DTE Energy's Energy Efficiency Program for Business

2012 Policies and Procedures Manual

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

Please contact DTE Energy's Energy Efficiency Program for Business staff with any questions.

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P.1 PROGRAM OVERVIEW

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

The following sections 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 DTE Energy's Energy Efficiency Program for Business website: dteenergy.com/saveenergy.

P.1.1 Incentives

Prescriptive Incentives are available for energy efficiency equipment upgrades and replacements such as lighting, HVAC, and gas water heating. Incentives are paid based on the quantity, size, and efficiency of the equipment. Incentives are provided for one-for-one replacements, retrofits or new installations of qualified equipment. For example, replacing a 4-lamp, 4', T12 lighting fixture with a 4-lamp, 4', T8 lighting fixture is a listed prescriptive measure.

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 involving measures not covered by the prescriptive incentive portion of the program may be eligible for a custom incentive. For example, adding a variable frequency drive to a primary chilled water pump is not listed as a prescriptive measure, and may therefore be submitted as a custom measure.

Customers may put prescriptive and custom measures on one application. Mixed incentives are available to customers with energy efficiency projects containing both prescriptive and custom components. Prescriptive incentives must be applied to the prescriptive portions of the project and custom incentives applied to the custom portions. For example, when installing exterior LED lighting with bi-level controls, the exterior LED lighting is eligible for a prescriptive incentive. However, the bi-level control incentive applies only to HID lighting; therefore the controls on LED lighting would be handled as a custom measure.

P.2 PROGRAM EFFECTIVE DATES

DTE Energy's Energy Efficiency Program for Business offers incentives for a current program year until approved funds are exhausted or until November 30th of each program year, whichever comes first. To be eligible for the current program year's incentive levels, all work must be completed and final application submitted with all required documents including specifications and invoices by November 30th of the current program year or by the application reservation end date, whichever comes first. (Refer to section P.9.1 for more detail)

P.3 CUSTOMER ELIGIBILITY

Customer eligibility parameters for DTE Energy's Energy Efficiency Program for Business are as follows:

- This program is available to commercial and/or industrial business customers of DTE Energy. Customers that are billed on non-residential rates are classified as business customers.
- Qualified measures must be installed at facilities served by DTE Energy and projects must result in an improvement in energy efficiency.
- Equipment must be new and meet the specifications as set forth in the Program Application.
- For each site, there must be at least one meter that is on an eligible rate schedule.
- Customers must be in good standing prior to final application being processed. A final check of account status will be completed for all applicants. If a customer is not in good standing, they will be advised that they have 30 days, from date of contact, to get account into good standing or the application will be cancelled.

This program is not available to DTE Energy business customers in multifamily buildings consisting of five or more units per building. These customers may be eligible to participate in the **Multifamily Program** for energy saving upgrades to both tenant and common areas.

P.4 PROJECT REQUIREMENTS

Project requirements for DTE Energy's Energy Efficiency Program for Business include the following:

- Projects must involve a facility improvement that results in a reduction in electrical and/or natural gas energy usage (kWh and/or MCF), due to an increase in efficiency, for the life of the product.
- Equipment must be new and project savings must be sustainable for a period of five years or for the life of the product, whichever is less.

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

- Fuel switching (e.g., electric to natural gas or natural gas to electric or purchased steam to natural gas projects)
- 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 (5) years or for the life of the product, whichever is less.

If the customer ceases to be a delivery service customer of DTE Energy, or removes the equipment or systems at any time during the 5-year period or the life of the product, the customer may be required to return a prorated amount of incentive funds to DTE Energy.

DTE Energy reserves the right to inspect proposed projects' pre- and post- equipment installation.

P.5 INCENTIVE CAPS AND LIMITS

Incentives are subject to limits to encourage equitable distribution of the funds among as many utility customers as possible.

P.5.1 Facility/Customer Limits

Program incentives are limited per facility, per year and per customer. Customer incentive limits are across all facilities under one tax identification number. A facility is defined as any single meter or multiple meters on a single property for which a single customer is responsible for paying the DTE Energy electricity and/or natural gas bill.

Customers installing eligible electric measures may receive up to $150,000 per project or facility per program year for electric measures; the total customer cap (across all facilities saving electricity) is $500,000 per program year. Customers installing eligible natural gas measures may receive up to $100,000 per facility per program year for natural gas measures with projects being capped at $25,000; the total customer cap (across all facilities saving natural gas) is $100,000 per program year.

