

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

Case No.: 17-0787-EL-EEC

Mercantile Customer: Penta Career Center

Electric Utility: The Toledo Edison Company

Program Title or Energy Efficiency Savings Projects for 2015

Description:

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 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 for a period of up to 12 months will also qualify for the 60-day automatic approval. However, all applications requesting an exemption from the EEDR rider for longer than 12 months must provide additional information, as described within the Historical Mercantile Annual Report Template, that demonstrates additional energy savings and the continuance of the Customer's energy efficiency program. This information must be provided to the Commission at least 61 days prior to the termination of the initial 12 month exemption period to prevent interruptions in the exemption period.

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 altered or 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 <u>ee-pdr@puc.state.oh.us</u>.

# **Section 1: Mercantile Customer Information**

Name:	Penta	Career Center
Princip	al ado	dress: 9301 Buck Road, Perrysburg, OH 43551
Addres	ss of fa	acility for which this energy efficiency program applies: (Same as above)
Name a	and te	elephone number for responses to questions: Kevin Baker (419) 661-6348
Elec	ctricity	y 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. (Please attach 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: The Toledo Edison Company
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)). If Checked, Please see Exhibit 1 and Exhibit 2
		Installation of new equipment to replace failed equipment which has no useful life remaining. 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)	Ene	rgy 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: 1,393,822 kWh
	2)	If you checked the box indicating that the customer installed new equipment to replace failed equipment which had no useful life remaining, then calculate the annual savings [(kWh used by new standard equipment) – (kWh used by the optional 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. **Please see Exhibit 1 if applicable** 

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 standard new equipment) – (kWh used by optional 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. <b>Please see Exhibit 1 if applicable</b>
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.
	Annual savings:kWh

# Section 4: Demand Reduction/Demand Response Programs

A)	The customer's program involves (check the one that applies):
	This project does not include peak demand reduction savings.
	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 tarif 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.
В)	On what date did the customer initiate its demand reduction program?
	<u>8/15/</u> 15
C)	What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):
	213 kW

# Section 5: Request for Cash Rebate Reasonable Arrangement, Exemption from Rider, or Commitment Payment

Under this section, check all boxes that apply and fill in all corresponding blanks.

A)	The customer is applying for:
	An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.
	Commitment payment
B)	The value of the option that the customer is seeking is:
	A cash rebate reasonable arrangement.
	A cash rebate of \$52,199. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)
	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.)
	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 12 month period, the customer will need to complete, and file within this application, the Historical Mercantile Annual Report

Template to verify the projects energy savings are persistent.
A commitment payment valued at no more than \$ (Attach documentation and calculations showing how this payment amount was determined.)
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: <b>See Exhibit 3</b> (Skip to Subsection 2.)
Subsection 1: TRC Test Used (please fill in all blanks).
The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.
The electric utility's avoided supply costs were
Our program costs were
The incremental measure costs were

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

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

Our avoided supply costs were **See Exhibit 3** 

The utility's program costs were **See Exhibit 3** 

The utility's incentive costs/rebate costs were **See Exhibit 3** 

# **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.
- 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.



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Case No.: 17-0787-EL-EEC

State of Ohio:

Kevin Baker, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Penta Career Center

[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.

Signature of Affiant & Title

 Customer Legal Entity Name: Penta County Vocational School District

Exhibit 1

Site Address: Penta Career Center Principal Address: 9301 Buck Road

equipment that you rejected in favor of Please describe the less efficient new the more efficient new equipment. ĕ ĕ Assuming T8 lamps replaced at 14,400 hours, operated 3237 his/yes/ of stock replaced each year (full turnover after 6 years). Assuming exterior HID lamps replaced at 24,000 hours, operated 8838 ins/year, then approximately 16% of stock replaced each year (full turnover after 6,3 years). What date would you have replaced your equipment if you had not replaced it early? Also, please explain briefly how you determined this future replacement date. Likely between 5-10 years. Normal attrition and modernization requirements. Description of methodologies, protocols and practices used in measuring and verifying project results See attached project analysis documentation: Penta Energy Calcs - HVAC.pdf Please see attached Lighting Calculator. Lighting Retrofit - Replace high bay metal halide lamps, HPS street/parking light fixtures, fluorescent 18/T5 tube lamps and other fluorescent strip lights, HID wallpack lights, and select CFL bulbs with LED equivalent lamps, and tie all lighting into automation system. Replace existing 1,000 Watt grow lamps with 750 Watt LED grow lamps for the greenfluores. Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment: Install occupancy sensors and space CO2 sensors in all areas served by fan powered VAV boxes and unit ventilators. The existing Automated Logic HVAC control system's programming will be updated. See attached Optimal LED cut sheets for model information. Project Name **HVAC Controls Improvements** Lighting Retrofit / Control Project No. -7

