

2021 Incentive Catalog



Consumers Energy
Business Energy Efficiency Programs



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Call 877-607-0737

or Email: ConsumersEnergyBusinessSolutions@cmsenergy.com

Our team is ready to help you with your next energy efficiency project.

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About This Program

The Consumers Energy Business Energy Efficiency Programs are a comprehensive suite of energy efficiency programs created to assist commercial and industrial businesses increase their energy optimization, lower their energy use and lower their cost of operation.

A wide variety of energy efficiency incentives are available to help business owners reduce the initial cost of installing new energy-efficient equipment in their facilities. An overview of the various program offerings is summarized below. The sections that follow provide detailed information on the actual incentives and specific program details related to each of the various offerings.

Application forms for all programs are available on the Consumers Energy website: [ConsumersEnergy.com/startssaving](https://www.consumersenergy.com/startssaving). All applicants are urged to download and review the Policies and Procedures Manual, located online.

Prescriptive Incentives

These incentives are available for energy efficiency equipment upgrades and improvements including categories such as: Lighting/Electrical, Mechanical, Refrigeration and Building Envelope. Incentives are paid based on either quantity, size or the efficiency of the equipment. Incentives are provided for qualified equipment commonly installed in a retrofit or equipment replacement situation. The total calculated incentive cannot exceed 100% of the project cost (as described on page 9 in Prescriptive Project Incentive Caps). Full details of the measures and equipment specifications are detailed in this catalog.

Custom Incentives

These incentives are available to customers for less common or more complex energy saving measures installed in qualified retrofit and equipment replacement projects that are not covered by the prescriptive incentive portion of the program. Custom incentives are paid based on the first-year energy savings (kWh or Mcf). Applicants have the option to apply for a custom incentive for projects that involve an integrated solution with both prescriptive and custom incentives.

Custom incentives include measures that result in a reduction in electric and/or natural gas energy use because of an improvement in system efficiency (i.e., a net decrease in energy use without a reduction in the level of service). The applicant must provide sufficient technical information, equipment performance data, operating assumptions, measurements and calculations to support the energy savings estimates. The decision as to whether or not an improvement is eligible for a custom incentive is within the sole discretion of Consumers Energy.

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

- Process improvements.
- Process exhaust heat recovery.
- Constant volume to variable volume water.
- Variable-speed or Frequency (VSD/VFD) control on motors (greater than 250 HP).
- Upgrade of a refrigeration compressor.
- Complex air compressor improvements.
- Tank insulation.
- DC to AC drives on injection mold machines.
- VFDs on hydraulic equipment.

New Construction Program

The New Construction Program provides an array of electric and natural gas incentives for commercial and/or industrial customers who design and construct their facilities with energy efficient equipment that exceeds standard building practices. Through early involvement in new construction or major renovation projects the program team can assist in design decisions to impact the overall building energy efficiency. Program staff will provide an engineering review of projects that are currently in the design stages to target financial incentive opportunities for customers and design teams. The program works with design professionals to influence prospective building owners and developers to construct high-performance buildings that provide improved energy efficiency, systems performance and comfort. Incentives can be pursued through either a Prescriptive/Custom application or a LEED® Whole Building Design application.

Incentive Options:

- Prescriptive/Custom application.
 - » Customers can choose from an assortment of prescriptive measures with set incentives.
 - » Incentives available for only the facility owner.

LEED® Whole Building Design Application

- Performance energy modeling analysis demonstrating significant improvement in the proposed building design compared to the program baseline standard.
- Incentives available for only the facility owner.
- Must receive LEED® certification to qualify for whole building.

Eligibility:

- Projects must result in a facility improvement with a permanent reduction in electrical (kWh) and/or natural gas (Mcf) energy use compared to baseline practices.
- The project MUST be in the pre-construction phase when submitting the Pre-Notification application.
- The new construction/major renovation project must meet one of the following definitions.
 - » New building projects wherein no structure or site footprint presently exists.
 - » Addition or expansion of an existing building or site footprint.
 - » Major tenant improvements that change the use of the space.

Agriculture Program

The Agriculture Program assists Michigan farmers, growers and producers by offering incentives for the completion of energy efficiency audits and projects. This program will incentivize the customer portion of an MSU/REAP energy audit payment for a USDA Tier II audit. The Consumers Energy Business Energy Efficiency team will review the results of the audit to provide guidance to the customer on applying for Prescriptive or Custom incentives.

Who can participate:

- Customers on a commercial rate code or a residential farm rate code.
- Customers installing measures at a full-time agricultural operation.

What we provide:

- Audit incentive for completion of MSU/REAP USDA Tier II energy audit.
- Evaluation of audit results.
- Prescriptive or Custom incentives through the Consumers Energy Business Energy Efficiency Programs.
- Details of the incentives are available through Consumers Energy Business Energy Efficiency Programs catalog and incentive application form.

Compressed Air Program

The Compressed Air Program is part of the Industrial Energy Program offering which is designed to provide special incentives to industrial customers with compressed air systems installed in their facilities. The program gives customers the opportunity to examine their system efficiency through Compressed Air Energy Audits, as well as to provide them with financial incentives for energy efficiency improvements to their systems. A variety of prescriptive measures are available and customers who have projects not listed can apply for custom incentives.

Details of the incentives are available through the Consumers Energy Business Energy Efficiency Programs catalog and incentive application form.

Buy Michigan Bonus

Customers who use Michigan Made products in their energy-saving projects may be eligible for an additional 15% bonus incentive. An affidavit from the manufacturer attesting the product is at least 50% manufactured and assembled in the state of Michigan (exclusive of packaging) is required. We will verify the eligibility.

Business Instant Discount Program

The Business Instant Discount Product Program incentivizes distributors to mark down the retail price of select energy efficient products. In turn, commercial and industrial contractors/customers receive an instant discount when they purchase the products. This minimizes the need to fill out and send in an application. Lighting, food service and various natural gas measures are eligible for the discount at participating distributor locations. The Business Instant Discount Product Program is available to all Consumers Energy business customers with an eligible commercial account number. For more information, visit ConsumersEnergy.com/instantdiscount.

How to Apply

Customer Eligibility

To participate in any Consumers Energy Business Energy Efficiency Programs, customers must be a commercial and/or industrial customer of Consumers Energy. Residential agricultural customers qualify for agricultural measures.

Qualified incentives must be installed at facilities served by Consumers Energy and projects must result in an improvement in energy efficiency. Equipment must meet the specifications as explained in this catalog and also set forth in the program application. For each site there must be at least one meter that is on an eligible rate schedule.

Program Effective Dates

The Business Energy Efficiency Program offers incentives for the 2021 program year until funds are exhausted or until Dec. 31, 2021, whichever comes first. All projects must be completed and final applications received no later than Nov. 30, 2021 to be eligible for the 2021 program incentives.

Project Requirements

The Business Energy Efficiency Program includes the following project requirements:

- Projects must involve a facility improvement that results in a permanent reduction in electrical and/or natural gas energy use (kWh and/or Mcf).
- Any measures installed at a facility must be sustainable and provide 100% of the energy benefits as stated in the application for a period of five years or for the life of the product, whichever is less. If the customer ceases to be a delivery service customer of Consumers Energy or removes the equipment or systems at any time during the five-year period or the life of the product, the customer may be required to return a prorated amount of incentive funds to Consumers Energy.
- The Business Energy Efficiency Program team reserves the right to inspect all projects to verify compliance with the program rules and verify the accuracy of project documentation. This may include pre and/or post inspections, data collection and interviews. The customer must allow access to records and installation sites for a period of three years after receipt of incentive payment.
- New construction projects MUST be in the design phase when submitting the Pre-Notification application. Final project eligibility is at the discretion of Consumers Energy Business Energy Efficiency Program personnel.
- To qualify under the New Construction Program, your new construction/major renovation project must meet the following definition: New building projects wherein no structure or site footprint presently exists; addition or expansion of an existing building or site footprint; major tenant improvements that change the use of the space; or energy load is added.

Projects that are **NOT** eligible for incentives include the following:

- Fuel switching (e.g., electric to natural gas or natural gas to electric)*.
- Changes in operational and/or maintenance practices or simple control modifications not involving capital costs.
- On-site electricity generation.
- Projects that involve peak-shifting (and not kWh savings).
- Projects involving renewable energy.
- LED lighting that is not ENERGY STAR® approved or listed by DesignLights Consortium® (DLC)® in applicable categories, unless approved.
- Installation of used equipment.
- Applications that are received for projects that involve a banned or ineligible contractor either as the installer, general contractor, A&E firm or supplier of qualifying equipment will be canceled.

*May be eligible under the self-direct program, if overall BTU/hr. are reduced at that facility.

Equipment Specifications

This catalog provides the equipment specifications for the measures eligible for incentives. All equipment must be recycled/disposed of according to state, federal and local regulations. Information about the requirements for the State of Michigan can be found at the Michigan Department of Environmental Quality Website: michigan.gov/deq/.

Incentive Caps and Limits

Incentives are subject to limits in order to encourage equitable distribution of the funds among as many Consumers Energy customers as possible. Incentive caps are annual and are calculated based upon which program year the incentive is paid to the customer.

Customer Annual Limits

The amount of incentives a facility or customer can receive is limited. A facility is defined as a single customer who is responsible for paying the Consumers Energy electricity and/or natural gas bill. A customer is defined as the organization under which the company (or companies) are owned or operated, regardless of who is responsible for paying the bill. Program year incentive limits are shown below.

Prescriptive Incentives	100% of the total project cost
Custom Incentives	50% of the total project cost
Electric Customer Incentive Limit	\$2 million across all facilities per customer
Natural Gas Customers Incentive Limit	\$1 million across all facilities per customer
Natural Gas Custom Tiers per Customer	100% of the calculated natural gas incentive up to \$500,000 50% of the calculated natural gas incentive above \$500,000

Prescriptive Incentive Caps

The amount of a prescriptive incentive cannot exceed 100% of the cost of the project. Project costs may include the labor necessary to install the measure and costs related with the disposal of the removed equipment. Internal labor costs may not be included in the total project cost. For prescriptive projects, project incentives are capped at 100% of the installation cost. The customer is responsible for providing sufficient documentation to validate the project costs. Manufacturer, vendor, distributor, Trade Ally or contractor provided incentives (credits, deductions, refunds, etc.) must be subtracted from the total installation costs.

Custom Incentive Caps and Calculation

For custom projects, project incentives cannot exceed 50% of the total custom project cost for purchasing and installing energy efficiency measures. The project cap applies to the whole project. Internal customer labor costs cannot be included in the total project cost. Consumers Energy reserves the right to apply this cap to individual custom measures when measure costs are significantly higher than typical costs seen in this program. Manufacturer, vendor, distributor, Trade Ally or contractor provided incentives (credits, deductions, refunds, etc.) must be subtracted from the total installation costs.

The payback period for Custom Incentives must be between one and eight years. The total calculated incentive cannot exceed 50% of the measure cost. Natural Gas custom Incentives are awarded at 100% of the calculated incentive up to \$500,000 and 50% above \$500,000.

Payback period is calculated with the following equation:

$$\text{Simple Payback Period} = \frac{\text{Measure Cost}}{(\text{Annual kWh Saved} \times \text{Electricity Rate}) + (\text{Annual Mcf Saved} \times \text{Natural Gas Rate})}$$

The Incremental Measure Cost (IMC) is the cost of implementing a measure; less any costs that would have been incurred by the applicant to achieve all of the project benefits, other than those resulting in the incented energy savings. The IMC can either be the incremental equipment cost or the full cost of a measure; and is determined by the cost basis. The cost basis is derived from the type of measure in the application (retrofit, replace on burnout, or new) and whether the measure is displacing existing technology, being installed in absence of any existing technology, or is an alternative to a competing technology. In general, new construction and replace on burnout measures use the incremental equipment cost as the IMC. For retrofit measures, the full cost is typically used as the IMC such as in the case where a customer installs a new technology such as a high efficiency boiler in place of a less efficient boiler.

New Construction Incentive Caps

New Construction projects are subject to the same customer caps and limits, prescriptive incentive caps and custom incentive caps set forth in the Customer Annual Limits section. Not all prescriptive measures are eligible for participation in the New Construction Program. Eligible measures are identified in the program application and the measure specifications.

Application Process

The application process is described in Section 1 of the application, which is available online at the Consumers Energy website. If you have questions regarding the program or the application please contact the program team at either:

- 877-607-0737
- ConsumersEnergyBusinessSolutions@cmsenergy.com

Documentation Requirements

Pre-Notification Application Information

Please review this Incentive Catalog and pay close attention to the required supporting documentation. These documents must be legible and submitted along with your incentive request(s). **Pre-Notification is required for any incentive with a Pre-Notification designation. Pre-Notification is also recommended on all projects requesting an incentive greater than \$10,000.**

Before submitting your Pre-Notification application, make sure you have completed the following:

- Include all required information in the applicant information and measure worksheet sections of the application.
- Verify that all required supporting documentation and new equipment specifications are included.
- Make copies of all documentation for your records.
- Copy of payee's W9.

Final Application

Detailed invoices and supporting documentation must be legible and submitted with your application within 60 days of the project completion date or reservation expiration date, whichever occurs first. Invoices and/or proof of purchase must include all of the following information:

- Invoice number and date.
- Vendor name and address.
- Itemized list of specific equipment, including model number, manufacturer, price and quantity.
- Customer name, address, email and phone number.
- Total cost of the of purchase.

Please allow six to eight weeks to receive your incentive check. Incentives cannot be processed for payment until the complete application and all required documentation is received and approved.

Please carefully read the Terms and Conditions. Before submitting your application, make sure you have completed the following. Any missing information will delay the processing of your application. Include all required information in the applicant information, final application and measure worksheet section of the application.

- Make sure your final application is signed by an authorized representative of the Consumers Energy account holder representative.
- Verify all required invoices, supporting documentation and equipment specification are included.
- Make copies of all documentation for your records.
- Copy of payee's W9.

Lighting



Rebranded LED lighting products do not qualify for an incentive unless the rebranded light is listed by DesignLights Consortium® (DLC®) or ENERGY STAR® under its rebranded name. Both the manufacturer (as defined by DLC) and model number must match on the lamp/fixture, invoice, specification sheet and DLC/ENERGY STAR listing.

- Only one manufacturer name (DLC listed only) is allowed on the specification sheet.
- The product may only have one manufacturer's label, which must be the DLC listed model.

For LED fixtures featuring the capability of varying wattages and/or lumen outputs after installation, rebate applications must be submitted with the 'post' wattage being the maximum wattage at which the fixture will operate at any point while installed.

All LED products must be listed as an approved product for their specific purpose by ENERGY STAR or DLC or meet the minimum requirements of their specific purpose/category.

Products not listed on either DLC or ENERGY STAR must have IES-LM-79-08 testing report from an accredited laboratory and TM-21 projection demonstrating lifetime. A form must be filled out and approved by program staff if not DLC or ENERGY STAR listed. Sample form can be found on page 95.

Fixture wattage as listed within the application must include any applicable ballast or other required operating device.

Linear LED Tube Lights

Linear LED Tubes (TLEDs) are defined by DLC as all tube-style LED products that use the lamp holders (i.e., sockets or tombstones) in the luminaire to mechanically or electrically connect to the fixture housing and the electrical supply. Type classifications are as follows:

- » **UL Type A:** TLEDs are used as a direct replacement for existing fluorescent tubes, reusing the existing fluorescent ballasts and reusing the existing lamp holders to connect the TLED tube to the fixture.
- » **UL Type B:** TLEDs typically use the lamp holders (either existing or retrofitted) to connect the TLEDs to

the existing fluorescent fixture, but do not operate through the existing fluorescent ballast. TLEDs have internal drivers and run off line voltage.

- » **UL Type C:** TLEDs connected to the low voltage side of the TLEDs new external driver. The existing fluorescent ballast is disconnected and fully removed from the existing fluorescent fixture.
- » **Dual Mode (DM) Internal Drivers (UL Type A and Type B):** TLEDs may operate off the existing fluorescent ballast or be rewired to operate off line voltage. They have the same requirements as Type A or Type B TLEDs.

Linear LED Tube Lights Replacing T12s or T8s (Pre-Notification Required) (LT101-LT107, LT110 - LT120, LT123 - LT126)

Requirements:

- Linear LED tube lights must be retrofitting existing interior T8 or T12 linear fluorescent lamps. Any existing T12 fixture ballast must be removed or permanently disabled.
- Linear LED tube lights must be DesignLights Consortium listed for linear replacement lamps or must meet the following requirements: efficacy ≥ 120 lumens/watt, CRI ≥ 80 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,000$ kelvin.
- New fixtures utilizing LED tube lamps do NOT qualify.
- Fixtures installed 15 feet or higher are considered "high bay".

4-foot T5 to 4-foot LED Tube Light (Pre-Notification Required) (LT108, LT109, LT121, LT122)

Requirements:

- Linear LED tube lights must be retrofitting existing interior T5 linear fluorescent lamps.
- Linear LED tube lights must be DesignLights Consortium listed for linear replacement lamps or must meet the following requirements: efficacy ≥ 120 lumens/watt, CRI ≥ 80 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,000$ kelvin.
- New fixtures utilizing LED tube lamps do NOT qualify.
- Fixtures installed 15 feet or higher are considered "high bay".

Permanent Lamp Removal

Permanent Lamp Removal (Pre-Notification Required) (LT127 - LT129)

Requirements:

- Available for the permanent removal of existing fluorescent lamps.
- Permanent lamp removal is the net reduction in the quantity of lamps after an incentive project is completed.
- Customers are responsible for determining whether or not to use reflectors in combination with lamp removal in order to maintain adequate lighting levels. Light retrofits are expected to meet the Illuminating Engineering Society of North America (IESNA) recommended light levels.
- Unused lamps, lamp holders and ballasts must be permanently removed from the fixture and disposed of in accordance with local regulations.
- This incentive is applicable when retrofitting from T12 or T8 lamps to linear LED tube lights. Removal of lamps from a fixture that is not retrofitted with linear LED tube lights is not eligible for this measure.

Lighting New/Retrofit Fixtures

Exterior LED Lighting (Pre-Notification Required) (LT201)

Requirements:

- Available for exterior applications for replacing incandescent (over 250 watts) or high-intensity discharge fixtures with LED fixtures.
- Applicable to exterior fixtures that are on a minimum of 11 hours/day.
- The new fixture or retrofit kit must be listed by DesignLights Consortium or ENERGY STAR or must meet the following requirements: efficacy ≥ 105 lumens/watt, CRI ≥ 65 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,700$ kelvin.
- Linear LED tube light retrofits, new Linear LED tube fixtures and LED screw-in lamps do not qualify for this incentive.

Parking Garage LED Lighting (Pre-Notification Required) (LT202)

Requirements:

- Available for parking garage applications for replacing existing high-intensity discharge fixtures or incandescent (over 250 watts) with LED fixtures.
- Applicable to parking garage fixtures that are on approximately 20 hours a day.
- Linear LED tube light retrofits or new Linear LED tube fixtures do not qualify for this incentive.
- The new fixture or retrofit kit must be listed by the DesignLights Consortium or must meet the following requirements: efficacy ≥ 105 lumens/watt, CRI ≥ 65 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,700$ kelvin.

Interior LED Lighting (LT203 - LT206)

Requirements:

- The new lighting fixture must either be a permanently -wired lamp retrofit or completely new fixture.
- New fixtures must replace or retrofit existing incandescent, mercury vapor, T8 fluorescent, T5/T5HO fluorescent, T12 fluorescent, standard metal halide or high pressure sodium fixture in interior installations.
- New product must be listed by the DesignLights Consortium or ENERGY STAR or must meet the following requirements:
 - » Low bay: efficacy ≥ 115 lumens/watt, CRI ≥ 80 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,000$ kelvin.
 - » High bay: efficacy ≥ 120 lumens/watt, CRI ≥ 70 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,700$ kelvin.
- Fixture wattage as listed within application must include any applicable driver or other operating device.
- Fixtures installed 15-feet or higher are considered "high bay".
- Tube LED lighting retrofits or new fixtures utilizing LED Tube DO NOT qualify for this incentive.
- To receive the continuous operation incentive, the fixtures must operate at 8,000 hrs./yr. prior to installation of the new fixture.
- New lamps or retrofit kits receiving power through their existing Edison socket would not qualify for this incentive but may qualify for the LED Screw-in incentive.

New Linear LED Tube Fixtures (Pre-Notification Required) (LT207 - LT209)

Requirements:

- New fixtures utilizing linear LED tube lamps qualify for this measure.
- Linear LED tube lights must be DesignLights Consortium listed for linear replacement lamps or must meet the following requirements: efficacy ≥ 120 lumens/watt, CRI ≥ 80 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT ≤ 5000 kelvin.
- New fixtures must replace existing incandescent, mercury vapor, T8 fluorescent, T5/T5HO fluorescent, T12 fluorescent, metal halide or high pressure sodium fixtures in interior installations.
- Fixtures installed 15-feet or higher are considered “high bay”.
- Fixture wattage as listed within the application must include any applicable ballast or other required operating devices.

LED Screw-In Replacing HID (Pre-Notification Required) (LT210)

Requirements:

- Existing HID lamps must be equal to or less than a nominal 400 watt lamp.
- The retrofit must be permanently wired around the existing ballast and in full compliance with the authorities having jurisdiction.
- LED lamp must be DesignLights Consortium listed or meet the applicable requirements (efficacy, CRI, etc) as listed in the interior and exterior LED lighting sections.
- Available for both interior or exterior applications.
- New lamp or retrofit kit must receive power through existing Edison socket.

Signage Lighting Retrofit (Pre-Notification Required) (LT211, LT212)

Requirements:

- To qualify for this incentive, the existing incandescent, metal halide, fluorescent or neon fixture must either be replaced with a permanently wired lamp retrofit or a completely new LED fixture.
- Measure is intended for the replacement or retrofit of: interior-lit roadway/walkway signage, canopy decorative / security lighting or permanently-wired neon lighting.
- All incentivized fixtures or kits must be listed by ENERGY STAR or DesignLights Consortium, if applicable to that type of light. For fixture types that are not approved by either certifying body, the new fixture must feature: an efficacy of at least 80 lumens per Watt, a 50,000 hour L-70 lifespan and a 5-year warranty.
- A fixture that is on continuously 24/7 would qualify for the continuous operation incentive.
- A fixture that does not operate continuously, but at least 10 hours per day would qualify at the commercial hours incentive.

Trim Kits (Pre-Notification Required) (LT301)

Requirements:

- Power must be supplied through the Edison base of the trim kit. Pin-based LED products are not eligible for this incentive.
- The LED trim kit must be approved by ENERGY STAR in either the Downlight Recessed or Downlight Solid State Retrofit fixture types or must meet the following requirements: efficacy ≥ 60 lumens/watt, CRI ≥ 80 , lifetime $\geq 50,000$ hours, warranty ≥ 5 years, CCT $\leq 5,000$ kelvin.
- Available for interior applications only.

Non-Defined Lighting

These measures apply to new lighting fixture replacements and/or retrofits that do not fall into one of the other prescriptive lighting categories offered. A separate Non-Defined Lighting Measure form is required for each area (office, production, office, etc.) receiving the lighting upgrade. These measures are part of a capital investment project that results in energy savings and is not easily reversible.

If applicable, all proposed technologies utilized in the Non-Defined Lighting section must meet the requirements for any prescriptive measure featuring those same technologies. Additionally, for technologies that feature certification and/or approval from ENERGY STAR or DesignLights Consortium, the installed product must be approved by the appropriate certifying body or meet the applicable requirements as listed in the interior and exterior LED lighting sections and approved by program staff. Form can be found on page 95.

Lumens per Watt Improvement (Pre-Notification Required) (LT302)

- The rated mean efficacy of the existing lighting system increases by a minimum of 5% and results in the total lighting wattage being reduced. If no mean efficacy is available on the products literature, a degradation factor will be assessed via Table 2.
- The simple payback period must be greater than or equal to one year and less than or equal to eight years.
- Incentive cannot exceed 50% of the measure cost.

Energy Conservation Improvement (Pre-Notification Required) (LT303)

- The rated mean efficacy of the existing lighting system changes less than 5% and results in the total lighting wattage being reduced. If no mean efficacy is available on the products literature, a degradation factor will be assessed via Table 2.
- The simple payback period must be greater than or equal to one year and less than or equal to eight years.
- Incentive cannot exceed 50% of the measure cost.

Table 1a: Default Wattages for Standard Linear Fluorescent Fixtures

Fixture Description	Default Fixture Wattage			
	1 Lamp	2 Lamp	3 Lamp	4 Lamp
4-foot F32 T8	31	58	85	112
2-foot F17 T8	20	33	48	63
3-foot F25 T8	26	46	68	88
4-foot F28 T5	32	65	93	126
4-foot F40 T12	43	85	130	170

Table 1b: Default Wattages for High-Output and High-Performance Linear Fluorescent Fixtures

Fixture Description	1 Lamp	2 Lamp	3 Lamp	4 Lamp	6 Lamp	8 Lamp
4-foot F32 T8 HP Ballast	38	74	110	144	220	-
F54 T5 HO	62	122	185	243	365	486

Table 1c: Default Wattages for Metal Halide and High Pressure Sodium Fixtures

Fixture Description	Default Fixture Wattage
32W HID	43
50W HID	64
75W HID	93
100W HID	128
150W HID	183
175W HID	208
250W HID	290
360W HID	414
400W HID	455
750W HID	812
1000W HID	1080
1500W HID	1610
2-Lamp, 8-foot T12 HO	210
2-Lamp, 8-foot T12 VHO	380
2-Lamp, 8-foot T12	132
4-Lamp, 8-foot T12	264
2-Lamp, 4-foot T12 (34 Watt/lamp)	74
3-Lamp, 4-foot T12 (34 Watt/lamp)	117
4-Lamp, 4-foot T12 (34 Watt/lamp)	143

Table 2: Lumen Reduction

Lighting Technology	Initial Lumens	Mean Lumens	Reduction Factor	Mean Lumen Watt
Metal Halide – 70W	4,900	3,300	32.7%	36.7
Metal Halide – 100W	8,500	5,900	30.6%	46.1
Metal Halide – 175W	13,500	8,775	35.0%	41.8
Metal Halide – 250W	20,500	13,500	34.1%	46.6
Metal Halide – 315W Ceramic (T9)	37,800	34,000	10.1%	100.6
Metal Halide – 320W Pulse Start	29,500	20,650	30.0%	56.7
Metal Halide – 320W P.S. Ceramic	28,800	23,000	20.1%	63.2
Metal Halide – 400W	36,000	24,000	33.3%	52.7
Metal Halide – 1000W	110,000	71,500	35.0%	66.2
High Pressure Sodium – 70W	6,300	5,850	7.1%	65.0
High Pressure Sodium – 100W	9,400	8,460	10.0%	66.1
High Pressure Sodium – 150W	15,000	13,500	10.0%	71.1
High Pressure Sodium – 250W	27,000	24,300	10.0%	83.8
High Pressure Sodium – 400W	50,000	45,000	10.0%	98.9
High Pressure Sodium – 1000W	125,000	112,000	10.4%	103.7
Mercury Vapor – 75W	2,800	2,250	19.6%	24.2
Mercury Vapor – 100W	4,400	3,400	22.7%	26.6
Mercury Vapor – 175W	7,900	7,600	3.8%	36.2
Mercury Vapor – 250W	13,000	10,700	17.7%	36.9
Mercury Vapor – 400W	23,000	19,100	17.0%	42.0
Mercury Vapor – 1000W	63,000	47,500	24.6%	44.0
LED*			10.0%	
Induction*			15.0%	
T12 (4-foot, 34W per lamp)	2,600	2,300	13.2%	67.6
T12 (8-foot, 60W per lamp)	5,400	4,750	12.0%	79.2
T12 HO (8-foot, 110W per lamp)	8,000	6,950	13.1%	63.2
T8 (4-foot, 32W per lamp)	2,950	2,800	5.1%	87.5
T5 (4-foot, 54W per lamp)	5,000	4,750	5.0%	88.0
CFL (Avg: 13W, 18W, 26W)	1,300	1,125	13.5%	

* Lumen Values vary significantly by manufacturer and wattage

**Lighting Power Density for New Construction
Lighting Specification
(Pre-Notification Required) (LT401 - LT403)**



Incentives are available for interior and exterior lighting where the lighting power density (LPD) is lower than the ASHRAE 90.1-2013 requirements by at least 10%. Lighting power densities must be based on designs that meet applicable codes and standards and follow industry guidelines for acceptable quantity and quality of lights for the space type and tasks. To receive incentives for lighting, use the U.S. Department of Energy COMcheck software (energycodes.gov/comcheck) for interior and/or exterior lighting and provide the following:

- COMcheck "Lighting and Power Compliance Certificate".
- Scaled lighting plans and/or site lighting plans.
- Lighting fixture schedules.
- Specification sheets for all lamps and fixtures.
- Explanation for any discrepancies between the plans, schedules and specs, as well as updates not reflected on the above documentation requirements.
- This measure only applies to new construction projects, as outlined on page 6 of this catalog.

Please refer to the sample COMcheck report below for an example of how the total allowed and total proposed watts can be determined for a new construction project. Either the "Space-By-Space" or the "Building Area Method" can be used to calculate the LPD for the purposes of the incentive. The incentive is based on the difference between the ASHRAE 90.1-2013 allowed wattage and the installed/proposed wattage.

Please reference pages 85 - 87 for building area method and exterior LPD. The lighting specification section to verify that the fixtures qualify. Fixtures that do not fall under one of these categories and meet those specifications are not eligible for incentives.

