

# COMMERCIAL ENERGY SERVICES 2018

NEW CONSTRUCTION SPECIFICATIONS 2009 IECC



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# 1. Lighting Specifications- 10% Better Than IECC 2009

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## 1.1. Lighting Controls

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### Daylight Dimming System

Eligible controls shall consist of a photo sensor that controls dimming ballasts. Dimming can be continuous or stepped at four or more levels (including on/off). Systems that allow on/off overrides are not eligible. Each sensor must control a minimum of 4 ballasts. **This measure cannot be used for fixtures with integrated motion sensor and daylight dimming control. This must be submitted as a Custom measure.**

## 1.2. Lighting – Performance-Based Approach

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For performance-based lighting, the energy savings will be based on the calculated lighting power density (LPD) on a watt per square foot basis. **Incentives will be paid only on the square footage of the building where the lighting installation is completed and is ready for occupancy. If a portion of a building is not completed such that final lighting installation is not complete and the space ready for occupancy then that portion is not eligible for an incentive.** IECC 2009 Lighting Standard specifies the allowable light density for each major building area type. Please see the Commercial Energy Services Policies and Procedures Manual for more detailed information and example qualification calculation.

The incentive for the lighting performance-based approach is \$350 per kW reduction in connected lighting load below the IECC 2009 standard. The total lighting wattage density must be 10% lower than the IECC 2009 standard to qualify for an incentive. **The minimum allowed lighting density used to calculate the incentive shall be at 50% of the IECC required value.** Where an applicant has installed a lighting density less than 50% of the IECC standard value, projects will be evaluated on a case by case basis to determine the incentive and will use either the Performance-Based Approach (section P.9.8) or the lighting density approach; whichever approach is used it will be for the entire incentive related to installed fixtures.

The following documentation is required to support the application:

- Supporting calculations demonstrating building/space area and installed lighting wattage such as COMcheck report or engineering calculations
- Lighting layout plans
- Lighting fixtures schedule including fixture counts and manufacturers specification sheet including model number and rated wattage

Please review the Commercial Energy Services Policies & Procedures for any additional information.

### Quick Facts:

- Energy savings is based on the calculated LPD on a watt per square foot basis.
- The total lighting wattage density must be 10% lower than the IECC 2009 standard to qualify for an incentive.

### 1.3. Lighting Performance-Based Approach Table

<b>Interior Lighting Power Densities</b>	<b>IECC Standard</b>	<b>CES Design Max</b>
<b>Building Area Type</b>	<b>Watts/Sq Ft</b>	<b>Watts/Sq Ft</b>
Automotive Facility	0.9	0.81
Convention Center	1.2	1.08
Courthouse	1.2	1.08
Dining: Bar Lounge/Leisure	1.3	1.17
Dining: Cafeteria/Fast Food	1.4	1.26
Dining: Family	1.6	1.44
Dormitory	1	0.9
Exercise Center	1	0.9
Gymnasium	1.1	0.99
Healthcare-Clinic	1	0.9
Hospital	1.2	1.08
Hotel	1	0.9
Library	1.3	1.17
Manufacturing Facility	1.3	1.17
Motel	1	0.9
Motion Picture Theater	1.2	1.08
Multi-family	0.7	0.63
Museum	1.1	0.99
Office	1	0.9
Parking Garage	0.3	0.27
Penitentiary	1	0.9
Performing Arts Theaters	1.6	1.44
Police/Fire Station	1	0.9
Post Office	1.1	0.99
Religious Building	1.3	1.17
Retail	1.5	1.35
School/University	1.2	1.08
Sports Arena	1.1	0.99
Town Hall	1.1	0.99
Transportation	1	0.9
Warehouse	0.8	0.72
Workshop	1.4	1.26

## 2. Cooling and Miscellaneous Specifications

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### 2.1. Air- and Water-Cooled Units

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New air- and water-cooled conditioning units or heat pumps that meet or exceed the qualifying efficiency (EER) shown in the Cooling Incentive Tech Sheet Table are eligible for an incentive. These units can be either split system or single packaged units. Evaporative coolers do not qualify under the New Construction Prescriptive Air Conditioning Incentive, but may qualify under the New Construction Performance-Based Service. All packaged and split system cooling equipment must meet Air Conditioning, Heating and Refrigeration Institute (AHRI) standards (210/240, 320 or 340/360), be UL listed, and use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC). A manufacturer's specification sheet indicating the system efficiency must accompany the application.

The total incentive is determined by two components – an equipment incentive and an efficiency incentive. Both the equipment and efficiency incentives are applied per ton of cooling installed. The equipment qualifies for an equipment incentive if the qualifying efficiency is met for the equipment size category. In addition, the efficiency incentive is added on a prorated basis if the equipment exceeds the minimum qualifying efficiency for the equipment size category.

