Policies & Procedures Manual

Table of Contents

1. Program Overview

Duke Energy Progress (DEP) Energy Efficiency for Business Program provides financial incentives for non-residential customers to implement energy efficiency measures. This program is available to non-residential customers, including commercial, industrial, governmental, and nonprofit customers receiving retail service from Duke Energy Progress in North Carolina and South Carolina.

This Policies and Procedures Manual is intended to convey the rules, policies and procedures that govern program administration and customer participation. It is a companion document to the Incentive Application forms and program information found at: http://www.duke-energy.com/carolinasbusiness.

1.1 Incentive Types

Prescriptive Incentives are available for energy efficiency upgrades and system improvements including lighting, HVAC and refrigeration. Incentives are paid based upon the quantity, size and efficiency of the qualified technology or equipment that is installed, replaced or removed. Incentives are provided for qualified equipment commonly installed in a retrofit or equipment replacement situation.

Custom Incentives are available for less common or more complex Energy Conservation Measures (ECMs) which are not covered by a prescriptive application. Custom measure incentives are paid based on the annual electric energy (kWh) savings of the measure. All projects must meet Duke Energy Progress' cost effectiveness requirements. Prescriptive measures are not eligible for custom incentives. Measures involving custom incentives require pre-approval before implementation.

Technical Assistance Incentives are offered for new construction and retrofit applications to provide assistance to qualified customers with development or implementation of system and building enhancements. Assistance may include, but is not limited to, feasibility studies, detailed energy audits, and retro-commissioning of existing systems, or for efficient design or energy modeling for new structures and systems. All measures involving technical assistance incentives must receive pre-approval before implementation.

The appropriate Retrofit, New Construction, or Technical Assistance Incentive Application(s) should be used to apply for project approval or incentive payments.

2. Program Effective Dates

The effective dates of the program year and application submittal requirements are as follows:

- Program year is defined at January 1st – December 31st.
- Final Applications for qualified project work completed during the program year must be received no later than 90 days after work is completed. All work must be completed and commissioned no later than December 31st or policies and incentives for the following year may apply.

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3. Customer Eligibility

The following rules pertain to customer eligibility for the Energy Efficiency for Business Program: This program is available to Duke Energy Progress retail non-residential customers in North Carolina and South Carolina as long as the ECMs are installed in one or more areas served by an existing metered electrical service listed in **Table 3-1**.

Eligible Rate Schedules
Table 3-1

Rate Schedule	Rate Schedule Description
SGS	Small General Service
SGS-TOU	Small General Service – Time of Use
MGS	Medium General Service
SI	Seasonal or Intermittent Service
CH-TOUE	Church Service – Time of Use
GS-TES	General Service (Thermal Energy Storage)
APH-TES	Agricultural Post-Harvest Service (Experimental)
LGS	Large General Service
LGS-TOU	Large General Service – Time of Use
LGS-RTP	Large General Service – Real Time Pricing (Experimental)
CSG	Church and School Service
CSE	Church and School Service

Qualified customers may include owners of businesses and:

- Publicly owned buildings and sites, such as municipal, school and military installations
- Non-profit organizations
- Common areas of multi-family or mixed-use buildings
- Centrally metered multi-family residential properties

If a customer is a tenant in a facility where the landlord owns the equipment for which the customer pays for the electricity, the property owner must agree to the terms and conditions of the program for a tenant to participate in the program.

The Duke Energy Progress customer paying for the Energy Conservation Measure (ECM) should submit the application to receive the incentive payment or designate the recipient of any incentive.

Incentive payments may be paid directly to one of the following for any single application submittal at the discretion of the customer applicant:

- Duke Energy Progress Customer
- Trade Ally (contractor, vendor, consultant, etc.)
- Owner of the building / site.

Opt Out Provision - Under some conditions, there is an opportunity for certain customers to be eligible to "opt out" of participating in the DSM/EE programs. If a customer elects to opt out of an account that account will no longer be able to participate in any DSM/EE programs unless they later elect to opt the account back into the DSM/EE program. For complete information on the DSM/EE rider and the Opt-out provision, please read the information found on Duke Energy's Web site located here: https://www.progress-energy.com/carolinas/business/commercial-industrial-governmental/dsm-ee-optout.page

4. Project Requirements

Project requirements under the Energy Efficiency for Business Program include the following:

- Projects must involve a facility energy efficiency improvement that results in a sustained reduction in electrical energy usage (kWh)
- New equipment and components must be installed. Used or refurbished equipment or components do not qualify for incentive payments.
- Final Applications, supporting documentation and invoices must be received within 90 days of the end of the project year that the project is completed.
- Projects that are **NOT** eligible for an incentive include the following:
  - Fuel switching (e.g., electric to gas or gas to electric)
  - Projects involving natural gas-driven equipment in place of electric equipment (such as a chiller)
  - On-site electricity generation
  - Projects involving renewable energy
  - Projects that involve peak-shifting and do not provide kWh savings
  - Measures installed with funding from or under another utility sponsored incentive program
  - Changes in operational or maintenance practices not involving a capital investment
  - Simple control modifications not involving capital investment costs

- Any measures installed at a Facility must provide 100% of the energy benefits as stated in the Application for a period of at least five (5) years or for the life of the installed product, whichever is less.
- If the Customer removes the equipment or systems from service at the metered site at any time during the 5-year period, the Customer may be required to return a prorated amount of incentive funds to Duke Energy.
- Duke Energy Progress reserves the right to thoroughly inspect project sites and related equipment prior to and after equipment installation. This includes, but is not limited to monitoring and other data collection related to ECM proposals and installations.
- All replaced materials and equipment must be permanently removed from future service. They shall be disposed of properly to comply with local, state and federal requirements.

5. Incentive Limits and Caps

Incentive payments are subject to tiered financial limits that apply to qualified incentive totals that exceed $100,000 per calendar year per facility. Duke Energy Progress utilizes this method to manage all available funds with the intent to attain equitable distribution among as many customers as possible.

For most situations, a "facility" is defined as a structure, multiple structures and / or area served by a meter located on a contiguous piece of property. For those customers that have a primary meter and their own distribution equipment or customers that have multiple meters on the same contiguous piece of property, a facility is a structure or area enclosed by defined boundaries, i.e. building firewalls, roadways, fences, etc. as determined by the Program.

5.1 Facility Incentive Limits

Facility incentive payments shall be paid using a tiered method as shown in **Table 5-1**. All incentives earned are combined and paid according to the tiers below. No **maximum** financial amount exists and the dollar values listed pertain to earned incentives for installed measures in a given calendar year for a facility.

Table 5-1
Incentives Payment Limits

Increment of Total Approved Measure Incentives	Incentive Payment, % of Total Approved Measure Incentives
$1 to $100,000	100%
$100,000 ≤ $500,000	50%
$500,000 ≤ $1,000,000	25%
Greater than $1,000,000	10%

Example: A project with viable energy efficiency measures totaling **$750,000** in gross qualified incentives will not receive a full incentive payment for this amount. Instead, a final incentive payment of **$362,500** will be issued in compliance with the tiered payment structure shown in **Table 5-1**.

- The initial $100,000 of the approved measure incentives is paid at **100%**
- The next $400,000 qualified measure incentives are paid at **50%**; and $200,000 will be paid for this portion of improvements
- The final $250,000 portion of the qualified measures is paid at **25%**; and $62,500 will be paid for this portion of improvements.
- The combined total incentive payment for this project example would be **$362,500**

$100,000	*x*	*100%*	=	*$100,000*
$400,000	*x*	*50%*	=	*$200,000*
$250,000	*x*	*25%*	=	*$ 62,500*
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$750,000				***$362,500***

5.2 Technical Assistance Incentive Caps

Technical Assistance incentive payments for retrofit projects are capped as described in **Section 6.3.** To qualify, facilities must use at least 500,000 kWh per year. For retrofit customers, the incentive is capped at 50% of feasibility study or retro commissioning service costs. Duke Energy Progress will pay a maximum of $10,000 for those customers whose use falls between 500,000 kWh and 2 million kWh and $20,000 for larger use customers. Technical Assistance incentive payments for new construction projects are capped as described in **Section 7.4.** The new construction facility must have 20,000 ft² or more to qualify for the Building modeling or Design Assistance incentive.

5.3 Prescriptive Incentive Caps

Prescriptive incentive payments for retrofit projects are limited to 75% of the total project cost to the owner, including materials, shipping, tax, and contracted labor. Internal labor costs cannot be included.

5.4 Custom Incentive Caps

Incentive payments for custom measures are capped at 75% of the incremental cost of the measure. Incremental measure cost is the difference in the cost of energy efficient measure and standard efficient measure. In some cases the incremental measure cost is the full cost of the measure.

6. Retrofit Incentives

6.1 Retrofit Prescriptive Incentives

The Energy Efficiency for Business Program offers prescriptive incentives for improvements in the following categories:

- Lighting
- Cooling & Heating (HVAC)
- Refrigeration

The following sections list the various prescriptive incentives available. You may pre-qualify your projects and proposed equipment to ensure they are eligible for an incentive by submitting a pre-approval application. Installed measures must meet program requirements to qualify for incentive. Pre-approval is the best method to check this requirement before work begins.

6.1.1 Retrofit Prescriptive Incentives – Lighting

Incentives are paid on a per unit basis for exit signs and screw-in compact fluorescent lamps. All other qualified lighting retrofits are paid per watt reduced. Occupancy sensors are paid per watt controlled. **Table 6-1** summarizes the incentive levels for these categories. Detailed specifications are provided in Section 8.

Table 6-1
Retrofit Prescriptive Lighting Incentives

Equipment Type	Unit	Incentive / Unit
Compact fluorescent lamps – Screw in (CFLs) - must replace incandescent or high intensity discharge lamps		
ALL Wattages*	Lamp	$1.50
LED exit sign		
Exit sign	Fixture	$25.00
Lighting controls (occupancy sensors provide calculation of total fixtures and watts controlled and remote mounted daylight sensors provide number of sensors)		
Occupancy Sensors	Watts Controlled	$0.06
Remote mounted daylight sensors	Sensor	$20.00
Replacement/Retrofit of existing fixtures not covered above.		
Total Existing Fixture Watts Less Total New Fixture Watts	Watts Reduced	$0.35

*NOTE: CFLs that were purchased at a retail location where a Duke Energy Progress discount has reduced the cost of the lamps are NOTeligible for incentive under this program.

Only those new lighting measure types listed in section 8.3 are eligible for this incentive. Induction lighting and other lighting measures not listed in section 8.3 are assessed and qualified using the custom incentive.