Sample COMcheck Report

Section 2 Interior Lighting and Power Calculation

A	B	C	D
	Floor Area	Allowed Watts / square-foot	Allowed Watts
Office	20,000	0.98	19,600
Manufacturing Facility	80,000	1.23	98,400
Total Allowed Watts =			118,000

Section 3 Interior Lighting Fixture Schedule

A	B	C	D	E
Fixture ID: Description/Lamp/Wattage Per Lamp/Ballast	Lamps Fixture	# of Fixtures	Fixture Watt.	(C x D)
Office (20,000 ft ²) Linear Fluorescent lamp 4' T8 32W (Super 8) Electronic	4	70	144	10,080
Manufacturing Facility (80,000 ft ²) LED1: B LED High Bays: Others	6	200	250	50,000
Total Allowed Watts =				60,080

Interior Lighting PASSES Design 49% better than code

Design is greater than or equal to 10% better than code and eligible for incentives if other requirements are met.

Lighting Controls



Lighting schedules must be submitted with the final application for the Watts Controlled measures in order to receive the incentive.

Lighting Occupancy Sensors (LC101 - LC102)

Requirements:

- All Sensors must be passive infrared, ultrasonic or microwave detectors that control interior lighting fixtures only.
- The inventory of the controlled fixtures must be submitted with the final application.
- Incentive is based on the area per sensor or watts controlled (pick one or the other per space).
- Cannot be combined with central lighting controls.
- Magnetic ballasts are ineligible for this incentive.
- Cannot be replacing an existing, operational occupancy sensor.
- Scaled floor plans showing the area controlled per sensor must be provided for measures LC101b and LC101c.
- Integrated sensors or sensors controlling one fixture are only eligible for LC101a or LC102 with the exception of single high-bay fixtures which can qualify for LC101b.

Interior Lighting Occupancy and Daylight Sensor Control (Pre-Notification Required) (LC103)

Requirements:

- Available for spaces controlled via both occupancy sensors and daylight sensors.
- Must comply with individual measure specifications.
- Does not qualify for new construction.

Daylight Sensor Controls (Pre-Notification Required) (LC104)

Requirements:

- Available for daylight sensor controls in indoor spaces with reasonable amounts of sunlight exposure and areas where task lighting is not critical.
- The controls can be on/off, stepped, or continuous (dimming).
- The on/off controller should turn off artificial lighting when the interior illumination meets the desired indoor lighting level.

- The stepped controller generally dims the artificial lighting 50% when the interior illumination levels reach 50% of the desired lighting levels.
- All types of daylight sensor controls are required to be commissioned in order to ensure proper sensor calibration and energy savings.
- Cannot be combined with occupancy sensors.
- Magnetic ballasts are ineligible for this incentive.
- Lighting within a 15-foot perimeter of a natural light source qualifies.
- Qualifies for both new construction or retrofit application.

Central Lighting Controls (Pre-Notification Required) (LC105)

Requirements:

- Available for automated central control systems with override capabilities in interior spaces.
- The occupants' schedule of operation must be taken into consideration when programming the system.
- Includes time clocks, package programmable relay panels, and complete building automation controls.
- Photo sensors may also be incorporated into the central lighting control system.
- Replacements of existing, functional lighting control systems do not qualify.
- Layout of building showing areas controlled by newly-installed system must be submitted with the final application.

Interior Stairwell Lighting Controls (Pre-Notification Required) (LC106)

Requirements:

- Stepped dimming occupancy controls consist of a lighting system that operates at full power and full light output when the space is occupied, then at a reduced power level and reduced light output when unoccupied.
- In order to qualify for this incentive, the occupancy sensor must be installed in an interior stairwell or passageway, i.e., applications requiring continuous lighting (24 hours a day) by code.

- The occupancy sensor must be hardwired, it can be a passive infrared or a microwave occupancy sensor and the sensor must reduce the fixture output to use no more than 50% of full power.
- Qualifies for new construction or retrofit applications.

Exterior Multi-Step Dimming Occupancy Sensors (Pre-Notification Required) (LC107)

Stepped dimming occupancy controls consist of an exterior lighting system that operates at full power and full light output when the space is occupied and at a reduced power level and reduced light output when unoccupied.

Requirements:

- Sensors must control exterior lighting fixtures, must be hardwired and can be a passive-infrared occupancy sensor or microwave occupancy sensor.
- The sensors must reduce fixture output to use no more than 50% of full power.
- Qualifies for new construction or retrofit applications.

Exterior Lighting Occupancy Sensors (LC108)

Requirements:

- Available for installing occupancy sensors on exterior LED lighting systems.
- Sensor should be passive infrared or ultrasonic depending on the area being lit.
- Baseline lighting system must operate continuously during night hours.
- Cannot be combined with other lighting control measures other than photo sensors or timers that schedule the exterior lighting to be on a minimum of 8 hours per night.
- Not eligible for new construction.

Exterior Multi-Step Dimming Timer Controls (Pre-Notification Required) (LC109)

Stepped dimming timer controls consist of an automatic (digital) lighting system on a building's exterior that operates at full power and full light output during periods of higher traffic and at a reduced power level and reduced light output during periods of lower traffic.

Requirements:

- The installation of a new time clock system featuring no multi-step dimming capabilities does not qualify.
- During low traffic periods, fixtures must use no more than 50% of full rated power.
- Fixtures must be at low power at least 5 hours per night.
- Cannot be combined with the Exterior Multi-Step Dimming Occupancy Sensor measure.
- Qualifies for new construction or retrofit applications.

Network Lighting Controls (NLC)

Network Lighting Controls (Pre-Notification Required) (LC110, LC111)

Requirements:

- Available for installing a central lighting control system to existing or retrofitted lighting systems in both interior and/or exterior spaces.
- A signed Memorandum of Understanding (MOU) must be filled out by customer and our staff before the project can be reserved (refer to appendix).
- Control system must provide complete programming and control from the central location.
- Reporting Capability.
 - » Occupancy Sensing reporting.
 - » Operational reporting.
- Energy use reporting, maximum 15-minute kWh monitoring interval.
- Storing and delivering in raw data format polled energy use information for, at a minimum, one year.
- Minimum of three energy saving control strategies must be utilized. Control strategies can include, but are not limited to:
 - » Time scheduling.
 - » Daylight harvesting.
 - » Occupancy/vacancy sensing.
 - » Task tuning.
 - » Load shedding.
 - » High end trim.
- At a minimum, step dimming capacity must be included.
- At a minimum, small zone control capability (16 fixtures or fewer per zone) must be included.
- Remote interface and control is also required, such as BACnet, LONworks, etc.

Variable Frequency Drives



When metering Variable Frequency Drives (VFDs), make sure that you meter the line side of the VFD, not the load side. It is recommended to meter power every 15 seconds.

Variable Frequency Drives on HVAC Fans, Cooling Tower Fans and HVAC Pumps (VF101 - VF105)

Requirements:

- Variable frequency drives (VFDs) installed on existing HVAC fans and pumps are eligible for this incentive. Redundant or back-up units do not qualify.
- VFDs on new chillers are not eligible. New chillers with integrated VFDs are eligible under the chiller incentive.
- The installation of a VFD must accompany the permanent removal or disabling of any throttling devices such as inlet vanes, bypass dampers, bypass valves, or throttling valves.
- VFDs for non-HVAC applications may be eligible for a different incentive.
- The incentive is per controlled HP.
- The replacement of existing VFDs does not qualify for this incentive.
- Existing two-speed cooling tower motors retrofitted with a VFD do not qualify for this incentive.
- The motor must operate more than 2,000 hrs./yr.
- New HVAC cooling towers do not qualify for this incentive.
- VFDs to be used, only soft-start motors do not qualify.
- Motors greater than 250 HP do not qualify for this incentive, but may qualify for a custom incentive.
- VFD speed must be automatically controlled by differential pressure, flow, temperature, or other variable signal.
- For fans installed on new DX equipment (i.e., RTUs) 5.4 tons or larger, VFDs are required and do not qualify for this incentive. VFDs on new chilled water or evaporative cooling equipment is not eligible for an incentive.
- New HVAC hydronic pumps having a pump head exceeding 100-foot WC and motor exceeding 5 HP do not qualify for this incentive (it is required via ASHRAE 90.1 - 2013).
- Pre-Notification required on motors greater than 100 HP.
- New fans must be under 10 HP and new pumps must be under 50 HP for all new construction projects.

HVAC Fixed Speed (Non-Dynamic) Control (Pre-Notification Required) (VF106 - VF110)

Requirements:

- Variable frequency drives (VFDs) installed on existing HVAC fans and pumps are eligible for this incentive. Redundant or back-up units do not qualify.
- The proposed VFD frequency must be reduced to 54 Hz or less.
- The motor must operate more than 2,000 hrs./yr.
- VFDs to be used, only soft-start motors do not qualify for this incentive.
- VFDs automatically controlled do not qualify for this incentive, but may qualify for another prescriptive VFD measure or as a custom measure.
- Motors larger than 100 HP do not qualify for this incentive; however, they may qualify as a custom measure.
- New fans must be under 10 HP and new pumps must be under 50 HP for all new construction projects.
- Qualifies for both new construction or retrofit application.
- For fans installed on new DX equipment (i.e., RTUs) 5.4 tons or larger, VFDs are required and do not qualify for this incentive. VFDs on new chilled water or evaporative cooling equipment is not eligible for an incentive.
- New HVAC hydronic pumps having a pump head exceeding 100-foot WC and motor exceeding 5 HP do not qualify for this incentive (it is required via ASHRAE 90.1 - 2013).

2 Speed RTU Supply Fan Control (VF111)

Requirements:

- Incentive is for installing 2-speed supply fan control on existing or new RTUs.
- The RTUs must operate more than 2,000 hrs./yr.
- The 2-speed controller must be automatically controlled by differential pressure, flow, temperature, or other variable signal.
- Qualifies for both new construction or retrofit application.
- To qualify for an incentive on a newly-installed RTU, the fan cannot be required via code.

Variable Frequency Drives on Condenser Fans (HVAC) (VF112)

Requirements:

- This incentive is designed for facilities that install VFDs on existing air cooled condenser units.
- The facility must have an existing cooling system that utilizes condenser fans that routinely do not operate at full capacity and frequently cycles on and off.
- Condenser fans already equipped with VFDs or two-speed control do not qualify.
- The HVAC system must run primarily during the summer months.
- VFDs automatically controlled do not qualify for this incentive, but may qualify for another prescriptive VFD measure or as a custom measure.
- Refrigeration systems that use 'free cooling' economizers, which shut down the compressor/condenser fans in a multiple compressor array must be controlled by the VFD.
- This measure applies to retrofit or new construction applications when not required by code.
- The incentive will be based on the total ton of load controlled by the VFDs.

Process Variable Frequency Drives

Variable Frequency Drive on Process Pumps or Fans (VF201 - VF204)

Requirements:

- For pumps or fans greater than 50 HP, a minimum of seven continuous days of power monitoring (kW) will be required before and after the retrofit. Energy savings must be proved.
- VFD must be used in conjunction with a Process (non-HVAC) Pumping or Process Fan application.
- Redundant or back-up units do not qualify, nor does routine replacement of existing VFDs.
- VFD speed must be automatically controlled by differential pressure, flow, temperature, or other variable signal.
- The installation of a VFD must accompany the permanent removal or disabling of any throttling devices such as inlet vanes, bypass dampers, bypass valves, or throttling valves.
- The pumps or fans must operate at least 2,000 hours per year.
- The incentive is per controlled HP and only controlled motors up to 250 HP are eligible.
- VFDs for large process motors (more than 250 HP) or air compressors may qualify for a custom incentive.
- Existing 2-speed cooling tower motors retrofitted with a VFD do not qualify for this incentive.

- VFDs to be used, only soft-start motors don't qualify for incentive.
- Pre-Notification required on motors greater than 50 HP.
- Open pumping systems (i.e., open-loop once through wells), deep well pumps, high static head pumps discharging into systems with varying head requirements (water storage tanks) do not qualify for this incentive, but may qualify for the well pump VFD measure or a custom incentive.
- Qualifies for both new construction or retrofit application.

Variable Frequency Drive on Process Fixed Speed (Non-Dynamic) Control (VF205, VF206)

Requirements:

- Variable frequency drives (VFDs) installed on existing process fans and pumps are eligible for this incentive. Redundant or back-up units do not qualify.
- The proposed VFD frequency must be reduced to 54 Hz or less.
- The motor must operate more than 2,000 hrs./yr.
- VFDs to be used, only soft-start motors don't qualify for incentive.
- VFDs automatically controlled do not qualify for this incentive, but may qualify for another prescriptive VFD measure or as a custom measure.
- Motors larger than 250 HP do not qualify for this incentive; however, they may qualify as a custom measure.
- Qualifies for new construction or retrofit applications.

Variable Frequency Drives on Computer Room Air Conditioning Units (CRAC) (VF207)

Requirements:

- This incentive is available for installing VFDs (or VSDs) on existing telecommunications or CRAC units.
- The units must operate continuously, year round.
- Replacement of existing VFDs does not qualify.
- Redundant or back-up units do not qualify.
- Qualifies for both new construction or retrofit applications.
- A feedback loop must be implemented to modulate the cooling output of the CRAC unit.

Variable Frequency Drives on Open Loop Pumping Systems (VF208)

Requirements:

- This incentive is available for adding VFD (or VSDs) to open pumping systems such as deep well pumps, or pumps discharging into systems with varying head requirements (water storage tanks).
- The VFD must operate at least 2,000-hrs./yr., be installed on a motor with a standard rated frequency of 60 Hz and be serving a centrifugal pump.
- The VFD must either be automatically controlled to ramp down the frequency based on pressure, or the frequency must be reduced to at most 50 Hz under normal operation to qualify for this incentive.
- Redundant or back-up units do not qualify.
- The replacement of existing VFDs does not qualify for this incentive.
- VFDs installed for the sole purpose as soft-start motors do not qualify.
- Motors larger than 100 HP do not qualify for this incentive; however, they may qualify as a custom measure.
- Qualifies for both new construction or retrofit applications.

Variable Frequency Drives on Condenser Fans (Refrigeration) (VF209, VF210)

Requirements:

- This incentive is designed for facilities that install VFDs on existing air cooled condenser units.
- The facility must have an existing cooling system that utilizes condenser fans that routinely do not operate at full capacity and frequently cycles on and off.
- Condenser fans already equipped with VFDs or 2-speed control do not qualify. The medium temperature (33 degrees to 50 degrees) and low temperature (below 32 degrees) refrigeration systems must operate throughout the year.
- VFDs must be automatically controlled in response to a variable floating head pressure signal. All condenser fans in a multiple compressor array must be controlled by the VFD.
- Refrigeration systems that use 'free cooling' economizers, which shut down the compressor/condenser and evaporator when the outdoor air temperature is favorable for free cooling, are not eligible.
- The incentive will be based on the total horsepower controlled by the VFDs.
- Qualifies for both new construction or retrofit applications.
- This measure applies to either retrofit or new construction applications when not required by code.

Variable Frequency Drives on Pool Circulation Pump (VF211)

Requirements:

- Incentive is available for installing a VFD on a pool circulation pump.
- It is recommended that the VFD speed be automatically controlled by a digital flowmeter and that the flow rate be displayed (i.e., digital flow meter) for facility staff to better understand and manage the pool flow rates.
- Minimum volume flow rates must comply with local and state regulations.
- Best practice is to install a filter differential pressure alarm to maximize savings.
- Redundant, back-up pumps or VFDs installed for the sole purpose of being a motor soft-start do not qualify.
- Replacement of existing VFD or 2-speed pump do not qualify.
- Existing pumps must operate continuous 24/7 throughout the year. Seasonal pool pumps (i.e., summer use only) do not qualify.
- Motors larger than 50 HP do not qualify for this incentive; however, may qualify as a custom measure.
- Qualifies for both new construction or retrofit applications.

Variable Frequency Drives on Process Cooling Tower Fan (VF212)

Requirements:

- Available for installing a VFD on new or existing process cooling tower fans.
- Fan motor must operate at least 2,000 hrs./yrs.
- Must be automatically controlled (i.e., basin temperature) or at a fixed speed no greater than 54 HZ.
- Incentive is per controlled HP.
- The replacement of existing VFDs, or installing VFDs on redundant or back-up cooling towers do not qualify for incentive.
- Pre-Notification is required on fan motors greater than 50 HP.
- Qualifies for new construction and retrofit applications.

Variable Speed Drives for Industrial Vacuum Pump Systems (VF213)

Requirements:

- An incentive is available for installing a VSD on new or an existing vacuum pump used for manufacturing or industrial applications.
- Existing vacuum pump must be a blower-type pump.
- Proposed VSD's speed may be either automatically controlled or manually controlled.
- Automatically controlled VSD may be controlled by differential pressure, flow, temperature or other signal. If manually controlled, it must be at a fixed speed less than 50 Hz.
- Vacuum pump must operate at least 4,000 hrs./yr. to qualify.
- Redundant or back-up vacuum pumps do not qualify for this incentive.
- Qualifies for new construction and retrofit applications.

Integrated Variable Speed Motors

Integrated Variable Speed Motor (ECM) for Furnace, UV, FC, Light Duty AHU (Up to 7.5 HP) (VF301)

Requirements:

- An incentive is available for equipping a furnace, unit ventilator (UV), fan coil unit (FCU), or light duty air handling unit (AHU) with an integrated variable speed motor.
- Fan motor of existing unit must be constant speed and the new motor must have a variable input to be eligible for this incentive.
- Measure applies to new systems or retrofitting existing equipment.
- A brushless DC motor, also known as an electronically commutated motor (ECM), also qualifies for this incentive.
- Qualifies for both new construction and retrofit applications.

Integrated Variable Speed Motor (ECM) for Exterior Condenser Fans (VF302)

Requirements:

- An incentive is available for replacing a standard efficiency condenser motor with a new EC motor. Condensers with ambient temperature and pressure fan cycling controls do not qualify.
 - » Condensers with controls other than on/off fan control also do not qualify. This incentive is for the installation of a brushless.
 - » DC motor are also known as an electronically commutated motor (ECM).

- » Fan motor of the existing unit must be constant speed and the new motor must have a variable input and operate at variable speed.
 - » Controls must be added to modulate the speed of the ECM based on load.
 - » Measure applies only to retrofitting the fans within existing RTU's or grocery store refrigeration condensers.
- New construction applications qualify for this measure when not required by code.

Integrated Variable Speed Motor (ECM) for Pumps (VF303 - VF305)

Requirements:

- An incentive is available for replacing existing constant volume permanent split capacitor (PSC) or shaded pole (SP) pumps used for domestic hot water recirculation, hydronic heating circulation, or chilled water circulation to an ECM pump.
- Pump motor must be EC, DC brushless, or permanent magnet style.
- Pump motor must be capable of variable speed operation.
- Motor must include integrated "smart" controls that will modulate flow based on demand.
- This measure applies to new systems or retrofitting existing equipment.
- Qualifies for new construction and retrofit applications.

Compressed Air



When replacing existing air compressor(s) with new, more energy efficient air compressor(s), the pre-existing compressor(s) must be turned off but may be left on site for cases of emergency. Old compressor(s) left on site must be physically locked out of the system. Qualifying lock points are: padlocks on electrical boxes or ball valves isolating the existing compressors from the main compressed air header.

- Unless otherwise noted, incentives are not available for backup or redundant air compressors.

Supply Side Measures

VSD Air Compressor (50 HP– 500 HP) Single Air Compressor Systems (Pre-Notification Required) (CA101, CA102)

Requirements:

- Incentives are available for installing one VSD (between 50 HP and 500 HP) rotary screw (RS) air compressor to replace constant speed RS compressor with inlet modulation or load/no-load controls. VSD compressors must be new and must have an annual operating period of at least 2,000 hours per year.
- Incentive is for a single compressor system.
- The HP of the new VSD compressor may be larger than the combined system HP of the existing system. To obtain this incentive when the VSD HP rating is larger, customer must provide the size of system being replaced.
- Replacement of existing VSD air compressor and VSD air compressor of equal or lesser HP is not eligible for this incentive. If a larger VSD air compressor is installed, the difference in horsepower may be incentivized.
- Back-up and redundant air compressors are not eligible for incentive.
- A single VSD compressor may replace multiple compressors.
- Each existing air compressor must operate a minimum of 2,000 hours annually.
- Applicants must provide:
 - » Existing flow control method (load/no-load, inlet modulation with or without blowdown, etc.)
 - » Existing and proposed operating pressure.
 - » Existing compressor model number.

- System and demand conditions requiring the new VSD compressor to be loaded constantly above 80% or constantly loaded below 30% are not eligible for this incentive. These operating conditions will not realize savings from a VSD controlled compressor.
- Cannot be combined with the VFD incentive.
- This incentive is for new VSD compressors; adding a VSD to an existing air compressor does not qualify, but may qualify for the retrofit air compressor.
- The customer should consult with the compressor manufacturer to determine the optimal speed range for air efficiency and the ability of the oil flow system to operate below full speed to help ensure reliable drive operation and expected energy savings are achieved.
- Qualifies for new construction and retrofit applications.

VSD on Air Compressors (50 HP – 500 HP) Multiple Air Compressor Systems (Pre-Notification Required) (CA103, CA104)

Requirements:

- This incentive is available for installing a variable speed screw (VSD) air compressor to replace an existing rotary-screw air compressor with inlet modulating (IM) or load/no load (LNL) control in a multiple air compressor system to be eligible.
- A multiple air compressor system is defined as more than one air compressor being required to operate simultaneously to meet the facility's compressed air demand, excluding redundant or standby air compressors.
- The VSD air compressor must operate a minimum of 4,000 hrs./yr. to qualify.
- The VSD air compressor must be at least 50 HP but no larger than 500 HP to qualify.
- System controls must keep the VSD air compressor as the partially loaded (trim) unit.
- Only one VSD air compressor can be incentivized per compressor plant. Compressor plants that already have a VSD or variable displacement (VD) air compressors do not qualify.
- The installation of a VSD air compressor as a redundant or backup compressor does not qualify.

- The customer may choose a custom incentive if an enhanced compressed air plant control system (master controller) is also implemented; however, this decision must be made during the pre-application review.
- Incentive is based on the horsepower size (HP) of the new VSD air compressor.
- This incentive is for new VSD compressors; adding a VSD to an existing air compressor does not qualify, but may qualify for the retrofit air compressor.
- The customer should consult with the compressor manufacturer to determine the optimal speed range for air efficiency and the ability of the oil flow system to operate below full speed to help ensure reliable drive operation and expected energy savings are achieved.
- Qualifies for new construction and retrofit applications.

VSD Retrofit Air Compressor (Pre-Notification Required) (CA105, CA106)

Requirements:

- Available for installing a VSD on an existing screw air compressor with either modulating control or load/no load control.
- This measure is only for retrofitting a VSD to existing air compressors; installing a new VSD air compressor does not qualify for this incentive, but may qualify for other incentives.
- The installation of a VSD on a redundant or backup compressor does not qualify.
- A multiple air compressor system is defined as more than one air compressor being required to operate simultaneously to meet the facility's compressed air demand, excluding redundant or standby air compressors.
- In a single compressor system, the retrofitted VSD air compressor must operate a minimum of 6,000 hrs./yr. to qualify.
- In a multiple compressor system, the retrofitted VSD air compressor must operate a minimum of 7,200 hrs./yr. to qualify.
- The retrofitted VSD air compressor must be at least 50 HP but no larger than 300 HP to qualify.
- In multiple compressor systems, system controls must keep the retrofitted VSD air compressor as the partially load (trim) unit.
- Only one retrofitted VSD air compressor can be incentivized per compressor plant. No incentive is available if any existing air compressor already has VSD control.

VSD Air Compressor (< 50 HP) (Pre-Notification Required) (CA107, CA108)

Requirements:

- Compressors with horsepower between 1 HP and 49 HP qualify for these incentives.
- The new VSD compressor may be larger in size than the existing machine.
- Incentives are available for installing one VSD (between 1 HP and 49 HP) rotary screw (RS) air compressor to replace constant speed RS compressor with inlet modulation or load/no-load controls. VSD compressors must be new and must have an annual operating period of at least 2,000 hours.
- Back-up and redundant air compressors are not eligible for this incentive.
- VSD Air compressor on multiple-compressor systems must be set up to control load variations and not base loaded.
- Only one compressor on a compressed air system (connected to piping) can qualify for this VSD incentive.
- This incentive is for new VSD compressors; adding a VSD to an existing compressor does not qualify.
- Qualifies for new construction and retrofit applications.

Variable Displacement (VD) Air Compressor (Pre-Notification Required) (CA109)

Requirements:

- Only new rotary-screw design air compressors whose rated horsepower (HP) is larger than 50 HP qualifies for this incentive.
- Incentive is for a single compressor system, multi-compressor systems may qualify for custom incentives.
- The new Variable Displacement (VD) air compressor must be replacing an existing inlet modulation (IM) constant speed or load/ no-load compressor having an equal or higher HP rating and annual operating hours of at least 4,000 hours per year.
- Back-up and redundant air compressors are not eligible.
- Qualifies for new construction and retrofit applications.

Two-Stage Rotary Screw Air Compressor (Pre-Notification Required) (CA110)

Requirements:

- New, two-stage, rotary-screw, air compressors whose rated horsepower (HP) is at least 50 HP qualifies for this incentive.
- Air compressors on multiple compressor systems must operate the new, two-stage, air compressor at least 4,000 hours per year.
- The savings from this design occur throughout the operating range, so there is no requirement on the compressor loading.
- Qualifies for new construction and retrofit applications.
- Can be combined with the VSD compressor measure.

Refrigerated Cycling Air Dryer – Thermal Mass, VSD or Digital Scroll (Pre-Notification Required) (CA111 - CA113)

Requirements:

- Available to replace a non-cycling constant volume refrigerated air dryer with a cycling refrigerated air dryer of equivalent capacity.
- The existing compressed air dryer must run exclusively in non-cycling mode – it cannot be equipped with a feature that allows it to run in a non-cycling mode.
- Qualifies for new construction and retrofit applications.

Air Dryer, Desiccant to Refrigerated (Pre-Notification Required) (CA114)

Requirements:

- This measure is for replacement of desiccant compressed air dryers with non-cycling refrigerated compressed air dryers.
- The measure may be combined with refrigerated cycling air dryer.
- Compressed air system horsepower must be greater than or equal to 50 HP.
- Qualifies for new construction and retrofit applications.

Heated Blower Purge Desiccant Compressed Air Dryer (Pre-Notification Required) (CA115)

Requirements:

- This measure is for the replacement of a timed heatless desiccant dryer with a heated blower purge desiccant dryer with dew-point controls.
- The compressed air system must have compressors which can trim adequately to match the reduced demand.

Qualified compressor controls that are eligible are: VSD, variable displacement controls, or load/ no load compressors.

- Compressor systems which run modulating compressor but have a trim compressor with any of the eligible control also qualify for these incentives. The system must have adequate controls to ensure the system can trim adequately.
- Qualifies for new construction and retrofit applications.

Compressed Air Desiccant Dryer, Dew-point Sensor Control (Pre-Notification Required) (CA116)

Requirements:

- This measure is for the addition of dew-point controlled column regeneration to a desiccant compressed air dryer.
- Can be a retrofit on an existing dryer or an option on a new dryer.
- This cannot be combined with the incentive for a new heated blower purge dryer with dew-point control.
- Qualified compressor controls that are eligible are: VSD, variable displacement controls, or load/ no load compressors.
- Compressor systems which run modulating compressor but have a trim compressor with any of the eligible controls qualify for incentives.
- The system must have adequate controls to ensure the system can trim adequately.
- Qualifies for new construction and retrofit applications.

Heat of Compression Air Dryer (Pre-Notification Required) (CA117)

Requirements:

- This measure is for replacement of a desiccant dryer with media regeneration from any method (e.g., supplemental heat, compressed air, blower air, or a combination of these) other than heat-of-compression.
- The desiccant dryer must be replaced with a heat-of-compression dryer using the heat in the compressed air to regenerate the desiccant media.
- Compressed air system rated horsepower (HP) must be larger than 50 HP to qualify.
- Qualifies for new construction and retrofit applications.

Air Recycling Pneumatic Valve (CA118, CA119)

Requirements:

- An incentive is available for the installation of an air recycling pneumatic valve on a pneumatic cylinder. Air recycling valves work by briefly connecting the valve's two cylinder (outlet) ports during each cylinder stroke. As the valve cycles, the pressurized cylinder port connects

to the opposing (unpressurized) cylinder port, recycling the compressed air from one end of the cylinder and its connecting tubing to the other. This effectively pre-charges the depressurized end before it is connected to the supply.

- The new valve must be replacing an existing standard pneumatic valve, serve a double-acting pneumatic cylinder and have a feature where the spool passes a center position to route the pressurized air from the energized side to the opposite side upon activation.
- Separate incentives are available for having at least 2,000,000 and at least 4,000,000 cycles annually. Those incentives cannot be combined.
- The cylinder's bore must be larger than one inch and stroke must be larger than two inches to qualify.
- Minimum line pressure to the cylinder must be at least 60 psig.

Low-Pressure Drop Air Filter (CA120)

Requirements:

- Available to prevent the over filtering of air compressor systems.
- The potential energy savings is attributed from the over pressuring of the compressed air to compensate for higher filtration.
- The proposed filter must:
 - » Be of the deep-bed "mist eliminator" style.
 - » Have a pressure loss at rated flow up to 1 psi when new and up to 3 psi at element change.
 - » Have particulate filtration that is 100% at 3.0 microns and at least 99.98% at 0.1 to 3.0 microns.
 - » Be rated for up to 5 PPM liquid carryover.
- The filter element life must be greater than or equal to five years.
- Qualifies for new construction and retrofit applications.

Compressed Air Pressure Flow Controllers (Pre-Notification Required) (CA121)

Requirements:

- A pressure flow controller must be installed downstream from the air storage receiver tank.
- The actual air compressor discharge pressure set-point must be reduced by five psig (example: 110 psig reduced to 105 psig).
- Qualifying air compressor systems must be a minimum of 50 HP.
- Pictures of pressure differential must be provided with final application.
- Qualifies for new construction and retrofit applications.

