

# **Consumers Energy Business Solutions Program**

*Everyone has the power to save.*

## **Policies and Procedures Manual** (2011 Program Year)

The Consumers Energy Business Solutions Program provides incentives for business customers who upgrade their facilities with energy efficient equipment. This incentive program is available to all customers who receive electric or natural gas delivery service from Consumers Energy. This document is intended to convey the rules, policies and procedures that govern program administration and customer participation. It is a companion document to the Incentive Application forms.

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## **P.1 PROGRAM OVERVIEW**

Consumers Energy is offering a comprehensive set of incentives under the Consumers Energy Business Solutions Program to facilitate the implementation of cost-effective energy efficiency improvements for business customers.

An overview of the various program offerings is summarized below. The sections that follow provide detailed information on the actual measures and specific program details related to each of the various offerings.

Application forms for all programs are available on the Consumers Energy website: [www.consumersenergy.com](http://www.consumersenergy.com).

### **P.1.1 Incentives**

**Prescriptive Incentives** are available for energy efficiency equipment upgrades and improvements including Lighting, HVAC, Motors and Drives & Miscellaneous. Incentives are paid based on the quantity, size and efficiency of the equipment. Incentives are provided for qualified equipment commonly installed in a retrofit or equipment replacement situation.

**Custom Incentives** are available to customers for less common or more complex energy saving measures installed in qualified retrofit and equipment replacement projects. Custom measure incentives are paid based on the first-year energy (kWh or MCF) savings. Projects where the measures are 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 measures.

Other incentives are available through the **Small Commercial Direct Install, New Construction, Retro-commissioning, Compressed Air, and Self-direct** Programs as well.

## **P.2 PROGRAM EFFECTIVE DATES**

The Business Solutions Program offers incentives for current program year until approved funds are exhausted or until December 31 of each program year, whichever comes first. The effective dates of the Business Solutions Program and application submittal requirements are as follows:

- All 2011 Business Solutions projects must be completed and Final Applications (described herein) received no later than November 30, 2011, to be eligible for the 2011 program incentives.
- Subsequent program year budgets and plans will be made available towards the end of the existing program year. At the current time, Consumers Energy intends to provide this program through the 2014 program year.

### **P.3 CUSTOMER ELIGIBILITY**

The following rules pertain to customer eligibility for the Business Solutions Program:

- This program is available to commercial and/or industrial customers of Consumers Energy. Qualified measures 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 Section P.8 and also as set forth in the Program application.
- For each site there must be at least one meter that is on an eligible rate schedule.
- Common areas of multifamily or mixed-use buildings are eligible if on an eligible rate schedule.
- Customer cannot apply for nor receive incentives for the same product, equipment or service from more than one utility.

### **P.4 PROJECT REQUIREMENTS**

The Business Solutions Program includes the following project requirements:

- Projects must involve a facility improvement that results in a permanent reduction in electrical and/or gas energy usage (kWh and/or MCF)
- Projects that are **NOT** eligible for an incentive include the following:
  - Fuel switching (e.g., electric to gas or gas to electric)<sup>1</sup>
  - Changes in operational and/or maintenance practices or simple control modifications that do not involve capital costs
  - On-site electricity generation
  - Projects that involve peak-shifting with no kWh savings
  - Projects involving renewable energy
- Any measures installed at a facility must be sustainable and provide 100 percent 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.
- Consumers Energy reserves the right to inspect proposed projects pre- and post-equipment installation.
- The Business Solutions team reserves the right to inspect all projects to verify compliance with the program rules and verify the accuracy of project documentation.

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<sup>1</sup> May be eligible under the self-direct program, if overall Btuh are reduced at that facility.

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.

## **P.5 INCENTIVE CAPS AND LIMITS**

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

### **P.5.1 Customer Limits**

The amount of incentives a facility or customer can receive is limited. A facility is defined as contiguous property for which a single customer is responsible for paying the Consumers Energy electricity and/or 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 per facility for custom incentives as shown in the following table.

**Table 5-1: Program Year Incentive Limits**

<b>Facility Incentives</b>	<b>Cap per Program Year</b>
Prescriptive	\$100,000 per facility
Custom	100 percent of the calculated incentive up to \$100,000 per facility
	50 percent of the calculated incentive above \$100,000 per facility
	Maximum \$200,000 custom incentive per facility
<b>Customer Incentives</b>	<b>Cap per Program Year</b>
Large Gas Customers (>100,000 MCF/yr usage)	\$25,000 per facility (gas projects only)
Customer Incentive Limit	\$500,000 per customer

The incentive limits are based on actual payments per facility, and apply even if payments for some or all projects are paid to one or more contractors.

### **P.5.2 Prescriptive Measure Incentive Caps**

For prescriptive measures, no incentives can exceed 100 percent of the cost of the project. Measure 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. The Customer is responsible for providing sufficient documentation to validate the measure costs.

### **P.5.3 Custom Project Incentive Caps**

For custom projects, project incentives cannot exceed 50 percent 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.

## **P.6 PRESCRIPTIVE INCENTIVES**

The Business Solutions Program offers prescriptive incentives for improvements to lighting, HVAC, motors and drives, gas water heaters, and other miscellaneous measures. Full details of the measures, incentive amounts, and equipment specifications are available in the 2011 Business Solutions Program Application. A summary list of measures for reference is shown below.

