



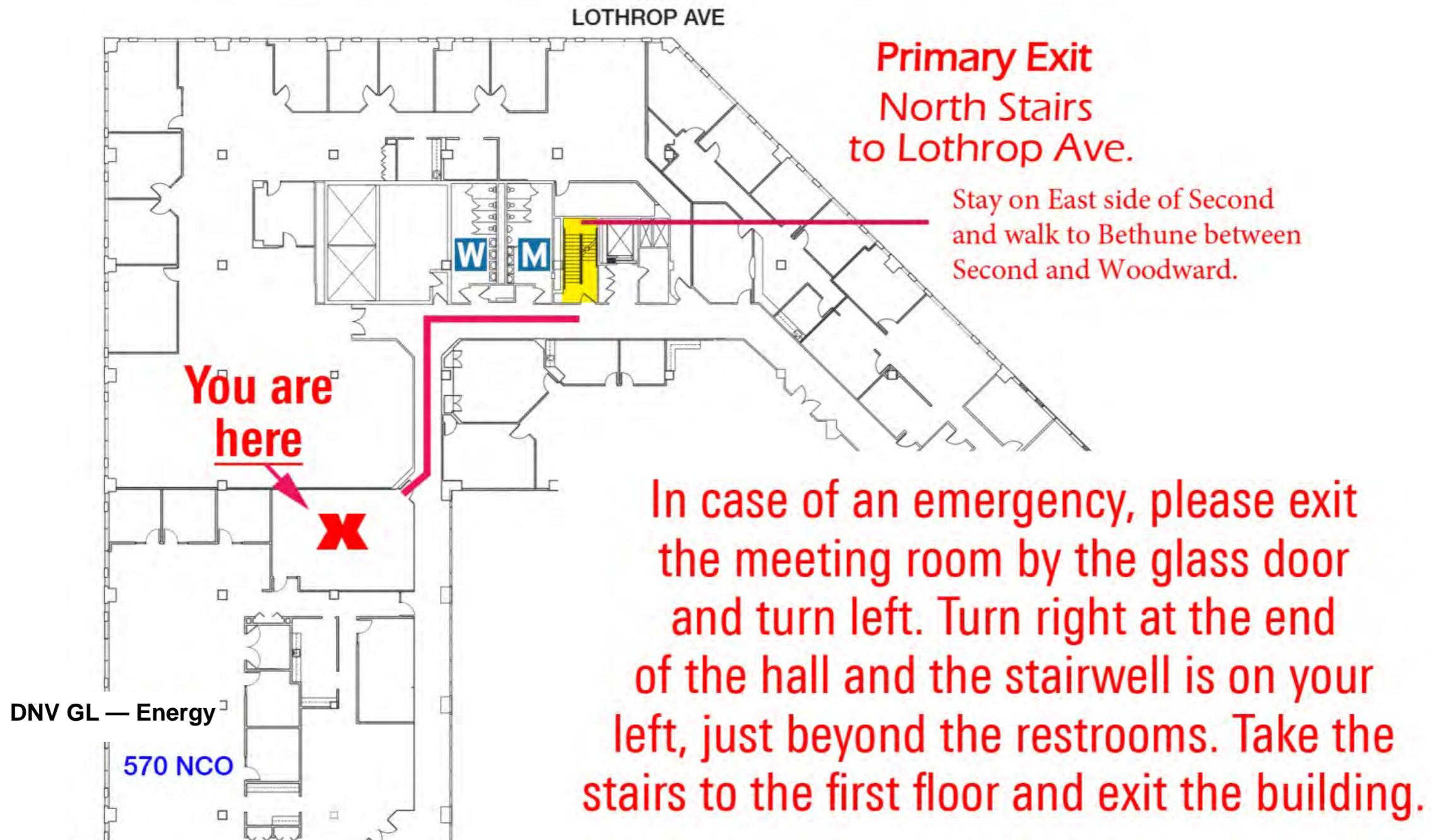
2014

Energy Efficiency Program for Business

Custom Project Training



Safety First





Agenda

1 p.m. - Sign-in, safety review

1:10 p.m. - Program Overview

Custom Project Application

Custom Project - Lighting

Custom Project - Large Custom Project
(Non-Lighting)

2:30-3 p.m. - Engineer 1 on 1

(Open Forum/Specific Project Questions)



There are three types of Application

Prescriptive

- **Predetermined** measures and incentives for the installation of various energy efficient improvements.
- Incentives typically average 20% to 50% of the incremental cost.

Custom

New Construction Major Renovation

- **New facilities/major renovations** of existing facilities or change of use projects.
- Adding load.



We're going to cover...

Prescriptive

- Prescribed measures and incentives for the installation of various energy efficient improvements.
- Incentives typically average 20% to 50% of the incremental cost.

Custom

- Capital investment projects that increase energy efficiency and are **NOT** eligible for a Prescriptive Incentive may qualify as a Custom Measure.
- Custom Incentives are determined on a case-by-case basis and are paid per unit energy saved (ex: \$0.08/kWh and/or \$4/Mcf).

New Construction Major Renovation

- New facilities/major renovations of existing facilities or change of use projects.
- Adding load.



Custom Projects

Project Reservation Application:

1. Submit a Reservation Application!
2. Work with the Program Reviewer to gather all relevant data.
3. Submitting full documentation with project indication will improve project timeline.
4. All Custom projects require a Reservation Application!



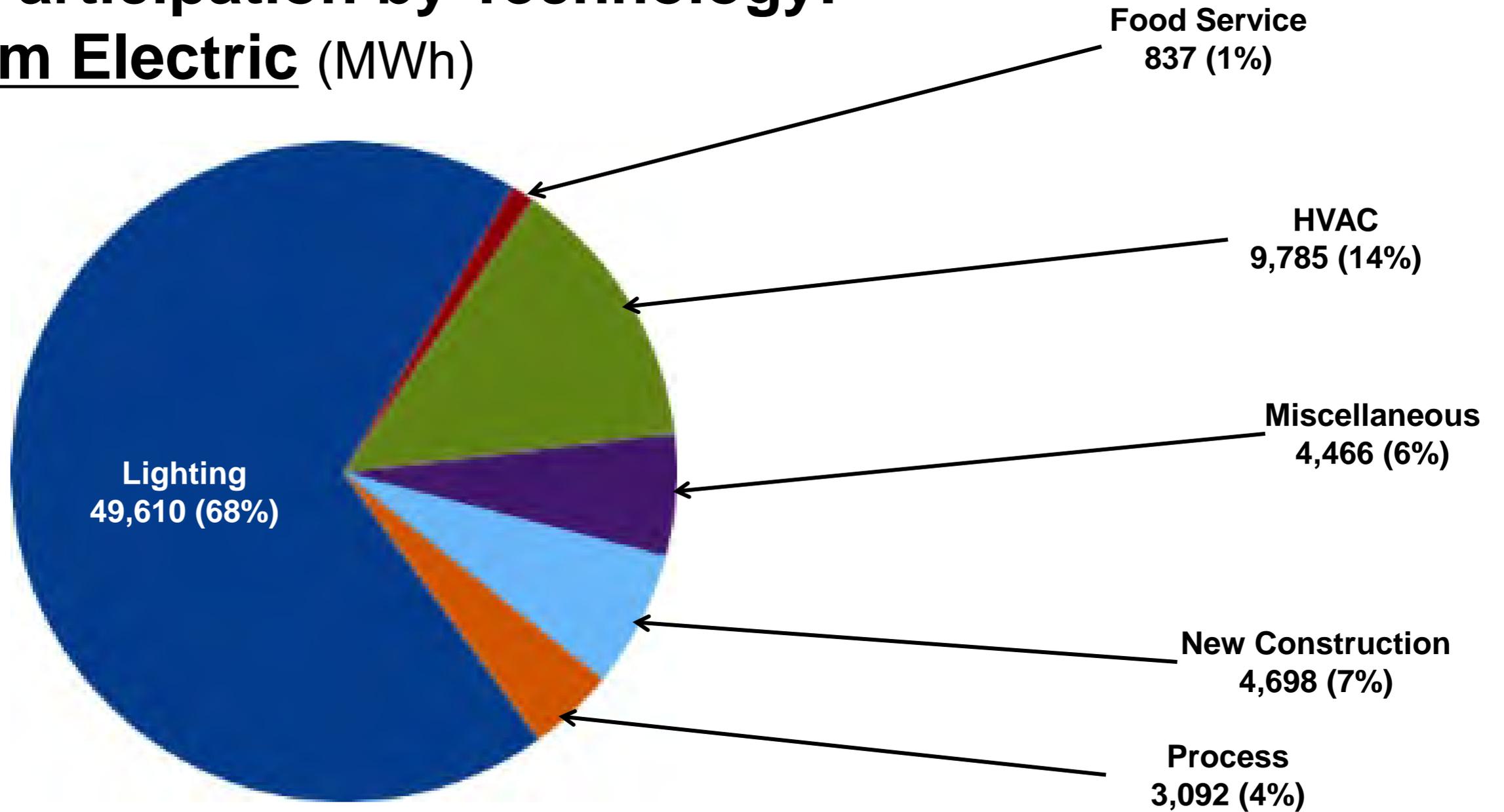
Since 2009*

- *More than **\$66 million** in cash rebates have been paid to Michigan businesses.*
 - **Electric: \$58.7 million • Gas: \$7.7 million**
- *More than **23,850 projects** have been completed.*
- *More than **1,470 GWh** and **3.6 million Mcf** have been realized in energy savings.*
- *More than **\$142 million** has been realized in energy savings.*

