final evaluation Report: Upstream Lighting Program Volume I, CALMAC Study ID CPU0015.01, prepared for the California Public Utilities Commission, Energy Division, February 8, 2010

points. In addition, at many locations 40W and 60W traditional incandescent light bulbs were in stock. At the time of this study, several retailers prominently displayed the 60W traditional incandescent light bulbs on pallets or end caps, which may indicate an effort to accelerate sell-through of remaining inventories of those bulbs. The ADM study is provided as Technical Appendix 15.

Based on these studies, the Company determined that the halogen light bulb is the baseline measure at this time.

The incremental costs for this Program are based on the following information:

- Direct input from Manufacturers on LED retail prices.
- Pricing gathered directly from retailers located in Nevada.

Incentives/Rebates

The Program incentives will be paid directly to the manufacturer based on retail sales to Nevada Power's customers. The implementation contractor will negotiate lamp discounts with manufacturers, then the manufacturers will sell their lamps to retailers at the lower incentive lamp cost. Company customers will then receive the lower prices lamps through the retailers.

The incentive structure will be based on an LED lamp sales projection, lamp retail pricing, potential lamp energy savings and the propensity of customer to purchase LED lamps. By monitoring lamp sales volume throughout the Companies territories, incentive levels can be established and adjusted to drive a higher number of lamp installations or increasing energy savings by moving incentives to higher energy savings lamps, while managing available incentive funding to better influence customer lamp purchases.

Measure Life

The useful life for this Program is 20 years as indicated in the M&V Report for 2015.

Units

A unit for this Program is a single LED light lamp.

Savings

The savings figures are generally based on the product mix from the 2014 Program year in terms of wattages and types of lamps. LED lamps with the comparable baseline wattage were substituted into the product mix. The energy savings assume an HOU factor of 1.9 hours per day. The baseline used to determine the energy savings is the halogen light bulb. For the baseline halogen bulbs, the

DOE IRL standards apply to the reflector and specialty halogen bulbs and the EISA standards apply to the standard lighting, Type 'A' omni directional halogen bulbs.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The input and output sheets for the 2019-2021 Action Plan period are provided. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Residential Lighting SPPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$1,100,000	$197,500	$390,000								
General Service LED				$325,000	$2.50	130,000	26.36	3,426,800	20.00	2.26	55.0%
Reflector LED				$187,500	$2.50	75,000	32.68	2,451,000	20.00	2.26	
Total				$512,500		205,000		5,877,800			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Residential Lighting SPPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$800,000	$150,000	$300,000								
General Service LED				$212,500	$2.50	85,000	26.36	2,240,600	20.00	2.26	55.0%
Reflector LED				$137,500	$2.50	55,000	32.68	1,797,400	20.00	2.26	
Total				$350,000		140,000		4,038,000			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Residential Lighting SPPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measures	$600,000	$112,500	$250,000								
General Service LED				$118,750	$2.50	47,500	26.36	1,252,100	20.00	2.26	55.0%
Reflector LED				$118,750	$2.50	47,500	32.68	1,552,300	20.00	2.26	
Total				$237,500		95,000		2,804,400			

*Incremental mesure costs is the difference between the cost of LED and baseline halogen bulb reduced for the payment to manufacturer

** Denotes payments made to manufacturers

Name:	2019-21 Residential Lighting	**Last Updated:**	5/14/2018 14:25
Customer Sector:	Residential	**Avg Measure Life:**	20.00
Region :	Reno	**Energy Savings Curve:**	Residential_Lighting
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$5,479,121	$2,041,646	$3,437,476	2.68	$0.028
Total Resource Cost (TRC)	$4,764,453	$2,041,646	$2,722,808	2.33	$0.028
Utility Cost Test (UCT)	$4,764,453	$2,090,363	$2,674,090	2.28	$0.029
Participant Cost Test (PCT)	$13,306,383	$834,107	$12,472,276	15.95	$0.006
Ratepayer Impact (RIM)	$4,764,453	$8,901,398	($4,136,944)	0.54	$0.122
Societal Cost (SCT)	$5,827,525	$2,041,646	$3,785,879	2.85	$0.028

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,100,000	$800,000	$600,000	$2,500,000
Electric Benefits ($)	$116,766	$89,675	$68,429	$4,764,453
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	3,450,113	2,370,199	1,646,108	149,328,396
Critical Peak Hour Demand (kW)	359	246	171	776
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	125,216	86,022	59,743	35,691,419
Total On Peak Hours (%)				23.90%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	55.0%		

Pool Pump Program

The Energy Efficient Pool Pump Program ("Program") provides incentives for upgrading inefficient single-speed pumps to more energy efficient variable-speed pumps. Swimming pool filtration pumps are typically the second largest user of energy in homes with residential swimming pools in the hot and dry southwest desert climate. The vast majority of existing pool pumps are conventional, single-speed units.

Replacing an inefficient single-speed pump with a variable-speed pump can decrease energy use up to 80 percent. This can be achieved by operating pool pumps at optimal speeds with additional savings achieved by properly sizing the pool pump for the application. Variable-speed pool pumps are designed to reduce heat and friction losses within the motor for additional energy savings and longer equipment life.

The Program will target residential customers in Nevada Power's service territory only, via retail, builder and pool sales channels. The Program will provide incentives to these industry partners for offering instant, point-of-purchase discounts (incentives) on variable-speed pumps.

Nevada Power Company Pool Pump Program

2019 - 2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $1,000,000 and a target of 5,310,000 kWh in 2019, and a budget of $1,200,000 and a target of 6,490,000 kWh in program year 2020, and a budget of $1,200,000 and a target of 6,490,000 kWh in program year 2021. The 2019-2021 proposed Program has a TRC ratio of 2.55.

The proposed Program would retain the basic program design implemented in previous program years. While the primary channel of program delivery is through retail pool outlets and service providers, individual customers may also participate in the program with self-installed, qualified, variable-speed pool pumps if the pumps are calibrated by a pool service person trained and certified by the Program. There are an estimated 100,000 pools in southern Nevada. Approximately 8,000 -10,000 pool pumps are replaced each year as they fail or reach the end of their useful lives. As a continuing offering, this Program may have achieved cost-effective energy and demand savings in previous program years.

In order to maximize energy and demand savings, a behavior component may be introduced by sending weekly messages via email reminding customers to run pools and spas at lower speeds or to turn off pumps from 1 pm to 7 pm, June through September. In addition, pumps may be programed during the commissioning period with these operating parameters.

The outreach approach positions Program representatives as trusted advisors, with technological expertise in the pool efficiency industry. Program representatives will work with retailers, pool builders, pool maintenance companies, pump suppliers and pump calibrators to train, implement best practices and promote the Program.

The Program may also accommodate individual customers who purchase and install a program approved pool pump not using the normal program retail channel. This process accommodates the customer who has purchased and installed an energy efficient pump through a non-program pool contractor not trained and qualified under the program to commission variable speed pool pump. To qualify for the rebate the customer must agree to have a program approved pool professional commission the pump, pay for their services and obtain a signed pump commission document from the contractor. This assures the program measure savings are achieved while assuring energy savings for the customer. The customer will then submit their application for the rebate with the commissioning documentation. The program will establish a standard fee for the commissioning by program contractors which will normally result in the customer retaining approximately 75 percent of the normal program rebate amount. This "Individual" rebate process was successfully implemented in prior years when Nevada Power had an approved pool pump program.

Participation in the Pool Pump Program will benefit Program partners by driving new business and improving customer service opportunities with their existing customer base. Retailers will be the primary source of customer outreach and education. Retailers, with large sales teams, will provide access to large numbers of potential program participants. The program will recruit and train pool contractors, with several large pool builders taking advantage of the program to promote energy savings with their customers.

Outreach materials, activities, and events will include:

- Materials: in-store materials, wobblers, banners, window clings, brochures, event displays, and "pull-up" signage promoting energy-efficient pool pumps.

- Direct Mail: the Program collaborated with retailer program partners to include program specifics and energy savings potential of program participation in their mailings. This effort may reach over 100,000 residential pool owners.

- Industry Events: Program representatives and participating partners may attend several training events including; Pentair Annual Training, Jandy Product Training Seminar, Hayward Product Training Seminar, Pool Industry Association meetings for both the International Pool and Spa Service Association ("IPSSA") and the United Pool Association ("UPA").

- Visits to participating retailers and distributors throughout the Las Vegas Valley may be made by the Program team where materials and Program training were delivered. Retail staff sales training, Program participation, parameters of the program, basic pool hydraulics and benefits of energy efficient pool pumps may be provided.

- In-store outreach events may be held at high foot traffic retailers, typically on Saturdays during store sales events during the summer months.

- The Program team may attend community and utility outreach events such as Earth Day, First Friday, The Senior Expo, and Green Fest, to educate customers on the benefits of this technology.

- Pentair, a large manufacturer of pool equipment, may provide an operating demonstration of the variable-speed- pump for use at community and outreach events. This may be a very effective tool in promoting the Program in that it may allow potential customers to enter their pool parameters (pool size, gallons and pump horse power) on an interactive display screen and see the reduced energy use as the pump speed was slowed. It may be a useful demonstration tool.

M&V Plan

The EM&V Contractor will perform M&V activities to confirm the savings realized through the Pool Pump Program.

Approach

The EM&V Contractor will provide the plans for performing the M&V activities for the Pool Pump Program. The choices for procedures that may be used to perform the M&V activities may be informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements may be included in the M&V planning:

- Descriptions of energy and demand savings metrics.

- Identification of the need for *ex ante* savings measures and how their values may be developed.

- Description of how realization rates may be determined.

- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.

- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

Electric energy savings for the program may be verified through a billing analysis. An engineering analysis will be also conducted to confirm the results and for consistency with past practice. Data in the analysis may include the following:

- A census of participant smart meter data
- Weather data
- Pool pump run times based on inspection of the timer settings for the old pump compared to the new pump
- Pool pump demand (kW) characteristics based on one-time power measurements (in watts)
- Pool water condition observed through visual inspection.

While the primary analysis for this study may be conducted through a billing analysis, site specific data were collected through implementer/ADM field visits and telephone surveys. ADM may visit pump participant homes and conducted telephone surveys of participants. From the site visits and telephone surveys, ADM verified a 100 pump pool pump installation rate. ADM also may also obtained data for the engineering analysis from sampled sites.

Sample Selection

M&V sampling may provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

As a frame for selecting the sample sites, the EM&V Contractor may use lists that the Company can compile. The EM&V Contractor may conduct a telephone survey to obtain the completed sample of households. A proportion of the households interviewed by telephone may also be on-site to collect primary data on pump size and hours of operation.

M&V Analysis Methods

On-Site Data Collection Procedures

1. To prepare for the data collection, the EM&V Contractor may develop survey instruments, an interview guide, and a detailed data monitoring and collection procedure, including survey and interview protocols. The survey instruments and interview guide are to be designed to ensure that the necessary data is collected to meet the study objectives.
2. For the on-site data collection, site-specific pool pump run-time and power data may be used to verify pool pump loads and load reduction impacts in the southern Nevada service territory. The data to be collected includes pool pump run-times, pool pump demand (kW) characteristics, a record of the pool timer operating schedule, and pool water condition by visual inspection. Photographs of equipment may be taken and one-time power use measurements obtained.
3. The EM&V Contractor may collect these data using a modified version of the on-site data collection form that has already been developed. This form is designed to collect information regarding swimming pools and pumps and their operation.

Information gathered through site visits may include pre-installation power usage, pre-installation pump running speeds and schedules, post-installation pump running speeds and schedules, average frequency of pool maintenance schedules, and pool water condition by visual inspection.

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

The input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Energy Savings Curves

To allocate kWh savings per month per rate class and kW demand reduction per month per rate class, ADM has developed an "energy savings curve" in 2017 that will be used for the 2019 - 2021 Pool Pump Program.

For each customer in the M&V sample, ADM will identify a unique daily operating schedule for the "summer" season (in southern Nevada, this is typically April 1 through September 30) and a unique daily operating schedule for the "winter" season (in southern Nevada, this is typically October 1 through March 31). For each of the 24 hours per day per season, each customer's operating schedules were assigned a value of unity (1.0) for pump-on hours and a null value (0.0) for pump-off hours. Operating schedules of all customers in the M&V sample are averaged to determine the program-level daily operating schedule.

Incremental Costs

Incremental cost is the energy-efficient measure cost minus the baseline equipment cost reduced for the incentive made to a retailer to offset customer out-of-pocket costs. In determining incremental cost, establishing the appropriate baseline will be required, and is dependent on the action be taken by a program participant. The program participant can either replace a pump motor that has failed, or is approaching failure, or replace a functioning pool pump. For the case in which the pool pump is being replaced because of operational deficiencies, it is considered replacement at burnout. For replacement at burnout, the incremental cost is the cost of a variable-speed pool pump minus the cost of the code compliant single-speed pool pump reduced for the incentive made to a retailer.

The second situation occurs when the pool pump being replaced is still fully functional, considered early replacement. For early replacement, the incremental cost is the cost of the variable-speed pool pump reduced for the incentive made to a retailer.

For this Program, energy efficiency measures are variable-speed pool pumps. Base case measures will be single-speed pool pump models. The average energy efficiency measure cost will be determined by analyzing actual invoice data for variable-speed pumps that were covered by this program in 2019-2021. Average base case measure cost will be determined by analyzing manufacturer, retailer and distributor cost data for single-speed pool pumps. The incremental costs used in this analysis are provided in the input sheet.

Incentives

The Pool Pump Program is an incentive program. The incentive provided by the program is provided to the pool pump supplier. After the pump has been installed and successfully calibrated, the pool pump supplier, who provided the discount to the customer, is then re-reimbursed by the Program.

The incentive level is projected to be $250 based on a market response to different rebate levels. The $250 rebate is consistent with incentives paid by similar programs in other pool pump programs in the southwest. The rebate level may be adjusted during the year in response to market reactions to the program.

Measure Life

The useful life for this Program is 10 years.

Units

A unit, for the purposes of this Program, is a single variable-speed pool pump.

Savings

The savings for this Program are computed on a per unit basis (per pump) based using the 2018 energy savings curve for Pools.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs” provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the ‘Financial Data’ section of the output sheet.

Pool Pumps NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measure	$1,000,000	$175,000	$375,000								
Variable speed pump				$450,000	$250.00	1,800	2,950.00	5,310,000	10.0	$143.09	70.0%
Total											

*Incremental measure costs is the difference between the cost of variable speed pump of $1015.29 and single speed of $822.19 reduced for the average payment to retailer of $267.53

** Denotes payments made to pool pump retailers

Pool Pumps NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measure	$1,200,000	$205,000	$445,000								
Variable speed pump				$550,000	$250.00	2,200	2,950.00	6,490,000	10.0	$143.09	70.0%
Total											

*Incremental measure costs is the difference between the cost of variable speed pump of $1015.29 and single speed of $822.19 reduced for the average payment to retailer of $267.53

** Denotes payments made to pool pump retailers

Pool Pumps NPC

2019	Expenditure	Utility Admin & M&V	Implementation Costs	Incentives**	Incentives per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit*	Net-to-Gross
Measure	$1,200,000	$205,000	$445,000								
Variable speed pump				$550,000	$250.00	2,200	2,950.00	6,490,000	10.0	$143.09	70.0%
Total											

*Incremental measure costs is the difference between the cost of variable speed pump of $1015.29 and single speed of $822.19 reduced for the average payment to retailer of $267.53

** Denotes payments made to pool pump retailers

Name:	2019-21 Pool Pumps	**Last Updated:**	5/14/2018 13:41
Customer Sector:	Residential	**Avg Measure Life:**	10.00
Region :	Vegas	**Energy Savings Curve:**	Pool_Pumps
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$6,792,471	$2,318,952	$4,473,518	2.93	$0.031
Total Resource Cost (TRC)	$5,906,496	$2,318,952	$3,587,544	2.55	$0.031
Utility Cost Test (UCT)	$5,906,496	$2,685,235	$3,221,262	2.20	$0.035
Participant Cost Test (PCT)	$13,739,295	$700,340	$13,038,955	19.62	$0.006
Ratepayer Impact (RIM)	$5,906,496	$11,446,221	($5,539,725)	0.52	$0.151
Societal Cost (SCT)	$7,052,613	$2,318,952	$4,733,661	3.04	$0.031

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,000,000	$1,200,000	$1,200,000	$3,400,000
Electric Benefits ($)	$224,866	$292,237	$316,461	$5,906,496
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	3,864,571	4,723,364	4,723,364	133,112,991
Critical Peak Hour Demand (kW)	1,169	1,429	1,429	4,027
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	704,209	860,700	860,700	24,215,814
Total On Peak Hours (%)				18.19%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data	
Discount Rate:	8.09%
Rate Escalator:	0.00%
Inflation Rate (T&D):	2.00%
Line Loss (Energy):	3.82%
Line Loss (Demand):	7.60%
Avoided T&D Capacity $/MW:	$52,295
Environmental Adder (SCT only)	10.00%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%
Electric Retail Rate ($/KWh):	$0.12
Gas Retail Rate ($/therm)	$0.66
Net-To-Gross Ratio	70.0%

Secondary Benefits	
Other Savings	$0
Scenarios:	
Measure Life	100%
Energy Savings	100%
Avoided Energy Cost	100%
Avoided Capacity Cost	100%
Incremental Measure Cost	100%

Low Income Program

The Company will provide a Low Income Program during the 2019-2021 program cycle. The purpose of the Program is to provide energy saving measures to low and limited income customers. This Program will bring utility bill relief to this vulnerable subset of Company customers.

The genesis for the Program is legislation adopted by the Nevada State Assembly which states the following:

A. Utility shall include in its demand side plan a proposal of programs or measures with a budget of not less than five percent of the total expenditures related to energy efficiency and conservation programs directed to low-income customers. Low-income customers targeted for these programs and measures are:
B. Households that do not exceed 200 percent of the federal poverty level; and
C. Individuals, areas or households identified by the utility as low-income on a program or measure basis deemed in the public interest.

The Low Income Program ("Program" in this section) is designed to provide energy efficient appliances and products to low or limited income customers who experience high energy bills due to the costs of operating old and inefficient appliances.

The Program will work in collaboration with state and local agencies, including the Southern Nevada Housing Authority, state weatherization programs and other agencies serving this market sector to develop delivery mechanisms to reach customers quickly and directly. The Program will leverage weatherization services and other services that state agencies currently provide.

Once the Program has determined that the household is eligible to participate in the program, the customer will be contacted by the Company to schedule program services. The Program will be coordinated with other utilities and agencies providing energy efficiency services so that the home visit will be leveraged for maximum efficiency and benefit for the customers. The Program will also rely on these agencies to qualify customers according to the definition of low income established by the low-income subcommittee from the DSM Collaborative.

Appliances and products provided under this program will all be ENERGY STAR® rated. The appliances included in the proposed Program are refrigerators, dishwashers, plug load controllers, clothes dryers, window air conditioners (as replacements to existing window units only), LED bulbs and residential lighting controls, also known as proximity sensors.

Nevada Power Company Low Income Program

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $2,000,000 and a target of 1,435,000 kWh in program year 2019, a budget of $2,000,000 and a target of 1,435,000 kWh in program year 2020, and a budget of $2,000,000 and a target of 1,435,000 kWh in program year 2021.

The Company is committed to ensuring that 5 percent of the Demand Side Plan budget is dedicated to serving low and limited income customers. This program is designed to meet 80 percent of that goal, with the remaining 20 percent coming from targeted low income customers within the other proposed programs in the overall portfolio.

Replacing aged appliances in low and fixed income households is an approach that has been used by the Company in previous program years. It was selected as the preferred approach at this time as other state and local agencies are providing weatherization and insulation measures to meet the deferred maintenance challenges that are present with this customer base. To partner with Nevada's low income agencies, the Company focused directly on the source of high energy consumption appliances. Low income customers generally endure budget constraints and could easily lower their energy costs by replacing old and inefficient appliances with ENERGY STAR® rated appliances. This approach will supplement the weatherization measures provided by other agencies and ultimately provide high value, high impact improvements in the lives of this challenged customer base. This preferred approach will provide low income families with greater home comfort as well as lower energy costs.

Additionally, providing high quality low energy consuming appliances will produce not only significant energy savings, but will extend those savings well into the future, with lower energy bills year after year, for many years.

A necessary feature of the program will be removing the old inefficient equipment from customers' homes and disposing of appliances in a way that the appliances cannot find their way back onto the electrical grid. The program will also ensure that old equipment and appliances will be disposed of in an environmentally acceptable method.

The full benefits of these products and the implementation costs associated with implementation will be borne by the program and there will be no cost to the customer for these products.

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Low Income Program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the EM&V activities for the Low Income Program. The choices for procedures that will be used to perform the EM&V activities have been informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the EM&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.

- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the EM&V work, including data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of EM&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive Low Income program measures such as ENERGY STAR® rated LEDs and appliances, lighting sensors, and smart power strips. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who receive Low Income measures that are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions that provide the expected savings estimates.

Engineering Desk Review Analysis
As a method to determine the savings that result from measures implemented through the Low Income Program, the EM&V Contractor will perform engineering calculations to determine the unit savings (*ex post* kWh) per measure installed; those kWh savings values will be applied to all verified installations. *Energy savings curves* will be utilized to determine *ex post* demand (kW) savings for the Low Income Program.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group. This comprehensive modeling software utilizes a stream of avoided costs, broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in

this Program data sheet and the materials referenced herein. Key inputs used in the creation of these results are described below.

Energy Savings Curves

The EM&V Contractor utilizes *energy savings curves* to calculate the portion of annual energy savings which occurs during each hour (as well as each day and each month) of the year. An energy savings curve describes the temporal nature of energy savings. For example, on any given day the energy savings achieved by a LED may be roughly 1/365 of its verified annual energy savings; summer savings are moderately lower due to longer daylight hours, while winter savings are moderately higher due to shorter daylight hours. In contrast to the roughly level month-to-month LED savings, an efficient air conditioner won't save any energy during January but may achieve 35 percent of its annual energy savings in the month of July alone. The EM&V Contractor has developed appropriate energy savings curves from metered data collected during M&V of other DSM programs – i.e., *Residential Energy Efficient Lighting Program (2016), Residential Air Conditioning Program, and Second Refrigerator Collection and Recycling Program (2015)* – customer billing data, calibrated DOE2 simulations, and engineering calculations. The energy savings curves are coupled with installation dates on a record-by-record basis to produce accurate determinations of the energy savings achieved for each hour, day, and month of the year.

Incremental Costs

Incremental cost is the difference between the cost of the energy efficiency measure and the cost of the base case or baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Since, the Program is bearing the full cost of the appliances and installation of the appliances, the incremental cost is equal to the full cost of each measure provided, including the measure cost plus the implementation cost.

Incentives

Incentives of the purposes of this program includes the full cost of the appliance provided, both the purchase cost and the installation cost.

Measure Life

The EUL is unique to each measure in this Program. The measure life for each measure is provided in the input sheet.

Units

For the Low Income Program a unit is defined at the measure level. Within the program design, a single customer may receive more than one measure, resulting in multiple units received by a given customer.

Savings

The energy savings for this program are on a per unit basis and were developed in consultation with the Company's EM&V consultant, and are consistent with prior year program experience.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

NPC Residential Low Income Appliance Program

Input Sheet

2019 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$2,000,000	$340,000		$750,000.00	$600.00	1,250	600.00	750,000	10.00	$700.00	100.0%
Energy Star Refrigerator				$275,000.00	$550.00	500	37.00	18,500	10.00	$625.00	100.0%
Energy Star Dish Washer				$210,000.00	$700.00	300	176.00	52,800	14.00	$790.00	100.0%
Energy Star Clothes Dryer				$50,000.00	$25.00	2,000	160.00	320,000	7.00	$30.00	100.0%
Smart Strips				$37,500.00	$250.00	150	168.00	25,200	10.00	$300.00	100.0%
Room AC Units Energy Star				$100,000.00	$50.00	2,000	126.00	252,000	4.00	$60.00	100.0%
LED Lighting Package (10 lamps)				$7,500.00	$ 15.00	500	33.00	16,500	10.00	$25.00	100.0%
Proximity Lighting Sensors			$230,000.00	$1,430,000.00				1,435,000			
Total							Cost/kWh	$ 1.39			

NPC Residential Low Income Appliance Program

Input Sheet

2019 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$2,000,000	$340,000		$750,000.00	$600.00	1,250	600.00	750,000	10.00	$700.00	100.0%
Energy Star Refrigerator				$275,000.00	$550.00	500	37.00	18,500	10.00	$625.00	100.0%
Energy Star Dish Washer				$210,000.00	$700.00	300	176.00	52,800	14.00	$790.00	100.0%
Energy Star Clothes Dryer				$50,000.00	$25.00	2,000	160.00	320,000	7.00	$30.00	100.0%
Smart Strips				$37,500.00	$250.00	150	168.00	25,200	10.00	$300.00	100.0%
Room AC Units Energy Star				$100,000.00	$50.00	2,000	126.00	252,000	4.00	$60.00	100.0%
LED Lighting Package (10 lamps)				$7,500.00	$ 15.00	500	33.00	16,500	10.00	$25.00	100.0%
Proximity Lighting Sensors			$230,000.00	$1,430,000.00				1,435,000			
Total											

NPC Residential Low Income Appliance Program

Input Sheet

2019 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$2,000,000	$340,000		$750,000.00	$600.00	1,250	600.00	750,000	10.00	$700.00	100.0%
Energy Star Refrigerator				$275,000.00	$550.00	500	37.00	18,500	10.00	$625.00	100.0%
Energy Star Dish Washer				$210,000.00	$700.00	300	176.00	52,800	14.00	$790.00	100.0%
Energy Star Clothes Dryer				$50,000.00	$25.00	2,000	160.00	320,000	7.00	$30.00	100.0%
Smart Strips				$37,500.00	$250.00	150	168.00	25,200	10.00	$300.00	100.0%
Room AC Units Energy Star				$100,000.00	$50.00	2,000	126.00	252,000	4.00	$60.00	100.0%
LED Lighting Package (10 lamps)				$7,500.00	$ 15.00	500	33.00	16,500	10.00	$25.00	100.0%
Proximity Lighting Sensors			$230,000.00	$1,430,000.00				1,435,000			
Total											

Name:	2019-21 Low Income Appliance	**Last Updated:**	5/14/2018 13:39
Customer Sector:	Residential	**Avg Measure Life:**	8.42
Region :	Vegas	**Energy Savings Curve:**	Multiple
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$1,566,900	$5,312,936	($3,746,036)	0.29	$0.238
Total Resource Cost (TRC)	$1,253,520	$5,312,936	($4,059,416)	0.24	$0.238
Utility Cost Test (UCT)	$1,253,520	$4,760,695	($3,507,175)	0.26	$0.213
Participant Cost Test (PCT)	$5,979,319	$3,956,138	$2,023,182	1.51	$0.177
Ratepayer Impact (RIM)	$1,253,520	$7,336,118	($6,082,598)	0.17	$0.329
Societal Cost (SCT)	$1,638,424	$5,312,936	($3,674,512)	0.31	$0.238

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$2,000,000	$2,000,000	$2,000,000	$6,000,000
Electric Benefits ($)	$60,349	$65,180	$71,671	$1,253,520
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,491,972	1,491,972	1,491,972	37,707,480
Critical Peak Hour Demand (kW)	249	249	249	748
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	159,806	159,806	159,806	4,091,457
Total On Peak Hours (%)				10.85%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data	
Discount Rate:	8.09%
Rate Escalator:	0.00%
Inflation Rate (T&D):	2.00%
Line Loss (Energy):	3.82%
Line Loss (Demand):	7.60%
Avoided T&D Capacity $/MW:	$52,295
Environmental Adder (SCT only)	10.00%
Non-Energy Benefit Adder (NTRC and SCT)	25.00%
Electric Retail Rate ($/kWh):	$0.12
Gas Retail Rate ($/therm)	$0.66
Net-To-Gross Ratio	100.0%

Secondary Benefits	
Other Savings	$0
Scenarios:	
Measure Life	100%
Energy Savings	100%
Avoided Energy Cost	100%
Avoided Capacity Cost	100%
Incremental Measure Cost	100%

Sierra Pacific Power Company Low Income Program

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $600,000 and a target of 367,700 kWh in program year 2019, a budget of $700,000 and a target of 483,000 kWh in program years 2020 and 2021.

Company is committed to ensuring that 5 percent of the Demand Side Plan budget is dedicated to serving low and limited income customers. This program is designed to meet 80 percent of that goal, with the remaining 20 percent coming from targeted low income customers within the other proposed programs in the overall portfolio.

Replacing aged appliances in low and fixed income households is an approach that has been used by the Company in previous program years. It was selected as the preferred approach at this time as other state and local agencies are providing weatherization and insulation measures to meet the deferred maintenance challenges that are present with this customer base. To partner with Nevada's low income agencies, the Company focused directly on the source of high energy consumption appliances. Low income customers generally endure budget constraints and could easily lower their energy costs by replacing old and inefficient appliances with ENERGY STAR® rated appliances. This approach will supplement the weatherization measures provided by other agencies and ultimately provide high value, high impact improvements in the lives of this challenged customer base. This preferred approach will provide low income families with greater home comfort as well as lower energy costs.

Additionally, providing high quality low energy consuming appliances will provide not only significant energy savings, but will extend those savings well into the future, with lower energy bill year after year for many years.

A necessary feature of the program will be removing the old inefficient equipment from customers' homes and disposing of appliances in a way that the appliances cannot find their way back onto the electrical grid. The program will also ensure that old equipment and appliances will be disposed of in an environmentally acceptable method.

The full benefits of these products and the implementation costs associated with implementation will be borne by the program and there will be no cost to the customer for these products.

M&V Plan

The EM&V Contractor will perform evaluation, M&V activities to confirm the savings realized through the Low Income Program being implemented in the Company's service territory.

Approach

The EM&V Contractor will provide the plans for performing the EM&V activities for the Low Income Program. The choices for procedures that will be used to perform the EM&V activities have been informed

by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the EM&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the EM&V work, including data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of EM&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive Low Income program measures such as ENERGY STAR® rated LEDs and appliances, lighting sensors, and smart power strips. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who receive Low Income measures that are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions that provide the expected savings estimates.

Engineering Desk Review Analysis
As a method to determine the savings that result from measures implemented through the Low Income Program, the EM&V Contractor will perform engineering calculations to determine the unit savings (*ex post* kWh) per measure installed; those kWh savings values will be applied to all verified installations. *Energy savings curves* will be utilized to determine *ex post* demand (kW) savings for the Low Income Program.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group. This comprehensive modeling software utilizes a stream of avoided costs, broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. Key inputs used in the creation of these results are described at the end of this Section.

Energy Savings Curves

The EM&V Contractor utilizes *energy savings curves* to calculate the portion of annual energy savings which occurs during each hour (as well as each day and each month) of the year. An energy savings curve describes the temporal nature of energy savings. For example, on any given day the energy savings achieved by a LED may be roughly 1/365 of its verified annual energy savings; summer savings are moderately lower due to longer daylight hours, while winter savings are moderately higher due to shorter daylight hours. In contrast to the roughly level month-to-month LED savings, an efficient air conditioner won't save any energy during January but may achieve 35 percent of its annual energy savings in the month of July alone. The EM&V Contractor has developed appropriate energy savings curves from metered data collected during M&V of other DSM programs – i.e., *Residential Energy Efficient Lighting Program (2016), Residential Air Conditioning Program, and Second Refrigerator Collection and Recycling Program (2015)* – customer billing data, calibrated DOE2 simulations, and engineering calculations. The energy savings curves are coupled with installation dates on a record-by-record basis to produce accurate determinations of the energy savings achieved for each hour, day, and month of the year.

Incremental Costs

Incremental cost is the difference between the cost of the energy efficiency measure and the cost of the base case or baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Since, the Program is bearing the full cost of the appliances and installation of the appliances, the incremental cost is equal to the full cost of each measure provided, including the measure cost plus the implementation cost.

Incentives

Incentives of the purposes of this program includes the full cost of the appliance provided, both the purchase cost and the installation cost.

Measure Life

The EUL is unique to each measure in this Program. The measure life for each unique measure is provided in the input sheet.

Units

For the Low Income Program, a unit is defined at the measure level. Within the program design, a single customer may receive more than one measure, resulting in multiple units received by a given customer.

Savings

The energy savings for this program are estimated base on utility experience.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

SPPC Residential Low Income Appliance Program

Input Sheet

2019 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$600,000	$102,000									
Energy Star Refrigerator				$240,000.00	$800.00	300	600.00	180,000	10.00	$900.00	100.0%
Energy Star Dish Washer				$68,750.00	$550.00	125	37.00	4,625	10.00	$625.00	
Energy Star Clothes Dryer				$70,000.00	$700.00	100	176.00	17,600	14.00	$790.00	
Smart Strips				$12,500.00	$25.00	500	160.00	80,000	7.00	$30.00	
Room AC Units Energy Star				$1,500.00	$150.00	10	168.00	1,680	10.00	$200.00	
LED Lighting Package (10 lamps)				$30,000.00	$50.00	600	126.00	75,600	4.00	$60.00	
Proximity Lighting Sensors				$3,750.00	$ 15.00	250	33.00	8,250	10.00	$25.00	
Total			$71,500.00	$426,500.00				367,755			

Cost/kWh $ 1.63

Input Sheet

2020 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$700,000	$120,000									
Energy Star Refrigerator				$280,000.00	$800.00	350	600.00	210,000	10.00	$900.00	100.0%
Energy Star Dish Washer				$71,500.00	$550.00	130	37.00	4,810	10.00	$625.00	
Energy Star Clothes Dryer				$84,000.00	$700.00	120	176.00	21,120	14.00	$790.00	
Smart Strips				$20,000.00	$25.00	800	160.00	128,000	7.00	$30.00	
Room AC Units Energy Star				$4,500.00	$150.00	30	168.00	5,040	10.00	$200.00	
LED Lighting Package (10 lamps)				$40,000.00	$50.00	800	126.00	100,800	4.00	$60.00	
Proximity Lighting Sensors				$6,000.00	$ 15.00	400	33.00	13,200	10.00	$25.00	
Total			$74,000.00	$506,000.00				482,970			

Cost/kWh $ 1.45

Input Sheet

2021 Program Year	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$700,000	$120,000									
Energy Star Refrigerator				$280,000.00	$800.00	350	600.00	210,000	10.00	$900.00	100.0%
Energy Star Dish Washer				$71,500.00	$550.00	130	37.00	4,810	10.00	$625.00	
Energy Star Clothes Dryer				$84,000.00	$700.00	120	176.00	21,120	14.00	$790.00	
Smart Strips				$20,000.00	$25.00	800	160.00	128,000	7.00	$30.00	
Room AC Units Energy Star				$4,500.00	$150.00	30	168.00	5,040	10.00	$200.00	
LED Lighting Package (10 lamps)				$40,000.00	$50.00	800	126.00	100,800	4.00	$60.00	
Proximity Lighting Sensors				$6,000.00	$ 15.00	400	33.00	13,200	10.00	$25.00	
Total			$74,000.00	$506,000.00				482,970			

Name:	2019-21 Low Income Appliance	**Last Updated:**	5/14/2018 14:13
Customer Sector:	Residential	**Avg Measure Life:**	8.18
Region :	Reno	**Energy Savings Curve:**	Multiple
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$502,498	$1,814,958	($1,312,460)	0.28	$0.242
Total Resource Cost (TRC)	$401,998	$1,814,958	($1,412,960)	0.22	$0.242
Utility Cost Test (UCT)	$401,998	$1,645,633	($1,243,635)	0.24	$0.219
Participant Cost Test (PCT)	$1,886,443	$1,352,540	$533,904	1.39	$0.180
Ratepayer Impact (RIM)	$401,998	$2,348,861	($1,946,863)	0.17	$0.313
Societal Cost (SCT)	$527,131	$1,814,958	($1,287,827)	0.29	$0.242

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$600,000	$700,000	$700,000	$2,000,000
Electric Benefits ($)	$14,658	$20,765	$22,853	$401,998
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	392,477	515,437	515,437	11,638,200
Critical Peak Hour Demand (kW)	52	66	66	184
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	15,528	20,145	20,145	2,327,332
Total On Peak Hours (%)				20.00%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	25.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Residential Air Conditioning Program

The Residential Air Conditioning Program ("AC Program" or "Program" in this section) encourages customers to make energy efficiency upgrades to existing air conditioners ("AC") and heat pumps. This Program achieves significant summer peak hour demand reduction as well as long-term energy savings. The Program is important because residential air conditioning is a major contributor to system summer peak hour electric demand. Efficiency upgrades for existing systems may include several air conditioning tune-up measures, installation of high efficiency air conditioners and heat pumps, duct testing and sealing, and adjusting refrigerant to correct levels

Residential customers are encouraged to have existing cooling systems evaluated, and, if feasible, brought back to factory specifications, or replaced with higher efficiency systems to remove older units whose performance has degraded such that they are using excessive energy to meet the customer's cooling requirements.

