Ohio | Public Utilities Commission

Application to Commit Energy Efficiency/Peak Demand Reduction Programs (Mercantile Customers Only)

Case No.: 12-0836-____-____-EL-EEC

Mercantile Customer: **University of Cincinnati**

Electric Utility: **Duke Energy**

Program Title or Description: **Boiler Fans 3 and 4 VFD's**

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. 10-834-EL-POR

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at ee-pdr@puc.state.oh.us.

Section 1: Mercantile Customer Information

Name: **University of Cincinnati**

Principal address: **51 Goodman Drive Ste 260, Cincinnati, Ohio 45221**

Address of facility for which this energy efficiency program applies:

3150 Eden Avenue, Cincinnati, Ohio 45221

3000 Glendora, Cincinnati, Ohio 45219

Name and telephone number for responses to questions:

Grady Reid, Jr. 513-287-1038

Electricity use by the customer (check the box(es) that apply):

- ✓ **The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (Refer to Appendix A for documentation)**
- □ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section 2: Application Information

A) The customer is filing this application (choose which applies):

- □ Individually, without electric utility participation.
- ✓ **Jointly with the electric utility.**

B) The electric utility is: **Duke Energy**

C) The customer is offering to commit (check any that apply):

- □ Energy savings from the customer's energy efficiency program. (Complete Sections 3, 5, 6, and 7.)
- □ Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)
- ✓ **Both the energy savings and the capacity savings from the customer's energy efficiency program. (Complete all sections of the Application.)**

Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (check those that apply):

✓ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).
The following new equipment was installed starting November 2008 and was finished June 2009.

1 VFD on 200 HP Boiler #3 ID Fan Motor

1 VFD on 75 HP Boiler #4 ID Fan Motor

□ Installation of new equipment to replace equipment that needed to be replaced The customer installed new equipment on the following date(s): _____.

□ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):

□ Behavioral or operational improvement.

B) Energy savings achieved/to be achieved by the energy efficiency program:

1) If you checked the box indicating that the project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) – (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: 154,632 kWh
Refer to Appendix B for calculations and supporting documents

2) If you checked the box indicating that the customer installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by the higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: _____kWh

Please describe any less efficient new equipment that was rejected in favor of the more efficient new equipment.

3) If you checked the box indicating that the project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: _____kWh

Please describe the less efficient new equipment that was rejected in favor of the more efficient new equipment.

4) If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.

_____

Section 4: Demand Reduction/Demand Response Programs

A) The customer's program involves (check the one that applies):

- ✓ **Coincident peak-demand savings from the customer's energy efficiency program.**
- □ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
- □ Potential peak-demand reduction (check the one that applies):
  - □ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
  - □ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

B) On what date did the customer initiate its demand reduction program?
The following new equipment was installed starting November 2008 and was finished June 2009.

C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

41.8 kW
Refer to Appendix B for calculations and supporting documentation.

Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) The customer is applying for:

✓ **Option 1: A cash rebate reasonable arrangement**.

OR

□ Option 2: An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.

OR

□ Commitment payment

B) The value of the option that the customer is seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

□ A cash rebate of $[redacted] **Refer to Appendix C for documentation.** (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

□ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for ____ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

□ A commitment payment valued at no more than

$\_\_\_\_\_$. (Attach documentation and calculations showing how this payment amount was determined.)

OR

□ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

□ Total Resource Cost (TRC) Test. The calculated TRC value is: _____ (Continue to Subsection 1, then skip Subsection 2)

✓ **Utility Cost Test (UCT) . The calculated UCT value is: 12.01 Refer to Appendix D for calculations and supporting documents. (Skip to Subsection 2.)**

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The incremental measure costs were _____.

Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were **$120,635**.

The utility's program costs were **$3,796.**

The utility's incentive costs/rebate costs were [redacted]

Refer to Appendix D for calculations and supporting documents.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

Narrative description of the program including, but not limited to, make, model, and year of any installed and replaced equipment.

A copy of the formal declaration or agreement that commits the program or measure to the electric utility, including:

1) any confidentiality requirements associated with the agreement;
2) a description of any consequences of noncompliance with the terms of the commitment;
3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

Refer to Rebate Offer Letter following this application

A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

DUKE ENERGY CORPORATION
Mercantile Self Direct Program
139 East Fourth Street
Cincinnati, OH 45202

513 419 5572 fax

December 7, 2011

Mr. Maurice DuPont
University of Cincinnati
3000 Glendora Ave
Cincinnati, Ohio 45221

Subject: Your Application for a Duke Energy Mercantile Self-Direct Rebate

Dear Name: Mr. DuPont

Thank you for your Duke Energy Mercantile Self Direct rebate application. As noted in the Energy Conservation Measure (ECM) chart on page two, a total rebate of [redacted] has been proposed for your variable frequency drive projects completed in the 2009 calendar year. All Self Direct Rebates are contingent upon approval by the Public Utilities Commission of Ohio (PUCO).

At your earliest convenience, please indicate if you accept this rebate by

- providing your signature on page two
- completing the PUCO-required affidavit on page three.

Please return the documents to my attention via fax at 513-419-5572 or e-mail to SelfDirect@Duke-Energy.com. Upon receipt, Duke Energy will submit the necessary documentation to PUCO. Following PUCO's approval, Duke Energy will remit payment.

At Duke Energy, we value your business and look forward to working with you on this and future energy efficiency projects. We hope you will consider our Smart $aver® incentives, when applicable. Please contact me if you have any questions.

Sincerely,

Grady Reid, Jr
Product Manager
Mercantile Self Direct Rebates

cc: Michael Pahutski, Duke Energy
Deanna Bowden, Duke Energy
Rob Jung, WECC

Please indicate your response to this rebate offer within 30 days of receipt.

☑ Rebate is accepted. ☐ Rebate is declined.

By accepting this rebate, University of Cincinnati affirms its intention to commit and integrate the energy efficiency projects listed on the following pages into Duke Energy's peak demand reduction, demand response and/or energy efficiency programs.

Additionally, University of Cincinnati also agrees to serve as joint applicant in any future filings necessary to secure approval of this arrangement as required by PUCO and to comply with any information and reporting requirements imposed by rule or as part of that approval.

Finally, University of Cincinnati affirms that all application information submitted to Duke Energy pursuant to this rebate offer is true and accurate. Information in question would include, but not be limited to, project scope, equipment specifications,equipmen t operational details, project costs, project completion dates, and the quantity of energy conservation measures installed.

If rebate is accepted, will you use the monies to fund future energy efficiency and/or demand reduction projects?

☑ YES ☐ NO

If rebate is declined, please indicate reason (optional):

Maurice DuPont Maurice DuPont 12/15/11

Customer Signature Printed Name Date

Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	Boiler ID Fan VFD (Boiler 3)	[redacted]
ECM-2	Boiler ID Fan VFD (Boiler 4)	[redacted]
ECM-3		
ECM-4		
ECM-5		
Total		[redacted]

Ohio | Public Utilities Commission

Application to Commit Energy Efficiency/Peak Demand Reduction Programs (Mercantile Customers Only)

Case No.: ____-____-EL-EEC

State of Ohio :

Maurice DuPont, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

   University of Cincinnati
   [insert customer or EDU company name and any applicable name(s) doing business as]

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.

3. I am aware of fines and penalties which may be imposed under Ohio Revised Code Sections 2921.11, 2921.31, 4903.02, 4903.03, and 4903.99 for submitting false information.