6.1.2 Retrofit Prescriptive HVAC Incentives

Cooling & Heating (HVAC) Unitary air-cooled air conditioning units, air or water-cooled chillers, room air conditioners, packaged terminal air conditioners (PTAC), and variable speed drives (VSDs) for heating, ventilation, and air conditioning (HVAC) motors, are eligible for incentives. Detailed product specifications are discussed in **Section 9**. Cooling equipment must meet the minimum qualifying efficiency levels as shown in **Table 6-2**. Water source heat pumps may qualify for a custom incentive in **Section 6.2**.

If the equipment usage is for other than human comfort, such as manufacturing process or data centers, then the custom incentive method should be used. See **Section 6.2.**

Table 6-2
Prescriptive HVAC Incentives

Equipment Type	Size Category	Qualifying Efficiency[1]			Incentive (per ton)
Unitary and Split Air Conditioning Units and Air Source Heat Pumps	< 65,000 Btuh (5.4 Tons)	14 SEER			$25
		15 SEER			$45
		EER	IPLV	IEER	
	≥ 65,000 Btuh (5.4 Tons) and <240,000 Btuh (20 Tons)	11.5	11.9	11.6	$30
		12.0	12.4	12.1	$55
	≥240,000 Btuh (20 Tons) and <760,000 Btuh (63.3 Tons)	10.5	10.9	10.6	$30
		10.8	12.0	10.9	$55
	≥ 760,000 Btuh (63.3 Tons)	9.7	11.0	9.8	$30
		10.2	11.0	10.3	$55
Water-Cooled Chillers	ALL	Level 1 (see Section 9.2)			$18
		Level 2 (see Section 9.2)			$35
Air-Cooled Chillers	ALL	1.04 kW / ton minimum			$35
Room Air Conditioners	ALL	Level 1 (see Section 9.3)			$25
		Level 2 (see Section 9.3)			$45
PTAC[2]	ALL	See Table 9.4			$30

Equipment Type		Incentive
Variable Speed Drive (VSD) on HVAC Fan and Pump Motors[3]		$45.00 / HP
Guestroom Controls for rooms heated with electric		$80.00/Room
Guestroom Controls for rooms heated with gas		$30.00/Room

[1] Efficiency requirements is either/or to qualify for the incentive.
[2] **Table 9-4** of qualifying PTAC units can be found in **Section 9.4**
[3] Refer to **Section 9.5** for qualified VSD applications pertaining to chillers, fans, pumps and other equipment.

6.1.3 Retrofit Prescriptive - Refrigeration

The following are some common methods of reducing energy usage in refrigeration. The Energy Efficiency for Business Program is offering incentives for the refrigeration measures shown in **Table 6-3**. The specifications for each of these measures are provided in **Section 10**.

Table 6-3
Prescriptive Refrigeration Incentives

Refrigeration Measures		
Measure	**Incentive Unit**	**Incentive/Unit**
Strip Curtains on Walk-In Coolers and Freezers	Per Square Foot	$3.00
Anti-Sweat Heater Control	Per Linear Foot	$20.00
Electrically Commutated Motor for Walk-in	Per Motor	$50.00
Electrically Commutated Motor for Reach-in	Per Motor	$40.00
Evaporator Fan Control	Per Motor	$60.00
Automatic Door Closers for Walk-in Freezers	Per Door	$140.00
Beverage Machine Control	Per Unit	$90.00
ENERGYSTAR® Beverage Machine	Per Unit	$90.00
Snack Machine Control	Per Unit	$50.00
Door Gaskets	Per Linear Foot	$1.00
ENERGY STAR® Solid Door Reach-in Freezer < 15 ft³	Per Unit	$75.00
ENERGY STAR® Solid Door Reach-in Freezer 15 ft³ - 30 ft³	Per Unit	$100.00
ENERGY STAR® Solid Door Reach-in Freezer 31 ft³ - 50ft³	Per Unit	$125.00
ENERGY STAR® Solid Door Reach-in Freezer > 50 ft³	Per Unit	$150.00
High-Efficiency Ice Makers (Air Cooled Only) ENERGY STAR® or CEE Tier 1		
Size (lbs. / 24 hrs.)	**Incentive per Ice Maker**	
101 - 200	$75.00	
201 - 300	$125.00	
301 - 400	$175.00	
401 - 500	$225.00	
501 – 1,000	$300.00	
1,001 – 1,500	$450.00	
> 1,500	$600.00	

6.2 Retrofit Custom Incentives

The Energy Efficiency for Business Program offers custom incentives for eligible improvements not listed as prescriptive measures. Measures listed in prescriptive tables that do not meet minimum program specifications cannot be submitted as a custom measure. Qualified custom ECMs reduce electric energy use due to an improvement in system efficiency, i.e. a net decrease in energy use without a reduction in the level of service. For example, installing a lower wattage lamp in place of a higher wattage lamp of the same type does not qualify for a custom incentive. However should the lighting *system* (i.e., lamp, ballast and fixture) demonstrably improve the total lumens per watt delivered, an incentive will be considered.

Examples of custom measures include, but are not limited to, the following:

- Economizers – air side or water-side
- Energy Star® solid door commercial freezers
- Variable frequency drives on non-HVAC pump and fan motors serving variable-capacity loads, such as air compressors, pumps, fans, blowers, process chillers and cooling towers
- Automatic controls, including time switches, sensors, etc.
- Day lighting or light harvesting, when combined with appropriate lighting controls
- Building envelope improvements (windows, window films, solar screens, cool roofs, etc.)[4].
- Improved process efficiency
- Compressed air system improvements
- Refrigerated case LEDs and sensors
- Induction and Plasma lighting fixtures or retrofit packages.

Incentives for custom measures are based on the electrical energy savings that result from the energy efficiency measure installation and are based upon the calculated annual kWh savings. The applicant must provide sufficient back-up descriptive information, equipment performance data, operating assumptions, measurements, calculations and models to support the energy savings estimates. Guidelines for calculating custom measure energy savings are detailed in **Section 16**.

The Custom incentive shown in **Table 6-5** is based on the expected life of the measure. Custom projects eligible for an incentive must have a payback period ≥ one year and ≤ 7 years to qualify for a $0.08 per first year kWh saved incentive. Project simplified payback is calculated as follows:

$$\text{Simplified Payback Period} = \frac{\text{Incremental Measure Cost}}{\text{Annual Energy Savings}}$$

[4] Only if facility has electric cooling or heating present.

Table 6-5
Custom Incentives

Incentive	**$0.08 / kWh**[5]
Minimum Payback Period	**One year**
Maximum Payback Period	**7 years**

All Custom incentive applications are subject to the Program's review and analysis. Incentive payments for custom ECMs are capped at 75% of the incremental cost of the measure[6].

6.3 Retrofit Technical Assistance Incentives

The program offers technical assistance incentives for studies in qualified existing facilities (retrofit) that may result in sustained energy efficiency improvements. Incentive types, values and limits described in this section are based upon task scope and anticipated outcomes. A detailed work scope of technical assistance activities and costs must be submitted for review and pre-approval to qualify for any technical assistance incentives.

Technical assistance incentives are intended to assist with the initial cost of identifying ECMs. Receipt of Technical Assistance incentives does not preclude applying for Prescriptive or Custom incentives identified by the study or report. Technical assistance incentives shall be submitted for approval separate from any Prescriptive and Custom incentive applications.

Retrofit technical assistance incentives are available for, but not limited to: **feasibility studies, energy assessments** and **retro-commissioning**. **Sections 6.3.1 and 6.3.2** briefly summarize the project requirements associated with each service type and both are intended to provide information and assistance to customers towards implementing ECMs at existing facilities.

Each existing facility is eligible to receive a technical assistance incentive payment once every three years. These incentives are issued to applicants that agree to implement cost effective ECMs in a timely manner. Failure to implement these ECMs in a timely manner constitutes a forfeit of any future technical assistance incentives until cost effective ECMs are investigated further and/or implemented.

Incentives for qualified retrofit Technical Assistance will be 50% of the total technical assistance costs associated directly with electrical energy savings efforts and will be capped at $10,000 for facilities that use 500,000 kWh to 2,000,000 kWh annually. The cap is increased to $20,000 for facilities who use over 2,000,000 kWh annually. Facilities currently using less than 500,000 kWh annually do not qualify for Retrofit Technical Assistance incentives.

[5] Incentive is a one-time payment for the value shown multiplied by the annual energy savings for a one year period.
[6] Incremental measure cost is the difference in the cost of energy efficient measure and standard efficient measure. In some cases the incremental measure cost is the full cost of the measure.

6.3.1 Retrofit Technical Assistance Feasibility Study/Energy Assessment

A feasibility study consists of a detailed engineering analysis to investigate the economics and technical feasibility of one or more ECM options. For purposes of this program, this includes comprehensive energy audits and technology feasibility studies.

Pre-approval is required for this incentive. Applicants should submit a Pre-approval application along with a brief description of the proposed scope of work of the service, and the estimated cost of the service. Once Pre-approval has been obtained, the service may begin.

To qualify for an incentive payment, applicants must submit a Final application, and the following requirements must be fulfilled satisfactorily:

- Existing systems or base case and proposed system
- Methodology for analysis
- Estimated potential energy savings and costs to implement
- Estimated schedule to complete each task
- Estimated study cost per task

A qualified service provider must produce a concise written report detailing the study findings, methodology and supporting documentation. The customer must submit the report plus an Energy Efficiency for Business Program application, copy of the invoice and proof of payment for the study or assessment report. The invoice for the Technical Assistance must clearly indicate the work performed.

A written report must be submitted with the Final incentive application and include the study findings, methodology and supporting documentation. The study must develop estimates of incremental measure costs and energy savings. The accuracy of the estimates should be aligned with the study purpose. Higher accuracy is typically required to make the final investment decision than what is needed to simply screen options for additional study. The study must identify and discuss barriers to implementation in the context of potential project economics.

6.3.2 Retrofit Technical Assistance Retro-Commissioning

Retro-commissioning services are designed to assess the operational and maintenance components of HVAC and lighting control systems in existing buildings to develop a strategy to optimize the systems' energy efficiency. Typical tasks include identifying and implementing relatively low-cost operational improvements, identifying current and future capital improvements and documenting these opportunities in a retro-commissioning report.

Pre-approval is required for this incentive. Applicants should submit a Pre-approval application along with a brief description of the proposed scope of work of the service, and the estimated cost of the service. Once Pre-approval has been obtained, the service may begin.

To qualify for an incentive payment, applicants must submit a Final application, and the following requirements must be fulfilled satisfactorily:

1. A qualified engineering firm or service provider performs retro-commissioning service for the entire facility and produces a concise written report documenting an assessment of the existing energy systems along with recommended actions for system optimization. The latter shall include energy savings estimates and calculations, accurately predicting the post-commissioning benefits and outcomes. At a minimum, retro-commissioning services must involve all of the following activities:

    - Review of all applicable equipment sequencing and operating schedules
    - Assess the existing condition and operation of economizers
    - Assess current control capability
    - Review and assess maintenance procedures

2. A written report must be developed and contain the following items at a minimum:

    - A description and assessment of the energy system(s)
    - Recommended actions for system optimization
    - Estimated costs and energy impact for each action
    - List of actions that were implemented
    - Prognosis for remaining recommended actions

7. New Construction Incentives

This section covers program offerings pertaining to new construction (NC) or existing buildings that are undergoing major renovation or expansion. The intent is to encourage energy efficiency at the onset of design and construction.