The Program will incentivize builders to install higher efficiency air conditioners and heat pump in newly constructed single and multi-family housing.

Five percent of the Program budget will be directed to low and fixed income customers. Measures will include comprehensive tune-ups aimed at extending the life and efficiency of existing air conditioners, correcting refrigerant levels, and sealing and repairing leaking duct work throughout the home.

Nevada Power Company Residential Air Conditioning Program

2017 Results

Budget: Expenditures were $6,237,363, or 89.1 percent of the budget of $7,000,000. The 2016 program evaluation found that certain measures did not meet the anticipated energy savings. This year-end analysis, combined with a mid-year Program redesign (based on the EM&V findings) resulted in several measures being dropped from the Program, and thus a scale-back in program goals and expectations.

Energy and Demand: In 2017, the verified energy savings were 10,937,357 kilowatt hours ("kWh") and demand savings were 5,267 kilowatts ("kW"). The verified energy savings resulted in 82.2 percent of target. The 2017 Residential AC Program achieved a TRC ratio of 1.12.

There were 21,900 unique customers who participated in the 2017 Program. This included customers living in multi-family, single family, low income housing and manufactured homes. The Program benefited each of these customer segments by providing increased comfort, lower electric bills, and reducing overall energy usage. The program operated through the entire calendar year, providing varied services at different seasons; air conditioning tune-ups and air conditioning

replacements during the cooling season, and duct testing and sealing, along with direct-install energy saving measures during the off-cooling season.

The Program provided instant rebates to customers at the time services were provided by local HVAC contractors. Contractors delivering services were authorized by the program to provide the services and offer the incentives at the time services were provided. Contractors participating in the program were also required to participate in program training and maintain strict standards of customer care and quality of workmanship.

Following the annual report and final evaluation of the 2016 program in late spring, 2017, the Program underwent a comprehensive redesign, in an effort to address evaluation findings, and implement the recommended changes provided by the Program evaluator. Changes to the Program design included the elimination of tiers, or multiple levels of payment based on airflow loss improvement with duct testing and repair, a comprehensive tune-up that required a more thorough number of adjustments, and removing HVAC contractors who were found to be inconsistent and unable to effectively reducing duct leakage. Additionally, non-air conditioning related direct install measures were dropped from the program offering midway through the Program year to concentrate on measures that were more specifically directed at air conditioning.

New measures were introduced during the mid-season redesign which incentivized customers to upgrade to high-efficiency air conditioners when air conditioners systems failed and needed to be replaced. The rebate qualifying requirements for this measure were the same as for the early replacement measure, with one exception; the air conditioning unit was not required to be operational.

The mid-year redesign delivered benefits of higher efficiency HVAC systems to a broader group of the Company's customers. This initiative lead to air conditioning services for two new customer segments, namely, low-income customers and new construction customers. These two offerings were not fully developed until late in the program year, which resulted in very few participants. Experience with these measures did however, inform the design of low-income and new construction measures included in the 2018 request for proposal (RFP) for the 2018-2021 Program cycle.

These Program design changes provided stability in terms of predictable energy and power savings, and removed uncertainty associated with certain Program measures which had mixed results. The stabilizing effects of these changes are seen in the final 2017 evaluation.

During the 2017 program year, a concerted effort was made to more fully collaborate with the third party evaluator, ADM and Associates, by providing opportunities to thoroughly understand all program measures, designs, and processes. During the heating season, Program evaluators attended contractor training, and equipment orientation of tools used to determine and measure energy savings. Evaluators were also present for contractor field training and in observing contractors performing field tune-up measures. Evaluators also observed implementation contractor personnel performing quality assurance evaluations of air condition measures

performed. This initiative improved the understanding of evaluators of the measures and practices used to assure program quality as the Program was delivered to customers.
High quality measure installations were an important contributor to the overall success of the program. Implementation contractors were required to perform Quality Assurance/Quality Control ("QA/QC") inspections of ten percent of installed premises. In 2017, 3,568 QA/QC inspections, representing 15.24 percent of the total, were performed with over 90 percent of projects passing inspection in the first instance. With projects failing quality inspection, the associated contractor were required to return to correct any deficiency... Contractors repeatedly failing to meet quality standards were removed from the Program.

A robust quality control program, combined with customer surveys, was used to identify and correct any identified quality shortcomings. This practice benefited customers by assuring that only contractors meeting a high degree of training and integrity would be providing services on their air conditioning equipment.

Although direct install measures were dropped from the program mid-year, a significant number of direct installations occurred early in the program year. Direct install measures were deployed to serve apartments using electric water heating. The majority of these apartments are occupied by lower income, senior, and/or disabled customers. These included Section 8 and fixed income housing complexes.

A customer survey was conducted by Clearesult, the implementation contractor, which produced the following results:

On a one to five scale, with 5 being the most positive:
1. Overall program experience – 4.6
2. Overall experience with the contractor – 4.6

Of the 907 customers surveyed, the following responses were given:
1. Were you provided information regarding other NV Energy Programs? – 373 yes (41 percent)
2. Was it clear to you that NV Energy provided the rebate/incentive? – 703 yes (78 percent)

Measurement & Verification

The M&V report titled Residential Air Conditioning Program was performed by ADM and is provided in Technical Appendix DSM-12. The report provides the evaluation results of the 2017 Program.

Lessons Learned and Recommendations

Outlined below is a recap of lessons learned and modifications being incorporated in 2018.

- Challenges associated with the potential for gaming and inconsistent results continue to challenge the Duct Test and sealing ("DTS") measure. The measure, as designed, was cumbersome and time consuming. There were also some customers who did not like HVAC contractors going into their attic spaces to do work which they could not observe, and shutting off home vents as part of the testing process.

- The Duct Test and Sealing measure will be eliminated in the 2018 program design.

- In-season review – A mid-year evaluation of Program performance was critically important to the overall success of the Program. Regular review of performance has provided important insights into original assumptions, assisted in identifying problems and opportunities not previously recognized and informed mid-season corrections which increased overall program outcomes.

- In-season reviews of program performance for this Program have been invaluable and will continue to be used in future program deployments.

2018 Status

The Residential Air Conditioning Program was put out for bid in the fall of 2017 through the company's request for proposal process for the 2018-2021 program years.

Based on the proposals that were submitted, a program design was selected which significantly changes the direction of the historical program offering. For the 2018 program year, the Residential Air Conditioning Program will be deployed as a mid-stream retrofit and replacement model, wherein customers benefit from reductions in utility costs when upgrading to high-efficiency AC units, either as an upgrade to existing functioning systems or when the AC system fails.

The Program design will target HVAC equipment distributors and manufacturers for promotion and deployment, with incentives provided by the Company, that are ultimately being realized by the customer.

The new Program is designed to promote and drive high-efficiency air conditioning into the Nevada market, ultimately transforming the retrofit and replacement market though education and promotion of high efficiency air conditioning.

The program will also promote high-efficiency air conditioning installed by builders at the time of construction in both single and multi-family housing. The goal is to incentivize customers to move to high-efficiency air conditioning by providing instant rebates, in the form of price reductions, when new air conditioners are installed.

In the current market state, if a customer has an interest in upgrading to high efficiency air conditioning, that equipment is typically considered "special order" by equipment suppliers, and must be special ordered, as it is not stocked and on the shelf locally and immediately available for

purchase. In a hot climate like Southern Nevada, customers cannot wait for several days or weeks for special order equipment to be shipped and are therefore, forced to accept what is readily available, or "at code" air conditioners. The mid-stream Program will require participating suppliers and distributors to stock high efficiency air conditioners which will then be readily available for purchase and installation. Having this high efficiency equipment readily available and promoted by installation contractors has been shown in other markets to drive demand for higher efficiency equipment. This design positions the company well for market transformation.

The Program will drive energy savings with predictable, deep, and persistent energy savings over the life of the new air conditioner or heat pump, as opposed to spending program funds on tune-ups and duct sealing and repair, which have had uncertain, and at times, less than desirable, and short-term effectiveness.

The mid-stream approach is expected to encourage homeowners to purchase premium efficiency air conditioners and heat pumps. Options will be available to customers both as an early replacement to more efficient equipment option, or to a high-efficiency upgrade option upon equipment failure. A reduction in the required air conditioning tonnage may also off-set the incremental cost associated with the higher efficiency unit.

2019 - 2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $7,000,000 and a target of 13,543,000 kWh in each program year. The Company will continue the program under the 2018 program design as a mid-stream offering, incentivizing customers and builders to upgrade to higher efficiency air conditioning and heat pump systems through reducing the cost of that equipment at the distributor level of the supply chain.

In addition, the Program will support the low and fixed income communities, who struggle with high cooling costs, poor equipment performance and unreliability. Five percent of the Program's incentive budget will be used to assist low and fixed income customers through providing air conditioning tune-ups, repair work, and coving the full cost of upgrading to higher efficiency air conditioning if an air conditioning system fails.

Continuous evaluation of program during the year will inform program managers in making any adjustments or changes necessary to offer the program in a cost-effective manner. New and emerging technologies will also be evaluated as potential program offerings as they mature and are proven to be effective.

Customer education and outreach will continue to play an essential role in the overall success of the Program. A number of marketing and customer touchpoints will be leveraged to increase customer awareness and demonstrate the value proposition of the Program to customers.

The most productive level of communication will be by participating contractors who communicated directly with customers about the benefits of the Program. Communications tools used for outreach will include post cards, door hangers, tri-fold brochures, websites, social media, direct contacts, radio advertising, and direct mail.
The Company provides educational materials and outreach materials used in the Program. The Program will continue to be promoted generally to the public through the company's PowerShift media campaign. Program materials outlining all of the Company's energy efficiency programs are also left with customers at the time air conditioning services are provided.

The Program will maintain outreach information on the company's website, where customers could learn of the participation benefits, measures available through the program, and a list of participating HVAC contractors.

The Program will continue to initiate a major emphasis in 2019 to fully support the Southern Nevada Air Conditioning and Refrigeration Service Contractors Association ("SNARSCA") and its sponsored events. The Residential Air Conditioning Program will be reintroduced early in the year at a SNARSCA monthly meeting, including a question and answer session regarding participation for all member HVAC contractors.

Other important outreach events supported by the program included the Association of Energy Engineers (AEE), the Advanced Energy Economy Institute and Clean Energy Project next steps in DSM: Policy and Programs Roundtable, and the 6th Annual Energy Services Coalition Market Transformation Conference, the Southern Nevada Home Owners Association Management Conference, and many other public and private outreach events where air conditioning improvement could appropriately be promoted.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the Portfolio Pro financial modeling software created by the Cadmus Group. This comprehensive modeling software utilizes a stream of avoided costs, broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program Data Sheet and the materials referenced herein. Key inputs used in the creation of these results are described below.

Energy Savings Curves

The phrase 'energy savings curve' is used to describe the temporal dependence of energy savings. The curves are typically hourly (1 × 8760 array), daily (1 × 365 array), or monthly (1 × 12 array). The energy savings curves are often normalized such the sum of all array elements is unity. When

normalized, each element describes the fraction of annual savings that is expected to occur in a given hour, day, or month.

Note that if the term 'load shape' is encountered in the spreadsheets that are used to tally monthly energy savings by program and rate class, one should take it to be the same as 'energy savings curve' as described herein. The reason for the usage of the term 'load shape' is twofold:

- Energy savings curves are differential load shapes describing differences in electricity loads resulting from the implementation of energy efficiency measures; in other words, energy savings curves indicate the shape over time of electricity that is saved or not used.
- An energy savings curve for a measure may or may not be synchronous with the load curve of the base case technology against which savings are determined.
-

As part of the evaluation effort, ADM determines for each EEM whether to use normalized energy savings curves that are either synchronous or asynchronous with the normalized load shape of the base case technology.

Incremental Costs

Incremental costs for this program differ between the 2017 program and the 2018 – 2019 Program designs as follows:

2017

Incremental cost is the difference between the cost of the EEM and the cost of the base case or baseline measure. Establishing the appropriate baseline generally defines the incremental cost. There are four scenarios, new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement. The base cost is not the same for the four measure types. This Program includes controls, replacement on burnout and early replacement. In the case of replacement at burnout, the baseline is the cost of the code or standard compliant measure, and the incremental cost is the difference between the costs of the energy-efficient measure minus the cost of the baseline measure. In the case of early replacement or controls, the base cost is zero and therefore the incremental cost is the full cost of the energy efficient measure reduced for the payment to contractor which partially offsets customer out of pocket cost.

The early AC replacements supported by this Program are not made solely for energy efficiency considerations but are made because the AC unit is not performing correctly, which is a condition of the Program. AC replacements are therefore determined to be a replacement on burnout for incremental cost purposes. The incremental cost for the AC replacements is therefore the difference in cost between the energy efficient measure and the baseline measure cost reduced for the payment to contractor which partially offsets customer out of pocket cost. For the tune-ups and repair measure the baseline measure is "do nothing", with a zero baseline cost. The incremental cost is therefore

the cost of the energy-efficient measure. The baseline measure for the duct testing and sealing is also do nothing. The incremental measure cost for the duct sealing measure is a weighted average of the duct diagnostic test and the duct repair levels one and two reduced for the payment to contractor which partially offsets customer out of pocket cost. The incremental cost for each of the ten measures in this analysis is provided in the input sheet, which is provided at the end of this program data sheet.

2019 – 2021

The Program design for these years has changed to a mid-stream buy-down model wherein, incentives are paid to manufacturers and distributors of air condition equipment to stock and promote higher than code efficiency air condition systems in the market, with the incentive ultimately being realized by the customer. Incremental costs for this model are defined as follows:

Replacement on Burnout **–** Replacement on burnout incremental cost is equal to the full cost of a new base efficiency system minus the full cost of the higher efficiency system.

Early Replacement – Early replacement incremental cost is equal to the full cost of the new higher efficiency system.

Base costs and incremental costs for this program design was determined by ICF International, the Program implementation contractor, and is based on a market survey of distributors providing air conditioning systems.

Incentives

This Program makes payment to the manufacturer or, typically, the distributor to reduce the customer out of pocket cost. The customers can see Company's payment on the invoice provided by the AC contractor.

Incentive levels to reduce customer costs are determined by program design and agreed to by manufacturers and distributors by way of program enrollment. Equipment incentives are reviewed and agreed to by both the distributor and the implementation contractor.

Measure Life

The EUL is unique to each measure in this Program. The source of the measure life for each measure is various national TRM established values. Measure life for each appliance proposed in the Program is listed in the Data Input Sheet.

Units

For the Residential Air Conditioning Program a unit is defined at the measure level.

Savings

The energy savings for this program are on a per unit basis as provided in the 2017 M&V Report. Savings values have also been validated through a survey of other appliance programs.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

NPC Residential AC Program

Input Sheet

2017 Result	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Ex Ante Annual Savings (kWh/unit)	Ex Post Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$6,237,363	$707,745	$1,505,707.00								
Diagnostic Evaluation MF				$21,550.00	$25.00	862	-	-	8.00	$25.00	91.0%
Coil Cleaning Indoor MF				$19,500.00	$50.00	390	309.826	120,832	8.00	$50.00	91.0%
Coil Cleaning Outdoor MF				$21,350.00	$25.00	854	314.601	268,669	8.00	$25.00	91.0%
Refrigerant Charging MF				$32,700.00	$50.00	654	315.099	206,075	8.00	$50.00	91.0%
CoolSaver Tune Up MF				$258,300.00	$150.00	1,722	335.934	578,479	10.00	$150.00	91.0%
CoolSaver Tune Up + Refrigerant MF				$823,600.00	$200.00	4,118	354.275	1,458,905	10.00	$200.00	91.0%
Diagnostic Evaluation SF				$9,575.00	$25.00	383	-	-	8.00	$25.00	91.0%
Coil Cleaning Indoor SF				$12,400.00	$50.00	248	378.496	93,867	8.00	$50.00	91.0%
Coil Cleaning Outdoor SF				$9,550.00	$25.00	382	375.783	143,549	8.00	$25.00	91.0%
Refrigerant Charging SF				$20,625.00	$75.00	275	375.255	103,195	8.00	$75.00	91.0%
CoolSaver Tune Up SF				$30,000.00	$150.00	200	322.235	64,447	10.00	$150.00	91.0%
CoolSaver Tune Up + Refrigerant SF				$74,925.00	$225.00	333	336.997	112,220	10.00	$225.00	91.0%
Heat Strip Lockout				$9,800.00	$50.00	196	270.000	52,920	8.00	$50.00	91.0%
Duct Testing (MF/SF/MH)				$725.00	$25.00	29	-	-	20.00	$25.00	91.0%
Duct Test and Sealing (DTS - MF)				$893,600.00	$125.21	7,137	353.270	2,521,289	20.00	$125.21	91.0%
Duct Test and Sealing (DTS - SF/MH)				$892,900.00	$263.78	3,385	445.181	1,506,936	20.00	$263.78	91.0%
Duct Return Modification				$250.00	$250.00	1	212.000	212	20.00	$350.00	91.0%
Early Replacement SF				$544,975.00	$1,001.79	544	1,750.649	952,353	6.00	$2,254.59	91.0%
Early Replacement MF				$1,675.00	$558.33	3	1,725.000	5,175	6.00	$1,354.33	91.0%
Burn Out SF				$12,500.00	$520.83	24	642.583	15,422	18.00	$1,133.27	91.0%
New Build Install SF				$15,750.00	$2,250.00	7	665.000	4,655	18.00	$1,249.50	91.0%
General Purpose LED				$80,112.00	$8.00	10,014	16.701	167,244	12.00	$8.00	91.0%
Reflector LED				$4,609.00	$11.00	419	26.761	11,213	12.00	$11.00	91.0%
Aerator				$86,165.00	$5.00	17,233	48.361	833,412	10.00	$5.00	91.0%
Showerhead				$146,775.00	$15.00	9,785	175.400	1,716,285	10.00	$15.00	91.0%
Total				$4,023,911.00				10,937,354			

Name:	2017 Residential AC	**Last Updated:**	4/30/2018 13:37
Customer Sector:	Residential	**Avg Measure Life:**	
Region :	Vegas	**Energy Savings Curve:**	Multiple
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2017	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$7,983,614	$6,866,816	$1,116,798	1.16	$0.081
Utility Cost Test (UCT)	$7,983,614	$6,237,381	$1,746,233	1.28	$0.074
Participant Cost Test (PCT)	$14,754,521	$4,715,616	$10,038,905	3.13	$0.051
Ratepayer Impact (RIM)	$7,983,614	$16,002,219	($8,018,606)	0.50	$0.189
Societal Cost (SCT)	$9,462,628	$6,866,816	$2,595,812	1.38	$0.081
*Includes rebates paid to freeriders					

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$6,237,381	$0	$0	$6,237,381
Electric Benefits ($)	$618,349	$0	$0	$7,983,614
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	10,348,141	0	0	136,589,829
Critical Peak Hour Demand (kW)	5,119	0	0	5,119
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	2,206,283	0	0	29,082,134
Total On Peak Hours (%)				21.29%
*Savings in this section are adjusted for line loss and net-to-gross				

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	91.0%		

Residential HVAC Program
Input Sheet

2019 Design	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures											
	$7,000,000	$1,244,663									
New Construction Central AC - SF SEER 15 - 20				$811,400.00	$243.91	3,327	356.81	1,186,951	18.00	$ 339.45	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$50,624.00	$372.84	136	467.06	63,418	15.00	$479.54	82.0%
New Construction PCM Motors - SF				$3,000.00	$75.00	40	894.00	35,760	5.00	$375.00	82.0%
New Construction Central AC or Heat Pump - MF SEER 15 or 15/8.5 HSPF				$76,000.00	$150.50	505	154.71	78,128	17.97	$250.50	82.0%
New Construction Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$90,000.00	$200.00	450	320.25	144,110	15.00	$350.00	82.0%
Existing Heat Pump or Central AC - SF SEER 15/8.5 - 16/8.6 HSPFor 15-20 ER				$842,958.00	$890.64	946	2,032.76	1,923,928	17.80	$3,776.63	82.0%
Existing Central AC - MF SEER 15/16 ER				$9,000.00	$450.00	20	1,153.50	23,070	18.00	$3,389.06	82.0%
Existing Central AC or Heat Pump - SF SEER 15-20 or 15/8.6 -20/10 HSPF				$1,918,460.00	$304.43	6,302	1,195.40	7,533,073	17.97	$530.03	82.0%
Existing PCM Motors - SF				$15,000.00	$75.00	200	1,192.00	238,400	5.00	$500.00	82.0%
Existing Central AC or Heat Pump - MF SEER 15 or 15/8.6 HSPF				$9,100.00	$156.90	58	538.66	31,242	17.59	$321.12	82.0%
Existing Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$160,000.00	$200.00	800	308.67	246,936	15.00	$466.67	82.0%
Low Income Measures				$563,550.00	$121.78	4,628	440.48	2,038,324	14.41	$406.86	82.0%
Total			$1,206,244.75	$4,549,092.00		17,411		13,543,340			

Residential HVAC Program
Input Sheet

2020 Design	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures											
	$7,000,000	$1,244,663									
New Construction Central AC - SF SEER 15 - 20				$811,400.00	$243.91	3,327	356.81	1,186,951	18.00	$339.45	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$50,624.00	$372.84	136	467.06	63,418	15.00	$479.54	82.0%
New Construction PCM Motors - SF				$3,000.00	$75.00	40	894.00	35,760	5.00	$375.00	82.0%
New Construction Central AC or Heat Pump - MF SEER 15 or 15/8.5 HSPF				$76,000.00	$150.50	505	154.71	78,128	17.97	$250.50	82.0%
New Construction Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$90,000.00	$200.00	450	320.25	144,110	15.00	$350.00	82.0%
Existing Heat Pump or Central AC - SF SEER 15/8.5 - 16/8.6 HSPFor 15-20 ER				$842,958.00	$890.64	946	2,032.76	1,923,928	17.80	$3,776.63	82.0%
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Existing Central AC or Heat Pump - SF SEER 15-20 or 15/8.6 -20/10 HSPF				$1,918,460.00	$304.43	6,302	1,195.40	7,533,073	17.97	$530.03	82.0%
Existing PCM Motors - SF				$15,000.00	$75.00	200	1,192.00	238,400	5.00	$500.00	82.0%
Existing Central AC or Heat Pump - MF SEER 15 or 15/8.6 HSPF				$9,100.00	$156.90	58	538.66	31,242	17.59	$321.12	82.0%
Existing Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$160,000.00	$200.00	800	308.67	246,936	15.00	$466.67	82.0%
Low Income Measures				$563,550.00	$121.78	4,628	440.48	2,038,324	14.41	$406.86	82.0%
Total			$1,206,244.75	$4,549,092.00		17,411		13,543,340			

Residential HVAC Program
Input Sheet

2021 Design	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
Measures											
	$7,000,000	$1,244,663									
New Construction Central AC - SF SEER 15 - 20				$811,400.00	$243.91	3,327	356.81	1,186,951	18.00	$339.45	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$50,624.00	$372.84	136	467.06	63,418	15.00	$479.54	82.0%
New Construction PCM Motors - SF				$3,000.00	$75.00	40	894.00	35,760	5.00	$375.00	82.0%
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Low Income Measures				$563,550.00	$121.78	4,628	440.48	2,038,324	14.41	$406.86	82.0%
Total			$1,206,244.75	$4,549,092.00		17,411		13,543,340			

Name:	2019-21 Residential HVAC	**Last Updated:**	5/14/2018 13:42
Customer Sector:	Residential	**Avg Measure Life:**	17.05
Region :	Vegas	**Energy Savings Curve:**	High_Efficiency AC
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$37,335,210	$28,962,305	$8,372,905	1.29	$0.108
Total Resource Cost (TRC)	$32,465,400	$28,962,305	$3,503,095	1.12	$0.108
Utility Cost Test (UCT)	$32,465,400	$16,662,757	$15,802,643	1.95	$0.062
Participant Cost Test (PCT)	$48,542,625	$25,828,193	$22,714,432	1.88	$0.079
Ratepayer Impact (RIM)	$32,465,400	$47,588,139	($15,122,739)	0.68	$0.178
Societal Cost (SCT)	$38,526,409	$28,962,305	$9,564,105	1.33	$0.108

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$7,000,136	$7,000,136	$7,000,136	$21,000,409
Electric Benefits ($)	$967,439	$1,018,355	$1,089,298	$32,465,400
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	11,546,655	11,546,655	11,546,655	590,570,174
Critical Peak Hour Demand (kW)	5,788	5,788	5,788	17,365
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	2,487,911	2,487,911	2,487,911	126,951,719
Total On Peak Hours (%)				21.50%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	82.0%		

Sierra Pacific Power Company Residential Air Conditioning Program

2019 - 2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $600,000 and a target of 998,000 kWh in 2019, a budget of $500,000 and a target of 789,000 kWh in 2020, and a budget of $500,000 and a target of 789,000 kWh.

Program design will mirror the Program offered in the southern Nevada service territory. The Program will feature a mid-stream program design, incentivizing air conditioning manufacturers and distributors to discount and promote high-efficiency air conditioning in the northern service territory market, to both residential customers and to new home builders.

On-going evaluation of program results will inform program managers in making adjustments or changes necessary to operate the program in a cost-effective manner. New and emerging technologies will also be evaluated as potential program offerings when they mature and are proven to be effective.

The Program will support the low and fixed income communities, who struggle with high cooling costs, poor equipment performance and unreliability. Five percent of the Program's incentive budget will be used to assist these low and fixed income customers through providing air conditioning tune-ups, repair work, and coving the full cost of upgrading to higher efficiency air conditioning if an air conditioning system fails.

Customer education and outreach will continue to play an essential role in the overall success of the Program. A number of marketing and customer touchpoints will be leveraged to increase customer awareness and demonstrate the value proposition of the Program to customers.

The most productive level of communication will be by participating contractors who communicated directly with customers about the benefits of the Program. Communications tools used for outreach will include post cards, door hangers, tri-fold brochures, websites, social media, direct contacts, radio advertising, and direct mail.

The Company provides educational materials and outreach materials used in the Program. The Program will continue to be promoted generally to the public through the company's PowerShift media campaign. Program materials outlining all of the Company's energy efficiency programs are also left with customers at the time air conditioning services are provided.

The Program will maintain outreach information on the company's website, where customers could learn of the participation benefits, measures available through the program, and a list of participating HVAC contractors.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group. This comprehensive modeling software utilizes a stream of avoided costs, broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Energy Savings Curves

The phrase 'energy savings curve' is used to describe the temporal dependence of energy savings. The curves are typically hourly (1 × 8760 array), daily (1 × 365 array), or monthly (1 × 12 array). The energy savings curves are often normalized such the sum of all array elements is unity. When normalized, each element describes the fraction of annual savings that is expected to occur in a given hour, day, or month.

Note that if the term 'load shape' is encountered in the spreadsheets that are used to tally monthly energy savings by program and rate class, one should take it to be the same as 'energy savings curve' as described herein. The reason for the usage of the term 'load shape' is twofold:

- Energy savings curves are differential load shapes describing differences in electricity loads resulting from the implementation of energy efficiency measures; in other words, energy savings curves indicate the shape over time of electricity that is saved or not used.
- An energy savings curve for a measure may or may not be synchronous with the load curve of the base case technology against which savings are determined.

As part of the evaluation effort, ADM determines for each EEM whether to use normalized energy savings curves that are either synchronous or asynchronous with the normalized load shape of the base case technology.

Incremental Costs

Incremental costs for this program differ between the 2017 program and the 2018 – 2019 Program designs as follows:

2017

Incremental cost is the difference between the cost of the EEM and the cost of the base case or baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Four scenarios were evaluated: new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement. The base cost is not the same for the four measure types. This Program includes controls, replacement on burnout and early replacement. In the case of replacement at burnout, the baseline is the cost of the code or standard compliant measure, and the incremental cost is the difference between the costs of the energy-efficient measure minus the cost of the baseline measure. In the case of early replacement or controls, the base cost is zero and therefore the incremental cost is the full cost of the energy efficient measure reduced for the payment to contractor which partially offsets customer out of pocket cost.

The early AC replacements supported by this Program are not made solely for energy efficiency considerations but are made because the AC unit is not performing correctly, which is a condition of the Program. AC replacements are therefore determined to be a replacement on burnout for incremental cost purposes. The incremental cost for the AC replacements is therefore the difference in cost between the energy efficient measure and the baseline measure cost reduced for the payment to contractor which partially offsets customer out of pocket cost. For the tune-ups and repair measure the baseline measure is "do nothing", with a zero baseline cost. The incremental cost is therefore the cost of the energy-efficient measure. The baseline measure for the duct testing and sealing is also do nothing. The incremental measure cost for the duct sealing measure is a weighted average of the duct diagnostic test and the duct repair levels one and two reduced for thepayment to contractor which partially offsets customer out of pocket cost. The incremental cost for each of the ten measures in this analysis is provided in the input sheet, which is provided at the end of this program data sheet.

2018 – 2021

The Program design for these years has changed to a mid-stream buy-down model wherein, incentives are paid to manufacturers and distributors of air condition equipment to stock and promote higher than code efficiency air condition systems in the market, with the incentive ultimately being realized by the customer. Incremental costs for this model are defined as follows:

Replacement on Burnout **–** Replacement on burnout incremental cost is equal to the full cost of a new base efficiency system minus the full cost of the higher efficiency system.

Early Replacement – Early replacement incremental cost is equal to the full cost of the new higher efficiency system.

Base costs and incremental costs for this program design was determined by ICF International, the Program implementation contractor, and is based on a market survey of distributors providing air conditioning systems.

Incentives

This Program makes payment to the manufacturer or distributor (typical) to reduce the customer out of pocket cost. The customers can see Company's payment on the invoice provided by the AC contractor.

Incentive levels to reduce customer costs are determined by program design and agreed to by manufacturers and distributors by way of program enrollment. Equipment incentives are reviewed and agreed to by both the distributor and the implementation contractor.

Measure Life

The EUL is unique to each measure in this Program. The source of the measure life for each measure is various national TRM established values. Measure life for each appliance proposed in the Program is listed in the Data Input Sheet.

Units

For the Residential Air Conditioning Program a unit is defined at the measure level.

Savings

The energy savings for this program are on a per unit basis as provided in the 2017 M&V Report. Savings values have also been validated through a survey of other appliance programs.

Inputs and Outputs of PortfolioPro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Residential HVAC Program

Input Sheet - SPPC

2019 Design Measures	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
	$600,000	$102,308	$120,000								
New Construction Central AC - SF SEER 15 - 20				$31,350.00	$279.91	112	404.08	45,257	18.00	$ 379.15	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$10,980.00	$407.27	27	505.84	13,638	15.00	$577.30	82.0%
New Construction PCM Meters - SF				$0.00	$75.00	-	804.60	-	5.00	$375.00	82.0%
New Construction Central AC or Heat Pump - MF SEER 15 or 15/8.5 HSPF				$490.00	$290.00	2	167.04	334	15.00	$300.00	82.0%
New Construction Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$4,090.00	$290.00	20	285.02	5,700	15.00	$350.00	82.0%
Existing Heat Pump or Central AC - SF SEER 15/8.5 - 16/8.6 HSPFor 15-20 ER				$127,958.00	$870.70	147	1,746.89	256,723	17.92	$3,694.40	82.0%
Existing Central AC - MF SEER 15/16 ER				$3,600.00	$450.00	8	1,038.15	8,305	18.00	$3,389.06	82.0%
Existing Central AC or Heat Pump - SF SEER 15-20 or 15/8.6 -20/10 HSPF				$64,904.00	$284.82	228	1,004.52	228,999	17.84	$507.00	82.0%
Existing PCM Meters - SF				$1,500.00	$75.00	20	1,072.80	21,456	5.00	$500.00	82.0%
Existing Central AC or Heat Pump - MF SEER 15 or 15/8.6 HSPF				$2,800.00	$175.00	16	498.15	7,970	16.50	$343.75	82.0%
Existing Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$1,600.00	$200.00	8	285.02	2,280	15.00	$466.67	82.0%
Low Income Measures				$128,600.00	$129.38	994	409.91	407,454	14.25	$439.88	82.0%
Total				$377,692.00		1,582		998,027			

Residential HVAC Program

Input Sheet - SPPC

2020 Design Measures	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
	$500,000	$95,000	$111,458								
New Construction Central AC - SF SEER 15 - 20				$17,100.00	$328.85	52	518.08	26,940	18.00	$ 437.31	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$10,980.00	$407.27	27	505.84	13,638	15.00	$577.30	82.0%
New Construction PCM Meters - SF				$0.00	$75.00	-	643.68	-	5.00	$375.00	82.0%
New Construction Central AC or Heat Pump - MF SEER 15 or 15/8.5 HSPF				$490.00	$290.00	2	167.04	334	15.00	$300.00	82.0%
New Construction Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$4,090.00	$290.00	20	285.02	5,700	15.00	$350.00	82.0%
Existing Heat Pump or Central AC - SF SEER 15/8.5 - 16/8.6 HSPFor 15-20 ER				$88,958.00	$872.48	102	1,766.01	180,063	17.88	$3,714.00	82.0%
Existing Central AC - MF SEER 15/16 ER				$3,600.00	$450.00	8	1,038.15	8,305	18.00	$3,389.06	82.0%
Existing Central AC or Heat Pump - SF SEER 15-20 or 15/8.6 -20/10 HSPF				$54,904.00	$292.33	188	1,027.59	193,063	17.81	$521.62	82.0%
Existing PCM Meters - SF				$750.00	$75.00	10	858.24	8,582	5.00	$500.00	82.0%
Existing Central AC or Heat Pump - MF SEER 15 or 15/8.6 HSPF				$2,800.00	$175.00	16	498.15	7,970	16.50	$343.75	82.0%
Existing Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$1,600.00	$200.00	8	285.02	2,280	15.00	$466.67	82.0%
Low Income Measures				$108,350.00	$133.11	814	420.89	342,697	14.70	$454.18	82.0%
Total				$293,442.00		1,247		789,483			

$293,442.00 20%

Residential HVAC Program

Input Sheet - SPPC

2021 Design Measures	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Total Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Life of Measure	Incremental Measure Cost per Unit	Net-to-Gross
	$500,000	$95,000	$111,458								
New Construction Central AC - SF SEER 15 - 20				$17,100.00	$328.85	52	518.08	26,940	18.00	$437.31	82.0%
New Construction Heat Pump - SF SEER 15/8.5 - 20/9.7 HSPF				$10,980.00	$407.27	27	505.84	13,638	15.00	$577.30	82.0%
New Construction PCM Meters - SF				$0.00	$75.00	-	643.68	-	5.00	$375.00	82.0%
New Construction Central AC or Heat Pump - MF SEER 15 or 15/8.5 HSPF				$490.00	$290.00	2	167.04	334	15.00	$300.00	82.0%
New Construction Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$4,090.00	$290.00	20	285.02	5,700	15.00	$350.00	82.0%
Existing Heat Pump or Central AC - SF SEER 15/8.5 - 16/8.6 HSPFor 15-20 ER				$88,958.00	$872.48	102	1,766.01	180,063	17.88	$3,714.00	82.0%
Existing Central AC - MF SEER 15/16 ER				$3,600.00	$450.00	8	1,038.15	8,305	18.00	$3,389.06	82.0%
Existing Central AC or Heat Pump - SF SEER 15-20 or 15/8.6 -20/10 HSPF				$54,904.00	$292.33	188	1,027.59	193,063	17.81	$521.62	82.0%
Existing PCM Meters - SF				$750.00	$75.00	10	858.24	8,582	5.00	$500.00	82.0%
Existing Central AC or Heat Pump - MF SEER 15 or 15/8.6 HSPF				$2,800.00	$175.00	16	498.15	7,970	16.50	$343.75	82.0%
Existing Quality Installation + Efficiency Upgrade- Split Air Conditioner SEER 15/16 Replacing SEER 14				$1,600.00	$200.00	8	285.02	2,280	15.00	$466.67	82.0%
Low Income Measures				$108,350.00	$133.11	814	420.89	342,697	14.70	$454.18	82.0%
Total				$293,442.00		1,247		789,483			

Name:	2019-2021 Residential HVAC	**Last Updated:**	5/14/2018 14:23
Customer Sector:	Residential	**Avg Measure Life:**	16.22
Region :	Reno	**Energy Savings Curve:**	Refrigerator_Recycling
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$921,096	$2,763,056	($1,841,961)	0.33	$0.227
Total Resource Cost (TRC)	$800,953	$2,763,056	($1,962,104)	0.29	$0.227
Utility Cost Test (UCT)	$800,953	$1,326,176	($525,223)	0.60	$0.109
Participant Cost Test (PCT)	$2,190,574	$2,553,081	($362,507)	0.86	$0.172
Ratepayer Impact (RIM)	$800,953	$2,465,801	($1,664,848)	0.32	$0.203
Societal Cost (SCT)	$970,175	$2,763,056	($1,792,882)	0.35	$0.227

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$600,004	$500,002	$500,002	$1,600,008
Electric Benefits ($)	$35,211	$11,116	$12,196	$800,953
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	873,398	256,798	256,798	22,490,343
Critical Peak Hour Demand (kW)	136	40	40	216
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	38,279	11,255	11,255	3,777,828
Total On Peak Hours (%)				16.80%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	82.0%		

Direct Install Program

The Direct Install program ("Program") DSM program which provides residential customers with direct installation of low-cost energy efficient measures in their homes. The installation of the measures is performed by a trained and certified PowerShift Energy Advisor and will further enhance the value proposition when implemented in combination with energy assessments and smart thermostat offerings. The Program promotes potential cost savings when customers are introduced to energy efficient measures and educated on implementing these low-cost measures.

