



**Case No.: 13-1280-EL-EEC**

**Mercantile Customer: Valley Asphalt Corporation**

**Electric Utility: Duke Energy**

**Program Title or  
Description: Multiple VFD Projects**

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](mailto:ee-pdr@puc.state.oh.us).

## Section 1: Mercantile Customer Information

Name: **Valley Asphalt Corporation**

Principal address: **11641 Mosteller Rd Cincinnati, Ohio 45241**

Address of facility for which this energy efficiency program applies:

**4850 Stubbs Mill Rd, Morrow OH 45152**

**7940 Main St, Newtown Ohio 45244**

**11641 Mosteller Rd, Cincinnati Ohio 45241**

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 July 2012 and was finished April 2013.**

**1 VFD on 200HP Asphalt Dryer - 4850 Stubbs Mill Rd  
1 VFD on 200HP Asphalt Dryer - 7940 Main St  
1 VFD on 200HP Asphalt Dryer -11641 Mosteller Rd  
1 VFD on 100HP Burner Blower -11641 Mosteller Rd**

- ☐ 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: 186,591 kWh  
Refer to Appendix B for calculations and supporting document**

- 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 new equipment was installed starting July 2012 and was finished April 2013.**

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

**0 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 **\$3155.00. Refer to Appendix C for documentation.** (Rebate shall not exceed 50% project cost.

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 **10.74** (Skip to Subsection 2.) **Refer to Appendix D for calculations and supporting documents.**

### 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 **\$85,738**

The utility's program costs were **\$4,827**

The utility's incentive costs/rebate costs were **\$3155.**

**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 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  
Mercantile Self Direct Program  
139 East Fourth Street  
Cincinnati, OH 45202  
513 629 5572 fax

May 14, 2013

Mr. Fred Brammer  
Valley Asphalt  
11641 Mosteller Road  
Cincinnati, Oh 45241

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

Dear Brammer:

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 \$3155.00 has been proposed for your VFD projects completed in the 2013 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 513-629-5572 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,

A handwritten signature in black ink, appearing to read 'Grady Reid, Jr.'.

Grady Reid, Jr  
Product Manager  
Mercantile Self Direct Rebates

cc: Deanna Bowden, Duke Energy  
Rob Jung, Ecova  
Doug Ison, F.D. Lawrence Electric Company

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

☒ Rebate is accepted.

☐ Rebate is declined.

By accepting this rebate, Valley Asphalt 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, Valley Asphalt 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, Valley Asphalt 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, equipment 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):

Fred Brammer

FRED BRAMMER

5-21-13

Customer Signature

Printed Name

Date

### Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	Plant 14 Asphalt Dryer Rotary Kiln VFD (Qty 1)	\$891.00
ECM-2	Plant 23 Burner Blower VFD (Qty 1)	\$411.00
ECM-3	Plant 23 Asphalt Dryer Rotary Kiln VFD (Qty 1)	\$1176.00
ECM-4	Plant 5 Asphalt Dryer Rotary Kiln VFD (Qty 1)	\$677.00
Total		\$3155.00



# Public Utilities Commission

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

Case No.: \_\_\_\_ - \_\_\_\_ -EL-EEC

State of Ohio :

Fred Brammer, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Valley Asphalt Corp.

[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.

Fred Brammer Supt.  
Signature of Affiant & Title

Sworn and subscribed before me this 21 day of May,  
2013 Month/Year

Anita R. Davis  
Signature of official administering oath

Anita R. Davis, Contract  
Print Name and Title Coordinator



My commission expires on

ANITA R. DAVIS  
Notary Public, State of Ohio  
My Commission Expires  
December 2, 2016

08403616 01		
VALLEY ASPHALT CORP		
4850 STUBBSMILL RD		
MORROW, OH 45152		
Electric Meter: 106882309 -- Rate DS01		
Date	Days	Actual KWH
4/3/2013	30	2,915
3/4/2013	31	3,359
2/1/2013	29	2,742
1/3/2013	34	18,329
11/30/2012	31	48,162
10/30/2012	29	49,727
10/1/2012	32	66,003
8/30/2012	29	63,021
8/1/2012	30	36,762
7/2/2012	31	44,716
6/1/2012	30	33,401
5/2/2012	30	45,025
<b>Total</b>		<b>414,162</b>

24600675 01		
VALLEY ASPHALT CORP		
11641 MOSTELLER RD		
CINCINNATI, OH 45241		
Bulked Metrs: 108000839 & 108004326 -- Rate DS01		
Date	Days	Actual KWH
3/27/2013	29	54,560
2/26/2013	29	54,574
1/28/2013	32	57,655
12/27/2012	31	129,266
11/26/2012	33	150,101
10/24/2012	29	160,625
9/25/2012	32	138,441
8/24/2012	29	161,215
7/26/2012	30	136,767
6/26/2012	32	134,521
5/25/2012	29	116,557
4/26/2012	30	116,905
<b>Total</b>		<b>1,411,187</b>

7940 MAIN		
CINCINNATI, OH 45244		
Bulked Electric Meter: 94273581 & 106939983 -- Rate DS01		
Date	Days	Actual KWH
3/19/2013	29	2,218
2/18/2013	31	2,525
1/18/2013	32	2,758
12/17/2012	33	43,441
11/14/2012	29	64,939
10/16/2012	29	61,647
9/17/2012	32	49,547
8/16/2012	29	57,523
7/18/2012	30	53,934
6/18/2012	32	59,419
5/17/2012	29	33,113
4/18/2012	30	14,971
<b>Total</b>		<b>446,035</b>

Appendix B - Valley Asphalt 3 Plants (No 5,14,23) 4 VFDs Energy Savings Achieved									
	Baseline Used			Post Project Actual			Hours of Operation	Savings	
	Description	Annual kWh	Summer Coincident kW	Description	Annual kWh	Summer Coincident kW		Annual kWh	Summer Coincident kW
ECM - 1	Valley Asphalt - Plant 14 Kiln No VFD	350,227	157	Installed new 200-hp VFD	301,380	134		48,847	23.0
ECM - 2	Valley Asphalt - Plant 23 Blower No VFD	176,684	79	Installed new 100-hp VFD	146,341	64		30,343	15.0
ECM - 3	Valley Asphalt - Plant 23 Kiln No VFD	321,173	157	Installed new 200-hp VFD	276,574	133		44,599	24.0
ECM - 4	Valley Asphalt - Plant 5 Kiln No VFD	332,952	157	Installed new 200-hp VFD	282,211	131		50,741	26.0
	TOTALS	1,181,036	550		1,006,506	462		174,530	88.0
Notes:	Energy consumption baseline, demand baseline and post project energy consumption basis are outlined in the following pages.								
After consideration of line losses, total energy savings are <b>186,591 kWh</b> and <b>0 summer coincident kW</b> . These values may also reflect minor DSMore modeling software rounding									

Mar 2013 V1

Salesforce Opportunity Name

0

Project Name

Valley Asphalt Corporation - Mercantile Self Direct - Kiln and Blower Motor VFD

Application #

CM013-1392199

Valley Asphalt - Plant 23 Kiln VFD

Rev.

0

State

OH

**Measure Description**  
The measure involved the installation of a new VFD on an existing 200-hp motor that drives a rotary kiln. The VFD allows the rotary kiln to revolve faster or slower based on the type of asphalt mix being produced.