### **Lighting**

- Compact Fluorescent Screw-in Lamps
- Compact Fluorescent Fixtures
- LED Lamps (replacing incandescent lamps)
- LED Fixtures
- Linear Fluorescent Retrofit (T12 to T8 or T5)
- High Performance & Reduced Wattage Linear Fluorescent Retrofit
- Permanent Lamp Removal (combined with T8 retrofit)
- Exit Sign Retrofit
- LED Traffic & Pedestrian Signals
- Exterior/Garage Lighting Retrofits with LED or Induction
- Interior HID to Fluorescent Conversion

### **Lighting Controls**

- Lighting Occupancy Sensors
- Central Lighting Controls
- Switching Controls for Multilevel Lighting
- Daylight Sensor Controls
- Exterior Lighting Bi-level Control (w/ override)

### **Miscellaneous Electric**

- Energy Efficient Ice Machines
- EC Motor Replacement for Coolers/Freezers
- LED Refrigerated Case Lighting
- Occupancy Sensor for LED Case Lighting
- Beverage Vending Machine Occupancy Controls
- Pre-rinse Sprayers (Electric Water Heat)
- Anti-sweat Heater Controls

- Night Covers
- Network Power Management Software

### **HVAC (Gas)**

- High Efficiency Space Heating Boiler Retrofits
- Boiler Oxygen Trim Control
- Boiler Modulating Burner Control Retrofit
- Boiler Water Reset Control
- Replacement High Efficiency Furnaces
- Pipe Wrap – Steam Boilers
- Infrared Heaters
- Programmable Thermostats
- Guest Room Occupancy Sensors
- Demand Control Ventilation
- Space Heating Boiler Tune-up

### **Miscellaneous Electric (cont'd)**

- Intelligent Surge Protectors
- High Efficiency Clothes Washers
- Compressed Air Engineered Nozzles
- Barrel Wraps for Injection Molding/Extruding Machines
- Variable Frequency Drives

### **HVAC (Electric)**

- Unitary & Split Air Conditioning Systems
- Air Source Heat Pumps
- Room Air Conditioners
- Package Terminal Air Conditioner
- Package Terminal Heat Pump
- Ground Source Heat Pump
- Air Cooled Chiller
- Water Cooled Chiller
- Guest Room Occupancy Sensors
- Demand Control Ventilation
- Programmable Thermostat

### **Miscellaneous Gas**

- Steam Trap Testing
- Steam Trap Repair/Replacement
- Pipe Wrap - Hot Water Boiler
- Low-flow Shower Heads (Gas water heat)
- Pre-rinse Sprayers (Gas water heat)
- Gas Water Heaters
- Tankless Gas Water Heaters
- High Efficiency Swimming Pool Heater
- Pool Covers
- High Efficiency Washing Machines
- Truck Loading Dock/Pit Seals

Forced Air Furnace/RTU Tune-up

Dry Cleaner Boiler Tune-up  
Laundry Ozone Generation System  
Greenhouse Heat Curtains  
Greenhouse Infrared Film  
Wall Insulation  
Roof Insulation  
Flexible Batch Broilers  
Commercial Conveyor Ovens (food processing)

## P.7 CUSTOM INCENTIVES

The Business Solutions Program offers custom incentives for those eligible improvements not included in the prescriptive measure list. Custom measures include measures that result in a reduction in electric and/or natural gas energy usage because of an improvement in system efficiency, i.e. a net decrease in energy use without a reduction in the level of service. For example, installing a lower wattage LAMP in place of a higher wattage lamp OF THE SAME TYPE will not qualify for an incentive. However should the lighting *system* (i.e., lamp, ballast and fixture) demonstrably improve the total lumens per watt delivered, an incentive will be considered. 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 measures include, but are not limited to, the following:

- Water-side and air-side economizer
- Exhaust heat recovery
- Constant volume to variable volume water or air distribution
- Variable-speed control on non-HVAC motors (>50HP)
- Control upgrades or energy management system programming changes
- CO<sub>2</sub> or occupancy-based ventilation controls
- Envelope: window film, insulation, cool roof
- Process improvements
- Floating head pressure controls for industrial refrigeration
- Upgrade of a refrigeration compressor
- Air compressor improvements

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

- Fuel switching (e.g. electric to gas or 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

Incentives for custom measures are based on the electrical and/or gas energy savings that result from the energy efficiency measure installation and are calculated from the first year's kWh or MCF savings. The applicant must provide sufficient back-up descriptive information, equipment performance data, operating assumptions, measurements and calculations to

support the energy savings estimates. Guidelines for calculating custom measure energy savings are in Section P.12.

The payback period has to be between one and eight years. The total calculated incentives cannot exceed half of the measure cost, as described in Section P5.2 above (Project Incentive Caps).

Payback period is calculated with the following equation:

$$\text{Payback period} = \frac{\text{Incremental Measure Cost}^2}{(\text{Annual kWh saved} \times \text{Electricity Rate}) + (\text{Annual MCF saved} \times \text{Gas Rate})}$$

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<sup>2</sup> 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 (a) the type of measure in the application (retrofit, replace on burnout, or new) and (b) 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 an LED exit sign in place of an existing incandescent exit sign.

## P.8 EQUIPMENT SPECIFICATIONS

The following provides the equipment specifications for the measures eligible for incentives. Note: 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: <http://www.michigan.gov/deq/>.

### P.8.1 PRESCRIPTIVE MEASURES

Detailed equipment specifications for Prescriptive Measures are found in the 2011 Business Solutions Program Application. Please refer to the application for details.

For pre-notification applications that do not include manufacturer specific details the following tables represent that default wattages that will be used in calculating energy savings and the associated incentives for lighting projects.