Maurice DuPont UTILITY ENGINEER
Signature of Affiant & Title

Sworn and subscribed before me this 15 day of December, 2011 Month/Year

Janice Adams
Signature of official administering oath

Janice Adams - Assistant To
Print Name and Title

JANICE ADAMS
Notary Public, State of Ohio
My Commission Expires 08-28-2016

My commission expires on _____

Appendix A

10002117 01
UNIVERSITY OF CINCINNATI
3001 VINE
CINCINNATI, OH 45219

Date	Days	Actual KWH
10/28/2011	29	9,780,527
9/29/2011	30	13,461,678
8/30/2011	29	15,433,477
8/1/2011	32	14,691,650
6/30/2011	29	12,713,072
6/1/2011	30	10,078,207
5/2/2011	32	9,178,830
3/31/2011	29	8,604,173
3/2/2011	29	10,900,746
2/1/2011	32	7,985,074
12/31/2010	31	7,686,691
11/30/2010	33	7,269,725
Total		**127,783,850**

See Appendix B At The End

Appendix C -Cash Rebate Calculation

VFD

Measure	Quantity	Cash Rebate Rate	Rebate	Cash Rebate
200 HP Boiler #3 ID Fan Motor	1	50% of incentive that would be offered by the Smart $aver Custom program	[redacted]	[redacted]
75 HP Boiler #4 ID Fan Motor	1	50% of incentive that would be offered by the Smart $aver Custom program	[redacted]	[redacted]
			Total	[redacted]

Appendix D -UCT Value

VFD

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
200 HP Boiler #3 ID Fan Motor	$100,134	$2,734	[redacted]	1	**13.84**
75 HP Boiler #4 ID Fan Motor	$20,501	$1,062	[redacted]	1	**7.29**
Totals	**$120,635**	**$3,796**	[redacted]	**2**	

Total Avoided Supply Costs	$120,635	***Aggregate Application UCT***	***12.01***
Total Program Costs	$3,796.00		
Total Incentive	[redacted]		

Appendix B – Energy Savings Achieved

	Pre-Project (at the meter)			Post-Project (at the meter)			Savings (at the meter)	
ECM	**As-Found Equipment**	**Total Annual kWh[1]**	**Summer Coincident kW[1]**	**New Equipment**	**Total Annual kWh[1]**	**Summer Coincident kW[2]**	**Energy Savings (kWh)**	**Demand Savings (kW) [2]**
ECM1	200 HP Boiler #3 ID Fan Motor (No VFD)	891,551	132	VFD Added	787,966	93	103,586	39
ECM2	75 HP Boiler #3 ID Fan Motor (No VFD)	266,514	0	VFD Added	226,420	0	40,093	0
						Totals	143,679	6

Notes:

1. Energy consumption baseline, demand baseline and post-project energy consumption basis are outlined in the following pages.
2. Demand savings are returned by DSMore software as a result of energy savings allocations at the coincident hour where applicable. Post-project demand is calculated as the difference between pre-project modeled demand and the DSMore software result. ECM2 is not in operation during the coincident hour and has no coincident demand savings.

Application of 7.43% line losses yields **154,632 kWh** savings and **41.8 coincident kW** savings at the plant. These numbers also reflect minor rounding error due to the analytical mode used to model these projects in DSMore software.

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #3 ID Fan w/VFD (ECM-1)** Rev.: **1**

1. INPUT DATA - BOILER #3 ID FAN MOTOR w/VFD (all values per pg 2 of 3 of Part 2 of the application for Boiler #3, except as otherwise noted)

Driven Equipment	**Name**	Boiler #3 ID Fan	**Type** Fan
Quantity		1	
Brake HP (BHP) at Full Load (see note 1)		168.4	
Nameplate HP		200.0	

Current Equipment Operation without VFD - Input values for ONE driven equipment and its motor.

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual	Motor output HP as % of Nameplate HP	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)											Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	168.4	84%	95	%	132.20	6,744	744	672	528	720	744	312	96	672	288	552	672	744	6,744
	%	0.0	#DIV/0!		%	#DIV/0!														0
	%	0.0	#DIV/0!		%	#DIV/0!														0
	%	0.0	#DIV/0!		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	2,016	0	0	216	0	0	408	648	72	432	192	48	0	2,016
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #3 ID Fan w/VFD (ECM-1)** Rev.: **1**

Proposed Equipment Operation with VFD - Input values for ONE driven equipment and its motor.

Efficiency of VFD	95	%

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual	Motor output HP as % of Motor Nameplat	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)												Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	168.4	84%	95	%	139.16	792	144	144	96	72	48	0	0	0	0	48	96	144	792
90	%	151.5	76%	95	%	125.24	2136	360	336	192	240	240	0	0	0	0	192	240	336	2136
80	%	134.7	67%	93	%	113.72	2184	240	192	120	192	240	168	0	288	144	144	192	264	2184
70	%	117.8	59%	90	%	102.82	1104			72	144	144	96	0	216	96	96	144		1008
60	%	101.0	51%	85	%	93.32	528			48	72	72	48	96	168	48	72			624
50	%	84.2	42%		%															0
40	%	67.3	34%		%															0
30	%	50.5	25%		%															0
20	%	33.7	17%		%															0
10	%	16.8	8%		%															0
Not Running		0.0	0%	NA	%	0.00	2,016	0	0	216	0	0	408	648	72	432	192	48	0	2,016
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #3 ID Fan w/VFD (ECM-1)** Rev.: **1**

2. CALCULATIONS OF ENERGY USAGE FOR BOILER #3 ID FAN MOTOR w/VFD

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Maximum
100%	139	139	139	139	139	0	0	0	0	139	139	139	139
90%	125	125	125	125	125	0	0	0	0	125	125	125	125
80%	114	114	114	114	114	114	0	114	114	114	114	114	114
70%			103	103	103	103	0	103	103	103	103		103
60%			93	93	93	93	93	93	93	93			93
50%													0
40%													0
30%													0
20%													0
10%													0
Maximum	**139**	**139**	**139**	**139**	**139**	**114**	**93**	**114**	**114**	**139**	**139**	**139**	**139**

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
100%	20,039	20,039	13,359	10,019	6,680	0	0	0	0	6,680	13,359	20,039	110,212
90%	45,087	42,081	24,046	30,058	30,058	0	0	0	0	24,046	30,058	42,081	267,515
80%	27,293	21,834	13,646	21,834	27,293	19,105	0	32,751	16,376	16,376	21,834	30,022	248,364
70%			7,403	14,806	14,806	9,871	0	22,209	9,871	9,871	14,806		103,644
60%			4,479	6,719	6,719	4,479	8,958	15,677	4,479	6,719			58,230
50%													0
40%													0
30%													0
20%													0
10%													0
Total	**92,418**	**83,954**	**62,934**	**83,437**	**85,555**	**33,455**	**8,958**	**70,638**	**30,726**	**63,691**	**80,057**	**92,142**	**787,966**

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #4 ID Fan w/VFD (ECM-2)** Rev.: **1**

1. INPUT DATA - BOILER #4 ID FAN MOTOR w/VFD (all values per pg 2 of 3 of Part 2 of the application for Boiler #4, except as otherwise noted)

Driven Equipment	**Name**	Boiler #4 ID Fan	**Type**	Fan
Quantity		1		
Brake HP (BHP) at Full Load (see note 1)		63.1		
Nameplate HP		75.0		

Current Equipment Operation without VFD - Input values for ONE driven equipment and its motor.

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load	Motor output HP as % of Nameplate HP	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)											Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	63.1	84%	95	%	49.57	5,376	672	672	432	720	696	312	0	648	288	0	192	744	5,376
	%	0.0	#DIV/0!		%	#DIV/0!														0
	%	0.0	#DIV/0!		%	#DIV/0!														0
	%	0.0	#DIV/0!		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	3,384	72	0	312	0	48	408	744	96	432	744	528	0	3,384
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #4 ID Fan w/VFD (ECM-2)** Rev.: **1**

Proposed Equipment Operation with VFD - Input values for ONE driven equipment and its motor.