Table 5-1: Program Year Incentive Limits

Cap Level	Electricity	Natural Gas
Facility	$150,000	$100,000
Project	$150,000	$25,000
Customer	$500,000	$100,000

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

P.5.2 Custom Project Incentive Caps

In addition to the incentive limits above, incentives for custom projects are limited to 50% of the sum of all custom measure costs (MC). Internal customer labor costs cannot be included in the total project cost. Used equipment is not eligible. DTE 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

DTE Energy's Energy Efficiency Program for Business offers prescriptive incentives for energy efficient improvements in areas of lighting, HVAC, gas water heaters, industrial processes, food service, and other miscellaneous measures. Prescriptive incentives are available for one-for-one change outs, replacements, or upgrades unless explicitly stated otherwise in the Program Application.

For verification on prescriptive incentive amounts or specifications please see the Program Application.

The following is a list of prescriptive measures that can be found in the Program Application:

TABLE 6-1: LIST OF ELIGIBLE PRESCRIPTIVE MEASURES

Electric Measures

Lighting
Compact Fluorescent Screw-in Lamps (CFL)
(CFL)Reflector Flood Lamps
Compact Fluorescent Fixtures
ENERGY STAR® Qualified LED Lamps
Standard Linear Fluorescent Retrofit (T12 to T8)
T12/T8 U-Bulb Retrofit
High Output (HO) Linear Fluorescents (T12HO to T8HO)
High Performance (HP) and Low Wattage (LW) Linear fluorescents
Interior High-Intensity Discharge (HID) to Fluorescent Fixtures
Garage/Exterior High-Intensity Discharge (HID) Conversion
Exit Signs Retrofit
LED Traffic Signals
Occupancy Sensors
Central Lighting Controls
Switching Controls for Multilevel Lighting
Daylight Sensor Controls
Exterior Lighting Bi-level Control w/Override
Light Tubes (Daylighting)
Delamping

HVAC Electric
Unitary and Split Air Conditioning Systems
Air Source Heat Pumps
Water Loop Heat Pumps
Room Air Conditioners
Package Terminal Air Conditioner & Heat Pump
Ground Source Heat Pump
Ground Source Heat Pump - Air Source Base
Air-Cooled Chiller
Water- Cooled Chiller
Programmable Thermostat (Air Conditioning)
Energy Management System for Chilled Water
Setback/Setup Controls (Air Conditioning)
Hotel Guestroom Energy Management System (Air Conditioning)
Chilled Water Reset - Air Cooled
Chilled Water Reset - Water Cooled
Variable Frequency Drive - HVAC Fan/Pump
Economizer
Cool Roof
High Performance Glazing
Window Film

Misc Electric
Beverage Vending Machine Controllers
Intelligent Surge Protector
Energy Efficient Ice Machines
High Efficiency Clothes Washer

Process Electric
High Efficiency Pumps
Variable Frequency Drive on Pumps
Compressed Air Engineered Nozzle
Barrel Wraps for Injection Molders & Extruders
Insulated Pellet Dryer Ducts

Food Service & Refrigeration Electric
Energy Star Commercial Solid Door Refrigerators
Energy Star Commercial Solid Door Freezers
Replacement Steam Cookers
Replacement Hot Holding Cabinets
Anti-Sweat Heater Controls
Efficient Refrigeration Condenser
Floating Head Pressure Controls
ECM Motor for Refrig. Cases, Freezers and Coolers
Evaporator Fan Motor Controls
LED Refrigerated Door Case Lighting
Refrigerated Case Night Covers

Natural Gas Measures

Gas
Steam Traps
Space Heating Boilers
Boiler Modulating Burner Control
Boiler Reset Control
High Efficiency Furnace
Pipe Wrap - Steam and Hot Water Boiler
Infrared Heaters
Chilled Water Reset
Variable Frequency Drive on Secondary Chilled Water Pump
Roof Insulation
Programmable Thermostat
Energy Management System For Chilled Water
Setback/Setup Controls (Gas Heat)
Demand Controlled Ventilation
Hotel Guestroom Energy Management Control
Indirect Domestic Hot Water Heating System
Gas Water Heater
Gas Tankless Water Heater
Domestic Hot Water Pipe Wrap
High Efficiency Pool Heater (Gas Heat)
Pool Covers
High Efficiency Clothes Washer
Greenhouse Heat Curtain
Greenhouse Infrared Film
Truck Loading Dock Seals- New Installation
Truck Loading Dock Leveler Ramp Air Pit Seals
Ozone Laundry System
High Efficiency Process Boiler (Water)
High Efficiency Process Boiler (Steam)
Dry Cleaning Boiler Descaling (Kettle-Type)
Dry Cleaning Boiler Descaling (Tube-Type)

