Ohio | Public Utilities Commission

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

Case No.: 13-1328-EL-EEC

Mercantile Customer: **Fifth Third Bank (Madisonville Operations Center)**

Electric Utility: **Duke Energy**

Program Title or Description: **HVAC**

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

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

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

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

Section 1: Mercantile Customer Information

Name: **Fifth Third Bank Corporation**

Principal address: **38 Fountain Square Plaza Cincinnati Ohio 45263**

Address of facility for which this energy efficiency program applies:

5050 Kingsley Drive Cincinnati Ohio 45227

Name and telephone number for responses to questions:

Megan Fox 513-287-3367

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, more energy efficient equipment was installed starting in September 2012 and completed in November 2012

- **Eight new 9.5 HP supply fan wall and nine 3 HP return fan wall components were installed on AHU1 and AHU2 along with new, more energy efficient VFDs**

□ 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: 128,409 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 in November 2012

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

4 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 **$5100.00. 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 8.09** (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 **$68,096.**

The utility's program costs were **$3,316.**

The utility's incentive costs/rebate costs were **$5,100.**

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

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

May 29, 2013

Ms. Janice Juergens
Fifth Third Bank – Madisonville Operations Center
38 Fountain Square Plaza Mail Drop 10ATA1
Cincinnati Ohio 45263

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

Dear Name:

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 $5100.00 has been proposed for your HVAC project completed in the 2012 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,

Grady Reid, Jr
Product Manager
Mercantile Self Direct Rebates

cc: Mike Harp, Duke Energy
Rob Jung, Ecova
Shannon Savage Lingo, Building Intelligence Group

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

☒ Rebate is accepted. ☐ Rebate is declined.

By accepting this rebate, Fifth Third Bank 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, Fifth Third Bank 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, Fifth Third Bank 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):

_____ _____ ____

Customer Signature Printed Name Date

Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	Fan Wall Upgrades for AHU1 and AHU2	$5100.00
Total		$5100.00

Ohio | Public Utilities Commission

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

Case No.: ____-____-EL-EEC

State of Ohio :

Janice Juergens, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

   Fifth Third Bank

   [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.

Janice Juergens VP
Signature of Affiant & Title

Sworn and subscribed before me this 30th day of May, 2013 Month/Year

Caharina McNeill
Signature of official administering oath

Caharina McNeill, Notary
Print Name and Title

My commission expires on Sept. 20, 2017

NOTARY PUBLIC STATE OF OHIO

CAHARINA McNEILL
Notary Public, State of Ohio
My Commission Expires
September 20, 2017

64503529 01		
5TH THIRD BANK		
5001 KINGSLEY DRMISC: 5001-B		
CINCINNATI, OH 45227		
Date	Days	Actual KWH
3/21/2013	29	132,314
2/20/2013	29	139,787
1/22/2013	34	119,983
12/19/2012	33	110,480
11/16/2012	29	104,781
10/18/2012	29	129,595
9/19/2012	30	165,848
8/20/2012	31	185,042
7/20/2012	30	190,078
6/20/2012	30	197,281
5/21/2012	31	163,190
4/20/2012	30	135,882
Total		**1,774,261**

Appendix B - Fifth Third Bank HVAC Energy Savings Achieved

	Baseline Used			Post Project Actual				Savings	
	Description	Annual kWh	Summer Coincident kW	Description	Annual kWh	Summer Coincident kW	Hours of Operation	Annual kWh	Summer Coincident kW
ECM - 1	Fan Wall Upgrade	13,478,546	2,655	Installed eight new 9.5Hp supply fan wall and nine 3 HP return fanwall compenents on AHU 1 and AHU 2 with new VFDs that were higher in efficency	13,358,653	2,651	8,760	119,893	4.0

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 **128,409 kWh** and **4 summer coincident kW**. These values may also reflect minor DSMore modeling

DETAILED CALCULATIONS

Mar 2013 V1

Salesforce Opportunity Name	0	Application #	CMO13-1404842	Rev.	0
Project Name	*Fifth Third Bank Madisonville Operations Center - Mercantile Self Direct Custom - Fan Wall Upgrade*		*Fifth Third Bank MOC -Fan Wall Upgrade*	State	OH

Measure Description

This project involves the replacement of the supply fans serving AHU 1 and AHU 2 for the Fifth Third Bank's Madisonville Operations Center. The new system is a fan wall type, (8) 9.5 HP fan components each, direct drive fan system equipped with VFDs. The return fans were also replaced with fan walls with (3) 9 HP fan components each. The base case system was a single 75HP Supply Fan and single 40HP return fan for each AHU. Both the baseline supply fan and return fan operated with a VFD on a 24/7 schedule. Savings will occur through the added efficiency and capacity ratios available due to the smaller fan motors compared to the single large fan motors that originally served the two AHUs.

Baseline

The baseline capacity is reasonable given the size of the supply fan and return fan motors involved. The application indicates there are multiple accounts for the site that the currently available billing history does not account for, so a comparison cannot be made directly. However, the Trade Ally included a calibration effort for the submitted energy model that shows the total utility usage for the facility to be 14,400 MWh per year which is in line with the model estimates of 13,500 MWh per year.

Savings Calculation Methodology

The Trade Ally revised the submitted single line calculations based on spot measurements to a detailed energy model of the facility using eQUEST. This change in calculation methodology resulted in the reduction of savings from 188,167 kWh to 119,893 kWh. Based on the provided data, inputs, and calibration study provided for the submitted energy model no further adjustments are considered necessary. As the eQUEST simulation software does not have built in fanwall fan curves, the Trade Ally generated the necessary coefficients to define the performance using a custom

Incremental Measure Cost (IMC)

An American Institute of Architects (AIA) document was provided that references the Fifth Third Bank AHU replacement project and associated total cost of $336,950.00. This includes all materials, labor, and rental equipment to provide temporary cooling while the work was being completed. As the applicant indicated the original equipment held a remaining useful life of greater than 2 years, the Incremental Measure Cost is equivalent to the Measure Cost of $336,950.00.

IMC Calculation

IMC ($)	Baseline Cost ($)	Measure Cost ($)
$336,950.00	$0.00	$336,950.00

References to source documents/back up files as appropriate

CMO13-140482 FIFTH THIRD BANK_Specs and Invoice.pdf

FanWallSavingsCalcs-MOCV2.xlsx

Attached Files

- ☑ Equipment Specs
- ☑ Calculations
- ☑ Cost Documentation

CMO13-140482 FIFTH THIRD BANK_Specs and ... — Specs and Invoice

FanWallSavingsCalcs-MOCV2.xlsx — Revised Savings Analysis

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

Baseline

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
EM1 ELECTRIC	ITY												
KWH	1149638	1051791	1080982	1012413	1111829	1158237	1332801	1301052	1115837	1049945	1013652	1100369	13478544
MAX KW	2093.4	2084.7	1875.3	2010.6	2210.9	2374.6	2655.1	2579.2	2371	2318.6	1885.4	1963.4	2655.1
DAY/HR	3/ 9	7/ 9	22/ 9	21/16	24/16	26/14	14/16	9/14	1/14	3/16	16/15	22/ 9	7/14
FM1 NATURAL-	GAS												
THERM	5333.	4765.	3187.	1129.	541.	348.	225.	238.	486.	1377.	1956.	4167.	23750.
MAX THERM/HR	9.1	11.1	10.3	7.5	4.3	2.4	1.1	0.7	3.5	7.6	7.3	9.1	11.1
DAY/HR	21/ 8	12/ 9	4/11	16/23	2/ 7	5/ 5	2/ 1	26/ 9	17/ 6	29/ 9	12/ 7	25/22	2/12

Proposed

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
EM1 ELECTRIC	ITY												
KWH	1140968	1044035	1071363	1002454	1101385	1147504	1321401	1289533	1105329	1039570	1003923	1091188	13358653
MAX KW	2083.8	2073.7	1861.1	1999.6	2201.6	2375.1	2651.4	2571.5	2361.7	2309.7	1874.9	1950.2	2651.4
DAY/HR	3/ 9	7/ 9	22/ 9	21/16	24/16	26/14	14/16	9/14	1/14	3/16	16/15	22/ 9	7/14
FM1 NATURAL-	GAS												
THERM	5333.	4780.	3214.	1141.	544.	349.	225.	238.	488.	1391.	1978.	4186.	23867.
MAX THERM/HR	9.1	11.1	10.3	7.6	4.3	2.5	1.1	0.7	3.6	7.6	7.3	9.1	11.1
DAY/HR	21/ 8	12/ 9	4/11	16/23	2/ 7	5/ 5	2/ 1	26/ 9	17/ 6	29/ 9	12/ 7	25/22	2/12

	Electric Consumption (kWh)		Electric Demand (kW)		Gas consumption (MMBtu)		Total energy consumption (MMBtu)		ERR-montl	(Average utility - Simulation)/Average Utility			CVRMSE - Electrical consumption		CVRMSE - Electrical demand		CVRMSE - Gas consumption
	Simulation data	Average utility data	Simulation	Average utility data	Simulation	Average utility data	Simulation	Average utility data		Electricity	Electricity	Gas consumption	(util-sim)	(util-sim)^2	util-sim	(util-sim)^2	util-sim
Jan	1149638	1270393	2093	2,133	533	1131	4456	5465		-10%	-2%	-53%	120755	########	40	1607	597
Feb	1051791	1132639	2085	2,181	477	869	4065	4733		-7%	-4%	-45%	80848	########	96	9258	392
Mar	1080982	1175303	1875	2,174	319	531	4007	4541		-8%	-14%	-40%	94321	########	298	89043	212
Apr	1012413	1101520	2011	2,068	113	275	3567	4033		-8%	-3%	-59%	89107	########	57	3297	162
May	1111829	1154646	2211	2,255	54	94	3848	4034		-4%	-2%	-43%	42817	########	44	1950	40
Jun	1158237	1199822	2375	2,490	35	47	3987	4141		-3%	-5%	-27%	41585	########	116	13426	13
Jul	1332801	1280225	2655	2,487	23	44	4570	4412		4%	7%	-49%	-52576	########	-168	28117	21
Aug	1301052	1286140	2579	2,460	24	42	4463	4430		1%	5%	-43%	-14912	########	-119	14228	18
Sep	1115837	1164838	2371	2,592	49	48	3856	4022		-4%	-9%	2%	49001	########	221	48678	-1
Oct	1049945	1363945	2319	2,701	138	175	3720	4829		-23%	-14%	-21%	314000	########	383	146322	37
Nov	1013652	1100972	1885	2,310	196	536	3654	4293		-8%	-18%	-64%	87320	########	425	180472	341
Dec	1100369	1205925	1963	2,237	417	1056	4171	5171		-9%	-12%	-61%	105556	########	274	74977	640
Yearly total	13478546	14436368			2375	4848	48364	54104	9%	ERR-yearly	-6.6%	-51.0%	sum	957822	########	1667	55579	2472
Average	1123212	1203031	2202	2341	198	404	4030	4509			-5.9%			122202		236	
Max			2655.1	2701								Coefficient of variation of the root mean squa	cvrmse	10.16	cvrmse	10.07	cvrmse
		0.1898										Normalized mean bias error	nmbe	7.24	nmbe	6.47	nmbe

Calibration Criteria

40% % total sav 50 get cvrmse for the total energy use

Savings un 10

Checking calibration criteria (monthly data)*

- Mean ERRmonth +/- 15% 100 * (M-S) / M
- Mean ERRyear +/- 10% ∑ ERRmonth / 12

* From FEMP M&V Guidelines v. 2.2 and ASHRAE Guideline 14 2002

- CV(RMSEyear) +/- 15% $((\sum [(M-S)^2 / 11)]^{0.5})/avg\ M$
- NMBE +/- 5% ∑ (M-S) / (11 *avg M)
- Savings uncertainty < 50% at 68% confidence interval

eQuest BEPS data - used in columns B, E, and H

EM1	ELECTR	ICITY												
KWH			1149638	1051791	1080982	1012413	1111829	1158237	1332801	1301052	1115837	1049945	1013652	1100369	13478544
MAX	KW		2093	2085	1875	2011	2211	2375	2655	2579	2371	2319	1885	1963	2655
FM1	NATL	GAS													
THERM			5333	4765	3187	1129	541	348	225	238	486	1377	1956	4167	23750
			533	477	319	113	54	35	23	24	49	138	196	417	2375

Appendix C -Cash Rebate Calculation

Fifth Third Bank HVAC

Measure	Quantity	Cash Rebate Rate	Cash Rebate
Fan Wall Upgrade - Installed eight new 9.5Hp supply fan wall and nine 3 HP return fanwall compenents on AHU 1 and AHU 2	1	50% of incentive that would be offered by the Smart $aver Custom program	**$5,100**
			$5,100

Appendix D -UCT Value

Fifth Third Bank HVAC

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
Wall Fan Upgrade	$68,096	$3,316	$5,100	1	**8.09**
Totals	**$68,096**	**$3,316**	**$5,100**	**1**	

Total Avoided Supply Costs	$68,096	***Aggregate Application UCT***	***8.09***
Total Program Costs	$3,316		
Total Incentive	$5,100		

Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

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

Email this form along with completed Mercantile Self Direct Prescriptive or Custom applications, proof of payment, energy savings calculations and spec sheets to SelfDirect@Duke-Energy.com. You may also fax to 1-513-629-5572.