Efficiency of VFD	95	%

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load	Motor output HP as % of Motor Nameplat	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)												Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	63.1	84%	95	%	52.18	696	144	144	96	72	48	0	0	0	0	0	48	144	696
90	%	56.8	76%	95	%	44.62	1656	288	336	144	240	240	0	0	0	0	0	72	336	1656
80	%	50.5	67%	93	%	40.51	1800	240	192	96	192	192	168	0	264	144	0	48	264	1800
70	%	44.2	59%	90	%	36.63	768			48	144	144	96	0	216	96	0	24		768
60	%	37.9	51%	85	%	33.24	456			48	72	72	48	0	168	48	0			456
50	%	31.6	42%		%															0
40	%	25.3	34%		%															0
30	%	18.9	25%		%															0
20	%	12.6	17%		%															0
10	%	6.3	8%		%															0
Not Running		0.0	0%	NA	%	0.00	3,384	72	0	312	0	48	408	744	96	432	744	528	0	3,384
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

DUKE ENERGY - NON-RESIDENTIAL CUSTOM PROGRAM
ENERGY DEMAND & USAGE CALCULATIONS

Applicant: **University of Cincinnati - Boiler ID Fan VFDs** App No.: **11-377 MSD**
ECM: **Boiler #4 ID Fan w/VFD (ECM-2)** Rev.: **1**

2. CALCULATIONS OF ENERGY USAGE FOR BOILER #4 ID FAN MOTOR w/VFD

% of Full Load Capacity of Driven Equipment	Energy Demand (kw)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Maximum
100%	52	52	52	52	52	0	0	0	0	0	52	52	52
90%	45	45	45	45	45	0	0	0	0	0	45	45	45
80%	41	41	41	41	41	41	0	41	41	0	41	41	41
70%			37	37	37	37	0	37	37	0	37		37
60%			33	33	33	33	0	33	33	0			33
50%													0
40%													0
30%													0
20%													0
10%													0
Maximum	**52**	**52**	**52**	**52**	**52**	**41**	**0**	**41**	**41**	**0**	**52**	**52**	**52**

% of Full Load Capacity of Driven Equipment	Energy Usage (kw-hr)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
100%	7,514	7,514	5,010	3,757	2,505	0	0	0	0	0	2,505	7,514	36,320
90%	12,850	14,991	6,425	10,708	10,708	0	0	0	0	0	3,212	14,991	73,886
80%	9,723	7,778	3,889	7,778	7,778	6,806	0	10,695	5,834	0	1,945	10,695	72,923
70%			1,758	5,275	5,275	3,516	0	7,912	3,516	0	879		28,132
60%			1,596	2,394	2,394	1,596	0	5,585	1,596	0			15,159
50%													0
40%													0
30%													0
20%													0
10%													0
Total	**30,087**	**30,284**	**18,678**	**29,912**	**28,660**	**11,918**	**0**	**24,192**	**10,946**	**0**	**8,541**	**33,201**	**226,420**

Cell: V6
Comment: bchiesa:
The only changes made from Rev. 0 were to split up the "monthly data' worksheet into two separate worksheets (i.e., one for ECM-1 & one for ECM-2)

Cell: F30
Comment: bchiesa:
corrected value - application shows a value of "0.95"

Cell: F39
Comment: bchiesa:
Adjusted to take into account lower motor efficiencies when motor output is significantly below 80% of motor full load.

Cell: F40
Comment: bchiesa:
Adjusted to take into account lower motor efficiencies when motor output is significantly below 80% of motor full load.

Cell: F41
Comment: bchiesa:
Adjusted to take into account lower motor efficiencies when motor output is significantly below 80% of motor full load.

Cell: I48
Comment: bchiesa:
Corrected equation in this cell

Cell: J48
Comment: bchiesa:
Corrected equation in this cell

Cell: K48
Comment: bchiesa:
Corrected equation in this cell

Cell: L48
Comment: bchiesa:
Corrected equation in this cell

Cell: M48
Comment: bchiesa:
Corrected equation in this cell

Cell: N48
Comment: bchiesa:
Corrected equation in this cell

Cell: O48
Comment: bchiesa:

Corrected equation in this cell

Cell: P48
Comment: bchiesa:
Corrected equation in this cell

Cell: Q48
Comment: bchiesa:
Corrected equation in this cell

Cell: R48
Comment: bchiesa:
Corrected equation in this cell

Cell: S48
Comment: bchiesa:
Corrected equation in this cell

Cell: T48
Comment: bchiesa:
Corrected equation in this cell

Cell: U48
Comment: bchiesa:
Corrected equation in this cell

Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

Questions? Call 1-866-380-9580 or visit www.duke-energy.com.

Email this form along with completed Mercantile Self Direct Prescriptive or Custom applications, proof of payment, energy savings calculations and spec sheets to SelfDirect@Duke-Energy.com. You may also fax to 1-513-419-5572.

Mercantile customers, defined as using at least 700,000 kWh annually are eligible for the Mercantile Self Direct program. Please indicate mercantile qualification:

- ☒ a single Duke Energy Ohio account
- ☐ multiple accounts in Ohio (energy usage with other utilities may be counted toward the total)

Please list Duke Energy account numbers below (attach listing of multiple accounts an/or billing history for other utilities as required):

Account Number	Annual Usage	Account Number	Annual Usage
1000-2117-01-6	108,524,021 kWh		

Self Direct rebates are available for completed Custom projects that have not previously received a Duke Energy Smart $aver® Custom Incentive. Self Direct incentives are applicable to Prescriptive measures that were installed more than 90 days prior to submission to Duke Energy and have not previously received a Duke Energy Prescriptive rebate.

Self Direct Program requirements dictate that certain projects that may be Prescriptive in nature under the Smart $aver program must be evaluated using the Custom process. Use the table on page two as a guide to determine which Self Direct program fits your project(s). Apply for Self Direct projects using the appropriate application forms in conjunction with this cover sheet. Where Mercantile Self Direct Prescriptive applications are listed, please refer to the measure list on that application. If your measure is not listed, you may be eligible for a Self Direct Custom rebate. Self Direct Custom applications, like Smart $aver Custom applications, should include detailed analysis of pre-project and post-project energy usage and project costs. Please indicate which type of rebate applications are included in the table provided on page two.

Please check each box to indicate completion of the following program requirements:

☒ All sections of appropriate application(s) are completed	☒ Proof of payment.*	☒ Manufacturer's Spec sheets	☒ Energy model/calculations and detailed inputs for Custom applications

* If a single payment record is intended to demonstrate the costs of both Prescriptive & Custom projects, please include an additional document with an estimated breakout of costs for each Prescriptive and Custom energy conservation measure.

Application Type	Replaced equipment at end of lifetime or because equipment failed**	Replaced fully operational equipment to improve efficiency***	New Construction
Lighting	MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐	MSD Prescriptive Lighting ☐	MSD Prescriptive Lighting ☐
		MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐	MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐
Heating & Cooling	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Prescriptive Heating & Cooling ☐
			MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	MSD Custom Part 1 ☐ MSD Custom General and/or EMS Worksheet(s) ☐	MSD Prescriptive Heating & Cooling ☐	MSD Custom Part 1 ☐ MSD Custom General and/or EMS Worksheet(s) ☐
Chillers & Thermal Storage	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Prescriptive Chillers & Thermal Storage ☐
			MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
Motors & Pumps	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Prescriptive Motors, Pumps & Drives ☐
			MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
VFDs	Not Applicable	MSD Prescriptive Motors, Pumps & Drives ☐	MSD Custom Part 1 ☐ MSD Custom VFD Worksheet ☐
		MSD Custom Part 1 ☒ MSD Custom VFD Worksheet ☒	
Food Service	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Prescriptive Food Service ☐
			MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
Process	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Prescriptive Process ☐	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
		MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	
Energy Management Systems	MSD Custom Part 1 ☐ MSD Custom EMS Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom EMS Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom EMS Worksheet ☐
Behavioral* & No/Low Cost**	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐		

** Under the Self Direct program, failed equipment and equipment at the end of its useful life are evaluated differently than early replacement of fully functioning equipment. **All equipment replacements due to failure or old age will be evaluated via the Custom program.**

*** Please ensure that you include the age of the replaced equipment for measures classified as "Early Replacement" in your application as well as the estimated date that you would have otherwise replaced the existing equipment if you had not chosen a more energy efficient option.

**** Behavioral energy efficiency and demand reduction projects must be both measurable and verifiable. Provide justification with your application.

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

Proposed energy efficiency measures may be eligible for Self-Direct Custom rebates if they clearly reduce electrical consumption and/or demand as compared to the appropriate baseline.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee a rebate will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications cannot be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, beginning on page 6.