The incentive for air conditioners is calculated as follows:

Tons X [Equipment Incentive/ton + Efficiency Incentive/ton X (EER new – EER qualifying)]

For air-cooled units =<65,000 Btuh, the SEER value must be entered for both the Unit Efficiency and the Qualifying Efficiency to calculate the incentive amount. The EER value for air-cooled units =<65,000 Btuh must also be entered under the column heading labeled "EER Value for Units =<65,000 Btuh." For all other sizes of air-cooled units, use the EER values in the Unit Efficiency and Qualifying Efficiency columns; it is not necessary to enter the EER Value under the column heading labeled "EER Value for Units =<65,000 Btuh."

#### Quick Facts:

- Evaporative coolers do not qualify under the New Construction Prescriptive Air Conditioning Incentive, but may qualify under the New Construction Performance-Based Service.

### 2.2. Packaged Terminal Units (PTAC/PTHP)

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Package terminal air conditioners and heat pumps are through-the-wall self-contained units that are two tons (24,000 Btuh or less). These units cool small areas and are typically used for individual rooms. Only units that have an EER greater than or equal to  $[13.08 - (0.213 \times \text{capacity in Btu/h} / 1000)]$  qualify for an incentive. All EER values shall be rated at 95 °F outdoor dry-bulb temperature. These units have a combination of heating and cooling assemblies intended for mounting through the wall. It includes refrigeration, outdoor louvers, forced ventilation, and may connect to external heating source or have electric resistance heating.

#### Quick Facts:

- Two tons (24,000 Btuh) or less.
- All EER values shall be rated at 95 °F outdoor dry-bulb temperature.

## 2.3. Flat Plate Heat Exchanger

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In a water-cooled chilled water cooling system, a heat exchanger may be installed to transfer heat directly between the chilled water loop and the condenser water (cooling tower) loop. A flat plate heat exchanger is most frequently used. This practice is also sometimes referred to as "tower free cooling". In the dry Nevada climate this will reduce the need to operate the chiller for many hours, especially during the cooler months.

Incentives will be paid for a heat exchanger or similar equipment that transfers heat between the cooling tower and chilled water loop that displaces mechanical cooling (chiller operation). The incentive will be based on the heat transfer capacity of the chilled water side of the heat exchanger converted to tons. The capacity of the heat exchanger in tons will be calculated as:

Capacity (tons) = [Design Inlet Temperature (°F) - Design Outlet Temperature (°F)] x Design Flow Rate through Heat Exchanger (gallons per minute) x 500 / 12,000.

### Quick Facts:

- The incentive will be based on the heat transfer capacity of the chilled water side of the heat exchanger converted to tons.

## 2.4. Variable Speed Drives

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Variable speed drives (VSD) offer a method of significantly reducing the energy consumed by fans, centrifugal pumps, and other motor driven machinery operating under varying loads. VSD must be installed for the primary purpose of reducing energy usage.

Prescriptive incentives are available for applications ≤ 200 HP on qualifying HVAC fans (supply, return, exhaust, make up), single speed cooling tower fans, chilled/condenser water circulation pumps (HVAC), hot water circulation pumps (HVAC), boiler feed water pumps as well as for installations on process related machinery. Integrated VSD applications on new chillers or package units are not eligible for this incentive. Equipment must run a minimum of 1500 hours annually. Hours of operation must be entered on the application.

VSDs on process equipment are not eligible for this measure and must utilize the Performance-Based Technology Form. For instances where VSDs are installed on redundant/backup systems (such as secondary chilled water pumps), only one unit is eligible for an incentive.

Application Code for eligible VSD applications:

BEF = Building exhaust fan

CTF = Cooling tower fan

CWP = Chilled/condenser water pump

FWP = Boiler feed water pump

HWP = Hot water circulator pump

MAF = Make-up air fan

RFA = Return fan on return air handler

SFA = Supply fan on supply air handler

**NOTE:** VSD applications required by IECC 2009 are not eligible for incentives. VSDs on all VAV fan



installations > 10 HP are not eligible as they are required by IECC 2009. Variable speed fans are required by IECC 2009 on cooling tower fans > 7.5 HP and are not eligible for incentives. Hydronic systems greater than or equal to 300,000 btu/h in design output capacity supplying heated or chilled water to comfort conditioning systems must have flow control capabilities (which can be satisfied with a VSD).

**Quick Facts:**

- Prescriptive incentives are available for applications  $\leq$  200 HP on qualifying HVAC fans, single speed cooling tower fans, chilled/condenser water circulation pumps, hot water circulation pumps, boiler feed water pumps as well as for installations on process related machinery
- VSDs on process equipment are not eligible for this measure and must utilize the Performance-Based Technology Form.