**Baseline**  
The customer estimates that the baseline equipment had a remaining useful life of more than two years, and as such the customer average baseline has been used. The baseline motor had only on/off type controls and ran at a constant load regardless of the product being produced. The customer estimates that the kiln operates for 2,045 hours/year.

**Savings Calculation Methodology**  
The new VFD allows the 200-hp motor to reduce electric output and kiln speed based on product requirements. The post-installation duty cycle, which was calculated by the customer, seems reasonable. Energy savings are achieved because the new VSD allows the motor to spend a majority of its 2,045 hour annual operating time running at a reduced load relative to the baseline period.

**Incremental Measure Cost (IMC)**  
Baseline choice was no action. Incremental costs are from invoices provided for the installed equipment

IMC Calculation	IMC (\$)	Baseline Cost (\$)	Measure Cost (\$)
	\$8,300.00	\$0.00	\$8,300.00


**References to source documents/back up files as appropriate**  
CMO13-1392199 - Valley Asphalt Corporation - Part 2 Worksheet & Invoices & Specs- Plant 23 Kiln - ECM1

Attached Files

☒ Equipment Specs

☒ Calculations

☒ Cost Documentation



CMO13-1392199 - Valley Asphalt Corporation - Part

**Savings Calculations** (insert all appropriate calculations or simulation results below)

The calculations below have been put together by the reviewer. The duty cycle for the VFD retrofitted motor was calculated by the customer.

Overall, savings decreased slightly compared to the submitted value.

BASELINE

Demand Calculations				Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	157.05	0	0	0	200	230	240	260	260	270	260	175	150
90%	134.28	95.00%	141.35												
80%	119.36	95.00%	125.64												
70%	104.44	95.00%	109.94												
60%	89.52	95.00%	94.23												
50%	74.60	95.00%	78.53												
40%	59.68	95.00%	62.82												
Total Hours				2,045											
Monthly Energy Consumption (kWh)				0	0	0	31,411	36,122	37,693	40,834	40,834	42,404	40,834	27,484	23,558
Monthly Average Demand (kW)				0.00	0.00	0.00	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05
Annual kWh				321,172.6											
Average kW				157.05											

POST-INSTALLATION

Demand Calculations					Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	VFD Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	97.50%	161.08	0	0	0	60	60	60	60	60	60	60	60	50
90%	134.28	95.00%	97.50%	144.97	0	0	0	50	60	60	60	60	60	60	50	50
80%	119.36	95.00%	97.50%	128.86	0	0	0	40	60	60	60	60	60	60	40	20
70%	104.44	95.00%	97.50%	112.76	0	0	0	30	30	40	40	50	60	50	10	20
60%	89.52	95.00%	97.50%	96.65	0	0	0	20	20	20	40	30	30	30	15	10
50%	74.60	95.00%	97.50%	80.54												
40%	59.68	95.00%	97.50%	64.43												
Total Hours					2,045											
Monthly Energy Consumption (kWh)					0	0	0	27,384	31,411	32,538	34,471	34,632	35,760	34,632	24,645	21,101
Monthly Average Demand (kW)					0.00	0.00	0.00	136.92	136.57	135.58	132.58	133.20	132.44	133.20	140.83	140.68
Annual kWh					276,573.7											
Average kW					135.78											

Annual Savings	44,599 kWh
Average kW Reduction	21.28 kW

Mar 2013 V1

Salesforce Opportunity Name

0

Project Name

Valley Asphalt Corporation - Mercantile Self Direct - Kiln and Blower Motor VFD

Application #

CM013-1392199

Valley Asphalt - Plant 23 Kiln VFD

Rev.

0

State

OH

**Measure Description**  
The measure involved the installation of a new VFD on an existing 100-hp motor that drives a burner blower. The VFD allows the blower to reduce output based on the type of asphalt mix being produced.

**Baseline**  
The customer estimates that the baseline equipment had a remaining useful life of more than two years, and as such the customer average baseline has been used. The baseline motor had only on/off type controls and ran at a constant load regardless of the product being produced. The customer estimates that the blower operates for 2,250 hours/year.

**Savings Calculation Methodology**  
The new VFD allows the 100-hp motor to reduce electric output and blower speed based on product requirements. The post-installation duty cycle, which was calculated by the customer, seems reasonable. Energy savings are achieved because the new VSD allows the motor to spend a majority of its 2,250 hour annual operating time running at a reduced load relative to the baseline period.

**Incremental Measure Cost (IMC)**  
Baseline choice was no action. Incremental costs are from invoices provided for the installed equipment

IMC Calculation	IMC (\$)	Baseline Cost (\$)	Measure Cost (\$)
	\$4,869.00	\$0.00	\$4,869.00


**References to source documents/back up files as appropriate**  
CMO13-1392199 - Valley Asphalt Corporation - Part 2 Worksheet & Invoices & Specs- Plant 23 Blower - ECM2

Attached Files

☒ Equipment Specs

☒ Calculations

☒ Cost Documentation



CMO13-1392199 - Valley Asphalt Corporation - Part 2

**Savings Calculations** (insert all appropriate calculations or simulation results below)

The calculations below have been put together by the reviewer. The duty cycle for the VFD retrofitted motor was calculated by the customer.

Overall, savings decreased slightly compared to the submitted value.

BASELINE

Demand Calculations				Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
100	74.60	95.00%	78.53	0	0	0	200	290	300	300	300	300	300	175	85
90%	67.14	95.00%	70.67												
80%	59.68	95.00%	62.82												
70%	52.22	95.00%	54.97												
60%	44.76	95.00%	47.12												
50%	37.30	95.00%	39.26												
40%	29.84	95.00%	31.41												
Total Hours				2,250											
Monthly Energy Consumption (kWh)				0	0	0	15,705	22,773	23,558	23,558	23,558	23,558	23,558	13,742	6,675
Monthly Average Demand (kW)				0.00	0.00	0.00	78.53	78.53	78.53	78.53	78.53	78.53	78.53	78.53	78.53
Annual kWh				176,684.2											
Average kW				78.53											

POST-INSTALLATION

Demand Calculations					Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	VFD Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
100	74.60	95.00%	97.50%	80.54	0	0	0	50	60	60	60	60	60	60	40	40
90%	67.14	95.00%	97.50%	72.49	0	0	0	50	60	60	60	60	60	60	40	10
80%	59.68	95.00%	97.50%	64.43	0	0	0	40	60	60	60	60	60	60	35	15
70%	52.22	95.00%	97.50%	56.38	0	0	0	30	60	60	60	60	60	60	30	10
60%	44.76	95.00%	97.50%	48.32	0	0	0	30	50	60	60	60	60	60	30	10
50%	37.30	95.00%	97.50%	40.27												
40%	29.84	95.00%	97.50%	32.22												
Total Hours					2,250											
Monthly Energy Consumption (kWh)					0	0	0	13,370	18,846	19,330	19,330	19,330	19,330	19,330	11,517	5,960
Monthly Average Demand (kW)					0.00	0.00	0.00	66.85	64.99	64.43	64.43	64.43	64.43	64.43	65.81	70.12
Annual kWh					146,340.8											
Average kW					65.55											

Annual Savings	30,343 kWh
Average kW Reduction	12.98 kW

Mar 2013 V1

Salesforce Opportunity Name

0

Project Name

Valley Asphalt Corporation - Mercantile Self Direct - Kiln and Blower Motor VFD

Application #

CM013-1392199

Valley Asphalt - Plant 23 Kiln VFD

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**Measure Description**  
The measure involved the installation of a new VFD on an existing 200-hp motor that drives a rotary kiln. The VFD allows the rotary kiln to revolve faster or slower based on the type of asphalt mix being produced.