Notes on the Application Process
If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact your Duke Energy Ohio, Inc account manager or the Duke Energy Smart $aver® team at 1-866-380-9580.

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. Monthly calculations are best. You, the Duke Energy Ohio customer, or your equipment vendor / engineer should perform these calculations and submit them to Duke Energy for review. *We strongly encourage the use of modeling software (such as eQuest or comparable) for complex projects.*

Upon receipt of your application, an acknowledgement email will be sent to you with an estimated response time based on an initial assessment of your application. The application review may include some communication to resolve any questions about the project or to request additional information. Applications that are received complete without missing information have a faster review time.

There are two ways to submit your completed application.

Email your scanned form to: SelfDirect@duke-energy.com

Or, fax your form to 513-419-5572

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

1. Contact Information (Required)

Duke Energy Customer Contact Information							
Company Name	University of Cincinnati						
Address	51 Goodman Drive, Ste 260						
Project Contact	Maurice DuPont						
City	Cincinnati	State	OH	Zip Code	45221		
Title	Utility Engineer						
Office Phone	513-556-1537	Mobile Phone	513-502-2185	Fax	513-556-4322		
E-mail Address	dupontmh@uc.edu						

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	CBT Cincinnati				
Address	737 W. 6th Street				
City	Cincinnati	State	OH	Zip Code	45201
Project Contact					
Title					
Office Phone	888-492-2244	Mobile Phone		Fax	
E-mail Address	sales@cbtcompany.com				
Describe Role	equipment vendor				

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):	University of Cincinnati Consolidated Utilities				
Mailing Address	3000 Glendor Ave				
City	Cincinnati	State	OH	Zip Code	45221
Type of organization (check one) ☐ Individual/Sole Proprietor ☐ Corporation ☐ Partnership ☐ Unit of Government ☒ Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:	31-6000989				
Who should receive incentive payment? (select one) ☒ Customer ☐ Vendor (Customer must sign below)					
If the vendor is to receive payment, please sign below: I hereby authorize payment of incentive directly to vendor: Customer Signature _____ Date____/___/_____ (mm/dd/yyyy)					

2. Project Information (Required)

A. Please indicate project type:
- ☒ New Construction
- ☐ Expansion at an existing facility
- ☐ Replacing equipment due to equipment failure
- ☐ Replacing equipment that is estimated to have remaining useful life of 2 years or less
- ☐ Replacing equipment that is estimated to have remaining useful life of more than 2 years
- ☐ Behavioral, operational and/or procedural programs/projects

B. Please describe your project, or attach a detailed project description that describes the project.

The addition of (1) variable frequency drive (VFD) devices to existing boiler #3 induced-draft (ID) fan in the University of Cincinnati Medical Campus Utility Plant.

C. When did you start and complete implementation?

Start date 11/2008 (mm/yyyy) End date 06/2009 (mm/yyyy)

D. Are you also applying for Self-Direct Prescriptive incentives and, if so, which one(s)[1]?

E. Please indicate which worksheet(s) you are submitting for this application (check all that apply):
- ☐ Lighting
- ☒ Variable Frequency Drive (VFD)
- ☐ Compressed Air
- ☐ Energy Management System (EMS)
- ☐ General (for projects not easily submitted using one of the above worksheets)

F. Please tell us if there is anything about your electrical energy projections (either for the baseline or the proposed project) that you are either unsure about or for which you have made significant assumptions. Attach additional sheets as needed.

Required: Attach a supplier or contractor invoice or other equivalent information documenting the Implementation Cost for each project listed in your application. (Note: self-install costs cannot be included in the Implementation Cost)

[1] If your project involves some equipment that is eligible for prescriptive incentives and some equipment that is likely eligible for custom incentives, and if it is feasible to separate the equipment for the energy analysis, then the equipment will be evaluated separately. If it is not feasible to separate the equipment for analysis, then the equipment will be evaluated together in the custom application.

3. Signature (Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Maurice DuPont, do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Incentives Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

_____

Duke Energy Ohio, Inc Customer Signature

Print Name Maurice DuPont

Date 4-Nov-11

Checklist for completing the Application

INCOMPLETE APPLICATIONS WILL RESULT IN DELAYS IN DUKE ENERGY PROCESSING YOUR APPLICATION AND NOTIFYING YOU CONCERNING AY REBATES. Before submitting the application and the required supplementary information, use the following checklist to ensure that your application is complete and the information in the application is accurate. (Note: this checklist is for your use only – do not submit this checklist with your application)

Section No. & Title	Have You:
1. Contact Information	☒ Completed the contact information for the Duke Energy customer? ☒ Completed the contact information for the equipment vendor / project engineer that can answer questions about the technical aspects of the project, if that is a different person than above?
2. Project Information	☒ Answered the questions A-E, including providing a description of your project. ☒ Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	☒ Signed your name? ☒ Printed your name? ☒ Entered the date?
Supplementary information (Required)	☒ Attached a supplier or contractor's invoice or other equivalent information documenting the Implementation Cost for projects listed in your application? (Note: self-install costs cannot be included in the Implementation Cost) ☒ (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for **each** project listed in your application?

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- your Duke Energy account manager
  or,
- the Duke Energy Smart $aver® team at 1-866-380-9580.

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

Instructions/Terms/Conditions

Note: Please keep for your records- do not submit with the application

1. Energy service companies or contractors may assist in preparing the application, but an authorized representative of the customer must sign this application to be eligible to participate in the Mercantile Self Direct Program. Completion of this application does not guarantee the approval of a Self Direct Custom Rebate.

2. Once all documentation requested in this application is received by *Duke Energy Ohio, Inc,* and any follow-up information requested by *Duke Energy* is received, the rebate amount for each Energy Conservation Measure (ECM) will be communicated to the customer. The rebate amount will be based on ECM energy savings and ECM incremental installation cost.

3. All rebates require approval by the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc* will submit an application for rebate on the customer's behalf upon customer attestation to program terms, conditions and requirements as outlined in the rebate offer letter and upon customer completion of attestation documents required by the Public Utilities Commission of Ohio.

4. *Duke Energy Ohio, Inc* will issue a Self Direct Custom Rebate check, based on the approved rebate amount for each ECM, upon receiving approval from the Public Utilities Commission of Ohio. *Duke Energy* Ohio, Inc does not guarantee PUCO approval.

5. With the application, the customer must provide a list of all sites where the ECMs were installed. *Duke Energy Ohio, Inc* requests that sites of similar size, hours of operation and energy consuming characteristics be grouped together in one application for the determination of the rebate amount. The application should identify the site where each unique ECM was installed.

6. Based on the information submitted with the application and the information gathered both before and after the initial installation of the ECM, *Duke Energy Ohio, Inc* will calculate the rebate amount for each ECM.

7. *Duke Energy Ohio, Inc* may conduct random site inspections of a sample of the locations where the ECMs are installed to verify installation and operability of the ECMs and to obtain information needed to calculate the Approved Incentive Amount.

8. Customers are encouraged to retain copies of all forms, invoices and supporting documentation for their records.

9. Approved rebates are valid for 6 months from the date communicated to the customer by *Duke Energy Ohio, Inc,* subject to the expiration of measure eligibility based on project completion dates and application submission deadlines as defined by PUCO. Customers are encouraged to execute their rebate offer contracts and PUCO-required affidavits promptly to ensure eligibility is not forfeited.

10. *Duke Energy Ohio, Inc* reserves the right to recover all unrecoverable costs associated with the project approval if the customer decides not to execute the rebate contract, after the project is approved by *Duke Energy Ohio, Inc.*

11. Projects financially supported by other funding sources will be evaluated on a case-by-case basis for potential partial funding from *Duke Energy Ohio, Inc*.

12. Participants must be *Duke Energy Ohio, Inc* nonresidential, mercantile customers with the project sites in the *Duke Energy Ohio, Inc* service territory.