### 3. Commercial Kitchens/Refrigeration Specifications

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Only electric equipment qualifies for incentives. ENERGY STAR® maintains a list of qualifying products and specifications at [www.energystar.gov](http://www.energystar.gov) or [www.CEE1.org](http://www.CEE1.org). To determine if non-ENERGY STAR models meet the ASTM standard, contact your manufacturer's representative

#### 3.1. Fryers

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The fryer shall meet or exceed ENERGY STAR specifications which are a heavy load cooking energy efficiency of > 80% utilizing American Society for Testing and Materials (ASTM) Standard F1361 and a normalized idle energy rate ≤ 1,000 watts (based on a 15-inch fryer).

#### 3.2. Large Vat Fryers

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The commercial fryer shall have a tested heavy load (French fry for large vats) cooking energy efficiency of > 80% utilizing ASTM Standard F2144 for large vat fryers. Multiple vat configurations are paid per qualifying vat.

#### 3.3. Griddles

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The griddle shall meet or exceed ENERGY STAR specifications which are a heavy load cooking energy efficiency of > 70% utilizing ASTM Standard F1275 and a normalized idle energy rate ≤ 320 watts per ft<sup>2</sup>.

#### 3.4. Convection Ovens

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The oven shall meet or exceed ENERGY STAR specifications which are a heavy load potato cooking energy efficiency of > 70% utilizing ASTM Standard F1496 and an idle energy rate of ≤ 1.0 kW for half size and ≤ 1.6 kW for full size.

#### 3.5. Combination Ovens

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The oven shall meet or exceed heavy load cooking energy efficiency of > 60% utilizing ASTM Standard F1639.

#### 3.6. Steam Cookers

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The commercial steam cooker shall meet ENERGY STAR specifications for energy efficiency or shall have a tested heavy load potato cooking energy efficiency of > 50% utilizing ASTM Standard F1484.

Pan Capacity	Idle Rate (watts)	Pan Capacity
3-pan	400	3-pan
4-pan	530	4-pan
5-pan	670	5-pan
6-pan or larger	800	6-pan or larger



### 3.7. Holding Cabinets

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This measure does not include cook and hold equipment. All measures shall be electric hot food holding cabinets that are fully insulated and have solid doors in full, three-quarter and half sizes respectively. Qualifying cabinets shall not exceed the maximum idle energy rate of 20 Watts per cubic foot in accordance with the ASTM Standard F2140 test method as stated in ENERGY STAR. Cook and hold equipment and units < ½ size may be eligible and should be applied for as a custom incentive.

### 3.8. Ventilation Control-New Hood

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This incentive applies towards the purchase and installation of a new commercial kitchen exhaust hood control system installed in a new dedicated commercial kitchen exhaust hood and make-up air system. The incentive is per exhaust fan hp. The control system must be used in conjunction with variable speed fan motor controls. Only pre-approved control systems will qualify for an incentive. Please see the Commercial Energy Services Policies and Procedures for details on approved control systems.

### 3.9. Evaporator Fan

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This measure is for the installation of controls in medium temperature walk-in coolers. The controller reduces airflow of the evaporator fans when there is no refrigerant flow. The measure must control a minimum of 1/20 HP where fans operate continuously at full speed. The measure also must reduce fan motor power by at least 75 percent during the off cycle. This measure is **NOT** applicable if any of the following conditions apply:

- 1) The compressor runs all the time with high duty cycle
- 2) The evaporator fan does not run at full speed all the time
- 3) The evaporator fan motor runs on poly phase power
- 4) The evaporator fan motor is not shaded-pole or permanent split capacitor
- 5) Evaporator does not use off-cycle or time-off defrost

### 3.10. Ice Machines

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This specification covers machines generating 60 grams (2 oz.) or lighter ice cubes, as well as flaked, crushed and fragmented ice makers. Performance data is based on Air-Conditioning, Heating and Refrigeration Institute (AHRI) Standard 810. Air-cooled (self-contained, ice making heads, or remote condensing) or Water-cooled machines with an independent and isolated compressor and ice formation feeds on a closed-chilled water loop are eligible. The efficiency specifications for the two qualifying tiers are equivalent to ENERGY STAR/or CEE Tier 2. The entire AHRI tested ice making system must be purchased to qualify. Remote machines shall be purchased with qualifying remote condenser or remote condenser/compressor unit. Visit [www.ahrinet.org](http://www.ahrinet.org) for product information and testing procedures.

Specifications are available at [www.energystar.gov](http://www.energystar.gov) or [www.cee1.org](http://www.cee1.org). The test method must be in accordance with AHRI Standard 810.