**Baseline**  
The customer estimates that the baseline equipment had a remaining useful life of more than two years, and as such the customer average baseline has been used. The baseline motor had only on/off type controls and ran at a constant load regardless of the product being produced. The customer estimates that the kiln operates for 2,230 hours/year.

**Savings Calculation Methodology**  
The new VFD allows the 200-hp motor to reduce electric output and kiln speed based on product requirements. The post-installation duty cycle, which was calculated by the customer, seems reasonable. Energy savings are achieved because the new VSD allows the motor to spend a majority of its 2,230 hour annual operating time running at a reduced load relative to the baseline period.

**Incremental Measure Cost (IMC)**  
Baseline choice was no action. Incremental costs are from invoices provided for the installed equipment

IMC Calculation	IMC (\$)	Baseline Cost (\$)	Measure Cost (\$)
	\$8,300.00	\$0.00	\$8,300.00


**References to source documents/back up files as appropriate**  
CMO13-1392199 - Valley Asphalt Corporation - Part 2 Worksheet & Invoices & Specs- Plant 14 Kiln - ECM3

Attached Files

☒ Equipment Specs

☒ Calculations

☒ Cost Documentation

 CMO13-1392199 - Valley Asphalt Corporation - Part

**Savings Calculations** (insert all appropriate calculations or simulation results below)

The calculations below have been put together by the reviewer. The duty cycle for the VFD retrofitted motor was calculated by the customer.

Overall, savings decreased slightly compared to the submitted value.

**BASELINE**

Demand Calculations				Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	157.05	0	0	200	230	240	250	260	260	270	270	250	0
90%	134.28	95.00%	141.35												
80%	119.36	95.00%	125.64												
70%	104.44	95.00%	109.94												
60%	89.52	95.00%	94.23												
50%	74.60	95.00%	78.53												
40%	59.68	95.00%	62.82												
Total Hours				2,230											
Monthly Energy Consumption (kWh)				0	0	31,411	36,122	37,693	39,263	40,834	40,834	42,404	42,404	39,263	0
Monthly Average Demand (kW)				0.00	0.00	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05	0.00
Annual kWh															
Average kW															
				350,227.4											
				157.05											

**POST-INSTALLATION**

Demand Calculations					Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	VFD Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	97.50%	161.08	0	0	60	60	60	60	60	60	60	60	60	0
90%	134.28	95.00%	97.50%	144.97	0	0	60	60	60	60	60	60	60	60	60	0
80%	119.36	95.00%	97.50%	128.86	0	0	50	60	60	60	60	60	60	60	60	0
70%	104.44	95.00%	97.50%	112.76	0	0	30	50	60	50	60	60	60	60	60	0
60%	89.52	95.00%	97.50%	96.65	0	0	0	0	0	20	20	20	30	30	10	0
50%	74.60	95.00%	97.50%	80.54												
40%	59.68	95.00%	97.50%	64.43												
Total Hours					2,230											
Monthly Energy Consumption (kWh)					0	0	28,189	31,733	32,860	33,666	34,793	34,793	35,760	35,760	33,827	0
Monthly Average Demand (kW)					0.00	0.00	140.94	137.97	136.92	134.66	133.82	133.82	132.44	132.44	135.31	0.00
Annual kWh																
Average kW																
					301,380.0											
					135.37											

Annual Savings	48,847 kWh
Average kW Reduction	21.68 kW



Mar 2013 V1

Salesforce Opportunity Name

0

Project Name

Valley Asphalt Corporation - Mercantile Self Direct - Kiln and Blower Motor VFD

Application #

CM013-1392199

Valley Asphalt - Plant 23 Kiln VFD

Rev.

0

State

OH

**Measure Description**  
The measure involved the installation of a new VFD on an existing 200-hp motor that drives a rotary kiln. The VFD allows the rotary kiln to revolve faster or slower based on the type of asphalt mix being produced.

**Baseline**  
The customer estimates that the baseline equipment had a remaining useful life of more than two years, and as such the customer average baseline has been used. The baseline motor had only on/off type controls and ran at a constant load regardless of the product being produced. The customer estimates that the kiln operates for 2,120 hours/year.

**Savings Calculation Methodology**  
The new VFD allows the 200-hp motor to reduce electric output and kiln speed based on product requirements. The post-installation duty cycle, which was calculated by the customer, seems reasonable. Energy savings are achieved because the new VSD allows the motor to spend a majority of its 2,120 hour annual operating time running at a reduced load relative to the baseline period.

**Incremental Measure Cost (IMC)**  
Baseline choice was no action. Incremental costs are from invoices provided for the installed equipment

IMC Calculation	IMC (\$)	Baseline Cost (\$)	Measure Cost (\$)
	\$8,300.00	\$0.00	\$8,300.00


**References to source documents/back up files as appropriate**  
CMO13-1392199 - Valley Asphalt Corporation - Part 2 Worksheet & Invoices & Specs- Plant 5 Kiln - ECM4

Attached Files

☒ Equipment Specs

☒ Calculations

☒ Cost Documentation



CMO13-1392199 - Valley Asphalt Corporation - Part

**Savings Calculations** (insert all appropriate calculations or simulation results below)

The calculations below have been put together by the reviewer. The duty cycle for the VFD retrofitted motor was calculated by the customer.

Overall, savings decreased slightly compared to the submitted value.

**BASELINE**

Demand Calculations				Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	157.05	0	0	0	180	240	250	280	280	280	280	230	100
90%	134.28	95.00%	141.35												
80%	119.36	95.00%	125.64												
70%	104.44	95.00%	109.94												
60%	89.52	95.00%	94.23												
50%	74.60	95.00%	78.53												
40%	59.68	95.00%	62.82												
Total Hours				2,120											
Monthly Energy Consumption (kWh)				0	0	0	28,269	37,693	39,263	43,975	43,975	43,975	43,975	36,122	15,705
Monthly Average Demand (kW)				0.00	0.00	0.00	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05	157.05
Annual kWh				332,951.6											
Average kW				157.05											

**POST-INSTALLATION**

Demand Calculations					Monthly Operating Profile											
bhp	Motor Load (kW)	Motor Eff.	VFD Eff.	Line Side kW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
200	149.20	95.00%	97.50%	161.08	0	0	0	50	60	60	60	60	60	60	60	60
90%	134.28	95.00%	97.50%	144.97	0	0	0	40	60	60	60	60	60	60	60	20
80%	119.36	95.00%	97.50%	128.86	0	0	0	30	50	50	60	60	60	60	40	20
70%	104.44	95.00%	97.50%	112.76	0	0	0	30	40	50	60	60	50	50	40	0
60%	89.52	95.00%	97.50%	96.65	0	0	0	30	30	30	40	40	50	50	30	0
50%	74.60	95.00%	97.50%	80.54												
40%	59.68	95.00%	97.50%	64.43												
Total Hours					2,120											
Monthly Energy Consumption (kWh)					0	0	0	24,001	32,216	33,343	36,726	36,726	36,565	36,565	30,927	15,141
Monthly Average Demand (kW)					0.00	0.00	0.00	133.34	134.23	133.37	131.16	131.16	130.59	130.59	134.47	151.41
Annual kWh					282,211.5											
Average kW					134.48											