New Construction Incentives are available using these methods:

- Prescriptive Measure Incentives
- Custom Measure Incentives
- Custom Whole Building Incentives (in lieu of Prescriptive & Custom Measure Incentives)
- Technical Assistance Incentives

Facilities utilizing the Custom Whole Building Incentive cannot apply for Custom or Prescriptive incentives at the same facility where project measures were implemented.

7.1 New Construction Prescriptive Incentives

Prescriptive incentives for new construction are available and listed below. Incentives will be paid for measures that exceed applicable building code minimum requirements. If a measure is required by code, such as in some cases lighting controls and variable speed drives, there may not be an incentive available.

7.1.1 New Construction Prescriptive Lighting

Two lighting prescriptive measures are available for new construction. One is a lighting power density measure. An incentive for overall reduced watts is paid if this measure exceeds an improvement below maximum allowed by the current applicable energy efficiency code. The occupancy sensor measure in **Table 7-1** below is also eligible.

Table 7-1
New Construction Prescriptive Lighting Incentives

Measure Description	Unit	Incentive / Unit
Lighting Power Density		
Improvement Below Allowable Code Requirement	Watt Reduced	$0.35
Lighting Controls		
Occupancy Sensors	Watt Controlled	$0.06
Remote Daylighting Sensors	Sensor	$20.00

Example: an applicant decides to install 1.20 lighting Watts / ft^2 within a 100,000 ft^2 space, where the maximum allowable (Code compliant) light power density equals 1.5 watts / ft^2.

- Incentive = (1.50-1.20) watts / ft^2 x 100,000 x $0.35 / watt = $10,500

7.1.2 New Construction Prescriptive HVAC

Table 7-2
Prescriptive HVAC Incentives

Equipment Type	Size Category	Qualifying Efficiency[7]			Incentive (per ton)
Unitary and Split Air Conditioning Units and Air Source Heat Pumps	< 65,000 Btuh (5.4 Tons)	14 SEER			$25
		15 SEER			$45
		EER	IPLV	IEER	
	≥ 65,000 Btuh (5.4 Tons) and <240,000 Btuh (20 Tons)	11.5	11.9	11.6	$30
		12.0	12.4	12.1	$55
	≥240,000 Btuh (20 Tons) and <760,000 Btuh (63.3 Tons)	10.5	10.9	10.6	$30
		10.8	12.0	10.9	$55
	≥ 760,000 Btuh (63.3 Tons)	9.7	11.0	9.8	$30
		10.2	11.0	10.3	$55
Water-Cooled Chillers	ALL	Level 1 (see Section 9.2)			$18
		Level 2 (see Section 9.2)			$35
Air-Cooled Chillers	ALL	1.04 kW / ton minimum			$35
Room Air Conditioners	ALL	Level 1 (see Section 9.3)			$25
		Level 2 (see Section 9.3)			$45
PTAC[8]	ALL	See Table 9.4			$30

Equipment Type		Incentive
Variable Speed Drive (VSD) on HVAC Fan and Pump Motors[9]		$45.00 / HP

[7] Efficiency requirements is either/or to qualify for the incentive.
[8] **Table 9-4** of qualifying PTAC units can be found in **Section 9.4** found on page 25.
[9] Refer to **Section 9.5** for qualified VSD applications pertaining to chillers, fans, pumps and other equipment.

7.1.3 New Construction Prescriptive Refrigeration

Table 7-3
Prescriptive Refrigeration Incentives

Refrigeration Measures		
Measure	**Incentive Unit**	**Incentive/Unit**
Anti-Sweat Heater Control	Per Linear Foot	$20.00
Automatic Door Closers for Walk-in Freezers	Per Door	$140.00
Refrigerated Vending Machine Control	Per Unit	$90.00
ENERGYSTAR® Refrigerated Vending Machine	Per Unit	$90.00
Non-refrigerated Vending Machine Control	Per Unit	$50.00
ENERGY STAR® Solid Door Reach-in Freezer < 15 ft³	Per Unit	$75.00
ENERGY STAR® Solid Door Reach-in Freezer 15 ft³ - 30 ft³	Per Unit	$100.00
ENERGY STAR® Solid Door Reach-in Freezer 31 ft³ - 50ft³	Per Unit	$125.00
ENERGY STAR® Solid Door Reach-in Freezer > 50 ft³	Per Unit	$150.00
High-Efficiency Ice Makers (Air Cooled Only) ENERGY STAR® or CEE Tier 1		
Size (lbs. / 24 hrs.)	**Incentive per Ice Maker**	
101 - 200	$75.00	
201 - 300	$125.00	
301 - 400	$175.00	
401 - 500	$225.00	
501 – 1,000	$300.00	
1,001 – 1,500	$450.00	
> 1,500	$600.00	

7.2 New Construction Custom Incentives

New Construction (NC) custom incentives are ECMs that are not included in the prescriptive measures incentives listed in **Section 7.1**. Incentives are based on the energy savings that result from the energy efficiency measure installation and are calculated using the estimated savings (kWh). The total incentive value shall be calculated using the annual energy savings multiplied by $0.08 per kWh. The total incentive paid will be limited to 75% of the incremental measure cost(s) and must meet the simple payback requirements of the Retrofit Custom measure described in **Section 6.2**.

For individual items or for measures in which a whole building simulation may require excessive effort relative to the project cost or the savings value, an alternative calculation of savings may be allowed. Please contact the program team for review.

The applicant must provide sufficient information to include equipment performance data, operating assumptions, and measurements, calculations and models to support the energy savings estimates. Applications and supporting calculations will be reviewed and accepted on a case-by-case basis. The program team may require equipment monitoring after the installation is complete to verify performance claims made in the application. The team will also work with the applicant to determine the appropriate energy use baseline.

7.3 Custom Whole Building Incentive (Performance-Based Approach)

The performance-based approach enables the building owner to consider integrated, optimized energy efficiency solutions. The applicant must provide the results of an acceptable building simulation model that shows that the annual energy consumption is at least 10% lower than the current Building Code. The model must be of the "As Built" condition of the building.

To receive an incentive, the following supporting documentation is required along with the application:

- A detailed narrative or list of specific energy efficient features of the building identifying the energy efficient system performance and comparing it to building code minimum system performance
- A detailed description of the building schedule and other 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. Building modeling tools such as e-Quest, DOE-2, Trane Trace, EnergyPlus, or System Analyzer, etc. can be used for building simulation purposes.
- A worksheet summarizing the results of the building modeling showing annual energy savings and summer peak demand savings between the "As Built" case and the building code
- A copy of the License to Occupy (Final Occupancy Permit) prior to issuance of any incentive payment. Beneficial Occupancy Permits are not acceptable.
- An active permanent service account by a Duke Energy Progress Customer is required

Savings derived from renewable energy and on-site generation cannot be included.

If a customer elects to apply for the Custom Whole Building Incentive they cannot receive prescriptive or custom incentives for the same facility. The incentives are shown in **Table 7-4**, and are based on the percentage of savings below building code.

Table 7-4
Performance-Based Incentives

$ / kWh[10]	Percent Savings
$0.09	**10% to 20%**
$0.14	**> 20%**

[10] Incentives listed are a one-time payment for the value shown multiplied by the annual energy savings for a one year period.

7.4 New Construction Technical Design Assistance

New Construction technical assistance incentives are available for electrical energy efficiency design assistance for new construction projects, significant renovations or additions exceeding 20,000 ft^2 of conditioned space. Conditioned space excludes covered parking structures and all other non-occupied spaces. These design services provide information and education to ownership and design teams in the use of energy efficient practices to improve the design and operation of the new facility and related systems. The project requirements differ slightly depending on the type of technical assistance or engineering study utilized.
Design assistance incentives off-set a portion of the incremental cost associated with a variety of new construction planning and design activities including building simulation modeling. To qualify the design services must focus on activities that result in energy savings. Customers may use these services to develop a business case for energy efficiency improvements or to incorporate energy efficiency concepts into the facility design.

The new construction design technical assistance incentive is available for new construction projects or significant renovations equal to or exceeding 20,000 ft^2 of conditioned space that achieve energy use predictions that are at least 15% below existing Code requirements. Incentives paid for new construction design technical assistance are available using one of the two following methods and cannot be combined:

Building simulation modeling: 100% of the costs associated directly with building simulation modeling, using a pre-approved software platform and methodologies, will be paid up to $20,000 maximum.

OR

Facility design assistance: a portion of the engineering and architectural design costs, specific to implementing and attaining energy efficiency performance within the Facility design will be offset by paying $0.05 / kWh for the predicted energy savings during the first year of building occupancy. This incentive is capped at $50,000.

8. Lighting Equipment Specifications

All ballasts, lamp fixtures and other materials shall be recycled or disposed of in compliance with local requirements. PCB ballasts and lamps are hazardous materials and should be disposed of properly. Manufacturer specifications of lamps, ballasts, and fixtures must accompany the application. National recognized testing laboratory (e.g., UL) ratings are mandatory where applicable.

8.1 Compact Fluorescent Lamps (Screw-in)

This measure applies to screw-in compact fluorescent lamps (CFLs) and applies only if an incandescent or high intensity discharge (HID) lamp of 150W or less is being replaced. Replacing existing lights above 150W with screw-in CFLs may be submitted as a custom measure. Replacing existing CFL lamps with new CFL lamps does not qualify. All screw-in CFLs must be ENERGY STAR® rated lamps or meet ENERGY STAR® criteria to be eligible for the incentive payment. Electronic ballasts are required for lamps ≥ 18 Watts. Dimmable CFLs are included in this category. Incentives are limited to the quantity of available sockets at the facility. CFLs that were purchased at a retail location where Duke Energy Progress' "Energy Efficient Lighting" discount has reduced the cost of the lamps are NOT eligible for incentive under this program.

8.2 Exit Signs

High-efficiency light emitting diode (LED) exit signs must replace an existing incandescent exit sign. T-1 type, non-electrified and remote exit signs are not eligible. All exit signs must be new, must be UL- or ETL-listed, have an input wattage ≤ 5 watts per face or be ENERGY STAR® rated, and comply with local codes and ordinances.

8.3 Watts Reduced Lighting Measure Category

This measure encompasses the following set of measures. If a specific retrofit does not fall into one of these categories, the measure may be considered for a custom incentive. The program team may complete a pre-retrofit inspection prior to starting actual fixture replacement(s).