*As of Sept. 30, 2013



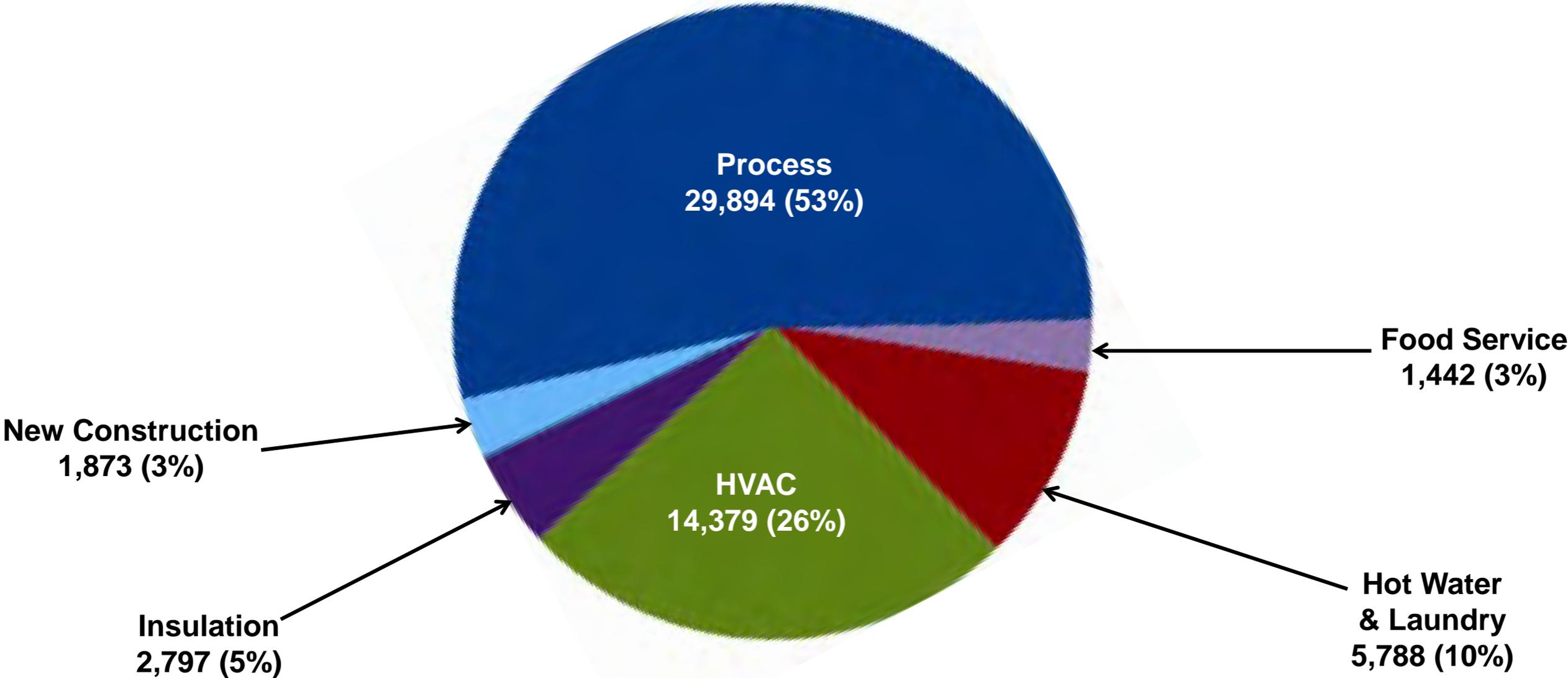
2013 Participation by Technology: Custom Electric (MWh)



*As of Sept. 23, 2013; does not include DI and Tstat



2013 Participation by Technology: Custom Natural Gas (Mcf)



*As of Sept. 23, 2013; does not include DI and Tstat



Our Program timeline is simple:

Reservation Application

Application Review (may require pre-inspection)

Reservation Letter issued (Proceed with project)

Install Measures

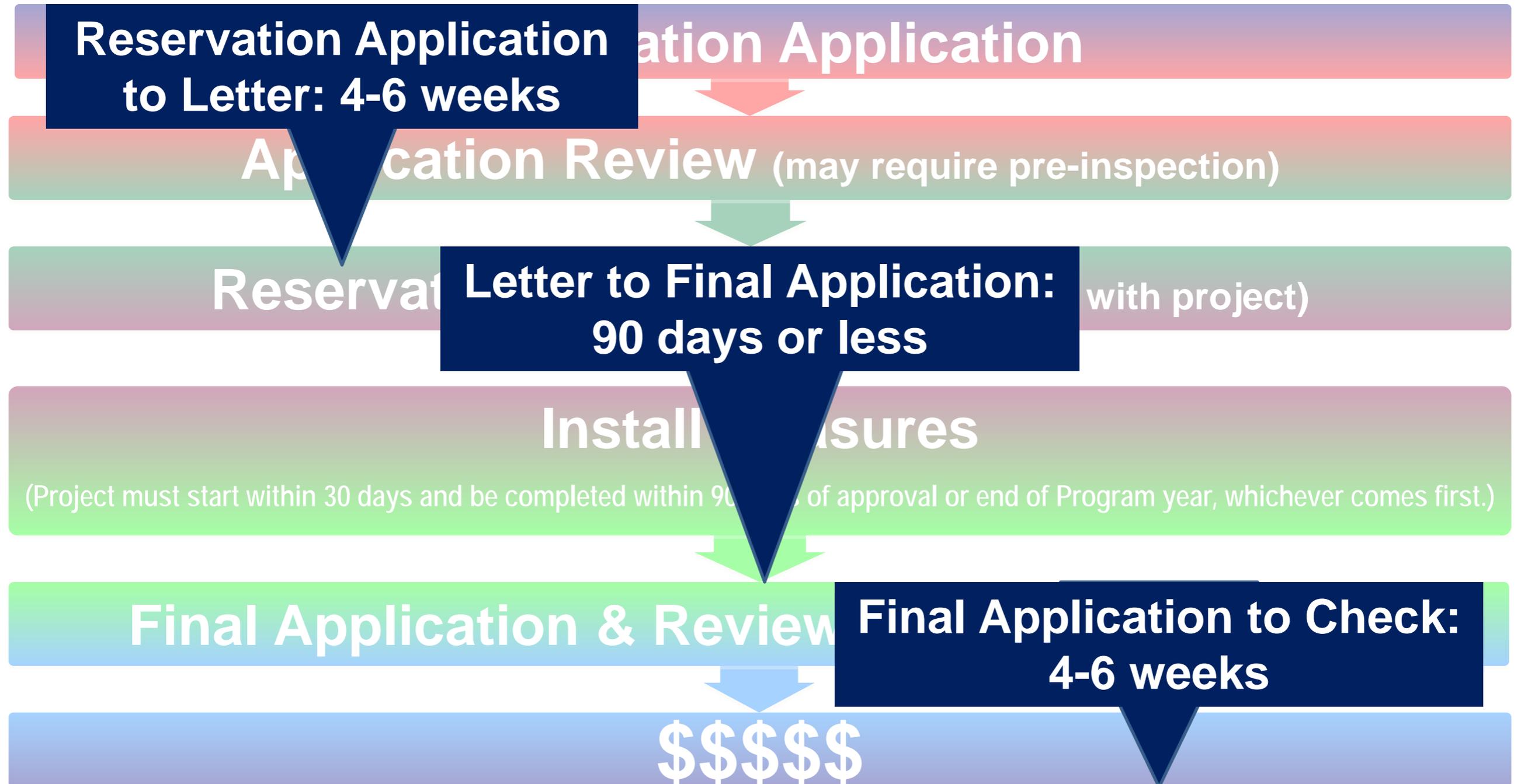
(Project must start within 30 days and be completed within 90 days of approval or end of Program year, whichever comes first.)

Final Application & Review (may require post-inspection)

\$\$\$\$\$



Our Program timeline is simple:





Custom Incentives

	Electric	Gas
Incentive Rate	\$0.08/kWh	\$4/Mcf
Maximum incentive	50% of measure cost	50% of measure cost
Simple Payback Period	≥ 1 year to ≤ 8 years	≥ 1 year (no upper limit)

Completing a Custom Application



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Completing a Custom Application

IMPORTANT: If you fail to complete each section, **check the appropriate category** or enter all required information, the worksheet will not calculate your incentive and carry the value to Page 6.

Ref# 27-1

Description							
Before Retrofit				After Retrofit			
Hours used per year (a)		kW (b)		Hours used per year (c)		kW (d)	

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		

Elec.	Category	Gas
<input type="checkbox"/>	Lighting	<input type="checkbox"/>
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	<input type="checkbox"/>
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive (from Total Awarded Incentive below)



Custom Form Requirements

• Description:

- Before and After Retrofit:
 - Complete Equipment or Process Description

Ref# 27-1

Before Retrofit	Descrip

• Hours used per year:

- Before and After retrofit operating hours

Hours used per year (a)		kW (b)		Hours used per year (c)	
-------------------------	--	--------	--	-------------------------	--

• kW:

- Before and After retrofit kW for electric
 - Take the wattage per item multiplied by the quantity and divide by 1,000.

kW (b)		Hours used per year (c)		kW (d)	
--------	--	-------------------------	--	--------	--

• Current Energy Cost:

- \$ per unit of energy

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		



Custom Form Requirements

• Annual Savings (kWh):

- Units per year
 - Electric items will calculate usage and savings automatically
 - You must provide calculations for gas

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		

• Measure Cost:

- Do not include labor if self-installed

• Category:

- Check the correct category box for each measure classification and to qualify for **Multi-Measure Bonus**

Elec.	Category	Gas
<input type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>



Calculating the Annual Energy Savings

- **Electric Savings (kW)**

$$= \frac{[(Qty_{OLD} \times Watts_{OLD}) - (Qty_{NEW} \times Watts_{NEW})]}{1,000 \text{ Watts/kilowatt}}$$

NOTE: To calculate kWh = kW X Annual Operating Hours

- **Gas Savings (Mcf)**

$$= \text{Average Mcf}_{OLD} \times \left(1 - \frac{\text{Efficiency}_{OLD}}{\text{Efficiency}_{NEW}}\right)$$

Custom Lighting Project





Custom Lighting Project

Existing

Metal Halide Fixtures*

Proposed

Fluorescent 3 Lamp T5HO Fixtures

Current Conditions		Proposed Conditions	
Average Energy Cost	\$0.10/kWh		
Fixture Type	400W HID	Fixture Type	3-lamp T5HO
Fixture Quantity	250	Fixture Quantity	200
Watts per Fixture**	455 Watts	Watts per Fixture**	179 Watts
Annual Operating Hours	4000 Hours	Annual Operating Hours	4000 Hours
		Measure Cost	\$40,000

*Metal Halide fixtures are HID fixtures and can be found under the HID category on the Application.