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
MOC = 92902204 01	3,069,677 kWh	MOB, 64503529 01	1,642,848 kWh
MOC = 66903730 01	2,286,193 kWh	MOB, 14400759 05	3,201,830 kWh
MOC = 62902204 01	4,121,314 kWh		
MOC = 72902204 01	4,730,379 kWh		

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

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

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

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

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

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

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

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

Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1

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

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

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

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

Notes on the Application Process

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

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. 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 (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	Fifth Third Bank, Madisonville Operations Center						
Address	5050 Kingsley Drive						
City	Cincinnati	State	OH	Zip Code	45263		
Project Contact							
Title	Janice Juergens, Vice President						
Office Phone	513.534.5147	Mobile Phone		Fax			
E-mail Address	janice.juergens@53.com						

Equipment Vendor / Contractor / Architect / Engineer Contact Information							
Company Name	Building Intelligence Group						
Address	5304 Barry Lane						
City	St. Paul	State	MN	Zip Code			
Project Contact	Shannon Savage Lingo						
Title	Project Engineer						
Office Phone	704.941.7077	Mobile Phone	(same)	Fax			
E-mail Address	shannon@buildingintelligencegroup.com						
Primary Contact for Technical Questions	Shannon Savage Lingo						

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):	Fifth Third Bank				
Mailing Address	511 Walnut St.				
City	Cincinnati	State	OH	Zip Code	55110
Type of organization (check one) ☐ Individual/Sole Proprietor ☒ Corporation ☐ Partnership ☐ Unit of Government ☐ Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:	31-0676865				
If the customer (Duke Energy account holder) is not the payment recipient, indicate who is: ☐ Vendor ☐ 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.

This application is for the Madisonville Operations Center, fan wall component upgrades for the field built air handler units, AHU1 and AHU2 at 5050 Kingsley Drive: Cincinnati, OH. The new (9.5HPx8 =76 HP) supply fanwall and (3.0HPx9 = 27HP) return fanwall components were installed in the existing AHUs along with new VFDs for both the supply and return fanwalls. The existing supply fans, return fans, and VFDs were removed. The fan efficiency for the fanwall selections installed are much higher than the efficiency of the previous return and supply fans, and were selected for efficiency, reliability, and redundancy.

C. When did you start and complete implementation?
Start date 09/2012 (mm/yyyy) End date 11/2012 (mm/yyyy)

D. Are you also applying for Self-Direct Prescriptive rebates and, if so, which one(s)[1]?
NO

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.

~~Amperage draws were taken before and after the project was completed (during similar conditions): Existing: 68 amps; New: 34.3 amps. These measurements were taken during the fall (low heating/cooling load). The AHU's were at lower airflow than would be witnessed during~~

[1] 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.

~~the summer or winter months at times of high heating or cooling load. As the energy reduction will be greater on a percentage basis at times of higher airflow when compared to low, the energy savings demonstrated here are considered to be conservative. These amperage measurements were converted to kWh using the electrical characteristics (3 phase, 460 V power feed, .80 PF) and the runtime characteristics detailed in this application.~~

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) Janice Juergens, 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).

Janice Juergens
Duke Energy Ohio, Inc Customer Signature

Print Name Janice Juergens

Date April 15, 2013

May 13, 2012

Scope of Proposal

Fifth Third Bank
Madisonville Operations Center
c/o Viox Services
5050 Kingsley Ave.
Cincinnati, Ohio 45227

Attn: Trent Fleming
Mark Coleman

Ref: MOC AHU-1 & AHU-2 Upgrade

Mr. Fleming,

PH+B is please to provide the following proposal for the upgrade of the built-up custom AHU-1 and AHU-2 at the Madisonville Operations Center. The scope of this estimate is based upon site visits and our record drawings of the various projects we have completed in the building.

AHU-1 Upgrade to Fanwall Technology: $168,475
AHU-2 Upgrade to Fanwall Technology: $168,475

Mechanical Scope:

1. Each existing vane axial fan (total of 4, (1) supply fan and (1) return fan per AHU) will be demolished including galvanized sheetmetal ductwork connections in the mechanical rooms.
2. New Hunt Air Fanwall Technology Supply and Return Air systems will be installed.
    a. These system consists of fan arrays containing multiple plenum fans. Multiple, smaller fans provide increased redundancy and common replacement parts.
    b. These systems have been selected to provide maximum capacity given the HP constraints of the current electrical service. The supply fans will operate at the same static pressure as the existing fans (which will require less HP consumption to do so).

System Clarifications:

1. Once Fifth Third has chosen the direction for its campus controls, we will coordinate with an appropriate controls subcontractor. To allow for adequate planning and coordination for the Columbus Day weekend installation, the drop dead date for a decision on the control scheme is July 16th.

General Clarifications:

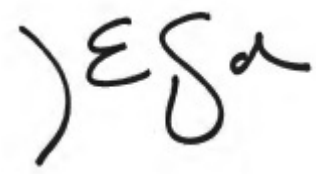
1. PH+B has included overtime/shift time in each price above.
    a. PH+B proposal assumes (1) prolonged shutdown (3-4 days) per AHU to be coordinated over holiday weekends (possibly Columbus day weekend and Thanksgiving weekend) to reduce the impact on the bank's operations. PH+B will

complete as much work upstream of the shutdowns as possible to reduce overtime premiums. Schedule will be coordinated with Fifth Third upon project approval.

2. Longest lead item has a lead time of 12-14 weeks. As such, the drop dead date for project approval to allow for a Columbus Day weekend installation is July 2nd.
3. Pricing of AHUs assuming (1) mobilization & procurement phase. System will be installed in sequential order as coordinated with the bank.
4. This proposal assumes that PH+B will be the engineer of record for the design and installation of the above mentioned systems.
5. No asbestos, lead based paint, or other type of abatement activities have been included in our pricing.

We appreciate the opportunity to continue the upgrade of the MOC Facility. Please contact us if you have any questions or comments.

Sincerely,



Joel Schriner

CONTINUATION SHEET

AIA DOCUMENT G703

PAGE OF PAGES

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing
Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: PHB #: 212524
APPLICATION DATE: 01/14/13 5/3rd AHU Replacement
PERIOD TO: 01/14/13 FANWALL BRE
VIOX PROJECT NO: 90080 -PO#02-016xxxx

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE 0 RATE)
	Engineering	6,000.00	6,000.00			6,000.00	100%		-
	Direct Job Costs (permit, consumables, etc.)	10,690.00	10,690.00			10,690.00	100%		-
	Mobilization/Demobilization	4,500.00	4,500.00			4,500.00	100%		-
	Coordination	7,657.00	7,657.00			7,657.00	100%		-
	Sheetmetal Labor	48,693.00	48,693.00			48,693.00	100%		-
	Sheetmetal Material	19,585	19,585.00			19,585.00	100%		-
	Electrical Work	26,600.00	26,600.00			26,600.00	100%		-
	Material Handling/Rigging	9,393.00	9,393.00			9,393.00	100%		-
	Equipment	163,108	163,107.95			163,107.95	100%		-
	Balancing	4,224.00	4,224.00			4,224.00	100%		-
	Return Fan VFD's	12,000.00	12,000.00			12,000.00	100%		-
	Controls	10,000.00	10,000.00			10,000.00	100%		-
	Rental Equipment (temp cooling units)	8,000.00	8,000.00			8,000.00	100%		-
	Concrete Pads	6,500.00	6,500.00			6,500.00	100%		
									-
	GRAND TOTALS	336,950	336,950	-		336,950	100%	-	-

GOVERNAIR CORPORATION

FANWALL TECHNOLOGY® 2.0

Project Name	5/3 BANK
Quote Number	
Job Number	-000

Unit Tag	AHU-1 SUPPLY MECHANICAL
Date	August 13, 2012

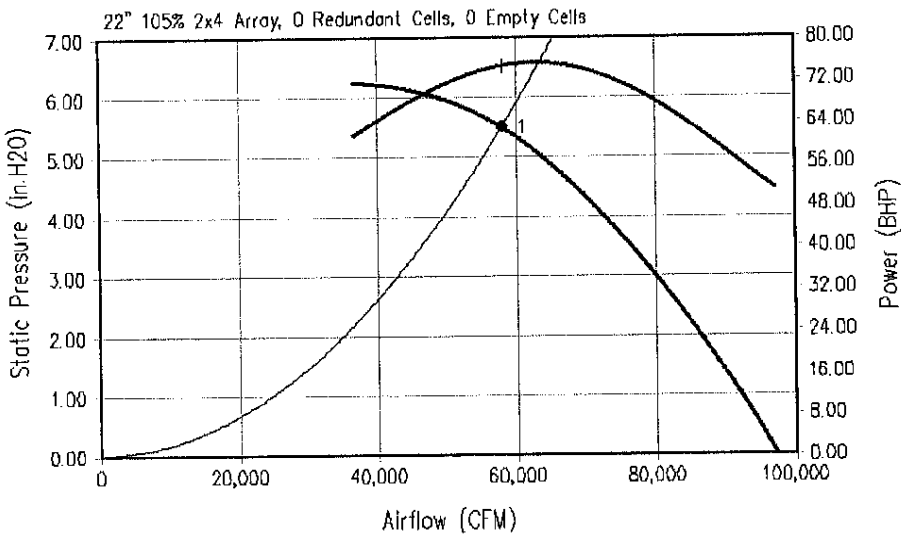
Same as AHU-2

Configuration	
Function	Supply Fan
Construction	Mechanical Frame
Selection Mode	Lowest Sound Power
Array	2 Rows x 4 Cols
Cell Size	40.000 H x 38.000 W
Fan Wall Depth	37.000
Altitude / Temp	0 Feet / 70 F
Redundant / Empty Cells	0 / 0

Fan Wheel	
Diameter	22
Width	105%
Balancing	1 Plane

Motor	
Manufacturer	Baldor
HP Each / Total	9.5 / 76.0
Poles / RPM	4-Pole / 1755 RPM
Frame	213T / TEAO
Voltage / Phase	460V / 3 Phase
Total FLA	92.0

Options	
Coplanar Silencer	Melamine
Back Draft Dampers	YES
Inlet Airflow Straightener	NO
Fan Safety Guard	NO
Powder Coat	NO



Power rating (BHP) does not include transmission losses.
Performance ratings include the effects of the Coplanar Silencer.

Notes

Huntair Inc. certifies that the fan model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal Applies to Air Performance only. Performance certified for installation type A – Free inlet, Free outlet. Cell velocity = 853 fpm.

Operating Points

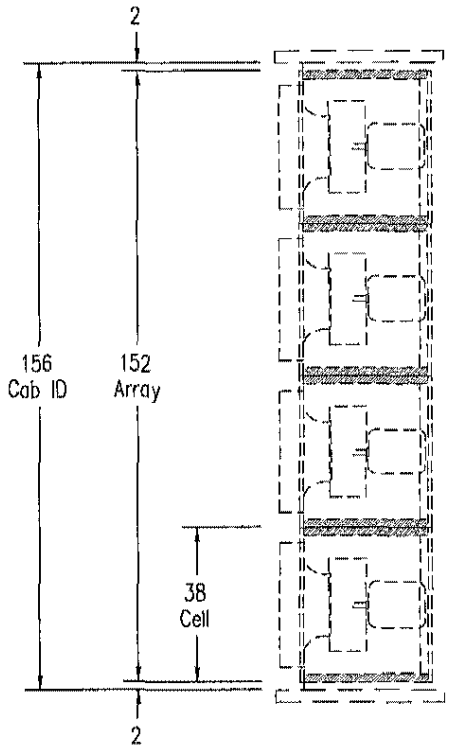
Label	Use	CFM	SP	Cell Quantities On	Off	Failed	RPM	Hz	BHP Each	BHP Total	Vel	Watts
1	1	58000	5.50	8			2102	71.9	9.33	74.67	853	n/a

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)

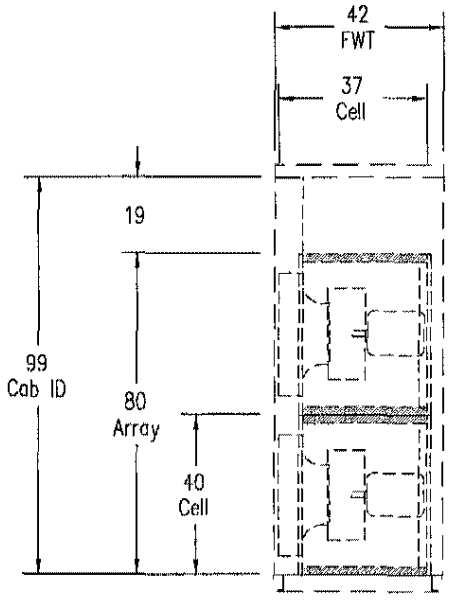
Label		63	125	250	500	1k	2k	4k	8k	LwA	Lw
1	Inlet	100	96	94	95	88	86	85	78	96	103
	Outlet	88	86	97	84	82	81	77	69	91	98