**Default Fixture Wattages (Standard Linear Fluorescent)**

Fixture Description	Default Fixture Wattage
1-lamp, 4-foot F32 T8	31
2-lamp, 4-foot F32 T8	58
3-lamp, 4-foot F32 T8	85
4-lamp, 4-foot F32 T8	112
1-lamp, 8-foot F59 T8	58
2-lamp, 8-foot F59 T8	112
1-lamp, 2-foot F17 T8	20
2-lamp, 2-foot F17 T8	33
3-lamp, 2-foot F17 T8	48
4-lamp, 2-foot F17 T8	63
1-lamp, 3-foot F25 T8	26
2-lamp, 3-foot F25 T8	43
3-lamp, 3-foot F25 T8	78
4-lamp, 3-foot F25 T8	86
1-lamp, 4-foot F28 T5	32
2-lamp, 4-foot F28 T5	65
3-lamp, 4-foot F28 T5	93
4-lamp, 4-foot F28 T5	126

**Default Fixture Wattages  
(High Output and High Performance Linear Fluorescent)**

Fixture Description	Default Fixture Wattage
1-lamp, 4-foot F32 T8 HP ballast	38
2-lamp, 4-foot F32 T8 HP ballast	74
3-lamp, 4-foot F32 T8 HP ballast	110
4-lamp, 4-foot F32 T8 HP ballast	144
6-lamp, 4-foot F32 T8 HP ballast	220
2-lamp, 8-foot T8 HO	160
1-lamp, F54 T5 HO	62
2-lamp, F54 T5 HO	122
3-lamp, F54 T5 HO	185
4-lamp, F54 T5 HO	243
6-lamp, F54 T5 HO	365
8-lamp, F54 T5 HO	486

\*HP = High Power

**Default Fixture Wattages (Metal Halides and High Pressure Sodium)**

Fixture Description	Default Fixture Wattage
32W HID	43
50W HID	72
75W HID	93
100W HID	128
150W HID	190
175W HID	210
250W HID	290
360W PS HID	365
400W HID	455
750W HID	850
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

**P.8.2 Examples of Common Lighting Retrofits**

Examples of the incentives associated with common retrofits found in the commercial sector are shown in the tables below. In order to calculate the incentives for replacing metal halides with new T8 and T5 fixtures, the applicant must provide the wattage reduction from the retrofit.

**Metal Halide to New T8/T5 Common Retrofit Examples**

Existing Measure	Retrofitted Measure	Wattage Reduction
250W MH	3-lamp, 4-foot T5 HO	105
400W MH	4-lamp, 4-foot T5 HO	212
400W MH	6-lamp, 4-foot T5 HO	90
750W MH	8-lamp, 4-foot T5 HO	364
1000W MH	Two 6-lamp, 4-foot T5 HO	350
150-175W MH	3-lamp, 4-foot F32 T8	115
250W MH	4-lamp, 4-foot F32 T8 HP ballast	146
400W MH	6-lamp, 4-foot F32 T8 HP ballast	235
400W MH	8-lamp, 4-foot F32 T8 HP ballast	167
1000W MH	Two 8-lamp, 4-foot F32 T8	504
4-lamp, 8-foot T12 HO	4-lamp, 4-foot T5 HO	177

**P.8.3 Custom Measures**

The Business Solutions Program staff will review each custom application. These measures will be reviewed based on (but not limited to) the following criteria: energy savings, verifiability, cost, measure life, and payback period. All equipment purchased for custom projects must be new. Applicants must provide the calculations documenting the estimated energy (kWh and/or MCF) savings. The calculations, assumptions supporting the kWh and/or MCF impact estimates and the resulting incentive amount are subject to the Business Solutions Program staff review and approval.

**Pre-notification is required for all custom incentive applications.** The pre-notification step provides an assurance that the methodology meets the program requirements. The Applicant must provide sufficient information and calculations to estimate the energy impacts. Business Solutions Program staff engineers will work with customers, their installing contractor or consultant to review the proposed savings methodology and to identify the information necessary to support the savings estimate and to collect any additional data needed to verify the savings.

Measurement and verification activities, including power measurements or monitoring for a period of time prior to and after the measure is installed may be required to document that energy impacts are consistent with the pre-approved estimates. In some cases, Consumers Energy may monitor the energy use of the base case (pre-retrofit) system as well as the post-retrofit system in order to establish the pre-retrofit energy and demand requirements. See Section P.12 and the Business Solutions Program Custom Application for more details.

The final incentive amount will be based on the final savings documented through the Final Application and may include post-retrofit measurement review. This may be greater or less than the savings and/or incentive amount originally estimated in the pre-notification estimate, and may also be limited to the reserved amount based on fund availability.

## **P.9 HOW TO APPLY**

The process of applying for an incentive under the Business Solutions Program is designed to be simple and to involve as few steps as possible. The program staff is available during normal business hours to facilitate the application process.

### ***P.9.1 Pre-notification Application***

Funding is limited and Pre-notification Applications are not a guarantee of program acceptance. Consumers Energy will review final applications for eligibility and completeness.

- A Pre-notification Application **is required** for custom projects.
- A Pre-notification Application **is required** for prescriptive incentive applications for HVAC Energy Management Systems, electrically commutated motor replacement, permanent lamp removal and T8/T5 new fluorescent fixture measures.
- Pre-notification is **strongly encouraged** for all participants in order to pre-approve incentive levels and to reserve funding.
- Pre-notification commits funds for a specific project based on the following criteria:
  - Measures are completely installed within 90 days of project approval from Consumers Energy
  - Customer has committed to commence work on the proposed measures within 30 days of project approval<sup>3</sup>
- It is the responsibility of the applicant to contact the Business Solutions Team if a project is delayed, substantially changed or cancelled.