Incentives for this measure are calculated based on the reduction in connected Watts. Documentation supporting the reduced wattage calculation showing existing fixture input wattages, and the proposed fixture input wattages must be included with the application. Acceptable values for input wattages of existing fixtures can be found in the prescriptive lighting application tab titled “Fixture Wattage Table” or the lighting worksheet. Use of other input wattage values will be considered on a case-by-case basis and must be supported by verifiable documentation. Incentives are available for new and retrofitted fixtures.

- Fixture Removal (in conjunction with retrofit or reconfiguring existing fixtures)
- New/Retrofit T8 or T5 Fixture
- High Performance T8
- Reduced Wattage 4-foot T8
- Reduced Wattage 8-foot T8
- T5
- CFL Pin-based (hardwired)
- Cold Cathode
- Ceramic or Pulse Start HID
- LED – Excluding refrigerated case lighting

8.3.1 New Four-Foot T8 Fluorescent Fixtures with electronic ballast

This measure consists of replacing or retrofitting one or more existing fixtures with fixtures containing qualified T8 lamps and electronic ballasts. Fixtures with T8 four-foot lamps and electronic ballast qualifying for this incentive must meet the Consortium for Energy Efficiency (CEE) high performance or reduced wattage T8 specifications (www.cee1.org). (See sections 8.3.4 and 8.3.5)

8.3.2 Other length (not 4-Foot), Linear and U-Tube T-8 Lamps

The lamp must have a color rendering index (CRI) ≥ 80, the ballast must have a total harmonic distortion (THD) ≤ 32% at full light output, and the power factor (PF) must be ≥ 0.90.

8.3.3 High Performance T8 or Reduced Wattage 4-foot T8 Systems

This measure consists of retrofitting existing fixtures with high performance T8 lamps and electronic ballasts or reduced wattage T8 lamps and electronic ballasts. This measure is based on the Consortium for Energy Efficiency (CEE) high performance and reduced wattage T8 specifications for commercial lighting (**www.cee1.org**) and is summarized below.

Table 8-5
CEE High Performance T8 Requirements

Performance Characteristics for Systems				
Mean System Efficacy	≥ 90 Mean Lumens per Watt (MLPW) for Instant Start Ballasts			
	≥ 88 MLPW for Programmed Rapid Start Ballasts			
Performance Characteristics for Lamps				
Color Rendering Index (CRI)	≥ 80			
Minimum Initial Lamp Lumens	≥ 3100 Lumens (≥ 2950 Lumens , for lamp with color temperatures ≥ 4500K)			
Lamp Life	≥ 24,000 hours			
Lumen Maintenance or Minimum Mean Lumens	≥ 90% or ≥ 2,900 Mean Lumens			
Performance Characteristics for Ballasts				
Ballast Efficacy Factor (BEF) BEF = (BF x 100) / Ballast Input Watts	**Instant-Start Ballast (BEF)**			
	Lamps	Low BF ≤ 0.85	Norm 0.85 < BF ≤ 1.0	High BF ≥ 1.01
	1	> 3.08	> 3.11	NA
	2	> 1.60	> 1.58	> 1.55
	3	≥ 1.04	≥ 1.05	≥ 1.04
	4	≥ 0.79	≥ 0.80	≥ 0.77
	Programmed Rapid Start Ballast (BEF)			
	Lamps	Low BF ≤ 0.85	Norm 0.85 < BF ≤ 1.0	High BF ≥ 1.01
	1	≥ 2.84	≥ 2.84	NA
	2	≥ 1.48	≥ 1.47	≥ 1.51
	3	≥ 0.97	≥ 1.00	≥ 1.00
	4	≥ 0.76	≥ 0.75	≥ 0.75
Ballast Frequency	20 to 33 kHz or ≥ 40 kHz			
Power Factor	≥ 0.90			
Total Harmonic Distortion	≤ 20%			

*For lamps with color temperatures >4500 K, 2950 minimum initial lamp lumens are specified pending further consideration by CEE.
** Life rating is based on a Rapid Start or Programmed-Rapid Start Ballast tested in accordance to ANSI C82.11. When used on an Instant Start Ballast, life may be slightly reduced depending upon the operating hours per start.
***Mean lumens measures at 7,200 hours.
**** Multi-Voltage Ballasts must meet or exceed the listed Ballast Efficiency Factor when operated on at least one of the intended operating voltages

Table 8-6
CEE Reduced Wattage 4-foot T8 Requirements

Performance Characteristics for Lamps		
Mean System Efficiency	≥ 90 MLPW	
Color Rendering Index (CRI)	≥ 80	
Minimum Initial Lamp Lumens*	≥ 2585 Lumens for 28W ≥ 2400 Lumens for 25W	
Lamp Life**	≥ 18,000 Hours at three hours per start	
Lumen Maintenance or Minimum Mean Lumens***	≥ 94% or ≥ 2430 Lumens for 28W ≥ 2256 Lumens for 25W	
Performance Characteristics for 28 and 25W Ballasts		
Ballast Efficacy Factor (BEF)	20 to 33 kHz or ≥ 40 kHz	
Power Factor	≥ 0.90	
Instant Harmonic Distortion	≤ 20%	
Performance Characteristics for Ballasts 28W Systems**		
Ballast Efficacy Factor (BEF)	Instant Start Ballast (BEF)	
BEF=[BEFx100]/Ballast Input Watts	Lamps	All Ballast Factor Ranges
Based on: (1) Type of ballast (2) No. of lamps driven by ballast (3) Ballast factor	1	≥ 3.92
	2	≥ 1.76
	3	≥ 1.16
	4	≥ 0.88
Performance Characteristics for Ballasts, 25W Systems**		
Ballast Efficacy Factor (BEF)	Instant Start Ballast (BEF)	
BEF=[BEFx100]/Ballast Input Watts	Lamps	All Ballast Factor Ranges
Based on: (1) Type of ballast (2) No. of lamps driven by ballast (3) Ballast factor	1	≥ 3.95
	2	≥ 1.98
	3	≥ 1.32
	4	≥ 0.99

* Lamps >= 4500 K and/or 24,000 hours have a system efficiency specified >= 88MLPW. Minimum initial and mean lumen levels are specified as follows: for 28W lamps, limits are 2600/2340. For 25W lamps, limits are 2300/2185.
** Life rating is based on an Instant Start Ballast tested in accordance with ANSI protocols, When used for Program Start; ballast life may be increased depending upon the operating hours per start.
***Mean lumens measures at 7,200 hours.
**** Multi-Voltage Ballasts must meet or exceed the listed Ballast Efficiency Factor when operated on at least one of the intended operating voltages

8.3.4 Reduced Wattage 4-foot T8

This measure consists of replacing existing or retrofitting fixtures with reduced wattage T8. The lamps must be reduced wattage in accordance with the Consortium for Energy Efficiency (CEE) specification (www.cee1.org).

8.3.5 Reduced Wattage 8-foot T8

This measure consists of replacing or retrofitting fixtures with reduced wattage 8-foot T8 lamps. Lamps must have a CRI ≥ 80 and lumen maintenance at 90%.

8.3.6 T5 Fixtures

This measure consists of replacing or retrofitting existing fixtures with T5 lamp and new electronic ballasts. Retrofit must result in T5 lamps with a color rendering index (CRI) ≥ 80. Ballasts must have total harmonic distortion (THD) ≤ 20% at full light output.

8.3.7 Hardwired Compact Fluorescent Fixtures

For hardwired CFL fixtures, only complete new fixtures or modular hardwired retrofits with electronic ballasts qualify. The CFL ballast must be programmed start or programmed rapid start with a power factor (PF) ≥90 and a total harmonic distortion (THD) ≤20%.

8.3.8 Cold Cathode

All Cold Cathode Fluorescent lamps (CCFLs) must replace incandescent lamps of greater than or equal to 10 Watts and not greater than 40 Watts. Cold cathode lamps may be medium (Edison) or candelabra base. Product must be rated for at least 18,000 average life hours.

8.3.9 Metal Halide -Pulse Start or Ceramic

This measure consists of retrofitting mercury vapor, high pressure sodium, standard metal halide, or incandescent fixtures with either quartz or ceramic pulse start metal halide fixtures. Total replacement wattage must be lower than existing wattage to ensure energy savings. Retrofit kits may be used on existing Mercury Vapor, Standard Metal Halide or High Pressure Sodium Fixtures only.

8.3.10 Integrated Ballast Ceramic Metal Halide Lamps

This measure consists of replacing incandescent lamps or high intensity discharge fixtures with integrated ballast ceramic metal halide lamps. Qualifying lamps are 25 watt or less integrated ballast ceramic metal halide PAR lamps with a rated life of 12,000 hours or greater.

8.3.11 LED Lighting – Excluding Refrigerated Case Lighting and Special Applications

The Program is promoting the use of nationally recognized specifications for LED lighting set forth by ENERGY STAR® and DesignLights TM Consortium (DLC). LED products that are listed under Energy Star or DLC meet the requirements of the program. Specification sheets showing model number and listing must be submitted with application.

Energy Star or DLC qualified LED lamps and fixtures replacing any lamp or fixture may be eligible for a Prescriptive Incentive, as long as the lamp or fixture is approved for the intended use. LED lights used in refrigerated case lighting should be filed as custom measures.

Some lamp and fixture categories will not be covered by Energy Star or DLC evaluation standards. Through the Custom Incentive process, Duke Energy Progress can evaluate specialty fixtures on a case-by-case-basis, as resources allow. Because of the added fixture qualification requirement in the review process, turnaround time for reservation letters, if granted, may take longer than with other applications. Prospective applications should include any and all available warranties, specifications and independent lab test results. Such documents include the following:

1. Product data sheet with complete information on exact options being specified.
2. LM-79 test. Provide report on results of testing, conducted according to IES standard LM-79 that provides efficacy, output, color and photometric distribution of your product. At a minimum, the LM-79 test report(s) should include:
    a. Luminaire efficacy (Lm/w)
    b. Light output (Lumens)
    c. Color rendering index (CRI)
    d. Correlated color temperature (CCT)
3. LM-80 test. Provide LED package manufacturer IES LM-80 test report with results showing relative (%) light output over time at 55°C, 85°C and X°C (a third temperature at the manufacturer's choice).
4. In-Situ temperature test. Provide test report indicating the temperature of the hottest LED In-Situ in ANSI/UL 1598-04 (hardwired) or ANSI/UL 153-05 (corded) environments. This temperature measurement will be used with LM-80 data to validate lumen maintenance and useful life of product. Note that this temperature measurement should be specially requested from the manufacturer as they are getting their UL testing.
5. Product warranty and proof of UL listing.

Additional documentation, including photometric layouts, site plans and project site information may be required.