Compressed Air Outdoor Air Intake (CA122)

Requirements:

- Available for customers whose existing air compressor(s) current air inlet comes from the ambient conditioned (heated) space and are proposing to permanently hard duct the air inlet directly from the outside. Outside air is, on average, cooler than the conditioned inside air and colder air is more dense and requires less energy to compress.
- Consult the compressor manufacturer to ensure the air compressor can address the increase static pressure drop on the ducted air intake and the potentially cold air temperatures without adverse effects.
- The compressor must run at least 2,000 hrs./yrs., be larger than 50 HP and operate at least 80 psig.
- Backup compressors do not qualify for this incentive
- Qualifies for new construction and retrofit applications.

Air Compressor Waste Heat Recovery (Pre-Notification Required) (CA123)

This incentive is for customers to utilize recovered waste heat generated by an air compressor system in order to reduce the annual natural gas use of a facility during the heating period or reduce the natural gas required for process heat.

Requirements:

- The compressed air system to which the heat recovery system is applied.
 - » Must not include the HP of a back-up or redundant air compressor.
 - » Must currently be completely thermally isolated from the conditioned space to benefit from the waste heat (i.e., excess heat from the air compressor room is rejected to the outside. The compressor cannot already be located in the heated space).
- Air Compressor waste heat recovery system (i.e., damper/ actuator) must duct the waste heat into a conditioned space (or process) when required during the heating period.
- The waste heat recovery system must be controlled by a thermostat, building automation system, or may be controlled via manual dampers.
- Heat recovery system shall be designed such that the rated external static pressure of the compressor's cooling fan is not exceeded.
- Customer must receive natural gas service from Consumers Energy to qualify for this incentive.
- Qualifies for new construction and retrofit applications.

Compressed Air Storage Tank (Pre-Notification Required) (CA124)

Requirements:

- HP and gallon/CFM used to calculate the incentive must be from the trim compressor.
- Eligible for systems comprised of rotary-screw compressors only.
- The air compressors supplying the receiver must have load/no-load, variable displacement, VSD or modulating controls.
- Replacement of existing end of life storage tanks with same sized tanks will not be eligible for this incentive.
- The measure for increasing storage capacity from less than or equal to 1 gallon/CFM to greater than or equal to 3 gallon/CFM can be combined with the measure for increasing storage capacity from less than or equal to 3 gallon/CFM to greater than or equal to 5 gallon/CFM, if storage capacity is increased from less than or equal to 1 gallon/CFM to greater than or equal to 5 gallon/CFM. Also, the applicable measures can be combined for increasing storage capacity from less than or equal to 3 gallon/CFM to greater than or equal to 10 gallon/CFM.
- Assume 5 SCFM/HP.
- Qualifies for new construction and retrofit applications.

Correct Sizing Air Compressors (Pre-Notification Required) (CA125)

Requirements:

- A new, rotary-screw, air compressor replacing an existing, at least 30% larger rotary-screw or reciprocating air compressor is eligible for this incentive.
- Incentive is based on the reduction in compressor HP.
- Provide a minimum of seven continuous days of power monitoring (kW) on a typical production schedule before and after the retrofit is collected; this data will not affect the incentive amount.
- The new, smaller, air compressor must operate at least 2,000 hrs./yrs.
- This incentive may be used in combination with a VSD air compressor incentive.
- Back-up and redundant air compressors or air compressors on multiple-operating air compressor systems are not eligible.

The replacement compressor(s) must be turned off but may be left on site for cases of emergency. Old compressor(s) left on site must be physically locked out of the system. Qualifying lock points are: padlocks on electrical boxes or ball valves isolating the existing compressors from the main compressed air header.

Demand Side Measures

Compressed Air Energy Audit (CA201 - CA204)

A comprehensive audit for the compressed air system includes leak detection/tagging and in some instances analysis of the system to recommend energy efficiency improvements.

Requirements:

- Eligible compressed air systems must:
 - » Be electrically driven.
 - » Have a rated horsepower (HP) of at least 50 HP (excluding back-up and non-production compressors; these, however, must be noted in the report).
 - » Have an annual runtime greater than 2,000 hours per year (excluding back-up).
- The audit must be completed by an independent contractor chosen by the customer. The contractor must have at least five years of experience implementing a fully instrumented compressed air audit (seven to 14 days of on-site data collection).
- 50% by volume of the air leaks identified in the audit must be repaired by either the customer or the contractor.
- The customer/contractor must submit evidence of the completion of repairs detailing leak location, leak volume, and date of repair on a spreadsheet. Verification of repairs may include: repair tickets, work orders and invoices for material and labor.
- Eligible audits qualify for the prescriptive dollar amount per combined installed horsepower (excluding backup or redundant), with a maximum incentive amount of \$20,000 or 100% of project cost, whichever is less. To receive the audit measure, raw data from logging activity may also be required to be submitted with report (email or CD/USB).
- Incentive is available every two years per facility.
- Increased incentive is available for air audits when flow data is collected or if a VSD compressor is present. Flowmeter logged data may be required to be submitted in conjunction with on-site data collection (kW, Amps, Volts, etc.) of the individual compressed air equipment.
- To receive the incentive, the contractor must complete the following:
 - » The average hours of operation.
 - » A detailed description of each air compressor, which must include: full-load kW, full-load CFM, full-load rated pressure, control mechanism, machine status (i.e., either lead or lag), manufacturer and model number
 - » On-site data collection of the individual compressed air equipment. Data must be logged for a minimum of seven days and the parameters measured must include: power (in kW), pressure and CFM where possible.

- » Major compressed air leak detection survey, including: identification, tagging and quantification of air leaks.
- » Written report and presentation of audit findings are required.
- » Recommendations may be required, as necessary.

Compressed Air Leak Repair (CA205, CA206)

Requirements:

- Eligible compressed air systems must:
 - » Be electrically driven.
 - » Have a rated horsepower (HP) of at least 50 HP (excluding back-up and non-production compressors; these, however, must be noted in the report).
 - » Have an annual runtime greater than 2,000 hours per year (excluding back-up).
- The leak repair must be completed by an independent contractor chosen by the customer. The contractor must have at least five years of experience implementing a fully instrumented compressed air audit (seven to 14 days of on-site data collection).
- 50% by volume of the air leaks identified in the audit must be repaired by either the customer or the contractor.
- The customer/contractor must submit evidence of the completion of repairs detailing leak location, leak volume, and date of repair on a spreadsheet. Verification of repairs may include: repair tickets, work orders and invoices for material and labor.
- Eligible leak repairs qualify for the prescriptive dollar amount per combined installed horsepower (excluding backup or redundant), with a maximum incentive amount of \$20,000 or 100% of project cost, whichever is less.
- Incentive is available every two years per facility.
- A detailed description of each air compressor, which must include: full-load kW, full-load CFM, full-load rated pressure, control mechanism, machine status (i.e., either lead or lag), manufacturer and model number, must be included.
- Major compressed air leak detection survey must be submitted and include: identification, tagging and quantification of air leaks.

Zero-Loss Condensate Drain (CA207, CA208)

Requirements:

- Both new compressed air systems and existing compressed air systems are eligible.
- Condensate drain being replaced must be a timed drain or manually opened drain.
- The replacement drain must be “no loss” – it must continuously measure the presence of condensate and

purge it only when necessary and only long enough as to prevent the unintentional purging of compressed air.

- Manual drains, timed drains and electronic solenoid valve drains are not eligible.
- Qualifies for new construction and retrofit applications.

Pressure Sensing Vortex Vacuum Generators (CA209)

Requirements:

- An incentive is available for the installation of a pressure sensing vortex vacuum generator replacing a conventional vortex vacuum generator. The pressure sensing vortex vacuum generator is equipped with a pressure sensor and check valve, allowing the compressed air flow to stop when the desired pressure is achieved.
- The new vortex vacuum generator must be used on an application that has the ability to seal, such as a suction cup.
- This measure must be utilized in a production environment where the production cell operates at least 4,000 hours annually.

Pneumatic Air Tools Replaced with Electric Tools (Pre-Notification Required) (CA210)

Requirements:

- To qualify for this incentive, the existing pneumatic hand tool must be used in a manufacturer setting and must be replaced with an electric (i.e., a 120V AC corded) hand tool.
- The compressed air branch pipe headers to the pneumatic hand tool that will be replaced must be demolished from the existing pneumatic hand tool back to the compressed air main header.
- Pneumatic hand tools that qualify for this measure include: die grinder, air disc sander, impact wrench, belt sander, hammer, air drill, or pneumatic tools that use more than 15 CFM per tool.
- Pneumatic hand tools that do not qualify for this measure include: beveller, nailer, riveter, or stapler.
- The incentive is for production related hand tools. The existing air hand tool must be permanently installed.
- Portable air hand tools or hand tools used for maintenance are not eligible for this incentive.
- The tools must be used in a production environment where the hand tool operates at least 400 hrs./yrs.

Pneumatic Air Tools Replaced with Electric Cordless Tools (Pre-Notification Required) (CA211)

Requirements:

- To qualify for this incentive, the existing pneumatic hand tool must be used in a manufacturer setting and must be replaced with an electric, cordless, rechargeable, hand tool (typically 12 volt to 24 volt).
- The compressed air branch pipe headers to the pneumatic hand tool that will be replaced must be demolished from the existing pneumatic hand tool back to the compressed air main header.
- Pneumatic hand tools that qualify for this measure include: die grinder, air disc sander, impact wrench, belt sander, hammer, air drill, or pneumatic tools that use more than 15 CFM per tool. Pneumatic hand tools that do not qualify for this measure include: beveller, nailer, riveter, or stapler.
- The incentive is for production related hand tools. The existing air hand tool must be permanently installed.
- Portable air hand tools or hand tools used for maintenance are not eligible for this incentive.
- The tools must be used in a production environment where the hand tool operates at least 400 hrs./yrs.

Electric Motors Replacing Pneumatic Motors (Pre-Notification Required) (CA212)

Requirements:

- To qualify for this incentive, the existing pneumatic motor must be replaced with an electric motor.
- The compressed air branch pipe headers to the pneumatic tools that will be replaced must be demolished from the existing pneumatic tool back to the compressed air header.
- The motors must be used in a manufacturing production environment where the air motor operates at least 400 hrs./yrs.
- Cycle time and operating schedule must be included with the application.

Compressed Air Applications Replacement with Air Blower (Pre-Notification Required) (CA213)

Requirements:

- The blower system must be replacing compressed air blow-off nozzles or pipes.
- The existing air compressor(s) must run at a pressure higher than 80 pound per square inch (psig).
- The blowers must be used in a manufacturing production environment where the pressure conditions are lower than 15 psig.
- The time the blow off nozzles/pipes are blowing must be greater than 1,000 hrs./yrs.
- The incentive is based on the horsepower of the new blower.

Compressed Air Engineered Nozzle (Pre-Notification Required)

Requirements:

- The engineered nozzle must replace simple open pipe/ tube assemblies connected to a compressed air system.
- Use of the nozzles must be 1,000 hours or greater per year.
- The engineered nozzles must be between 1/8" and 1/2" in diameter.
- Air jets and nozzles must have an SCFM rating at 80 psi less than or equal to those rated in Table 3 below.
- Qualifies for new construction and retrofit applications.

Table 3: Qualifying SCFM ratings

Size	1/8	1/4	3/8	1/2
SCFM	10	18	35	60

Miscellaneous Electric

Power Management

Advanced Power Strips (Tier 1) (ME101)

Requirements:

- Applies to surge protectors with built-in plug-load detection and control capabilities.
- The surge protector (power strip) must include at least one uncontrolled socket, which would be a primary device.
- Turning the primary device (usually a computer) on or off subsequently will turn the associated controlled devices in the power strip on or off (e.g., printers, monitors).
- The intelligent power strip may also contain sockets for devices that require a constant supply of power that will not be affected by the “control” device.
- Qualifies for new construction and retrofit applications.

Network Power Management Software (ME102)

Requirements:

- For the control of desktop computers only.
- Installation must allow centralized control at the server level of the power management settings (sleep mode and shutdown) of desktop computers on a distributed network.
- The software must have a reporting feature that allows monitoring and validation of energy savings.
- Qualifying software must result from: a new installation where none previously existed, an upgrade of an operating system, or other network support software where the desktop computer power management function did not previously exist.
- Verification of the software installation, the location of the installed control software, (at the server level) and the number of desktop computers controlled by the system may be required.
- Not applicable for the control of laptop and laptop stations.
- A copy of the software license agreement and a report (print-out) directly from the network energy management software showing the location and number of desktop computers being controlled by the system must be included with the final application.
- Qualifies for new construction and retrofit applications.

Beverage Vending Machine Controllers (ME103)

Requirements:

- 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.
- The control logic should power up the machine at a minimum of every two hours to maintain product temperature and provide compressor protection.
- For refrigerated beverage machines located indoors, backlighting lamps and ballasts should be removed to obtain additional energy savings.
- Qualifies for new construction and retrofit applications.

Engine Block Heater Controls (ME104)

Requirements:

- Timer must be outdoor rated or cold weather resistant.
- Timer should be set to turn on heater no more than 2 hours prior to engine start-up time.
- Timer should contain a thermostat that turns off the heater if ambient air temperature is warmer than a preset temperature.
- Timer must be used on block heaters for commercial, industrial, or agricultural applications.
- Qualifies for new construction and retrofit applications.

Drinking Water Cooling Misers (ME105)

Requirements:

- Water cooling miser must be installed on a water cooling machine such as water/drinking fountains.
- Misers must include a passive infrared occupancy sensor to turn off refrigeration systems when the surrounding area is unoccupied for 15 minutes or longer.

Snack Vending Machine Miser (ME106)

Requirements:

- Snack miser occupancy control unit must be installed on a non-refrigerated snack vending machine; non-cooled vending machines (i.e., candy machines).
- Misers must include a passive infrared occupancy sensor to turn off the machines lighting systems and any other vending machine electrical systems when the surrounding area is unoccupied for 15 minutes or longer.

Miscellaneous

High Efficiency Hand Dryers (ME107)

Requirements:

- An incentive is available for installing energy efficient, electric, hand dryers.
- To qualify for this incentive, the proposed electric hand dryers must have an electric demand rating equal to or below 1,500 Watts and a cycle time of 15 seconds or less.
- Replacement of existing high efficiency hand dryers does not qualify.
- New installations or upgrades from existing hand dryers qualify for this incentive.
- The incentive is only available for facilities that do not use paper towel dispensers or other non dryer applications in those specific restrooms.
- Qualifies for new construction and retrofit applications.

Cogged V-Belts (ME108, ME109)

Requirements:

- This measure is for the replacement of straight V-belt drives to notched V-belt drives operating at least 1,200 hrs./yr.
- Motors larger than 500 HP do not qualify for this incentive, but may qualify for a custom incentive.
- For a single drive with multiple V-belts, the horsepower needs to be divided by the number of belts.
- Qualifies for new construction or retrofit applications.

Efficient Rectifiers for Telecommunications (200 amps or less) (Pre-Notification Required) (ME110 - MC113)

- An incentive is available for installing efficient rectifiers
- Incentive will be based on site measured load (kW)
- The existing rectifier will have an efficiency in normal mode (not in energy saver mode) of less than 94%
- Proposed rectifier must have an efficiency of at least 94% in normal mode
- Existing rectifier must have an efficiency of less than 90% in normal mode
- Facility must operate 24 hours per day and seven days per week
- Only data center, telecom, or similar facilities qualify
- Rectifier amperage must be 200 amps or less
- Qualifies for new construction or retrofit applications

High Efficiency Pumps - Pump Efficiency Index (PEI)

Requirements:

Incentives are available for high efficiency pumps less than 51Hp with a Pump Efficiency Index (PEI) that is less than the baseline values in the tables 3 & 4. The lower the PEI the higher the incentive and the larger the energy savings. Pumps may be constant load (constant speed) PEICL or variable load (variable speed) PEIVL that includes the drive. The PEI is an efficiency rating for certain clean water pumps required by the Code of Federal Regulations Title 10: Energy Part 431.

Qualifying pump classes are: End Suction Frame Mounted (ESFM), End Suction Close Coupled (ESCC), In-Line (IL), Radially split multi-stage Vertical In-Line (RSV) and Vertical Turbine - Submersible (VTS).

- Eligible PEI values are found at the Hydraulic Institute - Energy Rating [website](http://er.pumps.org/ratings/search) (<http://er.pumps.org/ratings/search>) listing over 5,000 pumps.
- The pump must operate at least 2,000 hours or more per year to be eligible for a higher incentive. Irrigation pumps are not eligible.
- Redundant or back-up pumps are not eligible for this incentive.
- The baseline and efficient pump must be of the same system type
- For constant flow systems both efficient and baseline pumps must operate with constant speed controls
- For variable flow systems both efficient and baseline pumps must operate with variable speed controls
- Variable load rated pumps must not be operated in constant speed systems
- Pumps over 50 HP may be eligible for a custom incentive
- This measure can be combined with other variable frequency drive pump measures.
- Qualifies for both new construction and retrofit applications.

Table 4: PEI-CL baseline (Constant Load)

Pump Class*	Constant Load PEI-CL baseline
ESCC,1800	1.000
ESCC,3600	0.960
ESFM,1800	0.980
ESFM,3600	0.990
IL,1800	0.990
IL,3600	0.980
RSV,1800	0.980
RSV,3600	0.980
VT-S,1800	0.960
VT-S,3600	0.960

*1800/3600 is the nominal speed of the tested pump

Table 5: PEI-VL baseline (Variable Load)

Pump Class	Variable Load - PEI-VL baseline			
	1 - 1.9 HP	2 - 3 HP	3.1 - 5.9 HP	6 - 50 HP
ESCC,1800	0.55	0.53	0.51	0.49
ESCC,3600	0.57	0.55	0.54	0.51
ESFM,1800	0.55	0.53	0.52	0.49
ESFM,3600	0.58	0.55	0.51	0.51
IL,1800	0.54	0.55	0.51	0.49
IL,3600	0.56	0.57	0.54	0.51
RSV,1800	0.56	0.55	0.52	0.50
RSV,3600	0.56	0.55	0.52	0.50
VT-S,1800	0.66	0.63	0.60	0.60
VT-S,3600	0.66	0.63	0.60	0.60

Manufacturing



High Efficiency Injection Mold Machines, All-Electric or Hybrid (Pre-Notification Required) (MA101a, MA101b)

Requirements:

- This incentive is available for installation of hybrid or all-electric injection mold machines.
- Hybrid machines use an electric motor to directly drive the main screw; hydraulics are used for other functions.
- Hydraulic injection molding machines (baseline system) use a hydraulic motor for the main screw drive as well as hydraulic for other functions such as clamping and ejection.
- VSD control or servo hydraulic control on hydraulic injection molding machines does not qualify.
- The new injection mold machines must be screw type and driven by servo motors.
- The proposed injection mold machine must operate at least 4,000 hrs./yr. to qualify.
- Replacement of existing electric or hybrid injection mold machines do not qualify.
- Incentive is based on the metric tonnage of the new machine.
- Auxiliary hydraulic core puller packages are considered to be separate from the injection mold machine and are allowable for on both All Electric and Hybrid injection machines.
- Qualifies for new construction and retrofit applications.
- If clamp tonnage is rated in standard tons, divide by 1.1023.

Higher Efficient Injection Mold Machine, VSD or Servo Hydraulic (Pre-Notification Required) (MA101c, MA101d, MA101e)

Requirements:

- Available for new VSD controlled hydraulic injection mold machines or retrofitting existing hydraulic injection mold machines with a VSD.
- Hydraulic injection molding machines (baseline system) use a hydraulic motor for the main screw drive as well as hydraulics for other functions such as clamping and ejection.
- This incentive cannot be combined with either a hybrid or all electric machine.
- The proposed injection mold machine must operate at least 4,000 hrs./yr. and have an annual minimum production rate of 400 lb./yr. per machine ton.
- Incentive is based on the metric tonnage of the new machine.
- For retrofit, VSD must be automatically controlled, or programmed to reduce pump speed during periods of less pressure or a decrease in the hydraulic oil flow rate.
- Qualifies for new construction and retrofit applications.
- If clamp tonnage is rated in standard tons, divide by 1.1023.

Fiber Laser Cutting Replacing Carbon Dioxide Laser Cutting (Pre-Notification Required) (MA102a, MA102b)

Requirements:

- This incentive is for customers who are replacing their existing carbon dioxide (CO₂) laser cutting equipment with new Fiber-Optic Laser cutting equipment.
- New installation of Fiber Lasers where no previous CO₂ laser was used qualifies for this measure.
- To qualify for this incentive, the laser must be stock 0.2" (5mm) or less, the vast majority of the time.
- The cutting equipment must operate at least 2,500-hrs./yr. and must be mechanically cooled year round to qualify.
- The incentive is based on the Fiber Laser's cutting power kW output.
- Qualifies for new construction and retrofit applications.

Process Dryer Flow Rate Control with Relative Humidity Sensors (Pre-Notification Required) (MA103)

Requirements:

- An incentive is available for installing a relative humidity sensor within the exhaust stream of industrial process dryers (i.e., paint drying) featuring constant speed fans.
- New controls must feature a means to control the exhaust air flow rate, such as a feedback loop.
- New installations of process dryers with a relative humidity sensor or the addition of a humidity sensor on a pre-existing process dryer both qualify.
- The drying equipment must also operate for at least 4,000 hours per year to qualify.
- One week of post data logging is required to prove average reduction in the volume flow rate (CFM).
- An instantaneous volume flow rate reading under normal conditions will provide the baseline conditions.
- Qualifies for new construction and retrofit applications.

Dew-point Sensor Control for Desiccant Plastic Dryer (Pre-Notification Required) (MA104)

Requirements:

- An incentive is available for installing Dew-point monitoring controls on new or retrofit desiccant column plastic pellet dryers for process or manufacturing applications.
- The controls must use a feature that switches the column into regeneration only upon saturation of the drying media.
- This incentive does not apply to desiccant wheels. An additional VFD incentive on the blower fan may accompany this incentive.
- The incentive will be based on the rated electrical draw (kW) of the process heater element and the rated electrical draw (kW) of the regeneration dryer.
- Qualifies for new construction and retrofit applications.

Process Ventilation Reduction (Pre-Notification Required) (MA105 - MA107)

This incentive is available for natural gas or electric (fan only) customers who are permanently reducing their heating season manufacturing or process ventilation volume flow rates through facility or process improvements.

Requirements:

- The reduced volume flow rate must exceed 5,000 ft³ per minute and serve conditioned (heated) spaces.
- Significant changes of operational use (i.e., factory to warehouse) do not qualify for this incentive.

- Systems designed to allow the carbon dioxide (CO₂) levels in occupied spaces to exceed a maximum level of 1,200 ppm do not qualify for this incentive.
- The reduced volume flow rate levels must also comply with the local and/or state authority having jurisdiction.
- Decreases in ventilation rates of HVAC systems must be authored by a Professional Engineer (PE) licensed in the State of Michigan, or a Certified Industrial Hygienist (CIH).
- Operational performance verification (complete pre-construction and post-construction volume flow rate testing) by certified Testing, Adjusting and Balance (TAB) Agents are required to qualify for this incentive. TAB Agent is to be certified by either AABC (Associated Air Balance Council) or NEBB (National Environmental Balancing Bureau).
- Pre-Notification applications must include a one-page narration of the project's proposed scope of work.
- Electric incentives may be chosen based on either CFM or HP reduction.
- Heating CFM is based on the average heating season's outside air volume flow rate that is directly conditioned.

Decreasing Oven Exhaust Flow Rate (Pre-Notification Required) (MA108 - MA111)

Requirements:

- An incentive is available for installing controls on the exhaust of process ovens with constant speed exhaust fans.
- The installation can be coupled with the installation of a means to control the exhaust air flow rate (i.e., VFD incentive) or be a fixed speed reduction to qualify for incentive.
- Adding exhaust rate control as an upgrade to an existing process oven or as option on a new process oven will qualify for incentive.
- Machinery must operate for at least 4,000 hours per year to qualify.
- Incentive will be based on the average reduction of the exhaust volume flow rate (CFM) as well as the average discharge oven temperature (degrees).
- Volume flow rate reduction will be based on independent test and balance from an authorized contractor, or based on name-plate volume flow rate, if the existing equipment is operating "like new" and has not been altered since original installation.

Energy Recovery

Recuperative/Regenerative Thermal Oxidizer (RTO) (Pre-Notification Required) (MA112, MA113)

Requirements:

- An incentive is available for installing either a Recuperative or Regenerative Thermal Oxidizer (RTO) system replacing an existing thermal oxidizer (TO).
- Incentive is available for both new construction and retrofit.
- Applications where the facility is upgrading an existing TO to a larger RTO, we require a dual baseline, where the size of the existing TO will be incentivized at the retrofit rate and the increase in capacity will be incentivized at the new construction rate.
- Existing TO cannot already have any heat recovery capabilities.
- The retrofit RTO must have a minimum heat recovery efficiency of 70% and the RTO's exhaust temperature must not exceed 400 degrees.
- Minimum TO exhaust temperature shall be 1,400 degrees while in operation.
- The new construction RTO must be a regenerative thermal oxidizer and have a minimum heat recovery efficiency of at least 70%.
- Replacement of existing RTOs does not qualify.
- The incentive will be based on the proposed RTO's rated volume flow rate (CFM).
- The proposed RTO must operate at least 4,000 hours per year to qualify.
- RTO applications that do not meet these requirements may qualify as a custom incentive.

Miscellaneous Industrial Electric

Smart Battery Charging Stations (Pre-Notification Required) (MA114)

Requirements:

- New 3-phase high frequency charger(s) shall have a minimum power conversion efficiency of 92% and a minimum 8 hour shift operation for 5 days per week (2,000 hrs./yr.).
- The new battery charger must replace either an existing ferroresonant or a silicon controlled rectifier (SCR) charger.
- This measure is only applicable to battery charging for forklifts and other electric vehicles, not intended for use on public roadways.
- Qualifies for new construction and retrofit applications.

Barrel Wrap Insulation for Injection Molding and Extruders (Pre-Notification Required) (MA115)

Requirements:

- Insulated blankets strapped around barrels of extruders or injection molders are eligible for this incentive.
- Blankets must be installed on previously uninsulated barrels, per manufacturer recommendations.
- This incentive is available for Consumers Energy electric customers only.

Welders, Inverter Style (Pre-Notification Required) (MA116)

An incentive is available for replacing an existing transformer - rectifier power source welder with a new inverter power sourced welder.

Requirements:

- The facility must operate their welding process a minimum of 1,000 hrs./yr.
- Facility's welding process must be in "Arc Mode" for a minimum of 15% of the operational period.
- Qualifies for new construction and retrofit applications.

Heat Recovery for 100% Makeup Air Heating (Pre-Notification Required) (MA201, MA202)

Requirements:

- Heat exchanger must be installed on a system with 100% outside air that can be either direct or indirect fired heated.
- Heat exchanger must provide 100% of heat for incoming supply air stream. No auxiliary burners or electric resistant heat may be used on the MAU.
- Existing MAU cannot have any heat recovery capabilities.
- The MAU utilizing the waste heat recovery system must utilize an energy source that would otherwise be dumped outside to the environment prior to the installation of the proposed heat exchanger.
- MAU must operate continuously during occupied mode.
- New heat exchanger must be either water-to-air or air-to-air.
- A load match analysis must be provided to verify proper utilization of wasted heat. If this cannot be provided, a 25 degrees Fahrenheit increase in supply air temperature must be shown.
- Specification must include inlet temperatures, outlet temperature and flow rates for both streams during design conditions.
- Project where waste heat recovery is required by code are not eligible to receive this incentive.
- Eligible for new construction and retrofit applications.
- Facility must operate at least two production shifts.
- Incentive will be based on the nominally rated volume flow rate of the MAU. If the supply and exhaust flow rates are not the same, the smaller of the two values will be used.

HVAC Equipment



Unitary (i.e., RTU) and Split Air Conditioning Systems and Heat Pumps (HV101)

Requirements:

- New unitary air conditioning units or heat pumps that meet or exceed the qualifying cooling efficiency shown in Table 6 below are eligible for an incentive.
- New units must be single package (RTUs) or split systems.
- The efficiency of split systems is based on the Air-Conditioning, Heating and Refrigeration Institute (AHRI) reference number. Water-cooled systems or evaporative coolers do not qualify for this prescriptive incentive, but may qualify for a custom incentive.
- All packaged and split system cooling equipment must meet AHRI standards (210/240, 320 or 340/360), be UL listed and use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC).
- Cannot be combined with Ductless Air Conditioning or Heat Pump System measure.

Table 6: Qualifying Cooling Efficiency for Split and Unitary Air Conditioning Systems

Size Category	Qualifying Efficiency
≤ 5.4 tons	15.0 SEER
≥ 5.4 to < 11.25 tons	12.0 EER/ 13.8 IEER
≥ 11.25 to < 20 tons	12.0 EER/ 13.0 IEER
≥ 20 to < 63 tons	10.6 EER/ 12.1 IEER
> 63 tons	10.2 EER

High-Efficiency Computer Room Air Conditioning (HV102)

An incentive is available for installing new, air cooled, computer room air conditioning (CRAC), data center applications, or telecom applications. This incentive is available for new applications or replacing existing HVAC systems. New CRAC units that meet or exceed the qualifying efficiency shown in Table 7 are eligible for incentive.

Requirements:

- The proposed CRAC unit's Sensible Coefficient of Performance (SCOP) must exceed ASHRAE 90.1 2010's minimum SCOP by 30% as defined in ASHRAE Standard 127.

- The CRAC unit must have a Sensible Heat Ratio of at least 90%; standard HVAC cooling.
- Qualifies for new construction and retrofit applications.