FANWALL TECHNOLOGY® Patent Numbers US 7,137,775, US 7,179,046 and US 7,527,468 issued and others pending

4841 North Sewell • Oklahoma City, OK 73118
Phone: 405-525-6546 • Fax 405-528-4724



Plan View



Side View

Project1

Tag: AHU-1 SUPPLY MECHANICAL

GOVERNAIR
4841 N. SEWELL OKLAHOMA CITY, OK 73118
Phone 405-525-6546 Fax 405-528-4724

DRAWN BY	DATE	LAYOUT	TIME STAMP	SCALE	SHEET
	8/13/12			1:49	OF

JOB NO	DWG NO	REV
		A

FANWALL Replacement 58,000 CFM BLANKOFFS BY OTHERS

FANWALL Technology Patents US 7,137,775, US 7,179,046 & US 7,527,468 issued

GOVERNAIR CORPORATION

FANWALL TECHNOLOGY® 2.0

Project Name	5/3 BANK	Unit Tag	AHU-1 RETURN
Quote Number		Date	August 13, 2012
Job Number	-000		

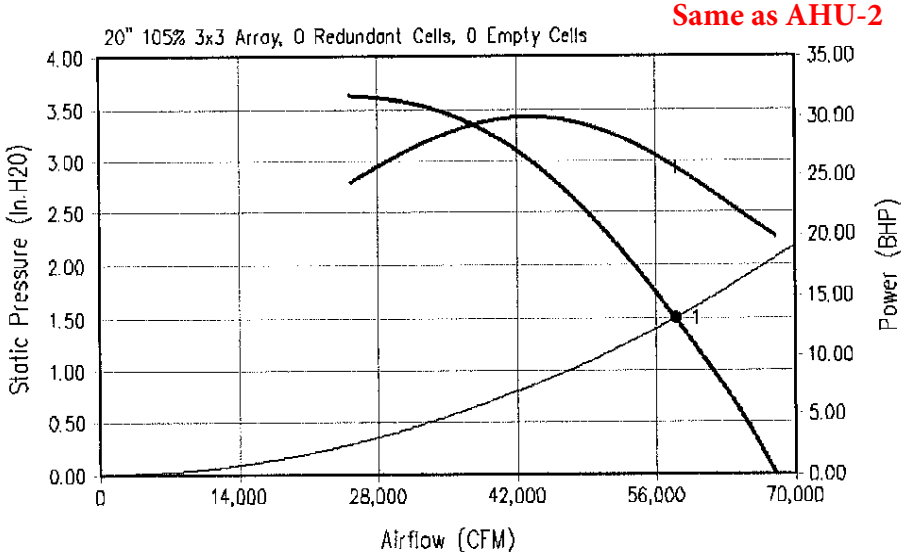
Same as AHU-2

Configuration	
Function	Return Fan
Construction	Mechanical Frame
Selection Mode	Lowest Sound Power
Array	3 Rows x 3 Cols
Cell Size	40.000 H x 36.000 W
Fan Wall Depth	32.500
Altitude / Temp	0 Feet / 70 F
Redundant / Empty Cells	0 / 0

Fan Wheel	
Diameter	20
Width	105%
Balancing	1 Plane

Motor	
Manufacturer	Baldor
HP Each / Total	3.0 / 27.0
Poles / RPM	4-Pole / 1760 RPM
Frame	182T / TEAO
Voltage / Phase	460V / 3 Phase
Total FLA	36.0

Options	
Coplanar Silencer	Melamine
Back Draft Dampers	YES
Inlet Airflow Straightener	NO
Fan Safety Guard	NO
Powder Coat	NO



Power rating (BHP) does not include transmission losses.
Performance ratings include the effects of the Coplanar Silencer.

Notes

Huntair Inc. certifies that the fan model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal Applies to Air Performance only. Performance certified for installation type A – Free inlet, Free outlet. Cell velocity = 806 fpm.

Operating Points

Label	Use	CFM	SP	Cell Quantities			RPM	Hz	BHP Each	BHP Total	Vel	Watts
				On	Off	Failed						
1	1	58000	1.50	9			1777	60.6	2.85	25.67	806	n/a

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)

Label		63	125	250	500	1k	2k	4k	8k	LwA	Lw
1	Inlet	94	91	88	88	84	84	80	72	90	97
	Outlet	82	83	92	78	77	76	72	62	86	93

FANWALL TECHNOLOGY® Patent Numbers US 7,137,775, US 7,179,046 and US 7,527,468 issued and others pending

4841 North Sewell • Oklahoma City, OK 73118
Phone: 405-525-6546 • Fax 405-528-4724

Project Name	FIFTH THIRD SUPPLY		
Quote Number			
Job Number	-001	Box	A

Design Name	Design_1
Date	5/7/2013

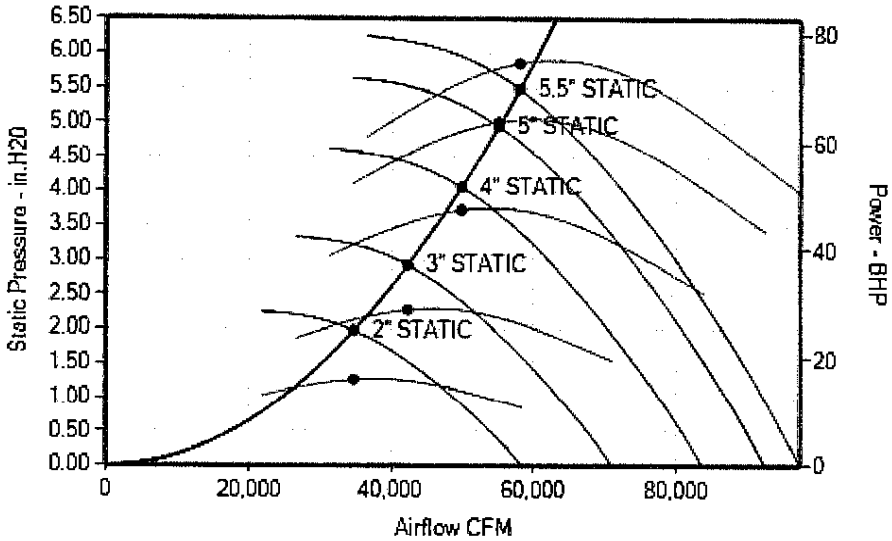
Supply Fan Performance Curve

Configuration						
Function	Supply Fan	Cell Size	Height	Width	Depth	Overall Depth
Cell Construction	PentaCube		40 in	38 in	32.5 in	40.75 in
Selection Mode	Best	Elev. / Temp.		39 ft / 70.0 °F		
Array	2 Rows x 4 Cols	Redundant / Empty Cells		0 / 0		

Fan Wheel	
Diameter	22
Width	105 %
Balancing Planes	1

Motor	
Manufacturer	Baldor
HP Each / Total	9.5 / 76
Poles / RPM	4-Pole / 1,755
Frame / Casing	213T / TEAO
Volts / Phase / Hz	460/3/60
Total FLA	92.0 Amps

Options	
Coplanar Insulation	Melamine
Back Draft Dampers	YES
Inlet Air Straight.	NO - Curved Cone
Fan Safety Guard	NO
Powder Coat	NO
Insulation Retainer	NO



Power Rating BHP does not include transmission losses.
Performance ratings include the effects of the Coplanar Silencer.

Notes:

1. Cell velocity is greater than 750 fpm.
2. To view patents and other pending U.S. or Canadian applications visit www.ces-group.com/patents

Operating Conditions												
Operating Condition	Annual Usage	ACFM	SP (in.H20)	Cell Quantities			RPM	Hz	Fanwheel BHP		Vel (ft/min)	Watts
				On	Off	Failed			Each	Total		
5.5" STATIC	20 %	58,000	5.50	8			2,103	71.89	9.33	74.67	853	34,446
5" STATIC	20 %	55,100	4.96	8			1,998	68.29	8	64.01	810	
4" STATIC	20 %	49,880	4.07	8			1,809	61.83	5.94	47.5	734	
3" STATIC	20 %	42,340	2.93	8			1,535	52.48	3.63	29.04	623	
2" STATIC	20 %	34,800	1.98	8			1,262	43.13	2.02	16.13	512	

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)											
Operating Condition		63	125	250	500	1K	2K	4K	8K	LwA	Lw
5.5" STATIC	Inlet	100	96	94	95	88	86	85	78	96	103
	Outlet	88	86	97	84	82	81	77	69	91	98
5" STATIC	Inlet	100	96	94	94	88	86	85	78	96	103
	Outlet	87	86	97	83	81	81	76	68	91	98
4" STATIC	Inlet	97	94	92	90	84	83	80	75	92	101
	Outlet	85	85	94	80	79	78	73	64	88	95
3" STATIC	Inlet	93	91	88	85	81	79	75	71	88	97
	Outlet	81	84	91	74	75	73	68	57	85	92
2" STATIC	Inlet	88	86	82	79	76	75	68	67	83	92
	Outlet	77	83	85	69	71	67	62	49	79	88

15 East Oklahoma Ave Okarche, OK 73762
(405) 263-7286 FAX (405) 263-4980

Project Name	FIFTH THIRD RETURN		
Quote Number			
Job Number	-001	Box	A

Design Name	Design_1
Date	5/7/2013

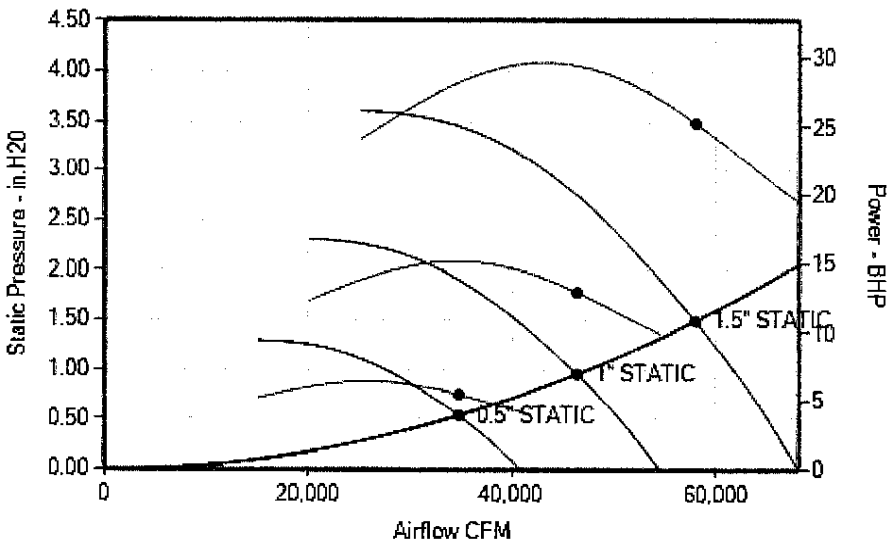
Return Fan Performance Curve

Configuration						
Function	Return Fan	Cell Size	Height	Width	Depth	Overall Depth
Cell Construction	PentaCube		41 in	37 in	28 in	36.25 in
Selection Mode	Best	Elev. / Temp.		39 ft / 70.0 °F		
Array	3 Rows x 3 Cols	Redundant / Empty Cells			0 / 0	

Fan Wheel	
Diameter	20
Width	105 %
Balancing Planes	1

Motor	
Manufacturer	Baldor
HP Each / Total	3 / 27
Poles / RPM	4-Pole / 1,760
Frame / Casing	182T / TEAO
Volts / Phase / Hz	460/3/60
Total FLA	36.0 Amps

Options	
Coplanar Insulation	Melamine
Back Draft Dampers	YES
Inlet Air Straight.	NO - Curved Cone
Fan Safety Guard	NO
Powder Coat	NO
Insulation Retainer	NO



Power Rating BHP does not include transmission losses.
Performance ratings include the effects of the Coplanar Silencer.