Boiler- Furnace Tune-up
Boiler Tune Up
Process Boiler Tune-up
Furnace/RTU Tune-up

Food Service Gas
Replacement Steam Cookers
Replacement Ovens
Replacement Fryers/Griddles
Furnace Tube Inserts
Pre-Rinse Sprayers (Gas Water Heat)
Night Covers (vertical)

P.7 CUSTOM INCENTIVES

DTE Energy's Energy Efficiency Program for Business allows for custom incentives for 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 due to an improvement in system efficiency, (i.e. a net decrease in energy use without a reduction in the level of service). For example, installing a lower wattage lamp in place of a higher wattage lamp OF THE SAME TYPE 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 DTE Energy.

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

- Exhaust heat recovery

- Constant volume to variable volume water or air distribution
- Process improvements
- Upgrade of a refrigeration compressor
- Air compressor improvements
- Energy Management Systems for DX systems

Projects that are **NOT** eligible for an incentive include, but are not limited to, 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

Incentives for custom measures are based on the first year's electrical and/or natural gas energy savings that result from the energy efficiency measure installation. The applicant must provide sufficient project 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 natural gas and electric incentives are shown in Table 7-1. The simple payback period must be between one and eight years. The total eligible custom incentive will not exceed 50% of the measure cost, as described in Section P.5.2 above (Custom Project Incentive Caps).

Table 7-1: Custom Incentives

Incentive	$0.08/kWh or $4.00/MCF
Minimum Payback Period	One Year
Maximum Payback Period	Eight Years

Simple payback period is calculated as follows:

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

P.8 EQUIPMENT SPECIFICATIONS

All final applications must include manufacturers' specification sheets. Lighting applications must include manufacturer's specification for lamps (light bulbs) and ballasts. All incentives are for one-for-one replacements except as noted.

Note: All replaced 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

To verify prescriptive measure specifications please refer to the Program Application, which can be found at the following website: dteenergy.com/saveenergy

P.8.2 Custom Measures

Reservation of incentives is required for all custom Reservation Applications (please see P.10.1 for definition of Reservation Application) prior to site work being conducted. Reservation provides an assurance that the methodology meets the program requirements. The applicant must provide sufficient information and calculations to estimate the energy impacts. DTE Energy's Energy Efficiency Program for Business staff engineers are available to work with customers, their installation contractor and/or consultants to review the proposed savings methodology and to identify the information necessary to support the savings estimate and verification activities. In some cases, power measurements or monitoring may be required for a period of time before and after the measure is installed in order to confirm that actual energy savings are consistent with the estimates. All final incentive amounts will be based on the estimated first year energy savings documented in the Final Application and may be greater or less than the incentive amount originally estimated in the Reservation Application. Final incentive amounts cannot be greater than the reserved amount once 100% of the program funds have been allocated. See Section P.12 for additional details on approaches to energy modeling for custom incentives.

Custom projects must involve a facility improvement that results in a permanent reduction in electrical (kWh) and/or natural gas energy usage (MCF) due to an increase in system efficiency. Projects that result in reduced energy consumption 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.

Custom and prescriptive measures may be included on one application. Mixed measures, those with both prescriptive and custom aspects, must be separated into prescriptive and custom components. Prescriptive measures are only eligible for prescriptive incentives and custom measures are only eligible for custom incentives.

For custom measures, incentives are limited to 50% of the sum of all custom measure costs (MC) and the simple payback period (SPP) for installing the measures must be between 1 and 8 years. The MC is the cost of implementing a measure less any costs incurred to achieve non-energy related project benefits. Simple payback period is defined as the project measure cost divided by the annual energy cost savings. Only costs associated with the rebated energy savings measure should be included in the MC. The MC is the basis for determining the simple payback period for custom measures and is defined as:

1. For retrofit and new technology measures, the cost of new equipment, components or materials added to existing equipment for the purpose of improving its energy efficiency; or

2. For non-functional or end-of-life equipment replacement measures, the cost differential between equipment meeting program efficiency criteria and equipment meeting the minimum efficiency allowable by code or industry standard.