**Includes ballast

Custom Project Lighting Example



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Completing the Custom Page

Ref# 27-1

Description							
Before Retrofit				After Retrofit			
Quantity (250) - 400 W Metal Halide fixtures, 455 watts / fixture, High Bay application				Item A - Quantity (200) - Fluorescent 3 lamp T5HO fixtures, 179 watts/fixtures, High Bay application			
Hours used per year (a)	4,000	kW (b)	113.75	Hours used per year (c)	4,000	kW (d)	35.8

Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

\$20,000

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	311,800	\$0.08	\$24,944	\$40,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$40,000	311,800	\$0.10	1.28	\$24,944	\$20,000
	Natural Gas						
Total Custom Incentive							\$20,000



Hours Used Per Year

Provide detailed information

4,000 Hours/Year Total (Before and After Retrofit)

Annual or Seasonal schedule?

Weekly Schedule

Monday – Friday = 8 AM – 8 PM (12 hours)

Saturday and Sunday = 8 AM – 6 PM (10 hours)

50 weeks / year (2 weeks removed for holidays)

Custom Project Lighting Example



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Completing the Custom Page

Ref# 27-1

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Quantity (250) - 400 W Metal Halide fixtures, 455 watts / fixture, High Bay application				Item A - Quantity (200) - Fluorescent 3 lamp T5HO fixtures, 179 watts/fixtures, High Bay application			
Hours used per year (a)	4,000	kW (b)		Hours used per year (c)	4,000	kW (d)	

Elec.	Category	Gas
<input type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric						
	Natural Gas						
						Total Custom Incentive	



Calculating kW (electric)

Current Energy Use:

$$\frac{250 \text{ fixtures} \times 455 \text{ watts/fixture}}{1000 \text{ watts/1 kW}}$$

$$= 113.75 \text{ kW}$$

Proposed Energy Use:

$$\frac{200 \text{ fixtures} \times 179 \text{ watts/fixture}}{1000 \text{ watts/1 kW}}$$

$$= 35.80 \text{ kW}$$



Calculating Energy Savings (electric)

$$113.75 \text{ kW} \times 4,000 \text{ (hours)} = 455,000 \text{ kWh}$$

$$35.80 \text{ kW} \times 4,000 \text{ (hours)} = \text{—} 143,200 \text{ kWh}$$

Energy Savings

=

311,800 kWh

Custom Project Lighting Example



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Elec.	Category	Gas
<input type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh		311,800	\$0.08		
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric		311,800				
	Natural Gas						
						Total Custom Incentive	



Selecting a category

- On the custom worksheet, you **must** select the appropriate **category** for each measure.
 - This will ensure that the measure is entered correctly on the summary page (Page 6)

Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

The Multi-Measure Bonus

To receive the **20% bonus**, you must submit more than one category of measures on the same Application.*

- This can be:
 - Two different electric categories
 - Two different gas categories
 - One electric and one gas category

**To qualify for the Multi-Measure Bonus, no single category can be more than 75% of the total Application value.*

Custom Project Lighting Example



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Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh		311,800	\$0.08		
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric		311,800				
	Natural Gas						
						Total Custom Incentive	



Calculating Current Average Energy Costs

Average Electricity Costs $\left(\frac{\$}{\text{kWh}}\right) =$

$$\frac{\text{Sum of 12 consecutive monthly utility bills for electricity (\$)}}{\text{Sum of electricity used during the same 12 consecutive 12 months as above (kWh)}}$$

Average Natural Gas Costs $\left(\frac{\$}{\text{Mcf}}\right) =$

$$\frac{\text{Sum of 12 consecutive monthly utility bills for natural gas (\$)}}{\text{Sum of natural gas used during the same 12 consecutive 12 months as above (Mcf)}}$$

NOTE: 1 Mcf = 10 Ccf

Custom Project Lighting Example



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Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
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<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
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Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric		311,800	\$0.10			
	Natural Gas						
						Total Custom Incentive	



Calculated Incentive:

	Annual Energy Savings
x	Incentive Rate
<hr/> <hr/>	

	311,800 kWh
x	\$0.08 /kWh
<hr/> <hr/>	
	\$24,944

Custom Project Lighting Example



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Capped Measure Incentive
(from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
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Natural Gas	Mcf			\$4.00		

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		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric		311,800	\$0.10		\$24,944	
	Natural Gas						
						Total Custom Incentive	



About Measure Cost

- Measure Cost (MC) is the cost of implementing a measure — less any costs incurred to achieve non-energy related project benefits.
- Only costs associated with the incented 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 either:
 - For 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.
 - External labor costs may also be included.
 - For retrofit, early replacement or new technology measures: the cost of new equipment or components added to existing equipment for the purpose of improving energy efficiency.
 - External labor costs may also be included.

Custom Project Lighting Example



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Capped Measure Incentive (from Total Awarded Incentive below)

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	311,800	\$0.08	\$24,944	\$40,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$40,000	311,800	\$0.10	1.28	\$24,944	
	Natural Gas						
						Total Custom Incentive	



Actual Incentive:

Incentives are capped at 50% of Measure Cost

	Measure Cost
X	50%
<hr/> <hr/>	

	\$40,000
X	.5
<hr/> <hr/>	
	\$20,000

Custom Project Lighting Example



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Elec.	Category	Gas
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<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

\$20,000

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
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Natural Gas	Mcf			\$4.00		

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Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$40,000	311,800	\$0.10	1.28	\$24,944	\$20,000
	Natural Gas						
Total Custom Incentive							\$20,000



What else you need to complete your Custom Application



Manufacturer Specifications

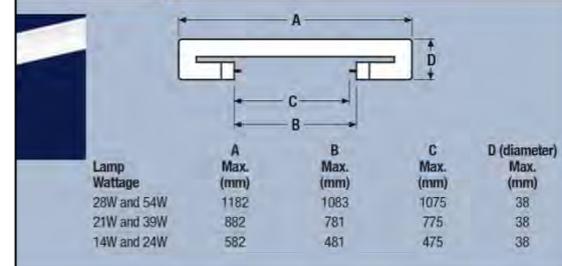
Not sufficient!

Specification Data	
Fixture Description:	Type
Project/Job:	
SYLVANIA lamp:	
SYLVANIA ballast:	
Notes:	

Ordering Information

Item	Ordering	Watts	Base	Average Rated Life (3 hrs/st)	Initial Lumens @35°C	Mean Lumens @35°C	Initial Lumens @25°C	Mean Lumens @25°C	CCT	CRI
24	Mini BiPin	20,000		1,750	1,630	1,550	1,440	3000K	85	
24	Mini BiPin	20,000		1,750	1,630	1,550	1,440	4000K	85	
39	Mini BiPin	20,000		3,100	2,885	2,745	2,555	3000K	85	
39	Mini BiPin	20,000		3,100	2,885	2,745	2,555	4000K	85	
54	Mini BiPin	20,000		4,450	4,140	3,940	3,665	3000K	85	
54	Mini BiPin	20,000		4,450	4,140	3,940	3,665	4000K	85	
14	Mini BiPin	20,000		1,200	1,115	1,060	985	3000K	85	
14	Mini BiPin	20,000		1,200	1,115	1,060	985	4000K	85	
21	Mini BiPin	20,000		1,900	1,765	1,680	1,560	3000K	85	
21	Mini BiPin	20,000		1,900	1,765	1,680	1,560	4000K	85	
28	Mini BiPin	20,000		2,600	2,420	2,300	2,140	3000K	85	
28	Mini BiPin	20,000		2,600	2,420	2,300	2,140	4000K	85	

	8	30	HO	SLS
CRI = 85		CCT = 3000K or 4000K	HO: High Output	SEAMLESS



www.sylvania.com

PENTRON® SEAMLESS and PENTRON HO SEAMLESS T5 and T5HO Linear Fluorescent Lamps

Key Features & Benefits

- Novel base design offers continuous lighting without shadows
- Dimmable
- Allows for sleek, compact luminaire designs
- 20,000 hour average rated life
- 93% mean lumens
- 3000K, 4000K
- 85 CRI
- Energy savings with controllable lighting option
- Compatible with T5 and T5HO ballasts
- QUICK 60+* System Warranty when paired with QUICKTRONIC ballasts

Product Offering

Lamp Type	Watts	CCT
FP24/800/HO/SLS	24	3000K, 4000K
FP29/800/HO/SLS	39	3000K, 4000K
FP54/800/HO/SLS	54	3000K, 4000K
FP14/800/SLS	14	3000K, 4000K
FP21/800/SLS	21	3000K, 4000K
FP28/800/SLS	28	3000K, 4000K

PENTRON® and PENTRON HO SEAMLESS T5 lamps offer continuous, smooth lines of light without the dark spots or shadows normally associated with applications that feature lamps or luminaires mounted end-to-end. The novel base configuration of these lamps eliminates the need to stagger lamps, allowing manufacturers to construct more compact luminaires, thus granting greater flexibility and smaller architectural features when creating linear lighting effects. With light output and dimming functionality similar to OSRAM SYLVANIA's standard PENTRON lamps, the PENTRON SEAMLESS T5 lamps may be specified in conjunction with their linear counterparts for a consistent appearance and reliable compatibility with lighting controls equipment across an entire installation. PENTRON and PENTRON HO SEAMLESS lamps are electrically identical to their standard linear counterparts and may be operated on QUICKTRONIC® PROStar® T5 and T5HO systems.

Application Information

Applications

- Canopy
- Cove lighting
- Pendant luminaires
- Valence lighting

Ballast Information

Contact your OSRAM SYLVANIA representative for a list of compatible electronic operating systems.