The measures are intended to introduce the customers to products available in the market which reduce the associated costs of energy consumption. Available direct installation measures include:

- Air Filter/Furnace Filter change out: 9 MERV-4 filter sizes which captures nearly of all filter replacement requirements are provided to customers.
- LED Lighting: Phillips A19-9W, BR30-8W, A19-11W, BR30-11W
- Photocells: GE Automatic Light Control (Model Number: 18265). The photocell is installed in each socket of indoor and outdoor lighting fixtures with rain-tight.
- Refrigerator thermometer: Go Green Refrigerator Thermometer (4 pack) (Model Number: PRF102-12-4pk or equivalent).
- Air conditioner refrigerant line insulation on outside condenser unit.

Nevada Power Company Direct Install Program

2017 Results

The Program was implemented under the Energy Assessment program in 2017 and offered the same measures as previously described with the Direct Install Program section above. These measures were offered and installed in customer homes in the Company's southern service territory at the end of Q3 and through Q4 of 2017.

2018 Status

The Program was implemented under the Energy Assessment program in 2018 and offered the same measures as previously described with the Direct Install Program section above. These measures were offered and installed in customer homes in the Company's southern and northern service territories in 2018.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $500,000 and an energy savings target of 1,000,000 kWh each program year. The TRC ratio for the proposed Program is 0.34.

The Program is designed to install low-cost energy efficiency measures in customer homes through the Home Energy Assessment and Residential Demand Response programs. The Direct Install program will add to the value proposition of the Home Energy Assessments program and will implemented primarily through this channel. The opportunity to bundle the Home Energy Assessment program, including direct install measures, with a Residential Demand Response program appointment will be automated in 2018. This will enable field service technicians to enroll customers in additional programs while onsite, and will increase the volume of bundled programs delivered to the customer during a single appointment. This automation requires the completion of enhancement upgrades to the Demand Response Management system and will allow the value proposition of the Direct Install program to be realized through the Residential Demand Response program.

The Program will continue to offer the current direct install measures and seek opportunities to expand the program and reach wider range of low-income customers. Introducing the current, and potentially other specific measures to low-income customers, will increase awareness and educate customers to become more energy efficient.

M&V Plan

ADM Associates, Inc. ("ADM") the EM&V contractor will confirm the savings realized through the Direct Install program being implemented in the Company's service territory.

Approach

The EM&V Contractor will provide the plans for performing the M&V activities for the Direct Install Program. The choices for procedures that will be used to perform the M&V activities have been determined by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection

The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive energy efficiency kits. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who have received direct install efficiency measures and who are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions to provide the expected savings estimates.

Engineering Desk Review Analysis
As a method to determine the savings that result from measures implemented through the Direct Install Program, the EM&V Contractor will perform an engineering calculation to determine the savings per unit/measure installed and apply that value to all verified installations.

Financial

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Energy Savings Curves

ADM developed a methodology that utilizes energy savings curves to calculate the portion of annual energy savings that occurs during each month of the year. An energy savings curve describes the temporal nature of energy savings. For example, on any given day the energy savings achieved by a LED are approximately 1/365 of the verified annual energy savings for that LED. On the other hand, an efficient air conditioner may not save any energy during the month of January but may achieve 35 percent of its annual energy savings in the month of July alone. ADM constructed appropriate energy savings curves from metered data collected during M&V of other NV Energy DSM programs.

Incremental Costs

The incremental cost for this program was determined using the measure analysis performed by ADM and is as follows:

- LED Bulbs $7.00
- Air Filters $5.00
- Photocell $5.25
- Refrigerator Thermometers $3.00
- AC Refrigerant Line Insulation $3.50

Incentives/Rebates

There are no incentives or rebates paid under this program. The measures are paid for in full and there is no cost to the customer.

Measure Life

ADM determined the EUL of each measure based on the most recent related residential energy efficiency programs (e.g., Residential Energy Efficient Lighting program, Residential Air Conditioning program, etc.). EUL for measures in this Program is 4.9 years:

Units

A unit for the purposes of this Program is an installed measure.

Savings

The savings for this Program are based upon verified M&V results.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs” provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the ‘Financial Data’ section of the output sheet.

NPC- Direct Install

2019	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$500,000	$90,000	$187,175							
LED Bulbs				$154,000.00	22,000	29	638,000	6	$7.00	85.0%
Air Filters				$30,000.00	6,000	48	288,000	2	$5.00	85.0%
Photocell				$15,750.00	3,000	3	9,000	8	$5.25	85.0%
Refrigerator Thermometer				$18,000.00	6,000	6	36,000	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$5,075.00	1,450	20	29,000	10	$3.50	85.0%
Total				$222,825.00	38,450	106	1,000,000	5.8	$23.75	85.0%

NPC- Direct Install

2020	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$500,000	$90,000	$187,175							
LED Bulbs				$154,000.00	22,000	29	638,000	6	$7.00	85.0%
Air Filters				$30,000.00	6,000	48	288,000	2	$5.00	85.0%
Photocell				$15,750.00	3,000	3	9,000	8	$5.25	85.0%
Refrigerator Thermometer				$18,000.00	6,000	6	36,000	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$5,075.00	1,450	20	29,000	10	$3.50	85.0%
Total				$222,825.00	38,450	106	1,000,000	5.8	$23.75	85.0%

NPC- Direct Install

2021	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$500,000	$90,000	$187,175							
LED Bulbs				$154,000.00	22,000	29	638,000	6	$7.00	85.0%
Air Filters				$30,000.00	6,000	48	288,000	2	$5.00	85.0%
Photocell				$15,750.00	3,000	3	9,000	8	$5.25	85.0%
Refrigerator Thermometer				$18,000.00	6,000	6	36,000	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$5,075.00	1,450	20	29,000	10	$3.50	85.0%
Total				$222,825.00	38,450	106	1,000,000	5.8	$23.75	85.0%

Name:	2019-21 Low Income Appliance	**Last Updated:**	5/14/2018 13:39
Customer Sector:	Residential	**Avg Measure Life:**	8.42
Region :	Vegas	**Energy Savings Curve:**	Multiple
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$1,566,900	$5,312,936	($3,746,036)	0.29	$0.238
Total Resource Cost (TRC)	$1,253,520	$5,312,936	($4,059,416)	0.24	$0.238
Utility Cost Test (UCT)	$1,253,520	$4,760,695	($3,507,175)	0.26	$0.213
Participant Cost Test (PCT)	$5,979,319	$3,956,138	$2,023,182	1.51	$0.177
Ratepayer Impact (RIM)	$1,253,520	$7,336,118	($6,082,598)	0.17	$0.329
Societal Cost (SCT)	$1,638,424	$5,312,936	($3,674,512)	0.31	$0.238

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$2,000,000	$2,000,000	$2,000,000	$6,000,000
Electric Benefits ($)	$60,349	$65,180	$71,671	$1,253,520
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,491,972	1,491,972	1,491,972	37,707,480
Critical Peak Hour Demand (kW)	249	249	249	748
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	159,806	159,806	159,806	4,091,457
Total On Peak Hours (%)				10.85%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	25.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Sierra Pacific Power Company Direct Install Program

2017 Results

The Program was implemented under the Energy Assessment program in 2017 and offered the same measures as previously described with the Direct Install Program section above. These measures were offered and installed in customer homes in the Company's southern service territory at the end of Q3 and through Q4 of 2017.

2018 Status

The Program was implemented under the Energy Assessment program in 2018 and offered the same measures as previously described with the Direct Install Program section above. These measures were offered and installed in customer homes in the Company's southern and northern service territories in 2018.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period 2019-2021 with a budget of $150,000 and an energy savings target of 400,000 kWh for each year in the Action Plan. The TRC ratio for the proposed Program is 0.44.

The Program is designed to install low-cost energy efficiency measures in customer homes through the Home Energy Assessment and Residential Demand Response programs. The Direct Install program will add to the value proposition of the Home Energy Assessments program and will implemented primarily through this channel. The opportunity to bundle the Home Energy Assessment program, including direct install measures, with a Residential Demand Response program appointment will be automated in 2018. This will enable field service technicians to enroll customers in additional programs while onsite, and will increase the volume of bundled programs delivered to the customer during a single appointment. This automation requires the completion of enhancement upgrades to the Demand Response Management system and will allow the value proposition of the Direct Install program to be realized through the Residential Demand Response program.

The Program will continue to offer the current direct install measures and seek opportunities to expand the program and reach wider range of low-income customers. Introducing the current, and potentially other specific measures to low-income customers, will increase awareness and educate customers to become more energy efficient.

M&V Plan

ADM the EM&V contractor will confirm the savings realized through the Direct Install program being implemented in the Company's service territory.

Approach
The EM&V Contractor will provide the plans for performing the M&V activities for the Direct Install Program. The choices for procedures that will be used to perform the M&V activities have been determined by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements will be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values will be developed.
- Description of how realization rates will be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection
The EM&V Contractor will conduct on-site verification visits for a selected sample of sites that receive energy efficiency kits. M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

On-Site Data Collection Procedures
For customers who have received direct install efficiency measures and who are also selected for the sample, the EM&V Contractor will utilize surveys and verification visits to confirm the as-installed and behavior conditions to provide the expected savings estimates.

Engineering Desk Review Analysis
As a method to determine the savings that result from measures implemented through the Direct Install Program, the EM&V Contractor will perform an engineering calculation to determine the savings per unit/measure installed and apply that value to all verified installations.

Financial Analysis

The cost/benefit analysis for this Program will be performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the projected results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The inputs used in the creation of these results are described below.

Energy Savings Curves

ADM developed a methodology that utilizes energy savings curves to calculate the portion of annual energy savings that occurs during each month of the year. An energy savings curve describes the temporal nature of energy savings. For example, on any given day the energy savings achieved by a LED are approximately 1/365 of the verified annual energy savings for that LED. On the other hand, an efficient air conditioner may not save any energy during the month of January but may achieve 35 percent of its annual energy savings in the month of July alone. ADM constructed appropriate energy savings curves from metered data collected during M&V of other DSM programs.

Incremental Costs

The incremental cost for this program was determined using the measure analysis performed by ADM and is as follows:

- LED Bulbs $7.00
- Air Filters $5.00
- Photocell $5.25
- Refrigerator Thermometers $3.00
- AC Refrigerant Line Insulation $3.50

Incentives/Rebates

There are no incentives or rebates paid under this program. The measures are paid for in full and there is no cost to the customer.

Measure Life

ADM determined the EUL of each measure based on the most recent related residential energy efficiency programs (e.g., Residential Energy Efficient Lighting program, Residential Air Conditioning program, etc.). The EUL for measures in this Program is 4.9 years.

Units

A unit for the purposes of this Program is an installed measure.

Savings

The savings for this Program are based upon verified M&V results.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

SPPC- Direct Install

2019	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$150,000	$27,000	$37,203							
LED Bulbs				$56,000.00	8,000	29	232,000	6	$7.00	85.0%
Air Filters				$15,000.00	3,000	48	144,000	2	$5.00	85.0%
Photocell				$7,875.00	1,500	3	4,500	8	$5.25	85.0%
Refrigerator Thermometer				$5,400.00	1,800	6	10,800	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$1,522.50	435	20	8,700	10	$3.50	85.0%
Total				$85,797.50	14,735	106	400,000	5.8	$23.75	85.0%

SPPC- Direct Install

2020	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$150,000	$27,000	$37,203							
LED Bulbs				$56,000.00	8,000	29	232,000	6	$7.00	85.0%
Air Filters				$15,000.00	3,000	48	144,000	2	$5.00	85.0%
Photocell				$7,875.00	1,500	3	4,500	8	$5.25	85.0%
Refrigerator Thermometer				$5,400.00	1,800	6	10,800	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$1,522.50	435	20	8,700	10	$3.50	85.0%
Total				$85,797.50	14,735	106	400,000	5.8	$23.75	85.0%

SPPC- Direct Install

2021	Total Budget	Utility & Admin M&V	Implementation Costs	Rebates	# of Units	kWh Saved per Unit*	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Direct Isntall	$150,000	$27,000	$37,203							
LED Bulbs				$56,000.00	8,000	29	232,000	6	$7.00	85.0%
Air Filters				$15,000.00	3,000	48	144,000	2	$5.00	85.0%
Photocell				$7,875.00	1,500	3	4,500	8	$5.25	85.0%
Refrigerator Thermometer				$5,400.00	1,800	6	10,800	3	$3.00	85.0%
Air Conditioner Refrigerant Line Insulation				$1,522.50	435	20	8,700	10	$3.50	85.0%
Total				$85,797.50	14,735	106	400,000	5.8	$23.75	85.0%

Name:	2019-21 Direct Install	**Last Updated:**	5/14/2018 13:58
Customer Sector:	Residential	**Avg Measure Life:**	4.59
Region :	Reno	**Energy Savings Curve:**	Multiple
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$187,703	$371,476	($183,773)	0.51	$0.104
Total Resource Cost (TRC)	$163,220	$371,476	($208,256)	0.44	$0.104
Utility Cost Test (UCT)	$163,220	$371,476	($208,256)	0.44	$0.104
Participant Cost Test (PCT)	$607,964	$212,478	$395,487	2.86	$0.050
Ratepayer Impact (RIM)	$163,220	$707,640	($544,420)	0.23	$0.197
Societal Cost (SCT)	$198,366	$371,476	($173,110)	0.53	$0.104

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$150,001	$150,001	$150,001	$450,002
Electric Benefits ($)	$12,461	$13,766	$15,173	$163,220
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	362,856	362,856	362,856	4,994,899
Critical Peak Hour Demand (kW)	39	39	39	102
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	12,944	12,944	12,944	1,194,019
Total On Peak Hours (%)				23.90%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	85.0%		

Residential Demand Response Program

The Residential Demand Response Program ("Program" in this section) recruits customers into an ongoing program in which the customers allow the Company to temporarily interact with their end-use loads such as AC on hot summer days when system peak loads occur or during emergency conditions in order to help the Company reduce peak demand. This is accomplished through demand response events, called Community Energy Events in which devices controlling customer's end-use loads receive signals from utility demand response systems to reduce energy consumption. These events shift a significant amount of energy consumption outside of the peak demand hours. In return for their participation in these events, the Program delivers a package of enabling technology that helps customers save energy and money all year round. The Company's primary strategy for engaging customers in demand response has been to provide customers with technologies and services that create tangible operational and energy efficiency benefits. Residential customers living in the Company's service territory are eligible to participate in the Program subject to a few requirements. Eligible customers must have an active Company power account, a compatible central Heating, Ventilation, and Air Conditioning (HVAC) system, an always-on broadband Internet service, are at least 18 years old, and are willing to sign the customer participation agreement. If the eligible customer is a renter, customer must be able to obtain their landlord's permission to install the Home Area Network ("HAN") device and connect the device to their HVAC system.

With respect to electricity grid benefits, the DR Program is currently used for 10-minute operating reserves. It can also be strategically dispatched by location to reduce congestion on the distribution system or in response to a distribution system emergency. The system can operate in much the same fashion as a supply-side peaking resource, but also provides an added suite of customer, environmental and locational dispatch benefits. Growth of demand response resources and distributed energy resource operational capabilities will allow Nevada Power to more easily accommodate an ever increasing amount of renewable energy on the grid.

Program Data Sheet Nomenclature and Structure

Program components and budget categories are broken down into Build and Manage activities across the residential customer segments. Hence, there are four components for tracking and performance analysis. The following paragraphs describe the purpose and general goals of each component:

Residential Build: The goal of the Residential Build component is to expand the capacity of the residential programs by recruiting additional residential customers to participate in the DR Program and to support the customers recruited in that year to the end of the program year. For program year 2017, the Residential Build component of the Program included only the customers who were added to the DR system between January 1, 2017 and December 31, 2017 and the associated costs, demand savings, and energy savings. The Residential Build component enables the Company to track and analyze the costs and benefits of adding new customers and capacity to the DR system each year.

Residential Manage: The goal of the Residential Manage component is to serve those customers who have enrolled in the Program in all prior years, regardless of the technology that was deployed

to enable them to participate. This component works to retain and service customers, maintain the magnitude of the capacity installed in prior years, and execute a wide range of DR business processes such as event forecasting, optimization, and execution. In 2017, the Residential Manage component included all customers who enrolled in the DR program prior to 2017. The Residential Manage component enables the Company to track the costs of managing all residential customers and the capacity acquired in prior program years.

Demand Response Management System

The DRMS is an enterprise software system that manages a wide range of demand response programs and provides the functionality to implement peak time rebate tariff riders such as Schedule OLM-AS, Optional Load Management and Automation Services, and potential future dynamic rates such as critical peak pricing rates. The DRMS helps automate business processes such as: customer enrollment, device management, device provisioning, workforce management related to device installation and service, demand response event and dispatch management, event notifications, event forecasting, and a wide range of reporting functions. It is the system of record for customer participation in demand response programs.

The DRMS has a series of application programming interfaces that support data transfers with external applications, such as the demand response customer web portals that provide customers with program and incentive information. It is integrated to a number of other major enterprise systems such as: the Meter Data Management System; the Regional Network Interface; the customer billing system (Banner), load forecasting (Tesla), and load tracking systems (Pi).

The DRMS supports the entire portfolio of DR program components. The proposed Program includes budget allocations and scope of work related to DRMS system maintenance and product upgrades and customer web portal enhancements.

Home Area Network

HAN systems are installed as part of the Power Shift Smart thermostat program. Two system platforms are now available for installation at customer premises. The older system is comprised of an Internet gateway device, one or more thermostats, and a cloud based software-as-a-service (SaaS) that provides data analytics and HVAC optimization. The associated Internet gateway device allows information to convert from broadband internet service into wireless communications via a protocol known as Zigbee. Zigbee protocol is used to link the gateway device with the one or more installed thermostats. Zigbee is also supported by the Company's smart meters and provides a pathway to present real-time consumption information to consumers. The newer system is comprised of one or more wi-fi based thermostats supported by the same SaaS system mentioned above. No Internet gateway device is required for the newer wi-fi system. This proposed Program includes budget and a technology strategy to upgrade the already deployed HAN systems to enable the display of real-time meter information on consumer devices along with analytics designed to discover additional energy savings opportunities. The proposed scope of work also includes budget resources to certify and make available to customers additional HAN solutions and premium devices.

Nevada Power Company Residential Demand Response Program

2017 Results

The Company called 40 Community Energy Events for the DR Program in 2017. This was part of an overall Company strategy to employ demand response to reduce costs for customers and to better integrate demand response resources with the overall dispatch of supply side resources. Since June 3, 2015, the approval of Schedule OLM-AS, Optional Load Management and Automation Services has resulted in event participation incentives that are more closely tied to the marginal cost of electricity generation. The tie with the marginal cost of electricity generation increased the value of the demand response system by increasing the number of opportunities the system could be operated economically.

Residential Manage

Demand Savings: During the 2017 DR Program season, the verified cumulative demand reduction capacity was measured at 180.89 MW, lower than the 189.04 MW target with a negative variance of 4.2 percent. These numbers are based upon dispatchable summer peak capacity available. This variance is primarily attributable to customer and device attrition. It is estimated that 8.15 MW of DR capacity was lost. In 2017, approximately 21,900 customers representing about 32,900 devices either specifically called in to cancel enrollment, or moved out. Customer move outs continue to be the largest cause of customer and device attrition. The Company was engaged in a restoration and customer engagement effort throughout the year, recovering about 15,900 customers representing 23,840 devices from existing premises via inspections, repairs and upgrades. Nonetheless, the customer attrition rate was higher than the restoration rate. By the end of 2017, 68,014 customers were retained in the managed program with an overall customer attrition rate of 8.1 percent.

Energy Savings: During the 2017 DR Program season, the verified cumulative energy saving was measured at 19,753,922 kWh lower than the 21,982,000 kWh target with a negative variance of 10.1 percent. These numbers are based upon combined savings from demand response events and from PowerShift Smart Thermostat and year-round energy savings from HVAC optimization. This variance is attributable to customer and device attrition as mentioned above.

Budget: Total expenditures were $5,852,210 (77 percent of the budget of $7,600,000). The spend variance of $1,747,790 was driven largely by lower cost of customer acquisition, and a reduced number of service request from the region.

Cost Effectiveness: The TRC is 5.05 for the Residential Manage component in 2017.

Residential Build

Demand Savings: During the 2017 DR Program season, the verified cumulative demand reduction capacity was measured at 23.6 MW, higher than the 23 MW target with a positive variance of 2.6

percent. These numbers are based upon dispatchable summer peak capacity available. This variance was largely due to the timing and amount of customer recruitment activity. Overall, end of the year enrollment activity and response rates to recruitment materials were higher than expected. In 2017, 7,970 new customers were added to the build program.

Energy Savings: During the 2017 DR Program season, the potential cumulative energy saving was measured at 3,659,813 kWh lower than the 4,535,000 kWh target with a negative variance of 19.3 percent. These numbers are based upon combined savings from demand response events and from PowerShift Smart Thermostat and year-round energy savings from HVAC.

Budget: Total expenditures were $7,016,381 or 94 percent of the budget of $7,500,000. Increased reliance on low cost email campaigns contributed to achieving 103 percent of the 2017 MW goals in the south. Overall per unit installation costs steadily declined throughout the year due to business process, contracting improvements, and low cost customer outreach. These factors lowered program execution costs without significantly compromising program growth.

Cost Effectiveness: The TRC was 2.19 for the Residential Build component in 2017.

Measurement & Verification

The M&V report labeled Residential Demand Response NV Energy – Southern Nevada (NPC) was performed by ADM is provided in the Technical Appendix DSM-13. The report provides the evaluation results of the 2017 Program.

Customer Education and Outreach

Customer education and outreach activities for the Program involved the use of corporate websites, email, bill inserts, outbound calling campaigns, multi-media videos, and social media. The Program was actively promoted with other energy efficiency programs at community events and in customer education presentations. Specific customer education and outreach measures in the residential sector included program recruitment via the following channels:

- Internet and electronic marketing - corporate website and email.
- Radio, print and display advertisement.
- Joint customer education and outreach efforts with other energy efficiency programs.
- Development of “pathway” strategies to leverage touchpoints of other DSM programs to educate and to generate new leads.

Survey responses were obtained from 70 customers that visited the Company’s exhibits at eight selected community events. Southern Nevada survey respondents (31.7 percent) reported that the DSM program or service that they would be most interested in participating in would be the smart thermostat program.

On March 6, 2017, a comprehensive multi-media outreach campaign was launched statewide to create awareness and to stimulate enrollment in the PowerShift smart thermostat program. The

campaign spanned a total of 42 weeks; tactics included print ads, direct mail, email, radio (traditional and Pandora), digital video (Hulu, pre-roll and YouTube), digital display ads and television ads. The campaign resulted in over 8,000,000 impressions. In addition, 42,140 direct mail pieces and 1,470,058 emails were sent to Company customers to promote the program and retain enrolled customers. These impressions and direct response tactics served to increase awareness of the program and to stimulate interest in energy conservation. Over 40,117 qualified leads were generated by the campaign

Message-based Demand Response

In 2017, the Company extended the trial that begun in 2016 to investigate the efficacy of Message-based Demand Response ("MDR") to complement the existing technology-based PowerShift smart thermostat program. The goal of MDR is to motivate customers to reduce peak demand, provide a pathway to participate in other energy efficiency programs, and to cost effectively increase customer satisfaction with the utility.

MDR has provided the Company the ability to drive peak energy reduction from residential customers without any controlled devices in the home. Utilizing meter and customer data, MDR connects with residents via multiple communication channels to motivate a reduction in peak demand and drive engagement during peak energy days. To effectively reach the customer and drive action, the customer must be motivated by the messages received and understand the benefits of their actions. Customer motivations not only vary from one individual to another but also for an individual over time.

MDR optimizes messaging across different message attributes - principally, message content (style) and timing (time of day) - to anticipate and deploy messages customized to successfully create demand reduction action by an individual. Quick post-event feedback is also provided to all customers to help reinforce positive behaviors.

In 2017, three MDR events were called. The target population consisted of 100,000 customers along with a 200,000 customer control group. The target group was split into 75,000 customers in the south and 25,000 customers in the north. MDR participation emails were well received with 27 percent – 32 percent unique opens. Information garnered from a follow up customer survey indicated that 68 percent of the customers who opened the email took some action on event day, 85 percent of those surveyed indicated a positive view of the Company and 71 percent of those surveyed indicated interest in future energy savings events. In addition, 909 enrollments in the technology-based smart thermostat program were attributable to the MDR program.

Wi-Fi Thermostat Pilot

The flagship smart thermostat professionally installed as part of the demand response program is the wireless programmable CT218 thermostat, manufactured by Computime Group Limited. The CT218 uses an internet gateway device that plugs into the customer's local area network and connects wirelessly to the wall mounted thermostat.

Two distinct wi-fi technologies were included in a technology trial in 2017: the Ecofactor S100 thermostat and the Ecobee3/4 thermostat. Over 1500 Ecofactor S100 thermostats and 350 Ecobee thermostats were installed in single family and multi-family homes. The Ecobee technology included motion sensors and cutting-edge remote temperature sensors that could be strategically located in rooms throughout the home. The temperatures measured by these remote temperature sensors could be blended and used to establish the temperature set point regulating the HVAC system. Implementing wi-fi thermostats eliminated the necessity for a separate gateway device, lowered hardware costs, simplified the provisioning of devices, reduced installation time, and increased customer perception of improved technology.

Lessons Learned and Recommendations

While 2017 can be characterized as a successful demand response year on many counts, the journey afforded the opportunity for growth in experience and insight useful in charting a path forward into 2018. Following, is a recap of lessons learned in 2017 that provides guidance for the design and delivery of the program in future periods.

- *Move In/Move Out* – The Company's southern territory continued to experience considerable turnover in residential housing. Move Outs of premises where demand response devices are installed present multiple "low hanging fruit" opportunities: to express appreciation for past participation in the Program, to provide instructions on how to return gateway devices, to encourage the moving customer to re-enroll in their new premise, and the opportunity for a low cost enrollment of the new move-in occupant. Unlike the legacy Cool Share program, upon a move-in, the smart thermostat customer is not automatically enrolled in the demand response program. A coordinated outreach campaign is needed to increase enrollment of these new customers. In addition, improved processes were needed to improve the efficiency of the move-in enrollment and to reduce the number of truck rolls needed to complete the account activation process.

- *Offline Devices* – Demand response devices must maintain communications with the SaaS back office system in order receive demand response curtailment signals and participate in demand response events. Additionally, mobile access to smart thermostat accounts is not possible if the device losses access to the internet and goes offline, preventing remote access to thermostat features and functions, including online programming and use of the "Away" feature. There are many causes for devices going offline, primary of which, are customer move-outs. Other causes include, loss of power to the gateway or thermostat, network outages on the customer's Internet, and failures of network gateway devices. A coordinated offline reporting and outreach campaign was needed to promptly recognize when devices went offline and launch a multi-channeled outreach campaign to advise customers and to offer assistance in bringing devices back online.

- *Digital Control Unit replacement* – Several technologies deployed as part of the legacy Cool Share demand response, such as Digital Control Unit ("DCU") switches, have exceeded their EUL and continue to drop out of the Residential Manage program as a result of the combination of equipment failures, customer terminations, and customer equipment

removals. Many of these installed switches are currently non-responding and will not participate in demand response events. These devices have been identified and targeted for removal, upgrade to the PowerShift Smart Thermostat program, or termination from the Program. As part of the replacement program, DCU customers will be offered free removal of DCU devices and free upgrades to the PowerShift smart thermostat program.

- *Pre-Cooling* - We have continued to evaluate the energy savings and customer impacts of the use of pre-cooling prior to demand response events. Lowering the indoor temperature by 1-2 degrees just prior to a demand response event is designed to improve overall customer satisfaction and reduce the potential comfort impact of small temperature swings during energy events. Early evidence points to marginal energy benefits of pre-cooling contributing to smaller energy snap backs following events. This evaluation will continue into 2018.

- *M&V* - The Company continues to heavily rely on third party M&V partners. Efforts to improve timely data flow, project tracking, and issue resolution remain important. Regular weekly meetings between program staff and our independent evaluator have been established to better support real time evaluation feedback.

Key Opportunities

1. *DSM Pathways* – Individual demand side programs may be introduced to customers through many different communications channels. Each introduction of one program creates an opportunity to expose the customer to other related and potentially beneficial demand side management programs. The company has invested time and energy in creating and implementing a number of pathway strategies for the benefit of our customers and in support of the success of our demand side management programs. These pathways have taken a number of forms, including: materials mash ups, customer service touchpoints, field service touchpoints, and web presence linkages. Working with marketing consultants, copy has been added to program materials and emails that speak to multiple demand side management programs regardless of program specifically being targeted. Customer service agents have been trained to include references to demand side management programs on all appropriate customer inbound calls and immediately follow up on any expressed customer interest. Information about demand side management programs has been included in field service technicians training to better equip them to better respond to customer interests. Web pages have been designed as part of the customer digital experience ("CDX") to speak to multiple programs under the banner of energy savings programs. While many pathways have been constructed, the efficiency of these structures remain not fully understood. Efforts are underway to create reporting mechanism to better track lead creation and follow up along with key performance indicators to track progress toward targets.

2. *Next generation technology* – The DR Program continues to improve upon the product development strategies for each of the DR Program components. With technology moving at the speed of thought, customers expect technology to evolve and offer feature-rich

solutions to energy needs. Several strategies are being actively pursued to meet this challenge. Continued progress will be made on the wi-fi pilot to gather data on how best to deploy and support wi-fi thermostats. The analytic framework supporting smart thermostats will be greatly expanded to leverage the diagnostic potential of the Software as a Service ("SaaS") platform. The diagnostic capability can identify degradations in the operation of the air conditioning systems controlled by the smart thermostat. The air conditioning diagnostic service identifies potential faults that, if corrected, could eliminate more costly repairs later. On the heels of our recognition of the importance of improving CDX and reflecting that recognition in our overall web presence, comes the customer voice experience ("CVX"). Digital assistant technology has found its way into an increasing number of lifestyle applications including health and security, entertainment, home automation and energy management. In 2018, digital assistance platforms such as Alexa and Google home will be integrated into our existing smart thermostat service to leverage the prevalence of this technology and to meet customer expectations of an ever improving service experience.

Energy Storage

As part of the Residential Manage component in 2017, the Company continued its field performance testing activities for ten residential energy storage devices at the Villa Trieste community: five energy storage units from vendor Sunverge; and, five units from vendor Tesla. The five battery energy storage units from Tesla were installed and commissioned in February 2017. Participating customers were recruited into a technology pilot designed to evaluate the technical capabilities of the energy storage systems to achieve bill savings for homeowners as well as providing grid services and benefits to the utility. The Company is leveraging lessons learned to develop customer strategies for behind the meter assets and support work on the valuation of grid services related to controllable storage assets on the distribution system.

During the 2017 pilot, the utility stacked service for peak load shifting was applied every day during the summer on-peak period between June 1, 2017 and September 30, 2017. During this period, demand response events were initiated and tested for the Tesla energy storage system sites. During the off-peak winter season, the photovoltaic self-consumption profile was applied as a customer benefit to assist with higher bill savings with a time-of-use rate component.

2018 Status

The 2018 program year activities are focused on growing the PowerShift by NV Energy home energy management offering through the installation of smart-thermostats, continuous process improvement, and execution of the customer engagement and program education plan designed to improve customer understanding of the Program and increase customer appreciation of programs and benefits made possible by the Company.

Residential Manage - The Company will continue to manage and engage the customers enrolled in the program prior to 2018 with particular attention to customer retention and customer education. Customer turnover is inevitable however reaching out to moving out and to moving in customers is the quintessential low hanging fruit. Moving out customers, already familiar with the technology,

would be highly likely to re-enroll if their new home is in the Company's service footprint. Moving in customers may be greeted by already installed smart thermostats that only require activation to join the demand response program.

Residential Build – The 2018 program year activities are focused on growing the residential home energy management program, continuous process improvement, and execution of the customer engagement and program education plan designed to improve customer understanding of: 1) the realized energy savings impact; 2) energy efficiency and event operations; and, 3) technology features and operation.

Every effort is now being made to recognize and leverage the synergies between the energy savings products and services offered by the Company. Pathway strategies are being developed and implemented to use every customer touchpoint to increase customer understanding of the Company value proposition and energy savings offers. Customer contacts regarding smart thermostat program receive offers for home energy assessments, including the installation of direct install measures such as LED bulbs, air filters, and exterior day/night light sensors. This pathway thinking extends beyond just customer contacts with our customer service staff but also reflected in our marketing materials, our online presence, and the training offered to field service technicians.

Move In/Move Out – A dedicated process improvement team has been created to implement the process flows designed in 2017. These new process flows will engage the analytics team, customer engagement, marketing consultants, and field services to efficiently message and engage both move-out and move-in customers to create a more seamless transaction for these important customers. Low volume trials have begun and will be evaluated for strategic expansion throughout 2018. Messages advising customers of additional demand side management programs (pathway strategy) will be included in all materials.

Offline Devices – A dedicated process improvement team has been created to implement the process flows designed in 2017. These new process flows will engage the analytics team, customer engagement, marketing consultants, PowerShift smart thermostat service providers, and field services to efficiently message and engage offline customers to create a more seamless transaction for these important customers. Using time-sensitive email, outbound calls, and direct mail communications, customers will be thoughtfully advised of their offline status and offered online and human assistance in resolving customer's offline status. Messages advising customers of additional demand side management programs (pathway strategy) will be included in all materials. Existing email communications is being revised and customer service is allocating required resources to support follow up calls as required by the process.

Digital Control Unit replacement – Data files identifying both responding and non-responding DCUs are being updated and the development of customer materials is on the key projects list of the marketing consulting team. Email information is only available for a fraction of the DCU customers. The primary communication channels will be direct mail and outbound calls.

Customer Retention – The ultimate low hanging fruit, even more than re-enrolling moving out customers or enrolling moving in customers is the retention of customers already enrolled. By the

end of 2017, more than 108,000 demand response devices were installed. During the year more than 13,000 devices (14 percent of installed devices) were lost from the program for a myriad of reasons, primary of which were: move-outs (72 percent), non-move out customer terminations (28 percent). Only 20 percent of the move-outs were recovered as new enrollments. The overall program goal is to reduce the instances of non-move out terminations by addressing the most significant root causes: poor understanding of energy optimization and unwillingness to participate in energy events, insufficient understanding of thermostat features and benefits.

Low Income Initiatives – The PowerShift smart thermostat program can significantly increase the convenience of energy management and lower electric bills for all eligible customers. These services are provided to customers for no out of pocket costs and professionally installed at the convenience of customers. Many of our low income and seniors on fixed income could greatly benefit by the Program. We recognize the challenge in reaching some of these important customers and have developed a number of strategies to expand our enrollment of low income customers. For those customers living in multi-family premises, we have officially expanded the program to include multi-family premises, including apartments. Using our big data platform we are now able to better target low income customers with customized materials that emphasizes lowering power bills, particularly during the summer when energy use, driven by air conditioning, is high. Additionally, bundled offers including, free home energy assessment, and direct installations of energy savings measures will be emphasized.