Table 7: Qualifying for CRAC Units

Size Category	Qualifying Efficiency
< 65 MBH	2.9
≥ 65 MBH to < 240 MBH	2.7
≥ 240 MBH	2.5

Data Room Hot/ Cold Aisle Configuration (Pre-Notification Required) (HV103)

Requirements:

- An incentive is available for optimizing a computer room air conditioning (CRAC) system to create a hot-aisle/cold-aisle configuration.
- The new configuration must result in an increase in the return air temperature of at least 5 degrees to the CRAC unit, achieved by reducing the average return air flow (per above description). Applications achieving a 10 degrees increase in the return air temperature are eligible for a bonus incentive.
- Documentation of existing and post return air temperatures must be provided showing a minimum of 7 continuous days of pre and post temperature monitoring.
- Incentive is based on nominal MBH rating of the CRAC unit.
- Redundant or backup systems do not qualify.

Packaged Terminal Air Conditioning (PTAC) or Heat Pump (HV104, HV105)

Requirements:

- Equipment must be through-the-wall self-contained units that are two tons (24,000 BTU/hr.) or less.
- Eligible systems must meet the following efficiencies:
 - » <7,000 Btu/hr. = 13.1 EER
 - » 7,000 Btu/hr. to 15,000 Btu/hr. = 11.8 EER
 - » >15,000 Btu/hr. = 10.5 EER
- All EER values must be rated at 95 degrees outdoor dry-bulb temperature.

Ductless Air Conditioning or Heat Pump System (HV106)

Requirements:

- Available for installing new ductless air conditioning (mini-splits) or new ductless heat pump systems.
- Ductless heat pumps must be replacing electric strip heating or air source heat pumps.
- Qualifying air conditioning efficiencies must equal or exceed 21-SEER (air conditioning).
- Qualifying heat pump efficiencies must equal or exceed 21-SEER (air conditioning) and 10-HSPF (heating).

Ground Source Heat Pumps (GSHP) (HV201)

- Equipment with an EER equal to 17 shall receive a fixed incentive amount. Equipment with an EER value greater than the qualifying value (17) will be paid an additional incentive per 0.1 EER incremental increase. The EER rating will be based on an entering water temperature of 77°F for closed-loop system and entering water temperature of 50°F for open-loop systems, in accordance with ARI/ISO standards.
- GSHP sizes are limited to 135,000 btu/hr (11.25 tons).
- All equipment must meet Air Conditioning and Refrigeration Institute (ARI) standards (325 or 330) and be UL listed.
- A manufacturer's specification sheet indicating the system efficiency for cooling and heating must accompany the application form.

Ultrasonic Humidifier (Pre-Notification Required) (HV202)

Requirements:

- An incentive is available for replacing existing electric steam humidifiers with ultrasonic humidifiers.
- The humidification system must operate a minimum of 2,000 hours annually.
- The space conditioned must maintain a minimum winter relative humidity level of at least 25%.
- Existing natural gas driven steam humidification systems do not qualify.
- Existing HVAC system must be natural gas heated; electric resistance HVAC heating does not qualify.
- Only available for data centers, large office buildings and hospitals.
- Special water treatment may be required for hospital applications to prevent water scale buildup or micro-organisms development.

Chillers

Air-and Water-Cooled Chillers (HV203 - HV205)

Requirements:

- Chillers are eligible for an incentive if they have a rated kW/ton for Full Load Value (FLV) and Integrated Part Load Value (IPLV) below the minimum efficiencies shown in Table 8 (ASHRAE 90.1-2013).

Table 8: Qualifying Chiller Efficiency for Air-and Water-Cooled Chillers

Equipment Type	Size (A)	Unit	Path A		Path B	
			FLV	IPLV	FLV	IPLV
All Air-Cooled Chillers	< 150 Tons	kW/Ton	1.19	0.88	1.24	0.76
	≥ 150 Tons	kW/Ton	1.19	0.86	1.24	0.75
Water Cooled Positive Displacement (Screw) Chillers	< 75 ton	kW/Ton	0.75	0.6	0.78	0.5
	≥ 75 ton and < 150 ton	kW/Ton	0.72	0.56	0.75	0.49
	≥ 150 ton & < 300 ton	kW/Ton	0.66	0.54	0.68	0.44
	≥ 300 ton & < 600 ton	kW/Ton	0.61	0.52	0.63	0.41
	≥ 600 ton	kW/Ton	0.56	0.5	0.59	0.38
Water Cooled Centrifugal Chillers	< 150 ton	kW/ton	0.61	0.55	0.7	0.44
	≥ 150 ton & < 300 ton	kW/ton	0.61	0.55	0.64	0.4
	≥ 300 ton & < 400 ton	kW/ton	0.56	0.52	0.6	0.39
	≥ 400 ton & < 600 ton	kW/ton	0.56	0.5	0.59	0.38
	≥ 600 ton	kW/ton	0.56	0.5	0.59	0.38

- Total incentive is determined by the qualifying base incentive per ton plus the maximum incentive per efficiency increase.
- Incentive per efficiency increase is calculated as the maximum incentive between Path A or Path B.
- The chiller efficiency rating must be based on AHRI Standard 550/590-2011 for IPLV. The chillers must meet AHRI standards 550/590-2011, be UL listed and use a minimum ozone-depleting refrigerant (e.g., HCFC or HFC).

- The AHRI net capacity value should be used to determine the chiller tons.
- A manufacturer's specification sheet with FLV and IPLV in either kW/ton or COP must accompany the application form.
- The addition of a VFD to an existing chiller is not eligible for this measure, but may qualify for a custom incentive.
- There is a fixed incentive for reaching the minimum qualifying efficiency and incremental incentives for every 0.01 kW/ton FLV or IPLV reduction from the minimum required.
 - » Redundant or back-up units do not qualify.
 - » Qualifies for both new construction and retrofit applications.

Industrial Fans

High-Volume, Low-Speed Fans (Pre-Notification Required) (HV301)

Requirements:

- This incentive is available for installing horizontal ceiling mounted, at least 16-foot diameter, high-volume low-speed (HVLS) fans which are either replacing multiple non-HVLS fans (including pedestal fans) or in new applications where no fan currently exists.
- Could be combined with destratification fan (combo customers).
- Qualifies for new construction and retrofit applications.

Destratification Fans (Pre-Notification Required) (HV302)

This incentive is for natural gas customers who are optimizing their building heating system by adding an air circulation system to reduce temperature gradient from thermostat to roof.

Requirements:

- The area served must be a conditioned space (heated) greater than 5,000 ft² with a floor-to-ceiling distance of at least 20 feet.
- The minimum temperature differential between the thermostat (5-foot above finished floor) and the bottom of the ceiling must be at least 15 degrees (i.e., 68 degrees at thermostat height, 83 degrees at ceiling height).
- Affected area cannot exceed building or room area served by the destratification fan.
- For ceiling fan diameters larger than 16 foot, affected area may be calculated by 5 times the fan diameter.

Example:

20-foot fan diameter

5 x 20-foot = 100-foot

Area = $\pi \times \text{diameter}^2 / 4 = 3.14 \times 100^2 / 4 = 7,850 \text{ ft}^2$

- For ceiling fan diameters smaller than 16-foot, the destratification effectiveness will be validated by taking the air temperature readings before construction and after construction under the same ventilation rate.
- The temperature gradient in the area affected must decrease by at least 10 degrees Fahrenheit, or minimum air velocity of 100FPM perpendicular to the floor at an elevation of 5-foot must be validated.
- Spaces already served by forced-air air handling systems (i.e., RTU) that are required to operate continuously during occupied periods (meet indoor air quality) do not qualify.
- Qualifies for new construction and retrofit applications.

Heating

High-Efficiency HVAC Hydronic Boiler (HV303, HV304)

Requirements:

- Available only for equipment used for space heating. Boilers purchased for back-up or redundancy are not eligible.
- Boilers must modulate their firing rate and have a sealed combustion unit.
- Applicant must submit boiler specifications with steady state boiler input and output ratings. The ratings will be defined per ANSI Standard Z21.13 and use supply and return water temperatures. Note that high efficiency condensing boilers will provide the rated efficiency only if return water is cold enough to condense the flue gases. If the heating system cannot meet the requirement, a non-condensing boiler may be a better choice.
- Qualifying efficiencies are shown in Table 7 below. The efficiency should be given as AFUE for units <300 MBH, thermal efficiency for units ≥300 MBH and ≤2,500 MBH, and combustion efficiency for units >2,500 MBH.
- 1 MBH = 1,000 Btu/hr.
- Qualifies for new construction and retrofit applications.

Table 9: Minimum Efficiency Requirements for Natural Gas Space Heating Boilers

Incentive Level	Minimum
Level 1	≥ 0.88 and < 0.90
Level 2	≥ 0.90

Steam or Process Boilers

High-Efficiency HVAC Steam, Process Steam, or Process Hydronic Boiler (HV305 - HV307)

Requirements:

- HVAC steam boilers must meet a minimum thermal efficiency of 82% as specified by the manufacturer.
- Process boilers must meet a minimum combustion efficiency of 82% as specified by the manufacturer.
- Only HVAC or process boilers qualify.
- Redundant or backup boilers do not qualify.
- Qualifies for new construction and retrofit applications.

High-Efficiency Pool Water Heater (HV308)

Requirements:

- Heater must be equal to or greater than 84% thermal efficiency and must replace a pre-existing pool heater.
- Heater must be rated between 500 MBH and 2,000 MBH.
- Must have an on/off switch and have no pilot light.
- Heater cannot be used as a back-up for solar water heating.
- Redundant or backup boilers do not qualify.
- Qualifies for new construction and retrofit applications.

High-Efficiency Unit Heater (HV309, HV310)

Requirements:

- Condensing unit heaters must be 92% AFUE (Annual Fuel Utilization Efficiency) or greater and have a sealed combustion unit.
- Direct-fired air handling units are not eligible for the incentive.
- Available only for equipment used in space heating conditions.
- Equipment purchased for back-up or redundancy is not eligible.
- Qualifies for new construction and retrofit applications.

Direct-Fired Makeup Air Handling Unit (HV311)

Requirements:

- An incentive is available for replacing standard efficiency, forced-air, space heating equipment (less than 84% efficient, i.e., indirect fired natural gas unit heater, steam air handling unit, 80/20 makeup air handling unit, etc.) with direct-fired HVAC system.
- Applications where there is an increase in outside air mechanically provided to or removed from the space do not qualify for this incentive.

- The customer must provide the Annual Fuel Utilization Efficiency (AFUE) and capacity of the new direct-fired unit(s).
- Can be combined with ventilation reduction.
- Qualifies for new construction and retrofit applications.

Condensing Rooftop Units (HV312)

Requirements:

- Condensing rooftop units must be 92% AFUE (Annual Fuel Utilization Efficiency) or greater.
- Direct-fired air handling units are not eligible for this incentive.
- Available only for equipment used in space heating conditions.
- Replacement of existing condensing RTU's does not qualify.
- Disposal of condensed liquid must comply with local codes and ordinances. The condensate cannot be discharged directly onto the roof or into the roof drains.

Infrared Heaters

(Pre-Notification Required) (HV313, HV314)

Requirements:

- Only building space heating applications are eligible.
- High-intensity and low-intensity heaters are eligible.
- Heaters must be replacing indirect unit type heaters (i.e., unit heating furnaces, AHUs, Unit Heaters, etc.).
- Pre-Notification application shall include infrared heater layout with locations of existing unit heater being replaced.
- Infrared heaters must be installed per manufacturer's recommendations.
- Replacement of an existing infrared heater doesn't qualify.
- Space setpoint temperatures of the proposed infrared heating system must be reduced by at least 5 degrees below the existing unit heater setpoint temperatures.
- Customers must provide a signed affidavit stating the base line set point temperature and the proposed set point temperature showing at least a 5 degrees reduction and set point temperature. Affidavit can be found in appendix of catalog.
- Installation of new IR heaters may qualify for programmable or web-based programmable thermostat incentive.
- Qualifies for new construction and retrofit applications.

High-Efficiency Furnace (HV315 - HV318)

Requirements:

- Condensing furnaces must be 92% AFUE (Annual Fuel Utilization Efficiency) or greater and have a sealed combustion unit.
- Direct-fired air handling units are not eligible for incentives.
- Chimney liners must be installed where a high-efficiency natural gas furnace replaces atmospherically drafted equipment that was vented through the same flue as a gas water heater. Flue closure protocol must be used when a high-efficiency furnace is installed and the chimney is no longer in use.
- Available for equipment used in space heating conditions.
- Equipment purchased for back-up or redundancy is not eligible.

High-Efficiency Domestic Water Heating Boiler (HV401)

Requirements:

- Available for domestic water heating boiler systems upgraded to minimum of 94% thermal efficiency heating system used in commercial applications.
- The domestic water boiler system typically utilizes a separate hot water storage tank(s).
- Only boilers greater than 75,000 BTU/hr. qualify for this incentive.
- Redundant boilers or those used for space heating do not qualify for this incentive.
- Qualifies for new construction and retrofit applications.

High-Efficiency Tank-Style Domestic Water Heater (HV402 - HV403)

Requirements:

Table 10: Heater must replace existing natural gas water heater and meets the criteria in the table below:

Size (Gallons)	Minimum
Up to 55 gallons	≤ 75 MBH, ≥ 0.64 Uniform Energy Factor
Up to 55 gallons	≤ 75 MBH, ≥ 0.68 Uniform Energy Factor
≥ 55 gallons	≤ 75 MBH, ≥ 0.80 Uniform Energy Factor
≤ 140 gallons	> 75 MBH, 94% Thermal Efficiency

Tankless Water Heaters (HV404)

Requirements:

- Instantaneous (i.e., “tankless”, “demand”, “instantaneous”) electric or natural gas water heaters can either be new construction or replacing an existing water heater with the same type of fuel source (i.e.: existing electric resistance domestic water heater being replaced with a new electric instantaneous water heater).
- The instantaneous electric water heater must have a UEF of at least 0.95.
- The instantaneous natural gas heater must have a UEF of at least 0.87.
- Replacement of existing tankless water heaters does not qualify.

Building Automation System

Web-Based Building Automation System (Temperature Setback in Non-Occupied Periods) (Pre-Notification Required) (BA101)

Please note that all controls upgrades must be capital improvement projects. Control upgrades included in Service or Maintenance contracts for any length of time do not qualify for incentives.

Requirements:

- Available for existing buildings that currently have no digital automated HVAC controls or outdated pneumatic control systems with inoperable time control functions.
- Existing HVAC control systems cannot have time of day scheduling (including seven-day programmable thermostats). Upgrading obsolete EMS HVAC system with inoperable time clock functions will be reviewed on a case-by-case basis for incentive eligibility.
- New control system must be fully programmable (i.e., ability to program complex central heating/cooling plants, custom AHU's, etc) and have the ability to display full customizable graphical overviews that depict actual equipment operation.
- Buildings upgrading existing digital EMS systems are not eligible for prescriptive incentives.
- HVAC BAS systems must be new and include:
 - » Central time clock control.
 - » Web-based interface with PC-based controls and graphic.
 - » Open-protocol architecture controls system shall consist of either LonTalk (ANSI/CEA 709.1) or BACNet (ASHRAE/ANSI 135) protocol being used between all controlled and controlling devices and every node on the network, unless granted a pre-approved exception.
 - » Minimum setback period must exceed 2,200 hrs./yr.
 - » A minimum setback space temperature of at least 5 degrees in both heating and air condition mode.
- New control systems must be entirely direct digital controlled (DDC); however, exceptions may be granted for large pneumatic actuators.
- Minimum area of 10,000 ft².
- It is recommended that the HVAC BAS include:
 - » Real-time outside air damper positioning.
 - » Whole building real-time power and energy monitoring capability.
 - » At least three “enhanced” control strategies, (i.e., critical zone hydronic heating supply temperature reset, AHU fan control, exhaust fan control, etc.).
 - » If incorporated with Demand Control Ventilation, real time carbon dioxide monitoring at the operator interface.
 - » As part of the new control system the owner should receive all hardware and software programming tools required for system changes and/or additions.
- Buildings must have more than 10,000 ft² of controlled heating space to be eligible for natural gas incentives and 10,000 ft² of controlled air conditioned (cooled) space to be eligible for electric incentives.
- Heated school areas that are not air conditioned may qualify for an electric BAS incentive based on shutting off fan motors and pumps during non-occupied periods except to remain space temperature.
- Manufacturing facilities may be eligible for a different incentive.
- The maximum incentive available is \$75,000 per facility.
- Pre-Notification application should include proposed BAS sequence of operations, scaled floor-plan of building with controlled area highlighted, specifications of proposed BAS system and estimated cost for the proposed BAS system.
- BAS systems controlling one piece of equipment would be considered stand alone controls and would not qualify.

Light Commercial Building Automation Systems (LC-BAS) (Pre-Notification Required) (BA102)

Requirements:

- Available for adding HVAC Building Automation Systems (BAS) to existing light commercial buildings with packaged units (i.e., RTUs) or split-systems.
- Incentive is intended for web-based or cloud based BAS. BAS that are fully programmable and based on Niagara Framework (i.e., Jace Controller) do not qualify for this incentive, but may qualify for a different control measure.
- If the facility already has an existing HVAC control system, the existing HVAC control systems cannot have time-of-day scheduling. Facilities simply upgrading existing digital EMS systems are not eligible for prescriptive incentives.
- The facility does not qualify if it has existing 7-day programmable thermostats.
- HVAC LC-BAS systems must be new and include:
 - » Central time clock control.
 - » Be either Web based or Cloud based.
 - » Real-time analytics allowing equipment issues to be found via system created graphs and trendlogs.
 - » System shall have remote monitoring and alarming capability.
 - » Open-protocol architecture controls system shall consist of either LonTalk (ANSI/CEA 709.1) or BACNet (ASHRAE/ANSI 135) protocol being used between all controlled and controlling devices and every node on the network, unless granted a pre-approved exception.
 - » Minimum setback period must exceed 2,200 hrs./yr.
 - » A minimum setback space temperature of at least 5 degrees in both heating and cooling mode.
 - » Ability for customers to determine if points or specific pieces of equipment are in an overridden state (i.e., points/equipment in "hand").
 - » New control systems must be entirely direct digital controlled (DDC).
- It is recommended that the HVAC LC-BAS include:
 - » Real-time outside air damper positioning.
 - » If incorporated with Demand Control Ventilation, real-time carbon dioxide monitoring at the operator interface.
 - » Monitor amp draw through compressor or fan motors for preventive maintenance.
 - » As part of the new control system the owner should receive all hardware and software programming tools required for system changes and/or additions.

- Pre-Notification application should include proposed LC-BAS sequence of operations, scaled floor-plan of building with controlled area highlighted, specifications of proposed LC-BAS system and budgetary cost estimate for the proposed LC-BAS system.
- LC-BAS systems controlling one piece of equipment would be considered stand-alone controls and would not qualify for this incentive.
- The LC-BAS measure is intended for building automation systems that are not fully programmable (i.e., only configurable) and do not have customizable graphics.
- Web-based (smart) thermostats, not eligible for incentive.
- The maximum incentive is \$35,000.

Optimal Start on Air Handling Unit (AHU) (Pre-Notification Required) (BA103)

Requirements:

- The HVAC sequence of operation shall be written to utilize the existing and new building automation system (BAS) to determine the length of time required to bring each zone from current unoccupied temperature to within 2 degrees of the occupied setpoint temperature in as short of time period as possible right before occupied mode. This shall be accomplished by using the difference between the actual zone temperature and occupied setpoint and outdoor air (OA) temperature/ humidity. These differences are then compared with historical performance of how quickly the zone has been able to warm up or cool down to determine when the system needs to startup in the morning.
- During optimal start morning warm-up, the supply fan shall run continuously and the heating or cooling shall be energized but the OA damper shall remain closed unless in economizer mode.
- Floor plans showing pertinent areas should be provided, along with a copy of the sequence of operation.
- Service contracts with an optimal start upgrade are not eligible for an incentive.
- Existing building automation systems with optimal start capability are not eligible for an incentive.
- Trendlogs demonstrating optimal start implementation may be required by program staff.
- System must have a minimum of 5-days per week of unoccupied (setback) periods.

Building Automation System (BAS) for Manufacturing HVAC Fans (Pre-Notification Required) (BA104)

Requirements:

- This incentive is available to control the HVAC ventilation equipment in non-air conditioned manufacturing facilities.
- The existing HVAC unit must be running 24/7.
- The manufacturing facility must have unoccupied period during which the HVAC equipment can be shut off.
- Motor size (HP) will be based on original HVAC equipment nameplate data.
- As part of the new control system, the owner should receive all hardware and software programming tools required for system changes and/or additions.
- Minimum setback period of 2,000 hrs./yr.
- Existing HVAC and controls cannot have time of day controls (i.e., 7-day programmable thermostats).
- Qualifies for new construction and retrofit applications.

Parking Garage Exhaust Fan Carbon Monoxide Control (Pre-Notification Required) (BA105)

Requirements:

- Mechanical ventilation systems serving enclosed parking garages with the total design exhaust rate for the garage greater than or equal to 10,000 CFM qualify for this measure.
- The existing fan must be constant speed and continuously operating year round.
- The existing fans cannot be VSD controlled.
- The occupied ventilation rate must be at least 1.5 CFM/ft².
- The proposed control system must automatically detect contaminant level and disable fans during periods of little use, provided acceptable contaminant level is maintained.
- Typically, CO concentration at all sensors is maintained below 25 parts per million (ppm). If the sensor is capable of NO₂ detection, the NO₂ cannot typically exceed 3 ppm.
- Typically one CO sensor per 5,000 ft² is required.
- The ventilation system is typically required to maintain the garage at negative or neutral pressure relative to occupied spaces adjoining the garage when the garage is scheduled for occupancy.
- The ventilation control system must comply with all local and/or state authorities having jurisdiction.
- Confirm with your blower manufacturer that the increased fan cycling will not result in unforeseen motor damage.
- Qualifies for new construction and retrofit applications.
- The parking garage must be open 24 hours per day and 7 days per week.
- New controls must feature variable speed capabilities.

Hydronic HVAC Pump Control (Pre-Notification Required) (BA106)

Requirements:

- Available for hydronic heating or chilled water pump system control upgrades.
- Qualifying pumping systems include hydronic heating pump controls, chilled water pump controls and condenser water pump controls (if applicable).
- The intent of this control strategy is to allow the hydronic pumps to be disabled during periods of minimal loads.
- Pumping systems currently operating with operable time clocks or outside air sensor controls/lockouts do not qualify for this incentive.
- The existing pumps must operate continuously at a constant pumping volume flow rate.
- Upgrades must include hardware installation for new DDC controls.
- Minimum qualifying area is 10,000 ft² of conditioned space.

Critical Zone Supply Air Reset Control Strategy (Pre-Notification Required) (BA107)

Requirements:

- Available for converting existing variable air volume (VAV) air handling systems into VAV systems with critical zone reset (static pressure reset).
- The area served by the air handling system must be fully conditioned space (both heating and air conditioned) and be fully controlled by an operational Energy Management System (EMS).
- At a minimum, the ability to read actual airflow at each VAV box and the following controls sequence must be added to all VAV air handling systems, in accordance with ASHRAE 90.1 Section 6.5.3.2. Provide the proposed Sequence of Operation.
- Verification of proper implementation of this measure will come from EMS screen shots of the damper position of VAV damper boxes confirming that during normal occupied periods; at least one VAV damper shall be fully opened.
- Single zone VFD HVAC systems do not qualify.

Air-Side Economizer

(Pre-Notification Required) (BA108)

Requirements:

- Available for retrofitting Roof-Top Units (RTUs), Air Handling Units (AHUs), Split Direct-Expansion (DX) systems, or Unit Ventilators (UVs) which were designed without economizers or systems which have inoperable economizer controls.
- The area served must be air conditioned (cooled) space.
- At a minimum, the new damper actuators and controls must be installed to the existing system and the proper calibration must be done by a certified professional.

Chilled Water Reset Retrofit

(Pre-Notification Required) (BA109)

Requirements:

- Available for installing a chiller water reset to allow the supply chilled water (CWS) temperature to increase by at least 5 degrees based on either zone demand or outside air (OA) temperature (i.e., at an OA=80 degrees, CWS=45 degrees; at an OA=55 degrees, CWS=55 degrees).
- If more than one chilled water valve on the terminal equipment is 100% open, the chilled water supply temperature should be decreased.
- The actual chilled water reset schedule should be calibrated at each site based on internal relative humidity.
- The reset schedule shall be provided with the application.
- Available for Consumers Energy electric customers only.
- Reset schedules with chillers in economizing mode (free cooling) do not qualify.

Optimized Chiller Plant Sequencing

(Pre-Notification Required) (BA110)

Requirements:

- This incentive is available for customers to implement optimized chiller sequencing to existing chiller plants where the existing chillers currently operate with stand-alone controls.
- The chiller plant incorporating the optimal sequencing must consist of at least two chillers.
- All chillers must be monitored and controlled, at a minimum, as follows: sequenced and staged, both enabled and disabled in a manner to optimize their operation as recommend by the chiller manufacturer.
- The chilled water plant controller must be fully automated. The chilled water plant controller must be programmed with each chiller's unique operating characteristic to optimize both full-load and part-load performance.

- Chillers with good part load efficiency (i.e., VSD drives) must be utilized as trim chillers.
- Water-cooled chiller plants must also control their corresponding cooling towers and condenser water pumps.
- Chilled water plants used for process application may be considered as HVAC chilled water plants as long as the process chilled water plant operates at least 4,000 hrs./yr.

Advanced Rooftop HVAC Control

Enhanced Ventilation Control (EVC) for RTUs (Pre-Notification Required) (BA111)

Requirements:

- This incentive is available for adding enhanced ventilation control (EVC) to single zone packaged heating, ventilation, and air condition (HVAC) units or roof-top units (RTU).
- The EVC requirements are as follows.
- Available for both new and existing HVAC equipment; however, the existing RTU must be in good working order.
- Must include the following:
 - » An advanced digital economizer control (ADEC) system, consisting of replacing their existing analog or no-functional economizer control system with an ADEC system.
 - » The ADEC system must identify and report problems with sensors, dampers and other components to ensure consistent and reliable economizer mode operation.
 - » Demand Control Ventilation (DCV) to reduce the amount of ventilation during periods of low occupancy, typically achieved through a carbon dioxide (CO₂) sensor.
 - » The DCV must be tied into the controller Variable Speed Drives (VSD) to modulate the supply fan (evaporator) motor. The VSD must be automatically controlled by differential pressure, flow, temperature or other variable signal. The VSD must be tied to the controller.
- Cannot be combined with the demand control ventilation (DCV), VFD, or economizer incentive measures.
- Incentive will be based on the nominal input rating in tons of the HVAC equipment.
- The existing system cannot have a supply fan VFD or CO₂ sensors installed.
- Qualifies for new construction and retrofit applications.
- Factory provided controls on a new RTU would not qualify.

Unitary Controls

Hotel Guest Room Occupancy Sensor (Natural Gas Heat) (Pre-Notification Required) (BA201a)

Requirements:

- Available for sensors that control natural gas heating units for individual hotel rooms.
- Sensors controlled by a front desk system are not eligible.
- Sensors must be controlled by automatic occupancy detectors and it is recommended that during unoccupied periods the default setting for controlled units differ by at least 8 degrees from the operating set-point.
- 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.
- Key cards that indicate occupancy also qualify.
- Replacement or upgrades of existing occupancy-based controls are not eligible as a prescriptive incentive.
- A floor plan defining the room layout and equipment being replaced must be provided with the application form.
- Qualifies for new construction and retrofit applications.

Hotel Guest Room Occupancy Sensor (Electric Heat) (Pre-Notification Required) (BA201b)

Requirements:

- Available for sensors that control heat pumps and other electric heating units for individual hotel rooms.
- Sensors controlled by a front desk system are not eligible.
- Key cards that indicate occupancy also qualify.
- Sensors must be controlled by automatic occupancy detectors and it is recommended that during unoccupied periods the default setting for controlled units differ by at least 8 degrees from the operating set point.
- 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.
- Replacement or upgrades of existing occupancy-based controls are not eligible as a prescriptive incentive.
- Qualifies for new construction and retrofit applications.
- A floor plan defining the room layout and equipment being replaced must be provided with the application form.

Programmable Thermostat (Pre-Notification Required) (BA202)

Requirements:

- Programmable thermostat must have the capability of enabling the user to set one or more time periods each day when a comfort set point temperature needs to be maintained and one or more time periods each day when an energy-saving set point temperature needs to be maintained.
- Thermostats on new HVAC equipment are not eligible.
- Minimum setback period of 2,000 hours per year and a minimum setback space temperature of at least 5 degrees in both heating and cooling (when applicable).
- Existing HVAC & controls cannot have time of day controls (i.e., 7-day programmable thermostats).

Occupancy Sensor Control For Smart Thermostat (Pre-Notification Required) (BA203)

Requirements:

- Available for customers who install single zone thermostats with occupancy sensors to reset the space temperature at least 5 degrees when the individual zone is unoccupied.
- Example: heating season, occupied set point temperature at 70 degrees Fahrenheit, switched to 60 degrees Fahrenheit during non-occupancy.
- The areas served by the proposed HVAC occupancy sensor must be a conditioned space.
- Cannot be combined with the demand control ventilation measure.
- Qualifies for new construction and retrofit applications.

Ventilation Control

Demand Control Ventilation (Pre-Notification Required) (BA204)

Requirements:

- Install ventilation controls on existing buildings that use carbon dioxide levels to measure occupancy and modify the percentage of outside air based on variable levels.
- Only buildings with space heating and cooling applications are eligible.
- Conditioned spaces must be kept between 65 degrees Fahrenheit and 75 degrees Fahrenheit during operating hours.
- Systems must have current fresh air requirements equal or greater to 10% of supply air requirements.
- Carbon dioxide (CO₂) sensors must be installed in conjunction with fully functioning air-side economizers.

- Dual-temperature air-side economizers with zone-level CO₂ sensors for rooftop units qualify and return system CO₂ sensors are required for built up systems.
- Controlled space must meet the minimum requirements of the current ASHRAE 62 standard, as well as all local building code and manufacturer's recommendations.
- The CO₂ sensors must control the outside air dampers to qualify.
- The incentive is calculated per square foot of area controlled.
- Must submit floor plan with final application.
- Cannot be combined with the HVAC Occupancy Sensor Incentive.