Application Notes

- Miniature bi-pin bases cannot be installed into T8 and T12 sockets.
- Miniature bi-pin bases require UL Listed 600 volt rated sockets.
- PENTRON lamps require programmed rapid start electronic ballasts for T5 lamps, equipped with end-of-lamp-life sensing circuit.
- Dedicated lamp holder 1282-SLS/FAU manufactured by A.A.G Stucchi. Visit A.A.G Stucchi web site for socket information. www.aagstucchi.it/en/prodotti/productsMain.aspx

SEE THE WORLD IN A NEW LIGHT **SYLVANIA**

FL093R1 12/11

Sample Specification

Lamps shall be PENTRON® T5 and HO SEAMLESS lamps having miniature bi-pin bases and a minimum of 93% lumen maintenance. Lamps shall have a correlated color temperature of 3000K or 4000K, and a CRI of 85. Lamps shall be operated on QUICKTRONIC® ballasts with a complete system warranty from the manufacturer, covering both lamps and ballasts.

United States
OSRAM SYLVANIA
100 Endicott Street
Danvers, MA 01923

Trade
Phone: 1-800-255-5042
Fax: 1-800-255-5043

National Accounts
Phone: 1-800-562-4671
Fax: 1-800-562-4674

OEM/Special Markets
Phone: 1-800-762-7191
Fax: 1-800-762-7192

Display/Optic
Phone: 1-888-677-2627
Fax: 1-800-762-7192

SYLVANIA Lighting Services
Phone: 1-800-323-0572
Fax: 1-800-537-0784

Canada
OSRAM SYLVANIA LTD.
2001 Drew Road
Mississauga, ON L5S 1S4

Trade
Phone: 1-800-263-2852
Fax: 1-800-667-6772

OEM/Special Markets/Display/Optic
Phone: 1-800-265-2852
Fax: 1-800-667-6772

SYLVANIA Lighting Services
Phone: 1-800-663-4268
Fax: 1-866-239-1278

Mexico
OSRAM MEXICO
Headquarters
Tultitlan/Edo de Mexico
011-52-55-58-99-18-50

www.sylvania.com

PENTRON, PENTRON HO SEAMLESS and QUICKTRONIC are registered trademarks of OSRAM SYLVANIA Inc. SEE THE WORLD IN A NEW LIGHT is a registered trademark of OSRAM SYLVANIA Inc. Specifications subject to change without notice.



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PENTRON® SEAMLESS and PENTRON HO SEAMLESS T5 and T5HO Linear Fluorescent Lamps



Key Features & Benefits

- Novel base design offers continuous lighting without shadows
- Dimmable
- Allows for sleek, compact luminaire designs
- 20,000 hour average rated life
- 93% mean lumens
- 3000K, 4000K
- 85 CRI
- Compatible with T5 and T5HO ballasts
- QUICK 60+® System Warranty when paired with QUICKTRONIC ballasts



Ref #27-1

Product Offering

Lamp Type	Watts	CCT
FP24/800/HO/SLS	24	3000K, 4000K
FP39/800/HO/SLS	39	3000K, 4000K
FP54/800/HO/SLS	54	3000K, 4000K
FP14/800/SLS	14	3000K, 4000K
FP21/800/SLS	21	3000K, 4000K
FP28/800/SLS	28	3000K, 4000K

PENTRON® and PENTRON HO SEAMLESS T5 lamps offer continuous, smooth lines of light without the dark spots or shadows normally associated with applications that feature lamps or luminaires mounted end-to-end. The novel base configuration of these lamps eliminates the need to stagger lamps, allowing manufacturers to construct more compact luminaires, thus granting greater flexibility and smaller architectural features when creating linear lighting effects. With light output and dimming functionality similar to OSRAM SYLVANIA's standard PENTRON lamps, the PENTRON SEAMLESS T5 lamps may be specified in conjunction with their linear counterparts for consistent appearance and reliable compatibility with lighting controls equipment across an entire installation. PENTRON and PENTRON HO SEAMLESS lamps are electrically identical to their standard linear counterparts and may be operated on QUICKTRONIC® PlusStart® T5 and T5HO systems.

Application Information

Applications

Application Notes

- Miniature bi-pin bases cannot be installed into T8 and T12 sockets.
- Miniature bi-pin bases require UL Listed 600 volt rated sockets.
- PENTRON lamps require programmed rapid start electronic ballasts for T5 lamps, equipped with end-of-lamp-life sensing circuit.
- Dedicated lamp holder 1282-SLS/FAU manufactured by A.A.G Stucchi. Visit A.A.G Stucchi web site for socket information. www.aagstucchi.it/en/prodotti/productsMain.aspx

Use the Reference Numbers assigned to each measure in the App

Manufacturer Specifications Lamps

Ordering Information

Item Number	Ordering Abbreviation	Watts	Base	Average Rated Life (3 hrs/st)	Initial Lumens @35°C	Mean Lumens @35°C	Initial Lumens @25°C	Mean Lumens @25°C	CCT	CRI
PENTRON HO SEAMLESS										
20182	FP24/830/HO/SLS	24	Mini BiPin	20,000	1,750	1,630	1,550	1,440	3000K	85
20183	FP24/840/HO/SLS	24	Mini BiPin	20,000	1,750	1,630	1,550	1,440	4000K	85
20184	FP39/830/HO/SLS	39	Mini BiPin	20,000	3,100	2,885	2,745	2,555	3000K	85
20185	FP39/840/HO/SLS	39	Mini BiPin	20,000	3,100	2,885	2,745	2,555	4000K	85
20186	FP54/830/HO/SLS	54	Mini BiPin	20,000	4,450	4,140	3,940	3,665	3000K	85
20187	FP54/840/HO/SLS	54	Mini BiPin	20,000	4,450	4,140	3,940	3,665	4000K	85
PENTRON SEAMLESS										
20098	FP14/830/SLS	14	Mini BiPin	20,000	1,200	1,115	1,060	985	3000K	85
20099	FP14/840/SLS	14	Mini BiPin	20,000	1,200	1,115	1,060	985	4000K	85
20100	FP21/830/SLS	21	Mini BiPin	20,000	1,900	1,765	1,680	1,560	3000K	85
20101	FP21/840/SLS	21	Mini BiPin	20,000	1,900	1,765	1,680	1,560	4000K	85
20102	FP28/830/SLS	28	Mini BiPin	20,000	2,600	2,420	2,300	2,140	3000K	85
20103	FP28/840/SLS	28	Mini BiPin	20,000	2,600	2,420	2,300	2,140	4000K	85

Sufficient!



Manufacturer Specifications Ballasts

277V or 347V through 480V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 1.0 for primary lamps.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at normal line voltage with full load primary lamps.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18°C (0°F) or -28°C (-20°F) for primary lamp.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

4.2 Ballast shall carry a 5 limited warranty from date of manufacture against defects in material or workmanship. (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

Ref #27-1 →

				ICN-2S54-90C-SC						B	
	347-480			HICN-2S54-90C-WL	120-119	1.00	10	0.35-0.25		L	74
3	120-277	PS	Centium	ICN-4S54-90C-2LS	182-179	1.00	10	1.52-0.66	-20/-29	G	75A
				ICN-4S54-90C-2LS-G							75
	347-480			HICN-4S54-90C-2LS-G	188-186	1.04	10	0.54-0.39			
4	120-277	PS	Centium	ICN-4S54-90C-2LS	240-234	1.00	10	2.00-0.86	-20/-29	G	75
				ICN-4S54-90C-2LS-G							

Custom Project Lighting Example



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Itemized Invoices

ENERGY SAVERS

We Help You Save

P O Box 0000
Detroit, MI 48000
Phone (313) 123-0000 Fax (313) 123-0000

QUANTITY	DESCRIPTION	AMOUNT
	Custom Lighting project with 200 fixtures	\$ 40,000.00
TOTAL		\$ 40,000.00

Bad...

...Good!

ENERGY SAVERS

INVOICE

We Help You Save

P O Box 0000
Detroit, MI 48000
Phone (313) 123-0000 Fax (313) 123-0000

DATE: February 15, 2010
QUOTE # 100

Bill To: JANE ENERGY
West End Productions
0000 Grand River Avenue
Detroit, MI 48000
313-123-4567

Ship To: SAME

Comments or Special Instructions:

SALESPERSON	P.O. NUMBER	SHIP DATE	SHIP VIA	F.O.B. POINT	TERMS
PETER SAVER	WE-00501	7/31/2013	BEST WAY	FACTORY	NET 30

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
200	T5HO 3-LAMP, 4' fixtures with electronic ballasts 85 CRI/FP54/800/HO/SLS - 4000K Ballast - ICN-4S54-90C-2LS-G	\$ 80.00	\$ 16,000.00
LOT	LABOR TO INSTALL	23,040.00	\$23,040.00

SUBTOTAL	\$ 39,040.00
TAX RATE	6.00%
SALES TAX	960.00
SHIPPING & HANDLING	
TOTAL	\$ 40,000.00

Ref #27-1

Make all checks payable to **ENERGY SAVERS**
If you have any questions concerning this invoice, contact Peter Saver @ 313-555-0000

THANK YOU FOR YOUR BUSINESS!



Is your project Prescriptive or Custom?

This calculator will answer your question when it comes to lighting projects that are **NOT** one-for-one retrofits.

Prescriptive or Custom?

Where does your lighting project fall?

Does your lighting project call for a Custom calculation — or does it fall within our Prescriptive measures?

To answer that question, follow these instructions:

Step 1:

Do the type of fixtures in your project match a Prescriptive measure in our Application?

No: Submit it as a Custom measure **Yes:** Continue to Step 2.

Step 2:

- Enter your fixture "Before Retrofit" quantity (the existing condition) in the box below.
- Enter your fixture "After Retrofit" quantity (the new condition) in the box below.
- Follow the instructions in the orange box.

Enter "Before Retrofit" fixture quantity:

Enter "After Retrofit" fixture quantity:

Follow these instructions:



T12 Baseline Wattage Table

For energy efficiency reasons, T12 lamps are no longer manufactured or imported into the United States in U-bend or linear 4- and 8-foot configurations. For these configurations, the Standard T8 is the minimum available lighting system.

Therefore, the baseline (pre-upgrade) wattages used for custom projects replacing U-bend or linear 4-foot and 8-foot T12 lighting with another lighting system have been adjusted to reflect the energy use of the minimum available, Standard T8 lighting system.