Notes:

1. Cell velocity is greater than 750 fpm.
2. To view patents and other pending U.S. or Canadian applications visit www.ces-group.com/patents

Operating Conditions												
Operating Condition	Annual Usage	ACFM	SP (in.H20)	Cell Quantities			RPM	Hz	Fanwheel BHP		Vel (ft/min)	Watts
				On	Off	Failed			Each	Total		
1.5" STATIC	34 %	58,000	1.50	9			1,771	60.37	2.81	25.28	760	34,446
1" STATIC	33 %	46,400	0.96	9			1,417	48.31	1.44	12.95	608	
0.5" STATIC	33 %	34,800	0.54	9			1,063	36.23	.61	5.46	456	

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)											
Operating Condition		63	125	250	500	1K	2K	4K	8K	LwA	Lw
1.5" STATIC	Inlet	94	91	88	88	84	84	80	72	90	97
	Outlet	82	83	92	78	77	76	72	62	86	93
1" STATIC	Inlet	88	86	83	80	78	78	71	65	84	91
	Outlet	77	81	87	71	72	69	64	51	81	89
0.5" STATIC	Inlet	83	80	74	73	72	71	61	58	77	85
	Outlet	73	79	78	65	67	62	54	41	73	82

15 East Oklahoma Ave Okarche, OK 73762
(405) 263-7286 FAX (405) 263-4980

The General 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. This worksheet is for all projects that are not easily submitted through one of the other worksheets

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

- Submitting this application does not guarantee an rebate will be approved.
- Rebates already decided to proceed.
- 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 Direct 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	Janice Juergens
Company	Fifth Third Madisonville, Operations Center; Cincinnati, OH

Equipment Vendor / Project Engineer Contact Information

Name	Shannon Lingo (Shannon@buildingintelligencegroup.com)
Company	Building Intelligence Group

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.

List of Sites (Required)

App No.	
Rev.	

Provide a list of sites addressed by this custom rebate application

Site ID (see note 1)	Duke Energy Electric Account Number(s) (see note 2)	Facility Address	List of Proposed Projects at each site	Annual Hours of Operation	Gross Square Footage	Conditioned Square Footage	Facility Age (years)
225	*12345678 01*	*Example: 123 Main Street, Anywhere USA 12345*	*Project Name(s)*	*5,840*	*42,000*	*38,000*	*12*
	9290220401 6690373001 6690220401 7290220401	*5050 Kingsley Drive: Cincinnati, OH*	*New Fan Wall Components for Supply and Return Fans, AHU1 and AHU2*	*8,760*	*461,285*	*461,285*	*??*
							unknown age

1 Site ID
Can be a store number, building name or other way to identify the location. If there is only one site involved in this application, then a Site ID is not necessary.

2 Account Numbers
Must match the facility of the proposed project(s). If there are multiple meters at a site, only include the meters that pertain to the project(s).

For each project, answer the following questions (use one worksheet per project)

App No.	0
Rev.	0

Project Name: Fifth Third, MOC Fan Wall

How would you classify this project? (Place an x in all boxes that apply.)

Lighting		**Heating/Cooling**	X	**Air Compressor**		**Energy Management System**	X
VFD		**Motors/Pumps**		**Process Equipment**		**Other, describe below:**	

Brief Project Description

Describe the Baseline (see note 3) **Equipment/System**	**Describe the Proposed High Efficiency Project**
AHU-1 and AHU-2 - the existing 75HP supply fan had been equipped with a VFD controlling to 1.5" static pressure. The return fan baseline includes a VFD on single return fan; systems are 24x7.	**New (9.5 HP by 8) Supply fanwall components (for a total of 76 HP per AHU) were installed in each of the existing AHU1 and AHU2 along with 2 new 40HP VFDs per AHU to replace existing supply fan VFDs. Return fans were also converted to 9x3HP fan wall components (27HP) and equipped with new return**

If Existing Equipment is the Baseline, how many years of useful life remain or how many years until scheduled replacement? 2

Detailed Project Description Attached? Yes (Required)

Operating Hours (see note 4)

	Weekday		Saturday		Sunday		Weeks of Use in Year	Total Annual Hours of Use
24 x 7	**Start Hour**	**End Hour**	**Start Hour**	**End Hour**	**Start Hour**	**End Hour**	(see note 5)	
Yes							***52***	***8,760***

Energy Savings

	Baseline (see Note 3)	**Proposed**	**Savings**	**Describe how energy numbers were calculated**
Annual Electric Energy	13,478,544 kWh	###########	119,891 kWh	
Electric Demand	2,655 kW	2,651 kW	4 kW	
Calculations attached	Yes	Yes	(Required)	savings due to fan wall efficiency improvements month to month. EPO data was pulle

Simple Payback

Average electric rate ($/kWh) on the applicable accounts (see note 6)			$0.10
Estimated annual electric savings			$11,893
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels			
Incremental cost to implement the project (equipment & installation) (see note 7)			$336,945.00
Copy of vendor proposal is attached (see note 8)			Yes
Simple Electric Payback in years (see note 9)	28.33092546	**Total Payback in years**	28.33092546

3 Baseline
Retrofit projects: the existing equipment is the baseline.
New construction projects: the baseline is the standard option in today's market, taking into account any applicable organizational, local, state or federal codes or standards currently in effect.

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:

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 electric payback is less than 1 year, the rebate structure is affected. Double check average electric rate for correct payback.

Building Intelligence Group					MOC Fanwall Mercantile Self Direct Project																$/kWh	**$0.09920**	Electricity $/MMBtu		8.65412	Gas	Area sqft	461,285
				TASK	MISC	SPACE	SPACE	HEAT	PUMPS	VENT	REFRIG	HT PUM	DOMEST Ho	EXT	TOTAL		Electric tota	Savings MME	%Savings	Savings kWh	Costs	Cost savings	Cost savings %		**Impl cost**	Payback		
		Peak	LIGHTS	LIGHTS	EQUIP	HEATING	COOLING	REJECT	& AUX	FANS	DISPLAY	SUPPLEI	WTR	USAGE													
		kW	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------													
Baseline																											
EM1	ELEC	TRICIT	Y												0.5801326						2655.1						
	MBTU		9891.3	0	16340.6	2626.3	9476.6	101.6	1241.3	5869	0	0	455.3	0	46001.9	95%	13478557				1337073						
																					2.90						
FM1	NATU	RAL-GA	S																								
	MBTU		0	0	222.8	2131.5	0	0	20.6	0	0	0	0	0	2375	5%					20554						
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04						
	MBTU		9891.3	0	16563.4	4757.8	9476.6	101.6	1262	5869	0	0	455.3	0	48376.9						1357626					31358.3	
			22%	0%	36%	6%	21%	0%	3%	13%	0%	0%	1%	0.00%	0.10						2.94						
			0%	0%	9%	90%	0%	0%	1%	0%	0%	0%	0%	0%	0.005												
			20%	0%	34%	10%	20%	0%	3%	12%	0%	0%	1%	0%	0.105												
Total Op1 (1+2)			1																			2651.4					
EM1	ELECT	RICIT	Y																			2651					
	MBTU		9891.3	0	16340.6	2660.9	9442.1	99.1	1238.6	5464.8	0	0	455.3	0	45592.7	95%	13358661	409.2	1%		1325179	11894	1%				
																					2.87						
FM1	NATUR	AL-GA	S																								
	MBTU		0	0	222.8	2143.2	0	0	20.6	0	0	0	0	0	2386.7	5%		-11.70	0%		20655	-101	0%				
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04						
	MBTU		9891.3	0	16563.4	4804	9442.1	99.1	1259.3	5464.8	0	0	455.3	0	47979.3			397.60	1%		1345834	11792	1%			30960.6	1%	397.7
			22%	0%	36%	6%	21%	0%	3%	12%	0%	0%	1%	0%	0.099						2.92						
			0%	0%	9%	90%	0%	0%	1%	0%	0%	0%	0%	0%	0.005												
			20%	0%	34%	10%	20%	0%	3%	11%	0%	0%	1%	0%	0.104												
			100%			101%	100%	98%	100%	93%																		
Total Op2 ()			0																			2565.3					
EM1	ELEC	TRICIT	Y																			0					
	MBTU		9664.4	0	16340.6	2451.5	7727.2	117.1	1230.4	4582.8	0	0	455.3	0	42569.1	96%	12472746	0	0%		1237296	0	0%				
																					2.68						
FM1	NATU	RAL-GA	S																								
	MBTU		0	0	222.8	1618.7	0	0	20.6	0	0	0	0	0	1862.2	4%		0.00	0%		16116	0	0%				
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.03						
	MBTU		9664.4	0	16563.4	4070.2	7727.2	117.1	1251	4582.8	0	0	455.3	0	44431.3			0.00	0%		1253412	0	0%				
			21%	0%	36%	5%	17%	0%	3%	10%	0%	0%	1%	0%	0.092						2.72						
			0%	0%	9%	68%	0%	0%	1%	0%	0%	0%	0%	0%	0.004												
			20%	0%	34%	8%	16%	0%	3%	9%	0%	0%	1%	0%	0.096												
Total Op3 () - NA																						2490					
EM1	ELECT	RICIT	Y																			0					
	MBTU		4943.5	0.0	3090.6	3740.2	3071.8	56.1	394.9	2500.3	0.0	0.0	0.0	56.5	17854.0	98%	5231222	0	0%		518937	0	0%				
																					1.12						
FM1	NATUR	AL-GA	S																								
	MBTU		0.0	0.0	0.0	75.1	0.0	0.0	0.0	0.0	0.0	0.0	283.5	0.0	358.6	2%		0.00	0%		3103	0	0%				
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.01						
	MBTU		4943.5	0.0	3090.6	3815.3	3071.8	56.1	394.9	2500.3	0.0	0.0	283.5	56.5	18212.6			0.00	0%		522041	0	0%				
			11%	0%	7%	8%	7%	0%	1%	5%	0%	0%	0%	0%	0.039						1.13						
			0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	12%	0%	0.001												
			10%	0%	6%	8%	6%	0%	1%	5%	0%	0%	1%	0%	0.039												
ECM1: FanWalls plus new VFDs fo			1																			2651.9					
EM1	ELECT	RICIT	Y																			2652					
	MBTU		9891.3	0.0	16340.6	2655.0	9446.8	99.5	1239.1	5566.1	0.0	0.0	455.3	0.0	45693.7	95%	13388254	308.2	1%		1328115	8958	1%				
																					2.88						
FM1	NATUR	AL-GA	S																								

	MBTU		0.0	0.0	222.8	2141.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2384.4	5%		-9.40	0%		20635	-81	0%					
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04							
	MBTU		9891.3	0.0	16563.4	4796.0	9446.8	99.5	1259.8	5566.1	0.0	0.0	455.3	0.0	48078.1			298.80	1%		1348750	8877	1%					
			22%	0%	36%	6%	21%	0%	3%	12%	0%	0%	1%	0%	0.099						2.92							
			0%	0%	9%	90%	0%	0%	1%	0%	0%	0%	0%	0%	0.005													
			20%	0%	34%	10%	20%	0%	3%	12%	0%	0%	1%	0%	0.104													
ECM2: - Fanwalls plus new VFDs f			1																			2655					
EM1	ELECT	RICIT	Y																			2655					
	MBTU		9891.3	0.0	16340.6	2639.1	9473.0	101.2	1240.8	5775.2	0.0	0.0	455.3	0.0	45916.6	95%	13453564	85.3	0%		1334594	2479	0%					
																					2.89							
FM1	NATUR	AL-GA	S																									
	MBTU		0.0	0.0	222.8	2134.8	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2378.3	5%		-3.30	0%		20582	-29	0%					
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04							
	MBTU		9891.3	0.0	16563.4	4773.9	9473.0	101.2	1261.4	5775.2	0.0	0.0	455.3	0.0	48294.8			82.10	0%		1355176	2451	0%					
			22%	0%	36%	6%	21%	0%	3%	13%	0%	0%	1%	0%	0.100						2.94							
			0%	0%	9%	90%	0%	0%	1%	0%	0%	0%	0%	0%	0.005							11327.41						
			20%	0%	34%	10%	20%	0%	3%	12%	0%	0%	1%	0%	0.105													
ECM3: - NA			0																			2593.1					
EM1	ELEC	TRICIT	Y																			0					
	MBTU		9891.3	0.0	16340.6	2417.8	9540.0	104.1	1183.7	5831.0	0.0	0.0	455.3	0.0	45763.7	95%	13408764	0	0%		1330149	0	0%					
																					2.88							
FM1	NATU	RAL-GA	S																									
	MBTU		0.0	0.0	222.8	2000.8	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2244.3	5%		0.00	0%		19422	0	0%					
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04							
	MBTU		9891.3	0.0	16563.4	4418.5	9540.0	104.1	1204.3	5831.0	0.0	0.0	455.3	0.0	48008.0			0.00	0%		1349572	0	0%					
			22%	0%	36%	5%	21%	0%	3%	13%	0%	0%	1%	0%	0.099						2.93							
			0%	0%	9%	84%	0%	0%	1%	0%	0%	0%	0%	0%	0.005													
			20%	0%	34%	9%	20%	0%	2%	12%	0%	0%	1%	0%	0.104													
ECM4: - NA			0																			2711.9					
EM1	ELEC	TRICIT	Y																			0					
	MBTU		9664.4	0.0	16340.6	2428.6	9473.4	106.2	1284.3	5822.3	0.0	0.0	455.3	0.0	45575.0	95%	13353475	0	0%		1324665	0	0%					
																					2.87							
FM1	NATU	RAL-GA	S																									
	MBTU		0.0	0.0	222.8	2040.2	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2283.7	5%		0.00	0%		19763	0	0%					
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04							
	MBTU		9664.4	0.0	16563.4	4468.8	9473.4	106.2	1304.9	5822.3	0.0	0.0	455.3	0.0	47858.7			0.00	0%		1344428	0	0%					
			21%	0%	36%	5%	21%	0%	3%	13%	0%	0%	1%	0%	0.099						2.91							
			0%	0%	9%	86%	0%	0%	1%	0%	0%	0%	0%	0%	0.005													
			20%	0%	34%	9%	20%	0%	3%	12%	0%	0%	1%	0%	0.104													
ECM5: - NA			0																			2680.4					
EM1	ELEC	TRICIT	Y																			0					
	MBTU		9891.3	0.0	16340.6	2200.4	9458.1	106.5	1285.9	5812.4	0.0	0.0	455.3	0.0	45550.5	95%	13346297	0	0%		1323953	0	0%					
																					2.87							
FM1	NATU	RAL-GA	AS																									
	MBTU		0.0	0.0	222.8	2004.4	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2247.8	5%		0.00	0%		19453	0	0%					
		=	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04							
	MBTU		9891.3	0.0	16563.4	4204.7	9458.1	106.5	1306.5	5812.4	0.0	0.0	455.3	0.0	47798.3			0.00	0%		1343405	0	0%					
			22%	0%	36%	5%	21%	0%	3%	13%	0%	0%	1%	0%	0.099						2.91							
			0%	0%	9%	84%	0%	0%	1%	0%	0%	0%	0%	0%	0.005													
			20%	0%	34%	9%	20%	0%	3%	12%	0%	0%	1%	0%	0.104													
ECM6: NA	infil		0																			2708.5				0.3878	0.34902
EM1	ELEC	TRICIT	Y																			0					