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<sup>3</sup> The Business Solutions Team reserves the right to contact the customer after the 30-day period has expired to ensure that the project is moving forward. The commitment may be cancelled if progress toward installation is not demonstrated.

- Funds that have been pre-approved for specific applications are not transferable to other projects, facilities/campuses, and/or customers.
- A complete faxed or e-mailed copy of the Pre-notification Application form initiates the review process. Funding reservations are only committed to a given project when the project details have all been approved.
- The Pre-notification Application for prescriptive incentives of prescriptive measures must include sufficient information (equipment specifications, quantities, etc.) to estimate the incentive amount.
- The Pre-notification Application for custom incentives must include an estimate of the annual energy savings, as well as sufficient descriptive information, including equipment performance data, operating schedules, load profiles, assumptions and calculations and other information to support the energy savings estimates.

### **P.9.2 Detailed Program Steps**

- **Step 1. Eligibility Check.** Verify that your project is eligible and meets the project requirements as set forth for customer eligibility (section P.3), project requirements (section P.4), and incentive caps and limits (section P.5).
- **Step 2. Obtain, Complete and Submit a Pre-notification Incentive Application.** Obtain a hard copy or access the Business Solutions application form online at [www.consumersenergy.com](http://www.consumersenergy.com). Complete all the required information as listed on the Incentive Checklist page of the application. Pre-notification is required for custom projects, HVAC Energy Management Systems, electrically commutated motor replacement, permanent lamp removal and new T8/T5 fixtures, and is strongly recommended for other projects. Contractors may complete the form on behalf of their customers, but all of the customer information and a customer contact name must be provided. Upon pre-notification, incentive funds will be secured for up to 90 days. A pre-inspection may be required.

**For projects requiring pre-notification, work should not begin until the customer receives a reservation letter from the Business Solutions team.**

- **Step 3. Project Installation.** Install the equipment or systems within 90 days of reservation.
- **Step 4. Assemble the required documentation of project completion and costs, and (for custom projects) documentation of energy savings within 60 days of**

**project completion.** Obtain copies of the purchase orders or work order, statement of work, equipment specifications, and paid invoices showing the costs for labor and materials for the covered work; labor and materials cost should be shown separately. The documents should clearly indicate the equipment quantities and performance that is indicated in the Incentive Application. If the project equipment is included on several invoices it will be helpful if the Applicant prepares a summary sheet that totals the quantities and shows how the quantities match the quantities in the application.

- **Step 5. Obtain, Complete, and Submit a Final Application. Obtain a hard copy, or complete and print out the Final Application form from the Consumers Energy website: [www.consumersenergy.com](http://www.consumersenergy.com)** (Note that the Final Application form is the same as the Pre-notification Application form. If a Pre-notification Application was submitted, be sure to correct any incomplete or incorrect information and check the “Final Application” box under the application type section. Final Applications must be received within 60 days after project completion or by **November 30, 2011** for the 2011 program year; whichever comes first. For Final Applications, sign and submit only after all equipment has been installed. **A customer signature is required for payment.**

**Final applications must be received within 90 days after reservation date, or 60 days after completion of the project – whichever is less. Final applications submitted after the deadline may not be eligible for incentives.**

- **Step 6. Final Application Review.** The Business Solutions Staff will review the Final Application and the final project documentation. A post-inspection may be required for verification purposes. Please note that the actual incentive amount paid will be based on Consumers Energy’s review of the Final Application and supporting project documentation of equipment installed, and will be subject to program specifications, and terms and conditions in the application agreement. It is essential that the applicant comply with all terms and conditions and ensure that the equipment the applicant installs meets the required specifications. Customers and contractors need to understand and comply with all specifications, terms and conditions. Equipment specifications and program terms and conditions can be found in the program application on [www.consumersenergy.com](http://www.consumersenergy.com). Please note that a reservation does not guarantee an incentive. Multiple projects and reservations for projects at the same premise or customer may be subject to an annual cap.

Incentive payments will be sent within six to eight weeks from the time that all the documentation is received and the field inspection is complete.

- **Step 7. Measurement and Verification.** Some projects will be chosen for independent measurement and verification (M&V) purposes. If so, customer will be contacted by a utility representative. M&V may include obtaining logged data on individual project components.

### ***P.9.3 Discrepancies***

If it is determined that there are significant discrepancies between the incentive application and Consumers Energy's on-site analysis, the Business Solutions Program staff will contact the customer to review these differences. This provides an opportunity for the customer (or contractor) to dispute the inspection results. After a period of **10 calendar days**, if the customer (or contractor) has not contacted Business Solutions Program staff to discuss inspection results, the revised incentive levels will be deemed final. If the customer (or contractor) disputes the inspection results, Consumers Energy's representatives and the customer (or contractor) shall thereupon attempt in good faith to resolve such dispute promptly.

If the project scope has changed or Final Application funding request differs from the Pre-Notification Application reserved funding amount, the project will be reviewed in light of funding availability. Additional funding above the reserved amount can be made available providing funding is available.

### ***P.9.4 Reservation Extension Process***

If the customer receives approval to move forward with a project and it appears the customer will need more than 90 days to complete the project, the customer may provide proof the project is progressing toward completion and request an extension of the reservation. Consumers Energy may grant a 30 day extension after reviewing project details. The granting or denying of the extension request is within the sole discretion of Consumers Energy.

If a customer receives one extension and it appears the project will not be completed until after the first extension has expired, the customer may provide additional proof the project is progressing toward completion and request a second 30 day extension. At the end of the second extension, customer must provide the Final Application, along with all required final documentation. Consumers Energy will not grant subsequent reservation extensions. Incentive payments are subject to funding availability.