For example, when replacing an existing injection molding machine that is at the end of its useful life with a new, high efficiency model, the price differential between the high efficiency model and a standard efficiency model is the MC. However, when adding a variable frequency drive (VFD) to an existing boiler pump or when changing high pressure sodium light fixtures to fluorescent fixtures, the MC is the installed cost (equipment and outside labor installation) of the VFD or light fixtures.

P.9 HOW TO APPLY

The process of applying for an incentive under DTE Energy's Energy Efficiency Program for Business is designed to be simple and to involve as few steps as possible. The Program Application can be found at the following website: dteenergy.com/saveenergy.

The Program staff is available during normal business hours, 8:00am-5:00pm, to facilitate the application process. For assistance, please call the Energy Efficiency Program for Business team at 866.796.0512.

There is only one Program Application form but there are two distinct ways in which a Program Application is handled. Reservation Application refers to a Program Application that is submitted, prior to project completion, for the purpose of assessing the proposed project for conformance and **reserving incentive funds**. The Reservation Application does not include a DTE account holder's signature and may be lacking some supporting documentation, including dated, itemized invoices and manufacturer's specifications.

Final Application refers to a Program Application that is submitted, after a project has been completed, for the payment of incentive funds. The Applicant is to submit a copy of the application form with any information not submitted with the Reservation Application. The Final Application must include a DTE account holders signature and all appropriate supporting documentation, including dated, itemized invoices and manufacturer's specifications.

P.9.1 Reservation Application

Funding is limited and Reservation Applications are not a guarantee that incentives will be provided. Actual incentives are based on Final Applications. DTE Energy will review all Final Applications for eligibility and completeness.

A Reservation Application **is required** for all Custom projects **and de-lamping measures**. A Reservation Application is **strongly encouraged** for prescriptive projects. A Reservation Application reserves funds for a specific project provided that:

- Measures are completely installed within 90 days of project approval
- Work commences on the proposed measures within 30 days of project approval

It is the responsibility of the applicant to contact DTE Energy's Energy Efficiency Program for Business team if a project is delayed, substantially changed or cancelled.

Funds that have been reserved for specific applications are not transferable to other projects, facilities/campuses, and/or customers.

A completed, mailed, faxed, or emailed copy of the Reservation Application form initiates the review process. Funds are only reserved for a given project when the project details have all been approved.

The Reservation Application for prescriptive measures must include sufficient information (quantities, etc.) to estimate the incentive amount. The Reservation Application for custom measures must include a project description, equipment performance data, operating

schedules, quote for proposed change, load profiles and an estimate of the annual energy savings.

P.9.2 Detailed Program Steps

Step 1. Eligibility Check. Verify that your project is eligible and meets the project requirements as set forth in 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 Reservation Application. Obtain a hard copy or access DTE Energy's Energy Efficiency Program for Business Application form on-line at dteenergy.com/saveenergy. Complete all the required information as listed on the Incentive Checklist page of the application. A Reservation Application is required for custom projects and is strongly recommended for other projects. Contractors may complete the form on behalf of their customers, but all of the required information and a DTE Energy customer contact name must be provided.

For all projects requiring a Reservation Application, a pre-inspection may be required prior to the start of work. If a pre-inspection is required for your project, you will be notified by Program staff.

Following application review, a reservation letter will be provided for all reserved projects. Reservation letters are not a guarantee that incentives will be provided. Actual incentives are based on Final Applications that meet all program criteria.

Step 3. Project Installation. Install the new equipment or systems within **90 days** of reservation.

Step 4. Obtain, Complete, and Submit a Final Application. Obtain a hard copy, or complete the electronic version and print out the Final Application form from the DTE Energy website: dteenergy.com/saveenergy. Note that the Final Application form is the same document as the Reservation Application form. If a Reservation Application was submitted, be sure to update any information and verify that the application reflects the equipment and quantities actually installed. Check the "Final Application" box under the Application Type section. **A DTE account holder signature on the Final Application Agreement page is required for payment.** Submit the signed Final Application only after all equipment has been installed. Submit the Final Application along with all necessary supporting documents including manufacturers' specifications, itemized invoices and any additional documentation that may be required. The documents should clearly indicate the equipment model numbers, quantities and energy performance that is indicated in the Reservation Application. Labor and material costs should be shown separately. 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. **Final Applications must be received within 60 days after project completion, by reservation end date or by November 30th of the program year; whichever comes first.** Program funds are limited and submission of a Final Application does not guarantee an incentive payment unless funds were set aside previously, based on an approved Reservation Application and resulting reservation letter, and all criteria of this document are met.