Energy Storage

To further demonstrate technical capabilities and use cases for energy storage systems, a pilot extension is proposed to the existing five Sunverge and five Tesla battery customers in 2018. Planned activities include field testing of interconnection interfaces and interoperability between utility electric power systems and distributed energy resources, including upcoming IEEE 2547 Standards requirements relevant to the performance, operation, testing, and maintenance of the interconnection. To assist with these efforts, all ten energy storage systems have been outfitted with Company provided cellular modems to ensure a secured, dedicated and stable internet connectivity

Measurement & Verification

The M&V report titled Residential Demand Response Program was performed by ADM and is provided in the Technical Appendix DSM-13. The report provides the evaluation results of the 2017 Program.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $7,300,000 and a target of 27,413,700 kWh for Residential Manage and a budget of $7,000,000 and a target of 3,600,200 kWh for Residential Build in 2019; and a budget of $7,500,000 and a target of 27,413,700 kWh for Residential Manage and a budget of $7,100,000 and a target of 3,600,200 kWh for Residential Build in 2020; and a budget of $7,700,000 and a

target of 27,413,700 kWh for Residential Manage and a budget of $7,300,000 and a target of 3,600,200 kWh for Residential Build in 2021.

The DR Program for the 2019-2021 period, buoyed by strong customer demand will extend the success and lessons learned in 2018 into more technologically-rich future. The DR program will continue to target single family and multi-family residential customers to offer advanced home energy management systems that provide significant energy savings, energy management convenience, and flexible peak load management. By 2021, most of the aging paging-based technology will be replaced by Internet of Things (IoT) solutions and advanced mobile communications platforms, including wide availability of voice-enabled services. Data analytics, relied upon on in 2018, will play an even larger role in 2019-2021, including leveraging the diagnostic power of the SaaS thermostat platform and combining it with customer propensity information in the Company's big data platform. Expansion of distributed energy resources ("DERs") will justify investments in the DRMS platform to accommodate a host of behind-the-meter devices, including solar systems, electric vehicles, batteries, other energy storage solutions, and implementation of the regulatory mandated critical peak pricing ("CPP") tariff rate. The 2019-2021 period will also see the expansion of new channel opportunities to engage customers in DR programs, including new construction and bring your own thermostat ("BYOT") programs. Overall growth of the DR program will be accompanied by continuous improvements in internal processes to manage the move-in and move-out of customer premises, processes to maintain the highest degree of connectivity possible between home energy management systems and the demand response management system, and clear pathways to connect energy minded customers to all the applicable demand side management services.

Critical Peak Pricing

Following the success of the Nevada Dynamic Pricing Trial which concluded in 2015, the Company proposed to implement an optional CPP rate to become effective for enrollment in 2018. It is expected that the DRMS will be used to issue CPP events, beginning in 2019 and to support the operational overhead of email delivery management and reporting, load reduction analysis and M&V.

Distributed Energy Resource Management System Implementation

The term "DERMS" applies to software that can integrate the needs of utility grid operators with the capabilities of flexible demand-side energy resources at the edges of the grid. Power distribution networks are being transformed by the connection of distributed energy resources ("DERs") like rooftop solar and battery energy storage. In 2019-2020, the DR program will take the early baby steps to position the existing DRMS to recognize DERs and to establish initial frameworks for coordination of these resources. In the 2020 time frame, experience gained in 2019, will inform early decisions whether to extend the current DRMS platform, to replace DRMS with a sufficiently mature market solutions, or to build a DERMS from the ground up.

HVAC Performance Monitoring

The SaaS currently in use for our flagship smart thermostat service is underpinned by a powerful analytic engine with access to a large quantity of environmental, customer behavior, and HVAC performance data. Using this wealth of data, the analytic engine has the capability to detect changes

in HVAC performance and to report these changes as potential HVAC faults to customers. This service is referred to as HVAC performance monitoring ("HPM"). The HPM service will continue to be productized in 2019-2021 to increase the value proposition of the smart thermostat service and as an addition to the "pathway" channels to support other energy savings programs such as the residential air conditioning program and the home energy assessment program.

Bring Your Own Thermostat

HVAC control and thermostat manufacturers now offer a wide range of smart devices and actively compete for the patronage of energy conscious customers. Energy conscious customers include a large embedded base of smart thermostat owners who could use their existing devices to participate in the demand response program essentially a BYOT opportunity. Work will continue in 2019-2021 to engage one or more major smart thermostat providers in a BYOT trial. The wi-fi pilot conducted in 2017 and 2018 with Ecobee offers to most near-term opportunity for a BYOT trial.

Advancing the Technology Platform

Smart thermostat technology continues to make significant strides in offering customers more convenience, connectedness, and price options. Price points for the wi-fi thermostats deployed in 2017 are expected to be significantly reduced in 2019-2012. The smart thermostat program will continue to add features such as voice enabled services, such as Amazons Alexa and geo-fencing to keep pace with technology. Geofencing creates a virtual perimeter using geographic positioning systems ("GPS") technology to manage temperature set points. Applications of voice enabled systems for electrical devices offer promising opportunity to extend demand responsive strategies to such energy consuming devices such as pool pumps and appliances. Communications technology is also taking leaps and bounds evolving from paging systems, to the Internet, and now moving to more innovative systems such as long range (LoRa) wireless communications to maintain active two-way network communications at low cost and low power consumption for battery operated devices.

DSM Pathway Strategies/Bundled Services

Overall customer satisfaction of program cost effectively are positively correlated with customer awareness and participation in energy savings programs. Bundling of energy services has the added benefit of lowering the cost of program delivery and increasing the efficiency of the delivery channels. Cross marketing communication channels, "pathways" built in 2018 will be extended and refined in 2019 and beyond. Processes to cross market energy programs and upgraded systems to schedule and report on the delivery of bundled services will be increasingly automated. Work management systems will be upgraded to better schedule delivery of bundled services and to tie more directly into field service tools used for technician work loading and installation routing.

Technology Migration

By the end of 2017, the Cool Share paging system based program included over 32,500 Carrier two-way thermostats, over 10,500 exterior mounted digital control units ("DCUs"), and over 5,200 Honeywell one-way thermostats. While connected Cool Share devices continue to deliver cost effective load reduction and energy savings, the technology is now either obsolescent or, in the case of DCUs, virtually obsolete. Beginning in 2017, Cool Share technology began to be systematically replaced with newer smart thermostat technology as devices failed. In 2019,

customers with DCUs will be offered free upgrades to smart thermostat technology and all removals as a result of repair services will be replaced with the smart thermostat technology. In 2020 and 2021, repair replacements will be expanded to all Cool Share devices and customers even with operating paging system thermostats will be offered free upgrades to the smart thermostat technology.

Non-responding Devices

The demand response program installs programmable communicating thermostats that can increase customer comfort and lower energy bills. If the thermostats loses connectivity with the demand response management system, the device is described as a non-responding device or offline. Offline devices cannot respond to load curtailment events and, for Internet-based thermostats, cannot be accessed using the customer's Internet connected device. Process improvements will continue to evolve throughout 2019-2021 to identity and reduce the number of offline devices. Increased success with offline devices, will increase overall load management and energy efficiency performance, reduce program costs, and work to increase customer satisfaction and program participation.

Process Improvement Move-In/Move-Out

A healthy demand response program consists of cost effective growth in the customer base, customer-centric support of already enrolled customers and management of the natural churn in customers reflected in move outs and move-ins. A customer moving out of smart thermostat equipped home is a prime candidate as a potential move-in at another premise. Move-out customers, already familiar with the smart thermostat technology, represent warm leads for re-enrollment if their new place of residence falls within the Companies' respective service territories. Communication and outreach process improvements which began in 2017 will continue to evolve along with systems upgrades to better track and report on success of re-enrollment efforts. Increased success with move out and move in customers will lower the overall program cost, increase the efficiency of program enrollments, and work to increase overall customer satisfaction and program participation.

New Construction Program

After years of declines in housing inventory and increases in prices with relatively little growth in construction, Nevada is starting to see construction respond with single-family building permit activity now at a ten-year high and housing inventory at record lows. Development of a demand response new constructions program will take advantage of this expanding new construction market to promote energy conservation to both builders and new home buyers. Builders would be incentivized by lowering cost of air conditioning equipment and increasing the marketability of their new homes through promotion of energy savings benefits and improvements in the cost of ownership. Home buyers would be incentivized by reduced energy bills and the added convenience of intelligent and mobile-enabled management of their air conditioning systems.

M&V 2.0

M&V is the process of using measurement and analysis to reliably document the savings achieved with a program and to determine whether the goals for the program are met. The expanding availability of advanced metering infrastructure has created an opportunity to derive additional

value from energy efficiency programs by obtaining timelier and more granular estimated impacts than those made available through traditional measurement and verification approaches. New approaches, commonly referred to as M&V 2.0, leverages this advanced metering infrastructure using custom econometric analysis and third party software tools.

Low Income Program
The DR program will contribute to the overall demand side management target to devote 5 percent of portfolio program cost to providing energy saving services to our low income customer base. Using big data analytics, low income candidates will be the focus of a multi-family target marketing campaign. In addition, partnering with the Nevada Housing Authority will provide valuable assistance in both identifying program candidates and in development of the most effective contact strategies.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the Portfolio Pro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were all calculated based upon the information contained in this program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Incremental Costs

There are no incremental costs for the DR Program components because there are no out of pocket costs experienced by the customer.

Rebates & Incentives

Program funds paid to the customer do not offset any incremental cost experienced by the customer and therefore this Program is an incentive program. The incentives for this program include the equipment provided (i.e., the thermostats and gateways provided for customers enrolled in the residential program) and the value of the energy savings delivered by program measures.

Measure Life

This Program assumes that it will operate for a period of ten years for Residential Build and nine years for Residential Manage. During this period, components that may fail or Program participant that may leave the Program are replaced. The ten year budget for the Program includes the cost for these replacements. The Program life is therefore set at ten years for Residential Build and nine years for Residential Manage.

Units

A residential unit for this Program is a single home.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report performed by ADM.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Demand Response Residential - NPC 2017 Manage

Actual 2017	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					97,656	202.28068	1.8492	19,753,922	4.00	100.0%
2017	$5,852,210	$793,923	$3,480,763	$1,577,524						
2018	$5,852,210	$793,923	$3,480,763	$1,577,524						
2019	$5,852,210	$793,923	$3,480,763	$1,577,524						
2020	$5,852,210	$793,923	$3,480,763	$1,577,524						

Unit is defined as an average device		
Gas Savings, therms per device	7.18	Weighted average, see Tab Device Vintage for detailed calculation
Total kW Capacity	180,590	See Tab Device Vintage for detailed calculation
DR Event and EE kWh Savings, kWh per device	202.28	Weighted average, see Tab Device Vintage for detailed calculation
Remaining Effective Useful Life, year	4	Weighted average remaing effective useful life is 4.48 years and rounded up to 4 years to be conservative

Demand Response Residential - NPC 2017 Build

2017	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					$8.00	7,970	459.1986	2.9600	3,659,813	10	100.0%
2017	$7,016,381	$729,919	$6,112,660	$173,803							
2018	$617,760	$100,000	$454,000	$63,760							
2019	$617,760	$100,000	$454,000	$63,760							
2020	$617,760	$100,000	$454,000	$63,760							
2021	$617,760	$100,000	$454,000	$63,760							
2022	$617,760	$100,000	$454,000	$63,760							
2023	$617,760	$100,000	$454,000	$63,760							
2024	$617,760	$100,000	$454,000	$63,760							
2025	$617,760	$100,000	$454,000	$63,760							
2026	$617,760	$100,000	$454,000	$63,760							

*Unit is defined as an average home with 1.51 AC, kW savings Include no adder for avoiding operating reserve; kW factor is reduced by 8.41% of NRD rate.

Gas savings are 24.61 therms per unit

Device to Premise ratio 1.51

Total DR Build Capacity	23,581	kW	Calculated based on Table 3 in the 2017 NPC MV Report for Residential DR by ADM
Total Potential Energy Savi	3,659,813	kWh	Calculated based on Table 4 in the 2017 NPC MV Report for Residential DR by ADM
Weighted average %NRD	8.41%		Calculated based on Table 3 in the 2017 NPC MV Report for Residential DR by ADM

Name:	2017 DR Residential Manage	**Last Updated:**	5/14/2018 12:13
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Residential
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2020	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$77,128,883	$15,273,101	$61,855,782	5.05	$0.208
Utility Cost Test (UCT)	$75,480,042	$20,909,469	$54,570,573	3.61	$0.285
Participant Cost Test (PCT)	$14,105,862	$0	$14,105,862		$0.000
Ratepayer Impact (RIM)	$75,480,042	$29,378,963	$46,101,079	2.57	$0.400
Societal Cost (SCT)	$89,046,146	$15,273,101	$73,773,045	5.83	$0.208
*Includes rebates paid to freeriders					

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$5,852,211	$5,852,211	$5,852,211	$23,408,845
Electric Benefits ($)	$14,618,543	$20,437,559	$25,226,994	$75,480,042
Gas Benefits ($)	$461,483	$461,483	$461,483	$1,648,841
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	20,538,178	20,538,178	20,538,178	82,152,712
Critical Peak Hour Demand (kW)	195,443	195,443	195,443	195,443
Gas Savings (therms)	699,217	699,217	699,217	2,796,868
Total On Peak Hours (kWh)	8,008,516	8,008,516	8,008,516	31,252,292
Total On Peak Hours (%)				38.04%
*Savings in this section are adjusted for line loss and net-to-gross				

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Name:	2017 DR Residential Build	**Last Updated:**	5/14/2018 12:11
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Residential
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$24,670,721	$10,290,440	$14,380,281	2.40	$0.374
Utility Cost Test (UCT)	$23,735,604	$10,861,059	$12,874,545	2.19	$0.395
Participant Cost Test (PCT)	$3,743,051	$0	$3,743,051		$0.000
Ratepayer Impact (RIM)	$23,735,604	$14,033,491	$9,702,113	1.69	$0.511
Societal Cost (SCT)	$28,547,424	$10,290,440	$18,256,984	2.77	$0.374

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$7,016,382	$617,760	$617,760	$12,576,222
Electric Benefits ($)	$1,938,174	$2,701,948	$3,319,296	$23,735,604
Gas Benefits ($)	$129,454	$129,454	$129,454	$935,117
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	3,805,113	3,805,113	3,805,113	38,051,132
Critical Peak Hour Demand (kW)	25,532	25,532	25,532	25,532
Gas Savings (therms)	196,142	196,142	196,142	1,961,417
Total On Peak Hours (kWh)	1,473,062	1,473,062	1,473,062	14,475,299
Total On Peak Hours (%)				38.04%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Demand Response Residential - NPC 2019 Manage

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving[t]	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					128,423	213.464	1.882	27,413,735	4.00	100.0%
2019	$7,300,000	$1,021,496	$4,478,504	$1,800,000	128,423					
2020	$6,576,000	$913,775	$4,006,225	$1,656,000	118,149					
2021	$5,851,000	$783,222	$3,433,847	$1,523,520	108,697					
2022	$5,851,000	$783,222	$3,433,847	$1,523,520	100,001					

Unit is defined as an average device		
Gas Savings, therms per device	7.83	Weighted average, see Tab Device Vintage for detailed calculation
Total kW Capacity	241,881	See Tab Device Vintage for detailed calculation
DR Event and EE kWh Savings, kWh per device	213.46	Weighted average, see Tab Device Vintage for detailed calculation
Remaining Effective Useful Life, year	4	Weighted average remaining effective useful life is 4.44 years and rounded up to 4 years to be conservative

Program Summary: TECHNOLOGY OPTION: EcoFactor S100

NPC Demand Response Residential Multi- Family Homes

DR Residential	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh/ unit saving	kW/ unit saving*	kWh/year (average annual)	Effective Useful Life	Net-to-Gross
						193	1.50		10	100.0%
2019	$418,000	$45,000	$365,000	$8,000	1,000			192,832		
2020	$508,000	$45,000	$447,000	$16,000	2,000			386,092		
2021	$608,000	$55,000	$529,000	$24,000	3,000			578,807		
2022	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2023	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2024	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2025	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2026	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2027	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2028	$240,000	$30,000	$186,000	$24,000	3,000			578,807		
2029	$170,000	$30,000	$124,000	$16,000	2,000			385,975		
2030	$100,000	$30,000	$62,000	$8,000	1,000			192,715		

*Unit is defined as an average home with 1.0 AC, kW savings include no financial adder for avoiding operating reserve
EE gas savings 16 Therms per unit

Program Summary: TECHNOLOGY OPTION: 10% (DIGI+COMPUTIME) + 90% (EF S100)

NPC Demand Response Residential Single Family Homes

DR Residential	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh/ unit saving	kW/ unit saving*	kWh/year (average annual)	Effective Useful Life	Net-to-Gross
						386	3.00		10	100.0%
2019	$6,582,000	$700,000	$5,776,000	$106,000	8,834			3,407,375		
2020	$7,516,000	$700,000	$6,604,000	$212,000	17,668			6,815,178		
2021	$8,541,000	$720,000	$7,503,000	$318,000	26,502			10,222,436		
2022	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2023	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2024	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2025	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2026	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2027	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2028	$2,924,000	$360,000	$2,246,000	$318,000	26,502			10,222,436		
2029	$2,069,000	$360,000	$1,497,000	$212,000	17,668			6,815,061		
2030	$1,215,000	$360,000	$749,000	$106,000	8,834			3,407,258		

*Unit is defined as an average home with 1.51 AC, kW savings Include no adder for avoiding operating reserve.

EE gas savings 24.81 Therms per unit

Name:	2019-21 DR Residential Manage	**Last Updated:**	5/14/2018 10:41
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Residential
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2022	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$111,808,294	$14,550,920	$97,257,374	7.68	$0.187
Total Resource Cost (TRC)	$97,224,604	$14,550,920	$82,673,683	6.68	$0.187
Utility Cost Test (UCT)	$95,411,529	$19,551,884	$75,859,645	4.88	$0.251
Participant Cost Test (PCT)	$13,989,036	$0	$13,989,036		$0.000
Ratepayer Impact (RIM)	$95,411,529	$28,539,956	$66,871,573	3.34	$0.366
Societal Cost (SCT)	$112,192,006	$14,550,920	$97,641,086	7.71	$0.187

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$7,300,002	$6,576,000	$5,740,588	$25,357,675
Electric Benefits ($)	$33,783,198	$31,682,893	$30,031,674	$95,411,529
Gas Benefits ($)	$663,588	$610,500	$561,660	$1,813,075
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	28,502,103	26,221,899	24,124,130	101,042,278
Critical Peak Hour Demand (kW)	261,565	240,639	221,388	261,565
Gas Savings (therms)	1,005,437	925,001	851,000	3,564,355
Total On Peak Hours (kWh)	11,104,250	10,215,897	9,398,618	38,438,205
Total On Peak Hours (%)				38.04%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Name:	2019-21 NPC DR Resid Build	**Last Updated:**	5/14/2018 10:42
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Residential
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2030	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$91,848,682	$30,476,816	$61,371,866	3.01	$0.474
Total Resource Cost (TRC)	$79,868,419	$30,476,816	$49,391,603	2.62	$0.474
Utility Cost Test (UCT)	$77,219,637	$32,437,140	$44,782,496	2.38	$0.504
Participant Cost Test (PCT)	$9,388,932	$0	$9,388,932		$0.000
Ratepayer Impact (RIM)	$77,219,637	$39,865,748	$37,353,889	1.94	$0.619
Societal Cost (SCT)	$92,347,943	$30,476,816	$61,871,127	3.03	$0.474

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$7,000,008	$8,024,016	$9,149,024	$49,875,240
Electric Benefits ($)	$3,923,557	$8,001,669	$12,371,945	$77,219,637
Gas Benefits ($)	$154,047	$308,094	$462,141	$2,648,782
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	3,743,193	7,486,386	11,229,579	112,295,789
Critical Peak Hour Demand (kW)	30,306	60,612	90,917	90,917
Gas Savings (therms)	233,405	466,809	700,214	7,002,142
Total On Peak Hours (kWh)	1,454,280	2,908,560	4,362,841	42,719,232
Total On Peak Hours (%)				38.04%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.12		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Sierra Pacific Power Company Residential Demand Response Program

2017 Results

The Company called 26 Community Energy Events for the DR program in 2017. This was part of an overall Company strategy to employ demand response strategies to reduce costs for customers and to better integrate demand response resources with the overall dispatch of supply side resources. Since June 3, 2015, the approval of Schedule OLM-AS, Optional Load Management and Automation Services has resulted in event participation incentives that are more closely tied to the marginal cost of electricity generation. The tie with the marginal cost of electricity generation increased the value of the demand response system by increasing the number of opportunities the system could be operated economically.

Residential Manage

Demand Savings: During the 2017 DR Program season, the verified cumulative demand reduction capacity was measured at 7.8 MW, lower/higher than the 7.4 MW target with a variance of 0.6 percent. These numbers are based upon dispatchable summer peak capacity available. This variance is attributable to customer and device attrition. It is estimated that 0.05 MW of DR capacity was lost. Approximately 1,150 customers representing about 1,365 devices either specifically called in to cancel enrollment, or moved out. Customer move outs continue to be the largest cause of customer and device attrition. In 2017, 3,731 customers participated in the managed program. The Company was engaged in a restoration and customer engagement effort throughout the year, recovering about 900 customers representing 1,066 devices from existing customers via inspections, repairs and upgrades. Nonetheless, the customer attrition rate was higher than the restoration rate with an overall customer attrition rate of 9.9 percent.

Energy Savings: During the 2017 DR Program season, the verified cumulative energy saving was measured at 1,188,915 kWh higher than the 1,004,000 kWh target with a positive variance of 18.4 percent, which is attributable to improved energy efficiency savings achieved per home. These numbers are based upon combined savings from demand response events and from PowerShift Smart Thermostat and year-round energy savings from HVAC optimization.

Budget

Total expenditures were $448,643 (89.7 percent of the budget of $500,000). The spend variance of $51,357 was driven largely by lower than anticipated installation and field service and repair costs in serving the sometimes remote customer installations in the northern region and a marketing strategy that concentrated outreach in the more densely populated Reno-Sparks metropolitan area.

Cost Effectiveness: The TRC was 2.85 for the Residential Manage component in 2017.

Residential Build

Demand Savings: During the 2017 DR Program season, the verified cumulative demand reduction capacity was measured at 6.5 MW, lower than the 7.0 MW target with a negative variance of 7.1 percent. These numbers are based upon dispatchable summer peak capacity available. This variance was largely due to the timing and amount of customer recruitment activity. Overall, end of the year enrollment activity and response rates to recruitment materials were lower than expected. In 2017, 3,085 new customers were added to the build program.

Energy Savings: During the 2017 DR Program season, the potential cumulative energy saving was measured at 761,727 kWh lower than the 1,272,000 kWh target with a negative variance of 40.1 percent. These numbers are based upon combined savings from demand response events and from PowerShift smart thermostat and year-round energy savings from HVAC optimization. This variance is attributable to lower than target-level customer enrollment and no energy efficiency savings being estimated for the pilot component of the Build program due to the lack of data.

Budget

Total expenditures were $2,428,553 (110 percent of the budget of $2,200,000). The difference of $228,553 which was largely due to the increased cost of outreach accompanied by a lower conversion rate in the target outreach area.

Cost Effectiveness: The TRC was 1.70 for the Residential Build component in 2017.

Measurement & Verification

The M&V report titled Residential Demand Response NV Energy – Northern Nevada (Sierra), Program Year 2017 was performed by ADM and is provided in the Technical Appendix DSM-14. The report provides the evaluation results of the 2017 Program.

Customer Education and Outreach

Customer education and outreach activities for the Program involved the use of corporate websites, email, bill inserts, outbound calling campaigns, multi-media videos, and social media. The Program was actively promoted with other energy efficiency programs at community events and in customer education presentations. Specific customer education and outreach measures in the residential sector included program recruitment via the following channels:

- Internet and electronic marketing - corporate website and email.
- Radio, print and display advertisement.
- Joint customer education and outreach efforts with other energy efficiency programs.
- Development of “pathway” strategies to leverage touchpoints of other DSM programs to educate and to generate new leads.

Survey responses were obtained from 81 customers that visited the Company's exhibits at four selected community events. Northern Nevada survey respondents (42.9 percent) reported that the DSM program or service that they would be most interested in participating in would be the smart thermostat program.

On March 6, 2017, a comprehensive multi-media outreach campaign was launched statewide to create awareness and to stimulate enrollment in the PowerShift smart thermostat program. The campaign spanned a total of 42 weeks; tactics included print ads, direct mail, email, radio (traditional and Pandora), digital video (Hulu, pre-roll and YouTube), digital display ads and television ads. The campaign resulted in over 8,000,000 impressions. In addition, 42,140 direct mail pieces and 1,470,058 emails were sent to the Companies' customers to promote the program and retain enrolled customers. These impressions and direct response tactics served to increase awareness of the program and to stimulate interest in energy conservation. Over 40,117 qualified leads were generated by the campaign

Message-based Demand Response

In 2017, the Companies extended the trial begun in 2016 to investigate the efficacy of Message-based Demand Response (MDR) to complement the existing technology-based PowerShift smart thermostat program. The goal of MDR was to motivate customers to reduce peak demand, provide a pathway to participate in other energy efficiency programs, and to cost effectively increase customer satisfaction with the utility.

Message-Based Demand Response (MDR) provides the Companies the ability to drive peak energy reduction from residential customers without any controlled devices in the home. Utilizing meter and customer data, MDR connects with residents via multiple communication channels to motivate a reduction in peak demand and drive engagement during peak energy days. To effectively reach the customer and drive action, the customer must be motivated by the messages received and understand the benefits of their actions. Customer motivations not only vary from one individual to another but also for an individual over time.

MDR optimizes messaging across different message attributes - principally, message content (style) and timing (time of day) - to anticipate and deploy messages customized to successfully create demand reduction action by an individual. Quick post-event feedback is also provided to all customers to help reinforce positive behaviors.

In 2017, three MDR events were called. The target population consisted on 100,000 customers along with a 200,000 customer control group. The target group was split into 75,000 customers in the south and 25,000 customers in the north. MDR participation emails were well received with 27 percent - 32 percent unique opens. Information garnered from a follow up customer survey indicated that 68 percent of the customers who opened the email took some action on event day, 85 percent of those surveyed indicated a positive view of the Companies and 71 percent of those surveyed indicated interest in future energy savings events. In addition, 909 enrollments in the technology-based smart thermostat program were attributable to the MDR program.

Wi-Fi Thermostat Pilot

The flagship smart thermostat professionally installed as part of the demand response program is the wireless programmable CT218 thermostat, manufactured by Computime Group Limited. The CT218 uses an internet gateway device that plugs into the customer's local area network and connects wirelessly to the wall mounted thermostat.

Two distinct wi-fi technologies were included in a technology trial in 2017: the Ecofactor S100 thermostat and the Ecobee3/4 thermostat. Over 1500 Ecofactor S100 thermostats and 350 Ecobee thermostats were installed in single family and multi-family homes. The Ecobee technology included motion sensors and cutting-edge remote temperature sensors that could be strategically located in rooms throughout the home. The temperatures measured by these remote temperature sensors could be blended and used to establish the temperature set point regulating the HVAC system. Implementing wi-fi thermostats eliminated the necessity for a separate gateway device, lowered hardware costs, simplified the provisioning of devices, reduced installation time, and increased customer perception of improved technology.

Lessons Learned and Recommendations

Many of the key lessons learned in 2016 persist in 2017 and continued to inform design and delivery decisions.

- On-going recruitment and support of northern customers continues to present a greater challenge than for their southern counterparts. Milder summer weather and typical home construction along with a lower penetration of central HVAC systems compared to the southern service territory explain some of the barriers to adoption of smart thermostat technology. In addition, difference in the preponderance of various customer life styles also can explain some of the differences in smart thermostat adoption. With the increased adoption of "big data", better understanding of customer attitudes and propensities is being achieved. Lifestyle mapping and categorization using lifestyle "personas" has helped to identify customers with higher likelihood of see value in energy saving solutions. Also, use of these target marketing techniques has informed the development of more effective messaging and outreach channel strategies.

- The northern service territory also presents geographic challenges not typical for our southern customers. The large service territory has created both cost and time of service issues that have increased the challenge to reach recruitment goals and to maintain high customer satisfaction outcomes. Working with field service teams and marketing consultants, materials that identifies windows of time when installations will be available have been used to manage customer expectations and to leverage truck rolls. In addition, by bundling demand side management services to include home energy assessments and direct installs, a single truck roll can significantly increase service delivery and overall customer satisfaction.

- We have continued to evaluate the energy savings and customer impacts of the use of pre-cooling prior to demand response events. Lowering the indoor temperature by 1-2 degrees just prior to a demand response event is designed to improve overall customer satisfaction and reduce the potential comfort impact of small temperature swings during energy events. Early evidence points to marginal energy benefits of pre-cooling contributing to smaller energy snap backs following events. This evaluation will continue into 2018.

- The Company continues to depend heavily on the program evaluation of our third party M&V partners. Efforts to improve timely data flow, project tracking, and issue resolution remain important. Regular weekly meetings between program staff and our independent evaluator have been established to better support real time evaluation feedback.

- Move Outs of premises where demand response devices are installed present a multiple "low hanging fruit" opportunity: to express appreciation for past participation in the Program, to provide instructions on how to return, no longer needed, gateway devices, the opportunity to encourage the moving customer to re-enroll in their new premise, and the opportunity for a low cost enrollment of the new move-in occupant to an already equipment-ready premise. Move-ins subsequently follow move-outs. Unlike the legacy Cool Share program in the southern territory, upon a move-in, the customer is not automatically enrolled in the smart thermostat program. A coordinated outreach campaign was needed to increase enrollment of these new customers. In addition, improved processes were needed to improve the efficiency of the move-in enrollment and reduce the number of truck rolls needed to complete the account activation process.

- Demand response devices must maintain communications with the Software as a Service ("SaaS") back office system in order receive demand response curtailment signals and participate in demand response events. Additionally, mobile access to smart thermostat accounts is not possible if the device losses access to the Internet and goes offline, preventing remote access to thermostat features and functions, including online programming and use of the popular "Away" feature. There are many causes for devices going offline, primary of which, are customer move-outs. Other causes include, loss of power to the gateway or thermostat, network outages on the customer's Internet, and failures of network gateway devices. A coordinated offline reporting and outreach campaign was needed to promptly recognize when devices went offline and launch a multi-channeled outreach campaign to advise customers and to offer assistance in bringing devices back online.

Key Opportunities

DSM Pathways – Individual energy efficiency programs may be introduced to customers through many different communications channels. Each introduction of one energy efficiency program creates an opportunity to expose the customer to other related and potentially beneficial demand side management programs. The company has invested time and energy in creating and implementing a number of pathway strategies for the benefit of our customers and in support of the success of our demand side management programs. These pathways have taken a number of

forms, including: materials mash ups, customer service touchpoints, field service touchpoints, and web presence linkages. Working with marketing consultants, copy has been added to program materials and emails that speak to multiple demand side management programs regardless of program specifically being targeted. Customer service agents have been trained to include references to demand side management programs on all appropriate customer inbound calls and immediately follow up on any expressed customer interest. Information about demand side management programs has been included in field service technicians training to better equip them to better respond to customer interests. Web pages have been designed as part of the customer digital experience (CDX) to speak to multiple programs under the banner of energy savings programs. While many pathways have been constructed, the efficiency of these structures remain not fully understood. Efforts are underway to created reporting mechanism to better track lead creation and follow up along with key performance indicators to track progress toward targets.

Next generation technology – The DR Program continues to improve upon the product development strategies for each of the Residential Manage and Residential Build components. With technology moving at the speed of thought, customers expect technology to evolve and offer feature-rich solutions to energy needs. Several strategies are being actively pursued to meet this challenge. Continued progress will be made on the wi-fi pilot to gather data on how best to deploy and support wi-fi thermostats. The analytic framework supporting smart thermostats will be greatly expanded to leverage the diagnostic potential of the Software as a Service (SaaS) platform. The diagnostic capability can identify degradations in the operation of the air conditioning systems controlled by the smart thermostat. The air conditioning diagnostic service identifies potential faults that, if corrected, could eliminate more costly repairs later. On the heels of our recognition of the importance of improving customer digital experience (CDX) and reflecting that recognition in our overall web presence, comes the customer voice experience ("CVX"). Digital assistant technology has found its way into an increasing number of lifestyle applications including health and security, entertainment, home automation and, yes, energy management. In 2018, digital assistance platforms such as Alexa and Google home will be integrated into our existing smart thermostat service to leverage the prevalence of this technology and to meet customer expectations of an ever improving service experience.

2018 Status

The 2018 program year activities are focused on growing the PowerShift by NV Energy home energy management offering through the installation of smart-thermostats, continuous process improvement, and execution of the customer engagement and program education plan designed to improve customer understanding of the Program and increase customer appreciation of programs and benefits made possible by the Company.

Residential Manage - The Company will continue to manage and engage the customers enrolled in the program prior to 2018 with particular attention to customer retention and customer education. Customer turnover is inevitable however reaching out to moving out and to moving in customers is the quintessential low hanging fruit. Moving out customers, already familiar with the technology, would be highly likely to re-enroll if their new home is in the Company service footprint. Moving

in customers may be greeted by already installed smart thermostats that only require activation to join the demand response program.

Residential Build – The 2018 program year activities are focused on growing the residential home energy management program, continuous process improvement, and execution of the customer engagement and program education plan designed to improve customer understanding of: 1) the realized energy savings impact; 2) energy efficiency and event operations; and, 3) technology features and operation. Logistically sound strategies are also be used to increase the focus on more remote areas in the northern service territory. Thoughtful use of marketing materials that establishes, "in your area" marketing can not only manage customer expectations but also allow better planning and positioning of installation resources to reduce travel time, increase onsite time, and lower costs of service.

Every effort is now being made to recognize and leverage the synergies between the energy savings products and services offered by the Company. Pathway strategies are being developed and implemented to use every customer touchpoint to increase customer understanding of the Company value proposition and energy savings offers. Customer contacts regarding smart thermostat program receive offers for home energy assessments, including the installation of direct install measures such as LED bulbs, air filters, and exterior day/night light sensors. This pathway thinking extends beyond just customer contacts with our customer service staff but also reflected in our marketing materials, our online presence, and the training offered to field service technicians.

Move In/Move Out – A dedicated process improvement team has been created to implement the process flows designed in 2017. These new process flows will engage the analytics team, customer engagement, marketing consultants, and field services to efficiently message and engage both move-out and move-in customers to create a more seamless transaction for these important customers. Low volume trials have begun and will be evaluated for strategic expansion throughout 2018. Messages advising customers of additional demand side management programs (pathway strategy) will be included in all materials.

Offline Devices – A dedicated process improvement team has been created to implement the process flows designed in 2017. These new process flows will engage the analytics team, customer engagement, marketing consultants, PowerShift smart thermostat service providers, and field services to efficiently message and engage offline customers to create a more seamless transaction for these important customers. Using time-sensitive email, outbound calls, and direct mail communications, customers will be thoughtfully advised of their offline status and offered online and human assistance in resolving customer's offline status. Messages advising customers of additional demand side management programs (pathway strategy) will be included in all materials. Existing email communications is being revised and customer service is allocating required resources to support follow up calls as required by the process.

Customer Retention – The ultimate low hanging fruit, even more than re-enrolling moving out customers or enrolling moving in customers is the retention of customers already enrolled. By the end of 2017, over 7,289 demand response devices were installed. Currently, only 20 percent of the move-outs were recovered as new enrollments. The goal of the move-out/move-in process improvement team is to significantly increase the move-in re-enrollments. The overall program

goal is to reduce the instances of non-move out terminations by addressing the most significant root causes: poor understanding of energy optimization, unwillingness to participate in energy events, or insufficient understanding of thermostat features and benefits.

Low Income Initiatives – The PowerShift smart thermostat program can significantly increase the convenience of energy management and lower electric bills for all eligible customers. These services are provided to customers for no out of pocket costs and professionally installed at the convenience of customers. Many of our low income and seniors on fixed income could greatly benefit by the Program. We recognize the challenge in reaching some of these important customers and have developed a number of strategies to expand our enrollment of low income customers. For those customers living in multi-family premises, we have officially expanded the program to include multi-family premises, including apartments. Using our big data platform we are now able to better target low income customers with customized materials that emphasizes lowering power bills, particularly during the summer when energy use, driven by air conditioning, is high. Additionally, bundled offers including, free home energy assessment, and direct installations of energy savings measures will be emphasized.

Incremental Costs

There are no incremental costs for the DR Program components because there are no out of pocket costs experienced by the customer.

Rebates & Incentives

Program funds paid to the customer do not offset any incremental cost experienced by the customer and therefore this Program is an incentive program. The incentives for this program include the equipment provided (i.e., the thermostats and gateways provided for customers enrolled in the residential program) and the value of the energy savings delivered by program measures.