Testing by the U.S. Department of Energy's CALiPER (Commercially Available LED Product Evaluation and Reporting) program indicates that some manufacturers provide product specification sheets that show inaccurate or misleading information. Due to this, a Custom Incentive application for any proposed LED fixture requires a copy of a lab test reports performed by a CALiPER testing laboratory, listed at http://www1.eere.energy.gov/buildings/ssl/test_labs.html. Test reports from any laboratory not listed on the CALiPER website will not be accepted.

8.4 Occupancy Sensor or Remote Mounted Daylight Sensor Controls

Passive infrared, ultrasonic detectors, fixture-integrated sensors or sensors with a combination thereof are eligible. All sensors must control interior or exterior lighting fixtures. The occupancy incentive is calculated on a per-Watt-controlled basis and the remote mounted daylight sensor is per sensor. Sensors may qualify for either occupancy or daylighting incentives. They will not qualify for both.

8.5 Lighting Power Density – New Construction or Major Renovation

Under the Performance Based Lighting Incentive, the lighting power installed is compared with the lighting power allowed by code. Incentives are available for systems where the installed lighting power is lower than the code-allowed power. Savings are based on the Lighting Power Density (LPD) calculated on a watts-per-square-foot basis. Incentives will be paid only on the area of the building where the lighting installation is complete and is ready for occupancy. If a portion of a building is not built-out such that the lighting in an area is not complete or ready for occupancy, then that portion is not eligible for an incentive. Baseline lighting power density is current state (N.C. or S.C.) building code unless local codes state otherwise. Either the "Building Area" or "Space-by-Space Method" must be used to calculate the LPD for the purposes of the incentive.

9. Cooling Equipment Specifications

9.1 Unitary and Split Air Conditioning Systems and Air Source Heat Pumps

New unitary air conditioning units or air source heat pumps that meets or exceeds the qualifying Energy Efficiency Ratio (EER) or Integrated Energy Efficiency Ratio (IEER) shown in Table 9-1 are eligible for an incentive. They can be either split systems or single packaged units. The efficiency of split systems is based on an Air-Conditioning and Refrigeration Institute (ARI) reference number. Water-cooled systems, evaporative coolers, and water source heat pumps do not qualify for prescriptive incentives, but may qualify for a custom incentive. All packaged and split system cooling equipment must meet ARI standards (210/240, 320 or 340/360), be Nationally Recognized Testing Laboratories (NRTL) listed, and use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC). All required efficiencies are based on the Consortium for Energy Efficiency (CEE) high efficiency commercial air conditioning and heat pump specifications (www.cee1.org)[11]. A manufacturer's specification sheet indicating the system efficiency must accompany the application. Disposal of the existing unit must comply with local codes and ordinances.

Table 9-1

Unitary and Split Air Conditioning Systems and Air Source Heat Pumps Qualifying Efficiencies

Size Category	Qualifying Efficiency[12]			Incentive (per ton)
< 65,000 Btuh (5.4 Tons)	14 SEER			$25
	15 SEER			$45
	EER	**IPLV**	**IEER**	
≥ 65,000 Btuh (5.4 Tons) and <240,000 Btuh (20 Tons)	11.5	11.9	11.6	$30
	12.0	12.4	12.1	$55
≥240,000 Btuh (20 Tons) and <760,000 Btuh (63.3 Tons)	10.5	10.9	10.6	$30
	10.8	12.0	10.9	$55
≥ 760,000 Btuh (63.3 Tons)	9.7	11.0	9.8	$30
	10.2	11.0	10.3	$55

[11] This website also has a list of eligible systems.
[12] Efficiency requirements is either/or to qualify for the incentive.

9.2 Water and Air-Cooled Chillers

Chillers are eligible for an incentive if they have a rated kW / ton for the Integrated Part Load Value (IPLV) that is less than or equal to the qualifying Level 1 and Level 2 kW/ton IPLV shown in the following table and; they are used for HVAC cooling for human comfort. If the chiller is used for process cooling or HVAC cooling for process requirements (example, maintaining humidity levels in textiles) the chiller may be eligible for an incentive using the custom measure. Chillers operating less than 600 hours per year are not eligible for a prescriptive incentive. The chiller efficiency rating must be based on ARI Standard 550/590-2003 for IPLV conditions and not based on full-load conditions. The chillers must also be NRTL listed and use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC). A manufacturer specification sheet with the rated kW / Ton-IPLV or COP-IPLV must accompany the application. Qualifying efficiencies for chillers are summarized below. Conversion for kw/ton = 12/EER @ IPLV

Table 9-2
Chiller Qualifying Efficiencies

Chiller type	Size (Tons)	Level 1 kW/ton IPLV	Level 2 kW/ton IPLV
Scroll or Helical-Rotary	< 150	0.61	0.54
	150 to 300	0.57	0.50
	≥ 300	0.51	0.46
Centrifugal	< 150	0.60	0.54
	150 to 300	0.54	0.48
	≥ 300	0.49	0.44
Reciprocating	ALL	0.63	0.56
Air-Cooled	ALL	1.04	NA

Chillers with integrated VSDs may qualify and should be included in Custom measure applications see Section 9.5.

9.3 Room Air Conditioners

Room air conditioning units are through-the-wall or built-in self-contained units that have capacity ratings of 2 tons or less. There are two eligible efficiency levels as listed by the Consortium for Energy Efficiency. A unit can either qualify under Level 1 or Level 2 standards. The minimum requirements and eligible equipment are listed in the Consortium for Energy Efficiency (CEE) high efficiency room air conditioning specifications (www.cee1.org)[13], under home appliances. These units are with and without louvered sides, without reverse cycle (i.e., heating), and casement. The qualifying efficiencies for both levels are provided below. Disposal of existing unit must comply with local codes and ordinances.

Table 9-3
Room Air Conditioner Qualifying Efficiencies

Size (Btuh)	Level 1 (EER)	Level 2 (EER)
< 8,000	10.7	11.2
8,000 to 13,999	10.8	11.3
14,000 to 19,999	10.7	11.2
≥ 20,000	9.4	9.8

[13] This website also has a list of eligible units.

9.4 Package Terminal Air Conditioning Units (PTAC)

Package terminal air conditioners and heat pumps are through-the-wall, self-contained units.[14] All EER values must be rated at 95ºF outdoor dry-bulb temperature. Minimum requirements are shown in **Table 9-4**.

Table 9-4
PTAC Minimum Efficiency Requirements

Capacity (Btuh)	Minimum Efficiency (EER)
≤ 7,000	11.3
7,001 - 8,000	11.0
8,001 - 9,000	10.8
9,001 - 10,000	10.5
10,001 - 11,000	10.3
11,001 - 12,000	10.0
12,001 - 13,000	9.8
13,001 - 14,000	9.5
14,001 - 15,000	9.4
≥ 15,000	9.2

[14] 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.

9.5 Variable Speed Drive on HVAC Chillers, Cooling Towers, Fans, and Pumps

Variable-speed drives (VSDs) installed on existing constant speed chillers, cooling towers, HVAC fans, or HVAC pumps used for human comfort are eligible for a prescriptive incentive. The installation of a VSD must accompany the permanent removal or disabling of any flow control or throttling devices such as inlet vanes, bypass dampers, and valves.

New chillers or other equipment with integrated VSDs are likely eligible as a custom measure.

VSDs for non-human comfort HVAC applications, air compressors and other equipment may be eligible for a custom measure incentive.

9.6 Guestroom Energy Management Controls

Sensors that control HVAC units for individual hotel rooms are eligible for a prescriptive incentive. Sensors must be controlled by automatic occupancy detectors. During unoccupied periods, the default setting for controlled units should differ by at least 8 degrees from the operating set point. Sensors controlled by a front desk system are not eligible. Replacement or upgrades of existing occupancy-based controls are not eligible for a prescriptive incentive. Upgrades could be considered for a custom measure.

The incentive is per guest room controlled, not per sensor, for multi-room suites the incentive is available per room controlled, if a sensor is installed in each room.

10. Refrigeration Equipment Specifications

Only electric equipment is eligible. All equipment shall replace existing electric equipment or be new equipment.

Energy Star and CEE maintains a list of most qualifying products and specifications at www.energystar.gov/cfs or www.CEE1.org.

10.1 Strip Curtains on Walk-in Coolers and Freezers

This measure consists of new strip curtains or clear plastic swinging doors installed on doorways of walk-in boxes and refrigerated warehouses. NOT eligible for display cases or for replacing existing strip curtains that have useful life left. A pre-inspection may be performed. The incentive is based on square footage of doorway (inside) opening.

10.2 Anti-Sweat Heater Controls

A control device is installed that senses the relative humidity in the air outside of the display case and reduces or turns off the glass door (if applicable) and frame anti-sweat heaters at low-humidity conditions. Technologies that can turn off anti-sweat heaters based on sensing condensation (on the inner glass pane) also qualify. Rebate is based on the total horizontal linear footage of doors controlled on the case.

10.3 Electronically Commutated Evaporator Fan Motor (Refrigerated Cases or Walk-ins)

This measure is applicable to the replacement of an existing standard-efficiency, shaded-pole evaporator fan motor in refrigerated display cases or fan coil in walk-ins. The replacement unit must be an electronically commutated motor. This measure cannot be used in conjunction with the Evaporator Fan Controller measure.

10.4 Evaporator Fan Controls

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% 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) Evaporator does not use off-cycle or time-off defrost.

10.5 Refrigerated Vending Machine Control

Controller must include a passive infrared occupancy sensor to turn off fluorescent lights and other vending machine systems when the surrounding area is unoccupied for 15 minutes or less. Also, the control logic should power up the machine at minimum every 2-hour to maintain product temperature and provide compressor protection.

10.6 Non-refrigerated Vending Machine Control

Controller must include a passive infrared occupancy sensor to turn off lamps and other vending machine systems when the surrounding area is unoccupied for 15 minutes or less. For vending machines located indoors, backlighting lamps and ballasts should be removed to obtain additional energy savings.

10.7 ENERGY STAR® Refrigerated Vending Machine

ENERGY STAR® vending machines qualify for an incentive. Qualifying machines can be found at http://www.energystar.gov/ia/products/prod_lists/vending_machines_prod_list.pdf.

10.8 High-Efficiency Ice Makers

The incentive offering covers ice machines that generate 60 grams (2 oz.) or lighter ice cubes, flaked, crushed, or fragmented ice. Only air-cooled machines qualify (self-contained, ice making heads, or remote condensing). The machine must have a minimum capacity of 101 lbs. of ice per 24-hour period. The minimum efficiency required is per ENERGY STAR® or CEE Tier 1[15]. A manufacturer's specification sheet must accompany the application that show rating in accordance with ARI standard 810.

10.9 Door gaskets

Incentive is based on total door perimeter in lineal feet. Gasket must replace a worn gasket on the door of a walk-in cooler or freezer. Replacement of gaskets must meet the manufacturer's installation specifications, specifically regarding dimensions, materials, attachment method, style, compression, and magnetism.