Step 5. Final Application Review. DTE Energy's Energy Efficiency Program for Business 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 review of the Final Application and supporting project documentation of equipment installed, and will be subject to program specifications, terms and conditions. It is essential that both customers and contractors understand and comply with all specifications and program terms and conditions. Equipment specifications and program terms and conditions can be found on dteenergy.com/saveenergy. Please note that a reservation does not guarantee an incentive. Multiple projects and reservations for projects at the same facility or customer may be subject to an annual cap.

Incentive payments will be sent within 4 to 6 weeks from the time that all the documentation is received and the field inspection is complete.

Step 6. Measurement & Verification. Some projects will be chosen for measurement and verification (M&V) independent from DTE Energy's Energy Efficiency Program for Business purposes. If so, the 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 Reservation Application and DTE Energy's on-site analysis, the processing staff will contact the customer to review these differences. This provides an opportunity for the customer (or contractor) to dispute the inspection results. If the customer (or contractor) disputes the inspection results, DTE Energy's representatives and the customer (or contractor) shall thereupon attempt in good faith to resolve such dispute promptly. After a period of **10 calendar days**, if the customer (or contractor) has not contacted DTE Energy's Energy Efficiency Program for Business Staff to discuss inspection results, incentive levels will be revised to coincide with DTE Energy's on-site findings and will be deemed final.

P.9.4 Reservation Extension Process

If the customer receives approval to move forward with a project but requires more than 90 days to complete the project, the customer may provide proof the project is progressing towards completion and request an extension of the reservation. DTE Energy's Energy Efficiency Program for Business staff may, but are not required to, grant an extension after reviewing project details. Length of extensions granted will depend on project type. The granting or denial of an extension is within the sole discretion of DTE Energy. Up to two (2) 30-day extension requests can be granted. When the second extension expires, the customer must immediately provide the Final Application, along with all required final documentation to claim reserved funds. DTE Energy will not grant subsequent reservation extensions, and incentive payments will be subject to funding availability.

P.9.5 Forms

DTE Energy's Energy Efficiency Program for Business Application form acts as both a Reservation Application form as well as a Final Application form.

If submitting a Reservation Application, use the Checklist page to check off the relevant documents that are being submitted with the Application. Mail, fax or email the completed application to DTE Energy's Energy Efficiency Program for Business Team for reservation of funds consideration.

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 Checklist page.

The Final Application must be fully completed and returned, with an original DTE account holder signature, before incentives will be paid. Signed applications received by fax or email will be treated the same as original applications received by mail. 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.10 below).

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

P.9.6 Waitlist

If the current year program becomes oversubscribed in any category (e.g. prescriptive natural gas), any new application submitted in that category will be put onto a waitlist and the customer notified of their project's waitlist status. Should funds become available during the remainder of that program year, that application will be taken off the waitlist and processed in the current program year in the order in which it was received.

If your project is still on waitlist at the end of the program year, and all funds have been paid, DTE Energy's Energy Efficiency Program for Business team will assist you with the transition of your application to the next program year as long as the project will not be completed until after November 1st of the current program year.

If the waitlisted project is completed before November 1st of the current program year, the project will not be eligible for the following program year funds and will be cancelled.

P.10 PAYMENT PROCESS

DTE Energy's Energy Efficiency Program for Business **incentives will be paid directly to a DTE account holder OR to a designated recipient.** Indicate the exact name of the designated payee and the appropriate Tax ID Number on the Customer Information page of the Reservation Application, and on the Payment Release Authorization section on the Final Application Agreement page only if there will be direct payment to a third-party. The DTE account holder must sign the Payment Release Authorization section on the Final Application Agreement Page and provide a Tax ID Number.

P.11 DOCUMENTATION

For prescriptive and custom measures, the required final project documentation includes detailed, itemized invoices listing specific equipment model numbers and quantities purchased. Copies of invoices must be itemized with the costs for equipment, labor, supplies, and other costs. Location or business name on the invoice must be consistent with the application information. Incentives will only be submitted for eligible expenses incurred during the term of the program.