Annual Savings	50,740 kWh
Average kW Reduction	22.57 kW

## Appendix C -Cash Rebate Calculation

### Valley Asphalt 3 Plants (No 5,14,23) 4 VFDs

Measure	Quantity	Cash Rebate Rate	Cash Rebate
Valley Asphalt - Plant 14 Kiln VFD	1	50% of incentive that would be offered by the Smart \$aver Custom program	<b>\$891</b>
Valley Asphalt - Plant 23 Blower VFD	1	50% of incentive that would be offered by the Smart \$aver Custom program	<b>\$411</b>
Valley Asphalt - Plant 23 Kiln VFD	1	50% of incentive that would be offered by the Smart \$aver Custom program	<b>\$1,176</b>
Valley Asphalt - Plant 5 Kiln VFD	1	50% of incentive that would be offered by the Smart \$aver Custom program	<b>\$677</b>
			<b>\$3,155</b>

Appendix D -UCT Value

Valley Asphalt 3 Plants (No 5,14,23) 4 VFDs

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
Valley Asphalt - Plant 14 Kiln VFD	\$23,794	\$1,351	\$891	1	10.61
Valley Asphalt - Plant 23 Blower VFD	\$14,953	\$839	\$411	1	11.96
Valley Asphalt - Plant 23 Kiln VFD	\$22,124	\$1,233	\$1,176	1	9.18
Valley Asphalt - Plant 5 Kiln VFD	\$24,867	\$1,403	\$677	1	11.95
Totals	\$85,738	\$4,827	\$3,155	4	

Total Avoided Supply Costs	\$85,738	Aggregate Application UCT	10.74
Total Program Costs	\$4,827		
Total Incentive	\$3,155		

## Ohio Mercantile Self Direct Program

### Application Guide & Cover Sheet

Questions? Call 1-866-380-9580 or visit [www.duke-energy.com](http://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](mailto:SelfDirect@Duke-Energy.com). You may also fax to 1-513-629-5572.

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 and/or billing history for other utilities as required):

Account Number	Annual Usage	Account Number	Annual Usage
08403616-01-0	416110		
27302143-01-9	447032		
24600675-01-6	1,396,076		

Self Direct rebates are available for completed Custom projects that have not previously received a Duke Energy Smart Saver® Custom Incentive. Self Direct rebates 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 Saver 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 Saver 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:

<input checked="" type="checkbox"/> All sections of appropriate application(s) are completed	<input checked="" type="checkbox"/> Proof of payment.*	<input checked="" type="checkbox"/> Manufacturer's Spec sheets	<input checked="" type="checkbox"/> 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	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet	<input type="checkbox"/> MSD Prescriptive Lighting <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet	<input type="checkbox"/> MSD Prescriptive Lighting <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet
Heating & Cooling	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Prescriptive Heating & Cooling <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet
Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s)	<input type="checkbox"/> MSD Prescriptive Heating & Cooling	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s)
Chillers & Thermal Storage	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Prescriptive Chillers & Thermal Storage <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet
Motors & Pumps	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Prescriptive Motors, Pumps & Drives <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet
VFDs	Not Applicable	<input type="checkbox"/> MSD Prescriptive Motors, Pumps & Drives <input checked="" type="checkbox"/> MSD Custom Part 1 <input checked="" type="checkbox"/> MSD Custom VFD Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom VFD Worksheet
Food Service	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Prescriptive Food Service <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet
Air Compressors	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet	<input type="checkbox"/> MSD Prescriptive Process <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet
Process	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Prescriptive Process <input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet
Energy Management Systems	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet	<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet
Chiller Tune-ups		<input type="checkbox"/> MSD Prescriptive Chiller Tune-ups	
Behavioral*** & No/Low Cost		<input type="checkbox"/> MSD Custom Part 1 <input type="checkbox"/> 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. These calculations are performed and submitted by the Duke Energy Ohio customer, or your designated equipment vendor / engineer. Application Part 2 worksheets and page 6 of this application contain additional guidance on acceptable calculations. *Complex or unique projects may require the use, at the applicant's expense, of modeling software.* Please contact the Duke Energy Smart \$aver® with questions about these requirements.

If you do not receive an acknowledgement email within 1 day of submitting an application via online, email, or fax, or within 1 week of sending an application via mail, please call 1-866-380-9580. The acknowledgement email will provide 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 three ways to submit your completed application form and excel worksheets.

Email: Complete, sign, scan and send this application form and attachments to:  
[SelfDirect@duke-energy.com](mailto:SelfDirect@duke-energy.com) (Note attachment size limit is applicable)

Fax: 513-629-5572

Mail: Duke Energy Mercantile Self Direct Custom Rebate  
PO Box 2445  
Spokane, WA 99210-2445

**Mercantile Self Direct  
Nonresidential Custom Rebate Application  
PART 1**



**1. Contact Information (Required)**

Duke Energy Customer Contact Information					
Company Name	Valley Asphalt Corporation ATT. Fred Brammer				
Address	11641 Mosteller Road				
City	Cincinnati	State	Ohio	Zip Code	45241
Project Contact	FRED BRAMMER				
Title	Superintendent				
Office Phone	513-771-8400	Mobile Phone	513-535-6127	Fax	513-326-3665
E-mail Address	fred.brammer@jrjnet.com				

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	F.D. Lawrence Electric Co.				
Address	3450 Beekman Street				
City	Cincinnati	State	Ohio	Zip Code	45223-2743
Project Contact	Doug Ison				
Title	Sales Representative				
Office Phone	513-542-1100	Mobile Phone	513-807-9474	Fax	513-542-2422
E-mail Address					
Primary Contact for Technical Questions			Dave Rogers		

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):			Valley Asphalt Corporation		
Mailing Address	11641 Mosteller Road				
City	Cincinnati	State	Ohio	Zip Code	45241
Type of organization (check one) <input type="checkbox"/> Individual/Sole Proprietor <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Unit of Government <input type="checkbox"/> Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:		31-0515195			
If the customer (Duke Energy account holder) is not the payment recipient, indicate who is: <input type="checkbox"/> Vendor <input type="checkbox"/> Other, type:					
If the vendor is to receive payment, customer must sign below. I hereby authorize payment of incentive directly to vendor or other:					
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 (existing Duke Energy account number)
- ☐ 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.

Installed VFD's on rotary Kilms to reduce Demand, Stress on Equipment and to be able to speed up or slow down revolutions on Rotary Kilms depending on the type of asphalt mix design we were running. Also installed 1ea. on burner blower to lower demand and to better control burner emissions.

C. When did you start and complete implementation?

Start date 07 / 2012 (mm/yyyy) End date 04 / 2013 (mm/yyyy)

D. Are you also applying for Self-Direct Prescriptive rebates and, if so, which one(s)<sup>1</sup>?

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. List all assumptions about the baseline and proposed equipment energy use and operation schedule, or attach a document listing that information. Attach specification sheets for all proposed new equipment.

ok

<sup>1</sup> If your project involves some equipment that is eligible for prescriptive rebates and some equipment that is likely eligible for custom rebates, 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.



**Mercantile Self Direct  
Nonresidential Custom Rebate Application  
PART 1**



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)

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

**Customer Consent to Release of Personal Information**

I, (insert name) Tim ST. Clair, 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 Rebates 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).