10.10 ENERGY STAR® Solid Door Reach-in Freezers

Incentive is based on volume of the freezer. Energy Star Solid Reach-in Freezers must be a commercial solid door model listed on the ENERGY STAR® qualified product list. Qualifying freezers can be found at https://data.energystar.gov/Active-Specifications/ENERGY-STAR-Certified-Commercial-Refrigerators-and/59dg-uw25?

[15] The websites have a list of qualifying model numbers, www.energystar.gov or www.cee1.org.

11. Custom Measures

The program staff will evaluate each Custom Application. These measures will be reviewed based on (but not limited to) the following criteria: electrical energy savings, persistence of energy savings, cost, and payback period. Applicants must provide the calculations documenting the estimated electrical energy (kWh) savings; the calculations and assumptions supporting the kWh impact estimates and the resulting incentive amount are subject to program staff review and approval.

Pre-approval is required for all custom incentive applications. The pre-approval step provides an assurance that the methodology meets the program requirements. Program staff engineers will work with customers or their installing contractor or consultant to review the proposed savings methodology and to identify the information necessary to support the savings estimate and any additional data that may be required to verify the savings after installation.

Measurement and verification activities, including power measurements or monitoring for a period of time prior to and after the measure is installed may be required to document that the energy impacts are consistent with the pre-approved estimates. In some cases Duke Energy Progress may require monitoring the energy use of the base case (pre-retrofit) system as well as the post-retrofit system in order to establish or verify the savings and/or assumptions.

The final incentive amount will be based on the final savings documented through the post-retrofit review, and may be different than the savings and/or incentive amount originally estimated in the pre-approval estimate.

12. How to Apply – The Application Process

The incentive application process is intended to be simple, with as few steps as possible. The program staff is available to help you with the application process.

12.1 Pre-Approval Application

A **Pre-Approval Application is required for custom projects** and is encouraged for prescriptive projects to reserve funding. Pre-Approval Applications are not a guarantee of project acceptance until program staff has indicated that the project is pre-approved and the funds are reserved. Installed measures must meet program requirements to qualify for incentive. Pre-approval is the best method to check this requirement before work begins.

- It is the responsibility of the Applicant to contact the Program team if a project is delayed, substantially changed or cancelled.
- Funds that have been pre-approved for specific applications are not transferable to other projects, facilities, and/or customers.
- A complete online, emailed, or faxed copy of the Pre-Approval application form initiates the review process. Funding reservations are only committed to a given project when the project details have all been approved.
- When requested, the Pre-Approval application for prescriptive incentives and measures must include sufficient information (equipment specifications, quantities, etc.) to estimate the incentive amount.

- The Pre-Approval application for custom incentives must include an estimate of the annual energy savings, as well as sufficient descriptive information, including equipment performance data, operating schedules, load profiles, assumptions and calculations and other information to support the energy savings estimates so Program staff can replicate savings estimates.
- **The Pre-Approval application must include a customer signature.**

12.2 Program Steps

- **Step 1: Verify project eligibility.** Ensure that your project meets the project requirements as set forth in **Sections 3** through **5** including: customer eligibility, project requirements, and incentive limits.

- **Step 2: Submit a Pre-Approval Incentive Application.** Access the appropriate application form at https://www.progress-energy.com/carolinas/business/save-energy-money/energy-efficiency-for-business.page?. Complete all the required information and check the form's "Pre-Approval" box Contractors may complete the form on behalf of their customers, using Customer information.

  Application forms can be downloaded or completed online from the "Incentive Applications" section of the Energy Efficiency for Business Program website which can be accessed through www.duke-energy.com/carolinasbusiness. **A pre-inspection may be required. For projects requiring pre-approval, work cannot commence until pre-approval is provided to the applicant in writing.**

- **Step 3: ECM Installation: Install the equipment or systems properly.** Dispose or recycle materials properly and permanently remove or disable all replaced equipment and systems.

- **Step 4: Assemble the required documentation of project completion, costs, and (for custom projects) documentation of energy savings.** Obtain copies of the purchase orders, work orders, statement of work, equipment specifications, and paid invoices showing the itemized costs for applicable labor and materials. Documents should clearly indicate the equipment specifications and quantities. If equipment is included on several invoices, a summary sheet should be provided showing how the quantities match the quantities in the application.

- **Step 5: Complete the Final Application form.** Note that this form is the same as the Pre-Approval Application form found at www.duke-energy.com/carolinasBusiness If Pre-Approval was submitted accurately record any changes and check the "Final Application" box on the form. A Federal **W-9** form must be included with the Final Application. Final Applications should be received within 90 days after project completion. **A customer signature is required for payment and the form should not be submitted unless all work has been completed.**

- **Step 6: Program staff will review the Request for Payment and the final project documentation.** A post-inspection may be required for verification purposes. The final payment will be based on the results of the post-review.

- **Step 7: Payment is processed.** Incentive payments will be sent within 6 to 8 weeks from the time that all the required documentation is received and the field inspection is complete.

The Program team reserves the right to conduct both pre- and post-inspections of all projects for quality control purposes. All projects are subject to be chosen for independent measurement and verification (M&V) purposes. If selected, the customer will be contacted by a Duke Energy Progress representative. M&V may include obtaining logged data on individual project components.

12.3 Discrepancies

If it is determined that there are significant discrepancies between the incentive application and Duke Energy Progress' analysis, the customer will be contacted to review these differences. This provides an opportunity for the customer (or contractor) to dispute the review results within **10 days. If the applicant does not respond adequately in the time frame of 10 days**, the revised incentive value will be confirmed and processed for payment.

12.4 Applications

The Energy Efficiency for Business Program Application acts as both a Pre-Approval application form as well as a Final Application form (**please select the appropriate type at the top of the application**).

If submitting an online Pre-Approval Application, simply select **"Pre-Approval"** on the online application and submit online. If submitting a Pre-Approval Application, select "Pre-Approval on the form and mail, fax or email the completed, signed and dated application to the Energy Efficiency for Business Program for pre-approval.

To request payment for a completed project, submit the same online application or form with the **"Final Application"** selection made and any project changes indicated. The Final Application must be fully completed and submitted/returned with an **original signature** before incentives will be paid. The Final Application must also include all necessary final documentation such as itemized invoices, receipts, cut sheets, a Federal **W-9** form and (when applicable) reports.

13. Payment Process

The Program team may choose to cap rebate payments at the reserved amount, even if actual project installations may calculate higher incentive amounts.

The incentive will be paid directly to a customer <u>or</u> to their designated recipient. Indicate the name and Tax ID number for the recipient on the Incentive Application. If a contractor is to be paid directly, a third party payment form with signatures, Tax ID and license number(s) must be included with the application.

14. Prescriptive Documentation

For prescriptive incentive payment requests, invoices listing specific equipment information and quantities must be provided. These documents must itemize costs for the equipment and

materials installed. The customer's address and business name on the invoice should be consistent with the application information.

Applicants may also be asked to provide more detailed information on equipment location(s) during the pre- and post-inspection process, such as a lighting audit (spreadsheet format is preferable, especially for larger sites). Manufacturer's literature, product brochures, cut sheets, or other certified performance data for the specific model numbers and sizes of the equipment must also be submitted with the Final Application. If the documented capacity or performance differs from the performance in the Pre-Approval Application, the incentive will be adjusted accordingly. Failure to provide the documentation will delay or prohibit payment.

All Final Applications must be submitted properly with final documentation that includes an original signature of the customer and, if applicable, the designated third party recipient of the incentive.

15. Guidelines for Calculating & Documenting Energy Savings for Custom Measures

Custom incentives are calculated based upon the first year's estimated annual kilowatt-hour (kWh) savings. To be accepted as a basis for the incentive, the savings calculations must be developed using acceptable engineering calculation techniques supported by site-specific operating and equipment performance documentation. Other required documents include invoices, cut sheets, or commissioning reports. Applicants must also be aware that the incentive estimates are not final until after the measures have been installed and Duke Energy Progress has performed various measurement and verification (M&V) activities. The final incentive payment may be different from the requested amount if the post-retrofit system operation or performance does not meet the criteria as provided to estimate the energy savings.

The following guidelines provide suggestions for submitting project documentation to ensure that your project qualifies for an incentive and delivers the proposed energy savings. This section also provides information to assist you with calculations or measures for energy savings.

The analysis methods and documentation details are recommendations and not requirements.

Before you submit your custom incentive application, verify that the proposed ECMs (Energy Conservation Measures) are not included as part of the prescriptive program and if so, submit them on a prescriptive application.

Before you begin your savings estimate, identify the project payback period as well as the measure life. Both of these factors will determine if the measure is eligible for the program as well as to identify the applicable incentive. If there is any concern on qualifying for the program, please contact the Energy Efficiency for Business Program Team for assistance.

For certain projects, in addition to energy savings calculations, the program may require measurement and verification (M&V) in order to qualify for an incentive payment. Any operational data that supports the energy usage claims or savings calculations should be provided with your application. If you need assistance in identifying appropriate M&V procedures, the program team can assist you.

The following sections discuss general guidelines for project submittals. We recommend that you contact the program team as you prepare your custom incentive application to discuss documentation requirements and energy savings calculation methods.

15.1 General Guidelines

To estimate first year energy (kWh) savings for retrofit projects, calculate the difference between the pre-retrofit ("base case") system energy (kWh) use and the post-retrofit or "efficient case" system kWh use. Define or describe the base case and efficient case system and operating conditions. The calculated kWh savings can be determined in a number of ways that depend upon the specific ECM.

There are general requirements that are common to all Custom projects as listed below:

- Concise project description: Describe **BOTH** the existing (pre-retrofit or "base case") system and the proposed (post-retrofit or "efficient-case") system. Be as concise as possible in the descriptions - include specific quantities and equipment descriptions.

- Provide the quantity, make, model number and rated capacity of **BOTH** the existing and the proposed equipment. Provide nameplate information, including operating voltage, operating efficiency and rated full load amps if applicable. **Work scope proposals issued to the customer are also often helpful to describe the new equipment and scope of work.**

- Provide copies of the manufacturer's specification or performance rating sheets and website addresses where further technical information about the equipment performance might be found:

- Utilize the Customer's numbering system and nomenclature to describe equipment. Example: "Replace compressor #3 with a new variable speed compressor."

- Provide copies of sketches, drawings, equipment lists, or inventories that help to clarify the scope.

- Describe the locations where the equipment is installed. Include the street address, building name, room number, work area, etc.

- Describe **BOTH** the Facility operating hours and the equipment operating schedule for year round seasonal and / or daily operation.

- Describe equipment load conditions for the hours the equipment typically operates.

- Annotate all assumptions or constants used in engineering calculations.

- Provide the name of the person(s) conducting the savings calculations so that program staff can discuss any questions.