Occupancy Sensor Control for HVAC BAS System (Pre-Notification Required) (BA205)

Requirements:

- Available for customers who are upgrading their building Energy Management System (EMS) by adding occupancy sensors to automatically switch the heating, ventilation, and air condition (HVAC) systems in zone specific spaces (i.e., classrooms, offices, health care, etc) from occupied to unoccupied mode when these areas are not in use.
- The area served by the proposed HVAC occupancy sensors must be a conditioned space.
- This incentive is not available for spaces already controlled by outside air demand control ventilation systems.
- The HVAC terminal equipment (i.e., unit ventilators or constant volume AHUs) controlled by the occupancy sensors must be capable of reducing to zero flow during periods of no occupancy.
- Floor plans showing pertinent areas must be provided, along with a copy of the sequence of operation confirming the optimal set point specification.
- Cannot be combined with the Demand Control Ventilation Incentive, or is not available if the space is already controlled by Demand Control Ventilation.
- The space controlled by the HVAC occupancy sensor must prove intermittent occupancy to qualify.
- Data logging may be required to validate HVAC occupancy system performance.

Demand Control Ventilation and Occupancy Sensors for HVAC (Pre-Notification Required) (BA206)

Requirements:

- This incentive is available for installing both demand control ventilation and occupancy sensors for HVAC.
- Must meet the individual requirement of each measure (DCV and HVAC Occupancy Sensors) to qualify.

Occupancy Sensor Controlled Restroom Exhaust Fan (Pre-Notification Required) (BA207)

Requirements:

- Available for installing occupancy sensors on existing restroom exhaust fans.
- The occupancy sensor must automatically shut off the exhaust fan or close the exhaust damper after a specific period of time when no occupancy is detected.
- No other controls other than a manual switch may be present to qualify. Fans cannot be controlled by an existing Building Automation System (BAS).
- Exhaust fan motor cannot be an ECM (electrically commutated motor).
- Manual timers controlling the exhaust fan does not qualify.

Boiler Controls

Optimized Boiler Plant Sequencing (Pre-Notification Required) (BA301)

Requirements:

- Available for installing sequence controls on existing boilers and for new boiler with built-in controls.
- The customer must provide the nominal unit rating (MBH) for the lead boiler and all additional lag/redundant boilers in the boiler plant.
- The Boiler Plant Control incentive is available for heating systems with at least two boilers currently isolated from each other independently feeding a common header.
- All boilers shall be monitored and controlled, at a minimum, as follows: sequenced and staged, both enabled and disabled, in a manner to optimize their operation as recommended by the boiler manufacturer.
- Within 15 minutes of disabling a boiler, the boiler's flow through that disabled boiler must be stopped, either by automatically disabling the boiler's corresponding circulating pump, or through automatically shutting of an isolation valve when applicable.
- Hospitals or universities whose boiler operates year round may qualify as a process boiler.
- Qualifies for new construction and retrofit applications.

Modulating Burner Control (Pre-Notification Required) (BA302)

Requirements:

- The burners must be able to be controlled to a minimum turn down ratio of 5:1 or greater.
- Boiler must operate (be enabled) a minimum of 4,000 hours per year to be eligible.
- Projects on existing or new boiler systems are eligible. The purchase of a new burner is required for this measure.
- New condensing boilers are not eligible.
- Redundant boilers do not qualify.
- Hospitals or universities whose boilers operate year round may qualify as a process boiler.
- Qualifies for new construction and retrofit applications.

Boiler Oxygen Trim Control (Pre-Notification Required) (BA303)

Requirements:

- Boiler must operate (be enabled) a minimum of 4,000 hours per year to be eligible. These are operating hours, not full-load hours.
- The incentive is eligible for retrofit or new boiler projects.
- Redundant boilers do not qualify.
- Hospitals or universities whose boilers operate year round may qualify as a process boiler.
- New condensing boilers are not eligible.
- Cannot be combined with linkageless boiler controls incentive.
- Qualifies for new construction and retrofit applications.

Linkageless (Parallel Positioning) Boiler Controls (Pre-Notification Required) (BA304)

Requirements:

- System must operate (be enabled) a minimum of 4,000 hours per year.
- Redundant boilers do not qualify for this incentive.
- This incentive is available for installing linkageless boiler controls on existing boilers used for HVAC or process applications that operate in parallel positioning. New process boiler applications also qualify; however, new HVAC boiler applications do not qualify.
- Hospitals or universities whose boilers operate year round may qualify as a process boiler.
- Cannot be combined with oxygen trim controls incentive.
- New condensing boilers are not eligible.

Combination Linkageless and Oxygen Trim Boiler Control (Pre-Notification Required) (BA305)

Requirements:

- System must operate (be enabled) a minimum of 4,000 hrs./year.
- Redundant boilers do not qualify for this incentive.
- This incentive is available for installing both linkageless and oxygen trim boiler controls on existing boilers used for HVAC or process applications.
- Hospitals or universities whose boilers operate year round may qualify as a process boiler.
- Qualifies for either retrofitting existing or new boiler applications.
- New condensing boilers are not eligible.
- Qualifies for new construction and retrofit applications.

Water Reset Control Retrofit (Pre-Notification Required) (BA306)

Requirements:

- Outside air temperature reset or cutout control incentives are for existing space heating boilers only. A new boiler with boiler reset controls is not eligible.
- The system must be set so that the minimum temperature is not more than 10 degrees above manufacturer's recommended minimum return temperature.
- This incentive is for one outdoor air reset control per boiler system.
- Redundant boilers do not qualify.
- Facilities with existing outdoor air reset or cutout controls on existing boiler loops (i.e., primary) or existing building heating loops (i.e., secondary) do not qualify.

Basic Snow Melt Controls retrofit (Pre-Notification Required) (BA307)

Requirements:

- A snow or ice melt controller must be added to existing, natural gas, hydronic heated boiler systems used to melt snow from exterior surfaces like: walkways, driveways, ramps, bridges and parking lots.
- Snow or ice melt systems already controlled by operable moisture sensors do not qualify.
- Snow or ice melt systems must be operated the entire winter period.
- The proposed snow or ice melt systems must be controlled by both exterior temperature and moisture sensors located in the concrete slab. In idle mode, the slab is to maintain a temperature of approximately 32 degrees.
- During a moisture event, as identified by the moisture sensor located in the slab, the slab temperature is to be raised to approximately 40 degrees.
- Care must be taken when locating the moisture sensor in the concrete slab to avoid “false positive” moisture events like spilled fluids, wet feet, or low areas prone to water ponding.
- New snow or ice melt systems do not qualify.

Enhanced Snow Melt Controls (Pre-Notification Required) (BA308)

Requirements:

- Enhanced snow/ice melt controller must be added to existing or new hydronic heating boiler system.
- The proposed controller must be programmed to turn off completely, not idle, when precipitation is not present. BAS system must gather weather forecast information and engage snow/ice melt system to maintain in idle mode slab temperature of approximately 32 degrees for approximately 8 hours before the predicated precipitation event hours.
- A slab moisture sensor is required to enable slab temperature to rise to 40 degrees during a moisture event.
- Qualifies for new construction and retrofit applications.

Modulating Burner on Makeup Air Handling Unit (Pre-Notification Required) (BA309)

Requirements:

- To qualify for this incentive, the existing 100% makeup air handling unit (MAU) must have a modulation ratio less than or equal to 3:1.
- Only MAUs serving either manufacturing processes or commercial kitchens in hotels, schools, or hospitals qualify.
- In commercial kitchen applications, the MAU must be coupled to an exhaust hood.
- To qualify in manufacturing process applications, the facility must be primarily heated with 100% outside air, MAUs (not unit heaters or through other means).
- Buildings that use other space heating equipment (e.g., unit heaters, rooftop units, boilers, infrared heaters) and commercial kitchens that have demand-controlled ventilation systems do not qualify.
- The replacement burner must be direct fired and have a modulation ratio of 10:1 or greater.
- The MAU must be 100% outside air.
- The proposed MAU must be monitored and controlled by the discharge air temperature (not the space temperature thermostat).
- The MAU must have a minimum operating time of 50 hours per week during the heating period to qualify.
- The incentive is based on the rated input MBH of the MAU.
- Qualifies for new construction and retrofit applications.

Advanced Air Distribution and Energy Recovery



Advanced Air Distribution Systems

Constant Volume (CV) to Variable Air Volume (VAV) AHU (Pre-Notification Required) (AE101)

Requirements:

- Available for converting existing constant volume air handling systems into variable air volume (VAV) air handling systems. The areas served by the air system must be conditioned spaces (both heated and air conditioned).
- At a minimum, variable frequency drives must be installed on all fans in the system and VAV boxes and reheat must be added to a minimum of four zones.
- Controls must be added or modified for the new VAV operating conditions and all zone sensors must be upgraded to digital.
- The incentive cannot be combined with the incentive for VFD/VSD on HVAC Fans or HVAC Pumps.
- Adding a VFD and controls to a constant volume AHU does not qualify.
- Existing single zone air handling equipment does not qualify (i.e., classroom unit ventilators or fan coil units).

Constant Volume AHU to Hydronic Heat Pump (Pre-Notification Required) (AE102)

Requirements:

- The areas served by the air system must be conditioned spaces (both heated and air conditioned).
- At a minimum, the proposed HVAC system must have at least four zones created.
- A water loop heat pump system must consist of water-to-air heat pumps at each zone and connected to a common water loop. Loop must also be connected to a cooling tower (summer operation) and a boiler system (winter operation) for supplemental heat rejection/addition.
- Air-to-air heat pumps or geothermal heat pump systems do not qualify for this incentive.
- Existing single zone air handling equipment does not qualify (i.e., classroom unit ventilators or fan coil units).

Energy Recovery

Enthalpy Wheel Energy Recovery Units (Pre-Notification Required) (AE103)

This incentive is available for integrating an enthalpy-based energy recovery (i.e., enthalpy wheels) to recover the waste energy out of exhaust air streams and to temper incoming makeup outside air streams before these air streams are mechanically conditioned.

Requirements:

- The area served must be conditioned.
- Enthalpy heat recovery as required by local or state code does not qualify for this incentive.
- The enthalpy heat recovery systems shall have a minimum of 70% total outside air wheel effectiveness, or the highest volume flow rate through the enthalpy wheel at a total effectiveness above 70%.
- The system should be equipped with an air stream bypass to operate in economizer mode, when applicable.
- To qualify for this incentive, the system's flow rate must operate between 250 CFM and 50,000 CFM.
- The rated volume flow rate is the supply volume flow rate being introduced into the space, as defined in AHRI Standard 1060-2005.
- Energy recovery is required by code when the design supply air capacity is $\geq 5,000$ CFM and the outside air supply is $\geq 70\%$ of the design supply air quantity.
- Unless an exception to the code is satisfied (consult ASHRAE 90.1-2013), incentives will not be awarded for new construction projects when required by codes.
- Qualifies for new construction and retrofit applications.

Fixed-Plate Air-to-Air Energy Recovery Unit (Pre-Notification Required) (AE104)

This incentive is available for integrating an air-to-air, fixed-plate, energy recovery system (sensible heat only) to recover the waste energy out of exhaust air streams to temper incoming makeup outside air streams before these air streams are mechanically heated.

Requirements:

- The area served must be a heated space.
- The fixed-plate recovery system shall be a minimum of 55% sensible effectiveness (temperature transfer efficiency).
- The system should be equipped with an air stream bypass to operate in economizer mode, when applicable.
- The minimum volume flow rate to qualify for this incentive is 250 CFM, while the maximum volume flow rate is 50,000 CFM.
- The rated volume flow rate is the supply volume flow rate being introduced into the space, as defined in AHRI Standard 1060-2005.
- Energy Recovery is required by code when the design supply air capacity is $\geq 5,000$ CFM and the outside air supply is $\geq 70\%$ of the design supply air quantity. Unless an exception to the code is satisfied (consult ASHRAE 90.1-2013), incentives will not be awarded for new construction projects when required by code.
- Only Consumers Energy natural gas customers and natural gas heat applications qualify.

Dust Collector Exhaust Air Recovery (Pre-Notification Required) (AE105)

Requirements:

- This incentive is available for the installation of an advanced filtration system where air coming from dust collectors or other particulate-heavy processes that would normally be exhausted directly outside can be filtered to be recirculated within the facility.
- Incentivized area must utilize 100% outside air at all times prior to installation of the filtration system.
- Mist collectors/eliminators and welding fume hoods also qualify for this measure.
- If controlled by a VFD, the exhaust air flow rate must be monitored for a minimum of seven continuous days during normal operation. The savings will be based on the metered exhaust air flow rate.
- The reduced volume flow rate must exceed 1,000 CFM and serve a heated space that utilizes natural gas to produce heat.
- The incentive is based on the measured exhaust volume flow rate in CFM of the dust collector or other device. The measured exhaust flow rate is not to exceed the rated volume flow rate of the equipment.

- The use of recirculated air from the dust collector of other device must result in a corresponding decrease in the amount of fresh air being brought into the facility.
- Reductions in general exhaust (such as roof-mounted non-ducted exhaust fans) do not qualify, but may qualify for a different measure.
- It is a customer's responsibility to ensure that the air reintroduced to the heated space meets air quality standards for the intended purpose. Additionally, changes to the building's airflow must comply with the local and/or state authority having jurisdiction.
- Projects that are required to be installed by local code as well as mist collectors/eliminators do not qualify for a new construction incentive.

Boiler Efficiency Improvements

Boiler Stack Economizer (Pre-Notification Required) (AE106, AE107)

This incentive is available for natural gas customers for adding a stack economizer to the exhaust flue stack of boilers to recover waste heat, which will be used to preheat the boiler's feed water system.

Requirements:

- Both traditional and condensing stack economizers qualify.
- Must operate at least 2,000 hrs./yr.
- Redundant boilers do not qualify for this incentive.
- Both space heating and process boiler systems qualify.
- The amount of the incentive will be based on the boiler's primary application (space heating or process), the boiler's nominal input rating and by the achieved exhaust flue temperature decrease at full fire, with the percent of excess air held constant.
- After the stack economizer has been installed the boiler stack temperature must be recorded and provided.
- Pre-construction and post-construction copies of the boiler combustion analysis must be provided to confirm the achieved exhaust flue temperature decrease.
- Qualifies for new construction and retrofit applications.

Steam Boiler Make Up Water Pre-Heat or Condensate Recovery (Pre-Notification Required) (AE108)

Requirements:

- This measure requires the installation of equipment (i.e., heat exchanger) to transfer waste heat into the natural gas steam boiler's make up water.
- Historical records covering one year of make up water use is required.
- Also required is one week of post data monitoring of the inlet water temperature and the outlet water temperature after implementation of the measure.
- The waste heat source must be discarded heat that would otherwise remain unused and not a fired or powered heater.
- Cannot be combined with boiler stack economizer.
- The amount of energy recovery is provided by the following formula.

$$Q_{\text{recovered}} = C_1 \times V_{\text{recovered}} \times (T_{\text{outlet}} - T_{\text{inlet}}) / (n_{\text{boiler}})$$

Where:

$Q_{\text{recovered}}$ = amount of energy recovered by the pre-heater in units of 1,000,000 Btu/yr, or MMBtu/yr.

C_1 = conversion constant, 8.34 lb./gal.

$V_{\text{recovered}}$ = annual make up water volume flow rate recovered, gal./yr.

T_{outlet} = outlet makeup water temperature, °F

T_{inlet} = inlet makeup water temperature, °F

n_{boiler} = boiler system efficiency, 80%

- This measure also applies to domestic or process water heating. One week of post flow measurement data (GPM) is required to verify savings.
- Qualifies for new construction and retrofit applications.

Automatic Boiler Blow-Down Reduction (Pre-Notification Required) (AE109)

Requirements:

- This measure requires the installation of equipment that results in lower blow-down without raising the impurity levels in the natural gas steam boiler to levels that will cause scaling.
- Simple changes in flow rate without capital expenditure (i.e., system modifications, changes in chemical treatment and blow-down reductions resulting from improved condensate recovery) do not qualify.
- Make up water must be metered and one year's worth of water use data must be provided.
- One year's average of water tests measuring parameters used to obtain the cycles of conductivity prior to the upgrade is required.
- Water test data after the upgrade is required to verify performance.

- Cycles of concentration is the ratio of blow-down conductivity to make up water conductivity and must be provided by the site water treatment service to show performance before and after the upgrade. For more information, see appendix.
- Qualifies for new construction and retrofit applications.

Refrigeration Waste Heat Recovery

Refrigeration Waste Heat Recovery (Pre-Notification Required) (AE110, AE111)

Requirements:

- This incentive is available for customers who are installing new waste heat recovery equipment on their commercial refrigeration equipment (i.e., case coolers, freezers, open dairy/meat cases, walk-in coolers, etc.).
- The recaptured waste heat must be sent to the domestic water heater or HVAC system. In either case, there must be sufficient need for this waste heat and it must result in a decrease in natural gas or electric use.
- To qualify for this incentive, at least 30% of the refrigeration systems waste heat must be utilized for space heating (HVAC) or domestic water heating (DWH) and the waste heat recovery heat exchanger must be designed to accommodate at least 70% of the recoverable refrigeration load.
- This incentive is available for retrofitting existing refrigeration systems.
- The condenser used to reject refrigeration system heat must be located where the heat is not used for building heat (typically outside) or other purposes i.e., > 95% wasted.
- The new system shall include a new heat exchanger installed in the HVAC duct or the cold water supply to the domestic hot water system to reclaim the heat from the refrigeration system condenser.
- The installation of pre-heat tanks on domestic water systems is expected.
- Qualifies for new construction and retrofit applications.

Air Side Economizer

Computer Room Air Conditioning Glycol Economizer (Pre-Notification Required) (AE201)

Requirements:

- An incentive is available for installing a glycol free-cooling economizer or pumped refrigerant economizer on mechanically DX cooled data centers.
- Incentive is available for installing economizer mode on new DX Computer Room Air Conditioning (CRAC) units or retrofitting existing DX CRAC units qualify.
- DX CRAC units with existing economizers or non-functioning glycol-free cooling economizers do not qualify.
- Qualifies for new construction and retrofit applications.

Air-Side Economizer For CRAC or Telecom Applications (AE202)

Requirements:

- An incentive is available for installing an air-side free cooling economizer on mechanically DX cooled data centers.
- Installing new DX CRAC units with economizers or retrofitting existing DX CRAC units qualify.
- DX CRAC units with existing economizers or non-functioning economizers do not qualify.
- Air-side economizer incentives are not available in applications where high humidity control is required.
- Qualifies for new construction and retrofit applications.

Air-Side, Air-to-Air Heat Exchanger Economizer for CRAC or Telecom Applications (Pre-Notification Required) (AE203)

Requirements:

- Available for installing an air-side, air-to-air heat exchanger economizer to draw in cooler outside air to condition data centers during milder outside conditions.
- Air-side, air-to-air heat exchangers do not have the potential humidification penalties associated with directly using outside air to cool a space.
- The proposed heat exchanger sensible effectiveness must be at least 55%.
- Qualifies for new construction and retrofit applications.

Water-Side Economizer

Water-Side Economizer (Pre-Notification Required) (AE204, AE205)

Requirements:

- To qualify for this incentive, the facility must have a need for chilled water throughout the year and be running their existing water-cooled or air-cooled chiller equipment during the winter period.
- After construction has been completed, mechanical cooling (i.e., chiller's compressor) must not operate below an outside air temperature of 45 degrees.
- The incentive will be based on the size of the chiller operating during the winter.
- This measure qualifies for new construction when used for process applications. New construction, HVAC applications do not qualify.

Condenser Heat Recovery (DX Compressor Waste Heat Recovery) (Pre-Notification Required) (AE206 - AE209)

Requirements:

- This incentive is available to customers who are installing air-cooled or water-cooled condenser heat recovery technology on their HVAC or process equipment (i.e., RTU, MAU, or chillers).
- The heat recovery system may either be packaged within the new HVAC unit (i.e., heat recovery condenser) or may be retrofitted to existing HVAC equipment through the use of heat exchangers, reconfiguring piping, addition of pumps, installing storage tanks and controls upgrades.
- The facility must have an adequate need for the recaptured waste heat (i.e., restaurant, health clubs, natatoriums pool dehumidification, hospitals, hotels, industrial process, or an office building greater than 100,000 ft²).
- A load match study must be performed showing there is sufficient need for the waste heat to receive the full incentive.
- Incentives are only available for heat recovery capacity that will be fully utilized. Excess or oversized systems will not receive extra incentives.
- For domestic water heating applications, pre-heat storage tanks are recommended to be located before the existing domestic water heater to better utilize the condenser's waste heat, especially when there is low demand for hot water.
- Implementation must result in a decrease in either natural gas or electric use.
- New construction applications with chiller plants that operate under 400 ton qualify.

- Additional benefits may include increased capacity in the cooling equipment.
- Incentive will be based on the lower of either: 1) the maximum recoverable tonnage from the cooling equipment; or 2) the maximum recoverable hot water load from the load match study.
- This incentive may be combined with high efficient air conditioning measures.

Operating Room Air Exchange Rate Setback (Pre-Notification Required) (AE210, AE211)

Requirements:

- An Incentive is available for reducing the amount of air changes per hour occurring within a hospital operating room during its unoccupied times. This typically occurs via the installation of new or upgraded controls, variable speed drives and airflow monitoring.
- Operating room must have its amount of air changes per hour reduced by at least 11 during unoccupied times at the time of project completion.
- If existing BAS is not capable of logging airflow into the operating room, operational performance verification (complete pre-construction and post-construction volume flow rate testing) by certified Testing, Adjusting and Balance (TAB) Agents are required to qualify for this incentive. TAB Agent is to be certified by either AABC (Associated Air Balance Council) or NEEB (National Environmental Balancing Bureau).
- Operating room must be unoccupied on average at least 15 hours daily. The pre-existing ventilation rate must be constant whether the space is occupied or unoccupied.
- Air handler serving the operating room must be single-zone and serve only one operating room.
- Separate incentives are available for operating rooms utilizing 100% outside air or at least 20% outside air. These two incentives cannot be combined on the same application.
- Space heating for operating room must be provided via natural gas.
- Incentive is calculated based upon the square footage of the operating room.
- Cannot be combined with an HVAC or Process Fan VFD measure.
- New construction applications do not qualify.

Laboratory



For commercial or industrial laboratory applications (minimum 2,200 hours per year), the following measures have been developed. The updated system must meet all state and local codes and/or the authority having jurisdiction, as well as the requirements of your environmental, health and safety department.

None of the following measures may be combined:

Reduced/optimized air change per hour (ACH) rate, laboratory fume-hood ventilation reduction, occupancy sensor with VAV hood, or low-flow hood with VAV hood.

Auto-Sash Closer (Pre-Notification Required) (LB101)

Requirements:

- The measure is available for systems with 100% outside air, VAV systems and for labs with a high fume hood density where the hood air flow drives the airflow rate for the laboratory.
- It is recommended that the auto-sash closure system have features such as: a sensor to stop sash closure before it hits any protrusion, the option to open based on either occupancy activation of buttons (user option), or user selectable time delay prior to sash closing.
- Other typical features include: sash positioning system with touch over-ride (up or down), failure alerts in any desired position and monitoring options.
- Incentive is based on horizontal linear foot of sash opening.
- Qualifies for new construction and retrofit applications.

Reduced/Optimized Air Change Per Hour (ACH) Rate (Pre-Notification Required) (LB102)

A standard/baseline design practice in many laboratory and vivarium spaces is for there to be 10 to 12.5 air changes per hour. In the absence of code guidance, standard practice is to use rules of thumb and legacy designs to set the air change rate.

- If the fume-hoods are operating safely, a lower ACH rate may be able to be maintained to control spill events. More current lab standards are recommending 4 to 6 ACH, which when implemented, may save large amounts of heating, cooling and ventilation energy when compared to higher air changeover rates.
- For reference, air exchanges per hour, $ACH = \text{Room Volume in ft}^3 / (\text{CFM} \times 60)$.
- Decreases in ventilation rates must be stamped by a Professional Engineer licensed in the State of Michigan.
- Operational performance verification (complete pre and post volume flow rate testing), by certified Testing, Adjusting and Balance (TAB) agents are required to qualify for this measure. TAB agents shall be an independent testing, adjusting and balancing professional services provider certified by either AABC (Associated Air Balance Council) or NEBB (National Environmental Balancing Bureau).
- Pre-applications are required and must include a one-page narration of the project's scope of work.

Sash Stops (Pre-Notification Required) (LB103)

Sash stops prevent the sash from opening all the way. Usually the stops are placed at 18" thus blocking the top two fifths of the opening. In most cases the stops are designed for easy override to lift the sash out of the way during setup. The measure is available for systems with 100% outside air, VAV systems, and for labs with a high fume-hood density where the hood air flow drives the airflow rate for the laboratory. Incentive is based on horizontal linear foot of sash opening.

Lab Fume-Hood Ventilation Reduction (Sash Location) (Pre-Notification Required) (LB104)

Requirements:

- Available for customers who install state-of-the-art energy efficient chemical fume-hood controls on the hood and in the supply and exhaust air stream to provide a constant “face velocity” while varying the air volumes.
- The proposed control scheme must maintain a minimum 100 feet per minute (FPM) face velocity at the sash opening.
- Controls should include an audible and visual alarm if either: The sash is open greater than 25% and no occupancy at the hood has been detected for 15 minutes, or the sash is open at any position, at least 100 FPM is not being maintained at the sash opening.
- Laboratories must have at least three fume-hoods that operate a minimum of 2,600 hours per year to qualify for this incentive.
- This incentive is available as a retrofit to an existing fume-hood or as an upgrade package purchased with a new hood.
- Existing fume-hoods cannot have any existing variable air volume controls.
- The reduced volume flow rate levels must comply with the State and Local codes and/or the authority having jurisdiction.
- This incentive may be combined with the incentive for VFD/VSD on HVAC Fans or HVAC pumps.
- Proposed fume-hoods must be converted from constant volume exhaust to variable volume exhaust flow rate controlled by sash positioning.
- Incentive is based on the average annual reduced CFM, prior to VFD installation (if applicable).

Occupancy Sensor with VAV Hood (Pre-Notification Required) (LB105)

A hood that is unoccupied does not need the same airflow as one with a person at or near its face. Control companies offer an occupancy sensor based two-position control that reduces the face velocity from 100 FPM to around 60 FPM unoccupied.

These systems are sometimes marketed as a substitute for VAV but they could be combined with VAV and other technologies. The benefit is assured savings even when the hood is left open.

Requirements:

- The new equipment must reduce the face velocity of a hood during unoccupied times from at least 100 feet per minute (FPM) to at most 75 FPM and reduce the space's supply makeup air, accordingly. Common practice is to reduce the face velocity from 100 FPM, which is a typical value required during occupied times to 60 FPM when the hood is unoccupied.

- The measure is available for systems with 100% outside air and for labs with a high fume-hood density where the hood air flow drives the airflow rate for the laboratory.
- Incentive is based on horizontal linear foot of sash opening.
- Qualifies for new construction and retrofit applications.

Low-Flow Hood with VAV Hood (Pre-Notification Required) (LB106)

Requirements:

- Low-flow hoods may be installed on constant volume (common) or variable air volume exhaust systems.
- Low-flow hoods operate with a face velocity at a max of 60 FPM.
- Proper adjustments must be made to the supply air system to maintain proper laboratory air balance as a result of the reduction in exhaust CFM.
- It is critical for the system owner to eliminate the effects of the heat effect, which occurs when the heat generation inside a hood exceeds what the volumetric rate of air (CFM) can adequately dilute. The heat effect can ultimately result in the reversal of airflow through the upper by-pass opening on the hood, pushing contaminated air into the laboratory.
- The measure is available for systems with 100% outside air and for labs with a high fume-hood density where the hood air flow drives the airflow rate for the laboratory.
- Incentive is based on horizontal linear foot of sash opening.
- Qualifies for new construction and retrofit applications.

Tune-Up/Maintenance



Equipment must be installed and fully operational for at least 12 months prior to receiving a tune-up incentive.

Boiler Tune-up

Space Heating Boiler Tune-Up (TU101)

Requirements:

- Only available for natural gas space-heating boilers.
- The minimum burner size for incentive eligibility is 110 MBH.
- Available once in a 24 month period per boiler.
- The service provider must perform before and after combustion efficiency tests for High Fire, provide original “after” combustion analysis tape and provide a copy of the contractor’s boiler tune-up checklist (example provided in Appendix).
- Burner must be adjusted to show an improvement in combustion efficiency.
- The incentives are only available for equipment used in space heating conditions. Equipment used primarily for domestic hot water, pool/spa use or process load are not eligible for this incentive.
- Redundant or back up boilers do not qualify.

Process Boiler Tune-Up (TU102)

Requirements:

- Only available for natural gas process boilers.
- The minimum burner size for incentive eligibility is 300 MBH.
- Available once in a 24 month period per boiler.
- The service provider must perform before and after combustion efficiency tests for High Fire, provide original “after” combustion analysis tape and provide a copy of the contractor’s boiler tune-up checklist (example provided in appendix).
- Burner must be adjusted to show an improvement in combustion efficiency.
- Boilers used primarily for domestic hot water, pools, spas, or space heating are not eligible for this measure.
- Redundant or back up boilers do not qualify.

Process Burner Tune-Up (TU103)

Requirements:

- The incentive is only available for natural gas process burners.
- Direct contact water heaters are not eligible.
- The manufacturer name and equipment model number must be provided.
- Available once in a 24 month period per burner.
- The service provider must perform before and after combustion efficiency tests for High Fire, provide original “after” combustion analysis tape and record the results on the boiler tune-up incentive application and checklist.
- Burner must be adjusted to show an improvement in combustion efficiency.
- Redundant or backup burners do not qualify.