Timothy St. Clair  
Duke Energy Ohio, Inc Customer Signature

Print Name Timothy St. Clair

Date 4-4-2013

**Mercantile Self Direct  
Nonresidential Custom Rebate Application  
PART 1**



## Checklist for completing the Application

INCOMPLETE APPLICATIONS WILL RESULT IN DELAYS IN DUKE ENERGY PROCESSING YOUR APPLICATION AND NOTIFYING YOU CONCERNING ANY 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	<input checked="" type="checkbox"/> Completed the contact information for the Duke Energy customer? <input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> Answered the questions A-E, including providing a description of your project. <input checked="" type="checkbox"/> Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	<input checked="" type="checkbox"/> Signed your name? <input checked="" type="checkbox"/> Printed your name? <input checked="" type="checkbox"/> Entered the date?
Supplementary information (Required)	<input checked="" type="checkbox"/> 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) <input checked="" type="checkbox"/> (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for <b>each</b> project listed in your application?

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

**Mercantile Self Direct  
Nonresidential Custom Rebate Application  
PART 1**



## Preferred Customized Calculation Tools

Please refer to the list below of the preferred software tools to use when calculating the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment or system. Click on each software tool to learn more.

Software Tool	Category
<a href="#"><u>eQuest</u></a>	Nonresidential retrofits and new construction
<a href="#"><u>EnergyPlus</u></a>	Nonresidential retrofits and new construction; Whole building simulation
<a href="#"><u>Carrier® HAP</u></a>	HVAC
<a href="#"><u>Trane® Trace™</u></a>	HVAC
<a href="#"><u>DOE OIT Pumping System Assessment Tool (PSAT)</u></a>	Pumps
<a href="#"><u>MotorMaster+</u></a>	Motors
<a href="#"><u>AirMaster</u></a>	Air compressor systems
<a href="#"><u>Emerson™ Product Selection &amp; Energy Analysis</u></a>	Refrigeration compressor retrofits using BIN analysis. <sup>2</sup> For projects of approximately 250,000 kWh or less.
<a href="#"><u>DOE2.2R</u></a>	Refrigeration measures
<a href="#"><u>SkyCalc™</u></a>	Skylighting
<a href="#"><u>BinMaker®</u></a>	Weather data analysis tool
<a href="#"><u>AFT Fathom</u></a>	Fluid flow analysis for industrial systems

# 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 Rebate 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.

**Mercantile Self Direct  
Nonresidential Custom Rebate Application  
PART 1**



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 rebates. 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 rebates;
  - 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*.



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](http://www.duke-energy.com).

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

- Submitting this application does not guarantee an 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 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  
Company

Fred Brammer  
Valley Asphalt Corp.

**Equipment Vendor / Project Engineer Contact Information**

Name  
Company

Doug Ison  
F.D.Lawrence Electric

**Location of Proposed VFD Project**

Site Name  
Electric Account Number(s)  
Site Address

Valley Asphalt Plant#5  
08403616-01-0  
4850 Stubbs Mill Road Morrow, Ohio 45152

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.  
The prescriptive rebate 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

Driven Equipment

Name

Asphalt Dryer (rotary kiln)

Type Process

Quantity

Brake HP (BHP) at Full Load (see note 1)

Nameplate HP

1
200.0
200.0

App No.	
Rev.	

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 %	200.0	100%	95 %	157.05					220	245	250	290	300	300	280	230	100	2,215
	0.0	0%		#DIV/0!														0
	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	8,760	744	672	744	500	499	470	454	444	420	464	490	644	6,545
						744	672	744	720	744	720	744	744	720	744	720	744	8,760
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 95 %

% of Full Load BHP of Driven Equipment	BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of 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 %	200.0	100%	95 %	157.05														0
90 %	180.0	90%	94 %	142.85					30	40	50	50	60	60	50	40		380
80 %	160.0	80%	93 %	128.34					20	30	50	40	60	50	40	30		320
70 %	140.0	70%	92 %	113.52					20	25	45	40	50	40	40	30		290
60 %	120.0	60%	91 %	98.37						10	20	20	20	20	25	20		135
50 %	100.0	50%	90 %	82.89														0
40 %	80.0	40%		#DIV/0!														0
30 %	60.0	30%		#DIV/0!														0
20 %	40.0	20%		#DIV/0!														0
10 %	20.0	10%		#DIV/0!														0
Not Running	0.0	0%	NA	0.00	8,760	744	672	744	650	639	555	594	554	550	589	600	744	7,635
						744	672	744	650	639	555	594	554	550	589	600	744	7,635
Totals					8,760	744	672	744	650	639	555	594	554	550	589	600	744	7,635

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)

24 x 7	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour		
	5:00AM	5:00PM	5:00AM	4:00PM	n/a	n/a	30	2,350

**Energy Savings**

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	416,110 kWh	385,000 kWh	31,110 kWh	Duke Energy Electric Bill
Electric Demand (kilowatts)	460 kW	415 kW	45 kW	
Calculations attached	Yes	Yes		

**Simple Payback**

Average electric rate (\$/kWh) on the applicable accounts (see note 6)	\$0.10
Estimated annual electric savings	\$3,111
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels	\$2,000.00
Incremental cost to implement the project (equipment & installation) (see note 7)	\$8,300.00
Copy of vendor proposal is attached (see note 8)	Yes
Simple Electric Payback in years (see note 9)	2.667952427
Total Payback in years	1.623948347

**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:

Asphalt Production is Seasonal because of Temperature.

**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.



ATTN: FRED BRAMER

**Altivar® 61 Drives Electrical Specifications**

Input Voltage	200 -15% to 240 +10%, 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.5 to 500 Hz
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @ 380/480 V
Speed Reference Inputs	AI1: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms AI2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA, X-Y) or volt
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs, & logic inputs, 7 ms +/- 0.5 ms on relay outputs
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/hz or SLFV (sensorless flux vector)
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O mapping status, Monitoring and self diagnostics with fault messages and status such as: Power on, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor stop
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment) compliant
Codes and Standards	UL, CSA, NOM-117, DNV, CE, C-Tick, GOST UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

**Altivar® 61 Drives Environmental Specifications**

Temperature	Operation: -14 to +122°F (-10 to +50°C) Storage: -13 to +159°F (-25 to +70°C)
Humidity	95% with no condensation or dripping water, conforming to IEC 600068-2-3.
Altitude	3,300 ft. (1,000 m) without derating, 3,300-9950 ft. (1,000-3,000 m) derate output current each additional 330 ft. (100 m), 6560 ft. (2000m) maximum for corner grounded distribution
Enclosure Rating	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600-900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1 Option S337 provides protection per IEC 60721-3-3 Class 3C2 25-60 hp @ 200/240 V, 30-100 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1 Option S337 provides protection per IEC 60721-3-3 Class 3C2 60-125hp @ 200/240 V, 125-900 hp @ 380/480V: Pollution degree 3 per IEC/EN 61800-5-1

# Variable speed drives for asynchronous motors

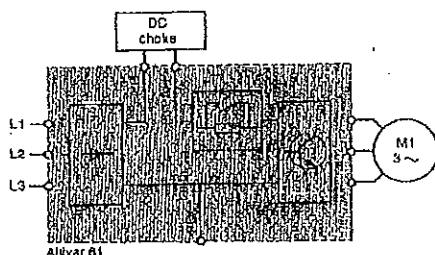
## Altivar 61: Reduction of current harmonics

### Option: DC chokes

The main solutions for reducing current harmonics are as follows:

- DC chokes, see below
- Line chokes, see page 2/228
- 16% and 10% passive filters, see page 2/231
- Use of passive filters with a DC choke, see pages 2/231 to 2/235

These 4 solutions can be used on the same installation. It is always easier and less expensive to handle current harmonics at installation level as a whole rather than at the level of each individual unit, particularly when using passive filters and active compensators.