Measure Life

This Program assumes that it will operate for a period of ten years for Residential Build and nine years for Residential Manage. During this period, components that may fail or Program participant that may leave the Program are replaced. The ten year budget for the Program includes the cost for these replacements. The Program life is therefore set at ten years for Residential Build and nine years for Residential Manage.

Units

A residential unit for this Program is a single home.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report performed by ADM.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $800,000 and a target of 2,784,600 kWh for Residential Manage and a budget of $2,500,000 and a target of 909,100 kWh for Residential Build in 2019; and a budget of $900,000 and a target of 2,784,600 kWh for Residential Manage and a budget of $2,600,000 and a target of 909,100 kWh for Residential Build in 2020; and a budget of $1,100,000 and a target of 2,784,600 kWh for Residential Manage and a budget of $2,700,000 and a target of 909,100 kWh for Residential Build in 2021.

The DR Program for the 2019-2021 period, buoyed by strong customer demand, will extend the success and lessons learned in 2018 into more technologically-rich future. The DR program will continue to target single family and multi-family residential customers to offer advanced home energy management systems that provide significant energy savings, energy management convenience, and flexible peak load management. By 2021, most of the aging paging-based technology will be replaced by Internet of Things ("IoT") solutions and advanced mobile communications platforms, including wide availability of voice-enabled services. Data analytics, relied upon on in 2018, will play an even larger role in 2019-2021, including leveraging the diagnostic power of the SaaS thermostat platform and combining it with customer propensity information in the Company's big data platform. Expansion of distributed energy resources ("DERs") will justify investments in the DRMS platform to accommodate a host of behind-the-meter devices, including solar systems, electric vehicles, batteries, other energy storage solutions, and implementation of the regulatory mandated CPP tariff rate. The 2019-2021 period will also see the expansion of new channel opportunities to engage customers in DR programs, including new construction and BYOT programs. Overall growth of the DR program will be accompanied by continuous improvements in internal processes to manage the move-in and move-out of customer premises, processes to maintain the highest degree of connectivity possible between home energy management systems and the demand response management system, and clear pathways to connect energy minded customers to all the applicable demand side management services.

Critical Peak Pricing

Following the success of the Nevada Dynamic Pricing Trial concluded in 2015, The Company proposed to implement an optional CPP rate to become effective for enrollment in 2018. It is expected that the DRMS will be used to issue CPP events, beginning in 2019 and to support the operational overhead of email delivery management and reporting, load reduction analysis and M&V.

Distributed Energy Resource Management System Implementation
The term "DERMS" applies to software that can integrate the needs of utility grid operators with the capabilities of flexible demand-side energy resources at the edges of the grid. Power distribution networks are being transformed by the connection of distributed energy resources (DERs) like rooftop solar and battery energy storage. In 2019-2020, the DR program will take the early baby steps to position the existing DRMS to recognize DERs and to establish initial frameworks for coordination of these resources. In the 2020 time frame, experience gained in 2019, will inform early decisions whether to extend the current DRMS platform, to replace DRMS with a sufficiently mature market solutions, or to build a DERMS from the ground up.

HVAC Performance Monitoring
The SaaS currently in use for our flagship smart thermostat service is underpinned by a powerful analytic engine with access to a large quantity of environmental, customer behavior, and HVAC performance data. Using this wealth of data, the analytic engine has the capability to detect changes in HVAC performance and to report these changes as potential HVAC faults to customers. This service is referred to as HVAC performance monitoring ("HPM"). The HPM service will continue to be productized in 2019-2021 to increase the value proposition of the smart thermostat service and as an addition to the "pathway" channels to support other energy savings programs such as the residential air conditioning program and the home energy assessment program.

Bring Your Own Thermostat
HVAC control and thermostat manufacturers now offer a wide range of smart devices and actively compete for the patronage of energy conscious customers. Energy conscious customers include a large embedded base of smart thermostat owners who could use their existing devices to participate in the demand response program essentially a BYOT opportunity. Work will continue in 2019-2021 to engage one or more major smart thermostat providers in a BYOT trial. The wi-fi pilot conducted in 2017 and 2018 with Ecobee offers to most near-term opportunity for a BYOT trial.

Advancing the Technology Platform
Smart thermostat technology continues to make significant strides in offering customers more convenience, connectedness, and price options. Price points for the wi-fi thermostats deployed in 2017 are expected to be significantly reduced in 2019-2012. The smart thermostat program will continue to add features such as voice enabled services, such as Amazons Alexa and geo-fencing to keep pace with technology. Geofencing creates a virtual perimeter using geographic positioning systems ("GPS") technology to manage temperature set points. Applications of voice enabled systems for electrical devices offer promising opportunity to extend demand responsive strategies to such energy consuming devices such as pool pumps and appliances. Communications technology is also taking leaps and bounds evolving from paging systems, to the Internet, and now moving to more innovative systems such as long range ("LoRa") wireless communications to maintain active two-way network communications at low cost and low power consumption for battery operated devices.

DSM Pathway Strategies/Bundled Services
Overall customer satisfaction of program cost effectively are positively correlated with customer awareness and participation in energy savings programs. Bundling of energy services has the added

benefit of lowering the cost of program delivery and increasing the efficiency of the delivery channels. Cross marketing communication channels, "pathways" built in 2018 will be extended and refined in 2019 and beyond. Processes to cross market energy programs and upgraded systems to schedule and report on the delivery of bundled services will be increasingly automated. Work management systems will be upgraded to better schedule delivery of bundled services and to tie more directly into field service tools used for technician work loading and installation routing.

Technology Migration

By the end of 2017, the Cool Share paging system based program included over 32,500 Carrier two-way thermostats, over 10,500 exterior mounted digital control units (DCUs), and over 5,200 Honeywell one-way thermostats. While connected Cool Share devices continue to deliver cost effective load reduction and energy savings, the technology is now either obsolescent or, in the case of DCUs, virtually obsolete. Beginning in 2017, Cool Share technology began to be systematically replaced with newer smart thermostat technology as devices failed. In 2019, customers with DCUs will be offered free upgrades to smart thermostat technology and all removals as a result of repair services will be replaced with the smart thermostat technology. In 2020 and 2021, repair replacements will be expanded to all Cool Share devices and customers even with operating paging system thermostats will be offered free upgrades to the smart thermostat technology.

Non-responding Devices

The demand response program installs programmable communicating thermostats that can increase customer comfort and lower energy bills. If the thermostats loses connectivity with the demand response management system, the device is described as a non-responding device or offline. Offline devices cannot respond to load curtailment events and, for Internet-based thermostats, cannot be accessed using the customer's Internet connected device. Process improvements will continue to evolve throughout 2019-2021 to identity and reduce the number of offline devices. Increased success with offline devices, will increase overall load management and energy efficiency performance, reduce program costs, and work to increase customer satisfaction and program participation.

Process Improvement Move-In/Move-Out

A healthy demand response program consists of cost effective growth in the customer base, customer-centric support of already enrolled customers and management of the natural churn in customers reflected in move outs and move-ins. A customer moving out of smart thermostat equipped home is a prime candidate as a potential move-in at another premise. Move-out customers, already familiar with the smart thermostat technology, represent warm leads for re-enrollment if their new place of residence falls within the Companies' respective service territories. Communication and outreach process improvements which began in 2017 will continue to evolve along with systems upgrades to better track and report on success of re-enrollment efforts. Increased success with move out and move in customers will lower the overall program cost, increase the efficiency of program enrollments, and work to increase overall customer satisfaction and program participation.

New Construction Program
After years of declines in housing inventory and increases in prices with relatively little growth in construction, Nevada is starting to see construction respond with single-family building permit activity now at a ten-year high and housing inventory at record lows. Development of a demand response new constructions program will take advantage of this expanding new construction market to promote energy conservation to both builders and new home buyers. Builders would be incentivized by lowering cost of air conditioning equipment and increasing the marketability of their new homes through promotion of energy savings benefits and improvements in the cost of ownership. Home buyers would be incentivized by reduced energy bills and the added convenience of intelligent and mobile-enabled management of their air conditioning systems.

M&V 2.0
M&V is the process of using measurement and analysis to reliably document the savings achieved with a program and to determine whether the goals for the program are met. The expanding availability of advanced metering infrastructure has created an opportunity to derive additional value from energy efficiency programs by obtaining timelier and more granular estimated impacts than those made available through traditional M&V approaches. New approaches, commonly referred to as M&V 2.0, leverages this advanced metering infrastructure using custom econometric analysis and third party software tools.

Low Income Program
The DR program will contribute to the overall demand side management target to devote 5 percent of portfolio program cost to providing energy saving services to our low income customer base. Using big data analytics, low income candidates will be the focus of a multi-family target marketing campaign. In addition, partnering with the Nevada Housing Authority will provide valuable assistance in both identifying program candidates and in development of the most effective contact strategies.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the Portfolio Pro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were all calculated based upon the information contained in this program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Incremental Costs

There are no incremental costs for the DR Program components because there are no out of pocket costs experienced by the customer.

Rebates & Incentives

Program funds paid to the customer do not offset any incremental cost experienced by the customer and therefore this Program is an incentive program. The incentives for this program include the equipment provided (i.e., the thermostats and gateways provided for customers enrolled in the residential program) and the value of the energy savings delivered by program measures.

Measure Life

This Program assumes that it will operate for a period of ten years for Residential Build and nine years for Residential Manage. During this period, components that may fail or Program participant that may leave the Program are replaced. The ten year budget for the Program includes the cost for these replacements. The Program life is therefore set at ten years for Residential Build and nine years for Residential Manage.

Units

A residential unit for this Program is a single home.

Savings

The savings for the per unit residential program are those provided in the 2017 M&V Report performed by ADM.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs” provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the ‘Financial Data’ section of the output sheet.

Demand Response Residential - SPPC 2017 Manage

Actual 2017	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					4,493	261.49	1.640	1,174,868	8.00	100.0%
2017	$448,643	$84,769	$361,556	$2,318						
2018	$448,643	$84,769	$361,556	$2,318						
2019	$448,643	$84,769	$361,556	$2,318						
2020	$448,643	$84,769	$361,556	$2,318						
2021	$448,643	$84,769	$361,556	$2,318						
2022	$448,643	$84,769	$361,556	$2,318						
2023	$448,643	$84,769	$361,556	$2,318						
2024	$448,643	$84,769	$361,556	$2,318						
2025	$448,643	$84,769	$361,556	$2,318						

Unit is defined as an average device

Gas Savings, therms per device	44.75	Weighted average, see Tab Device Vintage for detailed calculation
Total kW Capacity	7,389	See Tab Device Vintage for detailed calculation
DR Event and EE kWh Savings, kWh per device	281.49	Weighted average, see Tab Device Vintage for detailed calculation
Remaining Effective Useful Life, year	8	Weighted average remaing effective useful life is 8.14 years and rounded up to 8 years

Demand Response Residential - SPPC 2017 Build

2017	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					$5.00	3,085	247	2.108	761,726	10	100.0%
2017	$2,428,333	$259,141	$2,133,930	$14,882							
2018	$409,100	$74,800	$318,900	$15,400							
2019	$409,100	$74,800	$318,900	$15,400							
2020	$409,100	$74,800	$318,900	$15,400							
2021	$409,100	$74,800	$318,900	$15,400							
2022	$409,100	$74,800	$318,900	$15,400							
2023	$409,100	$74,800	$318,900	$15,400							
2024	$409,100	$74,800	$318,900	$15,400							
2025	$409,100	$74,800	$318,900	$15,400							
2026	$409,100	$74,800	$318,900	$15,400							

*Unit is defined as an average home with 1.19 AC, kW savings Include no adder for avoiding operating reserve; kW factor is reduced by 11.62% of NRD rate.

Gas savings are 52.12 therms per unit

Device to Premise ratio 1.19

Total DR Build Capacity	8.503	kW	Calculated based on Table 3 in the 2017 NPC MV Report for Residential DR by ADM
Total Potential Energy Savi	761,726	kWh	Calculated based on Table 5 in the 2017 NPC MV Report for Residential DR by ADM
Weighted average %NRD	11.62%		Calculated based on Table 3 in the 2017 SPPC MV Report for Residential DR by ADM
Total DR Manage Capacity	7.373	kW	Calculated based on Table 3 in the 2017 NPC MV Report for Residential DR by ADM

Name:	2017 DR Residential Manage	**Last Updated:**	5/14/2018 12:25
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Residential
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2025	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$8,968,677	$3,147,995	$5,820,683	2.85	$0.356
Utility Cost Test (UCT)	$8,358,887	$3,164,343	$5,194,543	2.64	$0.358
Participant Cost Test (PCT)	$845,000	$0	$845,000		$0.000
Ratepayer Impact (RIM)	$8,358,887	$3,992,995	$4,365,892	2.09	$0.452
Societal Cost (SCT)	$10,399,625	$3,147,995	$7,251,631	3.30	$0.356

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$448,643	$448,643	$448,643	$4,037,786
Electric Benefits ($)	$722,543	$979,835	$1,207,864	$8,358,887
Gas Benefits ($)	$86,457	$86,457	$86,457	$609,791
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,253,848	1,253,848	1,253,848	11,284,630
Critical Peak Hour Demand (kW)	8,599	8,599	8,599	8,599
Gas Savings (therms)	201,062	201,062	201,062	1,809,556
Total On Peak Hours (kWh)	86,572	86,572	86,572	2,381,074
Total On Peak Hours (%)				21.10%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Name:	2017 DR Residential Build	**Last Updated:**	5/14/2018 12:22
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Residential
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$8,548,548	$5,017,349	$3,531,198	1.70	$0.811
Utility Cost Test (UCT)	$8,022,162	$5,134,074	$2,888,088	1.56	$0.830
Participant Cost Test (PCT)	$696,654	$0	$696,654		$0.000
Ratepayer Impact (RIM)	$8,022,162	$5,714,003	$2,308,159	1.40	$0.923
Societal Cost (SCT)	$9,901,269	$5,017,349	$4,883,919	1.97	$0.811

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$2,428,553	$409,100	$409,100	$6,110,447
Electric Benefits ($)	$630,660	$857,097	$1,060,117	$8,022,162
Gas Benefits ($)	$69,140	$69,140	$69,140	$526,386
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	812,933	812,933	812,933	8,129,327
Critical Peak Hour Demand (kW)	7,589	7,589	7,589	7,589
Gas Savings (therms)	160,790	160,790	160,790	1,607,902
Total On Peak Hours (kWh)	58,143	58,143	58,143	1,715,300
Total On Peak Hours (%)				21.10%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Demand Response Residential - SPPC 2019 Manage

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					11,899	234.023	1.720	2,784,594	8.00	100.0%
2019	$800,000	$144,344	$615,656	$40,000	11,899					
2020	$586,000	$104,308	$444,892	$36,800	10,947					
2021	$470,000	$82,835	$353,309	$33,856	10,071					
2022	$470,000	$82,835	$353,309	$33,856	9,265					
2023	$470,000	$82,835	$353,309	$33,856	8,524					
2024	$470,000	$82,835	$353,309	$33,856	7,842					
2025	$470,000	$82,835	$353,309	$33,856	7,215					
2026	$470,000	$82,835	$353,309	$33,856	6,638					

Unit is defined as an average device

Gas Savings, therms per device	44.75	Weighted average, see Tab Device Vintage for detailed calculation
Total kW Capacity	20,472	See Tab Device Vintage for detailed calculation
DR Event and EE kWh Savings, kWh per device	234.02	Weighted average, see Tab Device Vintage for detailed calculation
Remaining Effective Useful Life, year	8	Weighted average remaing effective useful life is 7.81 years and rounded up to 8 years

Program Summary: TECHNOLOGY OPTION: 10% (DIGI+COMPUTIME) + 90% (EF 5100)

SPPC Demand Response Residential Single Family

$590 644

DR Residential	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh/ unit saving	kW/ unit saving*	kWh/year (average annual)	Effective Useful Life	Net-to-Gross
						274.76	1.800		10	100.0%
2019	$2,238,000	$430,000	$1,784,000	$24,000	3,025			831,138		
2020	$2,586,000	$440,000	$2,098,000	$48,000	6,050			1,662,703		
2021	$2,935,000	$450,000	$2,412,000	$73,000	9,075			2,493,724		
2022	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2023	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2024	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2025	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2026	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2027	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2028	$1,030,000	$225,000	$732,000	$73,000	9,075			2,493,724		
2029	$761,000	$225,000	$488,000	$48,000	6,050			1,662,586		
2030	$493,000	$225,000	$244,000	$24,000	3,025			831,021		

*Unit is defined as an average home with 1.19 AC, kW savings include no adder for avoiding operating reserve.

EE gas savings 52.12 Therms per unit

Program Summary: TECHNOLOGY OPTION: EcoFactor S100

SPPC Demand Response Residential Multi-Family Homes

DR Residential	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh/ unit saving	kW/ unit saving*	kWh/year (average annual)	Effective Useful Life	Net-to-Gross
						130	0.87		10	100.0%
2019	$262,000	$31,000	$227,000	$4,000	600			77,964		
2020	$328,000	$36,000	$284,000	$8,000	1,200			156,356		
2021	$395,000	$41,000	$342,000	$12,000	1,800			234,203		
2022	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2023	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2024	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2025	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2026	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2027	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2028	$159,000	$20,000	$127,000	$12,000	1,800			234,203		
2029	$113,000	$20,000	$85,000	$8,000	1,200			156,239		
2030	$66,000	$20,000	$42,000	$4,000	600			77,847		

*Unit is defined as an average home with 1.0 AC, kW savings Include no financial adder for avoiding operating reserve

EE gas savings 44 Therms per unit

Name:	2019-21 DR Residential Manage	**Last Updated:**	5/14/2018 10:23
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Residential
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$19,655,104	$2,853,354	$16,801,750	6.89	$0.216
Total Resource Cost (TRC)	$17,091,395	$2,853,354	$14,238,041	5.99	$0.216
Utility Cost Test (UCT)	$16,075,313	$3,053,300	$13,022,013	5.26	$0.232
Participant Cost Test (PCT)	$1,435,682	$0	$1,435,682		$0.000
Ratepayer Impact (RIM)	$16,075,313	$4,289,036	$11,786,277	3.75	$0.325
Societal Cost (SCT)	$19,794,736	$2,853,354	$16,941,382	6.94	$0.216

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$800,000	$585,999	$469,999	$4,205,945
Electric Benefits ($)	$3,345,548	$3,138,429	$2,971,666	$16,075,313
Gas Benefits ($)	$228,967	$210,648	$193,791	$1,016,081
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	2,971,835	2,734,069	2,515,283	18,082,516
Critical Peak Hour Demand (kW)	23,890	21,978	20,220	23,890
Gas Savings (therms)	532,480	489,878	450,677	3,239,945
Total On Peak Hours (kWh)	208,699	192,002	176,637	3,815,438
Total On Peak Hours (%)				21.10%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Name:	2019-21 SPPC DR Resid_Build	**Last Updated:**	5/14/2018 10:24
Customer Sector:	Residential	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Residential
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2030	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$26,003,942	$12,300,898	$13,703,044	2.11	$0.672
Total Resource Cost (TRC)	$22,612,124	$12,300,898	$10,311,226	1.84	$0.672
Utility Cost Test (UCT)	$21,119,846	$12,833,621	$8,286,225	1.65	$0.702
Participant Cost Test (PCT)	$2,246,882	$0	$2,246,882		$0.000
Ratepayer Impact (RIM)	$21,119,846	$14,547,780	$6,572,066	1.45	$0.795
Societal Cost (SCT)	$26,217,837	$12,300,898	$13,916,938	2.13	$0.672

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$2,499,990	$2,913,981	$3,329,969	$18,499,694
Electric Benefits ($)	$976,885	$1,992,789	$3,077,560	$21,119,846
Gas Benefits ($)	$79,147	$158,294	$237,441	$1,492,278
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	970,269	1,940,538	2,910,806	29,108,065
Critical Peak Hour Demand (kW)	6,961	13,921	20,882	20,882
Gas Savings (therms)	184,063	368,126	552,189	5,521,890
Total On Peak Hours (kWh)	67,299	134,598	201,896	6,141,845
Total On Peak Hours (%)				21.10%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.10		
Gas Retail Rate ($/therm)	$0.43		
Net-To-Gross Ratio	100.0%		

Section 7. Business Services

The Company's DSM Business programs service commercial and industrial customers for the Company. The Company has approximately 156,000 electric commercial and industrial customers.

The Company divides business customers into two large sub-segments for outreach purposes: large customers, and small/medium business customers. Large customers are typically single or aggregated electric customers with demand usage of over 500 kW, or national customers, such as fast-food chains. Large customers have a Company account manager assigned to them to serve as a liaison. Small business customers work with our Business Solutions Center to answer any questions they may have on their accounts and to investigate potential energy efficiency projects.

The portfolio of business services is based on Schools Program, Commercial Program, and Commercial Demand Response programs and is augmented by the educational programs; Energy Education and Energy Reports.

Table DSM-26: 2019-2021 Business Services Budgets

Programs	Budget($)			Demand Savings (kW)			Annual Energy Savings (kWh)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Schools Program	$2,200,000	$2,300,000	$2,300,000	2,175	2,250	2,250	19,100,000	19,800,000	19,800,000
Commercial Services	$19,500,000	$19,800,000	$20,600,000	24,000	23,750	24,725	213,700,000	208,400,000	216,800,000
Commercial Demand Response Program - Manage	$1,200,000	$1,400,000	$1,600,000	TBD	TBD	TBD	10,774,300	10,774,300	10,774,300
Commercial Demand Response Program - Build	$2,600,000	$2,600,000	$2,600,000	6,000	6,000	6,000	1,500,000	1,500,000	1,500,000
Business Services	**$25,500,000**	**$26,100,000**	**$27,100,000**	**32,175**	**32,000**	**32,975**	**245,074,300**	**240,474,300**	**248,874,300**

Schools Program

The Schools Program ("Program" in this section) is a DSM Program designed to facilitate energy efficiency and peak demand reduction and provide continuous energy improvement in public schools, including K-12 and higher education. The Program offers two types of energy services to school administrators. First, rebates help offset a portion of the first cost associated with efficiency investments for energy efficiency projects. Second, the Program provides a high level of technical assistance that serves to offset the staffing needs for school facility management that would be required for administering energy efficiency projects.

The technical assistance that is provided varies based on the needs of any given school or school district. Typically the Program supports the school to identify qualifying projects, provide assessment of program viability, and calculate energy and cost savings. The Program also provides energy savings verification, assists with school district's internal communications to management, retrofit specification design assistance, along with oversight and assistance with project management activities.

Nevada Power Company Schools Program

2017 Results

The Schools Program achieved its goals in 2017. The Program spent 87.7 percent of the budget and exceeded its energy and demand savings targets.

Budget: The program spent 87.7 percent of the $1,600,000 budget. The total spend was $1,402,427.

Energy and Demand: In 2017, the verified energy savings were 12,542,061 kilowatt hours ("kWh") and demand savings were 2,749 kilowatts ("kW"). The Program exceeded its energy savings target by 17.7 percent. The 2017 Program achieved a TRC ratio of 1.28

There were 98 schools participating in this Program in 2017, which included public, charter and schools of higher education such as universities and community colleges. Private schools were included in the Commercial Services program. The Program was delivered by offering rebates to the Company's school customers, along with support and encouragement to participate. Cash rebates were calculated at $0.05 per kWh saved and technical support for projects was provided for program participants.

There were no significant operational changes to the Program in 2017. However, given the continued high level of involvement from the ESCos, which had Performance Contracting agreements with Clark County School District, it was necessary to closely maintain our pipeline of projects as a predictive tool to help project the probability of completion within the program year. This helped to project necessary funding for the program.

The Program continued to employ a streamlined approach that requires participating customers to submit proposed projects with supporting documentation for current equipment and proposed equipment costs. Participants were required to answer questions on operation hours, allow on-site inspections to verify current equipment on retrofit projects and installed energy efficiency measures to confirm energy savings. Photos were also taken as part of supporting documentation for the project.

This Program also positively impacted trade allies and the industry by providing increased work for contractors with work crews, engineers, project managers, equipment manufacturers, hazardous waste disposal service, waste disposal service, and ESCos.

The Program works to provide additional benefits to the schools by assisting them with projects that enhance energy savings. The Program had opportunities to provide direction and guidance to trade allies to ensure that any projects proposed and delivered would be appropriate, cost-effective and defensible when completed.

The Program has a strong history of supporting renewable programs and encouraging schools to participate. The Company ensures its school customers are aware of all the products and services they are eligible for through the process.

Many schools currently focus on current and short term budgets, therefore it can be difficult to get them to plan beyond their current fiscal year. Consequently, successful and effective conservation project planning oftentimes requires looking several years into the future. In situations like this, ESCo projects are a simple and effective tool to help achieve efficiency gains. Remaining neutral in terms of efficiency approaches, the Program encouraged schools to move forward with projects whether there is ESCo involvement or not. For customers without staff engineering support, this Program is a valuable tool to help schools determine the type of energy efficiency measures, prioritization of projects, costs, energy savings and dollar savings. Without this Program, the schools would lose the benefit of the technical support services.

Lessons Learned and Recommendations

In 2017, the Program continued to include higher education institution customers enhancing program participation. This provides a broader Program outreach to support achievement of program goals. These institutions tend to have a sound focus on energy efficiency projects and their participation provides necessary depth to the program offering.

With current project pipeline projections showing flat numbers in 2018, it will be essential for the four Nevada System of Higher Education schools in the territory to receive strong levels of technical support in order to overcome any barriers to increased participation.

Measurement & Verification

The M&V report titled Energy Smart Schools Program was performed by ADM and is provided in the Technical Appendix DSM-15 the report provides the evaluation results of the 2017 Program.

2018 Status

In 2018, the Program will continue with the same basic design as implemented in 2017. The Program will continue to provide technical services to assist educational institutions in developing and implementing energy efficiency projects and providing project rebates that help make those projects more affordable. As costs for energy are reduced, the dollars saved can be made available to serve the other needs of the schools.

This Program has demonstrated over the last ten years that it provides energy efficiency services to schools that help schools reduce operating costs.

In 2018, the Program will continue to focus on the three Nevada System of Higher Education schools within the service territory - the College of Southern Nevada, Nevada State College and the University of Nevada Las Vegas – along with the Clark County School District served by the Company. Additionally, smaller opportunities will be pursued at public charter schools.

New Construction will continue in 2018 as a prominent contributor to the program as in 2017. Clark County School District has new construction projects to alleviate overcrowding situations that will increase participation in the program. The Program will work with builders to enhance plans and designs to exceed current building code, leverage rebates and improve building energy efficiencies.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $1,600,000 and a target of 14,500,000 kWh in 2019, and a budget of $1,700,000 and a target of 15,500,000 in program years 2020 and 2021. The program will continue supporting public schools, colleges and universities in the southern territory. Implementation will continue leveraging ESCos when appropriate and working closely with districts, schools, colleges and universities to promote the program and associated energy efficiency opportunities. Based on the experience gain from the pilot energy manager program which is co-funding and training in house energy managers for these institutions the program will make adjustment to maximize savings by leveraging such internal expertise.

The implementation process for the Program will consist of three major components: outreach, technical assistance, and rebate processing. Outreach activities are designed to create awareness and inform school staff about the Program benefits and features. The objective of outreach is to assist educational institutions to identify potential Program opportunities. Technical assistance

covers a broad range of activities and includes facility assessments, energy use benchmarking, energy savings calculations, energy efficient measure procurement support and other assistance activities. The objective of rebate processing is to confirm that qualifying energy efficiency measures were installed or implemented. This process consists of documentation reviews and on-site inspections. Once it has been determined that qualifying energy efficiency measures have been installed or implemented, rebate checks are provided to the qualifying participating school entity.

The current implementation contractor of this Program has a long and successful history working with the schools and continues providing technical support on proposed energy efficiency measures whether the schools are working independently or with the ESCos. Since the school districts only a few engineers specializing in energy efficiency, the implementation contractor reviews documents from the proposals, attends meetings related to ESCos and related projects, confirms savings, calculates incentives, recommends additional savings, and will issue incentive checks for the energy smart schools program. They also perform pre-installation inspections and post to verify installation of energy efficiency measures.

The Program management plan for 2019-2021 will continue the effective Program practices from previous program years. The Schools team will conduct routine staff meetings with the Company's Program Manager to track Program goals, monitor short and long-term objectives and assign deliverables to team members. Reports will be submitted by the Contractor to provide data on activities as well as demonstrate program performance relative to goals.

As indicated based on school ESCo contracts, work will also continue in a collaborative effort with the currently popular approach employing these performance contractors as part of a long-term strategy to utilize dollars as efficiently as possible for the school districts in Nevada.

M&V Plan

The EM&V Contractor will perform EM&V activities to confirm the savings being realized through the Schools Program.

Approach
Data for the study will be collected through a review of program materials, on-site inspections, and end-use metering. Based on data provided by the Company, a sample design will be developed for on-site data collection. The EM&V contractor will calculate program-level *ex post* verified energy savings by applying the sample projects' realization rate (i.e., the ratio of *ex post* verified energy savings and *ex ante* expected energy savings) to program-level *ex ante* expected energy savings.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection

M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level. The greater the degree of variability in the population's energy savings values, and the lower the correlation between *ex ante* expected savings and *ex post* verified savings, the greater the sample size that is required. For highly variable populations, the M&V sampling design will take into account the skewness of the population. A random sample of sites is selected by ordering them according to the magnitude of their savings and using systematic, stratified random sampling.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

Onsite Surveys and Verifications
The EM&V Contractor will perform on-site visits to collect primary data for a sample of custom measure projects. This effort includes collecting facility characteristics data and conducting monitoring of installed measures as appropriate.

On-Site Data Collection Procedures
The EM&V Contractor will review the participant's project file to verify the information on energy efficiency measures that were proposed and implemented, and will use a computerized system for tracking and managing the scheduling and field work. The EM&V Contractor's field engineers and technicians will conduct on-site data collection.

The EM&V Contractor will accomplish four primary objectives while at the site:

- Verify the implementation status of all proposed measures.
- Verify that the energy efficiency measures for which incentives were paid were indeed installed, that they were installed correctly, and that they still function properly.
- Collect the data needed to analyze the energy savings that have been realized from the installed measures.
- The EM&V Contractor's field staff interviews the contact personnel at a facility to obtain additional information on the installed system to complement the data collected from other sources.

During the on-site visit, the EM&V Contractor will also collect data on a variety of other information about factors that affect energy use. Data on these factors are needed for the analysis and determination of energy savings provided by rebated measures. Photographs of a site and of its electrical and mechanical systems are also taken during the on-site visit.

Monitoring Procedures
At some sites, the EM&V Contractor will also conduct monitoring to procure site-specific data for determining operating hours for the installed measures. Monitoring will be conducted at sites where the site-specific data can increase the accuracy of *ex post* energy savings calculations. Monitoring may not be necessary for sites where project documentation allows for detailed *ex post* energy savings calculations.

Energy Savings Curves
ADM utilized measure-specific Energy Savings Curves ("Curves") to determine program-level energy (kWh) savings per month per rate class and program-level critical peak demand (kW) savings per month per rate class. The Curves were derived from Curves published through the CEUS.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Incremental Costs

Incremental cost is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Lighting upgrades are generally considered early replacement as most of the work completed replaces functional but inefficient lighting. Occupancy sensors or light sensors fall under the controls scenario and the incremental cost is the full cost for the controls measures. AC replacements are generally not made solely for energy efficiency considerations and they are considered replacement on burnout with the incremental costs being the difference in cost between the energy efficient measure and the baseline measure.

Incentives/Rebates

The Schools Program funds are paid directly to the participating school or school district participant to offset the out of pocket expenditures made by the participants and therefore this is a rebate program. The rebates are paid after the Program team verifies that the energy efficiency measures have been installed.

Measure Life

As determined in the M&V Report for the Program, the EUL for this program is 12.45 years.

Units

The analysis of this Program has been performed using a derived unit because it includes a multitude of energy efficiency measures. The unit of measure for a derived unit for this Program is based on 1,000 kWh. The derived unit is derived from measures with different unit sizes (e.g. square foot of window film, number of fixtures installed, and watts reduced). Such differences make comparisons and energy efficiency computations by units installed extremely difficult and the entry of all measures in the financial modeling impractical.

Savings

Per unit savings are based on a derived unit of 1,000 kWh. As described above a derived unit is used due the multitude of measures with different units of measure that are employed in the program delivery.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

NPC - Schools Program

2017	Actual Expenditure	Utility Admin & M&V	Implementation Costs	Rebates	Rebate per Unit	# of Units	kWh Saved per Unit	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$1,402,427	$157,286	$624,829								
Schools				$620,312	$49.4585	12,542.06	1,000	12,542,061	12.5	$ 287.20	82.0%
Total				$620,312				12,542,061			

NPC Annual Report Budget $1,600,(87.65%

NPC Annual Report Target 10,660,000 117.66%

*Rebates amount includes a $338,342 rebates invoice that was recorded erroneously as implementation cost in February 2017 in our financial records, while it should have been recorded as rebates cost. This input sheet reflects the true rebates/implementation costs as performed in 2017.

Name:	2017 Schools	**Last Updated:**	4/30/2018 14:51
Customer Sector:	Commercial	**Avg Measure Life:**	12.50
Region :	Vegas	**Energy Savings Curve:**	Schools
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2017	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$4,920,860	$3,847,462	$1,073,398	1.28	$0.043
Utility Cost Test (UCT)	$4,920,860	$1,402,427	$3,518,433	3.51	$0.016
Participant Cost Test (PCT)	$8,952,696	$3,602,062	$5,350,633	2.49	$0.033
Ratepayer Impact (RIM)	$4,920,860	$8,234,982	($3,314,122)	0.60	$0.093
Societal Cost (SCT)	$5,904,879	$3,847,462	$2,057,417	1.53	$0.043

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$1,402,427	$0	$0	$1,402,427
Electric Benefits ($)	$455,279	$0	$0	$4,920,860
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	10,692,748	0	0	133,659,354
Critical Peak Hour Demand (kW)	2,975	0	0	2,440
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	1,656,896	0	0	20,674,009
Total On Peak Hours (%)				15.47%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	82.0%		

NPC Schools Program

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$1,600,000	$288,000	$656,890	$655,110	$45.18	14,500	1,000	14,500,000	12.5	$287.20	82.0%
Commercial measures				$655,110		14,500	1,000	14,500,000			
Total				$655,110		14,500	1,000	14,500,000			

NPC Schools Program

2020	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$1,700,000	$306,000	$738,815	$655,185	$42.27	15,500	1,000	15,500,000	12.5	$287.20	82.0%
Commercial measures				$655,185		15,500	1,000	15,500,000			
Total				$655,185		15,500	1,000	15,500,000			

NPC Schools Program

2021	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$1,700,000	$306,000	$738,815	$655,185	$42.27	15,500	1,000	15,500,000	12.5	$287.20	82.0%
Commercial measures				$655,185		15,500	1,000	15,500,000			
Total				$655,185		15,500	1,000	15,500,000			

Name:	2019-21 Schools	**Last Updated:**	5/14/2018 13:45
Customer Sector:	Commercial	**Avg Measure Life:**	12.50
Region :	Vegas	**Energy Savings Curve:**	Schools
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$19,160,742	$11,169,647	$7,991,095	1.72	$0.044
Total Resource Cost (TRC)	$17,418,857	$11,169,647	$6,249,210	1.56	$0.044
Utility Cost Test (UCT)	$17,418,857	$3,961,000	$13,457,857	4.40	$0.016
Participant Cost Test (PCT)	$25,502,633	$10,350,537	$15,152,096	2.46	$0.033
Ratepayer Impact (RIM)	$17,418,857	$23,594,365	($6,175,509)	0.74	$0.092
Societal Cost (SCT)	$20,045,274	$11,169,647	$8,875,627	1.79	$0.044

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,600,000	$1,700,000	$1,700,000	$5,000,000
Electric Benefits ($)	$660,443	$747,369	$810,378	$17,418,857
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	12,362,052	13,214,607	13,214,607	484,890,814
Critical Peak Hour Demand (kW)	3,440	3,677	3,677	8,851
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	1,915,563	2,047,671	2,047,671	75,001,389
Total On Peak Hours (%)				15.47%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	82.0%		

Sierra Pacific Power Company Schools Program

2017 Results

The Schools Program achieved its goals in 2017. The Program spent 90.4 percent of the budget and exceeded its energy and demand savings targets.

Budget: The Program spent 90.4 percent of the $400,000 budget. The total spend was $361,400.