8-foot T12 Lamps		
Fixture	Standard T12	High-Output T12
1-lamp	58	80
2-lamp	112	160
3-lamp	170	240
4-lamp	224	320
6-lamp	336	480

4-foot T12 Lamps	
Fixture	
1-lamp	31
2-lamp	58
3-lamp	85
4-lamp	112
5-lamp	143
6-lamp	174
8-lamp	232

The baseline wattages assumed for upgrades from 2- and 3-foot T12 lighting systems continues to be those T12 lighting systems, respectively. All custom projects for upgrades from T12 lighting will use the baseline wattages listed here.

3-foot T12 Lamps	
Fixture	
1-lamp	37
2-lamp	67
3-lamp	105
4-lamp	132

2-foot T12 Lamps	
Fixture	
1-lamp	25
2-lamp	50
3-lamp	70
4-lamp	100

T12 U-Lamps	
Fixture	
1-lamp	32
2-lamp	60
3-lamp	92



Modifications to the Custom Lighting Example

Custom Project Lighting Example



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Completing the Custom Page

Ref# 27-1

Description							
Before Retrofit				After Retrofit			
Quantity (250) - 400 W Metal Halide fixtures, 455 watts / fixture, High Bay application				Item A - Quantity (200) - Fluorescent 3 lamp T5HO fixtures, 179 watts/fixtures, High Bay application			
Hours used per year (a)	4,000	kW (b)	113.75	Hours used per year (c)	4,000	kW (d)	35.80

Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

\$20,000

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	311,800	\$0.08	\$24,944	\$40,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$40,000	311,800	\$0.10	1.28	\$24,944	\$20,000
	Natural Gas						
Total Custom Incentive							\$20,000



Example 1 – Price Cut

Existing

Metal Halide Fixtures*

Proposed

Fluorescent 3 Lamp T5HO Fixtures

Current Conditions		Proposed Conditions	
Average Energy Cost	\$0.10/kWh		
Fixture Type	400W HID	Fixture Type	3-lamp T5HO
Fixture Quantity	250	Fixture Quantity	200
Watts per Fixture**	455 Watts	Watts per Fixture**	179 Watts
Annual Operating Hours	4000 Hours	Annual Operating Hours	4000 Hours
		Measure Cost	\$30,000

Same Example: Notice the Measure Cost has changed

**Metal Halide fixtures are HID fixtures and can be found under the HID category on the Application.*

***Includes ballast*

Custom Project Lighting Example



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Example 1: Price Cut

Ref# 27-1

Description							
Before Retrofit				After Retrofit			
Quantity (250) - 400 W Metal Halide fixtures, 455 watts / fixture, High Bay application				Item A - Quantity (200) - Fluorescent 3 lamp T5HO fixtures, 179 watts/fixtures, High Bay application			
Hours used per year (a)	4,000	kW (b)	113.75	Hours used per year (c)	4,000	kW (d)	35.80

Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive (from Total Awarded Incentive below)
DNQ

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	311,800	\$0.08	\$24,944	\$30,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$30,000	311,800	\$0.10	.96	\$24,944	DNQ
	Natural Gas						
Total Custom Incentive							



Example 2 – Missing Information

Existing

Metal Halide Fixtures*

Proposed

Fluorescent 3 Lamp T5HO Fixtures

Current Conditions		Proposed Conditions	
Average Energy Cost	\$??/kWh		
Fixture Type	400W HID	Fixture Type	3-lamp T5HO
Fixture Quantity	250	Fixture Quantity	200
Watts per Fixture**	455 Watts	Watts per Fixture**	179 Watts
Annual Operating Hours	4000 Hours	Annual Operating Hours	4000 Hours
		Measure Cost	\$40,000

Same Example: Average Energy Cost is not available

*Metal Halide fixtures are HID fixtures and can be found under the HID category on the Application.

**Includes ballast

Custom Project Lighting Example



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Example 2: Missing Information

Ref# 27-1

Description							
Before Retrofit				After Retrofit			
Quantity (250) - 400 W Metal Halide fixtures, 455 watts / fixture, High Bay application				Item A - Quantity (200) - Fluorescent 3 lamp T5HO fixtures, 179 watts/fixtures, High Bay application			
Hours used per year (a)	4,000	kW (b)	113.75	Hours used per year (c)	4,000	kW (d)	35.80

Elec.	Category	Gas
<input checked="" type="checkbox"/>	Lighting	
<input type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

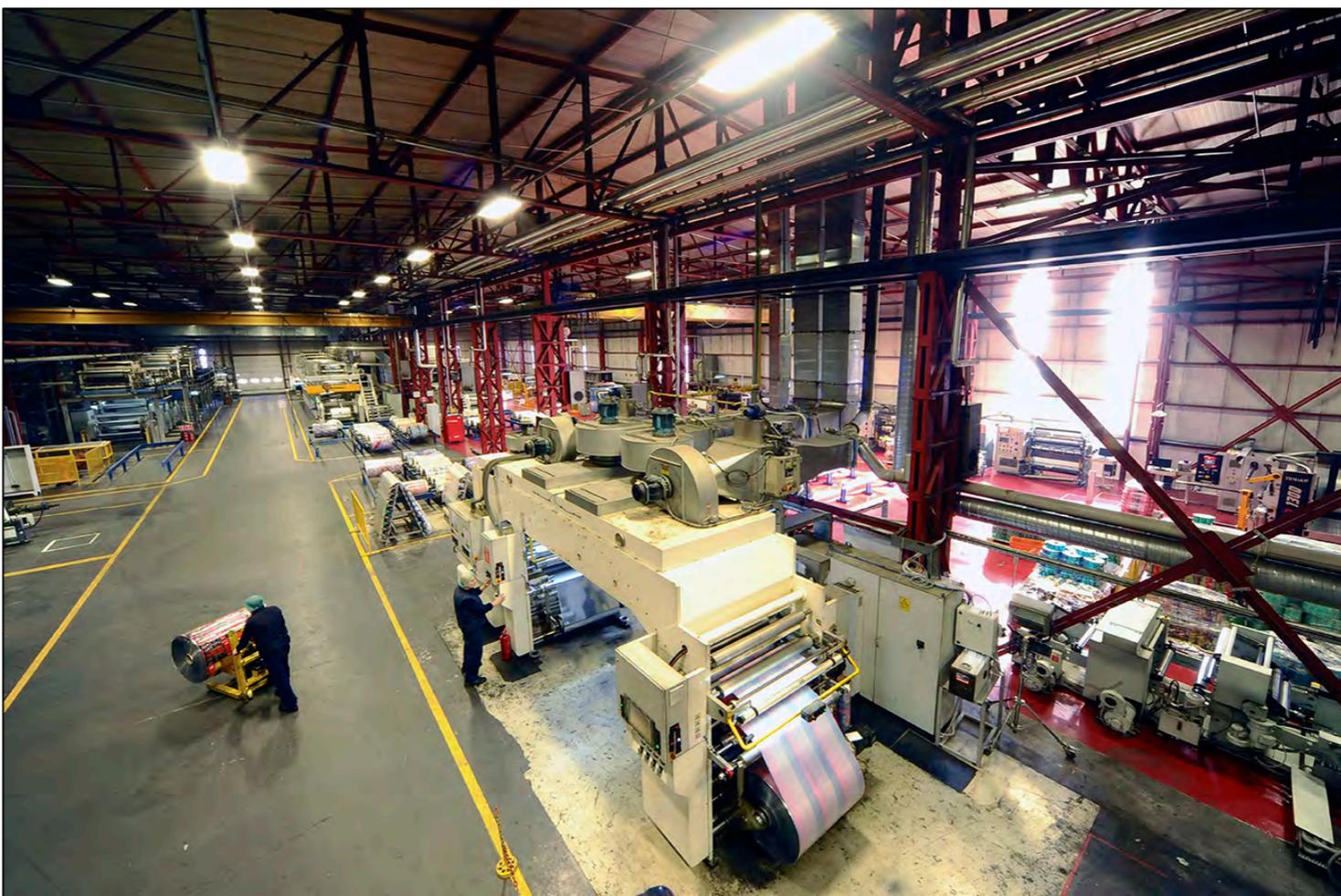
Capped Measure Incentive (from Total Awarded Incentive below)
DNQ

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh		311,800	\$0.08	\$24,944	\$40,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$40,000	311,800			\$24,944	DNQ
	Natural Gas						
Total Custom Incentive							

Large Non-Lighting Custom Project



Custom Project Lighting Example



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Custom Controls/EMS Project

Ref# 27-1

Description							
Before Retrofit			After Retrofit				
(50) ASH units and (100) exhaust fans/ No controls / Assembly Plant setting			Adding EMS to control ASH / Exhaust units when in Non-Production Mode				
Hours used per year (a)	8,760	kW (b)	1192.5	Hours used per year (c)	4,000	kW (d)	1305.79

Elec.	Category	Gas
<input type="checkbox"/>	Lighting	
<input checked="" type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

\$522,315.00

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	5,223,150	\$0.08	\$417,786.64	\$2,500,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$2,500,000	5,223,150	\$0.10	4.79	522,315.00	\$522,315.00
	Natural Gas						
Total Custom Incentive						\$522,315.00	\$522,315.00



Custom Controls/EMS Project

Project Description:

- **XYZ Assembly Plant**
- **Project:** add 50 Air Supply Houses (ASH's) and 100 Exhaust Fans to EMS
- **Currently:** all fans run 8,760 hours/year
 - **Goal:** to run fans only 4,000 hours/year
- **Energy reduction planned:**
 - Shutdown ASH units and Exhaust fans when in Non-Production Mode through newly installed EMS.
- **Planned incentive:** more than **\$100k**



Custom Controls/EMS Project

Items to Submit:

- Completed Application
- Scope of Work / Project Summary
- M & V Plan
(if included in project by contractor)
- Energy Calculations
 - Provide Pre and Post upgrade energy use and method of determination
 - Whole Building Modeling - Computer model input and output files, if necessary
 - Whole Building Metering
 - Equipment or Process Sub-Metering
 - Formula based excel sheets with measurements/assumptions



Custom Controls/EMS Project

Items to Submit:

- **Supporting Documentation**

(provide necessary proof of all assumptions and numbers in calculations)

- Pre and Post equipment drawings/process diagrams
- Construction schedule/operating hours
- Pictures/energy audit
- Trend data/meter data/load profile

- **Itemized Invoice**

(provide quote for reservation of funds)

- **Manufacturer's information:**

- Make, model, and certified performance data/design specifications



Scope of Work/Projects Summary Example (excerpt)

Application # DTE-13-xxxxxxx
Controls / EMS Example – Scope of Work

Project Summary:

The XYZ Plant, a 1 million square foot assembly facility located in Michigan. The building is heated with direct fired natural gas units and cooled with a chilled water system. A new energy management system (EMS) will be installed to automatically control the HVAC system. All supply fans, exhaust fans, temperature, and outside air dampers will be controlled.