### DC chokes

DC chokes are used to reduce current harmonics in order to comply with standard IEC 61000-3-12 for drives on which the line current is greater than 16 A and less than 75 A.

Using the DC choke with the drive complies with standard IEC 61000-3-12 provided that the RSCE  $\geq 120$  (1) at the point of connection to the public network. 120 represents the minimum value of RSCE (1) for which the values in table 4 of standard IEC 61000-3-12 are not exceeded.

It is the responsibility of the installer or the user to ensure that the device is connected correctly to a connection point with an RSCE  $\geq 120$ .

The DC choke is connected to the drive power terminals.

It is supplied as standard with ATV 61HD55M3X, HD90M3X and ATV 61HD00N4...HC63N4 drives and is integrated into ATV 61W...N4 and ATV 61W...N4C drives.

### Applications

Reduction of current harmonics.

Reduction of THD to 5% or to 10% in association with passive filters, see pages 2/231 to 2/235.

Maintaining the motor torque in relation to the line choke.

(1) Short-circuit ratio

Post-it® Fax Note	7671	Date	1/24/08	# of pages	5
To	Fred Brammer	From	Sarah Kimball		
Co./Dept.		Co.	Squibb		
Phone #		Phone #			
Fax #	513.326.3662	Fax #	919.217.6508		



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](http://www.duke-energy.com).

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

- Submitting this application does not guarantee an 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 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  
Company

Fred Brammer  
Vallet Asphalt Corp.

**Equipment Vendor / Project Engineer Contact Information**

Name  
Company

Doug Ison  
F.D. Lawrence Electric

**Location of Proposed VFD Project**

Site Name  
Electric Account Number(s)  
Site Address

Valley Asphalt Plant#14  
27302143-01-9  
7940 Main Street Newtown, Ohio 45244

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.  
The prescriptive rebate 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.



App No.	
Rev.	

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

Driven Equipment

Name

Asphalt Dryer (Rotary Kilm)

Type Process

Quantity

Brake HP (BHP) at Full Load (see note 1)

Nameplate HP

1
200.0
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 %	200.0	100%	95 %	157.05	2,650			200	315	320	325	325	400	375	350	250		2,860
	0.0	0%		#DIV/0!														0
	0.0	0%		#DIV/0!														0
	0.0	0%		#DIV/0!														0
	0.0	0%	NA		6,110	744	672	544	405	424	395	419	344	345	394	470	744	5,900
Not Running	0.0	0%	NA	0.00														
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 95 %

% of Full Load BHP of Driven Equipment	BHP of Driven Equipment @ Actual Load (BHP)	Motor output HP as % of 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 %	200.0	100%	95 %	157.05						10	15	15	20					60
90 %	180.0	90%	94 %	142.85				40	30	60	20	20	10	20	10			210
80 %	160.0	80%	93 %	128.34				40	40	50	40	50	60	40	30			350
70 %	140.0	70%	92 %	113.52				10	30	40	30	20	20	20	10			180
60 %	120.0	60%		#DIV/0!														0
50 %	100.0	50%		#DIV/0!														0
40 %	80.0	40%		#DIV/0!														0
30 %	60.0	30%		#DIV/0!														0
20 %	40.0	20%		#DIV/0!														0
10 %	20.0	10%		#DIV/0!														0
Not Running	0.0	0%	NA	0.00	8,760	744	672	654	620	584	615	639	634	640	694	720	744	7,960
Totals					8,760	744	672	654	620	584	615	639	634	640	694	720	744	7,960

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)

24 x 7	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour		
	5:00AM	6:00PM	6:00AM	5:00PM	n/a	n/a	38	2,800

**Energy Savings**

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	447,032 kWh	400,000 kWh	47,032 kWh	Duke Energy Electric Bills
Electric Demand (kilowatts)	476 kW	366 kW	110 kW	
Calculations attached	Yes	Yes		

**Simple Payback**

Average electric rate (\$/kWh) on the applicable accounts (see note 6)	\$0.10
Estimated annual electric savings	\$4,703
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels	\$2,500.00
Incremental cost to implement the project (equipment & installation) (see note 7)	\$8,300.00
Copy of vendor proposal is attached (see note 8)	Yes
Simple Electric Payback in years (see note 9)	1.764755911
Total Payback in years	1.15226566

**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:

Asphalt Production is seasonal because of temperature.

**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.

ATTN: FRED BRAMER

**Altivar® 61 Drives Electrical Specifications**

Input Voltage	200 -15% to 240 +10%; 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.5 to 500 Hz
Torque/over torque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @ 380/480 V
Speed Reference Inputs	AI1: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms AI2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA X-Y) or volt
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs, & logic inputs, 7 ms +/- 0.5 ms on relay output
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/Hz or SLFV (sensorless flux vector)
Motor Control Profiles	
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O mapping status, Monitoring and self-diagnostics with fault messages and status such as: Power on, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor stop
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment compliant)
Codes and Standards	UL, CSA, NOM-117, DNV, CE, C-Tick, GOST, UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

**Altivar® 61 Drives Environmental Specifications**

Temperature	Operation: -14 to +122°F (-10 to +50°C) Storage: -13 to +158°F (-25 to +70°C)
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000 m) without derating, 3,300-9850 ft. (1,000-3,000 m) derate output current each additional 330 ft. (100 m), 6560 ft. (2000m) maximum for corner-grounded distribution
Enclosure Rating	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600-900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 25-60 hp @ 200/240 V, 30-100 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 60-125 hp @ 200/240 V, 125-900 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1

Altivar 61: Reduction of current harmonics  
Option: DC chokes

The main solutions for reducing current harmonics are as follows:

- DC chokes, see below
- Line chokes, see page 2/228
- 16% and 10% passive filters, see page 2/231
- Use of passive filters with a DC choke, see pages 2/231 to 2/235

These 4 solutions can be used on the same installation.

It is always easier and less expensive to handle current harmonics at installation level as a whole rather than at the level of each individual unit, particularly when using passive filters and active compensators.

## DC chokes

**DC chokes**  
DC chokes are used to reduce current harmonics in order to comply with standard IEC 61000-3-12 for drives on which the line current is greater than 16 A and less than 75 A.

Using the DC choke with the drive complies with standard IEC 61000-3-12 provided that the RSCE  $\geq 120$  (I) at the point of connection to the public network. 120 represents the minimum value of RSCE (I) for which the values in table 4 of standard IEC 61000-3-12 are not exceeded.

It is the responsibility of the installer or the user to ensure that the device is connected correctly to a connection point with an RSCC  $\geq 120$ .

The DC choke is connected to the drive power terminals.

It is supplied as standard with ATV 61HD55M3X, HD90M3X and  
ATV 61HD08N4...HC63N4 drives and is integrated into ATV 61W...N4 and  
ATV 61W...N4C drives.

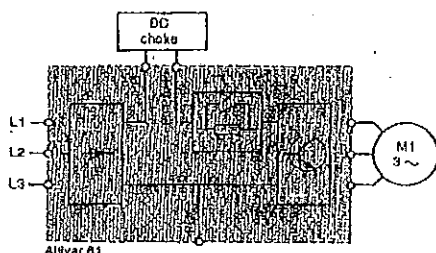
## Applications

Reduction of current harmonics.