	MBTU		9891.3	0.0	16340.6	2455.5	9523.0	107.4	1267.4	5834.6	0.0	0.0	455.3	0.0	45875.1	95%	13441404	0	0%		1333387	0	0%						
																					2.89								
FM1	NATU	RAL-GA	S																										
	MBTU		0.0	0.0	222.8	2000.3	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2243.8	5%		0.00	0%		19418	0	0%						
		=	======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04								
	MBTU		9891.3	0.0	16563.4	4455.8	9523.0	107.4	1288.1	5834.6	0.0	0.0	455.3	0.0	48118.9			0.00	0%		1352805	0	0%						
			22%	0%	36%	5%	21%	0%	3%	13%	0%	0%	1%	0%	0.099						2.93								
			0%	0%	9%	84%	0%	0%	1%	0%	0%	0%	0%	0%	0.005														
			20%	0%	34%	9%	20%	0%	3%	12%	0%	0%	1%	0%	0.104														
ECM7: - NA	crac eff		0																			2490						
EM1	ELECT	RICI	TY																			0						
	MBTU		9891.3	0.0	16340.6	2200.4	9458.1	106.5	1285.9	5812.4	0.0	0.0	455.3	0.0	45550.5	95%	13346297	0	0%		1323953	0	0%						
																					2.87								
FM1	NATUR	AL-G	AS																										
	MBTU		0.0	0.0	222.8	2004.4	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	2247.8	5%		0.00	0%		19453	0	0%						
			=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.04								
	MBTU		9891.3	0.0	16563.4	4204.7	9458.1	106.5	1306.5	5812.4	0.0	0.0	455.3	0.0	47798.3			0.00	0%		1343405	0	0%						
			22%	0%	36%	5%	21%	0%	3%	13%	0%	0%	1%	0%	0.099						2.91								
			0%	0%	9%	84%	0%	0%	1%	0%	0%	0%	0%	0%	0.005														
			20%	0%	34%	9%	20%	0%	3%	12%	0%	0%	1%	0%	0.104														
ECM8: - NA																						2490						
EM1	ELECT	RICI	TY																			0						
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	0.0	56.5	14224.7	98%	4167837.1	0	0%		413449	0	0%						
																					0.90								
FM1	NATUR	AL-G	AS																										
	MBTU		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	283.5	0.0	283.5	2%		0.00	0%		2453	0	0%						
			=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.01								
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	283.5	56.5	14508.2			0.00	0%		415903	0	0%						
			8%	0%	7%	6%	5%	0%	1%	4%	0%	0%	0%	0%	0.031						0.90								
			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	0.001														
			8%	0%	6%	6%	5%	0%	1%	4%	0%	0%	1%	0%	0.031														
ECM9: - NA																						2490						
EM1	ELECT	RICI	TY																			0						
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	0.0	56.5	14224.7	98%	4167837.1	0	0%		413449	0	0%						
																					0.90								
FM1	NATUR	AL-G	AS																										
	MBTU		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	283.5	0.0	283.5	2%		0.00	0%		2453	0	0%						
			=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.01								
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	283.5	56.5	14508.2			0.00	0%		415903	0	0%						
			8%	0%	7%	6%	5%	0%	1%	4%	0%	0%	0%	0%	0.031						0.90								
			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	0.001														
			8%	0%	6%	6%	5%	0%	1%	4%	0%	0%	1%	0%	0.031														
ECM10: - NA																						2490						
EM1	ELECT	RICI	TY																			0						
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	0.0	56.5	14224.7	98%	4167837.1	0	0%		413449	0	0%						
																					0.90								
FM1	NATUR	AL-G	AS																										
	MBTU		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	283.5	0.0	283.5	2%		0.00	0%		2453	0	0%						
			=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========						0.01								
	MBTU		3646.5	0.0	3090.6	2808.6	2353.5	38.8	363.1	1867.0	0.0	0.0	283.5	56.5	14508.2			0.00	0%		415903	0	0%						
			8%	0%	7%	6%	5%	0%	1%	4%	0%	0%	0%	0%	0.031						0.90								
			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	0.001														
			8%	0%	6%	6%	5%	0%	1%	4%	0%	0%	1%	0%	0.031														

	A	W+8			W+2	W+5	W+1		T+8	X+8	
5						Baseline M		2655			
	Description	**Total savings ($/year)**	**Estimated Cost ($)**	**Payback (years)**	Electricity Savings ($)	Gas savings ($)	Max kW		Energy Savings	Cost savings%	Notes
57	**ECM1: FanWalls plus new VFDs for Supply Fans, instead of 75HP fan with single VFD on**	$8,877		0.0	8958	-81		2652	1%	1%	
70	**ECM2: - Fanwalls plus new VFDs for return instead of single fan on VFD for AHU1/2**	$2,451		0.0	2479	-29		2655	0%	0%	
83	**ECM3: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
96	**ECM4: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
109	**ECM5: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
122	**ECM6: NA**	$0		#DIV/0!	0	0		0	0%	0%	
135	**ECM7: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
148	**ECM8: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
161	**ECM9: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
174	**ECM10: - NA**	$0		#DIV/0!	0	0		0	0%	0%	
18	**Total Op1 (1+2)**	$11,792		0.0	11894	-101		2651	1%	1%	
31	**Total Op2 ()**	$0			0	0		0	0%	0%	
44	**Total Op3 () - NA**	$0			0	0		0	0%	0%	

Electricity			Gas			
$/kWh	0.099200		$/MMBtu	8.6541	Area sqft	461285

	Annual Electric Use (kWh)	Annual Electric Use (kBtu)	Annual Electric Cost ($)
Baseline Case (based on eQuest model)	13,478,557	45,988,835	1,337,073
Proposed Design (OP1)	13,358,661	45,579,752	1,325,179
Savings	119896	409084	11894
% Improvement	1%	1%	1%

	Annual Electric Use (kWh/ft2)	Annual Electric Use (kBtu/ft2)	Annual Electric Cost ($/ft2)
Baseline Case (based on eQuest model)	29	100	2.9
Proposed Design (OP1)	29	99	2.9
Savings	0	1	0.0
% Improvement	1%	1%	1%

	Annual Gas Use (MMBtu)	Annual Gas Use (kBtu)	Annual Gas Cost ($)

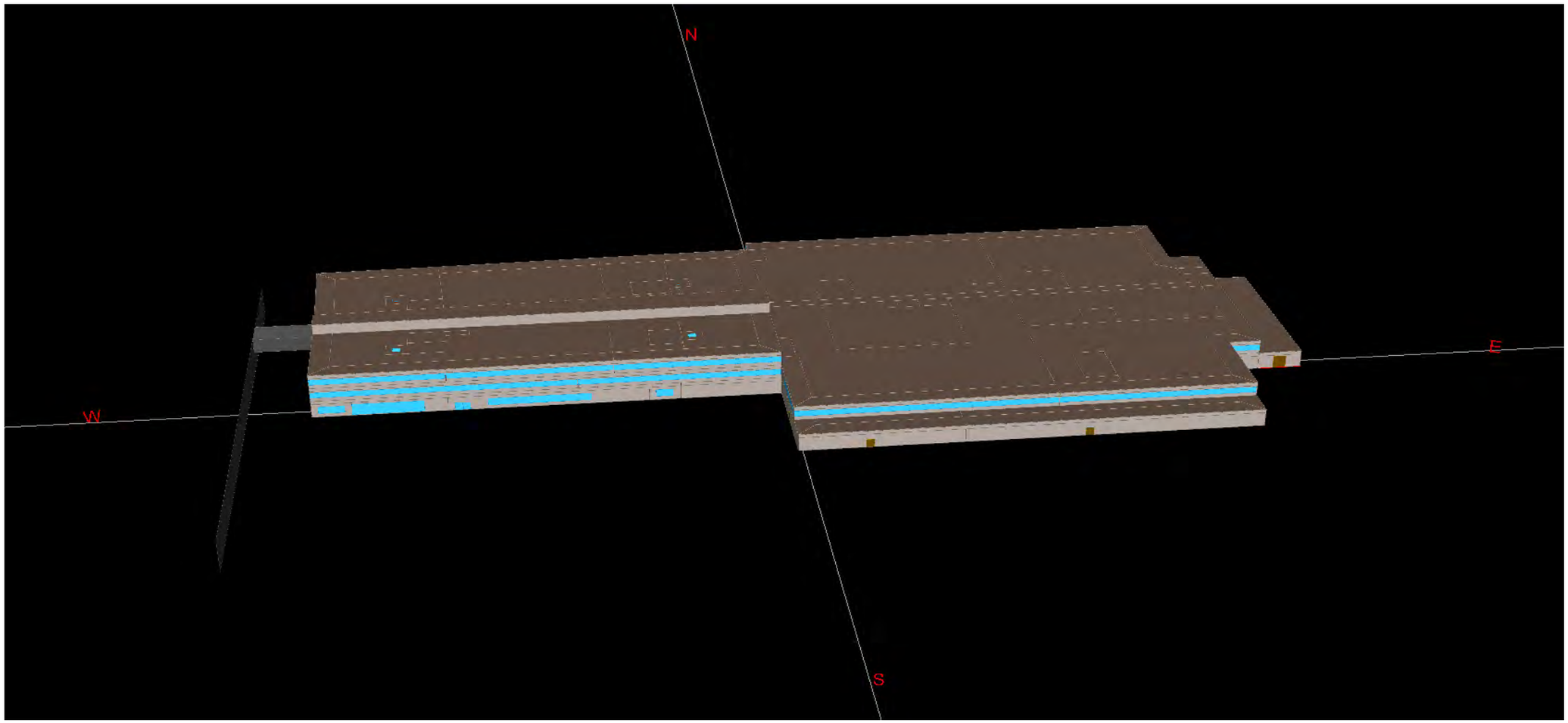
	Annual Gas Use (MMBtu/ft2)	Annual Gas Use (kBtu/ft2)	Annual Gas Cost ($/ft2)

Baseline Case (based on eQuest model)	2,375	2,375,000	20,554
Proposed Design (OP1)	2,387	2,386,700	20,655
Savings	-12	-11,700	-101
% Improvement	0%	0%	0%

Baseline Case (based on eQuest model)	0.01	5.15	0.04
Proposed Design (OP1)	0.01	5.17	0.04
Savings	0.00	-0.03	0.00
% Improvement	0%	0%	0%

	Total Energy Use (MMBtu)	Total Energy Use (kBtu)	Total Energy Cost ($)
Baseline Case (based on eQuest model)	48,377	48,376,900	1,357,626
Proposed Design (OP1)	47,979	47,979,300	1,345,834
Savings	398	397,600	11792
% Improvement	1%	1%	1%

	Total Energy Use (MMBtu/ft2)	Total Energy Use (kBtu/ft2)	Total Energy Cost ($/ft2)
Baseline Case (based on eQuest model)	0.10	104.87	2.94
Proposed Design (OP1)	0.10	104.01	2.92
Savings	0.00	0.86	0.03
% Improvement	1%	1%	1%