All new controls, sensors, and hardware will be installed to control air supply fans and exhaust fans. The new EMS will allow automatic controlling and scheduling of the HVAC system and control building pressurization.

Energy savings on this project will come from the following:

- Reduction of the number of units running during non-production
- Heating and cooling load reduction by keeping the building pressure balanced and reducing infiltration.
- Reduction of outdoor air supplied to building.

The production schedule is Monday through Friday, 6am to 4pm. Approximately 20 hours a month are used for production on the weekend as needed. Supply fans vary in size from the 32,500 cfm to 60,000 cfm. Exhaust fans vary in size from ¼ HP to 40 HP, including building and process exhaust.

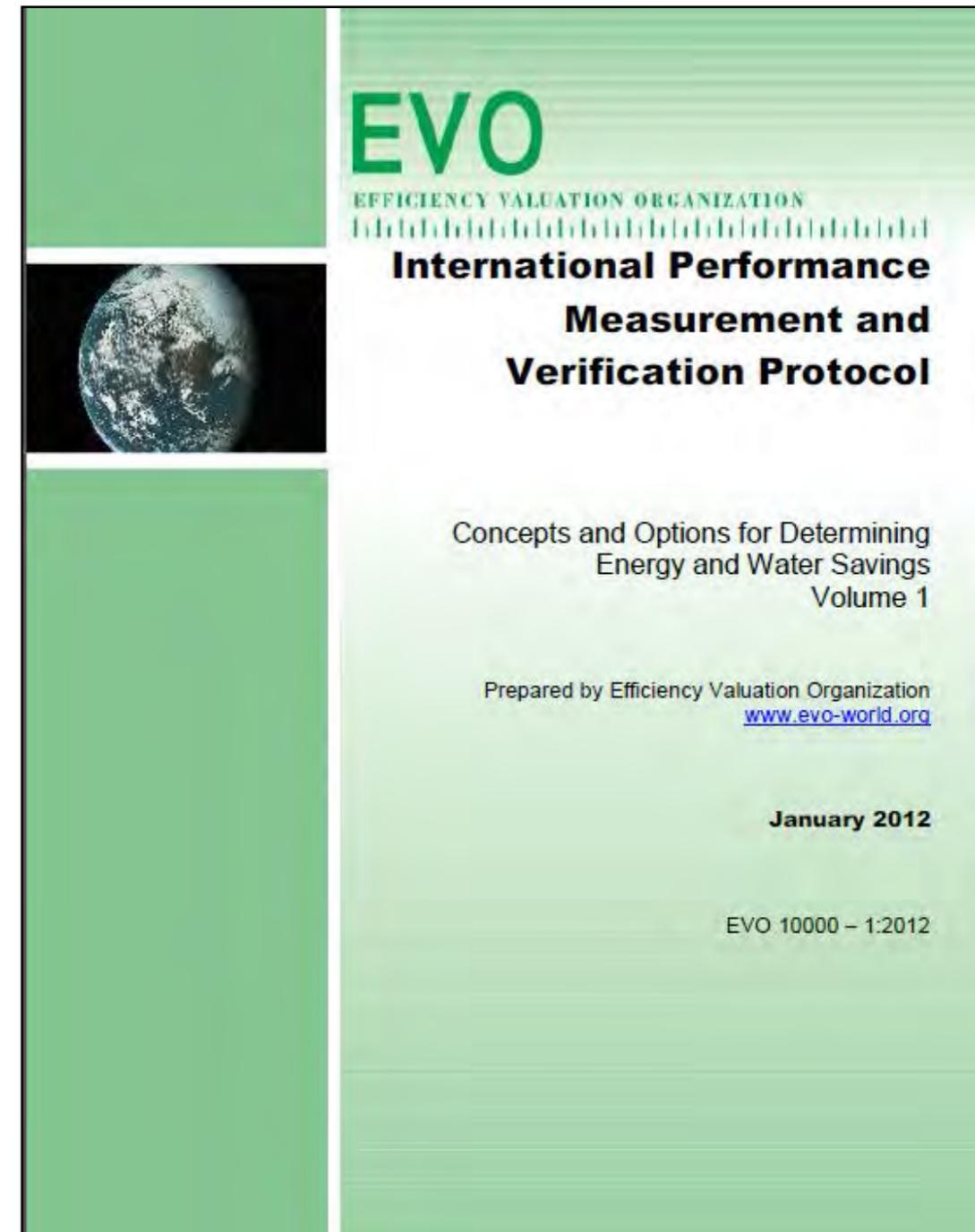
Explain what
work is being
completed
and where it's
being
completed



Metering and Verification Plan

Using **IPMVP 2012 Vol. 1** protocol, a M&V Plan will be used to show how savings will be proved and which baseline will be used.

The Program Team will develop this plan for the project or can use existing M&V Plans already in place for the project.





M & V Options

- **Option A:** Key Parameter Measurement
- **Option B:** All Parameter Measurement
- **Option C:** Whole Facility
- **Option D:** Calibrated Simulation/Model

M&V Plan for Project DTE-xx-xxx – XYZ Manufacturing Plant – EMS Project	
	Date
Purpose	To add an EMS which controls and schedules (xx) ASH units, monitors building pressure, and controls (x) exhaust fans. The EMS system being put into place at XYZ Complex will provide an. In addition, this project will update the current EMS (Energy Management System) with an EOS that will include trending of all applicable data which will be stored on the cloud. Building temperatures will be maintained using the automatic HVAC system control. This project will have both electric energy savings.
Measurement Boundary	Project savings will be determined within a measurement boundary that encompasses only the ASH units (total of xx) and exhaust units that are being controlled as part of the new EOS.
Interactive Effects	The measurement boundary excludes: <ul style="list-style-type: none">• The projects energy interactions with "soft" starting the units on the EOS. Energy savings will be accumulated from starting up the fans earlier, this savings is minimal looking at the entire project. Therefore the electrical load reduction achieved from "soft" starting the units will be ignored for this project.
IPMVP Option	IPMVP Volume 1, 2012, Option A was selected as it offers the best opportunity to minimize the costs of evaluating savings performance of the EOS contractor.
Measurement Equipment	Motor electric draw will be measured by random sampling of the power required by each motor of each type. Power will be measured by a freshly calibrated true RMS wattmeter owned by the contractor. This meter has a rated accuracy of 2% of reading.
Measurement Process	The contractor will measure amperage at randomly selected motors that are involved in this project, during production periods. The contractor will notify the customer of the exact time of measurement so that the customer can accompany the contractor throughout the process and