Reduction of THD to 5% or to 10% in association with passive fillers, see pages 2/231 to 2/235.

Maintaining the motor torque in relation to the line choke.

### (1) Short-circuit ratio



Post-It® Fax Note	7671	Date	1/24/08	# of pages	5
To	Fred Bromma	From	Sarah Kimball		
Co./Dept.		Co.	SquawD		
Phone #		Phone #			
Fax #	513.326.3662	Fax #	914.217.6500		



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](http://www.duke-energy.com).

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

- Submitting this application does not guarantee an 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 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  
Company

Fred Brammer  
Valley Asphalt Corp.

**Equipment Vendor / Project Engineer Contact Information**

Name  
Company

Doug Ison  
F.D. Lawrence Electric

**Location of Proposed VFD Project**

Site Name  
Electric Account Number(s)  
Site Address

Plant #23  
24600675-01-6  
11641 Mosteller Road

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.  
The prescriptive rebate 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.



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

Driven Equipment Name  
Quantity  
Brake HP (BHP) at Full Load (see note 1)  
Nameplate HP

(Asphalt Dryer) Rotary Kiln
1
200.0
200.0

Type Process

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 %	200.0	100%	95 %	157.05	2,800				200	305	380	430	440	420	375	175	75	2,800
	0.0	0%		#DIV/0!														0
	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	5,960	744	672	744	520	439	340	314	304	300	369	545	669	5,960
						744	672	744	720	744	720	744	744	720	744	720	744	8,760
					Totals	8,760	744	672	744	720	744	720	744	720	744	720	744	8,760

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 (BHP)	Motor output HP as % of 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 %	200.0	100%	95 %	141.35	230				20	30	30	30	50	30	20	10	10	230
90 %	180.0	90%	93 %	128.34	315				40	40	50	45	60	30	30	10	10	315
80 %	160.0	80%	92 %	113.52	220				10	30	20	40	30	40	30	10	10	220
70 %	140.0	70%	91 %	98.37	130				10	10	20	10	15	25	20	10	10	130
60 %	120.0	60%		#DIV/0!														0
50 %	100.0	50%		#DIV/0!														0
40 %	80.0	40%		#DIV/0!														0
30 %	60.0	30%		#DIV/0!														0
20 %	40.0	20%		#DIV/0!														0
10 %	20.0	10%		#DIV/0!														0
Not Running	0.0	0%	NA	0.00	7,865	744	672	744	640	634	600	619	589	595	644	680	704	7,865
					Totals	7,865	744	672	744	640	634	600	619	589	595	644	680	7,865

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)

24 x 7	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour		
	5:00AM	7:00PM	6:00AM	5:00PM	n/a	n/a	36	2,600

**Energy Savings**

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	1,396,076 kWh	1,310,000 kWh	86,076 kWh	Duke Energy Electric Bill
Electric Demand (kilowatts)	612 kW	560 kW	52 kW	
Calculations attached	Yes	Yes		

**Simple Payback**

Average electric rate (\$/kWh) on the applicable accounts (see note 6)	\$0.10
Estimated annual electric savings	\$8,608
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels	\$1,000.00
Incremental cost to implement the project (equipment & installation) (see note 7)	\$8,300.00
Copy of vendor proposal is attached (see note 8)	Yes
Simple Electric Payback in years (see note 9)	0.964264139
Total Payback in years	0.863899413

**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:

Asphalt Production is Seasonal Work due to Temperatures.

**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.

ATTN: FRED BRAMER

**Altivar® 61 Drives Electrical Specifications**

Input Voltage	200 -15% to 240 +10%, 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.5 to 500 Hz
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @ 380/480 V
Speed Reference Inputs	AI1: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms AI2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA, X-Y) or volt
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs, 8 logic inputs, 7 ms +/- 0.5 ms on relay output
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/Hz or SLFV (sensorless flux vector)
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O mapping status, Monitoring and self-diagnostics with fault messages and status such as: Power on, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor stop
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment) compliant
Codes and Standards	UL, CSA, NOM-117, DNV, CE, C-Tick, GOST UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

**Altivar® 61 Drives Environmental Specifications**

Temperature	Operation: -14 to +122°F (-10 to +50°C) Storage: -13 to +158°F (-25 to +70°C)
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000 m) without derating, 3,300-9,950 ft. (1,000-3,000 m) derate output current each additional 330 ft. (100 m), 6,560 ft. (2000m) maximum for corner grounded distribution
Enclosure Rating	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600-900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1 Option S337 provides protection per IEC 60721-3-3 Class 3C2 25-60 hp @ 200/240 V, 30-100 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1 Option S337 provides protection per IEC 60721-3-3 Class 3C2 60-125hp @ 200/240 V, 125-900 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1



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](http://www.duke-energy.com).

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

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  - 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  
Company

Fred Brammer  
Valley Corporation

**Equipment Vendor / Project Engineer Contact Information**

Name  
Company

Doug Ison  
F.D. Lawrence Electric

**Location of Proposed VFD Project**

Site Name  
Electric Account Number(s)  
Site Address

Plant#23  
24600675-01-6  
11641 Mosteller Road, Cincinnati, Ohio 45241

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.

The prescriptive rebate 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

Driven Equipment Name **Burner Blower**  
Quantity **1**  
Brake HP (BHP) at Full Load (see note 1) **100.0**  
Nameplate HP **100.0**

Type **Fan**

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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 %	100.0	100%	95 %	78.53	2,800				200	305	380	430	440	420	375	175	75	2,800
%	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	5,960	744	672	744	520	439	340	314	304	300	369	545	669	5,960
					<b>Totals</b>	<b>744</b>	<b>672</b>	<b>744</b>	<b>720</b>	<b>744</b>	<b>720</b>	<b>744</b>	<b>744</b>	<b>720</b>	<b>744</b>	<b>720</b>	<b>744</b>	<b>8,760</b>

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 (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 %	100.0	100%	%	#DIV/0!														0
90 %	90.0	90%	95 %	70.67					20	30	30	30	50	30	20	10	10	230
80 %	80.0	80%	93 %	64.17					40	40	50	45	60	30	30	10	10	315
70 %	70.0	70%	92 %	56.76					10	30	20	40	30	40	30	10	10	220
60 %	60.0	60%	91 %	49.19					10	10	20	10	15	25	20	10	10	130
50 %	50.0	50%	%	#DIV/0!														0
40 %	40.0	40%	%	#DIV/0!														0
30 %	30.0	30%	%	#DIV/0!														0
20 %	20.0	20%	%	#DIV/0!														0
10 %	10.0	10%	%	#DIV/0!														0
Not Running	0.0	0%	NA	0.00	8,760	744	672	744	640	634	600	619	589	595	644	680	704	7,865
					<b>Totals</b>	<b>744</b>	<b>672</b>	<b>744</b>	<b>640</b>	<b>634</b>	<b>600</b>	<b>619</b>	<b>589</b>	<b>595</b>	<b>644</b>	<b>680</b>	<b>704</b>	<b>7,865</b>

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)

24 x 7	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour		
	5:00AM	7:00PM	5:00AM	4:00PM	n/a	n/a	36	2,800

**Energy Savings**

	Existing (no VFD)	Proposed (VFD)	Savings	Describe how energy numbers were calculated
Annual Electric Energy	1,396,076 kWh	1,320,000 kWh	76,076 kWh	Duke Energy Electric Bills
Electric Demand (kilowatts)	612 kW	560 kW	52 kW	
Calculations attached	Yes	Yes		

**Simple Payback**

Average electric rate (\$/kWh) on the applicable accounts (see note 6)	\$0.10
Estimated annual electric savings	\$7,608
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels	\$2,000.00
Incremental cost to implement the project (equipment & installation) (see note 7)	\$4,869.00
Copy of vendor proposal is attached (see note 8)	Yes
Simple Electric Payback in years (see note 9)	0.640017877
Total Payback in years	0.506786294

**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:

Asphalt Production is seasonal due temperatures.