13. Customers or trade allies may not use any *Duke Energy* logo without prior written permission.

14. Only trade allies registered with *Duke Energy* are eligible to participate.

15. All equipment must be new. Used or rebuilt equipment is not eligible for incentives. All old existing equipment must be removed on retrofit projects.

16. Disclaimers: *Duke Energy Ohio, Inc*
    a. does not endorse any particular manufacturer, product or system design within the program;
    b. will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives;
    c. does not expressly or implicitly warrant the performance of installed equipment. (Contact your contractor for details regarding equipment warranties.);
    d. is not responsible for the proper disposal/recycling of any waste generated or obsolete or old equipment as a result of this project;
    e. is not liable for any damage caused by the installation of the equipment nor for any damage caused by the malfunction of the installed equipment; and
    f. reserves the right to change or discontinue this program at any time. The acceptance of program applications is determined solely by *Duke Energy Ohio, Inc.*

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

Proposed energy efficiency measures may be eligible for Self-Direct Custom rebates if they clearly reduce electrical consumption and/or demand as compared to the appropriate baseline.

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- Electric demand and/or energy reductions must be well documented with auditable calculations.
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Refer to the complete list of Instructions and Disclaimers, beginning on page 6.

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Or, fax your form to 513-419-5572

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

1. Contact Information (Required)

Duke Energy Customer Contact Information									
Company Name	University of Cincinnati								
Address	51 Goodman Drive, Ste 260								
Project Contact	Maurice DuPont								
City	Cincinnati	State	OH	Zip Code	45221				
Title	Utility Engineer								
Office Phone	513-556-1537	Mobile Phone	513-502-2185	Fax	513-556-4322				
E-mail Address	dupontmh@uc.edu								

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	CBT Cincinnati				
Address	737 W. 6th Street				
City	Cincinnati	State	OH	Zip Code	45201
Project Contact					
Title					
Office Phone	888-492-2244	Mobile Phone		Fax	
E-mail Address	sales@cbtcompany.com				
Describe Role	Equipment vendor				

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):	University of Cincinnati Consolidated Utilities				
Mailing Address	3000 Glendora Ave				
City	Cincinnati	State	OH	Zip Code	45221
Type of organization (check one) ☐ Individual/Sole Proprietor ☐ Corporation ☐ Partnership ☐ Unit of Government ☒ Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:	31-6000989				
Who should receive incentive payment? (select one) ☒ Customer ☐ Vendor (Customer must sign below)					
If the vendor is to receive payment, please sign below: I hereby authorize payment of incentive directly to vendor: Customer Signature _____ Date____/___/_____ (mm/dd/yyyy)					

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

2. Project Information (Required)

A. Please indicate project type:
- ☒ New Construction
- ☐ Expansion at an existing facility
- ☐ Replacing equipment due to equipment failure
- ☐ Replacing equipment that is estimated to have remaining useful life of 2 years or less
- ☐ Replacing equipment that is estimated to have remaining useful life of more than 2 years
- ☐ Behavioral, operational and/or procedural programs/projects

B. Please describe your project, or attach a detailed project description that describes the project.

The addition of (1) variable frequency drive (VFD) devices to existing boiler #4 induced-draft (ID) fan in the University of Cincinnati Medical Campus Utility Plant.

C. When did you start and complete implementation?

Start date 11/2008 (mm/yyyy) End date 06/2009 (mm/yyyy)

D. Are you also applying for Self-Direct Prescriptive incentives and, if so, which one(s)[1]?

E. Please indicate which worksheet(s) you are submitting for this application (check all that apply):
- ☐ Lighting
- ☒ Variable Frequency Drive (VFD)
- ☐ Compressed Air
- ☐ Energy Management System (EMS)
- ☐ General (for projects not easily submitted using one of the above worksheets)

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3. Signature (Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Maurice DuPont , do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Incentives Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

_____

Duke Energy Ohio, Inc Customer Signature

Print Name Maurice DuPont

Date 4-Nov-11

Checklist for completing the Application

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Section No. & Title	Have You:
1. Contact Information	☐ Completed the contact information for the Duke Energy customer? ☐ Completed the contact information for the equipment vendor / project engineer that can answer questions about the technical aspects of the project, if that is a different person than above?
2. Project Information	☐ Answered the questions A-E, including providing a description of your project. ☐ Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	☐ Signed your name? ☐ Printed your name? ☐ Entered the date?
Supplementary information (Required)	☐ Attached a supplier or contractor's invoice or other equivalent information documenting the Implementation Cost for projects listed in your application? (Note: self-install costs cannot be included in the Implementation Cost) ☐ (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for **each** project listed in your application?

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  or,
- the Duke Energy Smart $aver® team at 1-866-380-9580.

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

Instructions/Terms/Conditions

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3. All rebates require approval by the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc* will submit an application for rebate on the customer's behalf upon customer attestation to program terms, conditions and requirements as outlined in the rebate offer letter and upon customer completion of attestation documents required by the Public Utilities Commission of Ohio.

4. *Duke Energy Ohio, Inc* will issue a Self Direct Custom Rebate check, based on the approved rebate amount for each ECM, upon receiving approval from the Public Utilities Commission of Ohio. *Duke Energy* Ohio, Inc does not guarantee PUCO approval.

5. With the application, the customer must provide a list of all sites where the ECMs were installed. *Duke Energy Ohio, Inc* requests that sites of similar size, hours of operation and energy consuming characteristics be grouped together in one application for the determination of the rebate amount. The application should identify the site where each unique ECM was installed.

6. Based on the information submitted with the application and the information gathered both before and after the initial installation of the ECM, *Duke Energy Ohio, Inc* will calculate the rebate amount for each ECM.

7. *Duke Energy Ohio, Inc* may conduct random site inspections of a sample of the locations where the ECMs are installed to verify installation and operability of the ECMs and to obtain information needed to calculate the Approved Incentive Amount.

8. Customers are encouraged to retain copies of all forms, invoices and supporting documentation for their records.

9. Approved rebates are valid for 6 months from the date communicated to the customer by *Duke Energy Ohio, Inc,* subject to the expiration of measure eligibility based on project completion dates and application submission deadlines as defined by PUCO. Customers are encouraged to execute their rebate offer contracts and PUCO-required affidavits promptly to ensure eligibility is not forfeited.

10. *Duke Energy Ohio, Inc* reserves the right to recover all unrecoverable costs associated with the project approval if the customer decides not to execute the rebate contract, after the project is approved by *Duke Energy Ohio, Inc.*

11. Projects financially supported by other funding sources will be evaluated on a case-by-case basis for potential partial funding from *Duke Energy Ohio, Inc*.

12. Participants must be *Duke Energy Ohio, Inc* nonresidential, mercantile customers with the project sites in the *Duke Energy Ohio, Inc* service territory.

13. Customers or trade allies may not use any *Duke Energy* logo without prior written permission.

14. Only trade allies registered with *Duke Energy* are eligible to participate.

15. All equipment must be new. Used or rebuilt equipment is not eligible for incentives. All old existing equipment must be removed on retrofit projects.