Applicants may be asked to provide more detailed information on the equipment location 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 used as a basis for the incentive) must be submitted with the Final Application. If the documented capacity or performance differs

from the performance in the Reservation 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 energy use history plans or specifications for the equipment or systems that are modified, paid itemized 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 DTE Energy's Energy Efficiency Program for Business engineering staff. Power or other operating measurements or monitoring may be required for verification of estimated energy savings prior to approval of incentive payments. See Section P.13 for guidelines on calculating and documenting energy savings of custom measures.

All Final Applications must be complete with all required documentation and have an original signature of the DTE account holder. **Final Applications must be received within 60 days after project completion, by reservation end date or by November 30th of the program year; whichever comes first.**

P.12 Guidelines for Calculating and Documenting Energy Savings of Custom Measures

These guidelines provide suggestions for submitting project documentation to demonstrate that your project qualifies as a DTE Energy's Energy Efficiency Program for Business 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.

These analysis methods and documentation details are recommendations, not requirements. Following these guidelines will help speed our review of your project and help you meet the program requirements.

The incentives for custom projects are based on the calculated first year kilowatt-hour (kWh) or 1,000 cubic feet of natural gas (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 data. The final incentive payment may be different from the reserved amount if the post-retrofit system operation or performance is not in agreement with the assumptions and models used to set the reserve amount.

Before submitting an application for a custom project, confirm that the measures are not included in the list of prescriptive measures.

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) available at (www.ipmvp.org/download.html). Any operational data that you have available to support the energy usage claims for your project can help validate your savings calculations, so provide this data with your application. If you need assistance in identifying appropriate M&V procedures, contact the program team for assistance.

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 anticipated post-retrofit or efficient case system kWh or MCF. The applicants must define and describe the base case and efficient case system as well as operating conditions.

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

- Provide the **name and contact information** of the person(s) conducting the savings calculations so that DTE Energy's Energy Efficiency Program for Business Staff can discuss any questions.
- 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.
- **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 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.
- 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.**
- Describe the **locations** where the equipment is installed.
- 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.
- Use accepted engineering algorithms and procedures from recognized technical organizations such as ASHRAE, SMACNA, ANSI, etc.
- Annotate all assumptions or constants used in engineering calculations.
- 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.

Acceptable Calculation Methods

Whole Building Metering

For 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, production rates 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 between the base case and high-efficiency case can be understood and verified by the reviewers. Whole building metering models must be calibrated to actual energy use (electric or natural gas bills) and be normalized for weather and other known variances.

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.

Engineering Calculations

For measures with impacts over small and simple systems, sub-metering may not be feasible. For these measures, an engineering calculation method is best to document savings. For most equipment and efficiency measures there are well-established engineering procedures and there are a number of publicly available performance models that are available to calculate pre- and post- energy use.

Whole Building Modeling

For measures that have building-wide impacts or impacts across a number of systems, engineering modeling using generally accepted, commercially available, DOE approved software is acceptable to document savings. When using any model, the applicant must provide a report showing both the pre- and post-upgrade input and output data. Models that do not reflect the actual systems and their operation (i.e. defaults instead of building-specific equipment) are not acceptable. 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 planning to use whole building models to estimate savings as a basis for the incentive should contact the program staff early in the project development process.

P.12.2 Custom Lighting Measures

The following is an example of what should be provided when submitting custom lighting measures:

System Description

Before Retrofit	After Retrofit
220 quantity – 400 watt HID lighting fixtures (455 Watts each) in the warehouse, operating 3,000 hours per year	200 quantity – 3-lamp T5 HO fixtures (185 Watts each) in the warehouse, operating 3,000 hours per year

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
- Annual operating hours
- Interior or exterior fixtures
- 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.

The use of standard default fixture wattages is acceptable. Default fixture wattages for common fixture/lamp types are available upon request.

Use the following general equations to calculate the savings:

Base Case Lighting kW = [(# base case fixtures **X** base case fixture wattage **X** fraction of fixtures that are typically operating) / (1,000 watts/kW)]

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

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

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

Annual kWh Savings = Base case lighting kWh – post retrofit lighting kWh

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, emergency lighting and many hallway and stairway fixtures are typically on 24 hours a day, 7 days a week; and therefore, are in use 8,760 hours per year.

In order to provide more accurate operation hours, consider dividing the fixtures into usage groups (e.g. offices, common areas, restrooms, conference rooms, etc.) to define operating hours by usage group.

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 (the lumens per Watt must be the same or greater than) than the fixture that it replaces.

There may be cases when the program team will ask for validation of operating hours.