Customer Legal Entity Name: Penta County Vocational School District

Site Address: Penta Career Center

Principal Address: 9301 Buck Road

			Prescriptive Rebate Amount (G)	\$62,614	\$6,985			
			Utility Peak Demand Reduction Contribution, KW (F)	213				
			KWh Saved/Year (E) eligible for incentive	1,254,129	139,693			
			KWh Saved/Year (D) counting towards utility compliance	1,254,129	139,693			
Weather Adjusted Usage with Energy Efficiency Addbacks, kwh (c)	1,393,822 530,798 3,816,900		50% of Project Cost \$	\$342,526	\$43,130			
Weather Adjusted Usage, kwh (B)	3,816,900	3,816,900	Project Cost \$	\$685,051	\$86,260			
Unadjusted Usage, kwh (A)	3,816,900	3,816,900	In-Service Date	08/15/2015	08/15/2015			
	2014	Average	Project Name	Lighting Retrofit / Control	HVAC Controls Improvements			
			Project Number	-	7			

Eligible Rebate Amount (H) \$ Note 2

\$46,961

\$5,239

\$52,199

\$69,599

213

1,393,822

1,393,822

\$771,311

Total

Docket No. 17-0787
Site: 9301 Buck Road

Notes
(1) Customer's usage is adjusted to account for the effects of the energy efficiency programs included in this application. When applicable, such adjustments are prorated to the in-service date to account for partial year savings.

(2) The eligible rebate amount is based upon 75% of the rebates offered by the FirstEnergy Commercial and Industrial Energy Efficiency programs, not to exceed the lesser of 50% of the project cost or \$250,000 per project.

Page 2 of 4







Exhibit 3

UCT = Utility Avoided Costs / Utility Costs

L	10.1	00.
UCT (F)	-	ω
Fotal Utility Cost \$ (E)	61,527	8,661
•	↔	\$
Administrator Variable Fee \$ (D)	\$12,541	\$1,397
Cash Rebate \$	46,961	5,239
Ü	↔	↔
Itility Cost \$ (B)	2,025	2,025
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tility Avoided Cost \$ (A)	622,362	69,323
<b>D</b>	↔	↔
Project	_	2

70,187 \$13,938 52,199 4,050 691,684 Total

# Notes

- (A) Represents NPV of avoided energy and capacaity costs over a 10 year life multiplied by the annual project savings.
- (B) Represents the utility's costs incurred for self-directed mercantile applications for applications filed and applications in progress. Includes incremental costs of legal fees, fixed administrative expenses, etc.

  - (C) This is the amount of the Rebate Payment paid to the customer for this (D) Based on approximate Administrator's variable compensation for purposes of calculating the UCT, actual compensation may be less. (E) = (B) + (C) + (D) (F) = (A) / (E)