N
W
E
S

Baseline																			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL						
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------						
EM1 ELECTITY																			
KWH	1149638	1051791	1080982	1012413	1111829	1158237	1332801	1301052	1115837	1049945	1013652	1100369	13478544		4294824				4454663	0.964119
MAX KW	2093.4	2084.7	1875.3	2010.6	2210.9	2374.6	2655.1	2579.2	2371	2318.6	1885.4	1963.4	2655.1		4903919					
DAY/HR	3/ 9	7/ 9	22/ 9	21/16	24/16	26/14	14/16	9/14	1/14	3/16	16/15	22/ 9	7/14		4279803					
FM1 NATU GAS																			
THERM	5333.	4765.	3187.	1129.	541.	348.	225.	238.	486.	1377.	1956.	4167.	23750.						
MAX THERI	9.1	11.1	10.3	7.5	4.3	2.4	1.1	0.7	3.5	7.6	7.3	9.1	11.1						
DAY/HR	21/ 8	12/ 9	4/11	16/23	2/ 7	5/ 5	2/ 1	26/ 9	17/ 6	29/ 9	12/ 7	25/22	2/12						
Proposed																			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL						
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------						
EM1 ELECTITY																			
KWH	1140968	1044035	1071363	1002454	1101385	1147504	1321401	1289533	1105329	1039570	1003923	1091188	13358653		4258820	36004			4337475	0.981866
MAX KW	2083.8	2073.7	1861.1	1999.6	2201.6	2375.1	2651.4	2571.5	2361.7	2309.7	1874.9	1950.2	2651.4		4859823	44096				
DAY/HR	3/ 9	7/ 9	22/ 9	21/16	24/16	26/14	14/16	9/14	1/14	3/16	16/15	22/ 9	7/14		4240010	39793				
																119893				
FM1 NATU GAS																			
THERM	5333.	4780.	3214.	1141.	544.	349.	225.	238.	488.	1391.	1978.	4186.	23867.						
MAX THERI	9.1	11.1	10.3	7.6	4.3	2.5	1.1	0.7	3.6	7.6	7.3	9.1	11.1						
DAY/HR	21/ 8	12/ 9	4/11	16/23	2/ 7	5/ 5	2/ 1	26/ 9	17/ 6	29/ 9	12/ 7	25/22	2/12						

	Electric Consumption (kWh)			Electric Demand (kW)			Gas consumption (MMBtu)			Total energy consumption (MMBtu)		
	Simulation data	Average utility data		Simulation data	Average utility data		Simulation	Average utility data		Simulatio	Average utility data	
Jan	1149638	1270393		2093	2,133		533	1131		4456	5465	
Feb	1051791	1132639		2085	2,181		477	869		4065	4733	
Mar	1080982	1175303		1875	2,174		319	531		4007	4541	
Apr	1012413	1101520		2011	2,068		113	275		3567	4033	
May	1111829	1154646		2211	2,255		54	94		3848	4034	
Jun	1158237	1199822		2375	2,490		35	47		3987	4141	
Jul	1332801	1280225		2655	2,487		23	44		4570	4412	
Aug	1301052	1286140		2579	2,460		24	42		4463	4430	
Sep	1115837	1164838		2371	2,592		49	48		3856	4022	
Oct	1049945	1363945		2319	2,701		138	175		3720	4829	
Nov	1013652	1100972		1885	2,310		196	536		3654	4293	
Dec	1100369	1205925		1963	2,237		417	1056		4171	5171	
Yearly total	13478546	14436368					2375	4848		48364	54104	9%
Average	1123212	1203031		2202	2341		198	404		4030	4509	
Max				2655.1	2701							
		0.1898										

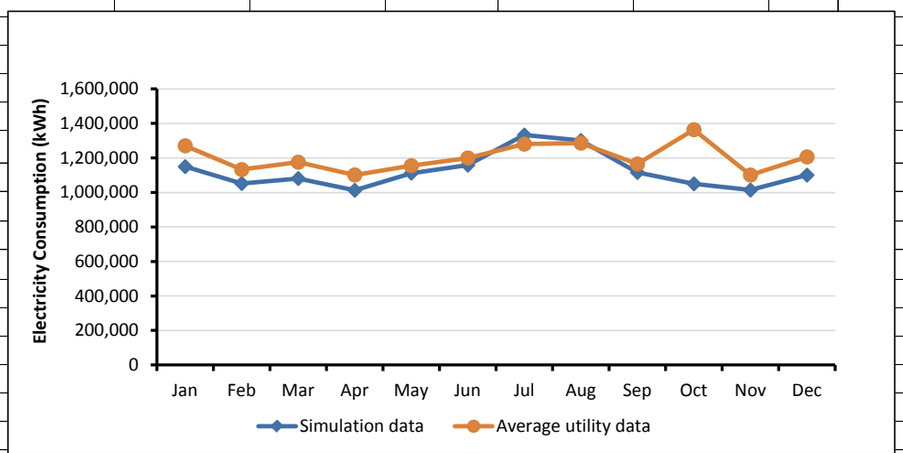
Calibration Criteria

ERR-month (%) (Average utility - Simulation)/Average Utility

	Electricity cons	Electricity dem	Gas consumption	
	-10%	-2%	-53%	
	-7%	-4%	-45%	
	-8%	-14%	-40%	
	-8%	-3%	-59%	
	-4%	-2%	-43%	
	-3%	-5%	-27%	
	4%	7%	-49%	
	1%	5%	-43%	
	-4%	-9%	2%	
	-23%	-14%	-21%	
	-8%	-18%	-64%	
	-9%	-12%	-61%	
ERR-yearly (	-6.6%		-51.0%	sum
		-5.9%		

Coefficient of variation of the root mean square error

Normalized mean bias error



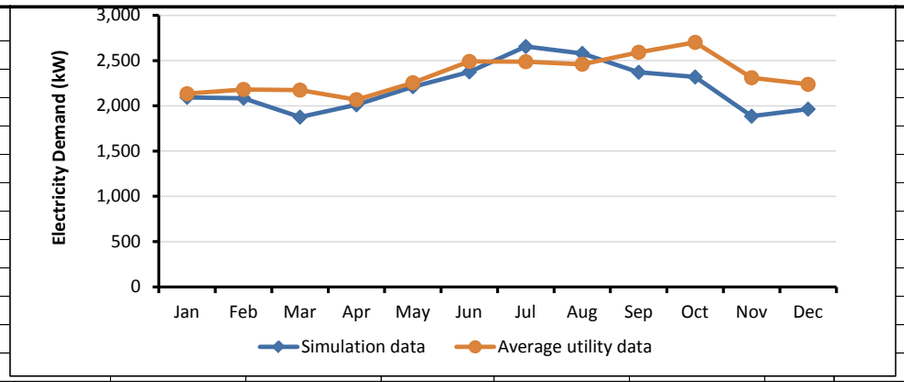
Checking calibration criteria (monthly data)*

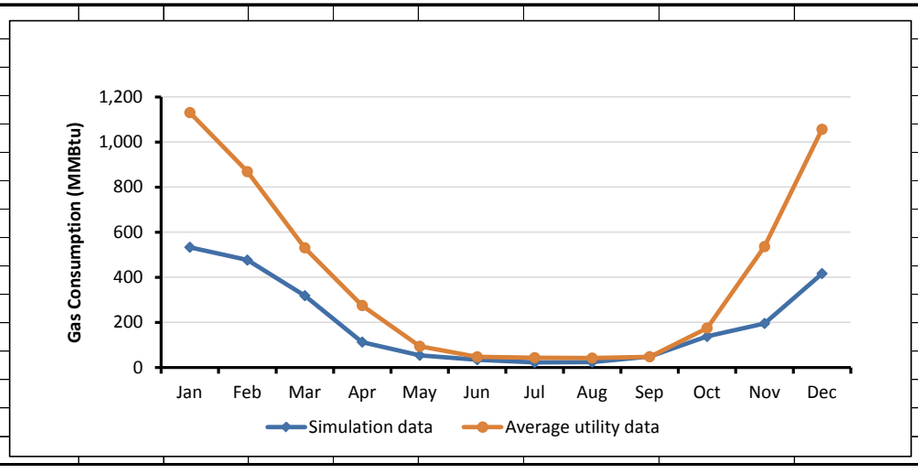
- Mean ERRmonth +/- 15% 100 * (M-S) / M
- Mean ERRyear +/- 10% ∑ ERRmonth / 12

* From FEMP M&V Guidelines v. 2.2 and ASHRAE Guideline 14 2002

- CV(RMSEyear) +/- 15% $((\sum [(M-S)^2 / 11])^{0.5})/avg\ M$
- NMBE +/- 5% ∑ (M-S) / (11 *avg M)
- Savings uncertainty < 50% at 68% confidence interval

eQuest BEPS data - used in columns B, E, and H									
EM1	ELECTR	ICITY							
KWH		1149638	1051791	1080982	1012413	1111829	1158237	1332801	1301052
MAX	KW	2093	2085	1875	2011	2211	2375	2655	2579
FM1 NAT	GAS								
THERM		5333	4765	3187	1129	541	348	225	238
		533	477	319	113	54	35	23	24

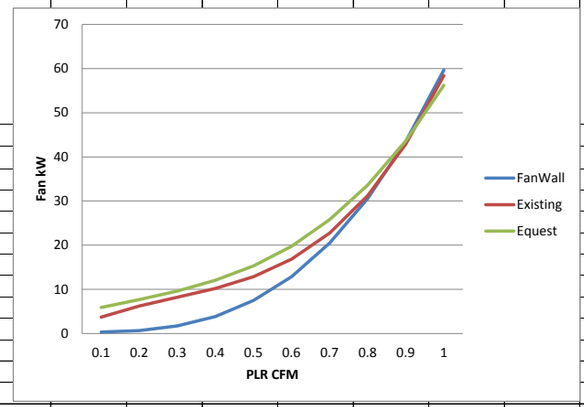

Electricity Demand (kW)
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Simulation data
Average utility data

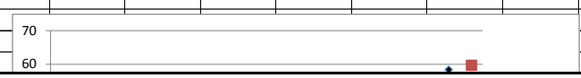

Gas Consumption (MMBtu)
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Simulation data
Average utility data

CVRMSE - Electrical consumption		CVRMSE - Electrical demand		CVRMSE - Gas consumption		CVRMSE - total energy consumption	
(util-sim)	(util-sim)^2	util-sim	(util-sim)^2	util-sim	(util-sim)^2	util-sim	(util-sim)^2
120755	14581713199	40	1607	597	356660	1009	1018536
80848	6536359418	96	9258	392	153730	668	446140
94321	8896392497	298	89043	212	45032	534	285187
89107	7940125048	57	3297	162	26277	466	217283
42817	1833324926	44	1950	40	1606	186	34657
41585	1729300269	116	13426	13	159	154	23867
-52576	2764256806	-168	28117	21	449	-158	25025
-14912	222367744	-119	14228	18	328	-33	1074
49001	2401098001	221	48678	-1	1	166	27684
314000	98596116151	383	146322	37	1393	1109	1229206
87320	7624813605	425	180472	341	116034	639	407777
105556	11142060104	274	74977	640	409158	1000	999623
957822	14933447979	1667	55579	2472	100984	5740	428733
	122202		236		318		655
cvrmse	10.16	cvrmse	10.07	cvrmse	78.67	cvrmse	14.52
nmbe	7.24	nmbe	6.47	nmbe	55.64	nmbe	11.57

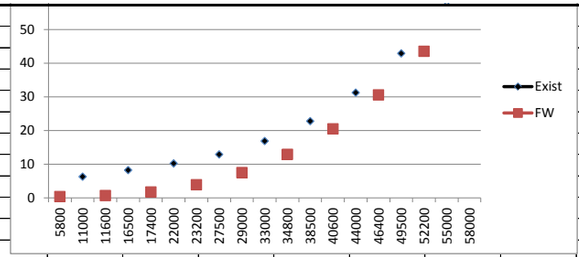
			40%	% total savings	50	get cvrmse for the total energy use					
			Savings uncerta	10							
1115837	1049945	1013652	1100369	13478544							
2371	2319	1885	1963	2655							
486	1377	1956	4167	23750							
49	138	196	417	2375							