Energy and Demand: In 2017, the verified energy savings were 3,253,549 kilowatt hours ("kWh") and demand savings were 471 kilowatts ("kW"). The Program exceeded its energy savings target by 8 percent. The 2017 Program achieved a TRC ratio of 2.55.

There were 37 schools participating in this Program, which was available to all public schools including K-12, charter and schools of higher education such as the state's universities and community colleges. Private schools were included in the Commercial Services program. The Program was delivered throughout the year offering rebates to the Company's school customers, along with technical support and encouragement to participate. Cash rebates were calculated at $0.05 per kWh saved and technical support for projects was provided for program participants.

There were no significant operational changes to the Program in 2017. However, given the continued high level of involvement from the Energy Service Companies ("ESCos"), which had Performance Contracting agreements with Carson City School District, it was necessary to closely maintain our pipeline of projects as a predictive tool to help project the probability of completion within the program year. This assisted in forecasting necessary funds at the end of the year.

The Program continued to employ a user-friendly approach that requires participating customers to submit proposed projects with supporting documentation for current equipment and proposed equipment associated costs. Participants were required to answer questions on operation hours, allow on-site inspections to verify current equipment on retrofit projects and installed energy efficiency measures to confirm energy savings. Photos were also taken as part of supporting documentation for the project.

This Program also positively impacted trade allies and the industry by providing increased work for contractors with work crews, engineers, project managers, equipment manufacturers, hazardous waste disposal service, waste disposal service, and ESCos.

The Program works to provide additional benefits to schools by assisting them with projects that could favorably impact their energy saving. The Program had opportunities to provide direction and guidance to trade allies to ensure that any projects proposed and delivered would be appropriate, cost-effective and defensible when completed.

The Program has a strong history of supporting renewable programs and encouraging schools to participate. The Company ensures its schools customers are aware of all the products and services they are eligible for through the process.

Many schools focus on current and, short term budgets, therefore it can be difficult to get them to plan beyond their current fiscal year. Consequently, successful and effective conservation project planning oftentimes requires looking several years into the future. In situations like this, ESCo projects are a simple and effective tool to help achieve efficiency gains. Remaining neutral in terms of efficiency approaches, the Program encouraged schools to move forward with projects whether there is ESCo involvement or not. For customers without staff engineering support, this Program is a valuable tool to help schools determine the type of energy efficiency measures, prioritization of projects, costs, energy savings and dollar savings. Without this Program, the schools would lose the benefit of the technical support services.

Lessons Learned and Recommendations

In 2017, the Program continued to include higher education institution customers enhancing program participation. This provides a broader Program outreach to support achievement of goals. These institutions tend to have a sound focus on energy efficiency projects and their participation provides necessary depth to the program offering.

The higher education institutions provide a broader customer base in a territory made up of smaller school districts which establishes a more stable program in achieving savings goals.

During 2017, Washoe County School District and the University of Nevada, Reno, enrolled in the Pilot Energy Manager Co-Funding Program which placed an energy efficiency staff member as the point of contact at each institution. This additional resource provided a simpler conduit for the Company to coordinate proposed and ongoing projects under the program. Additionally, the Energy Manager will be engaged in better strategic planning of energy efficiency projects that will aid in the Program's ability to collaborate and be engaged in longer term planning for each institution.

Measurement & Verification

The M&V report titled Schools Program was performed by ADM and is provided in the Technical Appendix DSM-16 the report provides the evaluation results of the 2017 Program.

2018 Status

In 2018, the Program will continue with the same basic design as implemented in 2017. The Program will continue to provide technical services to assist educational institutions in developing and implementing energy efficiency projects and providing project rebates that help make those

projects more affordable. As costs for energy are reduced, the dollars saved can be made available to serve the other needs of the schools.

This Program has demonstrated over the last ten years that it provides energy efficiency services to schools that help schools reduce operating costs.

In 2018, the Program will continue to focus on building relationships and encouraging participation from the territory's small school districts such as Esmeralda and Eureka. Performance contracting projects, as delivered by ESCos and which were a primary contributor to the Program at Carson City School District in 2017 are expected to play an even larger role in 2018.

Continuing in 2018, new construction projects designed to alleviate overcrowding situations by building new schools are now being pursued by Washoe County School District. These proposed projects provide an additional opportunity for the Program to provide support in terms of engineering assistance encouraging facility designs to be constructed superior to simply meeting code minimum building requirements.

The current project pipeline projections show strong numbers in 2018, in large part due to the performance contracting work at Washoe County School District. It will be essential to closely monitor program activity throughout the territory to ensure adequate rebate funding is available for all participants.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $600,000 and a target of 4,600,000 kWh in 2019, and a budget of $600,000 and a target of 4,300,000 kWh in program year 2020, and a budget of $600,000 and a target of 4,300,000 kWh in program year 2021. The program will continue supporting public schools, colleges and universities in the northern territory. Implementation will continue leveraging ESCos when appropriate and working closely with districts, schools, colleges and universities to promote the program and associated energy efficiency opportunities. Based on the experience gain from the pilot energy manager program which is co-funding and training in house energy managers for these institutions the program will make adjustment to maximize savings by leveraging such internal expertise.

The implementation process for the Program will consist of three major components: outreach, technical assistance, and rebate processing. Outreach activities are designed to create awareness and inform school staff about the Program benefits and features. The objective of outreach is to assist educational institutions in identifying potential Program opportunities. Technical assistance covers a broad range of activities and includes facility assessments, energy use benchmarking, energy savings calculations, energy efficient measure procurement support and other assistance activities. The objective of rebate processing is to confirm that qualifying energy efficiency measures were installed or implemented. This process consists of documentation reviews and on-

site inspections. Once it has been determined that qualifying energy efficiency measures have been installed or implemented, rebate checks are provided to the qualifying participating school entity.

The current implementation contractor of this Program has a long and successful history of working with the schools and continues to provide technical support on proposed energy efficiency measures whether the schools are working independently or with the ESCos. Since the school districts has only a few engineers specializing in energy efficiency, the implementation contractor reviews documents from the proposals, attends meetings related to ESCos and related projects, confirms savings, calculates incentives, recommends additional savings, and will issue incentive checks for the Schools Program. They also perform pre-installation inspections and post to verify installation of energy efficiency measures.

The Program management plan for 2019-2021 will continue the effective Program practices from previous program years. The team will conduct routine staff meetings with the Company's Program Manager to track Program goals, monitor short and long-term objectives and assign deliverables to team members. Reports will be submitted by the Contractor to provide data on activities as well as demonstrate program performance relative to goals.

As indicated based on school ESCo contracts, work will also continue in a collaborative effort with the currently popular approach employing these performance contractors as part of a long-term strategy to utilize dollars as efficiently as possible for the school districts in Nevada.

M&V Plan

The EM&V Contractor will perform EM&V activities to confirm the savings being realized through the Schools Program.

Approach

Data for the study will be collected through a review of program materials, on-site inspections, and end-use metering. Based on data provided by the Company, a sample design will be developed for on-site data collection. The EM&V contractor will calculate program-level *ex post* verified energy savings by applying the sample projects' realization rate (i.e., the ratio of *ex post* verified energy savings and *ex ante* expected energy savings) to program-level *ex ante* expected energy savings.

The EM&V Contractor will prepare a report on the analysis and the verified energy impacts.

Sample Selection

M&V sampling will provide for a program-level energy savings determination that achieves ±10 percent precision at the 90 percent confidence level. The greater the degree of variability in the population's energy savings values, and the lower the correlation between *ex ante* expected savings and *ex post* verified savings, the greater the sample size that is required. For highly variable populations, the M&V sampling design will take into account the skewness of the population. A

random sample of sites is selected by ordering them according to the magnitude of their savings and using systematic, stratified random sampling.

Sampling for collecting program M&V data also needs to account for the M&V effort occurring in real time, i.e., concurrent with program implementation. Projects will accumulate over time as the program is implemented. The sampling plan is therefore designed to have a predetermined sample size requirement for achieving certain analytical goals, but with adjustments made over time as data for additional sites become available. Sample selection is thus spread over the entire implementation period.

M&V Analysis Methods

Onsite Surveys and Verifications
The EM&V Contractor will perform on-site visits to collect primary data for a sample of custom measure projects. This effort includes collecting facility characteristics data and conducting monitoring of installed measures as appropriate.

On-Site Data Collection Procedures
The EM&V Contractor will review the participant's project file to verify the information on energy efficiency measures that were proposed and implemented, and will use a computerized system for tracking and managing the scheduling and field work. The EM&V Contractor's field engineers and technicians will conduct on-site data collection.

The EM&V Contractor will accomplish four primary objectives while at the site:

- Verify the implementation status of all proposed measures.
- Verify that the energy efficiency measures for which incentives were paid were indeed installed, that they were installed correctly, and that they still function properly.
- Collect the data needed to analyze the energy savings that have been realized from the installed measures.
- The EM&V Contractor's field staff interviews the contact personnel at a facility to obtain additional information on the installed system to complement the data collected from other sources.

During the on-site visit, the EM&V Contractor will also collect data on a variety of other information about factors that affect energy use. Data on these factors are needed for the analysis and determination of energy savings provided by rebated measures. Photographs of a site and of its electrical and mechanical systems are also taken during the on-site visit.

Monitoring Procedures
At some sites, the EM&V Contractor will also conduct monitoring to procure site-specific data for determining operating hours for the installed measures. Monitoring will be conducted at sites where the site-specific data can increase the accuracy of *ex post* energy savings calculations. Monitoring may not be necessary for sites where project documentation allows for detailed *ex post* energy savings calculations.

Energy Savings Curves
ADM utilized measure-specific Energy Savings Curves ("Curves") to determine program-level energy (kWh) savings per month per rate class and program-level critical peak demand (kW) savings per month per rate class.

The Curves were derived from Curves published through the CEUS. To adapt CEUS Curves to northern Nevada schools, ADM modified the CEUS Curves as follows:

- Curves were aligned with the Washoe County School District instructional calendar.
- A Heating and Cooling Interactive Factor ("HCIF") specific to northern Nevada was incorporated into the Curve for interior lighting measures. This modification improves the shape and accuracy of the interior lighting Curve but does not change annual energy (kWh) savings given that the Curve was normalized before being employed to disaggregate kWh savings into 8,760 hourly bins per rate class.

Assessing the Applicability of CEUS Curves:
Appropriate Energy Savings Curves are essential to the M&V task of allocating kWh and critical peak kW savings to hourly and monthly bins for each rate class that participated in the 2017 program. ADM explored using an Energy Savings Curve that was specific to the 2017 *Schools Program*: ADM had conducted a monitoring study in Nevada schools in 2011; therefore, we examined the feasibility of using the monitored lighting and HVAC schedules to create appropriate Energy Savings Curves. However, after examining the logger data from the 2011 study, we found that the monitored lighting and HVAC schedules closely matched the respective CEUS Curves for schools. ADM determined that the CEUS curves, after being modified to align with the actual instructional calendar for Washoe County Schools, would provide the most accurate Energy Savings Curves for this program.

Alignment of CEUS Curve with Washoe County School District Calendar:
Most schools in the 2017 *Schools Program* follow a traditional nine-month schedule. CEUS curves for lighting and HVAC measures were based predominantly on traditional nine-month schedules; for example, the CEUS curve for interior lighting depicts monthly energy usage declines in June and reaches a nadir in July, then increases during August and September until it reaches a peak in October.

Given that the CEUS data indicates that all schools were out-of-session during at least part of July, and the majority of schools were out-of-session during all of July, ADM used CEUS data for July

to "model" all out-of-session weekdays for Washoe County's summer vacation weeks. In other words, ADM modified the CEUS curves to incorporate the actual summer schedule for Washoe County Schools. Because the CEUS lighting schedules during July weekdays closely match ADM's 2011 lighting study data for summertime non-instructional days, ADM created each Energy Savings Curve for the PY2017 *Schools Program* by transposing weekday savings from the corresponding July CEUS curve onto all of Washoe County's out-of-session summer days. Therefore, compared to the corresponding CEUS curves, ADM's PY2017 *Schools Program* Curves have lower summertime kWh savings.

Incorporating HCIF Factors into the Savings Curve:
The HCIF was incorporated into the energy impact analysis for each M&V sample site. The overall savings curve also reflects secondary heating and cooling impacts in a manner that is consistent with the site-specific HCIF calculations. The methodology employed calculates HVAC impacts by estimating cooling and heating equipment efficiencies and applying specific thermal fractions for cooling and heating.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Incremental Costs

Incremental cost is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. Lighting upgrades are generally considered early replacement as most of the work completed replaces functional but inefficient lighting. Occupancy sensors or light sensors fall under the controls scenario and the incremental cost is the full cost for the controls measures. AC replacements are generally not made solely for energy efficiency considerations and they are considered replacement on burnout with the incremental costs being the difference in cost between the energy efficient measure and the baseline measure.

Incentives/Rebates

The Schools Program funds are paid directly to the participating school or school district participant to offset the out-of-pocket expenditures made by the participants and therefore this is a rebate program. The rebates are paid after the Program team verifies that the energy efficiency measures have been installed.

Measure Life

As determined in the M&V Report for the Program, the EUL for this program is 15 years.

Units

The analysis of this Program has been performed using a derived unit because it includes a multitude of energy efficiency measures. The unit of measure for a derived unit for this Program is based on 1,000 kWh. The derived unit is derived from measures with different unit sizes (e.g. square foot of window film, number of fixtures installed, and watts reduced). Such differences make comparisons and energy efficiency computations by units installed extremely difficult and the entry of all measures in the financial modeling impractical.

Savings

Per unit savings are based on a derived unit of 1,000 kWh. As described above a derived unit is used due the multitude of measures with different units of measure that are employed in the Program delivery.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the five tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet

SPPC - Schools Program

2017	Total Actual Expenditures	Utility Admin & M&V	Implementation Costs	Rebates	Rebate per Unit	# of Units	kWh Saved per Unit	kWh Saved per Year	Effective Useful Life	Incremental Cost per Unit	Net-to-Gross
Measures	$361,400	$46,027	$171,558	$143,814	$44.20	3,253.55	1,000	3,253,549	15.00	$127.70	83.0%
Schools											
Total				$143,814				3,253,549			

Name:	2017 Schools	**Last Updated:**	4/30/2018 11:01
Customer Sector:	Commercial	**Avg Measure Life:**	15.00
Region :	Reno	**Energy Savings Curve:**	Schools
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2017	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$1,497,636	$586,925	$910,711	2.55	$0.021
Utility Cost Test (UCT)	$1,497,636	$361,444	$1,136,192	4.14	$0.013
Participant Cost Test (PCT)	$2,405,817	$415,478	$1,990,338	5.79	$0.012
Ratepayer Impact (RIM)	$1,497,636	$2,238,906	($741,270)	0.67	$0.078
Societal Cost (SCT)	$1,810,478	$586,925	$1,223,552	3.08	$0.021

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$361,444	$0	$0	$361,444
Electric Benefits ($)	$108,839	$0	$0	$1,497,636
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	2,881,982	0	0	43,229,725
Critical Peak Hour Demand (kW)	551	0	0	457
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	187,845	0	0	5,391,677
Total On Peak Hours (%)				12.47%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	83.0%		

SPPC Schools Program

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$600,000	$108,000	$280,440	$211,560	$45,991	4,600	1,000	4,600,000	15.0	$127.70	83.0%
Commercial measures				$211,560		4,600	1,000	4,600,000			
Total				$211,560							

SPPC Schools Program

2020	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$600,000	$108,000	$280,440	$211,560	$49,200	4,300	1,000	4,300,000	15.0	$127.70	83.0%
Commercial measures				$211,560		4,300	1,000	4,300,000			
Total				$211,560							

SPPC Schools Program

2021	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$600,000	$108,000	$280,440	$211,560	$49,200	4,300	1,000	4,300,000	15.0	$127.70	83.0%
Commercial measures				$211,560		4,300	1,000	4,300,000			
Total				$211,560							

Name:	2019-21 Schools	**Last Updated:**	5/14/2018 14:28
Customer Sector:	Commercial	**Avg Measure Life:**	15.00
Region :	Reno	**Energy Savings Curve:**	Schools
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$6,860,800	$2,216,528	$4,644,272	3.10	$0.023
Total Resource Cost (TRC)	$6,237,091	$2,216,528	$4,020,563	2.81	$0.023
Utility Cost Test (UCT)	$6,237,091	$1,489,702	$4,747,389	4.19	$0.015
Participant Cost Test (PCT)	$8,168,439	$1,403,424	$6,765,015	5.82	$0.012
Ratepayer Impact (RIM)	$6,237,091	$7,831,490	($1,594,399)	0.80	$0.081
Societal Cost (SCT)	$7,229,309	$2,216,528	$5,012,781	3.26	$0.023

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$599,999	$600,000	$604,920	$1,804,919
Electric Benefits ($)	$164,452	$163,552	$183,797	$6,237,091
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	4,074,663	3,808,924	3,897,504	176,716,364
Critical Peak Hour Demand (kW)	657	614	628	1,899
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	265,462	248,149	253,920	22,040,335
Total On Peak Hours (%)				12.47%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data	
Discount Rate:	6.65%
Rate Escalator:	0.00%
Inflation Rate (T&D):	2.00%
Line Loss (Energy):	6.30%
Line Loss (Demand):	14.31%
Avoided T&D Capacity $/MW:	$60,702
Environmental Adder (SCT only)	10.00%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%
Electric Retail Rate ($/KWh):	$0.07
Gas Retail Rate ($/therm)	$0.46
Net-To-Gross Ratio	83.0%

Secondary Benefits	
Other Savings	$0
Scenarios:	
Measure Life	100%
Energy Savings	100%
Avoided Energy Cost	100%
Avoided Capacity Cost	100%
Incremental Measure Cost	100%

Commercial Program

The Commercial Program ("Program" or "Commercial Energy Services Program" in this section) offers energy efficiency technical assistance and incentives to commercial and industrial customers to promote investments in energy efficient retrofit and new construction projects.

The primary objective of the Program is to generate long-term energy savings and peak demand reduction. A longer term goal of the Program is to influence building owners, managers, architects, engineers, contractors and others to realize the benefits of incorporating energy efficiency into both retrofit and new construction projects. The Program facilitates the implementation of energy efficient measures in both existing and new commercial and industrial facilities through providing rebates and comprehensive technical services.

The retrofit portion of the Program offers per-unit prescriptive rebates for energy efficient lighting, cooling, motors, commercial kitchens, refrigeration and miscellaneous energy conservation measures. Additionally, custom rebates for most measures not covered under the prescriptive component that results in verifiable energy savings.

The new construction portion of the Program offers rebates for single pieces of equipment, entire systems, and whole buildings. In order for projects to qualify for a rebate, projects must exceed the applicable IECC or applicable local building code by at least 10 percent of the 2009 IECC or 5 percent of the 2012 IECC.

The Program's Non-Profit Agency Grant component offers qualifying non-profit organizations a financial means to implement energy efficiency measures. This component provides financial assistance in the form of rebates and technical support to non-profit organizations for the identification and installation of energy efficiency measures in new or existing buildings. To qualify, an agency must be a 501(c) 3 entity located within the Company's service territory. The Company aids these organizations by identifying areas where they can incorporate energy saving materials, equipment and/or construction methods into their buildings to reduce energy consumption.

Non-profit agencies benefit from this Program in two ways: first, by receiving free technical support and reducing or eliminating the cost associated with installing energy efficiency measures; and second, by effectively lowering the monthly utility cost that enables the non-profit organizations to provide more services to the community.

Nevada Power Company Commercial Program

2017 Results

In the 2017 program year the Program achieved 135,176,397 kWh in savings or 130 percent of its energy savings target while expending 113.6 percent of the approved budget.

The Program achieved a TRC ratio of 1.54 for 2017. Prescriptive and custom lighting measures accounted for 61.5 percent of the annual kWh claimed in 2017 with the largest measures being LED lighting retrofits. The Program supported 810 commercial energy efficiency projects including 23 grants for 17 non-profit agency grantees in 2017.

Budget Variance: The Program team was able to achieve exceptional value for customers as the program achieved 130.3 percent of the energy savings goal while expending 113.6 percent of the budget. Two factors contributed to this level of program performance. The first is that the competitive bidding process employed by the Company resulted in a cost effective contract. The second is the incentive strategy implemented for the program designed to enable more customers to participate in the program. The customers are eligible to receive incentive funding up to 50 percent of their total project cost then the project is tiered, which is dependent upon the total amount of incentive the customer has received for the program year. Expenditures for the program did increase by 13.6 percent to accommodate the program capturing 30.3 percent of additional energy savings supporting more than 470 commercial customers. By employing program tiers, the per-kWh rebate levels are reduced for these larger projects and results in lower cost per kilowatt hour saved program wide.

Energy and Demand Variance: The Program attained 130.3 percent of the approved kWh energy savings target because of the Program's actual measure mix and a high level of customer participation. Because the program design allows for tiering of rebates to distribute the dollars more evenly across all customer segments, several large projects achieved significant savings at a lower cost per kWh as compared to other projects. In addition, the program limits rebates to be no more than 50 percent of total project cost. Because of this design, the measure mix of actual projects achieved a higher verified savings in part because incremental pricing for more efficient measures continued to decline, allowing for more savings at a lower cost. The demand savings are generally proportional to the energy savings.

The Program maintained proactive customer satisfaction by tracking substantive communications with customers and trade allies. By doing this the Program was able to recognize issues that needed immediate attention, which were resolved quickly. The tracking and documentation of these interactions also enabled the team to quickly identify patterns that prompted program rules or operating procedure changes. As energy efficiency projects were completed throughout the year customers were requested to complete a follow-up questionnaire. The questionnaire inquired on the customer's overall experience, if they had a clear understanding of the services offered, ease of application process, interactions with the staff and quality of the technical and customer support.

Measurement & Verification

The M&V report titled Commercial Energy Services Program was performed by ADM and is provided in the Technical Appendix DSM-17. The report provides evaluation results of the 2017 Program.

Lessons Learned and Recommendations

The following section recaps lessons learned in 2017, that provide guidance for the design and delivery of commercial energy services in future periods and indicates how the lessons learned will be leveraged to modify the design or delivery of commercial energy services in future periods.

- Program administration cost could be reduced if there were more reliance on established and agreed upon deemed measure saving to establish consistent and transparent savings for qualified energy efficiency measures. For over 10 years the program has calculated and documented savings for installed or retrofitted measures establishing verified data supporting claimed measure savings. Consideration should be given to review the potential of leveraging the years of collected and validated data on measure savings to support the development of deemed savings tables to expedite program measure and verification and providing better service to customers. Once such standards are established for energy efficiency measures the program would benefit from:
    - Higher volume of efficiency measures can be implemented with low variability in results.
    - Fewer resources are required for delivery of energy efficiency services.
    - Fewer administrative costs are required for project completion.
    - Greater transparency and consistency is achieved in energy efficiency service delivery.
    - An annually updated TRM provides accurate and up-to-date market data and technology information.

  Based on the perceived program value and its cost effectiveness this strategy presents a review or study of this evaluation methodology should take place in advance of the 2019 program start.

- The integration of energy efficiency and demand management remains the next logical step to provide customers a holistic approach to smartly managing their energy consumption. The commercial energy services team continued in 2017 to leverage the Contractor Network and existing customer base established by the program over the years to promote the integrated energy efficiency and demand management concept to achieve market transformation. These efforts will continue in 2018. Direct install contractors and controls contractors will continue to be utilized to expand market penetration.

- To increase the awareness of energy efficiency and demand management throughout the service territory the commercial energy services team hosted smaller venues targeted for areas such as Laughlin. In addition a marketing campaign was established that included

email blasts, radio, print and Pandora advertising. It is recommended that these communications also be deployed in 2018.

- The continuation of the free energy facility assessment service remains popular among the small and medium customers who do not have the budget to accommodate facility evaluation. The enhanced free energy facility assessment report includes detailed information regarding the recommended technology and a measure summary table of the estimated energy savings and associated utility incentives. In 2018 improvements will include streamlining of the reports by standardizing the reports through the implementation of supplemental software.

- American Society of Heating, Refrigeration and Air-Conditioning Engineer level 2 audits designed to assist in identifying non-lighting projects that produce deeper energy savings are available to qualified contractors to provide the service on behalf of commercial energy services. These contractors are also listed as part of the NV Energy contractor network on the program website.

- Customer feedback is a critical element of commercial energy services to enable continuous improvement that will increase program participation and customer satisfaction. Commercial energy services plans to implement the following actions in response to customer feedback:

    1. Improve the Company brand and active management of the Contractor Network that includes contractor visits and ride-alongs. The purpose of the contractor visits is to discuss any barriers the contractor is experiencing to promote commercial energy services and what the team can do to provide improved support. Contractor ride-alongs are to ensure the contractor is promoting commercial energy services properly to Company customers.
    2. The Contractor Network is a key component in helping commercial energy services promote energy efficiency and demand management. The Company plans to add value to contractors who join the Contractor Network by providing them a tool kit, which may include Company branded pens, notebooks, portfolio, clip board, copy of all materials, case studies and fact sheets and talking points to promote commercial energy services. Better educating the contractors and instilling pride in promoting commercial energy services will be a continued focus in future years. Each contractor within the Contractor Network was assigned as specific program staff member as their primary point of contact to help contractors leverage the program.
    3. Reducing the wait time for customers and contractors to receive their incentive payment was identified as an improvement area. Contractors and customers will continue to receive their incentive payment 50 percent faster as a result of a streamlined project approval and accounting process.

Non-Profits Agency Grants achieved 179 percent of goal in 2017 due to the improved project screening process implemented to ensure the program remained cost effective and the technical

assistance provided to identify potential projects. The result of the project screening process and infusion of additional funding enabled the program to serve more nonprofit customers during the year.

2018 Status

The 2018 Program operates in a similar manner as the 2017 implementation. Many of the commercial demand response technologies are now included in the customer outreach that the Program implementation contractor is responsible for, providing economies of scale for market penetration. In addition, the Non Profit Agency Grants component will be included as part of Commercial Energy Services.

Providing customers with engineering assistance, project management support, program application aid while assisting them with identifying potential energy efficiency measures will continue in 2018. Program offering includes an increased emphasis on outreach, customer service, and education and training to drive increased program participation and customer satisfaction.

The program offers free energy assessments for commercial customers and during 2018 the program will be developing an automation tool to enhance assessment reporting and reduce the level of effort involved in report generation. This new tools should allow the program to serve more customers with their individual building assessments.

The Program has reserved funding for the Energy Project Manager trial. Working with local customers, this position is a co-funded staff resource at the customers' facility to develop and manage energy projects. The Company will work with the customers to develop a comprehensive energy plan that will garner a set amount of energy savings for a 12-month period.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $14,500,000 and a target of 161,100,000 kWh in 2019, and a budget of $14,500,000 and a target of 152,600,000 in program year 2020, and a budget of $15,000,000 and a target of 157,900,000 in program year 2021.

The Company proposes the Program be continued in a similar market delivery which offers increased technical assistance, commercial energy education, energy and demand savings opportunity assessment services, and rebates for energy efficiency measures implemented for retrofit and new construction projects.

An extensive portfolio of products is planned for commercial services in 2019. The product list will include lighting, motors, drives, refrigeration, retro-commissioning as well as cooling efficiency products. These products continue to penetrate their market segments and work to become larger contributors to the portfolio. Based on anticipated lighting standard changes planned

for 2020 there will be program adjustments to accommodate the new lighting baseline standards that will affect program lighting savings and lighting's overall impact to the program measure mix.

The program will continue to reserve specific funding for a Strategic Energy Project Manager. Working with local customers, this position is a co-funded staff resource at the customers' facility to develop and manage energy projects. The Company will work with the customers to develop a comprehensive energy plan that will garner a set amount of energy savings for a 12-month period.

The Program's outreach strategy will emphasize maintaining and strengthening key relationships with customers and trade allies to expand customer awareness and participation. Education and training events involved the use of various communication channels to promote customer awareness on the available of services. The key message focused on how the Company continues to be a reliable resource for energy efficiency information and assistance through the incentive services and free training available. The commercial energy services team will implement a new customer engagement strategy that significantly increased customer participation and raised customer awareness of incentives and services offered under the program. Major Account Executives in conjunction with the Commercial Energy Services Contractor Network continued to be key channels for outreach and support for new and existing customers.

Outreach communications channels included the commercial energy services website, the electronic quarterly newsletter, monthly electronic education and training announcement, presentations to industry associations and local chambers of commerce, and paid advertisement channels along with relationships established and maintained by the southern Nevada commercial energy services team of engineers, outreach staff and administrators.

The Program's website provides guidance and resources for customers, contractors and vendors to engage in the services provided. Incentive applications, policies and procedures, case studies, and promotional materials were all downloadable from the website. The website also provides a list of free education and training courses available to educate customers and contractors on the latest energy-efficiency advances. Attendees conveniently registered for classes and events online. Education and outreach materials, other service information, including eligibility criteria, project components and resources were also available for view and download on the website.

The Contractor Network is the name given to the group of contractors that have experience working as part of commercial energy services as demonstrated by the completion of at least one project. All applications for the Contractor Network have been verified by the commercial energy services team to ensure they have submitted the required application and references. These approved contractors have been trained on the processes and procedures of commercial energy services. The Contractor Network facilities reaching commercial customers of every size to raise customer awareness about energy efficiency options offered by commercial energy services. Well-trained contractors recruited participants, helped speed the application process, improved program efficiency while enhancing the customer's experience.

The Commercial Energy Services team will continue to educate customers through monthly lunch-and-learn seminars on various topics such as Online application, non-profit agency grants, small business program, chiller efficiencies, LED lighting, heating, refrigeration, ventilation and cooling, motor, pumps and compressed air, integrated energy efficiency and demand response technology. Networking opportunities at industry events played a pivotal role in developing contacts and identifying decision-makers.

Speaking engagements were secured and utilized to promote the services at events such as the Commercial Kitchen Expo in Las Vegas, the Henderson Chamber of Commerce, the Clark County Nevada Chamber of Commerce and the Green Chamber of Commerce. Commercial Energy Services provided specialized training for southern contractors by sponsoring a one-day training events.

The Program will continue to provide education and training workshops available for commercial customers to increase energy efficiency awareness and incentive participation, while improving the overall customer perception of the Company. The Program implemented a number of education and training events to provide building operators and facility manager's tools to aid and manage their facilities more efficiently. Customers who attend a monthly workshop are better equipped to identify energy efficiency opportunities within their existing facilities, with a better understanding of the available energy efficient incentives and free services that the Company offers.

M&V Plan

The EM&V Contractor may perform M&V activities to confirm the savings being realized through the Commercial Services program.

Approach

The EM&V Contractor may provide the plans for performing the M&V activities for the Commercial Energy Services Program. The choices for procedures that may be used to perform the M&V activities may be informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements may be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values may be developed.
- Description of how realization rates may be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.

- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor may prepare a report on the analysis and the verified energy impacts.

Sample Selection

M&V sampling may provide for a program-level energy savings determination that achieved ±7.88 percent precision at the 90 percent confidence level.

As a frame for selecting the sample sites, the EM&V Contractor may use lists that NV Energy can compile. The EM&V Contractor may conduct a telephone survey to obtain the completed sample of households. A proportion of the customers that are interviewed by telephone may also be visited on-site to collect primary data on pump size and hours of operation.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Energy Savings Curves

The energy savings curves for this program were created by first developing energy savings curves for a representative sample of the projects that were completed in 2017. A program level curve was then created by weighting each of the project level curves by the associated energy savings with that project to create a weighted average energy savings curve for the program.

For each program participant in the M&V sample, a unique daily operating schedule is identified. For some projects, the unique daily operating schedule is year-round or non-seasonal, there is no “summer” versus “winter” season; for other projects, and the unique daily operating schedule varies by season or by month.

For each of the 24 hours per day, the measure-specific schedule is assigned a specific fraction corresponding to the average usage rate during the specific hour. For example, a value of unity

(1.0) is assigned for any hour in which the equipment operated 100 percent of the hour; a null value (0.0) is assigned if the equipment is not on at all during the hour; or a value of 0.5 is assigned for any hour in which the equipment operated an average of 50 percent of the hour.

The measure-specific schedules are developed from primary data. Whenever possible, or deemed necessary, loggers were installed at sites with highly variable schedules. The data collected from the loggers could then be used to corroborate information collected through site interviews. Schedules for sites with fixed operating hours (24/7 operation, for example) were determined through site interviews.

ADM maintains and continuously refines a library of energy savings curves that may be used for cost effectiveness calculations, potential studies (especially regarding peak demand reduction potentials), and avoided sales calculations. The first set of energy savings curves, developed in 2010, were heavily reliant on secondary sources. In particular, ADM normalized end-use load shapes from the California Commercial End Use Survey to characterize impacts of the Sure Bet Commercial Retrofit Program. In past program years, ADM has used primary data to supplement CEUS-derived shapes. However, in Program year 2016, sufficient primary data was collected that allowed ADM to generate site specific shapes at all sampled sites. Thus, CEUS-derived shapes were no longer required.

For lighting projects, ADM has developed a spreadsheet-based tool that calculates and develops:

- Primary energy impacts from lighting and lighting controls upgrades in accordance to a site-specific operating schedule or from on-site metering.
- Secondary energy impacts from heating and cooling interactions in accordance to site-specific factors such as HVAC system efficiency, heating and cooling energy balance points, and fractions of energy radiated by interior lighting that “promptly” escape the building. These secondary impacts also include potential increases in natural gas or heating energy usage due to more efficient lighting.
- Project specific energy savings curves.

The lighting calculator improves the specificity of heating and cooling interactive factor (HCIF) calculations and also increases M&V transparency. It is expected that continuing use of this tool for M&V purposes will generate a Nevada-specific catalogue of lighting end-use curves that will surpass the CEUS project in sample size and specificity.

ADM’s sampling approach ensures that primary data are available for the most significant projects. All projects above a certain threshold in annual kWh savings are sampled with certainty. As a result of this sampling approach, primary data are available to inform the energy savings curves that have the largest contributions to the overall program savings.

The assignment of energy savings curves to specific measures, projects, or groups of projects for nonresidential programs is a complex process that is carried out in conjunction with the annual M&V effort. The availability of primary data and the applicability of secondary data are important

considerations in the assignment of energy savings curves to groups of projects. For the 2017 program year, ADM has constructed energy savings curves that are informed, to the greatest extent that is possible and appropriate, with primary data gathered from M&V visits. For all the sampled sites in 2017, both retrofit and new construction, energy savings curves have been developed using primary data collected during the M&V process.

Incremental Costs

Incremental measure cost ("IMC") is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. There are four scenarios, new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement. The base cost is not the same for the four measure types. All four measure scenarios can be present in this Program. In the cases of new construction and replacement at burnout, the base cost is the cost of the code or standard compliant measure and the incremental cost is the efficient measure minus the cost of the baseline measure. In the case of early replacement or controls the base cost is zero, therefore the incremental cost is the full cost of the energy efficient measure. Lighting upgrades are generally considered early replacement as most of the work completed replaces functional but inefficient lighting. Occupancy sensors or light sensors fall under the controls scenario and the incremental cost is the full cost for the controls measures. AC replacements are generally not made solely for energy efficiency considerations and there they are considered replacement on burnout with the incremental costs being the difference in cost between the energy efficient measure and the baseline measure cost.

The incremental cost for this Program is based on a derived unit of 1,000 kWh due to the dozens of measures supported by this Program. The incremental cost in 2017 was the weighted average incremental cost of all of the measures completed in 2017. The incremental cost used in this analysis is included in the input sheet, which is provided at the end of this section.

Incentives

This Program is a rebate program as dollars that support energy efficiency projects are paid directly to the customer to offset out-of-pocked costs. The exception to this process is the direct installed portion of the Program that targets small businesses and energy assessments that are a small component of the program. For direct install measures, Program funds are paid as incentives with the payments made to the direct install contractor. The rebates or incentives are paid after the Program team verifies that the energy efficiency measures have been installed.

This Program employs prescriptive, quasi prescriptive and custom rebates. Rebates are paid on per kWh saved basis. Prescriptive rebates apply for projects with reasonably predictable energy savings and with the rebates based on the kWh saved based on the prescriptive values for the included measures. Quasi prescriptive measures are employed for measures that are more variable than prescriptive measures but still fairly predictable. Quasi prescriptive rebates are adjusted to

match project conditions. Custom rebates are employed for projects where an engineered calculation is required to determine energy savings and for all larger projects.

Rebates and incentives are determined through cost effectiveness testing at the measure level and at the Program level.

Incentives are adjusted during the delivery of the Program in response to the market acceptance of the Program to increase the probability of the Program meeting its energy savings and cost effectiveness goals. The rebate value is included in the input sheet, which is provided at the end of this program data sheet.