### ***P.9.5 Forms***

The Business Solutions Application form acts as both a Pre-notification Application form as well as a Final Application form.

If submitting a Pre-notification Application, check off the relevant documents that will be submitted with the incentive application under the pre-notification header on the Incentive Application Summary page of the application. Mail, fax or e-mail the completed application to the Business Solutions Team for pre-notification and the reservation of funds.

To request payment for a completed project, submit the same form with the relevant attached documents checked off under the “Final Application” heading on the Incentive Application Summary page. The Final Application must be fully completed and returned with an original signature before incentives will be paid. The Final Application must also include all necessary final documentation such as paid, itemized invoices and/or receipts, cut sheets, and commissioning (operation) reports (See Section P.11 below).

**Please note:** Consumers Energy reserves the right to conduct both pre- and post-inspections of all projects.

## **P.10 PAYMENT PROCESS**

For commercial (retrofit) projects, the incentives paid by the Business Solutions Program will be based on either the per-unit, per-kWh, or per-MCF incentives for the prescriptive measures and per-kWh or per-MCF for custom measures.

The Business Solutions **incentive will be paid directly to customers OR to a designated recipient** – please indicate the exact name of the designated payee and the appropriate TAX ID number on the Customer Information page of the Incentive Application, or on the Payment Release Authorization section on the Final Application Agreement page if it is a third-party recipient. If a contractor is to be paid directly, be sure to provide the contractor signature on the Payment Release Authorization section on the Final Application Agreement Page, as well as the Contractor’s TAX ID number. **Incentives cannot be paid unless the TAX ID number is supplied.**

## **P.11 DOCUMENTATION**

For prescriptive measures, the final project documentation required includes detailed invoices listing specific equipment types and quantities purchased. Copies of invoices should be indicated as “paid”, and itemized with the costs for equipment, labor, supplies, and other costs. Location or business name on the invoice should be consistent with the application information. Only expenses incurred during the term of the program (program year) can be reimbursed.

Applicants may be asked to provide more detailed information on the equipment location and to aid in the pre and post-inspection process. Manufacturer’s product literature, product brochures, cut sheets, or other certified performance data for the specific model numbers and sizes of the

equipment installed that documents the performance factors that are used as a basis for the incentive must also be submitted with the Final Application. If the documented capacity or performance differs from the performance in the Pre-notification Application, the incentive will be adjusted accordingly. Failure to provide the documentation will delay the payment process and may result in no incentive payment.

For custom measures, final documentation may include plans or specifications for the equipment or systems that are modified, paid invoices, equipment specification sheets or other information indicating performance over the full range of operation, documentation of operating schedule and loading profiles, commissioning reports or other documentation required by the Business Solutions engineering staff. Power or other operating measurements or monitoring may be required for verification of calculated energy savings prior to approval of incentive payments. See Section P.12 for guidelines on calculating and documenting energy savings of custom measures.

All Final Application must be fully complete with final documentation and have an original signature of the customer and, if applicable, the designated third party recipient of the incentive. Applications must be received by **November 30, 2011** to apply for the 2011 program.

## **P.12 GUIDELINES FOR CALCULATING AND DOCUMENTING ENERGY SAVINGS OF CUSTOM MEASURES**

The incentives for Business Solutions Program's custom projects are based on the calculated annual kilowatt-hour (kWh) or MCF savings. To be accepted as a basis for the incentive, the savings calculations must be developed using acceptable engineering calculation techniques supported by site-specific operating and equipment performance documentation. Applicants must also be aware that the incentive estimates are not final until after the measures have been installed and Consumers Energy has performed various measurement and verification (M&V) activities. The final incentive payment may be different from the reserved amount if the post-retrofit system operation or performance does not reflect the assumptions used to set the reserve amount.

The guidelines provide suggestions for submitting project documentation to insure that your project qualifies as a Business Solutions custom measure and the savings estimates and incentive applied for are actually realized. This section provides information to assist you in calculating/measuring energy savings associated with your project.

The analysis methods and documentation details are recommendations and not requirements. These guidelines should help speed our review of your project by helping you meet the program requirements and by helping you complete energy savings calculations.

Before you submit your application as a custom project, please check that the measures are not included as part of our prescriptive program and if so, submit them on a prescriptive application. Before you begin your savings estimate, identify the project payback period as well as the measure life. Life of the measure for custom applications should exceed the project payback period. Both of these factors will determine if the measure is eligible for the program as well as identify the applicable incentive. If there is any concern on qualifying for the program, please contact the program team for assistance.

For certain projects, in addition to energy savings calculations, the program may require measurement and verification (M&V) in order to qualify for an incentive. We encourage custom incentive applicants to review the International Performance Measurement and Verification Protocol (IPMVP) ([www.ipmvp.org/download.html](http://www.ipmvp.org/download.html)) and review documents available through a web search on “Measurement and Verification” for some good discussion of the concepts behind project performance measurement. Any operational data that you have available to support the energy usage claims for your project can help validate your savings calculations so please provide this data with your application. If you need assistance in identifying appropriate M&V procedures, the program team can assist you.

The following sections discuss general guidelines for project submittals. It is recommended that the applicant contact the Business Solutions Program Team as you prepare your custom application, to discuss the data and documentation requirements, M&V requirements and savings estimation approach.

### ***P.12.1 General Guidelines***

To estimate first year energy (kWh or MCF) savings for retrofit projects, calculate the difference between the pre-retrofit or “base case” system energy (kWh or MCF) use and the post-retrofit or “efficient case” system kWh or MCF. First you need to define and describe the base case and efficient case system and operating conditions. The kWh and MCF savings calculations can be done in a number of ways that will depend on the specific measure that is installed and the percentage of the total usage that the savings represents.