- Use accepted engineering algorithms and procedures from recognized technical organizations such as ASHRAE, SMACNA, ANSI, etc.

- Use rated performance factors tested under accepted procedures specified by recognized rating agencies such as ARI, AGA, ANSI, ASTM, etc. Provide an explanation when equipment performance rating conditions vary from standard conditions.

15.2 Acceptable Calculation Methods

A list of acceptable energy savings calculation approaches follows. Each of the methods will be discussed in more detail as they apply to categories of measures in the following sections.

15.2.1 Whole Building Metering

For some projects, where the energy savings exceed 10% of the total annual kWh usage, a "bills before – bills after" approach may be used. This approach assumes that building occupancy levels or operating hours are unchanged. Usually, a regression must be included in this approach to adjust for uncontrolled variables, such as weather.

- If a whole system or building model is used, be sure to provide sufficient documentation or annotation so that the differences in inputs between the base case and high-efficiency case can be understood and verified by the reviewers.
- Models that do not reflect the actual systems and their operation (i.e. defaults are used instead of building-specific equipment) are not acceptable.
- Whole building models should be calibrated to actual energy use (electric bills) and use typical weather data, such as TMY for weather calibration.

15.2.2 Equipment or Process Sub-Metering

When ECMs are installed that affect individual equipment or systems, sub-metering may be used to document energy savings. This may require the installation of temporary portable monitoring equipment that measures and records the equipment power at short intervals over several days or weeks. When sub-metering is used, a method must be developed to extrapolate the savings for the measurement period to a full year of operation. Component sub-metering may often include observation of other variables like outside air temperature, operating hours, or production quantities during the measurement period to allow for this extrapolation.

15.2.3 Engineering Calculations

For ECMs that impact several small systems, sub-metering may be impossible. For these measures, an engineering calculation method is likely the best method to document savings. For most equipment types and efficiency measures there are well-established engineering procedures and there are a number of public domain component or equipment performance models that are available to calculate pre- and post-energy use. One common modeling method is the “bin-method” in which the equipment pre and post-energy requirements are identified for several fractional load “bins” (i.e. 25%, 50%, 75% and 100% load or temperature range bins) and the pre- and post-equipment performance in each load or temperature bin is applied to the loads and hours that the system operates in the bin over the year.

15.2.4 Whole Building Modeling Methods

For measures that have building-wide or multi-system impacts, engineering modeling using generally accepted **public domain** software, is acceptable to document savings. When using any model, the applicant must provide both the “base case” and “post-case” input files and annotate the files to clearly show how the differences between the pre- and post-retrofit systems are being simulated. Applicants who expect to use modeling to estimate savings as a basis for the incentive should contact the Energy Efficiency for Business Program staff early in the project development process.

The following sections describe how these basic savings estimation principles and submittal requirements may apply to certain project types or technologies.

15.3 Custom Lighting Measures

The following information should be provided when submitting custom lighting measures.

1. Project description – for example, “Replace 20 ea. 400 watt hi-bay HID lighting fixtures in the warehouse with 22 ea. suspended 6-lamp high output T8 fixtures, equipped with daylight controls.” Provide a detailed lighting inventory that includes the following:
   - Location (building, area, aisle #, etc.)
   - Existing and new fixture description, including specific ballast specifications
   - Existing and new fixture wattage
   - Existing and new fixture quantity
   - Existing and new controls
   - Existing and new annual operating hours (different if installing controls)
   - Interior or exterior fixtures
2. Provide the electrical plan sheet that shows the existing and proposed lighting layout or a reflected ceiling plan and the lighting fixture schedule, when available.
3. The use of standard “default” fixture wattages is acceptable. A table of “default” fixture wattages for common fixture / lamp types is available upon request. If the fixture type being installed is not on the table, specification sheets showing the wattage of all retrofit fixtures must be provided with the lighting inventory.

Use the following general equations to calculate the savings:

Base Case Lighting kW = (# base case fixtures * Base case ***input*** fixture wattage per fixture * fraction of fixtures that are typically operating) / (1,000 Watts/kW)

(Note: In the case of **new construction** projects, the base case lighting kW will be the maximum wattage that would be allowable by the applicable energy code in your jurisdiction.)

Base Case Lighting kWh = Base Case Lighting kW * base case annual operation hours

Post Retrofit Lighting kW = (# post-retrofit fixtures * post retrofit ***input*** fixture wattage per fixture * fraction of fixtures that are expected to be operating) / (1,000 Watts/kW)

Post Retrofit Lighting kWh = Post retrofit lighting kW ******* post retrofit annual operation hours

Annual kWh Savings = (Base Case Lighting kWh – Post Retrofit Lighting kWh) * HVAC Interaction Effect

Other Guidelines:

When preparing your project information, please consider:

- Operating hours are typically the operating hours of the Facility except as noted below. If the lighting is on a different operating schedule from the Facility, consider using lighting or power data loggers to document the fixture operating hours.
  - Exit signs and emergency lighting and many hallway and stairway fixtures are typically on 24 hours a day, 7 days a week, therefore use 8760 hours per year if you have a project that involves these technologies that falls outside of the prescriptive program.

  - In order to provide more accurate operation hours, consider dividing the fixtures into usage groups – offices, common areas, restrooms, and conference rooms to define operating hours by usage group or work area.
- Pre- and post-retrofit operation hours are often the same. However, if the project includes the installation of control technologies such as occupancy sensors, timers, etc., new (lower) hours of operation usually result. Justification for the lower hours should be provided.
- Installing a lower wattage lamp of the same type is NOT considered an eligible measure unless it can be established that the replacement fixture is more efficient (i.e. the lumens per watt) than the fixture that it replaces.
- There may be cases when the program team will ask for validation of operating hours.

The review team will verify installed fixture quantities and compare them to initial savings calculations and invoices. Applicants need to clearly list installed fixture types and lamp quantities.

15.3.1 LED Lighting for Refrigerated Case and Special Applications Only

The Program is promoting the use of nationally recognized specifications for LED lighting set forth by ENERGY STAR® and DesignLightsTM Consortium (DLC). General lighting projects using LED are to be filed as a prescriptive measure if they are DLC or ENERGY STAR® qualified. LED products used in refrigerated case lighting applications or a special application that is not addressed by an Energy Star or DLC fixture or lamp category will need to be submitted as a Custom application and will be considered on a case-by-case basis. If the refrigerated case LED product applied for meets the ENERGY STAR® or DesignLightsTM Consortium requirements, it may be eligible for the custom incentive.

For special applications that are not addressed by an Energy Star of DLC fixture or lamp category, Duke Energy Progress can evaluate specialty fixtures on a case-by-case-basis, as resources allow. Because of the added fixture qualification requirement in the review process, turnaround time for reservation letters, if granted, may take longer than with other applications. Prospective applications should include any and all available warranties, specifications and independent lab test results. Such documents include the following:

1. Product data sheet with complete information on exact options being specified.
2. LM-79 test. Provide report on results of testing, conducted according to IES standard LM-79 that provides efficacy, output, color and photometric distribution of your product. At a minimum, the LM-79 test report(s) should include:
    a. Luminaire efficacy (Lm/w)
    b. Light output (Lumens)
    c. Color rendering index (CRI)
    d. Correlated color temperature (CCT)
3. LM-80 test. Provide LED package manufacturer IES LM-80 test report with results showing relative (%) light output over time at 55°C, 85°C and X°C (a third temperature at the manufacturer's choice).
4. In-Situ temperature test. Provide test report indicating the temperature of the hottest LED In-Situ in ANSI/UL 1598-04 (hardwired) or ANSI/UL 153-05 (corded) environments. This temperature measurement will be used with LM-80 data to validate lumen maintenance and useful life of product. Note that this temperature measurement should be specially requested from the manufacturer as they are getting their UL testing.

5. Product warranty and proof of UL listing.

Additional documentation, including photometric layouts, site plans and project site information may be required.

Testing by the U.S. Department of Energy's CALiPER (Commercially Available LED Product Evaluation and Reporting) program indicates that some manufacturers provide product specification sheets that show inaccurate or misleading information. Due to this, a Custom Incentive application for any proposed LED fixture requires a copy of a lab test reports performed by a CALiPER testing laboratory, listed at http://www1.eere.energy.gov/buildings/ssl/test_labs.html. Test reports from any laboratory not listed on the CALiPER website will not be accepted.

Recommended guidelines for evaluating LED lighting can be found on the CEE website at http://www.cee1.org. Customers and contractors proposing LED lighting for task areas should consider these recommendations when evaluating the use of LED lighting as an energy efficiency replacement option. Customers considering LED lighting for non-task areas (for example, for entertainment, signage, display, hospitality, and other customer experience purposes) should consider installing a sample to be sure the equipment satisfies their needs before committing to a complete retrofit or requesting the address and contact information of facility where product has been installed for 6 months or more. The decision to move forward with the installation of LED lighting is determined by the customer and the Program team does not "approve" any specific LED equipment or any other technology.

15.4 Custom HVAC Measures

The most common HVAC measures are included in the list of prescriptive measures and include chiller or packaged AC unit replacement. Variable frequency drives (VFDs or VSDs) for HVAC motors should be applied-for under the prescriptive application. Custom HVAC measures may include:

- Water-side economizer, a.k.a. "free cooling" (e.g. plate and frame heat exchanger, closed-loop tower, or "glycooler")
- Air-side economizer
- Exhaust heat recovery equipment (heat exchangers)
- Constant volume to variable volume water or air distribution
- Variable-speed control of centrifugal equipment (other than HVAC fans or pumps) that are throttled by less efficient means
- Control upgrades
- CO2- or occupancy-based (demand-based) ventilation controls

Most HVAC system measures are weather-dependent. As such, the preferred methods of estimating energy savings are building or system models that integrate local weather conditions with system loads and performance or "temperature bin" models. This section includes several acceptable methods for providing the savings analysis for HVAC measures. In all cases, it is important to document the pre- and post-retrofit conditions thoroughly. For most projects, the analysis will need to be calibrated and adjusted to reflect the weather variances, occupancy variations or internal load changes.

The following techniques may be employed for calculating project savings:

- Building models that are publicly available and well-documented, such as EQuest, Energy Plus, and DOE2 are recommended for measures with building-wide or interactive effects. Proprietary vendor programs such as Trane Trace or Carrier HAP may be accepted with appropriate documentation and program team approval[16].

- ASHRAE-based simplified calculation methodologies including the "bin methods" may be used to estimate the savings of many weather-dependent strategies such as economizer systems (water and air), heat recovery, ventilation control, or VAV conversions. These methods can be easily calculated in a spreadsheet format so that the underlying assumptions can be easily followed. In many cases, for retrofit projects, the existing building energy use and energy use patterns can provide the basis for calibration for these methods.