Measure Life

The EUL for this Program is 11.5 years as set forth in the M&V Report provided as Technical Appendix DSM-17.

Units

The analysis of this Program has been performed using a derived unit because it includes a multitude of energy efficiency measures. The unit of measure for a derived unit for this Program is based on 1,000 kWh. The derived unit is derived from measures with different unit sizes (e.g. square foot of window film, number of fixtures installed, and watts reduced). Such differences make comparisons and energy efficiency computations by units installed extremely difficult and the entry of all measures in the financial modeling impractical. The derived unit also provides a summary of Program activity in the previous year that forms a sound basis for projecting Program activity in future years.

Savings

Per unit savings are based on a derived unit of 1,000 kWh. As described above a derived unit is used due the multitude of measures with different units of measure that are employed in the program delivery. The savings per unit are included in the input sheet, which is provided at the end of this section.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs” provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the ‘Financial Data’ section of the output sheet.

NPC Commercial Incentives

2017	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$10,915,122	$1,136,660	$3,861,376								
Commercial Incentives				$5,917,086	$44	135,176	1,000	135,176,397	11.7	$181.62	89.0%
Total				$5,917,086	$44	135,176	1,000	135,176,397			

Name:	2017 Commercial Program	**Last Updated:**	5/11/2018 11:39
Customer Sector:	Commercial	**Avg Measure Life:**	11.70
Region :	Vegas	**Energy Savings Curve:**	Commercial_Incentives
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2017	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$48,558,203	$27,498,960	$21,059,243	1.77	$0.028
Total Resource Cost (TRC)	$42,224,524	$27,498,960	$14,725,564	1.54	$0.028
Utility Cost Test (UCT)	$42,224,524	$10,914,690	$31,309,835	3.87	$0.011
Participant Cost Test (PCT)	$92,217,671	$24,550,665	$67,667,006	3.76	$0.022
Ratepayer Impact (RIM)	$42,224,524	$87,722,596	($45,498,071)	0.48	$0.088
Societal Cost (SCT)	$51,318,766	$27,498,960	$23,819,807	1.87	$0.028

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$10,914,690	$0	$0	$10,914,690
Electric Benefits ($)	$4,014,185	$0	$0	$42,224,524
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	125,083,375	0	0	1,463,475,466
Critical Peak Hour Demand (kW)	17,102	0	0	15,221
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	10,234,739	0	0	119,546,349
Total On Peak Hours (%)				8.17%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	89.0%		

NPC Commercial Program

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$14,500,000	$2,611,000	$4,044,397								
Commercial measures				$7,844,603	$48.69	161,100	1,000	161,100,000	11.7	$181.62	90.0%
Total				$7,844,603		161,100	1,000	161,100,000			

NPC Commercial Program

2020	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$14,500,000	$2,609,500	$4,069,750								
Commercial measures				$7,820,750	$51.25	152,600	1,000	152,600,000	11.7	$181.62	90.0%
Total				$7,820,750		152,600	1,000	152,600,000			

NPC Commercial Program

2021	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$15,000,000	$2,703,660	$4,069,750								
Commercial measures				$8,226,590	$52.10	157,900	1,000	157,900,000	11.7	$181.62	90.0%
Total				$8,226,590		157,900	1,000	157,900,000			

Name:	2019-21 Commercial Program	**Last Updated:**	5/14/2018 13:35
Customer Sector:	Commercial	**Avg Measure Life:**	11.70
Region :	Vegas	**Energy Savings Curve:**	Commercial_Incentives
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$161,161,777	$79,039,392	$82,122,385	2.04	$0.028
Total Resource Cost (TRC)	$146,510,707	$79,039,392	$67,471,315	1.85	$0.028
Utility Cost Test (UCT)	$146,510,707	$34,881,332	$111,629,375	4.20	$0.012
Participant Cost Test (PCT)	$257,962,332	$67,998,343	$189,963,989	3.79	$0.022
Ratepayer Impact (RIM)	$146,510,707	$250,006,982	($103,496,275)	0.59	$0.089
Societal Cost (SCT)	$170,882,444	$79,039,392	$91,843,052	2.16	$0.028

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$14,500,000	$14,500,000	$15,000,000	$44,000,000
Electric Benefits ($)	$5,121,346	$5,270,042	$6,052,306	$146,510,707
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	150,746,329	142,792,612	147,751,989	5,163,103,792
Critical Peak Hour Demand (kW)	18,202	17,241	17,840	53,283
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	12,332,158	11,681,486	12,087,199	421,756,443
Total On Peak Hours (%)				8.17%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	90.0%		

Sierra Pacific Power Company Commercial Program

2017 Results

In the 2017 program year the Program achieved 50,803,353 kWh in savings or 134 percent of its energy savings target while only expending 96.2 percent of the approved budget.

The Program achieved a TRC ratio of 1.88 for 2017. Prescriptive and custom lighting measures accounted for 79 percent of the annual kWh claimed in 2017 with the largest measures being LED lighting retrofits. The program supported 311 commercial energy efficiency projects including 18 projects for 17 non-profit agency grantees in 2017.

Budget Variance: The Program team was able to achieve exceptional value for customers as the program achieved 113 percent of the energy savings goal while expending 32 percent over the budget. Three factors contributed to this level of program performance. The first is that the competitive bidding process employed by the Company resulted in a very cost effective contract. The second factor is the incentive strategy implemented for the program designed to enable more customers to participate in the program. The customers are eligible to receive incentive funding up to 50 percent of their total project cost then the project is tiered, which is dependent upon the total amount of incentive the customer has received for the program year.

Energy and Demand Variance: The Program attained 134 percent of the approved energy savings target because of the Program's actual measure mix and a high level of customer participation. Because the program design allows for tiering of rebates to distribute the dollars more evenly across all customer segments, several large projects achieved significant savings at a lower cost per kWh as compared to other projects. In addition, the program limits rebates to be no more than 50 percent of total project cost. Because of this design, the measure mix of actual projects achieved a higher verified savings in part because incremental pricing for more efficient measures continued to decline, allowing for more savings at a lower cost. The demand savings are generally proportional to the energy savings.

The Program maintained proactive customer satisfaction by tracking substantive communications with customers and trade allies. By doing this the Program was able to recognize issues that needed immediate attention, which were resolved quickly. The tracking and documentation of these interactions also enabled the team to quickly identify patterns that prompted program rules or operating procedure changes. As energy efficiency projects were completed throughout the year customers were requested to complete a follow-up questionnaire. The questionnaire inquired on the customer's overall experience, if they had a clear understanding of the services offered, ease of application process, interactions with the staff and quality of the technical and customer support.

Measurement & Verification

The M&V report titled Commercial Energy Services Program was performed by ADM and is provided in the Technical Appendix DSM-18. The report provides evaluation results of the 2017 Program. This section provides a summary of ADM's results and findings from the M&V report.

Lessons Learned & Recommendations

The following section recaps lessons learned in 2017, that provide guidance for the design and delivery of commercial energy services in future periods and indicates how the lessons learned will be leveraged to modify the design or delivery of commercial energy services in future periods.

- Program administration cost could be reduced if there were more reliance on established and agreed upon deemed measure saving to establish consistent and transparent savings for qualified energy efficiency measures. For over 10 years the program has calculated and documented savings for installed or retrofitted measures establishing verified data supporting claimed measure savings. Consideration should be given to review the potential of leveraging the years of collected and validated data on measure savings to support the development of deemed savings tables to expedite program measure and verification and providing better service to customers. Once such standards are established for energy efficiency measures the program would benefit from:
    - Higher volume of efficiency measures can be implemented with low variability in results.
    - Fewer resources are required for delivery of energy efficiency services.
    - Fewer administrative costs are required for project completion.
    - Greater transparency and consistency is achieved in energy efficiency service delivery.
    - An annually updated TRM provides accurate and up-to-date market data and technology information.

  Based on the perceived program value and its cost effectiveness this strategy presents a review or study of this evaluation methodology should take place in advance of the 2019 program start.

- The integration of energy efficiency and demand management remains the next logical step to provide customers a holistic approach to smartly managing their energy consumption. The commercial energy services team continued in 2017 to leverage the Contractor Network and existing customer base established by the program over the years to initially promote the integrated energy efficiency and demand management concept to achieve market

transformation. These efforts will continue in 2018. Direct install contractors and controls contractors will continue to be utilized to expand market penetration.

- To increase the awareness of energy efficiency and demand management throughout the service territory the commercial energy services team will continue to host smaller venues targeted for areas such as Winnemucca and Elko. In addition a marketing campaign was implemented that included email blasts, radio, print and Pandora advertising. It is recommended that these communications also be deployed in 2018.

- The continuation of the free energy facility assessment service is still popular among the small and medium customers who do not have the budget to accommodate facility evaluation. The enhanced free energy facility assessment report includes detailed information regarding the recommended technology and a measure summary table of the estimated energy savings and associated Company incentives. In 2018 improvements will include streamlining of the reports by standardizing the reports through the implementation of supplemental software.

- American Society of Heating, Refrigeration and Air-Conditioning Engineer level 2 audits designed to assist in identifying non-lighting projects that produce deeper energy savings are available to qualified contractors to provide the service on behalf of Commercial Energy Services. These contractors are also listed as part of the Companies' contractor network on the program website.

- Customer feedback is a critical element of commercial energy services to enable continuous improvement that will increase program participation and customer satisfaction. Commercial energy services plans to implement the following actions in response to customer feedback:

    1. Improve the Company brand and active management of the Contractor Network that includes contractor visits and ride-alongs. The purpose of the contractor visits is to discuss any barriers the contractor is experiencing to promote commercial energy services and what the team can do to provide improved support. Contractor ride-alongs are to ensure the contractor is promoting commercial energy services properly to Company customers.

    2. The Contractor Network is a key component in helping commercial energy services promote energy efficiency and demand management. The Company plans to add value to contractors who join the Contractor Network by providing them a tool kit, which may include Company branded pens, notebooks, portfolio, and clip board, copy of all materials, case studies, fact sheets and talking points to promote commercial energy services. Better educating the contractors and instilling pride in promoting commercial energy services will be a continued focus in future years. Each contractor within the Contractor Network was assigned as specific program staff member as their primary point of contact to help contractors make the most of the Program.

3. Reducing the wait time for customers and contractors to receive their incentive payment was identified as an improvement area. Contractors and customers will continue to receive their incentive payment 50 percent faster as a result of a streamlined project approval and accounting process.

2018 Status

The 2018 Program operates in a similar manner as the 2017 implementation. Many of the commercial demand response technologies are now included in the customer outreach that the Program implementation contractor is responsible for, providing economies of scale for market penetration. In addition, the Non Profit Agency Grants component will be included as part of Commercial Energy Services.

Providing customers technical assistance in all facets of the Program was also increased for the 2018 services. Commercial Energy Services support customers with engineering assistance, project management, application aid as well as help identifying potential measures for customers. The 2018 offering includes an increased emphasis on outreach, customer service, and education and training in 2018 to drive increased program participation and customer satisfaction.

The program offers free energy assessments for commercial customers and during 2018 the program will be developing an automation tool to enhance assessment reporting and reduce the level of effort involved in report generation. This new tools should allow the program to serve more customers with their individual building assessments.

The Program has reserved $50,000 for an Energy Project Manager trial. Working with local customers, this position is a co-funded staff resource at the customers' facility to develop and manage energy projects. The Company will work with these customers to develop a comprehensive energy plan that will garner a set amount of energy savings for a 12-month period.

2019-2021 Plan

The Company recommends the Commission approve the proposed Program during the Action Plan Period with a budget of $5,000,000 and a target of 52,600,000 kWh in 2019, and a budget of $5,300,000 and a target of 55,800,000 in program year 2020, and a budget of $5,600,000 and a target of 58,900,000 in program year 2021.

The Company proposes the program be continued in a similar market delivery which offers increased technical assistance, commercial energy education, energy and demand savings opportunity assessment services, and rebates for energy efficiency measures implemented for retrofit and new construction projects.

An extensive portfolio of products is planned for commercial services in 2019. The product list will include lighting, motors, drives, refrigeration, retro-commissioning as well as cooling efficiency products. These products continue to penetrate their market segments and work to

become larger contributors to the portfolio. Based on anticipated lighting standard changes planned for 2020 there will be program adjustments to accommodate the new lighting baseline standards that will affect program lighting savings and lighting's overall impact to the program measure mix.

The program will continue to reserve specific funding for a Strategic Energy Project Manager. Working with local customers, this position is a co-funded staff resource at the customers' facility to develop and manage energy projects. The Company will work with the customers to develop a comprehensive energy plan that will garner a set amount of energy savings for a 12-month period.

The Program's outreach strategy will emphasize maintaining and strengthening key relationships with customers and trade allies to expand customer awareness and participation. Education and training events involved the use of various communication channels to promote customer awareness on the available of services. The key message focused on how the Company continues to be a reliable resource for energy efficiency information and assistance through the incentive services and free training available. The commercial energy services team will implement a new customer engagement strategy that significantly increased customer participation and raised customer awareness of incentives and services offered under the program. Major Account Executives in conjunction with the Commercial Energy Services Contractor Network continued to be key channels for outreach and support for new and existing customers.

Outreach communications channels included the commercial energy services website, the electronic quarterly newsletter, monthly electronic education and training announcement, presentations to industry associations and local chambers of commerce, and paid advertisement channels along with relationships established and maintained by the northern Nevada commercial energy services team of engineers, outreach staff and administrators.

The Program's website provides guidance and resources for customers, contractors and vendors to engage in the services provided. Incentive applications, policies and procedures, case studies, and promotional materials were all downloadable from the website. The website also provides a list of free education and training courses available to educate customers and contractors on the latest energy-efficiency advances. Attendees conveniently registered for classes and events online. Education and outreach materials, other service information, including eligibility criteria, project components and resources were also available for view and download on the website.

The Contractor Network is the name given to the group of contractors that have experience working as part of commercial energy services as demonstrated by the completion of at least one project. All applications for the Contractor Network have been verified by the commercial energy services team to ensure they have submitted the required application and references. These approved contractors have been trained on the processes and procedures of commercial energy services. The Contractor Network facilities reaching commercial customers of every size to raise customer awareness about energy efficiency options offered by commercial energy services. Well-trained contractors recruited participants, helped speed the application process, improved program efficiency while enhancing the customer's experience.

The Commercial Energy Services team will continue to educate customers through monthly lunch-and-learn seminars on various topics such as Online application, non-profit agency grants, small business program, chiller efficiencies, LED lighting, heating, refrigeration, ventilation and cooling, motor, pumps and compressed air, integrated energy efficiency and demand response technology. Networking opportunities at industry events played a pivotal role in developing contacts and identifying decision-makers.

The Program will continue to provide education and training workshops available for commercial customers to increase energy efficiency awareness and incentive participation, while improving the overall customer perception of the Company. The Program implemented a number of education and training events to provide building operators and facility manager's tools to aid and manage their facilities more efficiently. Customers who attend a monthly workshop are better equipped to identify energy efficiency opportunities within their existing facilities, with a better understanding of the available energy efficient incentives and free services that the Company offers.

M&V Plan

The EM&V Contractor may perform M&V activities to confirm the savings being realized through the Energy Efficient Pools and Spas program that Nevada Power may be implementing in the 2019 program year.

Approach

The EM&V Contractor may provide the plans for performing the M&V activities for the Commercial Energy Services Program. The choices for procedures that may be used to perform the M&V activities may be informed by standard technical references, such as the IPMVP and the National Action Plan Model Energy Efficiency Program Impact Evaluation Guide.

The following elements may be included in the M&V planning:

- Descriptions of energy and demand savings metrics.
- Identification of the need for *ex ante* savings measures and how their values may be developed.
- Description of how realization rates may be determined.
- Description of the methodologies, procedures and data tracking systems to be used to conduct the M&V work, includes data gathering, sampling and analysis methods.
- Description of other activities to be conducted in support of M&V related activities, such as market baseline assessments and assessing *ex ante* savings values.

The EM&V Contractor may prepare a report on the analysis and the verified energy impacts.

Sample Selection

M&V sampling may provide for a program-level energy savings determination that achieved ±7.87 percent precision at the 90 percent confidence level.

As a frame for selecting the sample sites, the EM&V Contractor may use lists that the Companies can compile. The EM&V Contractor may conduct a telephone survey to obtain the completed sample of households. A proportion of the customers that are interviewed by telephone may also be visited on-site to collect primary data on pump size and hours of operation.

The Program provides education and training workshops available for commercial customers to increase energy efficiency awareness and incentive participation, while improving the overall customer perception of the Company. The Program implemented a number of education and training events to provide building operators and facility manager's tools to aid and manage their facilities more efficiently. Customers who attend a monthly workshop are better equipped to identify energy efficiency opportunities within their existing facilities, with a better understanding of the available energy efficient incentives and free services that the Company offers.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Output sheets provide the results for the cost-benefit analysis. Financial assumptions are provided in the DSM Narrative, Section 4. The financial analysis results were calculated based upon the information contained in this Program data sheet and the materials referenced herein. The key inputs used in the creation of these results are described below.

Energy Savings Curves

The energy savings curves for this program are created by first developing energy savings curves for a representative sample of the projects that were completed in 2017. A program level curve was then created by weighting each of the project level curves by the associated energy savings with that project to create a weighted average energy savings curve for the program.

For each program participant in the M&V sample, a unique daily operating schedule is identified.

For some projects, the unique daily operating schedule is year-round or non-seasonal (i.e., there is no "summer" versus "winter" season); for other projects, the unique daily operating schedule varies by season or by month.

For each of the 24 hours per day, the measure-specific schedule is assigned a specific fraction corresponding to the average usage rate during the specific hour. For example, a value of unity (1.0) is assigned for any hour in which the equipment operated 100 percent of the hour; a null value (0.0) is assigned if the equipment is not on at all during the hour; or a value of 0.5 is assigned for any hour in which the equipment operated an average of 50 percent of the hour.

The measure-specific schedules are developed from primary data. Whenever possible, or deemed necessary, loggers were installed at sites with highly variable schedules. The data collected from the loggers could then be used to corroborate information collected through site interviews. Schedules for sites with fixed operating hours (24/7 operation, for example) were determined through site interviews.

ADM maintains and continuously refines a library of energy savings curves that may be used for cost effectiveness calculations, potential studies (especially regarding peak demand reduction potentials), and avoided sales calculations. The first set of energy savings curves, developed in 2010, were heavily reliant on secondary sources. In particular, ADM normalized end-use load shapes from the California Commercial End Use Survey (CEUS[6]) to characterize impacts of the Sure Bet Commercial Retrofit Program. In past program years, ADM has used primary data to supplement CEUS-derived shapes. However, in Program year 2016, sufficient primary data was collected that allowed ADM to generate site specific shapes at all sampled sites. Thus, CEUS-derived shapes were no longer required.

For lighting projects, ADM has developed a spreadsheet-based tool that calculates and develops:

- Primary energy impacts from lighting and lighting controls upgrades in accordance to a site-specific operating schedule or from on-site metering.
- Secondary energy impacts from heating and cooling interactions in accordance to site- specific factors such as HVAC system efficiency, heating and cooling energy balance points, and fractions of energy radiated by interior lighting that "promptly" escape the building. These secondary impacts also include potential increases in natural gas or heating energy usage due to more efficient lighting.
- Project specific energy savings curves.

The lighting calculator improves the specificity of heating and cooling interactive factor (HCIF) calculations and also increases M&V transparency. It is expected that continuing use of this tool for M&V purposes will generate a Nevada-specific catalogue of lighting end-use curves that will surpass the CEUS project in sample size and specificity.

ADM's sampling approach ensures that primary data are available for the most significant projects[7]. All projects above a certain threshold in annual kWh savings are sampled with certainty. As a result of this sampling approach, primary data are available to inform the energy savings curves that have the largest contributions to the overall program savings.

The assignment of energy savings curves to specific measures, projects, or groups of projects for nonresidential programs is a complex process that is carried out in conjunction with the annual M&V effort. The availability of primary data and the applicability of secondary data are important considerations in the assignment of energy savings curves to groups of projects. For the 2016 program year, ADM has constructed energy savings curves that are informed, to the greatest extent that is possible and appropriate, with primary data gathered from M&V visits. For all the sampled sites in 2016, both retrofit and new construction, energy savings curves have been developed using primary data collected during the M&V process.

More information regarding the development of the energy savings curves are provided on the 2016 M&V Report, Technical Appendix DSM-18.

Incremental Costs

Incremental measure cost ("IMC") is the cost of the energy efficient measure minus the cost of the baseline measure. Establishing the appropriate baseline generally defines the incremental cost. There are four scenarios, new construction, controls, replacement on burnout (failure, natural or on burnout or diminishing functionality) and early replacement. The base cost is not the same for the four measure types. All four measure scenarios can be present in this Program. In the cases of new construction and replacement at burnout, the base cost is the cost of the code or standard compliant measure and the incremental cost is the efficient measure minus the cost of the baseline measure. In the case of early replacement or controls the base cost is zero, therefore the incremental cost is the full cost of the energy efficient measure. Lighting upgrades are generally considered early replacement as most of the work completed replaces functional but inefficient lighting. Occupancy sensors or light sensors fall under the controls scenario and the incremental cost is the full cost for the controls measures. AC replacements are generally not made solely for energy efficiency considerations and there they are considered replacement on burnout with the incremental costs being the difference in cost between the energy efficient measure and the baseline measure cost.

The incremental cost for this Program is based on a derived unit of 1,000 kWh due to the dozens of measures supported by this Program. The incremental cost in 2017 is the weighted average incremental cost of all of the measures completed in 2017. The incremental cost used in this analysis is included in the input sheet, which is provided at the end of this section.

Incentives

This Program is a rebate program as dollars that support energy efficiency projects are paid directly to the customer to offset out-of-pocked costs. The exception to this process is the direct installed

portion of the Program that targets small businesses and energy assessments that are a small component of the program. For direct install measures, Program funds are paid as incentives with the payments made to the direct install contractor. The rebates or incentives are paid after the Program team verifies that the energy efficiency measures have been installed.

This Program employs prescriptive, quasi prescriptive and custom rebates. Rebates are paid on a per kWh saved basis. Prescriptive rebates apply for projects with reasonably predictable energy savings and with the rebates based on the kWh saved based on the prescriptive values for the included measures. Quasi prescriptive measures are employed for measures that are more variable than prescriptive measures but still fairly predictable. Quasi prescriptive rebates are adjusted to match project conditions. Custom rebates are employed for projects where an engineered calculation is required to determine energy savings and for all larger projects.
Rebates and incentives are determined through cost effectiveness testing at the measure level and at the Program level.

Incentives are adjusted during the delivery of the Program in response to the market acceptance of the Program to increase the probability of the Program meeting its energy savings and cost effectiveness goals. The rebate value is included in the input sheet, which is provided at the end of this program data sheet.

Measure Life

The EUL for this Program is 13.5 years as set forth in the M&V Report provided as Technical Appendix DSM-18.

Units

The analysis of this Program has been performed using a derived unit because it includes a multitude of energy efficiency measures. The unit of measure for a derived unit for this Program is based on 1,000 kWh. The derived unit is derived from measures with different unit sizes (e.g. square foot of window film, number of fixtures installed, and watts reduced). Such differences make comparisons and energy efficiency computations by units installed extremely difficult and the entry of all measures in the financial modeling impractical. The derived unit also provides a summary of Program activity in the previous year that forms a sound basis for projecting Program activity in future years.

Savings

The per unit savings are based on a derived unit of 1,000 kWh. As described above a derived unit is used due the multitude of measures with different units of measure that are employed in the program delivery. The savings per unit are included in the input sheet, which is provided at the end of this section.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

SPPC Commercial Incentives

2017	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$4,425,553	$547,351	$1,367,211								
Commercial Incentives				$2,510,991	$49	50,803	1,000	50,803,353	13.5	$179.55	72.0%
Total				$2,510,991	$49	50,803	1,000	50,803,353			

Name:	2017 Commercial Program	**Last Updated:**	5/11/2018 10:51
Customer Sector:	Commercial	**Avg Measure Life:**	13.70
Region :	Reno	**Energy Savings Curve:**	Commercial_Incentives
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2017	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$19,850,171	$9,185,304	$10,664,866	2.16	$0.025
Total Resource Cost (TRC)	$17,261,018	$9,185,304	$8,075,713	1.88	$0.025
Utility Cost Test (UCT)	$17,261,018	$4,425,754	$12,835,264	3.90	$0.012
Participant Cost Test (PCT)	$35,925,682	$9,121,679	$26,804,003	3.94	$0.018
Ratepayer Impact (RIM)	$17,261,018	$28,484,187	($11,223,169)	0.61	$0.078
Societal Cost (SCT)	$20,964,247	$9,185,304	$11,778,943	2.28	$0.025
*Includes rebates paid to freeriders					

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$4,425,754	$0	$0	$4,425,754
Electric Benefits ($)	$1,425,145	$0	$0	$17,261,018
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	39,037,107	0	0	534,808,364
Critical Peak Hour Demand (kW)	6,768	0	0	4,873
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	1,660,273	0	0	91,346,058
Total On Peak Hours (%)				17.08%
*Savings in this section are adjusted for line loss and net-to-gross				

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	15.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	72.0%		

SPPC Commercial Incentives

2019	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$5,000,000	$900,000	$1,487,358								
Commercial Incentives				$2,612,642	$49.67	52,600	1,000	52,600,000	12.7	$179.55	74.0%
Total				$2,612,642	$50	52,600	1,000	52,600,000			

SPPC Commercial Incentives

2020	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$5,300,000	$955,000	$1,519,846								
Commercial Incentives				$2,825,154	$50.63	55,800	1,000	55,800,000	12.7	$179.55	74.0%
Total				$2,825,154	$51	55,800	1,000	55,800,000			

SPPC Commercial Incentives

2021	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Rebates per unit	Number of Units	Annual Savings (kWh/unit)	Total Annual Savings (kWh/Year)	Effective Useful Life	Incremental Measure Cost per Unit	Net-to-Gross
Measures	$5,600,000	$1,008,000	$1,611,660								
Commercial Incentives				$2,980,340	$50.60	58,900	1,000	58,900,000	12.7	$179.55	74.0%
Total				$2,980,340	$51	58,900	1,000	58,900,000			

Name:	2019-21 Commercial Program	**Last Updated:**	5/14/2018 13:55
Customer Sector:	Commercial	**Avg Measure Life:**	12.70
Region :	Reno	**Energy Savings Curve:**	Commercial_Incentives
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$64,303,310	$26,270,969	$38,032,341	2.45	$0.027
Total Resource Cost (TRC)	$58,457,555	$26,270,969	$32,186,586	2.23	$0.027
Utility Cost Test (UCT)	$58,457,555	$13,093,589	$45,363,965	4.46	$0.013
Participant Cost Test (PCT)	$93,286,275	$24,736,883	$68,549,392	3.77	$0.019
Ratepayer Impact (RIM)	$58,457,555	$76,997,519	($18,539,964)	0.76	$0.079
Societal Cost (SCT)	$67,916,766	$26,270,969	$41,645,797	2.59	$0.027

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$5,000,000	$5,300,000	$5,600,000	$15,900,000
Electric Benefits ($)	$1,600,324	$1,824,706	$2,118,513	$58,457,555
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	41,540,645	44,067,833	46,516,046	1,677,981,426
Critical Peak Hour Demand (kW)	5,932	6,293	6,643	18,868
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	1,765,480	1,872,886	1,976,935	286,601,704
Total On Peak Hours (%)				17.08%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	74.0%		

Commercial Demand Response Program

The Commercial Demand Response ("DR") Program ("Program" in this section) recruits customers into an ongoing service in which the customers allow the Company to temporarily interact with their end-use loads such as air conditioning ("AC") and lighting on hot summer days when system peak loads occur or during emergency conditions in order to help the Company reduce peak demand. This is accomplished through demand response events in which devices controlling customers' end-use loads receive signals from utility demand response systems to reduce energy consumption. These events shift a significant amount of energy consumption outside of the peak demand hours. In return for their participation in these events, the Program delivers a package of enabling technology that helps customers save energy and money all year round. The Company's primary strategy for engaging customers in demand response has been to provide customers with technologies and services that create tangible operational and energy efficiency benefits.

With respect to electricity grid benefits, the DR Program is currently used for 10-minute operating reserves. It can also be strategically dispatched by location to reduce congestion on the distribution system or in response to a distribution system emergency. The system can operate in much the same fashion as a supply-side peaking resource, but also provides an added suite of customer, environmental and locational dispatch benefits. Growth of demand response resources and distributed energy resource operational capabilities will allow the Company to more easily accommodate an ever increasing amount of renewable energy on the grid.

Nomenclature and Structure

Program components and budget categories are broken down into "Build" and "Manage" activities. This program data sheet provides the 2017 historical results, current 2018 activity and the 2019-2021 plan for Commercial Build and Commercial Manage:

> **Commercial Build:** The goal of the Commercial Build component is to expand the capacity of the commercial programs by recruiting additional customers to participate in the DR Program and to support the customers recruited in that program year. For program year 2017, the Commercial Build component of the Program included only the customers who were added to the DR system between January 1, 2017 and December 31, 2017 and the associated costs, demand savings, and energy savings. The Commercial Build component enables the Company to track and analyze the costs and benefits of adding new customers and capacity to the DR system each year.
>
> **Commercial Manage:** The goal of the Commercial Manage component is to serve those commercial customers with completed enrollments in the Program in all prior years, regardless of the technology that was deployed to enable them to participate. This component works to retain customers and maintain the magnitude of the capacity installed in prior years. The Commercial Manage component will provide ongoing program services for all customers who enrolled in the DR program in prior years. In 2019, the Commercial

Manage component will include all commercial customers with completed enrollments in the Program prior to 2019

Demand Response Management System

The DRMS is an enterprise software system that manages a wide range of demand response programs and provides the functionality to implement peak time rebate tariff riders such as Schedule OLM-AS, Optional Load Management and Automation Services, and potential future dynamic rates such as critical peak pricing rates. The DRMS helps automate business processes such as: customer enrollment, device management, device provisioning, workforce management related to device installation and service, demand response event and dispatch management, event notifications, event forecasting, and a wide range of reporting functions. It is the system of record for customer participation in demand response programs.

The DRMS has a series of application programming interfaces that support data transfers with external applications, such as the demand response customer web portals that provide customers with program and incentive information. It is integrated to a number of other major enterprise systems such as: the Meter Data Management System; the Regional Network Interface; the Companies' customer billing system (Banner), and load forecasting (Tesla) and tracking (Pi) systems.

The DRMS supports the entire portfolio of DR program components. The proposed Program includes budget allocations and scope of work related to DRMS system maintenance and product upgrades and customer web portal enhancements.

Nevada Power Company Commercial Demand Response Program

2017 Results

By the end of 2017, the Commercial DR program provided 19.43 MW of demand reduction. This was comprised of 2.90 MW from the Commercial Build component and 16.53 MW from the Commercial Manage component.

In 2017, the Company called 40 economic DR events for commercial sites installed with Carrier or Honeywell thermostats (DP2 and DP8 legacy devices), 23 economic events for commercial sites installed with Pelican thermostats, Encycle demand limiting controls, and Universal Device gateways, and 29 economic events for the pilot technologies. This was part of an overall Company strategy to employ demand response strategies to reduce costs for customers and to better integrate demand response resources with the overall dispatch of supply-side resources. The approval of Schedule OLM-AS, Optional Load Management and Automation Services, on June 3, 2013 resulted in event participation incentives that are more closely tied to the marginal cost of

electricity generation.[27] The tie with the marginal cost of electricity generation increased the value of the demand response system by increasing the number of opportunities the system could be operated economically.

The following sections discuss the variances in actual results to target results for the Commercial Demand Response program components.

Commercial Manage

Demand Savings: The installed capacity of the Commercial Manage component under the Program was determined to be 16,529 kW by the end of 2017 in the M&V report, lower than its 27,184 kW target with a negative variance of 36.45 percent. A total of 6,073 devices remained in the commercial manage program in 2017. This variance was due to the higher Non Responsive Devices ("NRD") percentage and the decrease in kW factor for DP2 and DP8 over the previous year. This lowered both kW and kWh savings over last year; relative to the device population.

Energy Savings: In 2017, energy savings were delivered by networked thermostats, demand limiting controls and pilots. The program realized energy savings of 7,677,895 kWh, which exceeded the energy savings target of 4,420,000 kWh by 89.41 percent. The increase in energy savings is attributed primarily to the significant savings achieved from the commercial sites installed with Fitness Test technology, changing from the projected potential annual energy savings of 638, 868 kWh in the 2016 EM&V report to the verified energy savings of 5,526,222 kWh in 2017.

Energy Saving Building IQ: Of the fourteen buildings enrolled in Building IQ ("BIQ"), only four were controlled for greater than 65 percent of the year. Eight of the remaining buildings only participated in a series of three test demand response events intended to better calibrate the load shed in the building. One of the test events yielded successful load shed without creating comfort issues, another test event created occupant comfort issues, and a third test event increased demand rather than decreasing it. Due to the limited energy savings and demand response capacity, the BIQ program was cancelled effective December 31, 2017. This technology was ineffective and results were inconclusive.

Cost Variance: The program spent $895,044 or 77.8 percent of the budget. Expenditures on the commercial manage component were much lower than budget projections The original approved budget of $1,150,000 projected enrollments of a much larger number of customers in 2016 than was actually achieved. The Manage component achieved a TRC of 2.50 in 2017.

[27] Nevada Power's Advice letter No. 421, Replace Optional Load Management Schedule OLM with Optional Load Management and Automaton Services Rider Schedule OLM-AS, Docket No. 12-11028, Order issued June 3, 2013.

Commercial Build

Savings: The installed capacity of the Commercial Build component was 2.87 MW of capacity by year end, lower than its 5 MW target with a 42.1 percent variance. The goal for 2018 and the proposed target for 2019 remained the same and approved as part of the Company's 2017 DSM Annual Update Report Docket No. 16-07007 to reflect the slower than expected growth of this program.

Energy Savings: In 2017, energy savings were delivered by networked thermostats, demand limiting controls and pilots. The program realized energy savings of 1,310,511 kWh, which fell short the energy savings target of 2,700,000 kWh by 51.5 percent.

Cost Variance: The Program spent $1,470,947, or 98.06 percent of its budget. Expenditures included additional outreach and implementation contractor cost to achieve higher installation rates for the technologies offered to small and medium business customers and energy services and customer incentives for the pilot technologies offered to large customers. The Commercial Build component achieved a TRC of 1.65 for 2017.

Measurement & Verification

The M&V report was performed by ADM and is provided in the Technical Appendix DSM-19

Lessons Learned and Recommendations

This section presents some key lessons learned from the project implementation in 2017 and prior years.

- The Program will continue to use an implementation contractor to enhance outreach and enrollment activities and provide additional resources for program management and device installation. In 2017, this approach helped increase participation from customers who installed the Pelican brand thermostats by 31.5 percent compared to 2016. The Encycle enrollments decrease by 69.8 percent over 2016 due to a change in leadership at Encycle. Since then, a new relationship with upper management has been established and a plan is being developed to work with Encycle's new leadership.

- The Program began delivering custom performance reports to optimize savings and value for the Pelican thermostats. The reports will assist with improved heating and cooling schedules, identify unreachable thermostats, and indicate long compressor runtimes leading to high energy consumption. A pilot to evaluate the Pelican Pearl, which controls roof top unit economizers, was initiated in 2017. Economizers provide significant energy savings in shoulder and winter months, but lack of visibility in conventional economizer controls leads to a high level of disabled economizers. Installing the Pearl requires a higher level of technical skill than installing the basic thermostat, but the Pelican portal provides visibility and control that is expected to provide cost effective energy savings.

The Program had 12 commercial sites enrolled in the pilot technologies in 2017 that applied a Universal Devices gateway to a traditional energy efficiency measure. The Program will continue assessing similar internet connected integrated measures in 2018 with, pneumatic thermostat retrofits, HVAC thermal storage and net connected water heaters.

- Several pilot programs demonstrated results that enable the measures to be transitioned into the standard program portfolio as prescriptive or custom measures. Pilots are instrumental to define not only the expected savings but also the critical participation criteria necessary to achieve the savings.

- The Program will continue to improve on performing a preliminary assessment early in the demand response season to assess the level of non-responding devices and overrides to direct field services and customer engagement where needed to improve event performance. Preseason efforts will also continue to improved and be addressed at customer premises and by device to prepare for strong event performance.

- A more defined outreach, customer service and installation process for each technology type will be created for 2018 to address process gaps and improve customer service and engagement. This includes defining roles and responsibilities, implementing marketing campaigns, early customer engagement activities, establishing customer service and customer follow-up procedures, increasing customer service bandwidth and increasing installation technician bandwidth. A significant change is a transition from utilizing the trade allies for customer outreach alone instead of installations. This will improve the quality of the installation process and the matching of devices in both the APIs (application portal interfaces) and the DRMS (demand response management system database). This will aid in transparency when performing program impacts by a third party evaluation, monitoring and verification contractor.