# Penta County Vocational School District ~ Penta Career Center Docket No. 17-0787 Site: 9301 Buck Road

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	Testing		Yach by Area tigor (in prime rent)	Acres Second	See. Secret	Bee- Secen	for-Secon	Sce-Secon.	Scer Second	See Secret	Discrete Secretary School	Education Secondary School	See-Secon.	Ottom Secretary	Oreco Oper	Ortoor-Oher	OAKOC: Ober	Parlington	State and							ı
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	Gateers Name Building Addiess en-Construction	SACHERE	Marker or Danier Maren Bing Conserved	Menter	Here	Hero	hteror	stain	16030	160,034	hteror	stoio	16030	Many	Draver	Drawer	100,000	100,000	projec	hteior	l	l	l	l		ı
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ction Lie				Multiple Hatha to Gazonomic Offices Steps	Multiple (Halling In) O sociomic, Offices, Sheps)	Muhtglet Hallways, Glacorcons, Offices, Depti	Multiple (Halling Is, O assecting, O'Ross, Dioph	Multiple (Halina yo, Classic cero, Offices, Steps)	Multiple Halling Int, O accepted, Offices, Steppi	Makigle Hallward, O accepting, Offices, Degal	Multiple (Halling In) O acception, Offices, Sheph	Huitigle (Halling yo, Gazze cero, Officio, Steps)	Multiple (Holling by, Classicons, O'Ross, Shept)	e l	Dire	titl	Dift.	treat	Drawn	Greenh	l	l	l	l		ı
Coms frue	25			н	-	-			Н	Н	_			1	L	L	L	L	L	L	L	L	L	L	L	ŀ
Retrofit and New Construction Lighting Worls heet	FirstEnergy			Pertain	Petalis	Petal	Petatió	Fotatió	Petrior	2/11/04	2/11/10/	Fotal/S	Messy	Person	Petalis	Petatió	Petaton	Petaton	2/11/07	Petrical	l	l	l	l		ı
8	First		Projection (dip does rest)	Section 2	the sets	Men Di	۰	н	Me to St.	Ment St	Met ny fit.	н		Mente	Service Str.	Men fit	Me to St.	Ment St	Ment St	Met ny fit.	Ī	Ī	Ī	Ī	Γ	Ī
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Energy Calculations - HVAC Automation/Controls

Summary by unit:

Samuely by anne								
		Previous Annual	Annual	Annual Flor	Annual Floatric Carrings	Annual Natural	Total Annual	Total Annual
Equipment	ECM	Electric Usage	Usage	Allinai Ele	cuit saviiigs	Gas Savings	Energy Savings	<b>Energy Cost</b>
		kWh	peak kW	kWh	peak kW	therms	MMBtu	Savings*
Unit Ventilators	HVAC.1	303,266	67.2	91,961	1	3,037	617	\$ 9,190
FPB Fans	HVAC.2	698'06	28.7	26,579	-	٠	91	\$ 2,526
VAV AHUs	HVAC.3	186,283	103.3	21,153		832	155	\$ 2,134
	TOTAL:	579,918	199.3	139,693		3,869	864	\$ 13,849

\*Cost savings based on past year gas and electric rates (see last page)

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FCOX. HVMCI. Add cocupancy sensors to set zone into unoccupied mode during scheduled occupancy times. Assume 30% unitime reduction during schoolysen. Add CO2 sensors to reduce min CA ventilation (assume by 67%).

Unit Ventilators I have increally scheduled occupancy for 155 days during schoolysen. Saming schoolysen. Set flow is total for 111) unit ventilation. Preventilators in Preventilators and the school for 111 unit ventilation. Assume above the school for 111 unit ventilation. Assume above the school for 111 unit ventilation. Assume above the school for 111 unit ventilation. Assume above the school for 111 unit ventilation. Assume above the school for 111 unit ventilation.

| Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply Return | Part Motor information Supply S

	Pre	Previous	z	New	Sav	Savings
	Unit	\$	Unit	\$	Unit	Ş
Fan (KWħ)	211,356	211,356 \$ 20,085		149,192 \$ 14,177	62,164	62,164 \$ 5,907
Gas (therm)	3,165	3,165 \$ 470	128	\$ 19	\$ 200'8	\$ 451
Cooling (kWh)	91,910	91,910 \$ 8,734	62,112	62,112 \$ 5,902	29,797	29,797 \$ 2,832
Total (MMBtu)	1351.3	1351.3 \$ 29,289		733.8 \$ 20,099		617.5 \$ 9,190

91,961 \$ 8,739

Total kWh saved:

Previous Total kWh: 303,266

			kWh	7,309	38,936	44,235	1,429								91,910	62,112		kWh	4,256	25,631	31,217	1,009								62,112		kWh											
			Tons	261.82	202.37	161.55	29.9											Tons	216.00	188.72	161.51	5.62										Tons	202.35	181.90	161.49	5.62							
			Mbtu	108,287	707,935	931,260	37,607								1,785,088	1,212,809		Mbtu	63'029	466,012	657,191	26,546								1,212,809		Mbtu									-		
		oling Coil	Btu/hr	3,141,868	2,428,402	1,938,645	67,406								Previous: 1	New: 1	Cooling Coil	Btu/hr	2,591,950	2,264,605	1,938,148	67,406									Cooling Coil	Btu/hr	2,428,190	2,182,806	1,937,923	67,406							
		သ	h (btu/lb) B	23.23 3,	Н	Н	23.09	21.68	21.58	21.67	21.49	21.38	21.31	21.27	- b		သ	h (btu/lb) B	23.03 2,	Н	-	23.09	21.68	21.58	21.67	21.79	21.90	21.82	21.76		8	h (btu/lb) B	Н	Н	-	23.09	21.68	21.58	21.67	21.79	21.90	21.97	22.00
			DP (F) h (I	54.5	Н	Н	50.9	45.1 2	43.3 2	42.2	39.931 2	H	Н	33.5				DP (F) h (I	53.9	Н	-	H	$\dashv$	Н	$\dashv$	Н	-	Н	36.0 2			DP (F) h (I	Н	Н	_	Н	$\dashv$	Н	$\dashv$	Н	-	+	37.2
			DB (F)	55.0	Н	58.0	59.5	0.19	62.5	H	65.5	Н	68.5	70.0				DB (F)	55.0	H	-	Н	$\dashv$	Н	$\dashv$	Н	0.79	68.5	70.0			DB (F)	55.0	56.5	58.0	Н	$\dashv$	Н	$\dashv$	Н	0.79	68.5	70.0
			therms							ŀ	1,276	1,112	869	80	3,165	128		therms										109	19	128		therms											
			Mbtu							ŀ	121,180	105,644	66,287	7,595	300,707	12,185		Mbtu										10,398	1,787	12,185		Mbtu											
		at	Btu/hr							ŀ	480,816	961,632	1,442,448	1,923,264	Previous:	New:	at	Btu/hr										320,544	641,088		at	Btu/hr									-		
		Prehe	h (btu/lb)	27.93	26.84	25.95	23.19	21.68	21.58	21.67	21.49	Н	Н	21.27	_		Prehe	h (btu/lb)	26.91	26.25	25.66	23.19	21.68	21.58	21.67	21.79	21.90	21.82	21.76		Prehe	h (btu/lb)	26.40	25.96	25.51	23.19	21.68	21.58	21.67	21.79	21.90	21.97	22.00
			DP(F) h	55.3	Н	Н		45.1	43.3	42.2	H		Н	33.5				DP(F) h	H	H	-	H	$\dashv$	Н	$\dashv$	Н	_	Н	36.0			DP(F) h	H	Н	-	Н	$\dashv$	Н	$\dashv$	Н	-	+	37.2
			DB (F)	73.0	71.5	70.0	0.09	0.19	62.5	64.0	65.5	0.79	68.5	70.0				DB (F)	71.0	70.5	70.0	0.09	61.0	62.5	64.0	65.5	0.79	68.5	0.07			DB (F)	70.0	70.0	70.0	0.09	61.0	62.5	64.0	65.5	0.79	68.5	70.0
			h (btu/lb)	27.93	26.84	25.95	23.19	21.68	21.58	21.67	20.77	19.94	19.15	18.39				h (btu/lb)	26.91	26.25	25.66	23.19	21.68	21.58	21.67	21.79	21.90	21.34	20.80			h (btu/lb)	26.40	25.96	25.51	23.19	21.68	21.58	21.67	21.79	21.90	21.97	22.00
			WB(F)	61.8	60.3	59.0	54.7	52.2	52.0	52.2	9.09	49.1	47.7	46.2				WB(F)	60.4	59.4	58.6	54.7	52.2	52.0	52.2	52.4	52.6	51.6	20.7			WB (F)	9.65	59.0	58.3	54.7	52.2	52.0	52.2	52.4	52.6	52.7	52.8
duction:		lixed Air	HR (lbs/lb)	0.00952	0.00886	0.00838	0.00808	0.00647	0.00604	0.00579	0.00530	0.00487	0.00448	0.00411			Mixed Air	HR (lbs/lb)	0.00903	0.00854	0.00811	0.00808	0.00647	0.00604	0.00579	0.00557	0.00533	0.00494	0.00454		Mixed Air	HR (lbs/lb)	0.00879	0.00838	0.00798	0.00808	0.00647	0.00604	0.00579	0.00557	0.00533	0.00507	0.00476