	Fan curves																												
Equest no static reset fan curve coefficients	0.0704289	0.38533	-0.46086	1.0092					FanWall	Existing	Equest	No. of hours fan used	cfmExisting	cfm FW															
Fan Wall	0.0072367	-0.027712	0.03464	0.985781				0.1	0.3	3.7	6	0	5500	5800	0	0	0												
Existing fan	0	0.8126354	-1.64091	1.871334				0.2	0.7	6.3	8	0	11000	11600	0	0	0												
								0.3	1.7	8.2	10	1410	16500	17400	2411	11568	13553												
		fan wall	equest	existing fan				0.4	3.9	10.2	12	4629	22000	23200	17897	47208	55790												
PLR	CFM		kW			6.93	51470	0.5	7.5	12.9	15	2101	27500	29000	15706	27038	32212												
0.50	34800	12.03298	15	16.412		3.2		0.6	12.9	16.8	20	588	33000	34800	7580	9905	11636												
0.60	42340	21.66384	20	29.094		4.7		0.7	20.5	22.8	26	32	38500	40600	655	728	824												
0.71	49880	35.435	27	46.252		6.5		0.8	30.6	31.2	34	0	44000	46400	0	0	0												
0.79	55100	47.75146	32	59.68		7.9		0.9	43.5	42.9	44	0	49500	52200	0	0	0												
0.83	58000	55.70382	36	76.092		8.8		1	59.7	58.4	56	0	55000	58000	0	0	0												
															4390	9567	11310												
																5178	6921												
FanWallkW	PLR				SUMMARY OUTPUT										SUMMARY OUTPUT														
0.22	0.6	0.36	0.22																										
0.39	0.73	0.53	0.39		*Regression Statistics*										*Regression Statistics*														
0.64	0.86	0.74	0.64		Multiple R	0.99999997									Multiple R	0.99851													
0.86	0.95	0.90	0.86		R Square	0.99999993									R Square	0.997022													
1.00	1	1.00	1.00		Adjusted R	0.99999973									Adjusted R	0.853314													
					Standard E	0.00016727									Standard E	0.048582													
					Observatio	5									Observatio	10													
ExistFan_k	PLR																												
0.04	0.19	0.04	0.01		ANOVA										ANOVA														
0.14	0.29	0.08	0.02			*df*	*SS*	*MS*	*F*	*ignificance F*						*df*	*SS*	*MS*	*F*	*ignificance F*									
0.18	0.39	0.15	0.06		Regression	3	0.4175459	0.139182	4974669	0.00033					Regression	3	5.531547	1.843849	781.2091	3.64E-08									
0.27	0.49	0.24	0.11		Residual	1	2.798E-08	2.8E-08							Residual	7	0.016522	0.00236											
0.33	0.58	0.34	0.20		Total	4	0.417546								Total	10	5.548069												
0.34	0.68	0.46	0.31																										
0.60	0.82	0.68	0.56			*Coefficients*	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Upper 95.0%*			*Coefficients*	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Upper 95.0%*						
0.95	0.97	0.94	0.91		Intercept	0.00723668	0.0227324	0.318342	0.803795	-0.28161	0.296079	-0.28161	0.296079		Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A						
1.23	1.07	1.15	1.23		X Variable	-0.0277124	0.0881397	-0.31441	0.806068	-1.14763	1.092208	-1.14763	1.092208		X Variable	0.812635	0.227675	3.569286	0.009106	0.274271	1.351	0.274271	1.351						
1.56	1.13	1.27	1.43		X Variable	0.03464028	0.1119272	0.309489	0.808925	-1.38753	1.45681	-1.38753	1.45681		X Variable	-1.64091	0.61259	-2.67864	0.031601	-3.08945	-0.19236	-3.08945	-0.19236						
					X Variable	0.98578119	0.0466236	21.14338	0.030087	0.393372	1.578191	0.393372	1.578191		X Variable	1.871334	0.385114	4.859167	0.001837	0.960684	2.781984	0.960684	2.781984						
	6.93	51470																											
	0.07	5000										BHP	HP	eff	cfm	kW/cfm													
2.0	0.26	10000								Supply	existing		75	0.936	70000	0.000854													
7	0.59	15000									fanwall	74.67	76	0.95	58000	0.001029													
9	1.05	20000									fanwall	74.67	80	0.95	58000	0.001083													
13	1.63	25000								Return	existing		25	0.917	70000	0.000291													
16	2.35	30000									fanwall	74.67	27	0.936	58000	0.000371													
									Exist	FW																			
								5500	3.7																				
								5800		0.3																			
								11000	6.3																				
								11600		0.7																			
								16500	8.2																				
								17400		1.7																			
								22000	10.2																				

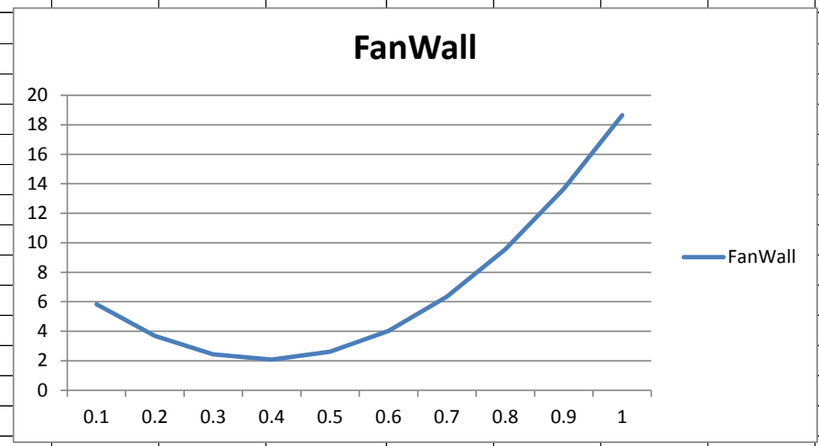




								23200		3.9																			
								27500	12.9																				
								29000		7.5																			
								33000	16.8																				
								34800		12.9																			
								38500	22.8																				
								40600		20.5																			
								44000	31.2																				
								46400		30.6																			
								49500	42.9																				
								52200		43.5																			
								55000	58.4																				
								58000		59.7																			



	Fan curves																	
Fan Wall	0.4758703	-1.869066	2.393196					FanWall										
							0.1	5.8										
							0.2	3.7										
		fan wall					0.3	2.4										
PLR	CFM	kW		1.5	58000		0.4	2.1										
0.50	34800	4.07316		0.54			0.5	2.6										
0.66	46400	9.6607		0.96			0.6	4.0										
0.83	58000	18.85888		1.5			0.7	6.3										
							0.8	9.6										
FanWallkW	PLR						0.9	13.7										
0.22	0.6	0.36	0.22				1	18.7										
0.51	0.8	0.64	0.51															
1.00	1	1.00	1.00															
						SUMMARY OUTPUT												
						Regression Statistics												
						Multiple R	1											
	262800					R Square	1											
	70080					Adjusted R Sq	65535											
	192720	19117.824				Standard Erro	0											
						Observations	3											
						ANOVA												
							df	*SS*	*MS*	*F*	*ignificance F*							
						Regression	2	0.313452	0.156726	#NUM!	#NUM!							
						Residual	0	0	65535									
						Total	2	0.313452										
							Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*				
						Intercept	0.4758703	0	65535	#NUM!	0.47587	0.47587	0.4758703	0.47587				
						X Variable 1	-1.8690665	0	65535	#NUM!	-1.86907	-1.86907	-1.8690665	-1.86907				
						X Variable 2	2.3931962	0	65535	#NUM!	2.393196	2.393196	2.3931962	2.393196				



Actual:

ALL Selected Account	Total Energy (kWh)	Weekday Energy (kWh)	Weekend Energy (kWh)	Load Factor	Power Factor	Reactive Demand	Total Energy (kWh)	Max.* Demand (kW)
6290220401 / 5050 KINGSLEY #B	1,224,923	880,066	344,856	0.6708	99.58%	227.2	1,224,923	628.8
6690373001 / 5050 KINGSLEY DR	717,659	530,132	187,526	0.5868	97.03%	112.0	717,659	421.1
7290220401 / 5050 KINGSLEY SERV C	1,487,506	1,080,184	407,323	0.7463	94.40%	374.4	1,487,506	686.4
9290220401 / 5050 KINGSLEY SERV D	1,024,576	751,926	272,650	0.4608	88.71%	405.6	1,024,576	765.6
Sum	**4,454,663**	**3,242,308**	**1,212,355**	**N.A.**	**N.A.**	**N.A.**	**4,454,663**	**N.A.**

* = Maximum

Normalize:

None

No normalization is selected.

Weather Adjustment:

None

Redraw

Selected Date Range Sunday, January 01, 2012 Through Monday, April 30, 2012

Actual:

ALL Selected Account	Total Energy (kWh)	Weekday Energy (kWh)	Weekend Energy (kWh)	Load Factor	Power Factor	Reactive Demand	Total Energy (kWh)	Max.* Demand (kW)
6290220401 / 5050 KINGSLEY #B	1,283,552	929,385	354,167	0.7824	99.34%	227.2	1,283,552	569.6
6690373001 / 5050 KINGSLEY DR	573,237	420,104	153,133	0.5749	96.23%	101.1	573,237	346.2
7290220401 / 5050 KINGSLEY SERV C	1,524,719	1,116,764	407,955	0.7822	88.16%	362.4	1,524,719	676.8
9290220401 / 5050 KINGSLEY SERV D	955,967	715,064	240,904	0.4520	94.01%	304.8	955,967	734.4
Sum	**4,337,475**	**3,181,316**	**1,156,159**	**N.A.**	**N.A.**	**N.A.**	**4,337,475**	**N.A.**

* = Maximum

Normalize:

None

No normalization is selected.

Weather Adjustment:

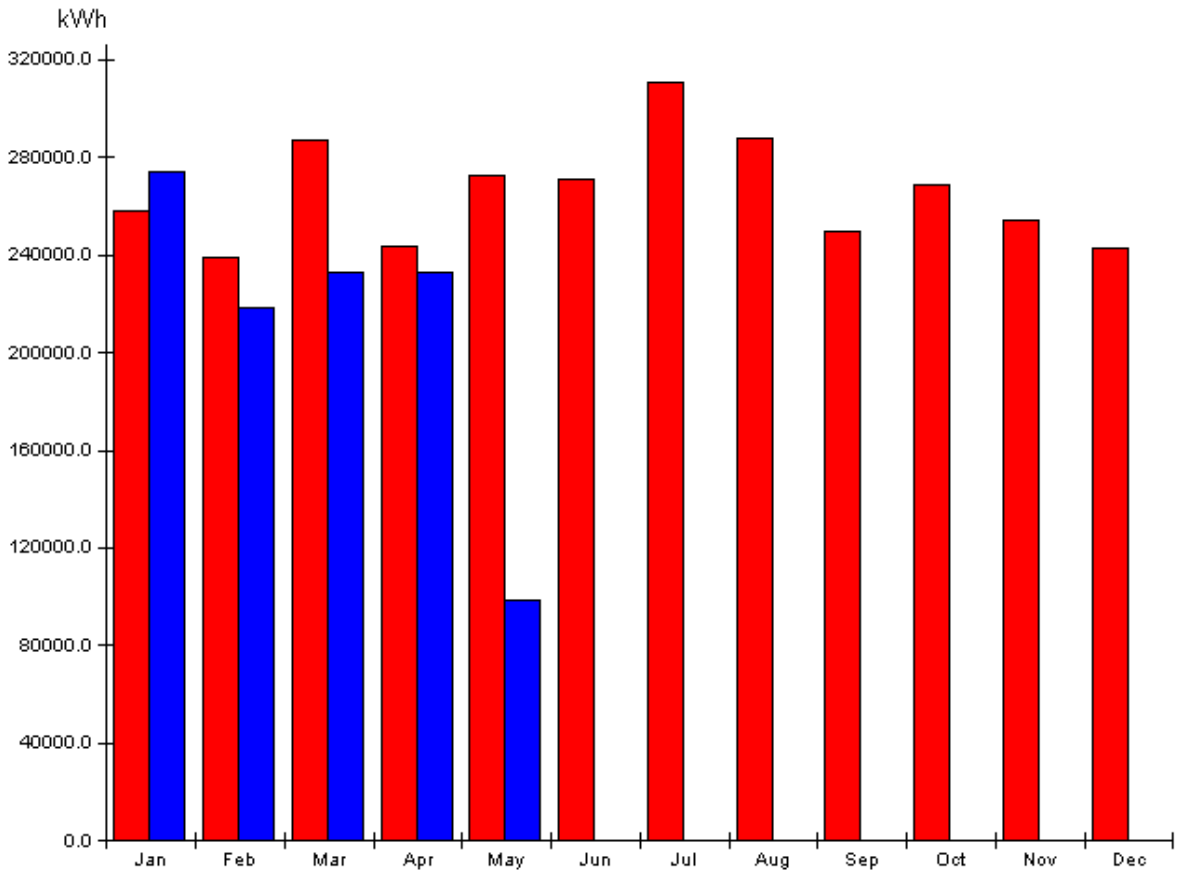
None

Redraw

Selected Date Range Tuesday, January 01, 2013 Through Tuesday, April 30, 2013

Monthly Totals

Account: 9290220401 5050 KINGSLEY SERV D

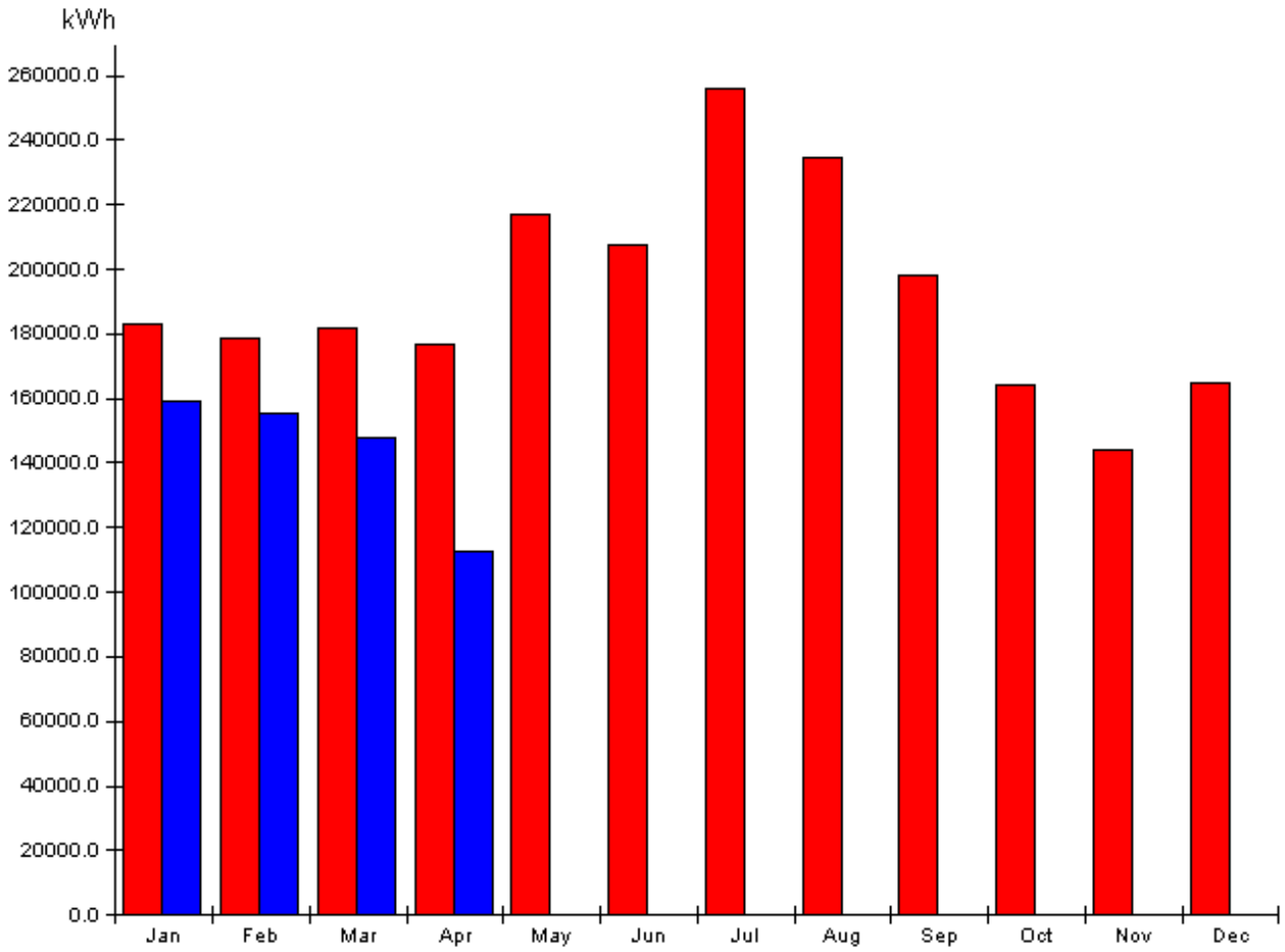


- January 2012
- January 2013
- February 2012
- February 2013
- March 2012
- March 2013
- April 2012
- April 2013
- May 2012
- May 2013
- June 2012
- July 2012
- August 2012
- September 2012
- October 2012
- November 2012
- December 2012

Available dates Saturday, January 01, 2005 Through Sunday, May 12, 2013

Monthly Totals

Account: 6690373001 5050 KINGSLEY DR

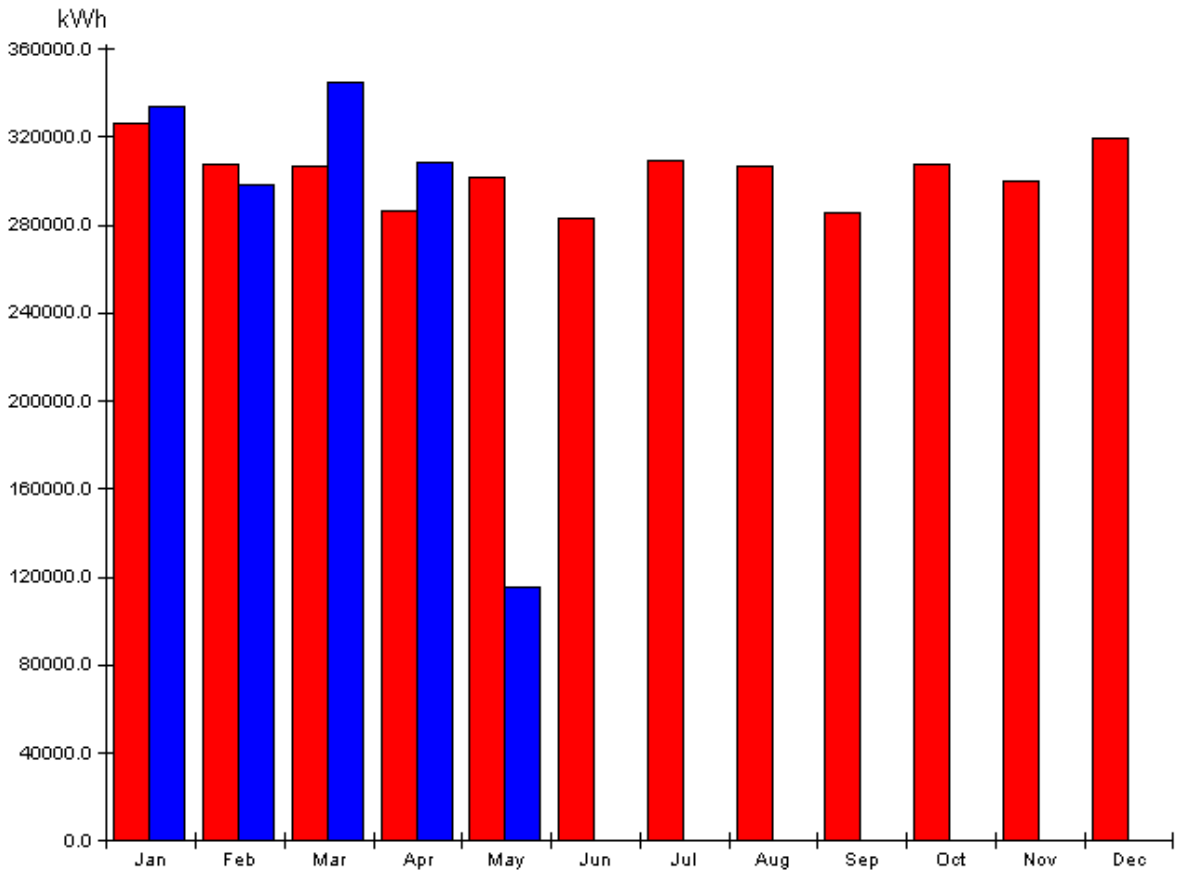


- January 2012
- January 2013
- February 2012
- February 2013
- March 2012
- March 2013
- April 2012
- April 2013
- May 2012
- June 2012
- July 2012
- August 2012
- September 2012
- October 2012
- November 2012
- December 2012

Available dates Saturday, October 09, 2010 Through Sunday, April 21, 2013

Monthly Totals

Account: 6290220401 5050 KINGSLEY #B

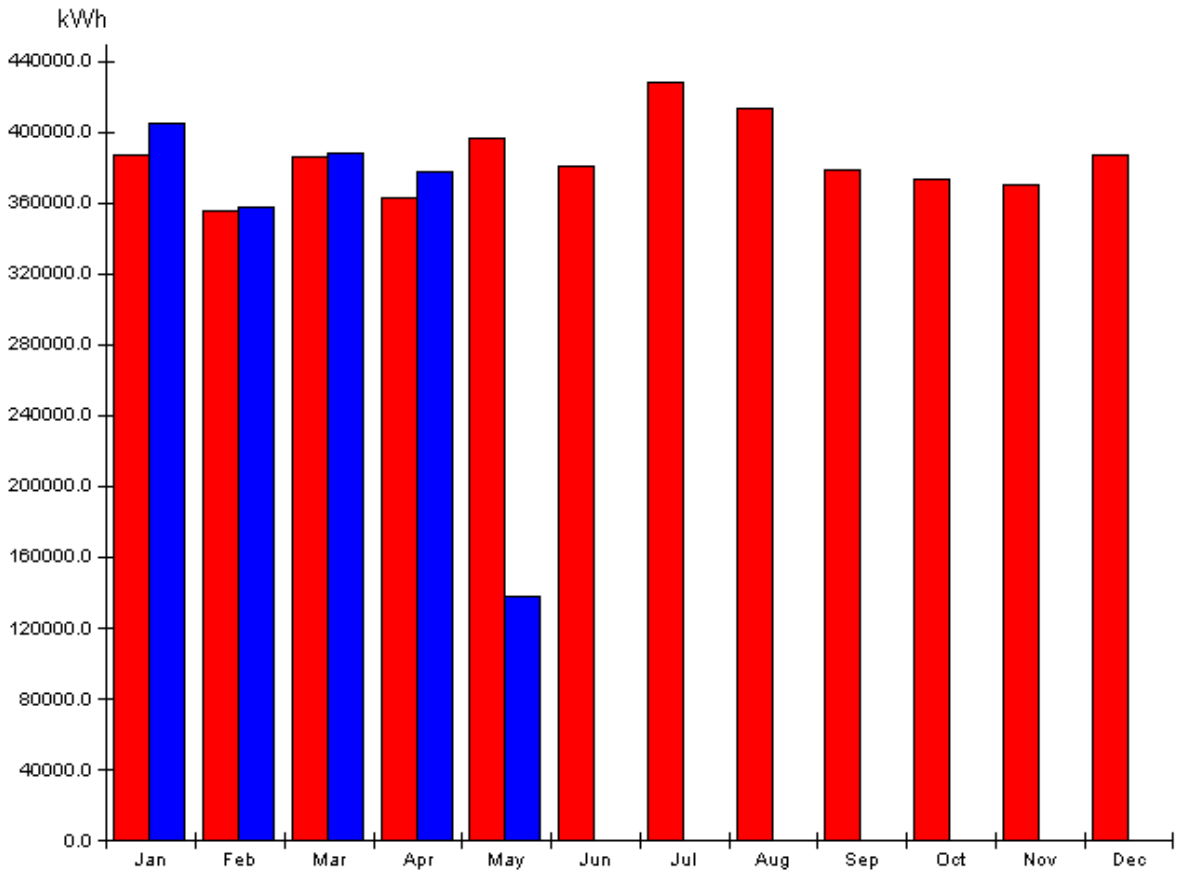


- January 2012
- January 2013
- February 2012
- February 2013
- March 2012
- March 2013
- April 2012
- April 2013
- May 2012
- May 2013
- June 2012
- July 2012
- August 2012
- September 2012
- October 2012
- November 2012
- December 2012

Available dates Saturday, January 01, 2005 Through Sunday, May 12, 2013

Monthly Totals

Account: 7290220401 5050 KINGSLEY SERV C



- January 2012
- January 2013
- February 2012
- February 2013
- March 2012
- March 2013
- April 2012
- April 2013
- May 2012
- May 2013
- June 2012
- July 2012
- August 2012
- September 2012
- October 2012
- November 2012
- December 2012

Available dates Saturday, January 01, 2005 Through Saturday, May 11, 2013

Fifth Third Madisonville Operations Center, Energy Analysis								
	AHU 1	**AHU 2**	**Total**					
Existing Capacity	87.00%	72.00%						
New Capacity	54.70%	48.30%						
Baseline Amperage	41	27	68					
New Amperage	19	15.3	34.3					
Amperage Reduction (per readings 1.14.13 and JM Previous AHU readings) [amps]	22	11.7	33.7					
Voltage	460	460						
Phase	3	3						
PF (Fanwall Fans)	0.8	0.8						
Kw existing	26.1	17.2	43.3					
Kw new	12.1	9.8	21.9					
Runtime [hrs]	8760	8760						
kWh existing	228,927	150,757	379,683					
kWh new	106,088	85,429	191,517					
kwH Savings [kwH]	122,839	65,328	188,167					
kwH Savings [$]	12,222	6,500	**18,723**					
Amperage draws were taken before and after the project was completed (during similar conditions). These measurements were taken during the fall (low heating/cooling load). The AHU's were at lower airflow than would be witnessed during the summer or winter months at times of high heating or cooling load. As the energy reduction will be greater on a percentage basis at times of higher airflow when compared to low, the energy savings demonstrated here are considered to be conservative. These amperage measurements were converted to kWh using the electrical characteristics (3 phase, 460 V power feed, .80 PF) and the runtime characteristics detailed in this application.								
Note: Return fans were also converted to 9x3HP fan wall components (27HP) and equipped with new VFDs; however, due to lack of measurements being taken for existing RFs as compared to new, these are not being submitted for savings.								