16. Disclaimers: *Duke Energy Ohio, Inc*
    a. does not endorse any particular manufacturer, product or system design within the program;
    b. will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives;
    c. does not expressly or implicitly warrant the performance of installed equipment. (Contact your contractor for details regarding equipment warranties.);
    d. is not responsible for the proper disposal/recycling of any waste generated or obsolete or old equipment as a result of this project;
    e. is not liable for any damage caused by the installation of the equipment nor for any damage caused by the malfunction of the installed equipment; and
    f. reserves the right to change or discontinue this program at any time. The acceptance of program applications is determined solely by *Duke Energy Ohio, Inc.*

3. Signature (Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Maurice DuPont, do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Incentives Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

Maurice DuPont

Duke Energy Ohio, Inc Customer Signature

Print Name Maurice DuPont

Date 4-Nov-11

Remit to: **PO BOX 630505**
Cincinnati OH 45263-0505
Phone: 513-621-9050 Fax: 513-621-0929

CBT
SOLUTIONS ON DEMAND

INVOICE	
5878021	
Invoice Date	Page
2/26/2009 11:34:20	1 of 1
ORDER NUMBER	
1415311	

DIRECT SHIPMENT

Bill To:
UNIVERSITY OF CINCINNATI
PO BOX 212000
CINCINNATI, OH 45221-0001

5105789898

Ship To:
CONSOLIDATED UTILITIES
DOCK EAST CAMPUS UTILITY PLANT UC
3220 EDEN AVE
CINCINNATI, OH 45221-0390

Ordered By: Zondra Hall

Customer ID: 203989

PO Number	*Terms Description*	*Net Due Date*	*Disc Due Date*	*Discount Amount*
B09-4500034275	2% 10 days net 30	03/28/09	03/08/09	1,695.38

Order Date	*Pick Ticket No*	*Account Manager*	*Taken by*	
10/28/2008 13:52:31	4839540	Cincinnati House	BCG	

Quantities					*Item ID* / *Item Description*	*Pricing UOM* / *Unit Size*	*Unit Price*	*Extended Price*
Ordered	*Shipped*	*Remaining*	*UOM* / *Unit Size*	*Disp.*				
					Carrier: MOTOR FREIGHT	*Tracking #:*		
1.000	1.000	0.000	EA	1.0	200HP CUSTOM DRIVE PACKAGE AB CUSTOM INVERTER PACKAGE FROM LDS	EA 1	50,738.0000	50,738.00
1.000	1.000	0.000	EA	1.0	75HP CUSTOM DRIVE PACKAGE AB 75 HP CUSTOM INVERTER PACKAGE	EA 1	34,031.0000	34,031.00

Total Lines: 2

SUB-TOTAL:	84,769.00
TAX:	0.00
AMOUNT DUE:	**84,769.00**

RECEIVED
MAR 02 2009
ACCOUNTS PAYABLE

ORIGINAL

THE F. D. LAWRENCE ELECTRIC CO.

Distributors of
ELECTRICAL MATERIALS

3450 BEEKMAN STREET
CINCINNATI, OHIO 452232743
513-542-1100 FAX 542-2422

ORIGINAL INVOICE

Invoice Information Type	Number	Level	Date
CJ	235695	01	4/15/09

Customer PO/JOB#: B09-4500034273

Ship Date	Inside Salesperson
4/13/09	16 BARNEY EVERHART

Acct#	Outside Salesperson
213000	11 MIKE KINNETT

Ship Via: BEST WAY

UC/ACCOUNTS PAYABLE
PO BOX 212000
CINCINNATI OH 45221-2000

5105796579

Ship To Information Below:
CONSOLIDATED UTILITIES

DOCK EAST CAMPUS UTILITY
UNIVERSITY OF CINCINNATI
3220 EDEN AVENUE
CINCINNATI OH 45221
FDL/235695 3911J

Remit check to The F.D. Lawrence Electric Co. L-6136 CINCINNATI OH 45270-6136

Line	Product Description/Customer Designation	Ordered	Backord	Shipped	Non	Unit Price	UM	Dis	Net Amount
2	SQD MODEL 6 LV MOTOR CONTROL CENTER	2		2	999	N/C	E	1.0	.00
	MARK: MCC-5, MCC-2								
3	SQD LOT PRICE	1		1	999	42684.61	E	1.0	42684.61

2.335%

RECEIVED
APR 20 2009
ACCOUNTS PAYABLE

If your account is current and this invoice is paid by: 5/10/09 TAKE DISCOUNT OF 426.85

0111 OHIO/HAM CO EXEMPT

Net	42,684.61
Tax	.00
Total	42,684.61

These goods were produced in compliance with all applicable requirements of section 6,7,and 12 of the Fair Labor Standards Act as amended and of regulation and orders of the United States Department of Labor issued under Section 14 thereof.
Returned merchandise or claims are subject to the conditions shown on sales tickets.
Merchandise shall not be returned without prior approval!
A charge of 1.5% monthly of 18% per annum will be added to all past due balances.

Change Order

Division of Administration and Finance
Planning + Design + Construction
P.O. Box 210186 ▪ Cincinnati, Ohio 45221-0186

UNIVERSITY OF Cincinnati

Project Name
East Campus Power Plant Closed Loop Cooling Water System & Ash Removal System Improvements

County: Hamilton

Contractor Name
Glenwood Electric Inc.

UC Purchase Order No.: B09-4500034803

Project No.: 07081D

Type of Contract: Electrical

Change Order No.: Boiler Room MCC Upgrade REVISED

Date: 3/13/2009

Basis of Change Order

- ☐ Error/Omission
- ☑ Owner Request
- ☐ Value Engineering
- ☐ Differing Condition
- ☐ Field Resolution
- ☐ Other

Encumbrance

Number ____ ☐ SF ☐ LF
Number ____ ☐ SF ☐ LF

State Funds:
Local Funds: 535106P22008A6

Current Completion Date: November 10, 2009
Contract Days Changed: 0
Revised Completion Date: November 10, 2009

Change Order Total: $100,074.21

Description / Justification (attach additional pages as necessary)

Labor and material associated with the Boiler Room MCC Upgrade to install new owner suppplied MCC panels for the control of boilers in the East Campus Utility Plant. Material cost breakdown is attached. This price has been revised to complete all the work during normal working hours (not overtime) during the plant shut down scheduled for the first week of May.

This Change Order identifies and provides full and complete satisfaction for all direct and indirect costs, including interest and all related extensions to the time for Contract Completion, for the described changes in the Scope of the Work.

Contractor Acceptance

Name: Glenwood Electric Inc.
Address: 2107 Lawn Avenue
Cincinnati, OH 45212

Signature _____ Date _____

Associate Recommendation

Name: N/A
Address:

Signature _____ Date _____

Construction Manager Recommendation (if applicable)

Name: N/A
Address:

Signature _____ Date _____

University Approval

(Vendor cannot invoice until receipt of University approved form A-600 "Cancellation or Change Order")

Sr. Staff Engineer/Project Manager _____ Date _____

University Project Administrator _____ Date _____

Change Order Detail Summary

Division of Administration and Finance
Planning + Design + Construction
P.O. Box 210186 ▪ Cincinnati, Ohio 45221-0186

UNIVERSITY OF Cincinnati

Project No.	07081D	Date	3/13/2009
Project Name	East Campus Power Plant Closed Loop Cooling Water Sys & Ash Removal Sys.	Description	Boiler Room MCC Upgrade REVISED
County	Hamilton	UC Purchase Order No.	B09-4500034803
Contractor Name and Address	Glenwood Electric Inc. 2107 Lawn Avenue Cincinnati, OH 45212	Change Order No.	2
		Type of Contract	Electrical

A. Labor Summary (excluding fringe benefits). Check box for overtime rate.*

☐	320.00 hours	x	28.72 /hour	=	9,190.40		
☐	629.00 hours	x	26.11 /hour	=	16,423.19		
☐	210.00 hours	x	19.06 /hour	=	4,002.60		
☐	hours	x	/hour	=			
☐	hours	x	/hour	=			
☐	hours	x	/hour	=		Total (A)	$ 29,616.19

B. Fringes:

320.00 hours	x	21.00 /hour	=	6,720.00		
629.00 hours	x	20.10 /hour	=	12,642.90		
210.00 hours	x	16.60 /hour	=	3,486.00		
hours	x	/hour	=			
hours	x	/hour	=			
hours	x	/hour	=		Total (B)	$ 22,848.90

C. Equipment Rental (attach itemized quotes / invoices) — Total (C) $

D. Owned Equipment (attach itemized supporting documentation) — Total (D) $

E. Trucking (attach itemized supporting documentation) — Total (E) $

F. Overhead (A+B+C+D+E) x 15.00% ** — Total (F) $ 7,869.76

G. Material (attach itemized supporting documentation) — Total (G) $ 30,641.70

H. Profit (A+B+C+D+E+F+G) x 10.00% — Total (H) $ 9,097.66

I. Subcontractor (attach Change Order Detail Summary and quotes / invoices) — Total (I) $

J. Contractor mark-up on Subcontractor (I x 5.00%)** — Total (J) $

K. Miscellaneous

1. Additional bond/insurance cost $
2. Fees for permits, licenses, inspection, tests, etc. (attach supporting documentation) $
3. Overnight lodging, travel and food (prior approval from University required) $

Total (K) $

Grand Total (A+B+C+D+E+F+G+H+I+J+K) $ 100,074.21

* Enter Overtime labor rates separately from regular labor rates.