**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.

ATTN: FRED BRAMER

**Altivar® 61 Drives** Electrical Specifications

Input Voltage	200 -15% to 240 +10%, 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.6 to 500 Hz
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @ 380/480 V
Speed Reference Inputs	AI1: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms AI2: Factory setting = 4 to 20 mA, software configurable for current, (0-20 mA, X-Y) or volt
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs, & logic inputs, 7 ms +/- 0.5 ms on relay out
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load,) or select from 2 point or 5 point volts/hz or SLFV (sensorless flux vector)
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O mapping status, Monitoring and self-diagnostics with fault messages and status such as: Power on, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor stop
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment) compliant
Codes and Standards	UL, CSA, NOM-117, DNV, CE, C-Tick, GOST, UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

**Altivar® 61 Drives** Environmental Specifications

Temperature	Operation: -14 to +122°F (-10 to +50°C) Storage: -13 to +158°F (-25 to +70°C)
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000 m) without derating; 3,300-9950 ft. (1,000-3,000 m) derate output current each additional 330 ft. (100 m); 6560 ft. (2000m) maximum for corner-grounded distribution
Enclosure Rating	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600-900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1. Option S337 provides protection per IEC 60721-3-3 Class 3C2 25-60 hp @ 200/240 V, 90-100 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5. Option S337 provides protection per IEC 60721-3-3 Class 3C2 60-125hp @ 200/240 V, 125-900 hp @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5

## Variable speed drives for asynchronous motors

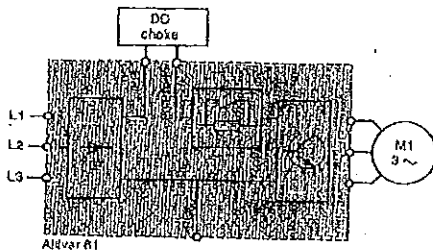
Altivar 61: Reduction of current harmonics  
Option: DC chokes

The main solutions for reducing current harmonics are as follows:

- DC chokes, see below
- Line chokes, see page 2/228
- 16% and 10% passive filters, see page 2/231
- Use of passive filters with a DC choke, see pages 2/231 to 2/235

These 4 solutions can be used on the same installation.

It is always easier and less expensive to handle current harmonics at installation level as a whole rather than at the level of each individual unit, particularly when using passive filters and active compensators.



### DC chokes

DC chokes are used to reduce current harmonics in order to comply with standard IEC 61000-3-12 for drives on which the line current is greater than 16 A and less than 75 A.

Using the DC choke with the drive complies with standard IEC 61000-3-12 provided that the RSCE  $\geq 120$  (1) at the point of connection to the public network. 120 represents the minimum value of RSCE (1) for which the values in table 4 of standard IEC 61000-3-12 are not exceeded.

It is the responsibility of the installer or the user to ensure that the device is connected correctly to a connection point with an RSCE  $\geq 120$ .

The DC choke is connected to the drive power terminals.

It is supplied as standard with ATV 61HD55M3X, HD90M3X and ATV 61HD00N4...HC63N4 drives and is integrated into ATV 61W...N4 and ATV 61W...N4C drives.

### Applications

Reduction of current harmonics.

Reduction of THD to 5% or to 10% in association with passive filters, see pages 2/231 to 2/235.

Maintaining the motor torque in relation to the line chokes.

(1) Short-circuit ratio

Post-it® Fax Note 7671		Date 1/24/00	# of pages 5
To Fred BRAMMA		From Sarah KIMBALL	
Co./Dept.		Co. SQUAD	
Phone #		Phone #	
Fax # 513.326.3662		Fax # 914.217.6500	



# Request for Taxpayer Identification Number and Certification

Give form to the  
requester. Do not  
send to the IRS.

Print or type  
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Valley Asphalt Corporation

Business name, if different from above

Check appropriate box: ☐ Individual/  
Sole proprietor

☒ Corporation

☐ Partnership

☐ Other ▶

☒ Exempt from backup  
withholding

Address (number, street, and apt. or suite no.)

11641 Mosteller Road

City, state, and ZIP code

Cincinnati, OH 45241

List account number(s) here (optional)

Requester's name and address (optional)

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

**Note.** If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

  |  |  |  |  |  |  |  |  |  |  |  |  |

or

Employer identification number

3 | 1 | 0 | 5 | 1 | 5 | 1 | 9 | 5

## Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (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, and
3. I am a U.S. person (including a U.S. resident alien).

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. (See the instructions on page 4.)

Sign  
Here

Signature of  
U.S. person ▶

Timothy Usella

Date ▶

## Purpose of Form

A person who is required to file an information return with the IRS, must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

**U.S. person.** Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee.

In 3 above, if applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

**Note.** If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

For federal tax purposes, you are considered a person if you are:

- An individual who is a citizen or resident of the United States,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States, or
- Any estate (other than a foreign estate) or trust. See Regulations sections 301.7701-6(a) and 7(a) for additional information.

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

3450 BEEKMAN STREET  
CINCINNATI, OHIO 452232743

513-542-1100 FAX 542-2422

Ship To Information Below:

VALLEY ASPHALT  
4850 STUBBS MILL ROAD  
MORROW, OH 45152

INVOICE	
Type Number	Level Date
S100056421	6-1-12
Customer PO/JO#	
0205	

Ship Date	Inside Salesperson
6-1-12	JOE KELLEY
Acct#	Outside Salesperson
	DOUG EISEN
Ship Via	
OUR TRUCK	

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.

## ELECTRICAL MATERIALS

452232743

VALLEY ASPHALT  
11641 MOSTELLER RD  
CINCINNATI, OH 45241

VALLEY ASPHALT  
7940 MAIN ST  
NEWTON, OH 45244

INVOICE	
Type Number	Level Date
S100066104	6-13-12
Customer PO/JOB#	
0214	

Ship Date	inside Salesperson
6-13-12	JOE KELLEY
Acct#	Outside Salesperson
	DOUG EISEN
Ship Via	
OUR TRUCK	

Ship To Information Below:

[illegible]

If your account is current  
and this invoice is paid by:

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 or 18% per annum will be added to all past due balances.

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.

## Distributors of ELECTRICAL MATERIALS

513-542-1100 FAX 542-2422

VALLEY ASPHALT  
11641 MOSTELLER RD  
CINCINNATI, OH 45241

INVOICE	
Type Number	Level Date
S100079962	1-6-13
Customer: PO/JOB#	
0223	

Ship Date	Inside Salesperson
1-6-13	JOE KELLEY
Acct#	Outside Salesperson
	DOUG EISEN
Ship Via	
OUR TRUCK	

Ship To Information Below:

VALLEY ASPHALT  
11641 MOSTELLER RD  
CINCINNATI, OH 45241

[illegible]

If your account is current  
and this invoice is paid by:

Net	4869.00
Tax	
Total	4869.00

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.

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**5/30/2013 4:06:12 PM**

**in**

**Case No(s). 13-1280-EL-EEC**

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