**Quick Facts:**

- The entire AHRI tested ice making system must be purchased to qualify.
- The efficiency specifications for the two qualifying tiers are equivalent to ENERGY STAR/or CEE Tier 2.

**3.11. Refrigerators/Freezers**

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The refrigeration system shall be a new built-in (packaged) unit. Cases with remote refrigeration systems do not qualify for a prescriptive incentive. Customers shall provide proof that the appliance meets the ENERGY STAR Version 2.0 specifications using ANSI/ASHRAE Standard 72-2005 (38 °F +/- 2 °F for refrigerators and 0 °F +/- 2 °F for freezers). Please see the Commercial Energy Services Policies and Procedures for energy usage specifications.

**NOTE:** If a refrigeration measure is required by code, it is not eligible for an incentive.

## 4. Performance- and Whole Building-Based Specifications

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**These specifications refer to the 2009 version of the IECC. The code for the jurisdiction under which a project is permitted will be the applicable code.**

### 4.1. Performance-Based Approach -10% Better Than IECC 2009

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The Performance-Based Approach enables the design team to consider a custom approach for individual items, such as a high efficiency chiller. Documentation of savings in the form of a building performance model or appropriate engineering algorithms must be provided by the applicant and must show that the annual energy consumption is at least 10% better than the IECC 2009 minimum. The incentive rate is based on kWh savings and varies for on-peak and non on-peak periods. (More detailed information is contained in the Commercial Energy Services Policies and Procedures document)

Please refer to the Commercial Energy Services Policies & Procedures Manual Appendix for guidelines on supporting documentation required for different project types. Note: the information below is required to confirm kWh savings. Examples of documentation to be included with the application are:

- A narrative or list of specific energy efficient features of the building and listing the energy efficient system performance and comparing it to IECC 2009 minimum system performance.
- A description of the building schedule and major operating assumptions.
- The input and output files used for the model annotated to show the base case and where the energy efficient features are included. Industry accepted modeling tools such as e-quest; DOE-2, Trane Trace, etc. can be used for building simulation purposes.
- A summary worksheet summarizing the results of the modeling and showing annual energy savings and summer peak demand savings between the high-efficiency case and the IECC 2009 minimum.
- By providing as much of the information given in the guidelines as possible, the timeframe for project approval will likely be reduced.

#### **Quick Facts:**

- The incentive rate is based on kWh savings and varies for on-peak and non on-peak periods.

### 4.2. Whole Building Approach-10% Better Than IECC 2009

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The Whole Building Based Approach enables the design team to consider a custom approach for either the building as a whole such as required for LEED qualifications or a combination of measures on a whole building level. Documentation of savings in the form of a building performance model or appropriate engineering algorithms must be provided by the applicant and must show that the annual energy consumption is at least 10% lower than the IECC 2009 minimum. The incentive rate is based on kWh savings and varies for on-peak and non on-peak periods.

Please refer to the Commercial Energy Services Policies & Procedures Manual Appendix for guidelines on supporting documentation required for this approach. Note, this information is required to confirm kWh savings. Examples of documentation to be included with the application are:

- A narrative or list of specific energy efficient features of the building and listing the energy efficient system performance and comparing it to IECC 2009 minimum system performance.
- A description of the building schedule and major operating assumptions.
- The input and output files used for the model annotated to show the base case and where the energy efficient features are included. Industry accepted modeling tools such as e-quest; DOE-2, Trane Trace, etc. can be used for building modeling purposes.
- A summary worksheet summarizing the results of the modeling and showing annual energy savings and summer peak demand savings between the high-efficiency case and the IECC 2009 minimum.

By providing as much of the information given in the guidelines as possible, the timeframe for project approval will likely be reduced.

**Quick Facts:**

- The incentive rate is based on kWh savings and varies for on-peak and non on-peak periods.

## 5. Energy Use Periods

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**NOTE: Please contact the Commercial Energy Services team for worksheets that may assist with the division of kWh into on-peak and non-on peak time periods.**

### 5.1. Northern NV Energy Time of Use Periods

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Summer On-peak Period:

1 p.m. to 6 p.m. (July 1 through Sept. 30); Monday through Friday only

Winter On-peak Period:

5 p.m. to 9 p.m. (Oct. 1 through June 30); 7 days/week

### 5.2. Southern NV Energy Time of Use Periods

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Summer On-peak Period:

1 p.m. to 7 p.m. (June 1 through Sept. 30); 7 days/week

All other hours are in the Non On-Peak period

Please refer to the Commercial Energy Services Policy and Procedures definitions page for a description of the Northern and Southern Service Territories.