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

- Concise project description: Describe BOTH the existing (pre-retrofit or “base case”) system and the proposed (post-retrofit or “efficient-case”) system. Be as precise, yet concise as possible in the descriptions — include specific quantities and equipment descriptions.
- Provide the quantity, make, model number and rated capacity of BOTH the existing and the new equipment that is being installed. Also provide other nameplate information like

operating voltage and rated full load amps where appropriate. **The scope of work from the proposal to the customer is often helpful to describe the new equipment.**

- Provide copies of the manufacturer's specification sheets and/or performance rating sheets and the website address where further technical information about the equipment performance might be found.
- Identify equipment using the terminology or numbering system used by the customer. (e.g. "Replace compressor #3 with a new variable speed compressor" or "install a VFD on VAV AHU #3,5,7,8,9").
- Provide copies of sketches, drawings, equipment lists, or inventories that help to clarify the scope.
- Describe the locations where the equipment is installed.
- Describe BOTH the facility operating hours and the equipment operating schedule for each day of the week. Where equipment operation varies with days of the week or seasons, be sure to provide a description of the operation for all days of the week and all seasons.
- Describe equipment load conditions for the hours the equipment typically operates.
- Annotate all assumptions or constants used in engineering calculations.
- Provide the name of the person(s) conducting the savings calculations so that the Business Solutions Staff can discuss any questions.
- Use accepted engineering algorithms and procedures from recognized technical organizations such as ASHRAE, SMACNA, ANSI, etc.
- Use rated performance factors tested under accepted procedures specified by recognized rating agencies such as ARI, AGA, ANSI, ASTM, etc. Provide an explanation when equipment performance rating conditions vary from standard conditions.
- Provide expected measure life

### ***P.12.2 Acceptable Calculation Methods***

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

### ***P.12.3 Whole Building Metering***

For some projects, where the savings are a significant fraction (10 percent or more) of the total monthly (or annual) kWh or MCF usage, a "bills before minus bills after" approach may be used. This approach assumes that conditions are identical before and after the project, such as

building occupancy levels or operating hours. Usually, a regression must be included in this approach to adjust for uncontrolled variables, such as weather.

- If a whole system or building model is used, be sure to provide sufficient documentation or annotation so that the differences in inputs between the base case and high-efficiency case can be understood and verified by the reviewers.
- Models that do not reflect the actual systems and their operation (i.e. defaults are used instead of building-specific equipment) are not acceptable.
- Whole building models should be calibrated to actual energy use (electric or gas bills) and use typical weather data, such as TMY<sup>4</sup> for weather calibration.

#### ***P.12.4 Equipment or Process Sub-Metering***

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

#### ***P.12.5 Engineering Calculations***

For measures with impacts over several small systems, sub-metering may be impossible. For these measures, an engineering calculation method is probably the simplest method to document savings. For most equipment types and efficiency measures there are well-established engineering procedures and there are a number of public domain component or equipment performance models that are available to calculate pre- and post- energy use. One common modeling method is the “bin-method” in which the equipment pre- and post-energy requirements are identified for several fractional load “bins” (i.e. 25 percent, 50 percent, 75

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<sup>4</sup> Typical Meteorological Year (TMY) values are a data set of hourly values of solar radiation and meteorological elements for a 1-year period. The intended use of TMY data is for computer simulations of solar energy conversion systems and building systems to facilitate performance comparisons of different system types, configurations, and locations in the United States and its territories. TMY data represents typical rather than extreme conditions and is not suited for designing systems to meet the worst-case conditions occurring at a location. Definition adapted from the National Solar Radiation Data Base, link: [http://rredc.nrel.gov/solar/old\\_data/nsrdb/tmy2/](http://rredc.nrel.gov/solar/old_data/nsrdb/tmy2/) accessed, 14 October 2009.

percent and 100 percent load or temperature range bins) and the pre- and post-equipment performance in each load or temperature bin is applied to the loads and hours that the system operates in the bin over the year.

### ***P.12.6 Whole Building Modeling Methods***

For measures that have building-wide impacts or impacts across a number of systems, engineering modeling using generally accepted **public domain** software is acceptable to document savings. When using any model, the applicant must provide both the base case and post-case input files and annotate the files to clearly show how the differences between the pre- and post-retrofit systems are being simulated. Initial savings estimates that are submitted based on manufacturers' proprietary performance models may be acceptable for initial estimates of savings but additional information and actual on site operating data or measurements verifying the model assumptions will usually be required to confirm the final savings. Applicants who expect to use modeling to estimate savings as a basis for the incentive should contact the program staff early in the project development process.

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

### ***P.12.7 Custom Lighting Measures***

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

1. Project description – for example, “Replace 200 – 400 watt hi-bay HID lighting fixtures in the warehouse with 220 suspended 6-lamp high output T8 fixtures equipped with daylight controls.”
2. Provide a detailed lighting inventory that includes the following):
  - Location (area, aisle #, etc.)
  - Existing and new fixture description
  - Existing and new fixture wattage
  - Existing and new fixture quantity
  - Existing and new controls
  - Existing and new annual operating hours (different if installing controls)
  - Interior or exterior fixtures
3. Provide the electrical plan sheet that shows the existing and proposed lighting layout or a reflected ceiling plan and the lighting fixture schedule, when available.
4. The use of standard “default” fixture wattages is acceptable. A table of “default” fixture wattages for common fixture/lamp types is available upon request. If the fixture type being

installed is not on the table, specification sheets showing the wattage of all retrofit fixtures must be provided with the lighting inventory.