** Percentage shown is maximum allowed on contracts awarded under the Standard Requirements, 2007 Edition. For contracts awarded under the Standard Conditions (May 2003 Lead Contractor or March 2000 Construction Manager), the maximum allowable percentage is 10 for each category.

Change Order Pricing - Supplemental Sheet
Material Pricing Sheet

Project: **U.C. MSB Expansion CARE**
231 Albert Sabin Way
Cincinnati, Ohio 45267

County: Hamilton

Contractor: **Glenwood Electric Inc.**
2107 Lawn Avenue
Cincinnati, Ohio 45212

UC Purchase Order No.: **B094500034803**
Project Number: **07081D**

Type of Contract: Electrical Work

Change Order No.: Boiler Rm MCC Upgrade

Date: 5-Mar-09

Description of Change:
labor and material associated with the Boiler Room MCC Upgrade.

Materials:

Quantity	Description	Unit	Unit Price	Extended Amount
2100'	3/4" rigid metal conduit & fittings	LOT	3200	$ 3,200.00
110'	1" rigid metal conduit & fittings	LOT	300	$ 300.00
100'	1 1/4" rigid metal conduit & fittings	LOT	350	$ 350.00
260'	3" rigid metal conduit & fittings	LOT	3221	$ 3,221.00
120'	2" rigid metal conduit & fittings	LOT	700	$ 700.00
60'	24" X 24" wireway	LOT	4500	$ 4,500.00
LOT	supports for conduits & wireway (unistrut, rod, etc.)	LOT	1175	$ 1,175.00
10590'	#14 THHN CU stranded wire	M	44.89	$ 475.39
7990'	#12 THHN CU stranded wire	M	64.95	$ 518.95
240'	#10 THHN CU stranded wire	M	99.77	$ 23.94
215'	#8 THHN CU stranded wire	M	177.74	$ 38.21
130'	#6 THHN CU stranded wire	M	267.93	$ 34.83
805'	#4 THHN CU stranded wire	M	426.4	$ 343.25
180'	#2 THHN CU stranded wire	M	655.28	$ 117.95
225'	#1/O THHN CU stranded wire	M	971.48	$ 218.58
270'	#3/O THHN CU stranded wire	M	1568.2	$ 423.41
1555'	#350 MCM THHN CU stranded wire	M	321.62	$ 5,001.19
55	Butt Splices & cold shrink	LOT	1500	$ 1,500.00
1000'	Beldon Cable #9182	LOT	670	$ 670.00
1000'	Beldon Cable #8760	LOT	220	$ 220.00
LOT	Concrete: cut & patch floor, new pads	LOT	5000	$ 5,000.00
LOT	Misc. materials	LOT	2610	$ 2,610.00
	Total Materials:			**$ 30,641.70**

Boiler #3 VFD

East Campus Utility Plant

University of Cincinnati

Project Description

The East Campus Utility plant at the University of Cincinnati houses a coal-fired boiler known as Boiler #3. The induced-draft (ID) fan motor that is rated at 200 HP was originally a constant volume fan operating whenever the boiler itself was in operation. The ID fan is connected to the boiler via ductwork downstream of the boiler. It's primary function is to exhaust combustion gases from the boiler to baghouse and the stack. The Variable Frequency Drive (VFD) was added to save energy and gain better control of the boiler operation. The estimated electric savings (see spreadsheet, Part 2) show a simple payback of slightly over 4 years.

Boiler #4 VFD

East Campus Utility Plant

University of Cincinnati

Project Description

The East Campus Utility plant at the University of Cincinnati houses a coal-fired boiler known as Boiler #4. The induced-draft (ID) fan motor that is rated at 75 HP was originally a constant volume fan operating whenever the boiler itself was in operation. The ID fan is connected to the boiler via ductwork downstream of the boiler. It's primary function is to exhaust combustion gases from the boiler to baghouse and the stack. The Variable Frequency Drive (VFD) was added to save energy and gain better control of the boiler operation. The estimated electric savings (see spreadsheet, Part 2) show a simple payback of slightly over 4 years.

The VFD Worksheet is part 2 of the application. Do not submit this file without submitting a completed Part1 Custom Application document file, which can be found at www.duke-energy.com.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee an incentive will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications will not be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, found in the Mercantile Self Custom Application Part 1 document.

Please enter your information and data into the cells that are shaded.
Cells in white are locked and cannot be written over.

Duke Energy Customer Contact Information (Match the information in Application Part 1):

Name	Maurice DuPont
Company	University of Cincinnati

Equipment Vendor / Project Engineer Contact Information

Name	
Company	Cincinnati Belting & Transmission (CBT Cincinnati)

Location of Proposed VFD Project

Site Name	Medical (East) Campus Utility Plant
Electric Account Number(s)	1000-2117-01-6
Site Address	3150 Eden Avenue, Cincinnati, OH 45221

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.
The prescriptive incentive applications can be found at:
http://www.duke-energy.com/ohio-large-business/smart-saver/mercantile-self-direct.asp
Prescriptive rebate amounts are pre-approved.

Use one worksheet for each type of motor or fan that is being evaluated for a VFD

App No.	
Rev.	

Driven Equipment	**Name**	Boiler #3 ID Fan	**Type** Fan
Quantity		1	
Brake HP (BHP) at Full Load (see note 1)		168.4	
Nameplate HP		200.0	

Current Equipment Operation without VFD - Input values for ONE driven equipment and its motor.

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of Nameplate HP	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)												Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	168.4	84%	95	%	132.20	6,744	744	672	528	720	744	312	96	672	288	552	672	744	6,744
	%	0.0	0%		%	#DIV/0!														0
	%	0.0	0%		%	#DIV/0!														0
	%	0.0	0%		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	2,016	0	0	216	0	0	408	648	72	432	192	48	0	2,016
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

Proposed Equipment Operation with VFD - Input values for ONE driven equipment and its motor.

Efficiency of VFD	0.95	%

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of Motor Nameplate	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)												Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	168.4	84%	95	%	132.20	792	144	144	96	72	48	0	0	0	0	48	96	144	792
90	%	151.5	76%	95	%	118.98	2136	360	336	192	240	240	0	0	0	0	192	240	336	2136
80	%	134.7	67%	95	%	105.76	2184	240	192	120	192	240	168	0	288	144	144	192	264	2184
70	%	117.8	59%	95	%	92.54	1104			72	144	144	96	0	216	96	96	144		1008
60	%	101.0	51%	95	%	79.32	528			48	72	72	48	96	168	48	72			624
50	%	84.2	42%		%	#DIV/0!														0
40	%	67.3	34%		%	#DIV/0!														0
30	%	50.5	25%		%	#DIV/0!														0
20	%	33.7	17%		%	#DIV/0!														0
10	%	16.8	8%		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	2,016	0	0	216	0	0	408	648	72	432	192	48	0	2,016
						Totals	**2,016**	**0**	**0**	**216**	**0**	**0**	**408**	**648**	**72**	**432**	**192**	**48**	**0**	**2,016**

Detailed Project Description Attached? Yes (Required)

1 Brake HP (BHP) at Full Load
The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD)

2 Annual hours that motor runs
If the % operating loads do not vary between months, then enter the total annual hours that the motor will run at full load, partial load and hours not operating.

3 Monthly hours that each motor runs
If the % operating loads vary between months (due to weather conditions or seasonal load), fill in the expected hours that the motor will run each month at full load, partial load and hours not operating.