Be aware that the review team 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.12.3 Custom HVAC Measures

Note that many 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 (e.g. plate and frame heat exchanger, closed-loop tower, or "glycooler")
- Exhaust heat recovery equipment (heat exchangers)
- Conversions from constant volume to variable volume for water or air distribution
- Adding variable-speed control to centrifugal equipment (other than HVAC fans or pumps) that are throttled by less efficient means
- Control upgrades or energy management system programming changes[1]. To qualify for a custom incentive, an energy management system needs to include a strategy not included in the list of prescriptive measures

Most (but not all) HVAC system measures are weather-dependent. As such, the acceptable 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 and/or internal load changes.

The following techniques may be employed for calculating project savings:

- Building models that are publicly available and well-documented, such as eQUEST, Energy Plus, and DOE2 are recommended for measures with building-wide or interactive effects.
- Proprietary vendor programs, such as Trane Trace or Carrier HAP, may be accepted with appropriate documentation. Without sufficient documentation, these models cannot be utilized and offer little confidence in the results[2].
- 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.
- Simple spreadsheet analysis may be used for certain stand-alone retrofits such as carbon monoxide sensors for parking garages.

These methods can be calculated in a spreadsheet format so that the underlying assumptions can be easily followed. In many retrofit projects, the existing building energy use and energy use patterns can provide the basis for calibration for these methods.

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

[1] Except for measures listed as prescriptive measures.
[2] The Energy Efficiency Program for Business review team may need to duplicate savings estimates using other tools and must be provided sufficient information to do so.(Refer to section P12.6)

pre-project measurements when planning a future project. The following are some suggested parameters to be measured pre- and post-retrofit:

- Power (kW), energy (kWh), natural gas use (MCF)
- Air flows, temperatures, water flows
- Outdoor temperatures and humidity (may be available from other sources)
- Building activity (people, hours, etc.)

*P.12.4 **Custom Building Envelope Measures***

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

- Insulation (wall, cracked sealing)
- Door or window opening treatments that reduce infiltration
- Shading (windows or building)

Accurately estimating energy savings resulting from envelope improvement is often difficult because 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. Modeling provides the opportunity to describe the pre- and post-retrofit insulation and surface characteristics and do an excellent job of including all 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.12.5 **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 cooling tower, or "glycooler")
- Waste heat recovery equipment (heat exchangers)
- Constant volume to variable volume water or air distribution
- Upgrade of a refrigeration compressor
- Air compressor improvements
- Injection molding replacement
- Evaporator fan controller on a walk-in cooler and freezer
- Replacement of entire existing refrigerated display cases with new energy efficient cases

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, measurement 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 sometimes be correlated to production output. One method to document annual savings is to compare the pre- and post-retrofit systems over a representative production period (which may include multiple shifts) and then extrapolate the results to a full year. The method is as follows:

- Determine the pre-retrofit system kWh per unit of production per shift, production run or equipment cycles, as appropriate.
- Determine the post-retrofit kWh per unit of production per shift, production run or 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. 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 full 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.12.6 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 has not been verified by a certified third party will not be accepted.

For intermittent 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, as in variable speed drive situations (where the voltage may vary as well as the amperage). Contact DTE Energy's Energy Efficiency Program for Business Team to verify monitoring needs where VSDs are installed.

P.13 DEFINITIONS

Applicant: The entity, either the customer or the customer's representative, submitting the Reservation Application.

BEF: Ballast Efficacy Factor.

Btu: British Thermal Unit; a measure of energy.

Btu/h or Btuh: British Thermal Units per hour; a measure of power.

CEE: Consortium of Energy Efficiency©; the consortium of EE program administrators develop initiatives to promote the manufacture and use of EE products.

CFL: Compact Fluorescent Lamp.

COP: Coefficient of Performance; measure of efficiency for HVAC equipment measured in Btu/h_{out} / Btu/h_{in}.

CRI: Color Rendering Index; the measure of the ability of a lamp to accurately render colors.

Customer: The utility customer-of-record responsible for paying the utility bill(s) for the principal account (the account with the largest kWh or MCF consumption) that is affected by the project. The primary criterion for determining the customer is the Account Name and Tax ID Number.

Custom Project: A project comprised of efficiency improvement measures which are not included in the List of Eligible Prescriptive Measures.