Pool and Spa Boiler Tune-Up (TU104)

Requirements:

- Only available for natural gas pool or spa boilers.
- Available once in a 24-month period per boiler.
- The service provider must perform before and after combustion efficiency tests for High Fire, provide original “after” combustion analysis tape and provide a copy of the contractor’s boiler tune-up checklist (example provided in Appendix).
- Burner must be adjusted to show an improvement in combustion efficiency.
- The incentives are only available for equipment used in pool or spa heating. Equipment used primarily for space heating, domestic hot water, or process loads does not qualify.
- Redundant or back up boilers do not qualify.

Domestic Water Heater Tune-Up (TU105)

Requirements:

- Available once in a 24 month period per boiler.
- Only available for natural gas boilers used for domestic water heating.
- The minimum burner size for eligibility is 199 MBH. Available once every other cooling period per boiler.
- The service provider must perform before and after combustion efficiency tests for High Fire and provide original "after" combustion analysis tape and provide a copy of the contractors boiler tune-up checklist (example provided in appendix).
- Burner must be adjusted to show an improvement in combustion efficiency.
- Equipment used for pool/spa use, space heating, or process load does not qualify.
- Redundant or back up boilers do not qualify.

Furnace Tune-Up

Forced Air Natural Gas Furnace or Rooftop Unit (RTU) Tune-Up (TU106)

Requirements:

- This incentive is for tuning up furnaces, unit heaters and RTUs.
- Unit must have a minimum input of 40 MBH.
- A single unit with multiple burners or modules is considered one unit. A rooftop unit is considered one unit.
- A burner that is dual-fuel is considered one unit.
- Available once in a 24 month period per furnace/RTU/ unit heater.
- Direct-fired heating units do not qualify for this incentive.
- The service provider must perform before and after combustion efficiency tests for High Fire and record the results on the RTU/ furnace tune-up incentive application and checklist (example provided in appendix).
- Provide original "after" combustion analysis tape.
- Burner must be adjusted to show an improvement in combustion efficiency.
- Redundant or back-up furnaces do not qualify.

Chiller Tune-Up

Chiller Tune-Up (TU201)

This incentive is available to any air-cooled or water-cooled chiller, greater than 20 tons, used for either space or process cooling. The incentive is available once every other cooling period. Each individual chiller is considered one unit. Redundant or back-up chiller do not qualify.

Requirements:

Cooling service tune-up must include the following maintenance items:

- Only available for air-cooled or water cooled chillers used for space or process cooling.
- The minimum capacity for incentive eligibility is 20 tons.
- Available once every other cooling period.
- Each individual chiller is considered one unit.
- Redundant or back-up chillers do not qualify.
- Inspect and correct oil level and pressure at full load operation.
- Clean the air-cooled condenser coil.
- Check and adjust the system pressure.
- Inspect and/or replace filter.
- Inspect and/or replace belt.
- Check and repair the electrical contactors.
- Check and repair evaporator condition.
- Validate compressor amp draw.
- Validate supply motor amp draw.
- Validate condenser fan(s) amp draw.
- Check liquid line temperature.
- Check suction pressure and temperature.
- Check refrigerant temperature and pressure.
- Validate low-pressure controls.
- Validate high pressure controls.
- Validate crankcase heater operation.
- Clean water cooled chiller condenser tubes.
- Clean water cooled chiller evaporator tubes (if performance warrants).
- Check and repair economizer operation.
- Validate sub-cooling and superheat.
- Validate suction temperature and pressure.
- Lubricate all motors.

Steam Trap Monitoring

For the repair or replacement of existing steam traps, refer to the Steam Trap Express Program at [ConsumersEnergy.com/SteamTrapExpress](https://www.consumersenergy.com/SteamTrapExpress).

Steam Trap Monitoring System, Space Heat and Process (TU202, TU203)

Requirements:

- Available for installing a steam trap monitoring system.
- Facility cannot have a pre-existing automatic steam trap monitoring systems.
- Monitoring system must be installed on a properly functioning steam traps serving either space heating or process heating loads.
- Provide supporting documentation and must provide characteristics for the steam system, including: number of steam traps, boiler efficiency, steam trap orifice size(s), operating pressure and other data.
- Monitoring systems must provide real time data to identify leaking and failed steam traps.
- Incentive is per trap.
- Qualifies for new construction and retrofit applications.

New or Repaired Outdoor Air Damper Assembly (Pre-Notification Required) (TU204)

Requirements:

- Available for replacing existing, poorly operating, motorized, outside air dampers with new, motorized, ultra-low leakage, outside air damper.
- Ultra-low leakage, outside air dampers are defined as a maximum leakage rate of 3 CFM per ft² at 1-inch water gauge.
- To qualify for this incentive, the outside air leakage rate through the existing damper must exceed 15% nominal volume flow rate of the air handling unit (AHU) or rooftop unit (RTU).
- This measure is applicable to single zone HVAC systems where heating and cooling energy is supplied at the air handler. Central HVAC systems serving multiple zones where heating is supplied at the zone level are not eligible.
- Both whole damper assembly or simply changing damper seals qualify.
- All existing (pre) leakage rates must be validated by a certified Testing, Adjusting and Balance (TAB) Agents. Only changing the damper seals will require both pre (greater than 15%) and post (less than 5%) validation by a TAB Agent.

- The TAB Agent is to be certified by either AABC (Associated Air Balance Council) or NEBB (National Environmental Balancing Bureau).
- Minimum non-occupied periods of the facility must exceed 2,200 hours per year. Facilities continuously occupied (24/7) do not qualify.
- New construction applications do not qualify.
- Incentive will be based on the nominal supply volume flow rate (CFM) of the AHU or RTU.

Steam Trap Repair or Replacement (TU205, TU206)

Requirements:

- The repair incentive is available only for repair or replacement of traps that have malfunctioned and are leaking steam (failed open).
- It is not available for traps that have failed closed or are plugged.
- The incentive is available once in a 24 month period.
- Replacement with an orifice trap is not eligible for incentive.
- Steam trap survey and repair work must be recorded and attached to the application by the vendor.
- A spreadsheet with survey/repair/replacement results must be provided.
- New construction applications do not qualify.

Refrigeration, Laundry & Kitchen



Discus or Scroll Refrigeration Compressors (Pre-Notification Required) (RL101, RL102)

Requirements:

- Available for installing either high-efficiency, semi-hermetic discus or scroll compressor replacing standard hermetic or semi-hermetic reciprocating refrigeration compressor.
- Both low temperature freezers and medium temperature coolers qualify.
- Low temperature freezers would be kept at a temperature at or below 32 degrees.
- Medium temperature coolers would be kept at a temperature range between 33 degrees to 50 degrees.
- This measure is intended for use for facilities with walk-in coolers or freezers. Industrial or other large-scale refrigeration systems are not eligible for this measure.
- Incentive is based on the total tonnage of the freezer or cooler cooling system.
- Both retrofit or new construction applications qualify.
- Replacement of existing high efficient compressors does not qualify.

Table 11.1: Eligible Efficiencies

Low Temperature		
Operating Conditions: Condensing Temp.: 90 degrees, Evaporator Temp.: -25degrees		
Capacity (Bth/h)	Single Phase Min. (EER)	Three Phase Min. (EER)
4,200 - 8,399	5.05	5.37
8,400 - 12,599	5.21	5.52
12,600 - 16,799	5.48	5.70
16,800 - 20,999	5.75	5.84
21,000 - 25,199		6.06
25,200 - 29,399		6.15
29,400 - 33,599		6.39
33,600 - 37,800		6.06

Table 11.2: Eligible Efficiencies

Medium Temperature		
Operating Conditions: Condensing Temp.: 90 degrees, Evaporator Temp.: 20 degrees		
Capacity (Bth/h)	Single Phase Min. (EER)	Three Phase Min. (EER)
7,500 - 14,999	10.65	11.07
15,000 - 22,499	11.79	11.88
22,500 - 29,999	11.72	12.58
30,000 - 37,499	11.93	12.85
37,500 - 44,999	12.49	12.91
45,000 - 52,499	11.79	13.25
52,500 - 59,999	13.06	13.19
60,000 - 67,499		13.13
67,500 - 75,000		12.37

Floating Head Pressure Control (Pre-Notification Required) (RL103a,b)

Available for installing automatic controls to lower the condensing pressure at lower ambient temperature in grocery store and industrial process cooling and refrigerated warehouse systems.

Requirements:

- Controls installed must vary head pressure to adjust condensing temperature in relation to the outdoor air temperature.
- The proposed control scheme must have a minimum Saturated Condensing Temperature (SCT) programmed for the floating head pressure control of less than, or equal to 70 degrees Fahrenheit and include balanced-port expansion valves to replace existing constant pressure or manually controlled systems. Please note that the expansion valve is a device used to meter the flow of liquid refrigerant entering the evaporator at a rate that matches the amount of refrigerant being boiled off in the evaporator.
- Ice rinks would be considered industrial process cooling.
- Qualifies for new construction and retrofit applications.

Refrigeration Air-Side Economizer (Pre-Notification Required) (RL104)

Requirements:

- Available for installing air-side economizers with controls for medium temperature (range between 33 degrees to 50 degrees Fahrenheit) walk-in coolers that are at least 1,000 ft³ in size.
- Use of the air-side economizer must reduce the use of the refrigeration system compressor.
- Outside air and exhaust dampers must close automatically when the outside air temp exceeds 35 degrees Fahrenheit.
- Installation of new economizer equipment must not void the warranty or UL listing for any of the facility's pre-existing refrigeration equipment.
- Freezer applications do not qualify.
- Incentive is based on the number of evaporator fans serving the walk-in cooler.
- Qualifies for new construction and retrofit applications.

Refrigeration Light Reduction (Pre-Notification Required) (RL105 - RL107)

Requirements:

- The lighting energy use must be permanently reduced as a result of a lighting retrofit project increasing system efficiency in a space primarily used as a refrigeration area.
- The refrigerated area must be conditioned to between 40 degrees Fahrenheit to -20 degrees Fahrenheit at all times and must contain items perishable at standard outdoor temperature and conditions.
- This incentive is available for retrofitting existing lighting systems to newer lighting systems with decreased electrical use.
- Incentive works with a qualifying lighting project.
- Cannot be combined with LED Lighting for Refrigeration Cases.
- Qualifies for new construction and retrofit applications.

Refrigeration Controls

Anti-Sweat Heater Controls (Pre-Notification Required) (RL108)

Requirements:

- 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.
- Incentive is based on the total number of doors on the case controlled.
- Doors must have never previously had anti-sweat heater controls.

Cooler or Freezer Defrost Control (Pre-Notification Required) (RL109)

Requirements:

- An incentive is available for the installation of intelligent electronic defrost controls replacing a functioning time clock defrost control system for cooler or freezer application.
- The new controls must have the ability to sense whether a defrost cycle is required or should be skipped based on evaporator coil temperature and pressure, which indicate the amount of frost building-up.
- This incentive is available for installations on commercial walk-in coolers and freezers.
- Incentive is based on the tonnage of the refrigeration/freezer system receiving controls.

Evaporator Fan Motor Controls (Pre-Notification Required) (RL110a-c)

This incentive consists of the installation of speed controls on the evaporator fans in walk-in coolers (medium-temperature) and freezers (low-temperature).

Requirements:

- The controller reduces airflow of the evaporator fans when there is no refrigerant flow.
- Must control a minimum of 1/20 HP where fans operate continuously at full speed.
- Must reduce fan motor power by at least 75% during off cycle.
- Not applicable if one of the following conditions applies.
 - » Compressor runs all the time with high-duty cycle.
 - » Evaporator fan does not run at full speed all the time.
 - » Evaporator fan motor runs on poly-phase power.
 - » Evaporator fan does not use off-cycle or time-off defrost.
- RL110a qualifies for new construction and retrofit applications.

Evaporator Fan Controls with Demand Defrost (Pre-Notification Required) (RL111-RL112)

Requirements:

- Evaporator controls with demand defrost for low and medium temperature refrigerated walk-in boxes must utilize sophisticated algorithms and controls to optimize the runtimes and operation of the equipment.
- The following functions must be included:
 - » Adaptive learning via a micro-processor or web-based controller.
 - » The evaporator fans must be controlled by the system. Manual control (fans being always on) is not permitted.
 - » Initiation of defrost cycle is based on coil temperature/demand and termination is based on temperature.
 - » The controller has the option to define the differential temperature between the space temperature setpoint and the temperature that enables the refrigeration cycle.
- Qualifies for new construction and retrofit applications.

Walk-In and Case Cooler Electronically Commutated Motors (ECM) (Pre-Notification Required) (RL113 - RL114)

Requirements:

- Applies to replacement of an existing standard efficiency shaded-pole or permanent split capacitor evaporator motor.
- The replacement must be an EC motor.
- ECM's installed in new walk-in or case coolers do not qualify.

Walk-In Cooler Evaporator Motor Reduction (Pre-Notification Required) (RL115)

Available for replacing of existing evaporator fan/motor assemblies for walk-in coolers (medium-temperature) and freezer (low-temperature)

Requirements:

- Must include evaporator or fan housing upgrades with similar cooling capacity in conjunction with the motor reduction.
- Blanking off existing fan ports or reducing the motor HP of existing fans does not qualify.
- Existing evaporator fan motor must be greater than 1/20 HP and less than 1/5 HP.
- The new evaporator fan/motor assemblies cannot increase the individual assembly's motor size.
- Not applicable if the existing evaporator fan motor does not run at full speed all the time.

- Incentive is based on the number of evaporator fan motors removed.

LED Lighting for Refrigeration Cases (Pre-Notification Required) (RL116)

Incentives are for replacing fluorescent refrigerated case lighting with LED source illumination. Fluorescent lamps, ballasts and associated hardware are typically replaced with pre-fabricated LED light bars and LED driver units.

Requirements:

- New light fixtures must be replacing either T12 or T8 lighting fixtures, or be installed in a new refrigeration device where a T8 fixture could have been installed instead.
- Product must be approved by DesignLights Consortium for use as refrigeration light. Qualification under non-refrigeration categories by DesignLights.
- Consortium does not qualify that product for this measure.
- Incentive is based on the lamp's length in nominal feet.
- Qualifies for new construction and retrofit applications.

Occupancy Sensors for LED Refrigeration Case Lighting (RL117)

Requirements:

- Occupancy sensors must cover at least two doors per sensor.
- LED refrigerated lighting must be at least 35 lumens per watt and at least 72 CRI to be eligible for the sensor incentive.
- Product must have a minimum warranty of three years.
- Qualifies for new construction and retrofit applications.

Walk-in and Case Cooler Permanent Magnet Synchronous Motor (PMSM) (Pre-Notification Required) (RL201 - RL206)

Requirements:

- Applies to replacement of existing standard efficiency shaded-pole or permanent split capacitor evaporator motor.
- The replacement must be a permanent magnet synchronous motor (PMSM).
- PMSMs installed in new walk-in or case coolers do not qualify.

Refrigeration Case Doors

No Heat Reach-In Refrigerated Case Doors (Pre-Notification Required) (RL207a, b)

Requirements:

- This measure is for the replacement of existing case doors with operable anti-sweat heaters with a special glass door that requires no anti-sweat heat.
- Existing case door anti-sweat heaters or heaters located on the case frame must be permanently disabled/removed.
- Incentive is based on a per door unit.
- Both low temperature freezers and medium temperature coolers qualify.
- Low temperature freezers would be kept at a temperature at or below 32 degrees Fahrenheit.
- Medium temperature coolers would be kept at a temperature range between 33 degrees to 50 degrees Fahrenheit.
- New glass door must be made of two or three panes of glass that include a low conductivity filler, special coating and must include door seals.
- New doors must keep the outer glass warm and prevent condensation within the frame assembly.
- Cannot be used in conjunction with anti-sweat heater controls incentive at any point.
- Retrofit of existing doored reach-in cases or installation of new cases with no-heat doors are eligible.
- Qualifies for new construction and retrofit applications.

Reach-in Refrigerated Case Doors Medium Temperature (Pre-Notification Required) (RL208a-c)

This measure is for installing new vertical glass doors on existing open, vertical (or multi-deck), medium temperature (MT), display cases or for replacing existing, open, vertical (or multi-deck), display cases with new reach-in glass door display cases.

Requirements:

- The air temperature inside the cases ranges from 33 degrees to 50 degrees Fahrenheit.
- The new case length must be equal to, or shorter than, the original case.
- The incentive is based on the new case's horizontal linear length.

Reach-in Refrigerated Case Doors, Low Temperature (Pre-Notification Required) (RL209a-c)

This measure is for installing new vertical glass doors on existing open, vertical (or multi-deck), low temperature (LT), display cases or for replacing existing, open, vertical (or multi-deck), display cases with new reach-in glass door display cases.

Requirements:

- The air temperature inside the cases ranges from 0 degrees to 32 degrees Fahrenheit.
- The case length must be equal to, or shorter than, the original case.
- The incentive is based on the case's horizontal linear length.

Refrigeration Insulation

Night Covers (Pre-Notification Required) (RL210)

Incentives are available for night covers installed on open refrigerated display cases in supermarkets and grocery stores. The purpose of night covers is to reduce the amount of cold lost from the open refrigerated display cases during facility non-operating hours.

Requirement:

- The store must have a minimum of six non-operating hours per day to qualify for this incentive.
- To decrease moisture build-up, it is recommended that the night covers are perforated.
- Applicant should consider using proper compressor capacity modulation and ensure the case manufacturer has no objections to use of a night cover.
- Replacement of existing night covers does not qualify.
- Qualifies for new construction and retrofit applications.

Strip Curtains

(Pre-Notification Required) (RL211, RL212)

Requirements:

- New strip curtains or plastic swinging doors must be installed on doorways of refrigerated spaces such as walk-in coolers, freezers or refrigerated warehouses.
- A cooler is defined as having an inside operating temperature of approximately 40 degrees Fahrenheit and the operating temperature of a freezer being approximately 0 degrees Fahrenheit.
- Incentive is based on the square footage of the doorway that the strip curtains are being installed in.
- Opening between the strip curtain and bottom of doorway must be no larger than 1 inch.
- Strips must have an overlay greater than 1 inch.
- It is recommended that low temp strip curtains be used on low temperature applications.
- This incentive is not available for replacement of existing strip curtains that have remaining useful life (not missing any strips) or purchased within the last four years.

Door Gasket Seals (Pre-Notification Required) (RL213)

Requirements:

- Incentive is available for replacing existing worn gaskets on doorways to walk-in coolers and freezers.

Automatic High-Speed Doors (Pre-Notification Required) (RL214a-c)

Hydraulic or motorized automated doors provide a way to reduce infiltration from controlled rooms by reducing the time that rooms are exposed to each other and also provides better insulation between the divided areas.

Requirements:

- Replacement of existing high speed doors does not qualify.
- Qualifies for new construction and retrofit applications.
- The incentive is available for Consumers Energy electric customers.
- Incentive is based on the square footage of the high speed door.

Integrated Variable Speed Motor (ECM) for Exterior Condenser Fans (RL215)

Requirements:

- See page 22 (VF302).
- Qualifies for new construction and retrofit applications.

Laundry

Laundry Ozone-Generation System (Pre-Notification Required) (RL301)

Incentives will be paid for a newly purchased product that is added on to a new or existing commercial washing machine(s).

Requirements:

- The system must utilize a natural gas water heater or natural gas-fired boiler that supplies hot water to an on premise laundry system.
- The ozone laundry system must transfer ozone into the water through Venturi Injection or Bubble Diffusion.
- Qualifies for new construction and retrofit applications.
- Ozone Generation System must result in a reduction in hot water use by at least 80%.

Clothes Washers ENERGY STAR, Electric and Natural Gas Water Heater (RL302, RL303)

Incentives are available for high-efficiency clothes washers.

Requirements:

- Qualified clothes washers must be approved by ENERGY STAR with a Modified Energy Factor (MEF) ≥ 2.2 .
- The incentive is available for Consumers Energy electric or natural gas customers.
- Qualifies for new construction and retrofit applications.
-

Commercial Kitchen Ventilation Control (RL302)

Requirements:

- The existing commercial kitchen ventilation exhaust fan must be controlled with an on/off switch or by a manually operated 2-speed system.
- Either temperature or temperature and optical sensor control systems qualify.
- The proposed system must utilize a variable frequency drive on the exhaust fan motor and a temperature and optical sensor to monitor cooking conditions.
- The system must vary the rate of exhaust by reducing the exhaust fan motor speed according to demand as determined by the monitoring sensors.
- This incentive may be combined with the incentive for VFD/VSD on HVAC Fans or HVAC Pumps.
- FM is based on kitchen ventilation's total.
- Qualifies for new construction and retrofit applications.

Engineered Commercial Kitchen Ventilation Hood (Pre-Notification Required)

Requirements:

An incentive is available for engineered commercial kitchen ventilation systems by reducing ventilation rates. Incentive is based on CFM reduced.

- Retrofit projects may use existing hood CFM as baseline; new construction and end of life will select from the minimum exhaust rate (table 12) below.
- Provide the hood duty (i.e., light, medium, heavy, extra-heavy duty) and the type of hood (wall-mounted, eyebrow, single island canopy, double island canopy, back shelf, Passover).
- Maximum and minimum exhaust rates for each hood type and duty listed in tables below (CFM per linear foot of hood):

Table 12: Type of Hood

	Light Duty Equipment	Medium Duty Equipment	Heavy Duty Equipment	Extra-Heavy Duty Equipment
Wall-mounted Canopy	175	250	300	475
Single Island Canopy	275	350	450	625
Double Island Canopy	175	250	325	525
Eye brow	200	200	N/A	N/A
Backshelf/Passover	150	250	350	N/A

Table 13: Type of Hood

	Light Duty Equipment	Medium Duty Equipment	Heavy Duty Equipment	Extra-Heavy Duty Equipment
Wall-mounted Canopy	200	300	400	550
Single Island Canopy	400	500	600	700
Double Island Canopy	250	300	400	550
Eye brow	250	250	N/A	N/A
Backshelf/Passover	250	300	400	N/A

ENERGY STAR® Dishwasher-Commercial (RL306)

Requirements:

- Incentives are available for high efficiency dishwashers that replace non-high efficiency dishwashers that use a gas water heater.
- Dishwasher types include: stationary single tank door, single tank conveyor and multiple tank conveyor. Dishwashers can have either electric, gas or no booster.
- Qualified dishwashers must meet ENERGY STAR requirements.
- Incentive is per washer.
- Qualifies for new construction and retrofit applications.

ENERGY STAR® Under Counter Dishwasher (RL307)

Requirements:

- Incentives are available for high efficiency dishwashers that replace non-high efficiency dishwashers that use a gas water heater.
- Dishwashers must be an under counter style. Dishwashers can have either electric, gas or no booster.
- Qualified dishwashers must meet ENERGY STAR requirements.
- Incentive is per washer.
- Qualifies for new construction and retrofit applications.

Building Envelope and Insulation



Insulation incentives are available only for retrofit projects using natural gas as the primary fuel source, unless indicated otherwise.

Wall Insulation (Pre-Notification Required) (BE101)

Requirements:

- Wall insulation must be installed in a wall separating a space that has natural gas-fired space heating and an unconditioned space or the outdoors.
- Existing wall assembly must be below R-3 to qualify.
- The final insulation levels must exceed R-13 and/or local code for the building type.
- Incentives will be paid on total square footage of wall insulation.
- Consumers Energy natural gas customers only.

Flat Roof Insulation (Pre-Notification Required) (BE102)

Requirements:

- Projects must meet the General Requirements listed.
- “Insulation Entirely Above Deck” and “Metal Building” (as defined by ASHRAE 90.1-2013) roof insulation are eligible for the incentive only when installed between the conditioned and unconditioned areas.
- This measure is not eligible for roofs above areas with insulation at drop ceiling level i.e., between the occupied space and ceiling plenum.
- Insulation installed above dropped commercial ceilings is not eligible.
- Buildings with a roof area larger than 500,000 ft² may be eligible for a custom incentive.
- Consumers Energy natural gas customers only.

Attic Roof Insulation (Pre-Notification Required) (BE103)

Requirements:

- Projects must meet the General Requirements listed previously.
- “Attic and Other” (as defined by ASHRAE 90.1-2013) roof insulation is eligible for the incentive only when it is installed between the conditioned and unconditioned areas.
- Insulation installed above dropped commercial ceilings is not eligible.
- Please note that pre-retrofit insulation levels for attic roof must be less than R-11; however, final assembly levels on attic roofs must exceed R-48.

General Requirements for Roof Insulation (Pre-Notification Required) (BE102, BE103)

This incentive is for adding insulation to existing buildings.

Requirements:

- Total roof area should be less than 500,000 ft².
- Roof insulation must be installed in a space that requires natural gas-fired space heating.
- All materials must be new and meet applicable state and local codes and must be installed in accordance with the manufacturer’s requirements.
- Pre-Notification applications will require the following.
- A scaled floor plan of the facility’s total roof area (ft²) being insulated.
- A roof construction detail (sketch) showing a section cut of the existing roof.
- Roof construction detail (sketch) showing a section cut of the proposed roof.
- Specifications of the proposed roof insulation.
- Consumers Energy natural gas heat customers only.

Window Reduction (Pre-Notification Required) (BE104)

Requirements:

- Window insulation must be installed in a space that requires natural gas-fired space heating.
- All materials must be new and meet applicable state and local codes and must be installed in accordance with the manufacturer's requirements.
- Lighting systems utilizing daylight harvesting controls in the areas served by the existing windows do not qualify for this incentive.
- Consumers Energy natural gas customers only.
- The final thermal resistance through the new window assembly must be greater than or equal to R-13.
- Pre-Notification applications will require the following:
 - » A scaled plan of the facility's total window area (square foot) being insulated.
 - » A window construction detail (sketch) showing a section cut of the existing window with proposed insulation.
 - » Specifications of the proposed window insulation.
- Pre-construction pictures of the condition of the existing windows would also be beneficial.
- Incentive is based on the area of the window.

Window Film (Pre-Notification Required) (BE105)

Incentives are available for film applied to windows having an east, west, or southern exposure and a minimum of a 5-year manufacturer's warranty.

Requirements:

- Film must be applied to an existing window assembly featuring Shading Coefficient (SC) value ≥ 0.84 and a U-Value ≥ 0.72 . These values are typical of a clear, double-pane window, although conditions of pre-existing window assembly will need to be reviewed on a case-by-case basis.
- The installed window film must have a Solar Heat Gain Coefficient (SHGC) value of ≤ 0.39 and a U-value of ≤ 0.72 .
- The space upgraded with the glazing must be cooled by equipment using a vapor-compression refrigeration cycle (i.e., DX RTU or chiller).
- Spaces cooled by evaporative cooling or absorption chillers are not eligible.
- To convert Shading Coefficient (SC) to SHGC: multiply SC x 0.87
- The incentive is available for Consumers Energy electric customers.
- Incentive is based on the area of the window.

Window Awnings (Pre-Notification Required) (BE106)

Requirements:

- An Incentive is available for the installation of awnings above windows that block sunlight from entering a building during the summer but allow sunlight to enter during the winter.
- The distance between the point that the awning connects to the exterior wall and the top of the window must be no more than 0.329 times the height of the window.
- The awning must extend out from the wall at least 0.614 times the height of the window.
- The incentive is available for Consumers Energy electric customers in building areas served with air conditioning.
- Windows cannot have any form of pre-existing film or coating installed that reflects sunlight.
- Windows must be south facing +/- 20 degrees.
- Windows that are significantly blocked from the sun during the summer months from foliage, buildings, or other obstructions are not eligible for this incentive.
- Incentive is based on the area of the window.
- Incentive is eligible for new construction.

High Performance Glazing in Windows (Pre-Notification Required) (BE107)

Requirements:

- Incentives are available for windows facing east, west, or south and a minimum 5-year manufacturer's warranty.
- Glazing must replace an existing window assembly featuring Shading Coefficient (SC) value ≥ 0.84 and a U-Value ≥ 0.72 . These values are typical of a clear, double-pane window, although conditions of pre-existing window assembly will need to be reviewed on a case-by-case basis.
- The new glazing must have a Solar Heat Gain Coefficient (SHGC) value of ≤ 0.39 and a U-value of ≤ 0.57 .
- The space upgraded with the glazing must be an electrically air conditioned area.
- To convert Shading Coefficient (SC) to SHGC: multiply SC x 0.87
- Floor plans and exterior building dimensions must be submitted to verify square footage and dimensions.
- Qualifies for new construction and retrofit applications.
- The incentive is available for Consumers Energy electric customers.
- Incentive is based on the area of the window.

Cool (White) Roof (Pre-Notification Required) (BE108)

Requirements:

- Available for upgrading existing roofs to cool (white) roofs that have a solar absorption of ≤ 0.3 (solar reflectance of ≥ 0.7).
- Roof must be installed over conditioned (mechanically cooled) space.
- Floor plan should be submitted to verify roof area.
- Qualifies for new construction and retrofit applications.
- The incentive is available for Consumers Energy electric customers.

Automatic High-Speed Doors (BE109)

This incentive is for a commercial/industrial refrigeration facility with freezer, cooler and/or dock areas that are currently dividing the separate spaces with different cooling set point with strip curtains.

Hydraulic or motorized automated doors provide a way to reduce infiltration from controlled rooms by reducing the time that rooms are exposed to each other and also provides better insulation between the divided areas. This measure is for the installation of an automatic high-speed door between a conditioned (heated) indoor space and an unconditioned exterior space.

Requirements:

- Replacement of existing high speed doors does not qualify.
- Qualifies for new construction and retrofit applications.
- Incentive is based on the square footage of the high speed door.

Automatic Pool Covers (BE110)

Requirements:

- Must be 400 - 10,000 ft².
- Equipment must be new.
- This incentive is available for Consumers Energy natural gas customers only.
- Liquid pool covers do not qualify for this incentive.
- Automatic pool covers (and retractable pool covers) must be motorized (both on & off) to qualify for the higher incentive.