App No.	0
Rev.	0

Operating Hours (see note 4)

	Weekday		Saturday		Sunday		Weeks of Use in Year	Total Annual
24 x 7	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour	(see note 5)	Hours of Use
	12:00 AM	*12:00 AM*	*12:00 AM*	*12:00 AM*	*12:00 AM*	*12:00 AM*	*40*	*6,744*

Energy Savings

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	890,097 kWh	732,595 kWh	157,502 kWh	
Electric Demand (kilowatts)	132 kW	132 kW	0 kW	
Calculations attached	Yes	Yes		ming the products of the kW demand and operating hours for each applicable % l

Simple Payback

Average electric rate ($/kWh) on the applicable accounts (see note 6)			$0.10	
Estimated annual electric savings			$15,750	
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels				
Incremental cost to implement the project (equipment & installation) (see note 7)			$122,179.00	
Copy of vendor proposal is attached (see note 8)			Yes	
Simple Electric Payback in years (see note 9)	7.75729832	**Total Payback in years**		7.75729832

4 Operating Hours
Describe when the equipment is typically used. If the project is proposed for more than one site, provide any variations in operating hours between the sites on a separate sheet.

5 Weeks of Use in Year
If the equipment is not in use 52 weeks during the year (for example, during holiday or summer break), provide an explanation of when usage is not expected and why: Usage may not be expected during summer months when gas boilers are operated instead of

6 Average electric rate ($/kWh)
If you do not know your average electric rate, use $0.10/kWh.

7 Incremental cost to implement the project
Costs exclude self installation costs.
Retrofit projects, incremental cost is the total cost of the proposed project. New construction or where the existing equipment must be replaced anyway, then incremental cost is the premium of the proposed high efficiency project over baseline.

8 Copy of vendor invoice is attached
Vendor invoices detailing costs of the project are always required.
New construction projects or where the existing equipment must be replaced anyway, vendor proposal of baseline must also be attached.

9 Simple Electric Payback
If the simple payback on the project is less than 1 year, the rebate structure is affected.
Please check that the electric rate is accurate based on history.

The VFD Worksheet is part 2 of the application. Do not submit this file without submitting a completed Part1 Custom Application document file, which can be found at www.duke-energy.com.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee an incentive will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications will not be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, found in the Mercantile Self Custom Application Part 1 document.

Please enter your information and data into the cells that are shaded.
Cells in white are locked and cannot be written over.

Duke Energy Customer Contact Information (Match the information in Application Part 1):

Name	Maurice DuPont
Company	University of Cincinnati

Equipment Vendor / Project Engineer Contact Information

Name	
Company	Cincinnati Belting & Transmission (CBT)

Location of Proposed VFD Project

Site Name	Medical (East) Campus Utility Plant
Electric Account Number(s)	1000-2117-01-6
Site Address	3150 Eden Avenue, Cincinnati, OH 45221

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.
The prescriptive incentive applications can be found at:
http://www.duke-energy.com/ohio-large-business/smart-saver/mercantile-self-direct.asp
Prescriptive rebate amounts are pre-approved.

Use one worksheet for each type of motor or fan that is being evaluated for a VFD

App No.	
Rev.	

Driven Equipment	**Name**	Boiler #4 ID Fan	**Type** Fan
Quantity		1	
Brake HP (BHP) at Full Load (see note 1)		63.1	
Nameplate HP		75.0	

Current Equipment Operation without VFD - Input values for ONE driven equipment and its motor.

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of Nameplate HP	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)											Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	63.1	84%	95	%	49.57	5,376	672	672	432	720	696	312	0	648	288	0	192	744	5,376
	%	0.0	0%		%	#DIV/0!														0
	%	0.0	0%		%	#DIV/0!														0
	%	0.0	0%		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	3,384	72	0	312	0	48	408	744	96	432	744	528	0	3,384
						Totals	**8,760**	**744**	**672**	**744**	**720**	**744**	**720**	**744**	**744**	**720**	**744**	**720**	**744**	**8,760**

Proposed Equipment Operation with VFD - Input values for ONE driven equipment and its motor.

Efficiency of VFD	0.95	%

% of Full Load BHP of Driven Equipment		BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of Motor Nameplate	Motor Efficiency @ Motor Output HP (%)		Motor Electrical Power Draw (kw)	Annual hours that motor runs (see note 2)	Monthly hours that each motor runs (see note 3)											Yearly Total (hr)
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100	%	63.1	84%	95	%	49.57	696	144	144	96	72	48	0	0	0	0	0	48	144	696
90	%	56.8	76%	95	%	44.62	1656	288	336	144	240	240	0	0	0	0	0	72	336	1656
80	%	50.5	67%	95	%	39.66	1800	240	192	96	192	192	168	0	264	144	0	48	264	1800
70	%	44.2	59%	95	%	34.70	768			48	144	144	96	0	216	96	0	24		768
60	%	37.9	51%	95	%	29.74	456			48	72	72	48	0	168	48	0			456
50	%	31.6	42%		%	#DIV/0!														0
40	%	25.3	34%		%	#DIV/0!														0
30	%	18.9	25%		%	#DIV/0!														0
20	%	12.6	17%		%	#DIV/0!														0
10	%	6.3	8%		%	#DIV/0!														0
Not Running		0.0	0%	NA	%	0.00	3,384	72	0	312	0	48	408	744	96	432	744	528	0	3,384
						Totals	**3,384**	**72**	**0**	**312**	**0**	**48**	**408**	**744**	**96**	**432**	**744**	**528**	**0**	**3,384**

Detailed Project Description Attached? Yes (Required)

1 Brake HP (BHP) at Full Load
The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD)

2 Annual hours that motor runs
If the % operating loads do not vary between months, then enter the total annual hours that the motor will run at full load, partial load and hours not operating.

3 Monthly hours that each motor runs
If the % operating loads vary between months (due to weather conditions or seasonal load), fill in the expected hours that the motor will run each month at full load, partial load and hours not operating.

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Operating Hours (see note 4)

	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
24 x 7	**Start Hour**	**End Hour**	**Start Hour**	**End Hour**	**Start Hour**	**End Hour**		
	12:00 AM	***12:00 AM***	***12:00 AM***	***12:00 AM***	***12:00 AM***	***12:00 AM***	***32***	

Energy Savings

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	333,786 kWh	219,993 kWh	113,793 kWh	
Electric Demand (kilowatts)	50 kW	50 kW	0 kW	
Calculations attached	Yes	Yes		ming the products of the kW demand and operating hours for each applicable % l

Simple Payback

Average electric rate ($/kWh) on the applicable accounts (see note 6)			$0.10	
Estimated annual electric savings			$11,379	
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels			$0.00	
Incremental cost to implement the project (equipment & installation) (see note 7)			$105,479.00	
Copy of vendor proposal is attached (see note 8)			Yes	
Simple Electric Payback in years (see note 9)	9.269375093	**Total Payback in years**		9.269375093

4 Operating Hours
Describe when the equipment is typically used. If the project is proposed for more than one site, provide any variations in operating hours between the sites on a separate sheet.

5 Weeks of Use in Year
If the equipment is not in use 52 weeks during the year (for example, during holiday or summer break), provide an explanation of when usage is not expected and why: Usage may not be expected during summer months when additional gas boilers are operated

6 Average electric rate ($/kWh)
If you do not know your average electric rate, use $0.10/kWh.

7 Incremental cost to implement the project
Costs exclude self installation costs.
Retrofit projects, incremental cost is the total cost of the proposed project. New construction or where the existing equipment must be replaced anyway, then incremental cost is the premium of the proposed high efficiency project over baseline.

8 Copy of vendor invoice is attached
Vendor invoices detailing costs of the project are always required.
New construction projects or where the existing equipment must be replaced anyway, vendor proposal of baseline must also be attached.

9 Simple Electric Payback
If the simple payback on the project is less than 1 year, the rebate structure is affected.
Please check that the electric rate is accurate based on history.

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3/26/2012 11:15:48 AM

in

Case No(s). 12-0836-EL-EEC

Summary: Application Application to Commit Energy
Efficiency/Peak Demand
Reduction Programs
(Mercantile Customers Only)- University of Cincinnati electronically filed by Carys Cochern on behalf of Duke Energy