DTE Account Holder: See Customer

EER: Energy Efficiency Ratio; measure of rating point efficiency for small HVAC equipment measured in Btu/h_{out} / $Watts_{in}$

Facility: A single meter or multiple meters on a single property for which a single customer is responsible for paying the DTE Energy electric and/or natural gas bill

Final Application: This term refers to a Program Application that is submitted, after a project has been completed, for the payment of funds. The Applicant is to submit a copy of the application form with any information not submitted with the Reservation Application. The Final Application must include a DTE account holders signature and all appropriate supporting documentation, including dated, itemized invoices and manufacturer's specifications.

HVAC: Heating, Ventilation and Air Conditioning

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

IPLV: Integrated Part Load Value; measure of efficiency for larger HVAC equipment during a cooling season

LED: Light Emitting Diode; type of lamp.

Lighting Fixture: Apparatus attached to a building to hold lamps and ballasts. The fixture is defined by the number of lamps it holds, regardless of the number of ballasts used.

LPW: Lumens per watt; lamp efficiency or efficacy.

MBtu/h or MBH: 1,000 Btu/h

MMBtu/h or MMBH: 1,000,000 Btu/h

MC: The Measure Cost (MC) is the cost of implementing a measure less any costs that would have been incurred to achieve all of the project benefits, except those resulting in the rebated energy savings. The MC is:

1. For retrofit and new technology measures; the cost of new equipment, components or materials added to existing equipment for the purpose of improving its energy efficiency; or,

2. For non-functional or end-of-life equipment replacement measures, the cost differential between equipment meeting program efficiency criteria and equipment meeting the minimum efficiency allowable by code or industry standard.

For example, when replacing an existing injection molding machine that is at the end of its useful life with a new, high efficiency model, the price differential between the high efficiency model and a standard efficiency model is the MC. However, when adding a variable frequency drive to an existing boiler pump or when changing high pressure sodium light fixtures to fluorescent fixtures, the MC is the installed cost (equipment and installation) of the VFD or light fixtures.

MCF: 1,000 cubic feet.

Mixed Project: A project comprised of efficiency improvement measures, some of which are included in the List of Eligible Prescriptive Measures and some of which are not.

MLPW: Mean Lumens per Watt.

PF: Power Factor; ratio of (electrical) working power to total power measured in kW/kVA.

Prescriptive project: A project comprised solely of measures included in the List of Eligible Prescriptive Measures.

Program Year: The duration of the program in that given year. The program year starts on January 1 and ends on November 30th of that year.

PTAC: Package Terminal Air Conditioner.

Reservation: The process of submitting a Reservation Application form for approval of your project plans. Reservation is required for all custom projects and strongly encouraged for prescriptive projects.

Reservation Application: This term refers to a Program Application that is submitted, prior to project completion, for the purpose of assessing the proposed uncompleted project for conformance and reserving incentive funds. The Reservation Application does not include a DTE account holders signature and may be lacking some supporting documentation, including dated, itemized invoices and manufacturer's specifications.

Reservation End Date: Date on which a customer's reservation is cancelled unless an extension has been granted. If a reservation spans more than one program year, eligible incentives are paid according to the incentive schedule in place at the time the completed Final Application is submitted along with all required supporting documentation.

THD: Total Harmonic Distortion; a measure of the relative distortion of the fundamental current/ voltage caused by lighting ballasts and other non-linear loads.

TMY: Typical Meteorological Year.

VFD: Variable Frequency Drive; a system for controlling the rotational speed of an alternating current (AC) electric motor by controlling the frequency of the electrical power supplied to the motor.

VSD: Variable Speed Drive; an electronic device that controls the rotational speed of a piece of motor-driven equipment (e.g., a blower, compressor, fan, or pump). For the purposes of this program VSD is synonymous with VFD.

P.14 SATISFACTION

DTE Energy's Energy Efficiency Program for Business Team will take every possible step to ensure a high level of satisfaction with all aspects of the program. However, if any problems or concerns should arise, we encourage you to contact DTE Energy's Energy Efficiency Program for Business Hotline at 866.796.0512.

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 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

Neither DTE Energy, nor any of its affiliates, guarantees the energy savings or makes any warranties associated with the measures eligible for incentives under this program. DTE 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. Payment of incentives is for the installation of energy-saving equipment only and does not guarantee or imply that the equipment installation complies with any state or local code. DTE Energy has no obligation to pay any incentive described herein unless the minimum requirements of the Program have been met and funds allocated for such incentives are available for distribution.

P.17 CONTACT INFORMATION

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Website:	dteenergy.com/saveenergy
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