- The Program will examine the application to installation timeline to shorten delivery time to the customer. This will include improving inventory management, customer scheduling and installation.

- The significant NRD percentage for the Pelican technology are due to air conditioners turned off by the customer, thermostat settings set at a high temperature, customers that have moved out of the location with new customers moving in without reconnecting the existing thermostats to their internet. The program results may have been further understated due to the installation completed at the customer locations, but not finalized in our demand response management systems (DRMS database) by matching all equipment at the customer location. We have develop reconciliation reports between the Pelican API (Application Portal Interface) and DRMS to insure transparency for EM&V purposes. These reports will be use to insure that the information matches both the Pelican API and the DRMS databases

- The Program will continue to examine the application to installation timeline to shorten delivery time to the customer. This will include improving inventory management, customer scheduling and installation by use of work management systems by projecting installation timelines, material delivery timelines, current inventory levels and establishing minimum inventory levels, these key performance indicators will allow us to accomplish these goals.

2018 Status

In 2018, the Program will continue with the same basic design as implemented in 2017.

Commercial Manage - This Program component continues to focus on managing the commercial customers with completed enrollments and installed technologies prior to 2018. The Program will continue to offer custom reports to assess off-line devices and energy savings opportunities for each participant. The Program will continue to offer on-site training and will initiate web-based training for customers on these reports and other device functionality to help customers maximize their energy savings and control of their facilities. Customers will also receive tools to help communicate the value of demand response events to their business patrons and employees. A preliminary assessment will continue to be performed after the first few demand response events of the season to assess device performance and direct improvements as needed.

Participants in pilots such as advanced refrigeration controls, fitness test and Belimo (energy valve) will be given options to continue participating in demand response in return for cash incentive based on the load drop they provide.

Commercial Build - The Program has promoted and will continue to with three primary offerings to commercial customers: Pelican thermostats; Encycle demand limiting controls; and Universal Gateway devices. The Universal Gateway devices are available to customers through two types of incentives. Customers either qualify for a financial incentive based on actual demand they reduce or energy efficiency technologies in exchange for participation in demand response events through the universal devices. The technologies being tested include custom central plant chiller refrigerant charging and pneumatically controlled thermostats.

Mechanical pneumatic thermostats are an older technology, and one that is very expensive to retrofit. Replacing pneumatic systems requires extensive reworking of all major heating and cooling equipment in a building. The pneumatic thermostat pilot is evaluating a digital pneumatic thermostat that can replace existing mechanical pneumatic thermostats without having to rework all the other equipment, while still providing all the accuracy and data collection a digital system typically provides.

The advanced refrigeration controls pilot completed in 2017, demonstrated the value of measure, and Program will look for opportunities within customer engagements. Implementation contractors specializing in commercial refrigeration can recruit customers from their existing base, as the energy savings and data collection capabilities, when combined with an equipment purchase incentive, provide a quick simple payback. During the pilot, advanced refrigeration controls

demonstrated good energy savings through reduced defrost cycles and fan and compressor run times. Demand response was shown to be very effective with larger commercial freezers, due to the energy storage inherent in freezer design.

The fitness test pilot provided enhanced algorithmic control of a standard central plant and major air handlers, while offering data handling and enhanced control capabilities. The pilot resulted in consumption and demand reductions that justify promoting this type of measure as a custom incentive in the standard commercial program in 2018.

The Belimo energy valve pilot upgraded the air handling unit chilled water control valves at a site, providing a measurable energy savings impact at the central plant. The pilot was concluded in 2017 and results justify promoting the measure as a prescriptive measure in the 2018 commercial program.

The Program will continue to leverage an implementation contractor to reach a greater number of customers. The implementation contractor has a significant amount of outreach staff that can promote both the traditional energy efficiency program measures and the demand response enabling technologies. The implementation contractor promotes the demand response offerings to past energy efficiency program participants who have already demonstrated interest in making improvements to their facility. In addition, a small group of trade allies that provide air conditioning and controls services have been invited to participate in the Program. These contractors will promote the demand response offerings to their existing customer base providing added value to both the customer and the contractor.

Upon approval and definition, this program will attempt to address low income areas by zip code. The businesses that will be targeted may be 501(c)3.

2019 – 2021 Plan

The Company recommends the Commission approve the proposed Commercial Demand Response Program during the Action Plan Period 2019-2021 with a budget of $2,500,000 in 2019, and a budget of $2,600,000 in 2020, and a budget of $2,700,000 in program year 2021. The Commercial Build component of the Program will have a budget of $1,700,000 and a target of 1,000,000 kWh in program years 2019-2021. The Commercial Manage component of the Program will have a budget of $800,000 and a target of 10,147,600 kWh in program years 2019, a budget of $900,000 and a target of 10,147,600 kWh in program years 2020, and a budget of $1,000,000 and a target of 10,147,600 kWh in program years 2021.

Commercial Build - The program implemented a new strategy for outreach and recruitment in 2017 and will continue with the current energy efficiency and demand response measure mixes. These measure mixes may change by deploying proven technologies from program development pilots. In 2019 through 2021, we will continue to leverage the implementation contractor for customer outreach. Internal personnel will be leveraged to provide a seamless suite of products and services to business Customers. This will result in program savings, increase quality control, increase coordination of site installation and commissioning, better inventory control and

centralized handling of customer inquiries. This will result in a more economical program and greater customer satisfaction.

The Program continues to promote a variety of product offerings to meet the needs of customers with varying levels of usage from small businesses to large institutions, municipalities, and hotel properties. The Program will continue to offer to commercial customers four primary technologies: Pelican thermostats; Encycle demand limiting controls; Certified Customer Equipment; Add On Glass HVAC Fitness Test; and Universal Gateway devices. Manual demand response will be added to the measure mix, since some customers are unable to overcome information technology firewalls that are blocking community even signals. While the Encycle technology will not be excluded, it will not be a priority in the program mix of measures.

Commercial Manage - This Program component is focusing on managing the commercial customers with completed enrollments and installed technologies prior to the current program year. The program will perform repairs as needed and removals for any customers who no longer wish to participate in demand response. The Program will also provide for software services for installed devices and event participation incentives for the gateway and customer owned equipment. The Program will provide for continued customer education on how to maximize their energy savings through their devices and the benefits of participation in demand response. The budget for Commercial Manage has been reduced based on previous year's results.

M&V Plan

There are no plans to change the quantification methodology from previous years unless a more effective one develops within the industry. The exception will be moving pilot programs from program development to program implementation will require a more robust evaluation, monitoring and verification to establish baseline savings as a larger population begins participating in the Universal Device, Manual Demand Response and Certified Owned Equipment portion of this program. Due to the varying technologies being controlled by the building management systems, capturing savings using whole building analysis with telemetry will be necessary in order to capture savings and reductions.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

Demand response for device populations in the residential and commercial sectors was achieved through the direct load control of energy management devices that employ software-based optimization to reduce energy usage. As such, the programs are expected to achieve energy impacts on both "event" and "non-event" days. ADM developed hourly savings curves for these programs through a combination of methods including energy simulation, analysis of load research data, and M&V. The development of the savings curves are discussed below.

The Commercial Demand Response Program also combines elements of energy efficiency through optimization with direct load control. The energy savings curve developed for the *kW guru*™ inputs are based on actual year hourly savings. A savings curve for each commercial program component and EE or DR are developed for separate *kW guru*™ files. The hourly savings profile for the networked thermostats was investigated and no methodology was identified that could project the actual year savings, so no projection of future year curves was developed.

More detailed information can be found in the M&V report proved in Technical Appendix DSM-19.

Incremental Costs

There is no incremental cost for this Program because there are no out of pocket costs experienced by the customer.

Rebates & Incentives

Program funds paid to the customer do not offset any incremental cost experienced by the customer and therefore this Program is an incentive program. For the Commercial Build component of the Program, the value of the energy savings delivered by Program measures is the largest financial incentive for Program participation.

Measure Life

This Program assumes that it will operate for a period of ten years for Commercial Build and four years for Commercial Manage calculated based on the remaining average life of the devices managed under the Commercial Manage Program. During this period, components that may fail or Program participant that may leave the Program are replaced. The ten year budget for the Build Program and the four year budget for the Manage Program include(s) the cost for these replacements

Units

For the 2017 analysis the actual M&V results were utilized and therefore the unit used was a commercial building.

Savings

Savings are based upon verified M&V results for the Program.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the 'Stakeholders Perspective's and Tests' section of the output sheet. The section 'Utility Savings and Costs" provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Demand Response Commercial - NPC 2017 Manage

Actual 2017	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					6,073	1,264.2546	2.8446	7,677,818	5.00	100.0%
2017	$895,044	$143,204	$751,840	$0						
2018	$1,013,044	$143,204	$751,840	$118,000						
2019	$1,013,044	$143,204	$751,840	$118,000						
2020	$1,013,044	$143,204	$751,840	$118,000						
2021	$1,013,044	$143,204	$751,840	$118,000						

Unit is defined as an average device

Total kW Capacity 17,275 See Tab Device Vintage for detailed calculation

DR Event and EE kWh Savings, kWh per device 1,264.25 Weighted average, see Tab Device Vintage for detailed calculation

Remaining Effective Useful Life, year 5 Weighted average remaing effective useful life is 4.87 years and rounded up to 5 years.

Demand Response - NPC C&I Build

2017	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					1,893	692.2932	2.7218	1,310,511	10	100.0%
2017	$1,470,947	$187,345	$1,343,602	-$60,000						
2018	$285,930	$43,000	$224,000	$18,930						
2019	$285,930	$43,000	$224,000	$18,930						
2020	$285,930	$43,000	$224,000	$18,930						
2021	$285,930	$43,000	$224,000	$18,930						
2022	$285,930	$43,000	$224,000	$18,930						
2023	$285,930	$43,000	$224,000	$18,930						
2024	$285,930	$43,000	$224,000	$18,930						
2025	$285,930	$43,000	$224,000	$18,930						
2026	$285,930	$43,000	$224,000	$18,930						

*Unit is defined as an average device installed in 2017.

Installed kW in 2017	5,152	Table 5 in 2017 NPC MV Report for Commercial Demand Response by ADM
Installed Device #	1,893	Table 5 in 2017 NPC MV Report for Commercial Demand Response by ADM
Installed kWh Savings	1,310,511	Table 5 in 2017 NPC MV Report for Commercial Demand Response by ADM

Name:	2017 DR Commercial Manage	**Last Updated:**	5/14/2018 12:04
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2021	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$9,631,153	$3,853,614	$5,777,539	2.50	$0.112
Utility Cost Test (UCT)	$9,631,153	$4,243,664	$5,387,489	2.27	$0.123
Participant Cost Test (PCT)	$3,034,599	$0	$3,034,599		$0.000
Ratepayer Impact (RIM)	$9,631,153	$6,888,213	$2,742,940	1.40	$0.200
Societal Cost (SCT)	$11,152,973	$3,853,614	$7,299,359	2.89	$0.112

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$895,044	$1,013,044	$1,013,044	$4,947,221
Electric Benefits ($)	$1,526,803	$2,092,495	$2,520,956	$9,631,153
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	7,982,640	7,982,640	7,982,640	39,913,199
Critical Peak Hour Demand (kW)	18,697	18,697	18,697	18,697
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	741,536	741,536	741,536	3,614,195
Total On Peak Hours (%)				9.06%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Name:	2017 DR Commercial Build	**Last Updated:**	5/14/2018 12:08
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$5,265,979	$3,192,642	$2,073,337	1.65	$0.324
Utility Cost Test (UCT)	$5,265,979	$3,250,454	$2,015,526	1.62	$0.330
Participant Cost Test (PCT)	$815,138	$0	$815,138		$0.000
Ratepayer Impact (RIM)	$5,265,979	$4,007,780	$1,258,200	1.31	$0.407
Societal Cost (SCT)	$6,082,120	$3,192,642	$2,889,478	1.91	$0.324

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$1,470,946	$285,930	$285,930	$4,044,316
Electric Benefits ($)	$432,643	$599,407	$732,847	$5,265,979
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,362,540	1,362,540	1,362,540	13,625,404
Critical Peak Hour Demand (kW)	5,576	5,576	5,576	5,576
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	128,956	128,956	128,956	1,233,799
Total On Peak Hours (%)				9.06%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Demand Response Commercial - NPC 2019-2021 Manage

2019-2021	Total Budget (all categories included)	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					10,796	939.943	1.540	10,147,625	5.00	100.0%
2019	$800,000	$144,000	$538,000	$118,000	10,796					
2020	$785,351	$141,363	$535,428	$108,560	9,932					
2021	$770,702	$138,726	$532,100	$99,875	9,138					
2022	$770,702	$138,726	$540,090	$91,885	8,407					
2023	$770,702	$138,726	$547,441	$84,534	7,734					

Demand Response - NPC Commercial Build

DR Commercial	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
						692	2.72		10	100.0%
2019	$1,700,000	$306,000	$1,394,000	$0	1,445			1,000,000		
2020	$1,814,649	$326,637	$1,488,012	$0	2,890			2,000,000		
2021	$1,929,298	$347,274	$1,582,024	$0	4,335			3,000,000		
2022	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2023	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2024	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2025	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2026	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2027	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2028	$343,947	$61,910	$282,036	$0	4,335			3,000,000		
2029	$229,298	$41,274	$188,024	$0	2,890			2,000,000		
2030	$114,649	$20,637	$94,012	$0	1,445			1,000,000		

*Unit is defined as an average device installed in 2017.

Name:	2019-21 DR Commercial Manage	**Last Updated:**	5/14/2018 10:34
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Commercial
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2023	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$14,672,801	$2,501,403	$12,171,399	5.87	$0.075
Total Resource Cost (TRC)	$13,338,910	$2,501,403	$10,837,508	5.33	$0.075
Utility Cost Test (UCT)	$13,338,910	$2,876,813	$10,462,097	4.64	$0.086
Participant Cost Test (PCT)	$2,958,130	$0	$2,958,130		$0.000
Ratepayer Impact (RIM)	$13,338,910	$5,459,533	$7,879,377	2.44	$0.163
Societal Cost (SCT)	$14,753,878	$2,501,403	$12,252,475	5.90	$0.075

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$800,000	$785,348	$770,704	$3,897,457
Electric Benefits ($)	$3,962,656	$3,735,664	$3,553,916	$13,338,910
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	10,550,501	9,706,149	8,930,204	44,960,811
Critical Peak Hour Demand (kW)	29,683	27,308	25,124	29,683
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	985,046	906,213	833,767	4,071,263
Total On Peak Hours (%)				9.06%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Name:	2019-21 DR Commercial Build	**Last Updated:**	5/14/2018 10:32
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Vegas	**Energy Savings Curve:**	DR_Commercial
Start Year:	2019	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2030	**CAD File Name:**	Vegas_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Vegas_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
NEB Total Resource Cost (NTRC)	$12,217,525	$5,745,029	$6,472,496	2.13	$0.321
Total Resource Cost (TRC)	$11,106,841	$5,745,029	$5,361,812	1.93	$0.321
Utility Cost Test (UCT)	$11,106,841	$5,745,029	$5,361,812	1.93	$0.321
Participant Cost Test (PCT)	$1,376,070	$0	$1,376,070		$0.000
Ratepayer Impact (RIM)	$11,106,841	$7,121,099	$3,985,742	1.56	$0.398
Societal Cost (SCT)	$12,276,546	$5,745,029	$6,531,517	2.14	$0.321

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2019**	**2020**	**2021**	**Total Project**
Total Utility Investment ($)	$1,700,000	$1,814,649	$1,929,298	$8,195,516
Electric Benefits ($)	$559,410	$1,143,870	$1,770,390	$11,106,841
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	1,040,080	2,080,159	3,120,239	31,202,391
Critical Peak Hour Demand (kW)	4,257	8,513	12,770	12,770
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	98,437	196,874	295,312	2,825,419
Total On Peak Hours (%)				9.06%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	8.09%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	3.82%	Measure Life	100%
Line Loss (Demand):	7.60%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$52,295	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Non-Energy Benefit Adder (NTRC and SCT)	10.00%	Incremental Measure Cost	100%
Electric Retail Rate ($/KWh):	$0.08		
Gas Retail Rate ($/therm)	$0.66		
Net-To-Gross Ratio	100.0%		

Sierra Pacific Power Company Commercial Demand Response Program

2017 Results

By the end of 2017, the Commercial DR program is estimated to have 6.35 MW of potential demand reduction. This was comprised of 3.88 MW from the Commercial Build component and 2.46 MW from the Commercial Manage component.

In 2017, the first full year of outreach and service, the Program rolled out the commercial smart thermostats and demand limiting control technologies at scale and added full time outreach staff in northern Nevada. This resulted in the installation of 1023 Pelican network thermostats over the 519 devices in 2016.

The following sections discuss the variances in actual results to target results for the Commercial Demand Response program components.

Two pilot programs were initiated in 2017 and several participants enrolled at the end of the year. The installation of equipment for these pilots will occur in 2018 before demand response season. The two pilots are pneumatic thermostat retrofits and Pelican economizer controllers. Pneumatic thermostat retrofits will provide similar consumption and demand response benefits to Pelican thermostats in facilities with existing pneumatic controls. The Pelican economizer benefits will leverage the cooler night time outdoor temperatures to reduce summer consumption in addition to the winter and shoulder season benefits the measure will provide in the south.

Commercial Manage

Demand Savings: The installed capacity of the Commercial Manage component under the Program was determined to be 2.46 kW by the end of 2017 in the M&V report, higher than its 1.20 kW target with a variance of 105 percent. Demand savings were higher than target because the kW factor for Pelican changed from 2.88 in 2016 to 4.4 for 2017, which impacted the kW demand savings.

Energy Savings: In 2017, energy savings were delivered for 708 networked thermostats, universal gateway and demand limited controls. The realized energy savings were 130,440 kWh, which fell short of the energy savings target of 375,000 kWh by 65.2 percent.

Cost Variance: Expenditures on the commercial manage component was $261,775 and was much lower than budget projections of with a variance of 58 percent. The original approved budget of $450,000 projected enrollment of a much larger number of customers in 2017 than was actually achieved. Approximately half the program costs incurred were for the Agricultural Center Pivot Trial and will not reoccur in future program years. The Manage component achieved a TRC of 1.48 in 2017.

Commercial Build

Demand Savings: The installed capacity of the Commercial Build component was 3.88 MW of capacity by year end, significantly higher than its 2.0 MW target with a 94.2 percent variance. The goal for 2018 and the proposed target for 2018 were established and approved as part of the Company's 2016 IRP filing in Docket No. 16-07001 to reflect the slower than expected growth of this program.

Energy Savings: In 2017, energy savings were delivered for 1023 networked thermostats. The program is estimated to have potential energy savings of 228,553 kWh, which fell short of the energy savings target of 450,000 kWh by 49.2 percent.

Cost Variance: Expenditures on the commercial build program were much higher expenditures of $801,004 than the budget of $750,000 with a variance of 106.80 percent. As mentioned above, the adoption rate of the Demand Response Commercial technologies was higher than expected and continues to gain momentum. The Company has continued to develop new offerings appropriate for a wider range of commercial customers. These upfront development costs, as well as development of associated customer outreach and education strategies contributed to the expenditures in this program component. The Commercial Build component achieved a TRC of 1.31 for 2017.

Measurement & Verification

The M&V report was performed by ADM and is provided in the Technical Appendix DSM-20.

Lessons Learned & Recommendations

This section presents some key lessons learned from the project implementation in 2017 and prior years.

- The Program will continue to use an implementation contractor to enhance outreach and enrollment activities and provide additional resources for program management and device installation. In 2017, this approach helped increase participation by customer who installed the Pelican thermostats by 97 percent. There were no enrollments of the Encycle technologies in 2017, due to a change in leadership at Encycle. Since then, a new relationship with upper management has been established and a plan is being developed by Encycle to work with Encycle's new leadership. Further, another issue is that the targeted big box stores are national accounts and often the decision making is at a corporate level, which makes a partnership with the manufacturer's customer outreach representative key to the success of installing these direct load controllers at a local level.

- The Program is continuing to develop custom performance reports to optimize savings and value for the Pelican thermostats. The reports will assist with improved heating and cooling

schedules, identify unreachable thermostats, and indicate long compressor runtimes leading to high energy consumption and possible indicating a need for air conditioning service.

- The Program will continue to perform a preliminary assessment early in the demand response season to assess the level of non-responding devices and overrides to direct field services and customer engagement where needed to improve event performance. Preseason efforts will be addressed at customer premises and by device to prepare for strong event performance.

- A more defined outreach process, customer service and installation process for each technology type will be created for 2018 to address process gaps and improve customer service and engagement. This includes defining roles and responsibilities, implementing marketing campaigns, early customer engagement activities, establishing customer service and customer follow-up procedures, increasing customer service bandwidth and increasing installation technician bandwidth. A significant change is a transition from utilizing the trade allies for customer outreach alone instead of installations. This will improve the quality of the installation process and the matching of devices in both the APIs (application portal interfaces) and the DRMS (demand response management system database). This will aid in transparency when performing program impacts by a third party evaluation, monitoring and verification contractor.

- The Program will continue to examine the application to installation timeline to shorten delivery time to the customer. This will include improving inventory management, customer scheduling and installation by use of work management systems by projecting installation timelines, material delivery timelines, current inventory levels and establishing minimum inventory levels, these key performance indicators will allow us to accomplish these goals.

2018 Status

In 2018, the Program will continue with the same basic design as implemented in 2017.

Commercial Manage – This Program component is focusing on managing the commercial customers with completed enrollments and installed technologies prior to 2018. The Program has continually developed custom reports to assess off-line devices and energy savings opportunities for each participant. The Program will continue to offer on-site training for customers on these reports and other device functionality to help customers maximize their energy savings and control of their facilities. Customers will also continue to receive tools to help communicate the value of demand response events to their business patrons and employees. A preliminary assessment will be performed after the first few demand response events of the season to assess device performance and direct improvements as needed.

Commercial Build – The Program is promoting three primary offerings to commercial customers: Pelican thermostats; Encycle demand limiting controls; and Universal Gateway devices. The Universal Gateway devices are available to customers through two types of incentives. Customers either qualify for a financial incentive based on actual demand they reduce or energy efficiency technologies in exchange for participation in demand response events through the universal devices. The technologies that are being tested include custom central plant chiller refrigerant charging and pneumatically controlled thermostats.

The Program will continue to leverage an implementation contractor to reach a greater number of customers. The implementation contractor has a significant amount of outreach staff that can promote both the traditional energy efficiency program measures and the demand response enabling technologies. The implementation contractor promotes the demand response offerings to past energy efficiency program participants who have already demonstrated interest in making improvements to their facility.

2019 – 2021 Plan

The Company recommends the Commission approve the proposed Commercial Demand Response Program during the Action Plan Period 2019-2021 with a budget of $1,300,000 in 2019, and a budget of $1,400,000 in 2020, and a budget of $1,500,000 in program year 2021. The Commercial Build component of the Program will have a budget of $900,000 and a target of 500,000 kWh in program years 2019-2021. The Commercial Manage component of the Program will have a budget of $400,000 and a target of 626,700 kWh in program years 2019, a budget of $500,000 and a target of 626,700 kWh in program years 2020, and a budget of $600,000 and a target of 626,700 kWh in program years 2021.

Commercial Build –The Program implemented a new strategy for outreach and recruitment in 2017 and will continue with the current energy efficiency measure mixes. These measure mixes may change by deploying proven technologies from our program development pilots. In 2019 through 2021, the program will continue to leverage the implementation contractor to deliver the program for customer outreach. Internal personnel will be leveraged to provide a seamless suite of products and services to business customers. This will result in Program savings, increase quality control, increase coordination of site installation and commissioning, better inventory control and centralized handling of customer inquiries, thus a more economical Program and greater customer satisfaction.

The Program continues to promote a variety of product offerings to meet the needs of customers with varying levels of usage from small businesses to large institutions, municipalities, and hotel properties. The Program will continue to offer to commercial customers three primary technologies: Pelican thermostats; Certified Customer Equipment; and Universal Gateway devices. Manual demand response will be added to the mix in the event, since some customers are unable to overcome information technology firewalls that are blocking community even signals. While the Encycle technology will not be excluded, it will not be a priority in the program mix of measures.

Commercial Manage – This Program component is focusing on managing the commercial customers with completed enrollments and installed technologies prior to the current program year. The program will perform repairs as needed and removals for any customers who no longer wish to participate in demand response. The Program will also provide for software services for installed devices and event participation incentives for the gateway and customer owned equipment. The Program will provide for continued customer education on how to maximize their energy savings through their devices and the benefits of participation in demand response. The budget for Commercial Manage has been reduced based on previous year's results.

M&V Plan

There are no plans to change the quantification methodology from previous years unless a more effective one develops within the industry. The exception will be moving pilot programs from program development to program implementation and will require a more robust evaluation, monitoring and verification to establish baseline savings as a larger population begins participating in the Universal Device, Manual Demand Response and Certified Owned Equipment portion of this program. Due to the varying technologies being controlled by the building management systems, capturing savings using whole building analysis with telemetry will be necessary in order to capture savings and reductions.

Financial Analysis

The cost/benefit analysis for this Program was performed utilizing the PortfolioPro financial modeling software created by the Cadmus Group for the Company. This comprehensive modeling software utilizes a stream of avoided costs broken down by each of the 8,760 hours for each year of the useful life of a measure.

A copy of the input data sheets and the financial model output sheets are provided at the end of this section. Financial assumptions are provided in the DSM Narrative, Section 4. These figures were all calculated based upon the information contained in this Program data sheet and the materials referenced herein. Output sheets provide the results for the cost-benefit analysis. The assumptions used in the creation of these results are described below.

Energy Savings Curves

Demand response for device populations in the residential and commercial sectors was achieved through the direct load control of energy management devices that employ software-based optimization to reduce energy usage. As such, the programs are expected to achieve energy impacts on both "event" and "non-event" days. ADM developed hourly savings curves for these programs through a combination of methods including energy simulation, analysis of load research data, and M&V. The development of the savings curves are discussed below.

The Commercial Demand Response Program also combines elements of energy efficiency through optimization with direct load control. The energy savings curve developed for the *kW guru*™

inputs are based on actual year hourly savings. A savings curve for each commercial program component and EE or DR are developed for separate *kW guru*™ files. The hourly savings profile for the networked thermostats was investigated and no methodology was identified that could project the actual year savings, so no projection of future year curves was developed.

More detailed information can be found in the M&V report proved in Technical Appendix DSM-20.

Incremental Costs

There is no incremental cost for this Program because there are no out of pocket costs experienced by the customer.

Rebates & Incentives

Program funds paid to the customer do not offset any incremental cost experienced by the customer and therefore this Program is an incentive program. For the Commercial Build component of the Program, the value of the energy savings delivered by Program measures is the largest financial incentive for Program participation.

Measure Life

This Program assumes that it will operate for a period of ten years for Commercial Build and four years for Commercial Manage calculated based on the remaining average life of the devices managed under the Commercial Manage Program. During this period, components that may fail or Program participant that may leave the Program are replaced. The ten year budget for the Build Program and the four year budget for the Manage Program include(s) the cost for these replacements

Units

For the 2017 analysis the actual M&V results were utilized and therefore the unit used was a commercial building.

Savings

Savings are based upon verified M&V results for the Program.

Inputs and Outputs of Portfolio Pro Cost Benefit Model

The following pages provide the input and output sheets for the cost benefit analysis. The benefits, costs, net benefits and benefits/cost ratios for the six tests are provided in the ‘Stakeholders Perspective’s and Tests’ section of the output sheet. The section ‘Utility Savings and Costs”

provides the annual and lifetime costs and savings from the utility perspective. Assumptions used to obtain the results are provided in the 'Financial Data' section of the output sheet.

Demand Response - Commercial Manage

2017	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					708	184	3.477	130,440	9.00	100.0%
2017	$261,775	$53,901	$208,919	-$1,045						
2018	$262,820	$53,901	$208,919	$0						
2019	$262,820	$53,901	$208,919	$0						
2020	$262,820	$53,901	$208,919	$0						
2021	$262,820	$53,901	$208,919	$0						
2022	$262,820	$53,901	$208,919	$0						
2023	$262,820	$53,901	$208,919	$0						
2024	$262,820	$53,901	$208,919	$0						
2025	$262,820	$53,901	$208,919	$0						

*Unit is defined as an average device installed prior to 2017.

Installed kW	2,462	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM
Installed Device #	708	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM
Installed kWh Savings	130,440	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM
Remaining Effective Useful Life, year	9	

Demand Response - SPPC Commercial Build

2017	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					1,023	223	3.80	228,553	10	100.0%
2017	$801,005	$98,868	$791,222	-$89,085						
2018	$415,000	$85,000	$330,000	$0						
2019	$415,000	$85,000	$330,000	$0						
2020	$415,000	$85,000	$330,000	$0						
2021	$415,000	$85,000	$330,000	$0						
2022	$415,000	$85,000	$330,000	$0						
2023	$415,000	$85,000	$330,000	$0						
2024	$415,000	$85,000	$330,000	$0						
2025	$415,000	$85,000	$330,000	$0						
2026	$415,000	$85,000	$330,000	$0						

*Unit is defined as an average device installed in 2017.

Installed kW in 2017	3,884	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM	
Installed Device #	1,023	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM	
Installed kWh Savings	228,553	Table 5 in 2017 SPPC MV Report for Commercial Demand Response by ADM	
Future Utility admin and M&V cost is based on the actual expenses in the SPPC commercial manage program in 2017 on a $/kW basis			$ 21.89
Future Implementation cost is based on the actual expenses in the SPPC commercial manage program in 2017 on a $/kW basis			$ 84.86

Name:	2017 DR Commercial Manage	**Last Updated:**	5/14/2018 12:27
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2025	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$2,738,636	$1,853,707	$884,929	1.48	$1.888
Utility Cost Test (UCT)	$2,738,636	$1,852,662	$885,974	1.48	$1.887
Participant Cost Test (PCT)	$63,356	$0	$63,356		$0.000
Ratepayer Impact (RIM)	$2,738,636	$1,917,063	$821,573	1.43	$1.952
Societal Cost (SCT)	$3,152,278	$1,853,707	$1,298,570	1.70	$1.888
*Includes rebates paid to freeriders					

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$261,775	$262,820	$262,820	$2,364,335
Electric Benefits ($)	$234,772	$320,271	$397,985	$2,738,636
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	139,209	139,209	139,209	1,252,879
Critical Peak Hour Demand (kW)	2,873	2,873	2,873	2,873
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	42,325	42,325	42,325	438,775
Total On Peak Hours (%)				35.02%
*Savings in this section are adjusted for line loss and net-to-gross				

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	100.0%		

Name:	2017 DR Commercial Build	**Last Updated:**	5/14/2018 12:29
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$4,744,422	$3,634,633	$1,109,789	1.31	$1.957
Utility Cost Test (UCT)	$4,744,422	$3,545,548	$1,198,874	1.34	$1.909
Participant Cost Test (PCT)	$32,719	$0	$32,719		$0.000
Ratepayer Impact (RIM)	$4,744,422	$3,667,352	$1,077,070	1.29	$1.975
Societal Cost (SCT)	$5,461,628	$3,634,633	$1,826,995	1.50	$1.957

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$801,005	$415,000	$415,000	$4,536,005
Electric Benefits ($)	$371,327	$506,421	$628,971	$4,744,422
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	243,917	243,917	243,917	2,439,174
Critical Peak Hour Demand (kW)	4,536	4,536	4,536	4,536
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	73,664	73,664	73,664	854,232
Total On Peak Hours (%)				35.02%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	100.0%		

Demand Response Commercial - SPPC 2019-2021 Manage

2019-2021	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					3,114	201	3.327	626,679	5.00	100.0%
2019	$400,000	$72,000	$328,000	$0	3,114					
2020	$404,157	$72,748	$331,409	$0	2,865					
2021	$408,314	$73,497	$334,817	$0	2,636					
2022	$408,314	$73,497	$334,817	$0	2,425					
2023	$408,314	$73,497	$334,817	$0	2,231					

Demand Response - SPPC Commercial Build

DR Commercial	Total Budget	Utility Admin & M&V	Implementation Costs	Rebates	Total # of units	kWh Saved per Unit	kW/ unit saving*	kWh Saved per Year	Effective Useful Life	Net-to-Gross
					645	775.000	3.100		10	100.0%
2019	$900,000	$162,000	$738,000	$0	645			500,000		
2020	$995,843	$179,252	$816,591	$0	1,290			1,000,000		
2021	$1,091,686	$196,503	$895,182	$0	1,935			1,500,000		
2022	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2023	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2024	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2025	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2026	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2027	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2028	$287,528	$51,755	$235,773	$0	1,935			1,500,000		
2029	$191,686	$34,503	$157,182	$0	1,290			1,000,000		
2030	$95,843	$17,252	$78,591	$0	645			500,000		

*Unit is defined as an average device installed in 2017.

Name:	2017 DR Commercial Manage	**Last Updated:**	5/14/2018 12:27
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2025	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$2,738,636	$1,853,707	$884,929	1.48	$1.888
Utility Cost Test (UCT)	$2,738,636	$1,852,662	$885,974	1.48	$1.887
Participant Cost Test (PCT)	$63,356	$0	$63,356		$0.000
Ratepayer Impact (RIM)	$2,738,636	$1,917,063	$821,573	1.43	$1.952
Societal Cost (SCT)	$3,152,278	$1,853,707	$1,298,570	1.70	$1.888
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Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$261,775	$262,820	$262,820	$2,364,335
Electric Benefits ($)	$234,772	$320,271	$397,985	$2,738,636
Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	139,209	139,209	139,209	1,252,879
Critical Peak Hour Demand (kW)	2,873	2,873	2,873	2,873
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	42,325	42,325	42,325	438,775
Total On Peak Hours (%)				35.02%
*Savings in this section are adjusted for line loss and net-to-gross				

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	100.0%		

Name:	2017 DR Commercial Build	**Last Updated:**	5/14/2018 12:29
Customer Sector:	Commercial	**Avg Measure Life:**	1.00
Region :	Reno	**Energy Savings Curve:**	DR_Commercial
Start Year:	2017	**Model File Name:**	DSM_PortPro_April2018_AY.xlsm
End Year:	2026	**CAD File Name:**	Reno_CAD_April2018_AY.xlsx.xls
Notes:		**Program DB Name:**	PD_Reno_April2018_AY.xlsx

Stakeholder Perspectives & Tests	**Benefits (PV)**	**Costs (PV)**	**Net Benefits (PV)**	**B/C Ratio**	**Cost of Conserved Energy ($/kWh)**
Total Resource Cost (TRC)	$4,744,422	$3,634,633	$1,109,789	1.31	$1.957
Utility Cost Test (UCT)	$4,744,422	$3,545,548	$1,198,874	1.34	$1.909
Participant Cost Test (PCT)	$32,719	$0	$32,719		$0.000
Ratepayer Impact (RIM)	$4,744,422	$3,667,352	$1,077,070	1.29	$1.975
Societal Cost (SCT)	$5,461,628	$3,634,633	$1,826,995	1.50	$1.957

*Includes rebates paid to freeriders

Utility Savings & Costs*	**2017**	**2018**	**2019**	**Total Project**
Total Utility Investment ($)	$801,005	$415,000	$415,000	$4,536,005
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Gas Benefits ($)	$0	$0	$0	$0
Incremental Energy & Demand Savings:				
Electric Savings (kWh)	243,917	243,917	243,917	2,439,174
Critical Peak Hour Demand (kW)	4,536	4,536	4,536	4,536
Gas Savings (therms)	0	0	0	0
Total On Peak Hours (kWh)	73,664	73,664	73,664	854,232
Total On Peak Hours (%)				35.02%

*Savings in this section are adjusted for line loss and net-to-gross

Financial Data		**Secondary Benefits**	
Discount Rate:	6.65%	Other Savings	$0
Rate Escalator:	0.00%		
Inflation Rate (T&D):	2.00%	**Scenarios:**	
Line Loss (Energy):	6.30%	Measure Life	100%
Line Loss (Demand):	14.31%	Energy Savings	100%
Avoided T&D Capacity $/MW:	$60,702	Avoided Energy Cost	100%
Environmental Adder (SCT only)	10.00%	Avoided Capacity Cost	100%
Electric Retail Rate ($/KWh):	$0.07		
Gas Retail Rate ($/therm)	$0.46		
Net-To-Gross Ratio	100.0%		