Custom Project Controls/EMS Example



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Energy Calculations

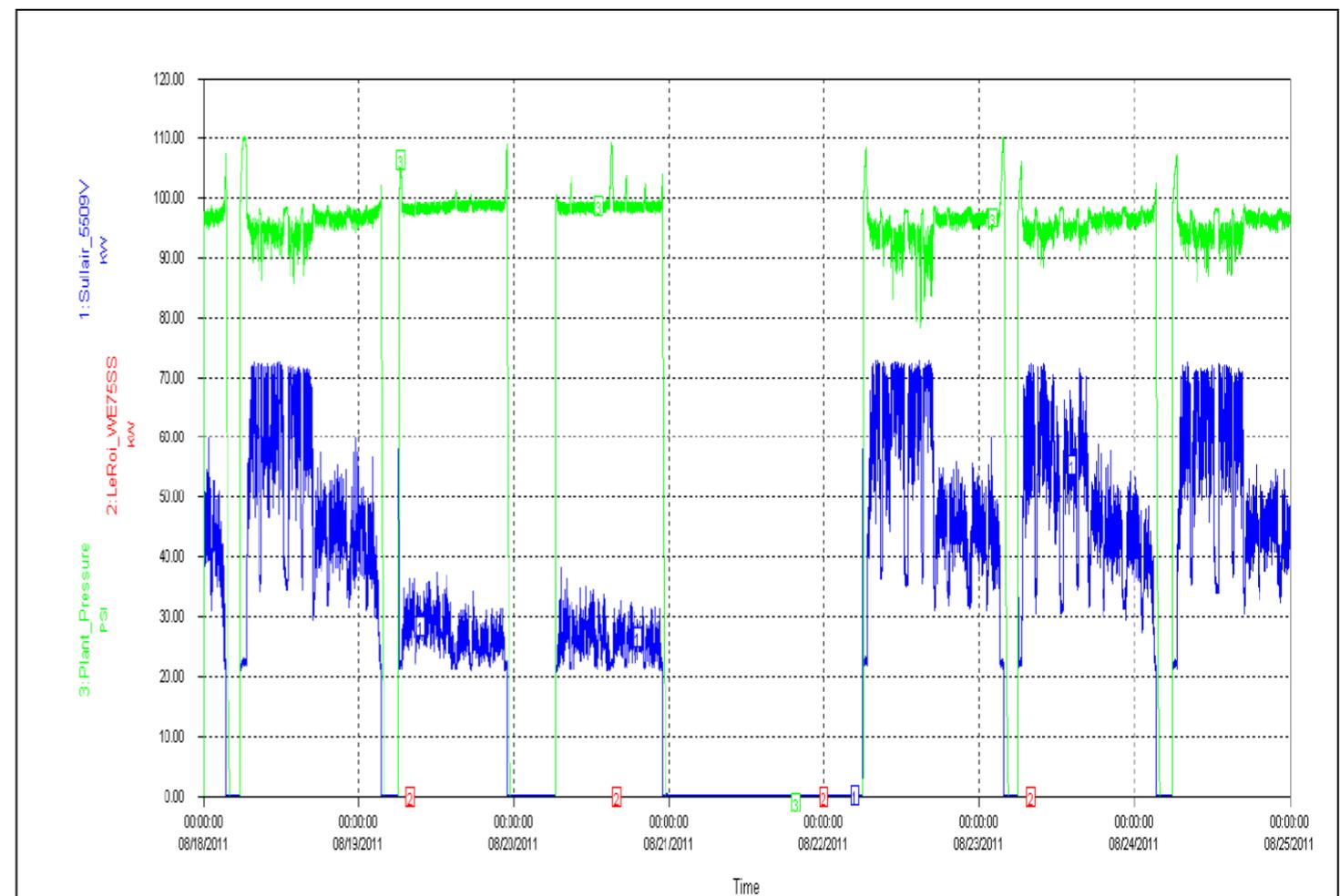
Base Equipment Parameters							24/7 Operation of Equipment							Revised Operation of Equipment (potential)							Notes
AHU Unit	CFM	Hp	kW	Load Factor	Motor Eff. (est)	Motor Loaded kW (input)	Hrs / Day	Days / Week	Weeks / Year	Total Yearly hours	Total Yearly kWh	\$/kWh (blend)	Yearly Cost \$	Hrs / Day	Days / Week	Weeks / Year	Total Yearly hours	Total Yearly kWh	\$/kWh (blend)	Yearly Cost \$	
ASH1		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
ASH11		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
ASH5		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VA04	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VA52E		60	44.8	0.77	0.91	37.87	24.0	7	52	8736	330866	0.065	\$21,506	18.0	5	48	4320	163615	0.065	\$10,635	
VA52W		60	44.8	0.77	0.91	37.87	24.0	7	52	8736	330866	0.065	\$21,506	18.0	5	48	4320	163615	0.065	\$10,635	
VAD10		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VAD19		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VAD25		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VAD31		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VAU37	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VAU43	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VAU49		50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VAU55		50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VAY37	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBO1A	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VBA49		50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBA55		50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBC37	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBC43	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBJ42	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBJ56	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBL26	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBL34	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBL50	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBP26	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBP34	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBP42	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBP50	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VBP58	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VC16	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VD40(VP40)		40	29.8	0.77	0.91	25.25	24.0	7	52	8736	235722	0.065	\$17,922	18.0	5	48	4320	109077	0.065	\$7,090	
VD55	50000	50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VH01	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VH22	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VH66		50	37.3	0.77	0.91	31.56	24.0	7	52	8736	275722	0.065	\$17,922	18.0	5	48	4320	136346	0.065	\$8,862	
VK48		40	29.8	0.77	0.91	25.25	24.0	7	52	8736	235722	0.065	\$17,922	18.0	5	48	4320	109077	0.065	\$7,090	
VK99	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VM10		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VM25		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VM31		75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	30	2700	127824	0.065	\$8,309	
VP01	75000	75	56.0	0.77	0.91	47.34	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	204519	0.065	\$13,294	
VX67	10000	100	74.6	0.77	0.91	63.12	24.0	7	52	8736	413582	0.065	\$26,883	18.0	5	48	4320	272692	0.065	\$17,725	
Totals	1335000	2625	1958			1657											176040	6697990		\$435,369	

Provide Excel Sheet
with embedded
formulas/ Show the
numbers



System Sub-Metering

- For measures that impact large or complex, single systems
- Additional documentation requirements are:
 - Pre- and post-upgrade metered consumption data
 - Written report with metered (logged) data in graphical format and summarized in tabular form





Whole Building Metering

- For measures that impact single systems and also significantly reduce the total monthly energy usage.
- Additional documentation requirements are:
 - Pre- and post-upgrade metered consumption data
 - Normalized energy data





Whole Building Modeling

- For measures that impact multiple building systems
- Additional documentation requirements are:
 - Written input and output reports from DOE-approved software
 - Electronic files from DOE-approved software
 - Energy savings verified with post-upgrade utility data





Energy Calculations

Avoid submitting the following types of calculations:

- Simple percentages
- Rules of Thumb
- Assuming results from other sites
- Marketing data





Supporting Documentation

The image displays three distinct pieces of technical documentation for a VBP-50 system:

- Control Panel Interface (Left):** A graphical user interface showing various status indicators and controls. It includes buttons for 'UNIT RUNNING', 'HAND', 'HOST IN COMMAND', 'HOST LOCK ENABLED', 'LAST HOST COMMAND', 'SUPPLY AIR FLOW PROVEN', 'SUPPLY FAN RUNNING', 'OA DAMP OPEN', 'BYPASS DAMP OPEN', 'START RUN FAILURE', 'RUNNING WITH COMMAND', 'SUPPLY FAN DISC. CLSD', 'LOW TEMP LIMIT', and 'CTRL PWR ON'. It also displays 'Space Temp: 82 °F', 'Mode: Winter', 'Outside Air Temperature: 19 °F', 'Return Air Temperature: 82 °F', 'Outside Air Damper Position: 30%', 'Heating Damper Position: 43%', and 'Steam Valve Position: 43%'. A 'Controls' section has 'Start', 'Stop', 'Lock', and 'Unlock' buttons, and a 'Setpoint' field.
- Schematic Diagram (Middle):** A detailed electrical schematic showing the internal wiring and components of the system, including relays, switches, and control logic.
- Wiring Diagram (Right):** A wiring diagram showing the physical connections between various components, including 'INTAKE DAMPER MOTOR #1', 'INTAKE DAMPER MOTOR #2', 'INTAKE DAMPER MOTOR #3', 'SUPPLY FAN MOTOR', and 'UNIT START RELAY'. It includes terminal numbers and component labels.

Provide any documentation that helps with assumptions/energy calculations



Itemized Invoices

If you have:

- Multiple pieces of different equipment on the same invoice...

or

- Multiple project sites included in a single invoice...

You must provide a summary that explains the distribution of the equipment within your Application.

Motor Guy INVOICE
We Help You Save

P O Box 0000
Detroit, MI 48000
Phone (313) 123-0000 Fax (313) 123-0000

DATE: July 31, 2013
QUOTE # 123

Bill To: XYZ Company
XYZ Company
XYZ Street
XY, MI 48202

Ship To: SAME

Comments or Special Instructions:

SALESPERSON	P.O. NUMBER	SHIP DATE	SHIP VIA	F.O.B. POINT	TERMS
Mike Motor	123	7/31/2013	BEST WAY	FACTORY	NET 30

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
50	Model M7285 - Modutrol Motors	\$ 500.00	\$ 25,000.00

Ref 27-1

SUBTOTAL	\$ 25,000.00
TAX RATE	6.00%
SALES TAX	1,500.00
SHIPPING & HANDLING	
TOTAL	\$ 26,500.00

Make all checks payable to **Motor Guy**
If you have any questions concerning this invoice, contact Peter Saver @ 313-555-0000

THANK YOU FOR YOUR BUSINESS!

Custom Project Controls/EMS Example



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Reference
Numbers

Itemized Invoices

CUSTOMER: Your City Public School District						APPLICATION No.: DTE-14-20000			
BUILDING NAME/INSTALLATION ADDRESS: Dew Point Middle School, 12345 Main Street, Your City, MI									
REQUESTED INCENTIVES			INVOICE						
Ref. No.	EO Measure	QTY	Date	Number	Line Item	Qty	Manufacturer	Model Number	NOTES
7-1	2 Lamp HPT8 replacing T12	100	1/2/13	23-09876-00	1	100	Fixture Maker	FM-14-232N	Ballast incl
			1/2/13	23-09876-00	4	1675	Lamp Maker	LM-F32	
7-5	4 Lamp HPT8 replacing T8	25	1/2/13	23-09876-00	2	275	Fixture Maker	FM-24-432W	Ballast incl
7-6	4 Lamp HPT8 replacing T12	250	1/2/13	23-09876-00	4	1675	Lamp Maker	LM-F32	
			1/2/13	23-09876-00	3	80	Fixture Maker	FM-24-632N	Extras for inventory. Ballast incl
7-10	6 Lamp T8 replacing 400W HID	75	1/2/13	23-09876-00	4	1675	Lamp Maker	LM-F32	
			1/5/13	23-09876-01	1	25	Lamp Maker	LM-F32	
			1/7/13	75499	1	50	Alternate Lamper	AL-F032T8	
			1/7/13	Inv-6579	1	350	Sensor Maker	SM-OSLB	
9-4	Occupancy sensors	400	1/7/13	27698-00	2	50	Sensor Fab	SF-231	
12-3	175 Ton Centrifugal Chiller	1	12/15/12	976500-01	1	1	Comfort Maker	CM14-175SGKL-460	

An Invoice Summary must be submitted for:

- (a) a single project having three (3) or more Invoice pages
- (b) multiple projects sharing three (3) or more invoice pages

This self-explanatory example is of a completed Invoice Summary for a single project with six (6) separate Invoices.
To complete an Invoice Summary for your project, please use the **Create Your Invoice Summary Sheet (Tab)** in this Workbook.
You can configure it to meet your needs.

We will provide this form for your invoice summary.



Manufacturer Specifications

Include
manufacturer
Spec Sheets for
all installed
equipment

M7281, M7282, M7284, **M7285**, M7294 Modutrol IV™ Motors

Ref 27-1

SPECIFICATION DATA



FEATURES

- Replace M744S,T,Y and M745S,T,Y Motors.
- M7284, M7281 are 150 lb.-in. non-spring return; M7294 is 300 lb.-in. non-spring return; M7285, M7282 are 60 lb.-in. spring return.
- Oil immersed motor and gear train for reliable performance and long life.
- Wiring box provides NEMA 3 weather protection.
- Quick-connect terminals standard—screw terminal adapter available.
- Adapter bracket for matching shaft height of older motors is standard with replacement motors.
- Die cast aluminum housing.
- Models available with integral auxiliary switches.
- Models available with adjustable zero and span.

APPLICATION

The M7281, M7282, M7284, M7285 and M7294 are Electronic Modutrol® Motors used to control dampers and valves. These motors accept a current signal from an electronic controller to position a damper or valve at any position between open and closed.