5. In addition to the above requirements, custom Light-emitting Diode (LED) lighting projects must include the following documentation in order to be considered for an incentive.
  - a. Proof of a 3+ year warranty
  - b. Manufacturer specification sheets
  - c. LightingFacts Label (if available)
  - d. LM-79 test documents (if available)
  - e. LM-80 test documents (if available)
  - f. DesignLights Consortium Qualified

Use the following general equations to calculate the savings.

**Base Case Lighting kW** = [( # base case fixtures \* base case fixture wattage \* fraction of fixtures that are typically operating) / (1000 watts/kW)]

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

**Post Retrofit Lighting kW** = # post-retrofit fixtures \* kW per fixture \* fraction of fixtures that are expected to be operating

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

**Annual kWh Savings =**

(Base case lighting kWh – post retrofit lighting kWh) \* HVAC interaction effect

### Other Guidelines

When preparing the project information, please consider:

- Operating hours are typically the operating hours of the facility except as noted below. If the lighting is on a different operating schedule from the facility, consider using lighting or power data loggers to document the fixture operating hours.
  - Exit signs and emergency lighting and many hallway and stairway fixtures are typically on 24 hours a day, 7 days a week, and therefore use 8,760 hours per year if you have a project that involves these technologies that falls outside of the prescriptive program
  - In order to provide more accurate operation hours, consider dividing the fixtures into usage groups – offices, common areas, restrooms, conference rooms, etc. to define operating hours by usage group
- Pre-retrofit and post-retrofit operation hours are often the same. However, if the project includes the installation of control technologies such as occupancy sensors, timers, etc.,

new (lower) hours of operation usually result. Justification for the lower hours should be provided.

- Installing a lower wattage lamp of the same type is NOT considered an eligible measure unless it can be established that the replacement fixture is more efficient (i.e. the lumens per watt) than the fixture that it replaces
- There may be cases when the program team will ask for validation of operating hours.
- Be aware that Consumers Energy will check for inconsistencies between the quantities of fixtures used in the savings calculation, shown in the invoice documentation and observed in the post-inspection.

### **P.12.8 Custom HVAC Measures**

Note that some of the most common HVAC measures are included in the list of prescriptive measures. These measures, including HVAC chiller or packaged AC unit replacement and variable frequency drives (VFDs or VSDs) for HVAC motors should be applied for under the prescriptive application. Common custom measures that may be applied for under the Custom HVAC Category might include:

- Water-side economizer, also know as “free cooling” (e.g. plate and frame heat exchanger, closed-loop tower, or “glycooler”)
- Air-side economizer
- Exhaust heat recovery equipment (heat exchangers)
- Constant volume to variable volume water or air distribution
- Variable-speed control of centrifugal equipment (other than HVAC fans or pumps) that are throttled by less efficient means
- Control upgrades or energy management system programming changes. To qualify for a Custom incentive, an energy management system needs to include a strategy not included in the standard specification.
- CO<sub>2</sub>- or occupancy-based (demand-based) ventilation controls

Most (but not all) HVAC system measures are weather-dependent. As such, the preferred methods of estimating energy savings are building or system models that integrate local weather conditions with system loads and performance or “temperature bin” models. This section includes several acceptable methods for providing the savings analysis for HVAC measures. In all cases, it is important to document the pre- and post-retrofit conditions thoroughly. For most projects, the analysis will need to be calibrated and adjusted to reflect the weather variances, occupancy variations or internal load changes.

The following techniques may be employed for calculating project savings:

- Building models that are publicly available and well-documented, such as eQUEST, Energy Plus, and DOE2 are recommended for measures with building-wide or interactive effects. Proprietary vendor programs such as Trane Trace, Carrier HAP etc. may be accepted with appropriate documentation; without good documentation, these models cannot be utilized and offer little confidence in the results<sup>5</sup>.
- ASHRAE-based simplified calculation methodologies including the “bin methods” are usually useful to estimate the savings of many weather-dependent strategies such as economizer systems (water and air), heat recovery, ventilation control, or even VAV conversions. These methods can be easily calculated in a spreadsheet format so that the underlying assumptions can be easily followed. In many cases for retrofit projects the existing building energy use and energy use patterns can provide the basis for calibration for these methods.
- Simple spreadsheet analysis may be used for certain stand-alone retrofits such as carbon monoxide sensors for parking garages.
- For certain projects, a monitoring/metering approach may be the best means to document savings. The applicant should remember that it is simpler to verify the post-case, but it is the base case condition that requires documentation for program verification. Be sure to consider pre-project measurements when planning a future project. The following are some suggestion parameters for measuring pre- and post-retrofit:
  - Power (kW), energy (kWh), gas use (MCF)
  - Air flows, temperatures, water flows
  - Outdoor temperatures and humidity (however may be available from other sources)
  - Building activity (people, hours, etc)

### ***P.12.9 Custom Building Envelope Measures***

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

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

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<sup>5</sup> The Saving Solutions review team may attempt to duplicate savings estimates using other tools and must be provided sufficient information to do so.

Accurately estimating envelope improvement measure energy savings is often difficult because their impacts involve a high degree of system and interactive effects. The best way to estimate the impacts of envelope treatments is to use a whole building model as described in the previous section. The models described provide the opportunity to describe the pre- and post-retrofit insulation and surface characteristics and do an excellent job of including all the system and any interactive effects.