Manual Pool Covers (BE111)

Requirements:

- Must be 400 - 10,000 ft².
- Equipment must be new.
- This incentive is available for Consumers Energy natural gas customers only.
- Liquid pool covers do not qualify for this incentive.

Pipe and Ductwork Insulation

These incentives are available only for retrofit projects using Consumers Energy natural gas as the primary fuel source. If a dual-fuel system is used, or if natural gas is the back-up or redundant fuel, the Custom Incentive Worksheet should be used.

Requirements:

- A minimum of R-4 (approximately 1 inch) of pre-formed pipe insulation must be added to existing bare metal pipe system applications. New or recently repaired piping does not qualify for this incentive.
- The bare pipe size must be between ½ inch to 2½ inch nominal pipe diameter. Piping that has a 3-inch nominal diameter or larger may qualify for a custom incentive.
- A minimum of 10 linear feet of pipe must be insulated.
- For HVAC and domestic applications, this incentive is limited to a maximum of 500 linear feet per boiler system.
- Insulation used for pipes should be high-density fiberglass insulation or closed-cell elastomeric foam insulation shaped for pipes.
- Documentation including the manufacturer's name, insulation material type and the material K-value or R-value rating must be provided with the application form.
- Non-conditioned spaces are not temperature-controlled.
- Conditioned spaces must be heated.

Pipe Insulation – Hydronic Space Heating or Steam Space Heating (unconditioned space), Steam Condensate Space Heating (Pre-Notification Required) (IN101 - IN103)

Requirements:

- Applies only to existing hydronic heating piping systems operating at a minimum design supply water temperature of 180 degrees Fahrenheit or steam heating piping systems which currently have no insulation.
- Implementation of this measure must result in a decrease of natural gas use.

Domestic Hot Water Pipe Insulation (Consumers Energy Natural Gas Customers) (Pre-Notification Required) (IN104)

Requirements:

- Applies only to existing domestic hot water and domestic hot water return piping systems operating at a minimum of 120 degrees Fahrenheit domestic hot water supply temperature, that currently have no insulation on the piping.
- Implementation of this measure must result in a decrease of natural gas use.

Process Steam Pipe Insulation (Pre-Notification Required) (IN105)

- Applies only to existing saturated steam piping systems operating at a minimum of 5 psi system pressure that currently have no insulation on the piping.

Process Steam Pipe Condensate Insulation (Pre-Notification Required) (IN106)

Requirements:

- Applies only to existing saturated steam piping systems operating at a minimum of 5 psi system pressure, that currently have no insulation on the piping.
- Only condensate return piping qualifies; condensate piping extending to a drain does not qualify.

PEX Pipe Insulation (Pre-Notification Required) (IN107- IN109)

Requirements:

- The measure applies only to existing domestic hot water, hydronic HVAC water supply and hydronic HVAC water return piping systems located in either conditioned or unconditioned spaces.
- Existing PEX piping cannot have insulation.
- Water temperature must be at or above: 100 degrees Fahrenheit HVAC water supply, or 165 degrees Fahrenheit for hydronic HVAC water return.
- New or recently repaired tubing does not qualify for this incentive.
- A minimum of R-4 (approximately one inch) of pre-formed tube insulation must be added to existing bare metal tube system applications.
- The bare tube size must be between 3/8" to 2½ inch nominal tube diameter. Tubing 3 inch nominal tube diameter and larger may qualify as a custom measure.
- A minimum of 10 linear feet of tube must be insulated.
- This incentive is limited to a maximum of 500 linear feet per boiler system.
- Insulation used for tubes should either be high density fiberglass insulation, or closed-cell elastomeric foam insulation, shaped for tubes.
- Applications must include the manufacturer's name, insulation material type and the material k-value or R-value rating.
- All hot surfaces should be insulated.
- Conditioned spaces must be air conditioned for human comfort to qualify for this incentive. Non-conditioned spaces are defined as not temperature controlled.
- The surface temperature of the bare uninsulated tube is to be recorded on the application.
- Inspection by program staff is required prior to installation of insulation.
- Please note that PEX tubing is rated for a maximum water temperature of 180 degrees.
- In domestic hot water piping applications, a domestic recirculation pump must be employed.
- Hydronic HVAC supply and return systems must operate during the heating season.

Electric Domestic Hot Water Pipe Insulation (Pre-Notification Required) (IN110)

Requirements:

- Applies only to existing domestic hot water and domestic hot water return piping systems operating at a minimum of 120 degrees Fahrenheit supply temperature, that currently have no insulation on the piping.
- Implementation of this measure must result in a decrease of electrical use.

Refrigerant Piping Insulation (Pre-Notification Required) (IN111 - IN113)

Requirements:

- To qualify for this incentive, the facility must have exposed refrigeration piping of 2" or less in diameter in conditioned and/or semi-conditioned spaces and/or unconditioned spaces.
- Consumers Energy Business Energy Efficiency Program defines a non-conditioned space as a space outside of the thermal envelope of the building that is not intentionally heated for occupancy.

Ductwork Insulation (Pre-Notification Required) (IN114 - IN117)

An incentive is available for installing R-3.3 insulation (i.e., 1 ½-inch fiberglass) or greater around non-insulated HVAC ductwork located in a non-conditioned space.

Requirements:

- The facility must be natural gas heated to qualify.
- Both the supply air and return air ductwork qualify; exhaust venting ductwork does not qualify.
- Consumers Energy Business Energy Efficiency Programs defines a non-conditioned space as a space outside of the thermal envelope of the building that is not intentionally heated for occupancy.
- Incentive is available on existing ductwork only.
- New installation of ductwork does not qualify.
- A minimum of 10 linear feet of exposed ductwork must be insulated.
- It is recommended that all ductwork be sealed before it is insulated.
- Please note that sealing and insulating leaking ductwork in damp building crawlspaces may exacerbate the existing moisture issues. It is recommended to address the moisture concerns first (i.e., repair leaking water pipes, confirm rain gutters are properly discharging into storm drains or away from the building).

Agricultural



Farm Energy Audit (AG101)

Requirements:

- Facility must operate primarily as an agricultural business.
- Audit must be a tier II energy audit as defined by the US Department of Agriculture.

Grain Dryers

(Pre-Notification Required) (AG102, AG103)

Requirements:

- Existing grain dryer must be in good condition, at least 10 years old and does not utilize heat recovery. New grain dryer applications may qualify under the Business Energy Efficiency New Construction Program.
- New dryer or retrofitted dryer must be natural gas heated, permanently installed and have a minimum grain dryer efficiency of 1,590 Btu/lb water.
- Applications must include the manufacturer's name, model number and specifications for the proposed grain dryers operating efficiency.
- Applications must also include documentation identifying the proposed annual of volume (bushels/year) of grain to be processed.
- Qualifies for new construction and retrofit applications.

Temperature and Moisture Management Controller (Pre-Notification Required) (AG104)

Requirements:

- Installation of grain storage temperature/moisture management controller is eligible for this incentive.
- The existing non-controlled fan aeration system must operate a minimum of 1,000-hours per year.
- The proposed system must consist of hanging multiple temperature and/or moisture sensors within the grain storage bin. Outdoor air temperature and relative humidity must also be monitored.
- Data sensors must be digital; analog sensors do not qualify.
- The grain data must be sent to a controller to evaluate the internal bin conditions as well as outside air temperature and outside air relative humidity to control the aeration fans.

- Replacement of existing grain storage management controllers does not qualify.
- Bi-Weekly bin inspection is still recommended.
- Aeration fans equipped with VFDs do not qualify for this incentive.
- Qualifies for new construction and retrofit applications.

Greenhouse Heat Curtains (Pre-Notification Required) (AG105)

Requirements:

- Heat curtains are required to be installed for heat retention in an existing natural gas-heated commercial growing greenhouse for agricultural use.
- Curtains that are eligible for incentive must have been designed by the manufacturer to be a heat curtain.
- This incentive applies to a new curtain where none previously existed, or new installation to replace an existing curtain that is no longer functional.
- All heat curtains must have a natural gas savings rate of 40% or better and have a warranty or an effective product life of five years.
- Installation must allow the curtain(s) to be automatically moved or manually moved into place.
- Square footage claimed for the incentive will not exceed the square footage of the greenhouse floor; overhang or overlap material will not be included in incentive calculation.
- Qualifies for new construction and retrofit applications.

Greenhouse IR Film (Pre-Notification Required) (AG106, AG107)

Requirements:

- Film must be infrared, anti-condensate, polyethylene plastic. The roof must be double-inflated polyethylene roof.
- Infrared coating must be applied via the factory to the film; coatings applied on site to existing film do not qualify.
- The film must have a minimum thickness of 6 mil plastic.
- Incentive is only for use in an existing natural gas-heat greenhouse. The installation of polyethylene with IR film, replacing existing polyethylene with IR film that is past its useful life (four years or older) is also applicable.
- IR film must have a useful life of at least 4 years.
- Incentive is based on greenhouse floor area, ft².
- Qualifies for new construction and retrofit applications.

Greenhouse Environmental Controls (Pre-Notification Required) (AG108)

Requirements:

This incentive is available for customers installing an automated environmental controls system to an existing greenhouse space which does not have any automatic, scheduled temperature setback controls.

Requirements:

- The environmental control system must, at the very least, control greenhouse space temperature set points with hourly control configuration.
- This measure does not apply to greenhouses that are manually set back. A minimum setback space temperature of at least 5 degrees Fahrenheit is required.
- Qualifies for new construction and retrofit applications.

Greenhouse In-Floor Heating System (Pre-Notification Required) (AG109, AG110)

Requirements:

This incentive is available for installing under-floor (within concrete or direct contact) or under-bench hydronic heating loop for agricultural greenhouse applications. Savings is achieved by creating a micro-climate around the plant instead of fully conditioning the entire environment of the structure. If the plant's root temperature is maintained at 67 degrees Fahrenheit, the air temperature surrounding the plant may be allowed to decrease 10 degrees to 12 degrees down to approximately 55 degrees.

Requirements:

- The existing heating system must be a forced air heating system (i.e., unit heaters).
- This measure qualifies for new construction applications.
- The forced air heating system may be retained for secondary, supplemental heating or for backup; however, it may not be utilized as the primary heating means.

- Proposed boiler system must be high efficient with a minimum efficiency of 90%.
- The temperature sensor(s) serving the underfloor or under bench hydronic heating system must be located within the growing media.
- The incentive is based on the area served by the underfloor hydronic heating system. The under-bench's incentive is based on the area of the benches served by the hydronic heating system.
- Qualifies for new construction and retrofit applications.

Circulation, Exhaust or Ventilation Fans (Pre-Notification Required) (AG111)

Requirements:

- Fans must be replacing existing fans and meet specifications listed in Table 14.
- Qualifies for new construction and retrofit applications.

Table 14: Circulation or Exhaust Fan Ventilation Specification

Fan Diameter	Exhaust Minimum Efficiency	Circulation Minimum Efficiency
24" - 35"	14.0 CFM/Watt @ 0.10	12.5 lbf/kW
36" - 47"	17.1 CFM/Watt @ 0.10	18.2 lbf/kW
48" - 72"	20.3 CFM/Watt @ 0.10	23.0 lbf/kW

High-Volume, Low-Speed Fans (HVLS) (Pre-Notification Required) (AG112)

Requirements:

HVLS fans are an efficient alternative to high-speed box fans traditionally used in ventilation of livestock facilities. It is ideal for large areas with a high ceiling.

Requirements:

- To qualify, the minimum fan diameter must be at least 16-foot.
- Qualifies for new construction and retrofit applications.

Fan Thermostat Controller (AG113)

Requirements:

- Existing circulation, ventilation or exhaust fans to be controlled must be used in an agricultural setting and operate continuously from May through October.
- Controller must have thermostat functions to disable the fans when the outside air temperature drops below a predetermined set-point temperature, typically 70 degrees Fahrenheit.
- Replacement of existing thermostat fan controller does not qualify.
- Qualifies for new construction and retrofit applications.

Variable Speed Drives on Agricultural Irrigation Systems (Pre-Notification Required) (AG114)

Requirements:

- Variable speed drives installed on existing agricultural irrigation systems qualify for this incentive. Redundant or back-up pumps do not qualify.
- Pumps must operate a minimum of 500 hrs./yr. to qualify.
- Qualifying existing irrigations systems must either include: a) several center pivots served by one well, or b) have a corner arm center pivot where the water flow rate increases when the corner arms swing out towards the corners of the fields. Other proposed VFD irrigation systems applications will be reviewed on a case-by-case basis, or may qualify for a custom incentive.
- This incentive cannot be combined with the Sprinkler Drip Irrigation incentives or Low-Pressure Sprinkler nozzles.
- Qualifies for new construction and retrofit applications.

Variable Speed Drives on Golf Course Irrigation Systems (Pre-Notification Required) (AG115)

Requirements:

- Variable speed drives installed on existing golf course irrigation systems qualify for this incentive. Redundant or back-up pumps do not qualify.
- A minimum of seven continuous days of power monitoring (kW) will be required after the retrofit of typical water use.
- The replacement of existing VFDs does not qualify for this incentive.
- The motor must operate more than 750 hrs./year.
- Qualifies for new construction and retrofit applications.

Sprinkler to Drip Irrigation (Pre-Notification Required) (AG116)

Requirements:

- The applicant must convert from a high-pressure, impact-type sprinkler irrigation system (50 psi or greater at the sprinkler head) to a micro-irrigation system.
- Drip tape systems are not eligible.
- The incentive application must include an assessor's parcel map or other documentation to verify acreage.
- Must remove existing sprinklers.
- Drip Irrigation cannot be combined with VSD on Agriculture Irrigation System measure.
- Qualifies for new construction and retrofit applications.

Low-Pressure or Zero Energy Sprinkler Nozzle (Pre-Notification Required) (AG117)

Requirements:

- The applicant must convert from a one-to-one high-pressure (50 psi or greater at the sprinkler head) sprinkler system nozzle to a low-pressure sprinkler nozzle.
- Both permanent (solid set) and portable (hand-move) sprinkler system nozzles are eligible for incentives.
- Qualifies for new construction and retrofit applications.

Low-Energy or Zero-Energy Livestock Waterer (AG118)

Requirements:

- Equipment must be replacing waterer with heating elements.
- New waterer must have a minimum 2-inch insulation and maximum combined heating element wattage of 250 watts.
- New Zero-Energy waterer must serve same herd size as existing waterer being replaced and contain no heating elements.
- Qualifies for new construction and retrofit applications.

Scroll Compressor for Dairy Refrigeration (Pre-Notification Required) (AG201 - AG204)

Requirements:

- This measure is for replacing reciprocating units only.
- This measure is designed for one milk pump system per farm. If multiple milk systems, incentive will be based on ratio of milk processed through each system.
- Redundant pumps do not qualify.
- Qualifies for new construction and retrofit applications.
- Existing compressor must feature an EER of 9.5 or less, while the new compressor must feature an EER of at least either 10.5 or 11.5.

Variable Speed Controller for Vacuum Pump (Pre-Notification Required) (AG205)

Requirements:

- Existing pump must be blower-type pump.
- VFD speed must be automatically controlled by differential pressure, flow, temp, or other signal.
- Qualifies for new construction and retrofit applications.

Variable Speed Drives on Milk Pump with Existing or New Milk Pre-Cooler (Pre-Notification Required) (AG206, AG207)

Requirements:

- Installation of VSD must accompany plate-type pre-cooler.
- Pre-cooler may be installed at the same time as the variable speed milk pump.
- Minimum daily milk production must be $\geq 5,000$ lb./day.
- Incentive cannot be combined with any other VFD incentive.
- This measure is designed for one milk pump system per farm. If multiple milk systems, incentive will be based on ratio of milk processed through each system.
- Redundant pumps do not qualify.
- Qualifies for new construction and retrofit applications.

Milk Pre-Cooler and Heat Exchanger Chiller Savings (Pre-Notification Required) (AG208)

Requirements:

- This incentive is available for adding a pre-cooler heat exchanger ahead of the milk storage tank.
- This measure applies only to new heat exchangers, but may be combined with VSD Milk Pump and Water Pre-Heat Heat Exchanger measures.
- Replacement of existing heat exchangers does not qualify.
- This measure is available for capturing the waste heat within the well water used to pre-cool milk with a Pre-Cooler Heat Exchanger.
- The existing waste heat captured within the well water must result in a decrease in natural gas or electricity used to heat water (i.e., pre-heat heated wash water).
- This incentive may be combined with VSD Milk Pump and Milk Pre-Cooler Heat Exchanger.
- Existing or new heat exchangers qualify if the waste heat from the previous heat exchanger was not being utilized.
- This measure typically involves the installation of a heat recovery tank.
- Qualifies for new construction and retrofit applications.

Water Pre-Heat Heat Exchanger (Heat Recover Tank) (Pre-Notification Required) (AG209)

This Measure is available for capturing the waste heat within the well water used to pre-cool milk with a Pre-Cooler Heat Exchanger.

Requirements:

- The existing waste heat captured within the well water must result in a decrease natural gas or electricity used to heat water (i.e., pre-heat heated wash water).
- This incentive may be combined with VSD Milk Pump and Milk Pre-Cooler Heat Exchanger.

- Existing or new heat exchangers qualify if the waste heat from the previous heat exchanger was not being utilized.
- This measure typically involves the installation of a heat recovery tank.
- Qualifies for new construction and retrofit applications.

Dairy Refrigeration Tune-up (AG210)

Requirements:

- This incentive is only eligible for commercial-grade on-farm dairy refrigeration equipment.
- A Dairy Refrigeration Tune-Up Checklist must be completed by the service provider for each unit.
- Incentives are available for tune-ups only once per 24-month period with the intention of reducing energy use.

LED Grow Lights

(Pre-Notification Required) (AG211)

Requirements:

- To qualify for this incentive, the existing fluorescent, incandescent, HPS or MH fixture must be replaced by a completely new LED fixture.
- Lamps must be reduced in wattage, third-party tested, UL or ETL listed, have a power factor (PF) ≥ 0.90 , a minimum rated lifetime of 50,000 hours and minimum warranty of 5 years.
- The new LED lamp or fixtures should meet proper supplemental lighting levels in terms of micromoles of photosynthetic light ($\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$) per watt of energy per area (W/m^2) suitable for specific vegetative, fruit and flowering plants.
- The intensity of the photosynthetically active radiation (PAR) light (400-700 nm) emitted should also be suitable to the respective plants under growth.
- Fixtures must operate 6,570 hours/year to qualify for higher incentive.
- Qualifies for new construction and retrofit applications.

Dairy Long-Day Lighting System retrofit

(Pre-Notification Required) (AG212)

An incentive is available for retrofitting Long-Day Lighting (LDL) dairy system with new energy-efficient LED lighting systems.

Requirements:

- The proposed energy efficient lighting system must comply with all lighting specifications located in the lighting section of this application.
- A lighting design layout must be provided showing a minimum mean lumen light level of greater/equal to 15-foot-candles but no more than 24-foot-candles at the cow's eye level in spaces utilizing Long-day Lighting.
- The proposed lighting system must be operated between 16 to 18 hours per day followed by 6 to 8 hours of darkness.
- Qualifies for new construction and retrofit applications.

Poultry LED Lighting System (Pre-Notification Required) (AG213)

Requirements:

- To qualify for this incentive, the existing high pressure sodium, metal halide, fluorescent, or incandescent lighting must be replaced by a completely new LED Fixture.
- Lamps must be reduced in wattage, third-party tested, UL listed, have a power factor (PF) 0.90, a minimum rated lifetime of 50,000 hours and minimum warranty of 5 years.
- The LED lights must be able to provide the suitable wave length to benefit specific poultry production (i.e., broiler, brooder and layer production).
- Qualifies for new construction and retrofit applications.

Indoor Ag Dehumidification Units (Pre-Notification Required) (AG214)

Requirements:

- Measure is for new portable or standalone dehumidifiers.
- Dehumidifiers must be installed in an indoor cannabis facility that operates year-round.
- Greenhouse installations do not qualify.
- Proposed unit must have an Energy Factor of 2.80 L/kWh or greater.
- Existing unit must have an Energy Factor of 1.9 L/kWh or below.
- Proposed unit must have a capacity of 155 pints/day or greater.
- If an existing unit is being replaced, proposed must be the same size.
- Qualifies for new construction and retrofit applications.

HVAC Reduction in Indoor Ag Grow Rooms (Pre-Notification Required) (AG215)

Requirements:

- For indoor cannabis grow facilities that operate year-round.
- Measure is for the cooling load reduction when replacing typical fixtures with LED grow lights.
- Existing HPS, metal halide, incandescent, or fluorescent fixture must be replaced by completely new fixture.
- Proposed fixtures must specifications for LED Grow light measure (AG211).
- Only eligible when combined with LED grow light measure.
- Spaces with free cooling are not eligible and facility must use mechanical cooling (AC) year-round same size.
- Qualifies for new construction and retrofit applications.

EC Fan Motor for Cold Storage Evaporator (Pre-Notification Required) (AG301)

Requirements:

- Available for replacement of an existing cold storage air handling unit (AHU) motor or evaporator fan motor with an integrated variable speed motor.
- Fan motor of the existing unit must be constant speed and the new motor must have a variable input to be eligible for this incentive.
- The existing motor must operate a minimum of 2,000 hours per year.
- Measure applies to both new systems or retrofitting existing equipment.
- A brushless DC motor, also known as an electronically commutated motor (ECM) qualifies for this incentive.
- Qualifies for new construction and retrofit applications.

Mats for Swine Farrowing Crates (Pre-Notification Required) (AG302, AG303)

Requirements:

- Incentives are available for replacing lighting used to warm swine within farrowing crates to heated mats.
- The incentive for a double mat is available if the mat is capable of warming two litters of separated piglets.
- Warming mats must operate at least 5,000 hours annually.
- This incentive is available for Consumers Energy electric customers only.

VFD for Agricultural Fans and Pumps (Pre-Notification Required) (AG304 - AG307)

Requirements:

- Variable frequency drives (VFDs) or variable speed drives (VSDs) installed on existing or new applications of agricultural fans and pumps are eligible for this incentive.
- Applicant is to provide a summary statement explaining:
 - » a) what the motor is used for.
 - » b) motor's annual run time.
 - » c) how the motor is currently controlled.
 - » d) proposed motor VFD control method.
- The installation of a VFD must accompany the permanent removal or disabling of any throttling devices such as inlet vanes, bypass dampers, bypass valves, or throttling valves.
- The VFD speed must be automatically controlled by humidity, temperature, differential pressure, flow, or other variable signal.
- VFDs installed on irrigations or HVAC systems do not qualify for this incentive, but may qualify for either a different prescriptive measure or a custom incentive.
- Motors greater than 50 HP do not qualify for this incentive, but may qualify for a custom incentive.
- Redundant or back-up units do not qualify.
- The replacement of existing VFDs does not qualify for this incentive.
- The motor must operate more than 750 hrs./yr.
- Qualifies for new construction and retrofit applications.

LEED® Whole Building

New construction Whole Building LEED (Leadership in Energy and Environmental Design®) (WB101 - WB103)

The intent of this approach is to validate the savings associated with LEED certified buildings. Incentives are available for new construction projects that receive LEED certification. The incentives will be paid upon receiving LEED Certification at the saving values validated by LEED. The LEED Whole Building Approach incentives directly correspond to the LEED NC v2009 and LEED BD+C v4 ratings systems. The following incentives are paid to Consumers Energy customers based on the energy savings reported in the energy model and verified by the Green Building Certification Institute (GBCI) first year only. For all specifications and guidance on this incentive, please reference LEED – EA Prerequisites Minimum Energy Performance (usgbc.org).

Customer Eligibility

- Projects must result in a facility improvement with a permanent reduction in electrical (kWh) and/or natural gas (Mcf) use less than or equal to 10% above baseline practices.
- Projects receiving the Whole Building Design program incentive are not eligible to receive duplicate incentives for the same product or equipment through the prescriptive and custom incentives.
- To qualify under the New Construction Program your new construction/major renovation project must meet the following definition – new building projects wherein no structure or site footprint presently exists; addition or expansion of an existing building or site footprint; or major tenant improvements that change the use of the space.
- Projects receiving the Whole Building Design program incentive are not eligible to receive duplicate incentives for the same product, equipment, or service from more than one utility, unless that product, equipment, or service yields both natural gas and electric savings for a customer with two utility providers.
- Incentives are not provided for renewable energy installations.
- Projects must apply the standards adopted by the Green Building Council Institute (GBCI) in the state of Michigan for the NC v2009 and LEED BD+C v4 ratings system.
- Savings calculated for interior buildings systems only.

Exterior lighting is not included in calculations, but qualifying incentives can be pursued through the new construction prescriptive program.

- Final incentive application must be received within 60 days of the facility receiving the LEED Certification.

Site Verification

- Upon submittal of the Final Application Agreement, program staff will conduct a second review to verify your project meets program requirements and to perform necessary inspections.

Energy Savings Analysis

- Applicants must utilize one of the GBCI approved software tools to provide a Whole Building Simulation energy model. The proposed model must reflect the designed system and be verified to match the mechanical, architectural and electrical drawings and schedules. Ultimately, incentives will be paid upon receiving LEED Certification at the savings value that is validated by GBCI during the certification process.
- Electrical Energy Savings = 1 kWh per GBCI validation = 1 kWh savings.
- Natural Gas Fuel Savings = 1 Mcf per GBCI validation = 1 Mcf savings.
- Conversion Constant: 10.28 therms = 1 Mcf.
- Projects are not allowed to take credit for savings above baseline for systems utilizing renewable energy.

For all projects, please provide the following reports corresponding to the modeling software on your project.

	DO_{E2}, EQUEST & Visual DOE	Energy Plus	Carrier HAP	Trane TRACE
1	Building Energy Performance (BEPS)	Annual Building Utility Performance Summary (ABUPS)	Annual Cost Summary	Energy Cost Budget/PRM Summary
2	Building Utility Performance (BEPU)	System Summary - showing the unmet load	Unmet load reports for all plants and systems	Energy Use Summary Reports
3	Energy Cost Summary (ES-D)	Report that shows annual energy cost by fuel source	Systems Energy Budget by Energy Source	Performance Rating Method Details
4	System Design Parameters (SV-A)	-	System input data reports	Equipment Energy Use
5	Details of Exterior Surfaces (LV-D)	-	Wall constructions	Entered Values Report (for all rooms and systems)

The following documentation must be submitted in addition to the program documentation outlined above. Energy savings will be validated per the LEED review findings:

- LEED Certification Project Review Report and LEED Reviewers Comments.
- LEED 2009- EA Prerequisite 2: Minimum Efficiency Use Performance Form: This form details the building's Performance Rating Method Compliance and Total Building Energy Summary.
- EAp2 Section 1.4 Table.xls from all supporting documentation submitted with the LEED template.

Custom



2021 Custom Specifications (CU101, CU102)

Custom projects must involve a facility improvement that results in a permanent reduction in electrical (kWh) and/or natural gas energy use (Mcf) because of an increase in system efficiency. Projects that result in reduced energy use without an improvement in system efficiency are not eligible for a custom incentive. However, projects that involve an automated control technology, such as energy management system programming, may be eligible for an incentive. All equipment purchased for custom projects must be new.

Projects involving measures covered by the prescriptive incentive portion of the program are not eligible for a custom incentive.

Applicants have the option to apply for a custom incentive for projects that involve an integrated solution with both prescriptive and custom incentives.

New construction Projects can apply for a custom measure if there is a verifiable reduction in electrical (kWh/yr.) and/or natural gas energy use (Mcf/yr.) from a baseline system using applicable federal and local energy codes and standard practices in the absence of regulations.

Projects that are NOT eligible for an energy efficiency incentive include the following:

- Fuel switching (e.g., electric to natural gas or natural gas to electric).
- Changes in operational and/or maintenance practices, or simple control modifications not involving capital costs.
- On-site electricity generation.
- Projects that involve peak-shifting (and not kWh savings).
- Renewable energy.
- Systems designed to allow carbon-dioxide (CO₂) levels in occupied spaces to exceed a maximum level of 1,200 ppm.
- Project payback equals the ratio of the project cost divided by the annual energy bill savings.
- Project payback must be at least one year and no more than eight years to be eligible for a custom incentive.

- The applicant is required to submit a Pre-Notification application for all custom projects while the existing equipment is still in operation in order to allow Consumers Energy the opportunity to verify the existing equipment.

Requirements for Custom Project Electricity and/or Natural Gas Savings Calculation

The annual electricity and/or natural gas savings must be calculated for custom projects using industry-accepted engineering algorithms or simulation models. The applicant must estimate the annual electricity and/or natural gas use of both the existing and proposed equipment based on the current operation of the facility. If the existing equipment is at the end of its useful life, the applicant must substitute equipment that would meet the applicable federal and local energy codes when calculating the annual energy savings.

The applicant must submit calculations and methods used to derive the savings. The applicant must provide all assumptions used in the calculations and document the source for these assumptions. Consumers Energy will review the submittal. Consumers Energy is solely responsible for the final determination of the annual energy savings to be used in calculating the incentive amount. Consumers Energy may need to conduct inspections both before and after the retrofit projects to verify equipment and operation conditions. Consumers Energy also reserves the right to require specific measurement and verification activities, including monitoring both before and after the retrofit, and to base the incentive payment on the results of these activities.