Manufacturer Specifications

Please highlight the equipment you installed; notice the exact model and options are shown.

NOTE: Send only relevant sheets, not a complete catalog

M7281, M7282, M7284, M7285, M7294 Modutrol IV™ MOTORS

SPECIFICATIONS *Ref 27-1*

M7281A, C, Q
M7282A
M7284A, C, Q
M7285A, C, Q
M7294A, Q

Control Type:
72 is electronic with current input

Power Designation:
8 is high torque, 150 lb-in. for M7281, M7284, 60 lb-in. for M7282, M7285

9 is extra high torque, 300 lb-in. at 2 or 4 minute timing

Output Drive:
4 is dual-ended shaft, non-spring return.
1 is single-ended shaft, non-spring return.
5 is dual-ended shaft, spring return, mechanically normally closed.
2 is single-ended shaft, spring return, mechanically normally closed.

Electrical Ratings:
Voltage and Frequency: 120 Vac, 50/60 Hz.
Power: M7281, M7284, M7294: 23W, 0.24A. M7282, M7285: 28W, 0.26A.

Controller:
These motors can be used with any electronic controller that provides a stable noise-free proportional current output; see Input Range.

Input Range:
M7281A, C; M7282A, C; M7284A, C; M7285A, C; M7294A: 4-20 mA nominal, 25 mA maximum.
M7281Q, M7282Q, M7284Q, M7285Q, M7294Q: 4-20 mA adjustable, 50 mA maximum.
Zero/Null (Motor Closed): 08 to 18 mA.
Span: 1.8 to 18 mA.

Input Impedance:
100 ohms.

Motor Rotation:
Normally closed. The closed position is the limit of the counterclockwise rotation as viewed from the power end. All models rotate to the closed position on minimum input; M7282, M7285 spring return to the closed position on power interruption.

Stroke:
Fixed 90° or 160° stroke models available.

Timing:
Nominal 30 seconds for 90° stroke and 60 seconds for 160° stroke.

Suffix Letter:
A: Fixed stroke (90° or 160°).
No auxiliary switches.
C: Fixed stroke (90° or 160°).
2 auxiliary switches.
Q: Fixed stroke (90° or 160°).
2 auxiliary switches, with adjustable zero and span.

Torque:
M7181, M7184 150 lb-in. (17 N·m).
M7182, M7185 60 lb-in. (6.8 N·m).
M7294 300 lb-in. (34 N·m).

Maximum Damper Rating:

Motor Torque lb-in.	B dim	
	in.	mm
60	58	1727
150	202	5131
300	258	6563

Dead Weight Load On Shaft:
Power or Auxiliary End: 200 lb (90.8 kg) maximum.
Maximum Combined Load: 300 lb (136 kg).

Ambient Temperature Ratings:
Maximum: 150°F (66°C) at 25% duty cycle.
Minimum: -40°F (-40°C).

Shaft: 3/8 in. (9.5 mm) Square.
M7284, M7285, M7294 have dual-ended shaft.
M7281, M7282 have single-ended shaft.

Dimensions:
See Fig. 1.

Auxiliary Switch Ratings (Amperes):

One Contact Rating ^a Amps	120V	240V
Full Load	7.2	3.6
Locked Rotor	43.2	21.6

^a40 VA pilot duty, 120/240 Vac on opposite contact.

Underwriters Laboratories Inc. Listed:
File No. E4438, Guide No. XAPX.

Canadian Standards Association Certified:
General Listed File No. LR1620, Guide No. 400-E.

Accessories:
E6550117 Explosion-proof Housing: Encloses motor for use in explosive atmospheres. Not for use with Q601, Q618, and Q455 Linkages. Order separately from Nelson Electric Co. Requires Honeywell 7616DM Coupling.
Q607 External Auxiliary Switch: Controls auxiliary equipment as a function of motor position.
Q605 Damper Linkage: Connects motor to damper. Includes motor crank arm.
Q618 Linkage: Connects Modutrol motor to water or steam valve.
Q601 Bracket and Linkage Assembly: Connects Modutrol motor to water or steam valve.
Q100A,B Linkage: Connects Modutrol motor to butterfly valve. Requires adapter bracket packed with motor.
221455A Infinitely Adjustable Crank Arm: Approximately 0.75 inch (19 mm) shorter than the 4074EL Crank Arm. Can rotate through downward position and clear base of motor without requiring use of adapter bracket.
7617ADW Adjustable Crank Arm: Approximately 0.75 inch (19 mm) shorter than 7616BR Crank Arm.

Custom Project Lighting Example



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**SAVE
MORE.**

Custom Controls/EMS Project

Ref# 27-1

Description							
Before Retrofit			After Retrofit				
(50) ASH units and (100) exhaust fans/ No controls / Assembly Plant setting			Adding EMS to control ASH / Exhaust units when in Non-Production Mode				
Hours used per year (a)	8,760	kW (b)	1192.5	Hours used per year (c)	4,000	kW (d)	1305.79

Elec.	Category	Gas
<input type="checkbox"/>	Lighting	
<input checked="" type="checkbox"/>	HVAC	<input type="checkbox"/>
<input type="checkbox"/>	Miscellaneous	
<input type="checkbox"/>	Process	<input type="checkbox"/>
<input type="checkbox"/>	Food Service	<input type="checkbox"/>
	Hot Water/Laundry	<input type="checkbox"/>
	Insulation	<input type="checkbox"/>

Capped Measure Incentive
(from Total Awarded Incentive below)

\$522,315.00

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (Units/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh	\$0.10	5,223,150	\$0.08	\$417,786.64	\$2,500,000
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

		Aggregate Measure Cost	Aggregate Annual Savings	Current Energy Cost	Simple Payback Period*	Total Calculated Incentive**	Total Awarded Incentive†
Total Custom Incentives (Includes values entered on pages 27-29)	Electric	\$2,500,000	5,223,150	\$0.10	4.79	522,315.00	\$522,315.00
	Natural Gas						
Total Custom Incentive						\$522,315.00	\$522,315.00



Change for 2014

- Increased facility caps for Electric projects

CAP	2013	2014
Facility	\$200,000	\$750,000
Project	\$200,000	\$200,000
Customer	\$750,000	\$750,000



- Natural Gas caps remain unchanged

CAP	2013	2014
Facility	\$200,000	\$200,000
Project	\$100,000	\$100,000
Customer	\$200,000	\$200,000



Requirements - Overview

- Completed Application
- Assumptions
- Pre- and Post-upgrade equipment or process description
- Pre- and Post-upgrade energy use and Method of Determination
- Computer model input and output files, if applicable
- Operating hours, schedule and load profile
- Manufacturer's make, model, specifications and certified performance data
- Quote (for reservation of funds) and invoice (for payment of incentive)
- Other documentation as required

Custom Incentive Worksheet

IMPORTANT: Use the reference numbers in the left column to identify and mark all related invoices, specification sheets and other documents related to that measure and submit with this Application.

IMPORTANT: If you fail to complete each section, check the appropriate category or enter all required information, the worksheet will not calculate your incentive and only the issue to Page 6.

Must be submitted BEFORE project begins.

See Instructions on Page 26 ("Custom Specifications"). Complete every blank box for each item you submit. Please attach all equipment specifications to your Reservation Application before you submit for review.

Refr 27-1

Before Retrofit		Description		After Retrofit	
Hours used per year (a)	kWh (b)	Hours used per year (c)	kWh (d)		

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (\$/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

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Before Retrofit		Description		After Retrofit	
Hours used per year (a)	kWh (b)	Hours used per year (c)	kWh (d)		

Service	Unit	Current Energy Cost (\$ per Unit)	Annual Savings* (\$/Year) (A)	Incentive Rate (\$ per Unit) (B)	Calculated Incentive (A x B)	Measure Cost
Electric	kWh			\$0.08		
Natural Gas	Mcf			\$4.00		

* For Electric projects use the following formula: (a x b) - (c x d). For natural gas projects, you must enter your own calculated Annual Savings and provide documentation.

Electric Single Payback Period must be ≤ 2.1 years. Gas Single Payback Period must be ≤ 2.1 years.

	Aggregate Annual kWh Saved x Current Energy Cost	Gas Single Payback Period	Gas Aggregate Measure Cost
Electric Single Payback Period			

	Aggregate Annual kWh Saved x Current Energy Cost	Gas Single Payback Period	Gas Aggregate Measure Cost
Electric Single Payback Period			

	Aggregate Annual kWh Saved x Current Energy Cost	Gas Single Payback Period	Gas Aggregate Measure Cost
Electric Single Payback Period			

	Aggregate Annual kWh Saved x Current Energy Cost	Gas Single Payback Period	Gas Aggregate Measure Cost
Electric Single Payback Period			

IMPORTANT NOTES:

* The Simple Payback Period must fall within the electric or gas parameters to qualify for an incentive and determine amount of the Total Awarded Incentive for either electric or gas displays DNO (does not qualify), then the payback period (a) outside of required parameters or the incentive capital or savings savings were missing.

** Total Awarded Incentives for each utility are capped at no more than 50% of the Total Measure Cost. If one utility does not qualify for an incentive, the other utility is capped at no more than 50% of the Aggregate Measure Cost for that utility.

To download an interactive application, go to: dteenergy.com/saveenow

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**If you have questions,
please contact our office**

Email: saveenergy@dteenergy.com

Phone: **866-796-0512** (press option 3)

Fax: **877-607-0744**

Website: dteenergy.com/savenow



: www.linkedin.com/in/dteenergysaveenergy



Thank you for joining us today!

Engineers available for additional questions





2014 Events

Throughout the year, we schedule important and valuable events that help keep our Program stakeholders informed of developments and trained on the latest energy-saving technologies and opportunities.

In 2013, we scheduled sessions concerning:

Training:

- For small businesses
- Custom Applications
- New Construction
- Designated Trade Ally

Opportunities for:

- Auto dealers
- Lodging
- Warehousing
- Schools/Government
- Large Industrial

Presentations:

- Michigan-Made Bonus
- Advanced Lighting
- Refrigeration
- Air Compression

Watch for email invitations and reminders in 2014!