However, setting up a whole building model to estimate the savings for envelope improvements is often not practical. There are a number of simplified degree-day or weather-based “bin analysis” methods that are sufficient to estimate the impacts of these measures. These methods are described in detail in the ASHRAE Handbooks. ASHRAE combined with local weather data files will provide most of the information and calculation procedures necessary to estimate savings resulting from building envelope measures. Some of the more common methodologies have been put into spreadsheet format and are available commercially online. The Department of Energy and some states have supported the development of analytical tools that are useful in isolating the savings for various envelope improvements such as the Cool Roof Rating Council (<http://www.coolroofs.org/>) tool. It is useful in estimating the impacts of roof insulation and treatments. The performance characteristics and properties of various coatings and materials are also provided.

### **P.12.10 Custom Process and Refrigeration Measures**

Some typical measures that may fall in this category are:

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

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

- **Short-term pre- and post-retrofit measurements extrapolated by production.** Energy use for process systems can often (but not always) be related to production output. One method to document annual savings is to compare the pre- and post-retrofit systems over a representative production period (which may include multiple shifts) and then extrapolate the results to a full year. The method is as follows:
  - Determine the pre-retrofit system kWh per unit of production per shift/production run/equipment cycles, as appropriate.
  - Determine the post-retrofit kWh per unit of production per shift/production run/equipment cycles, as appropriate.
  - Adjust the baseline using the post-retrofit production levels.
  - Extrapolate to a full year by multiplying the difference by the annual production.
- **Short-term measurements extrapolated by shifts or operating time.** In some cases the energy use does not relate to production, but to equipment operating time or availability instead. In this case the savings are similar to the above except the time in days or number of shifts is the factor used to extrapolate the savings to the full year.

- **Short-term monitoring extrapolated to a year.** A short term pre- and post monitoring of a week or two can be carried out and the results extrapolated to a full year based on time. The difference is then multiplied by the ratio of annual hours to the monitored hours.
- **Post-retrofit energy monitoring and calculated base case energy, extrapolated to a full year.** This method is useful when the performance or efficiency of the base case equipment is known, but the load profile was not monitored prior to the project. This method often applies to compressed air systems or large refrigeration systems. In this case, the post-retrofit system power and output (cfm or tons) is measured for a period of a week or more. The base case power for the same period is then calculated by multiplying the output by the base case equipment performance. The savings are then extrapolated to a full year by extrapolating based on the projected loading pattern.

#### ***P.12.11 Unacceptable Documentation***

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

- Vendor-specific or proprietary analysis software will not be accepted unless the methods used are available for review and the input parameters are specific to the site.
- Simple percent of total kWh or MCF savings or percent of end use energy savings are not acceptable.
- Factors or percentages of savings achieved at other sites are not acceptable as documentation for custom savings unless there is an extensive body of statistically valid results.
- Using rules of thumb for calculating savings is not acceptable.
- Marketing materials from the manufacturer or distributor, their company's case studies, or savings claims based on non-standardized methods are not acceptable. For example, a manufacturer or distributor product savings claim that is not or was not verified by a certified third party will not be accepted.
- For intermittently operating equipment, the hours of operation must be documented in some fashion – either from logs, elapsed time meters, or daily observation of occupancy hours. If documentation is not provided, very conservative estimates must be used.
- Spot measurements as documentation of power or energy use are typically not acceptable for variable load equipment.
- Amperage can often be used as a proxy for true power (kW) measurements EXCEPT for systems where the power factor may vary significantly and often in variable speed drive

situations (where the voltage may vary as well as the amperage). Contact the Business Solutions Team to verify monitoring needs where VSDs are installed.

## **P.13 DEFINITIONS**

**BEF:** Ballast Efficacy Factor

**Btu/h:** British Thermal Units per hour

**CEE<sup>®</sup>:** Consortium of Energy Efficiency<sup>®</sup>

**CFL:** Compact Fluorescent Lamp

**COP:** Co-efficient of Performance

**Customer:** The customer is the organization under which the company (or companies) are owned or operated, regardless of who is responsible for paying the bill.

**EER:** Energy Efficiency Ratio

**Facility:** The primary criterion for determining the extent of a site is necessary for the incentive cap. A facility is defined as a customer at a single address having contiguous property.

**Final Application:** Once the project has been completed, the applicant is to submit a copy of the Application form with any information not completed in the Pre-Notification Application. The Final Application must include a signature and all appropriate backup documentation, including detailed invoices.

**IPLV:** Integrated Part Load Value

**LED:** Light-emitting Diode

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

**MLPW:** Mean Lumens per Watt

**Pre-notification:** Pre-notification is the process of informing the program team of your project plans for pre-notification based on customer eligibility and project requirements. Pre-notification is required for all custom projects, for prescriptive projects with incentives for HVAC Energy Management Systems, electrically commutated motor replacement, all permanent lamp removal and the fluorescent T8 or T5 new fixture measures.

**PTAC:** Package Terminal Air Conditioner

**Program Year:** The program year starts on January 1, 2011 and ends on December 31, 2011.

**THD:** Total Harmonic Distortion

## **P.14 SATISFACTION**

Consumers Energy strives to ensure a high level of satisfaction with all aspects of the program. However, if any problems or concerns should arise, we encourage you to contact Business Solutions Program Hotline: 1-877-607-0737.

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

## **P.15 TAX IMPLICATIONS**

Paid incentives that exceed \$600 are reported to the IRS on Form 1099. Incentive payments may have tax implications for businesses and/or contractors who receive them. The recipient is responsible for any and all tax payments that may result from an incentive payment. Participating businesses and contractors are encouraged to consult their accountant or tax experts to determine implications.

## **P.16 DISCLAIMER**

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



## **P.17 CONTACT INFORMATION**

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