Process Improvement Guidelines

Manufacturing or process, technically based, capital improvement projects resulting in an increase in production energy efficiency (kWh/unit or Mcf/unit, where unit could be defined as a measurement of production) may qualify for a custom incentive. The following guideline is one way to analyze a Custom Process Improvement. The savings method chosen must be agreed upon with Consumers Energy Business Energy Efficiency Program. The customer must clearly identify the efficiency improvement. In following, electric projects would be evaluated based on the following parameters:

The Annual Energy Savings (AES) attributed to replacement of equipment leading to increased production efficiency will be based on the unit energy savings multiplied by the production rate. The existing production equipment must be in good repair and operational. See dual baseline exception below.

$$\text{Annual Energy Savings} = (\text{Existing Baseline kWh/unit} - \text{Proposed kWh/unit}) \times \text{Production Rate}$$

Projects involving burnout, end of life, or natural replacement of equipment may use the new, future (proposed) production rate; however, the unit energy savings baseline will be based on new equipment meeting minimum State or Federal energy efficiency standards or in accordance to industry standard practices.

$$\text{Annual Energy Savings} = (\text{New Baseline kWh/unit} - \text{Proposed kWh/unit}) \times \text{Proposed Production Rate}$$

The electrical energy use (kWh) must be based on the affected production equipment, only. Production data will be validated with the customer's internal production documentation. In cases where the Proposed Production Rate exceeds the Existing Baseline Production Rate, the following interpreted method shall be used:

$$\text{Production Rate} = \text{Existing Rate} + (\text{Proposed Rate} - \text{Existing}) \times \text{Correction Factor}$$

Post retrofit Actual	Correction Factor
1 month	40%
2 month	60%
3 month	75%
4 month	90%

Process Improvement Example

A plastic injection molding facility, operating 3,680 hrs./yr, is retrofitting its current 10-year-old injection molding machine in response to an increase in product sales to an improved injection molding machine that has both a higher capacity and is more efficient. The existing baseline machine can produce 100 lb./hr. of product at a unit energy rate of 15.0 kWh/lb. The proposed retrofitted machine is expected to produce 120 lb./hr. of product at a unit energy rate of 11.0 kWh/lb. Assume two months of daily typical production data averaging 120 lb./hr. was provided to support the increase in production data.

- Since the existing machine is still fully operational and is being retrofitted to increase production and unit efficiency, the current in-situ operating performance can be used as the baseline. The proposed annual energy savings calculation can be calculated as follows.

$$\begin{aligned} \text{Production Rate} &= 100 \text{ lb./hr.} + (120 \text{ lb./hr.} - 100 \text{ lb./hr.}) \times 0.60 \\ &= 112 \text{ lb./hr.} \end{aligned}$$

$$\begin{aligned} \text{Annual Energy Savings} &= (15.0 \text{ kWh/lb.} - 11.0 \text{ kWh/lb.}) \times (112 \text{ lb./hr.} \times 3,680 \text{ hr./yr.}) \\ &= 1,648,640 \text{ kWh/yr.} \end{aligned}$$

Please note that in some cases resulting in an increase in the production rate, a dual baseline approach may be more realistic in determining savings impacts. A dual baseline approach would be warranted if the customer would have had to install new equipment at improved production energy efficiencies, to meet code-minimums, or is a standard practice, or perhaps is the only option available. In some cases, interactive effects may be significant and must be included in the savings analysis. An example of significant interactive effects could be a project to better capture waste heat off of the process. As a result of capturing additional waste heat, the facility uses more fuel for space heating. In this example, the interactive effect of the increased fuel used for space heating must be subtracted from the captured waste heat energy savings.

Additional Offerings

Building Operator Certification

Building Operator Certification is a competency-based training program for operations and maintenance staff working in commercial, institutional, or industrial buildings. Building Operator Certification achieves energy savings by training individuals directly responsible for the maintenance of energy-using building equipment and day-to-day building operations. Participants attend training classes, take quizzes and complete hands on projects at their own facilities. Upon successful completion of the course, Consumers Energy customers may be eligible for incentives. Only participants who have facilities larger than 50,000 ft² will be eligible for tuition reimbursement.

For more information and current class registration, please visit boccentral.org.

Retro-Commissioning Program

The Retro-Commissioning Programs utilizes enhanced energy assessments that draw upon existing building commissioning techniques to assist Consumers Energy customers to optimize the energy efficiency of their facilities. The focus of the Retro-Commissioning Program is to optimize the existing HVAC systems and Building Automation Systems operation. These assessments are particularly effective at identifying short payback no or low-cost improvements. Additional capital type measures that could provide deeper savings and qualify for Custom or Prescriptive incentives are also identified. The Retro-Commissioning Program also utilizes benchmarks from ENERGY STAR® Portfolio Manager®.

Who can participate:

- Customers who receive electric service only or electric and natural gas service to your location.
- > 150,000 ft² of conditioned space (heated and cooled).
- Modern Building Automation System with a majority of the building Direct Digital Controls.
- No major maintenance issues or building system upgrades planned.
- Management commitment and resources to support engineering study/implementation.
- Willing to commit at least 50% of the Study cost toward the implementation of low-cost or quick payback measures.

Retro-Commissioning Defined Actions

Any number of eleven specifically defined but common building energy efficient actions are employed rather than using an in depth assessment to find building system opportunities or issues. The MI Custom Building Optimization Analysis tool is then utilized to calculate energy savings on the item(s) implemented. Modified Custom incentives are paid on calculation on the implemented items.

Who can participate:

- Requirements are the same as the Retro-Commissioning Programs except:
 - » > 15000 ft² conditioned space.
 - » No upfront financial commitment because only Actions taken are incentivized.

ENERGY STAR® Programs

Consumers Energy Business Energy Efficiency Program has teamed up with ENERGY STAR to help your organization understand its current energy use and provide recommendations to help reduce energy use. This is accomplished by Benchmarking, setting an Energy Saving Goal and developing an Energy Management Plan to implement.

Who can participate:

- Organizations with multiple buildings over 5,000 ft².
- Time commitment of staff to assist benchmarking and on site building evaluation.
- Agreement to submit and complete at least one project eligible for Prescriptive or Custom incentives.

Industrial Energy Programs

The Industrial Energy Management program is designed to help industrial customers learn energy management tools and reduce energy use. This is accomplished through regional networking meetings, on-site training events, Kaizen activities and energy audits. Customers can reduce energy use between 10% and 20% during the first five years by adopting sound energy management techniques.

Who can participate:

- Consumers Energy electric customers with an annual energy use of 1,000 MWh or greater.
- Consumers Energy natural gas customers with an annual energy use of 30,000 Mcf or greater.
- If a customer receives both services, the energy use determines qualification.

APPENDIX

Example Custom Calculation

- A batch chemical process requires aeration during a portion of the process which is accomplished by two 25 HP blowers. To ensure full aeration, both blowers run for 12 of the 15 minute batch processing time. A study has been conducted that shows on average, only 10.5 minutes of aeration are required for a full batch size. Only 8 minutes of aeration are required for a half batch size. The running current for each blower was measured as 21.8 amps.
- Production records from the prior 12 months show that on average, 31 half batches and 181 full batches are produced per week. The plant operates 50 weeks per year. It is proposed to incorporate a diffused oxygen sensor to optimize the duration of aeration through the blowers.

Parameters:

Motors:	480V, 3ph
Existing blower run time:	12 minute/batch
Existing current draw:	21.8 A (each blower)
Average weekly batches:	181 full batches 31 half batches
Production wks./yr.:	50
Project cost:	\$4,367.00
Blended electric rate:	\$0.091/kWh

Assumptions:

Power factor:	0.8
Expected blower run with sensor:	10.5 minutes/full batch (to be verified post project) 8 minutes/half batch

Saving Calculation

$$\text{Power}_{30} = V \times A \times \text{PF} \times \sqrt{3}$$

$$\text{Power} = 480\text{V} \times 21.8\text{A} \times 0.8(\text{pf}) \times \sqrt{3} \times 2 \text{ blowers} = 28,999\text{W} = 29 \text{ kW}$$

Baseline Project Electric Energy use

$$\begin{aligned} \text{Electric Use}_{\text{baseline}} &= (181 + 31) \text{ batches/week} \times 12 \text{ min.} \times 1 \text{ hour}/60 \text{ min.} \times 29 \text{ kW} \\ &\times 50 \text{ wks./yr.} \\ &= 61,480 \text{ kWh/yr.} \end{aligned}$$

Post Project Electric Energy use

$$\begin{aligned} \text{Electric Use} &= \{(181 \text{ batches/week} \times 10.5 \text{ min.}) \\ &+ (31 \text{ batches/week} \times 8 \text{ min.})\} \\ &\times 1 \text{ hr}/60 \text{ min.} \times 29 \text{ kW} \times 50 \text{ wks./yr.} \\ &= 51,920 \text{ kWh/yr.} \end{aligned}$$

Saving

$$\begin{aligned} \text{Annual Energy Savings} &= 61,480 \text{ kWh/yr.} - 51,950 \text{ kWh/yr.} \\ &= 9,560 \text{ kWh/yr.} \end{aligned}$$

$$\begin{aligned} \text{Annual Energy Cost Savings} &= 9,560 \text{ kWh} \times \$0.091 \text{ kWh/yr.} \\ &= \$869.96/\text{yr.} \end{aligned}$$

$$\begin{aligned} \text{Simply Payback} &= \$4,367.00 / \$869.96/\text{yr.} \\ &= 5 \text{ yr.} \end{aligned}$$

$$\begin{aligned} \text{Anticipated Incentive} &= 9,560 \text{ kWh/yr.} \times \$0.10/\text{kWh} \\ &= \$956.00 \end{aligned}$$

APPENDIX

Sample Lighting Invoice

SAMPLE LIGHTING INVOICE

INVOICE

2 Stark Mechanical

123 W. 12th Street
Okemos, MI 48864
517-123-4567

1

INVOICE # 1234 Date:
March 27, 2019

4

SOLD TO Peter Quil
123 Happy St.
Grand Rapids, MI 48910

SHIP TO Bruce Bannor
9876 Oak St.
Kalamazoo, MI 47650

SALESPERSON	JOB	SHIPPING METHOD	SHIPPING TERMS	DELIVERY DATE	PAYMENT TERMS	DUE DATE
Steve Rogars	Lighting retrofit	UPS	Due on receipt	3/21/2019	By Credit Card	2/1/2019

3

QTY	ITEM #	MANUFACTURER	DESCRIPTION	UNIT PRICE	DISCOUNT	LINE TOTAL
50	72866	Sylvania	GE-F28T8 / XLSP41ECO	\$32.00		\$1600.00
25	72262	Philips	GE-232-MAX-L-Ultra	\$15.00		\$375.00
TOTAL DISCOUNT						
					SUBTOTAL	\$1975.00
					SALES TAX	\$118.50
					5 TOTAL DUE	\$2093.50

Make all checks payable to ABC Mechanical
THANK YOU FOR YOUR BUSINESS!

REQUIRED INFORMATION

1. INVOICE NUMBER AND DATE
2. VENDOR NAME AND ADDRESS
3. ITEMIZED LIST OF EQUIPMENT MODEL NUMBER, MANUFACTURER, UNIT PRICE AND QUANTITY
4. CUSTOMER NAME AND ADDRESS
5. TOTAL AMOUNT DUE

THE REQUIRED INFORMATION IS NEEDED FOR ALL PROJECTS; ANY MISSING INFORMATION WILL DELAY THE PROCESS OF YOUR PROJECT.

APPENDIX

Sample Boiler Tune-Up Checklist

Customer Information

Company Name			
Address			
City	State	ZIP	Date
Phone			

Tune-Up Documentation (Submit one sheet per Tune-Up)

Site Name	Manufacturer	Date of Tune-Up
Customer Contact Name	Model Number	Work Order/PO Number
Company Performing Tune-Up	Boiler Type	Annual Hours of Operation
Technician Performing Tune-Up	Boiler Size (MBH)	

- Measure pre/post combustion efficiency using electronic flue natural gas analyzer
- Clean burners, combustion chamber and heat exchanger surfaces
- Include a copy of the combustion analyzer test
- Clean and inspect burner nozzles
- Adjust air flow and reduce excessive stack temperatures
- Complete visual inspection of system piping and installation
- Adjust burner and natural gas input, manual or motorized draft control
- Check safety controls

	Before	After
--	--------	-------

Combustion Efficiency		
Stack Temperature		
Oxygen Level		
Carbon Dioxide		
Carbon Monoxide		

Additional Comments

APPENDIX

Sample RTU/Furnace Tune-Up Checklist

Customer Information

Company Name			
Address			
City	State	ZIP	Date
Phone			

Tune-Up Documentation (Submit one sheet per Tune-Up)

Make	Model Number	Serial Number
Work Order/PO Number	Burner Size (BTU)	
Date	Technician Performing Tune-Up	Company

Combustion Efficiency Percentage (Pre & Post adjustment) _____

Fan Section

- Check Filters. Clean or replace as necessary
- Adjust belt tension, wear and replace if necessary
- Inspect bearing and lubricate if needed
- Inspect sheaves for alignment or wear
- Check blower motor
- Check fan blades/housing. Clean or repair if necessary

Electrical

- Check voltage
- Check contactor/relays
- Inspect circuit boards
- Amp check blow motor
- Check wiring/connections

Heating Section

- Check combustion efficiency and optimize
- Check O₂ and CO₂ levels and optimize
- Check heat exchanger/flue
- Check pilot assembly/flame rod
- Check/clean burners
- Verify operating/safety controls
- Check inducer
- After adjustment combustion analysis tape

Miscellaneous Equipment

- Check for proper damper operation (if applicable)
- Visually inspect insulation for moisture accumulation
- Visually inspect ductwork
- Check safety devices per manufacturer

APPENDIX

Variable Frequency Drive Information Worksheet

(Required for motors over 100 HP or Process Pumps and Fans over 50 HP.) In addition to a minimum of seven continuous days of power monitoring (kW) will be required before and after the retrofit to qualify for this incentive.

Motors larger than 250 may qualify for a Custom Incentive.

Fan / Pump Information

Fan or pump ID tag (from worksheet):	Type of area served by fan or pump:
If fan, note type (centrifugal, forward curve, backward curve, axial, etc.):	Equipment served by fan or pump:
Nominal HP (if multiple motors, list individual HPs):	Nameplate motor efficiency(ies):
Manufacturer:	Model:
Full load design conditions: Flow (CFM, GPM):	Pressure (in static, feet of water, PSI, other)
Existing controls (discharge damper, inlet guide vanes, outlet control valve, bypass valve, etc)	Existing set point (in static, feet of water, PSI, other):

Operation Hours

The fan or pump operates the following hours (e.g., 0600 to 1800 or on demand):

Summer		Winter	
Weekdays	to	Weekdays	to
Saturdays	to	Saturdays	to
Sundays	to	Sundays	to
Number of shifts per weekday:		Number of shifts per weekend day:	

Existing Motor Load

The fan or pump operates the following hours (e.g., 0600 to 1800 or on demand):

Option 1 (retrofit): Measured input power under full load: _____ kW (true RMS power) _____ Power Factor

Option 2 (retrofit): Measured current and voltage under full load: _____ Amps _____ Volts
 Three-phase load calculation = _____ Volts x _____ Amps _____ x _____ PF x 1.73/1000 = _____ kW

Option 3 (retrofit or new) Measured estimated fan or pump full load: _____ kW
 If estimating load, provide description, assumptions and formula used to calculate power:

Proposed Operations

The proposed VFD will be automatically controlled to maintain the following set points:

Flow (CFM, GPM, other): _____ Pressure (in static, feet of water, PSI, other): _____

If other, please describe: _____

APPENDIX

Compressed Air Correct Sizing

	Existing/Baseline	Proposed/Post
Size of Air Compressor		
Air Compressor Control Strategy		
Nominal Production Rate During Data Collection		

Annual Hours of Operation	hrs./yr.
Typical Discharge Pressure of the Air Compressor in this application	psig

Boiler Blow-Down Reduction Calculation

The annual gallons saved can be obtained from the following:

$$V_{\text{Reduction}} = M \times [1 - (C_p \times (C_x - 1)) / (C_x \times (C_p - 1))]$$

Where:

$V_{\text{Reduction}}$ = Annual boiler blow-down volume flow reduced, gal./yr.

M = Existing metered annual make-up water volume flow rate before upgrade, gal./yr.

C_x = Existing cycles of concentration before upgrade (annual average)

C_p = Post cycles of concentration after upgrade

Cycles of concentration is the ratio of blowdown conductivity to make-up water conductivity and must be provided by the site water treatment service to show performance before and after the upgrade.

APPENDIX

Network Lighting Controls Pilot Memorandum of Understanding

Following is a memorandum of understanding between (Customer) and Consumers Energy to support installation of an Network Lighting Controls (NLC) System solution. The Consumers Energy program offers two-tier incentive levels:

- Incentive Rate Tier 1: Commercial, Office, Schools and Hospitals.
- Incentive Rate Tier 2: Manufacturing, heavy Industrial, Parking Structures and Warehousing.

The intent of this document is to ensure each party understands their respective responsibilities associated with receiving NLC Program funding. Both parties agree that this agreement is voluntary and may be terminated at any time if the Customer decides to no longer pursue incentives through the NLC Pilot program and/or opts to participate in the C&I Prescriptive program instead.

*Payback period must be greater than or equal to one and less than or equal to eight years to receive the incentive.

** Total Awarded Incentive cannot exceed 50% of the total custom project cost or Annual Customer Limits.

*** If new construction, the baseline shall be in accordance with Michigan Energy Code or standard customary practice.

**** Facility Type based on majority ft². use and building SIC/NAISC description.

Network Lighting Control Program Overview:

The goal of the program is to implement and incorporate best practice lighting design for energy savings, visual appeal, acuity and productivity. The Network Lighting Control pilot identifies the project as a system; tying in control savings and fixture replacement or elimination savings from a custom lighting design. By requiring a central/master front end system, the goal is to continuously monitor and adjust the lighting systems for energy savings and comfort within the facilities. The results of the program can see energy savings ranging from 65% to as much as 90% for an advanced networked solution.

The Customer agrees to:

- Use the following NLC system requirements as qualifying criteria to participate in both the NLC and C&I Custom programs. The networked lighting control system shall have the following minimum capabilities.
- A central/master programming, control and reporting interface that is connected via hardwire or wireless technology to all devices and luminaires throughout the entire system. At a minimum, the networked lighting control system shall be capable of the following:
 - » Providing complete programming and control from the central location.
 - » Reporting capability:
 - Occupancy reporting.
 - Operational reporting.
- Energy use reporting, maximum 15-minute monitoring interval.
 - » Storing and delivering in raw data format polled energy use information for, at a minimum, one year
 - » Capability for the following control strategies (minimum of three used):
 - Time scheduling.
 - Daylight harvesting.
 - Occupancy/vacancy sensing.
 - Task tuning.
 - Load shedding.
 - High End Trim.
- At a minimum, step dimming capacity.
- At a minimum, small zone control capability (16 fixtures or fewer per zone).
- Remote interface and control, such as BACnet, LONworks, etc.
- Assist Consumers Energy program staff by providing Pre- and Post- installation/monitoring/verification information, which includes but is not limited to.

- » Pre-installation information:
 - Existing lighting plans.
 - Fixture inventory.
 - Existing operation schedule and control strategy.
- » Post-installation information:
 - New lighting plans.
 - New fixture and control specification sheets.
 - New operation schedule and control strategy.
 - Raw data file with kW, watts or voltage and amperage readings in an Excel spreadsheet. The metered data should have a maximum of 15-minute intervals over a minimum of a two-week period.
- Accept the Terms and Conditions, Incentive caps and Limits outlined within the Consumers Energy C&I Custom application by signing a Final Application Agreement for the project.
- Submit this MOU with a C&I NLC worksheet in the Lighting Control Section application to participate in the NLC Program. The customer is only eligible for Consumers Energy’s C&I NLC worksheet in the Lighting Control Section incentives if both this MOU and a C&I Custom application are submitted. Otherwise, projects may only pursue incentives through the C&I Prescriptive program.

Consumers Energy agrees to:

- Assist Customer and their designated trade allies throughout the incentive and bonus application process.
- Review the C&I Custom Incentive application and this NLC Pilot MOU per the eligibility requirements outlined above.
- For qualified and eligible Customers, provide a C&I Customer incentive of \$0.25/kWh saved or \$0.18/kWh saved (Facility Type) within the bounds of program caps and limits, upon final measurement and verification.

(Customer)

Consumers Energy
Business Energy Efficiency Program

Signature

Signature

Print Name and Title

Print Name and Title

Date

Date

Building Interior Lighting Power Densities

For interior lighting, the Building Area Method or the Space by Space Method can be used to assess the lighting power density allowances for new facilities, additions, or change in space type major renovations. Building exterior lighting power densities should be utilized for all new exterior lighting. The following LPD values and tables provided are from ASHRAE 90.1-2013 “Energy Standard for Buildings Except Low-Rise Residential Buildings.” The space-by-space method may be used instead of the Building Area Type Method. To utilize this method, refer to ASHRAE 90.1-2013.

Building Area Type Method

Building Area Type ^a	Lighting Power Density (Watts per ft ²)
Automotive facility	0.80
Convention center	1.01
Courthouse	1.01
Dining: bar lounge/leisure	1.01
Dining: cafeteria/fast food	0.90
Dining: family	0.95
Dormitory	0.57
Exercise center	0.84
Fire Station	0.67
Gymnasium	0.94
Health-care clinic	0.90
Hospital	1.05
Hotel/Motel	0.87
Library	1.19
Manufacturing facility	1.17
Motion picture theater	0.76
Multifamily	0.51
Museum	1.02
Office	0.82
Parking garage	0.21
Penitentiary	0.81
Performing arts theater	1.39
Police station	0.87
Post office	0.87
Religious building	1.00
Retail	1.26
School/university	0.87
Sports arena	0.91
Town hall	0.89
Transportation	0.70
Warehouse	0.66
Workshop	1.19

Exterior Lighting Zones

Lighting Zone	Description
1	Developed areas of national parks, state parks, forest land and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas
4	High-activity commercial districts in major metropolitan areas as designated by the local jurisdiction

Individual Lighting Power Allowances for Building Exteriors

	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance (base allowance may be used in tradable or non-tradable surface)				
	500w	600W	750W	1300W
Tradable Surface (LPDs for uncovered parking areas, building grounds, building entrances, exits and loading docks, canopies and overhands and outdoor sales area may be traded)				
Uncovered Parking Areas				
Parking Areas and Drives	0.04 W/ft ²	0.06 W/ft ²	0.10 W/ft ²	0.13 W/ft ²
Building Grounds				
Walkways less than 10 ft wide	0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot
Walkways 10ft wide or greater				
Plaza Areas	0.14 W/ft ²	0.14 W/ft ²	0.16 W/ft ²	0.2 W/ft ²
Special Feature areas				
Stairways	0.75 W/ft ²	1.0 W/ft ²	1.0 W/ft ²	1.0 W/ft ²
Pedestrian tunnels	0.15 W/ft ²	0.15 W/ft ²	0.2 W/ft ²	0.3 W/ft ²
Landscaping	0.04 W/ft ²	0.05 W/ft ²	0.05 W/ft ²	0.05 W/ft ²
Building Entrance, Exits and Loading Docks				
Main entries	20 W/lin ft of door width	20 W/lin ft of door width	30 W/lin ft of door width	30 W/lin ft of door width
Other doors	20 W/lin ft of door width	20 W/lin ft of door width	20 W/lin ft of door width	20 W/lin ft of door width
Entry canopies	0.25 W/ft ²	0.25 W/ft ²	0.4 W/ft ²	0.4 W/ft ²
Loading docks	0.5 W/ft ²	0.5 W/ft ²	0.5 W/ft ²	0.5 W/ft ²

Individual Lighting Power Allowances for Building Exteriors (continued)

Sales Canopies				
Free Standing and Attached	0.6 W/ft ²	0.6 W/ft ²	0.8 W/ft ²	1.0 W/ft ²
	Zone 1	Zone 2	Zone 3	Zone 4
Outdoor sales				
Open Areas (including vehicle sales lots)	0.25 W/ft ²	0.25 W/ft ²	0.5 W/ft ²	0.7 W/ft ²
Street frontage for vehicle sales lots in addition to "open area" allowance	No allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot
Non-tradable Surface (LPD calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.)				
Building facades	No allowance	0.1 W/ft ² for each illuminated wall or surface for 2.5 W/linear foot for each illuminated wall or surface length	0.5 W/ft ² for each illuminated wall or surface for 3.75 W/linear foot for each illuminated wall or surface length	0.2 W/ft ² for each illuminated wall or surface for 5.0 W/linear foot for each illuminated wall or surface length
Automated teller machines and night depositories	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location
Entrances and gatehouse inspection stations at guarded facilities	0.75 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.75 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.75 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.75 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")
Loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.5 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.5 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.5 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")	0.5 W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")
Drive-through windows/doors	400 W per drive-through	400 W per drive-through	400 W per drive-through	400 W per drive-through
Parking near 24-hour retail entrance	800 W per main entry	800 W per main entry	800 W per main entry	800 W per main entry

APPENDIX

AFFIDAVIT OF INFRARED HEATER THERMOSTAT MINIMUM 5 DEGREES SETBACK

I, _____, declare that after installing an infrared radiant (IR) heater that I will set the occupied temperature set-point of the proposed IR heater a minimum of 5 degrees less than the current occupied set-point temperature of the previous forced air system (i.e., unit heaters, furnaces, etc). An example would be if a space maintained at 70 degrees by a previous unit heater would now be set-back to a maximum temperature of 65 degrees serving the new IR heater. Please note that in most cases, the thermostat set-point reduction accounts for the majority of the fuel savings of IR heaters over conventional forced air systems.

I further declare that:

I am an authorized representative of company purchasing the new IR heater (i.e., Customer or End User).

Occupied Thermostat Set-Point of the existing forced air system: _____ degree Fahrenheit
Occupied Thermostat Set-Point of the proposed IR heater: _____ degrees Fahrenheit (Must be at least 5 degree Fahrenheit below the existing thermostat set-point).

NAME and ADDRESS OF THE CUSTOMER (COMPANY) RECEIVING THE IR HEATER

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Please note, in order to qualify for an infrared heater incentive from the Consumers Energy Business Solution Energy Efficiency Program, the proposed IR-heater thermostats must be set back a minimum of 5 degrees lower than the previous forced air heating system.

Consumers Energy Business Energy Efficiency Programs

Questions: 877-607-0737 or

ConsumersEnergyBusinessSolutions@cmsenergy.com

Compressed Air Energy Audit Checklist

To assure a timely review and project approval, please complete this checklist. Your system must meet the following requirements:

Compressed air system has a rated horsepower (HP) of at least 50 HP (excluding back-up and non-production compressors).

On-site data collection of the individual compressed air equipment. Data must be logged for a minimum of seven days and the parameters measured must include: power (in kW), pressure and CFM where possible. Data must be provided to Consumers Energy Business Energy Efficiency Program engineer.

A written report containing the following requirements must be submitted with the final application. Please note which page in your report addresses each requirement.

- Page ____ Brief description of the facility's air utilization by process.
- Page ____ A detailed description of each air compressor, which must include: full-load kW, full-load CFM, full-load rated pressure, control mechanism, machine status (i.e., either lead or lag), manufacturer and model number.
- Page ____ Compressed air system has an annual runtime greater than 2,000 hrs./yrs. (excluding back-up).
- Page ____ Description of system storage capacity and demand/flow controllers.
- Page ____ Flow diagram with description of flow path and pressures.
- Page ____ Major compressed air leak detection survey, including: identification, tagging and quantification of air leaks.
- Page ____ Evidence of the completion of repairs detailing: leak location, leak volume and date of repair on a spreadsheet that has been provided. Verification of repairs must include one of the following: repair tickets, work orders and invoices for material and labor. Documentation must indicate what leaks were repaired. 50% by volume of the air leaks identified in the audit have been repaired.
- Page ____ Detailed potential energy/cost savings calculations based on measurements (both from leaks and compressed air system).
- Page ____ Presentation of audit findings and recommendations.
- Page ____ Detailed description of the technology proposed to the customer.
- Page ____ Approximate cost to improve system operation.
- Page ____ Identify the existing and proposed system efficiency in units of CFM/HP.

Non-DLC and Non-ENERGY STAR® Product Approval Form

If requesting to install non-DLC or non-ENERGY STAR lighting, the below approval form must be completed, submitted and approved to qualify for an incentive. A fillable form can be found at CEtradeally.com.



Non-DLC and Non-ENERGY STAR® Product Approval Form

Use this form if your project includes non-DLC and non-ENERGY STAR lighting that meets our evaluation criteria

Since Dec. 1, 2015 lighting not listed by the DesignLights Consortium® (DLC) and/or by ENERGY STAR has not qualified for prescriptive and custom incentives. However, such lighting may now be approved for incentives if it meets any of the following criteria:

1. The product does not fall into a category listed on the DLC and/or ENERGY STAR website.
2. The product is not currently listed but meets the DLC and/or ENERGY STAR specifications.

To receive incentives for non-DLC and/or non-ENERGY STAR listed products, applicants must:

- Use this form to have the equipment evaluated for an incentive award.
- Complete this form for each equipment type along with the supporting technical documentation required and submit it with your reservation application.

The Consumers Energy Program Team must determine that the product meets DLC and/or ENERGY STAR performance criteria. Lighting that fails to meet DLC and/or ENERGY STAR performance criteria is ineligible for Consumers Energy incentives.

LED screw-ins are not eligible for incentives through the Prescriptive Program, as they are incentivized through our [Business Instant Discount Programs](#).

The following information is required to review LED products that are not listed by DLC and/or ENERGY STAR, but may meet our program criteria and be eligible for incentives:

Product manufacturer:

Specific model number being used:

Explanation for installing this specific product:

Technical documentation required (attach to your reservation application, along with this form):

- Specification sheet
- Warranty terms and conditions (if not included on the specification sheet)
- IES-LM-79-08 testing report from an accredited laboratory (see DLC and/or ENERGY STAR websites for more information)
- UL/CUL/ETL certification

Note: You may be required to submit photometry for certain products. Consumers Energy reserves the right to deny an application for incentives based on product reference data. *Funds will be awarded on a first-come, first-served basis; program based on availability of funding and may end at any time; certain other conditions apply; contact office for details.

Consumers Energy
PO Box 1040
Okemos, MI 48805

Business Energy Efficiency Programs
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10152020 v2

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