- Simple spreadsheet analysis may be used for certain stand-alone retrofits such as carbon monoxide sensors for parking garages.

- For certain projects, a monitoring / metering approach may be the best means to document savings. The applicant should remember that it is simpler to verify the post-case, but it is the base case condition that requires documentation for program verification. Be sure to consider pre-project measurements when planning a future project. The following are some suggestion parameters for measuring pre- and post-retrofit:
  - Power (kW) and energy (kWh)
  - Air flows, temperatures, water flows
  - Outdoor temperatures and humidity (may be available from other sources)
  - Building activity and operating schedules (people, hours, etc.)

15.5 Custom Building Envelope Measures

Common custom measures that may be applied for under this category include:

- Window treatments: external or internal shading
- Window film
- Insulation
- Cool roof technologies
- Door or window opening treatments that reduce infiltration

Accurately estimating envelope improvement ECM savings is often difficult because their impacts involve a high degree of system and interactive effects. Using a whole building model as described in the previous section may offer the best results and provide the opportunity to describe the pre- and post-retrofit insulation and surface characteristics, and effectively include all the system and interactive effects.

However setting up a whole building model to estimate the savings for envelope improvements is often not practical. There are a number of simplified degree-day or weather-based "bin analysis" methods that are sufficient to estimate the impacts of these measures. These

[16] The Program review team may attempt to duplicate savings estimates using other tools and must be provided sufficient information to do so.

methods are described in detail in the ASHRAE Handbooks. Combined with local weather data files, they will provide most of the information and calculation procedures necessary to estimate savings resulting from building envelope measures. Some of the more common methodologies have been put into spreadsheet format that are available commercially online. The Department of Energy and some states have supported the development of analytical tools that are useful in isolating the savings for various envelope improvements.

15.6 Custom Process and Refrigeration Measures

Some typical process and custom refrigeration measures are:

- "Tower-free cooling" for process cooling (e.g. plate and frame heat exchanger, closed-loop tower, or "glycol-cooler")
- Waste heat recovery equipment (heat exchangers)
- Constant volume conversion to variable volume water or air distribution
- Variable-speed control of centrifugal equipment, such as fans or pumps, that are throttled by less efficient means
- Higher efficiency or improved-control process equipment
- Floating head pressure controls for industrial refrigeration
- Refrigeration compressor upgrades.
- Air compressor improvements

There are several methods that can be used to document energy savings for process ECMs. Nearly all process related measures will require some degree of monitoring, measurement, or hourly log observations to establish the load profile for the equipment. The energy use and the savings are then extrapolated to a full year period. In all cases, it is important to consider any seasonal, weekly, or monthly variations in operation.

Short-term pre- and post-retrofit measurements extrapolated by production. Energy use for process systems can often be related to production output. One method to document annual savings is to compare the pre- and post-retrofit systems over a representative production period (which may include multiple shifts) and then extrapolate the results to a full year. The method is as follows:

- Determine the pre-retrofit system kWh per unit of production, per shift, production run, or equipment cycle as appropriate.
- Determine the post-retrofit kWh per comparable unit.
- Adjust the baseline using the post-retrofit production levels if the ECM provides increased production output volume.
- Extrapolate to a full year by multiplying the difference by the (new) annual production.

- **Short-term measurements extrapolated by shifts or operating time.** In some cases the energy use does not relate to production but to equipment operating time or availability. In this case the savings are similar to the above except the time in days or number of shifts is the factor used to extrapolate the savings to the full year.

- **Short-term monitoring extrapolated to a year.** A short term pre- and post-monitoring of a week or two can be carried out and the results extrapolated to a full year based on time. The difference is then multiplied by the ratio of annual hours to the monitored hours.

Post-retrofit energy monitoring and calculated base case energy, extrapolated to a full year. This method is useful when the performance or efficiency of the base case equipment is known but the load profile was not monitored prior to the project. This method often applies to compressed air systems or large refrigeration systems. In this case, the post retrofit system power and output (cfm or tons) is measured for a period of a week or more. The base case power for the same period is then calculated by multiplying the output by the base case equipment performance. The savings are then extrapolated to full year by extrapolating based on the projected loading pattern.

15.7 Unacceptable Documentation

This section lists methods that are not acceptable for calculating the energy savings for custom measures.

- Vendor-specific or proprietary analysis software will not be accepted unless the methods used are available for review and the input parameters are specific to the site.
- Simple percent of total kWh savings or percent of end use energy savings are not acceptable.
- Factors or percentages of savings achieved at other sites are not acceptable as documentation for custom savings unless there is an extensive body of statistically valid results.
- Using rules of thumb for calculating savings is not acceptable.
- Marketing materials from the manufacturer or distributor, their company's case studies, or savings claims based on non-standardized methods are not acceptable[17]. A manufacturer or distributor product savings claim will not be accepted.
- For intermittently operating equipment, the hours of operation must be documented in some fashion – either from logs, elapsed time meters, and daily observation of occupancy hours. If documentation is not provided, very conservative estimates must be used.
- Spot measurements as documentation of power or energy use are typically not acceptable for variable load equipment.

[17] The program reserves the right to evaluate and excluded the means and methods used, including software or systems utilized to derive modeled outcomes.

16. Definitions

BEF: Ballast Efficacy Factor

BF: Ballast Factor

Btuh: British Thermal Units per hour. (12,000 Btuh = 1 Ton)

Baseline ECMs: Also called "Prescriptive Measures, these Energy Conservation Measures ECMs exceed Code requirements and will be included in the building without analysis required. These measures represent typical design practice of the Design Team and / or measures that are commonly found to be cost effective and don't warrant individual ECM analysis.

Building Code: Applicable state building energy codes

Cap: Maximum monetary limit associated with one or more incentive payments.

CEE: Consortium of Energy Efficiency www.cee1.org

CFL: Compact Fluorescent Lamp

COP: Coefficient of Performance

Code Building: A hypothetical building design based on existing Code requirements that incorporate the design features of typical buildings of the same usage and just meets the requirements of the North or South Carolina Energy Code. The Code building is used to benchmark the energy efficiency improvements and determine relative energy efficiency performance.

Customer: The Duke Energy Progress customer-of-record for the principal account with the largest kWh consumption that is affected by the project. The primary criterion for determining the customer is the "Account name."

ECM: Energy Conservation Measure

EE: Energy Efficiency

EER: Energy Efficiency Ratio

Earned Incentive: A financial payment associated with completing the installation and successful operation of one or more qualified energy efficiency measures, while meeting the minimum specifications pertaining to the implemented measure(s).

Energy Code: The current applicable Building Energy Code for NC or SC. The North Carolina Energy Conservation Code is authored by North Carolina Building Code Council and North Carolina Department of Insurance. It is based on the provisions of the applicable International Energy Conservation Code and ASHRAE 90.1.

Facility: A "facility" is defined as a structure, multiple structures and / or area served by a meter located on a contiguous piece of property. For those customers that have a primary meter and their own distribution equipment or customers that have multiple meters on the same contiguous piece of property, a facility is a structure or area enclosed by defined boundaries, i.e. building firewalls, roadways, fences, etc. as determined by the Program.

Final Application: The required documentation package submitted by the applicant after project completion. This includes a request for payment bearing an original applicant's signature and all appropriate backup documentation, including detailed invoices.

IPLV: Integrated Part Load Value

LED: Light Emitting Diode

IEER: Integrated Energy Efficiency Ratio was developed by AHRI as an improvement over the old Integrated Part Load Value (IPLV) for unitary equipment. IEER is a weighted average of the unit's efficiency at four load points –100%, 75%, 50% and 25% of full cooling capacity

Incentive: The amount to be paid to the customer or contractor once the final project documentation has been approved.

Incremental measure cost: Realized additional financial costs, including design considerations, materials, equipment, and labor required and utilized to implement an energy conservation measure that exceeds current baseline Code requirements (i.e., the cost of the

system with the energy-saving features minus the cost of the proposed or existing baseline system.)

Measure: Any single energy efficiency method.

Measure Evaluation: Technical review method or tasks related to a specific energy efficiency measure.

MLPW: Mean Lumens per Watt

NRTL: The Nationally Recognized Testing Laboratory (NRTL) Program, which is a part of OSHA's Directorate of Technical Support and Emergency Management. The Program recognizes private sector organizations as NRTLs, and recognition signifies that an organization has met the necessary qualifications specified in the regulations for the Program. The NRTL determines that specific equipment and materials ("products") meet consensus-based standards of safety to provide the assurance, required by OSHA, that these products are safe for use in the U.S. workplace.

Pre-Approval: The process of informing the program team of your project plans for the purposes of gaining prior approval based upon customer eligibility and project requirements.

PTAC: Packaged Terminal Air Conditioner

Program Year: The program year starts on January 1st and ends on December 31st.

Project: A defined scope of work or tasks not necessarily bounded by Facility or geography.

Proposed Baseline Building: A code compliant building as planned by the design team before final decisions are made regarding which ECMs will be included in the final building design. The Proposed Baseline Building shall include ECMs that do not require cost effectiveness analysis. The Proposed Baseline Building is used to benchmark the cost effectiveness of ECMs that do require analysis.

Reflector: A device or assembly utilized to focus and / or direct lamp light output towards intended area.

SEER: Seasonal Energy Efficiency Ratio

Site: A qualified customer at a single address having contiguous property

THD: Total Harmonic Distortion

Total Project Cost: The total cost to the owner, including materials, shipping, tax, and contracted labor. Internal or self-installed labor does not count towards the project cost.

Unsatisfactory Credit: A customer account that is not in good standing with Duke Energy Progress.

17. Dispute Resolution

The program team will take every possible step to ensure a high level of satisfaction with all aspects of the program. However, if any problems or concerns should arise, we encourage you to contact the Energy Efficiency for Business Program Hotline: (866) 326-6059.

If the hotline staff cannot answer your questions, they will provide you with the appropriate contact information or other resources to help answer your questions.

18. Tax Implications

Paid incentives that exceed $600 are reported to the IRS and may have tax implications. The recipient is responsible for any and all tax payments that may result from an incentive payment. Participants are encouraged to consult their tax advisors to determine implications.

19. Disclaimer

Duke Energy Progress does not guarantee the energy savings and does not make any warranties associated with the measures eligible for incentives under this program. Duke Energy Progress has no obligations regarding and does not endorse or guarantee any claims, promises, work, or equipment made, performed, or furnished by any contractors or equipment vendors that sell or install any energy efficiency measures.

20. Contact Information

Program Hotline:	(866) 326-6059
Email Address:	carolinasBusiness@dnvkema.com
Website:	http://www.duke-energy.com/carolinasBusiness
Mailing Address:	DEP Energy Efficiency for Business 3605 Glenwood Avenue, Suite 435 Raleigh, North Carolina 27612
Fax:	(919)-573-6942 or toll free (877)-607-0746