Peak kW reduction:		2	DB (F) HF	73.0 0	Н	Н	0'09	61.0 0	62.5 0	H	62.5 0	61.0 0	Н	58.0			2	DB (F) HF	H	Н	1	Н	+	Н	$\dashv$	Н	-	Н	0 0'99		2	DB (F) HR	Н	Н	-	Н	$\dashv$	Н	$\dashv$	Н	-	+	70.0
			OA%	15.0%			100.0%	45.0%	25.0%	15.0%	15.0%			15.0%				OA%											2.0%			0A%									2.0%		0.0%
		lir.	HR (lbs/lb)	0.00879	0.00838	0.00798	0.00758	0.00717	0.00677	0.00637	0.00597	0.00556	0.00516	0.00476			i.	HR (lbs/lb)	0.00879	0.00838	0.00798	0.00758	0.00717	0.00677	0.00637	0.00597	0.00556	0.00516	0.00476			HR (lbs/lb)	0.00879	0.00838	0.00798	0.00758	0.00717	0.00677	0.00637	0.00597	0.00556	0.00516	0.00476
		Return A	RH (%) HR	55.0% 0	52.5% 0	Н	47.5% 0	45.0% 0	42.5% 0	40.0%	37.5% 0	Н	Н	30.0%			Return Air	RH (%) HF	55.0% 0	Н	-	Н	$\dashv$	Н	$\dashv$	Н	_	Н	30.0%		Return Air	RH (%) HR	Н	Н	_	Н	$\dashv$	Н	$\dashv$	Н	$\dashv$	+	30.0% 0
		Fan Energy	(kwh) F	2,316			37,494	28,543	35,781	27,674	16,937	7,383	Ш	_	211,356	149,192	Fan Energy	(kWh)	1,635	Ш			_	Ш			_	2,180	187	149,192	Fan Energy	(kwh)											
			Return (	00.00	00.0	0.00	00.0	00.0	00.0	0.00	0.00	00.00	00.0	00.0	2	1		Return (	0.00	00.00	00.0	0.00	00.0	0.00	00.0	0.00	0.00	0.00	00.00	-		Return (	00.0	0.00	00.00	0.00	00.0	0.00	00.0	0.00	0.00	00.00	00.0
		Fan Power (kW)	Supply Re	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	Fan Power (kW)	Supply Re	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	Fan Power (kW)	Supply Re	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20
			Return Su	%0.0	%0'0	%0.0	%0'0	%0.0	%0'0	%0.0	%0.0	%0.0	%0.0	%0.0	ak kW:	ak kW:		Return Su	%0.0	Ш	%0.0	%0.0	%0.0	%0.0	%0.0	%0.0	%0:0	%0.0	%0.0	Peak kW:		Return Su	%0'0	%0.0	%0.0	%0.0		%0.0	%0.0	%0.0	%0:0	%0.0	%0.0
		Fan % Power	Supply R	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Previous: Peak kW:	New: Peak kW	Fan % Power	Supply R	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Pe	Fan % Power	Supply R	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
			OA cfm S	22,260		Ш	22,260	22,260	22,260	22,260	22,260		Ц	22,260	Pre			OA cfm S	7,420					Ш		Ш		7,420	7,420			OA cfm S											
		litions	SAcfm 0,	148,400	148,400		148,400	148,400	148,400	148,400	148,400	148,400		148,400			litions	SAcfm 0	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400		itions	SAcfm 0	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400	148,400
		Operating Conditions	%Capacity SA	100.0%				100.0%	100.0%					100.0% 14			Operating Conditions	%Capacity SA					- 1						100.0%		Operating Conditions	%Capacity SA					- 1					- 1	100.0% 14
2		do	Occ hrs %Ca		292		558		532			110	46 1	4	3,145		do	Occ hrs %Ca		Ш	339		300					32 1	3	2,220	do	cchrs %Ca		-									- 1
New):				0.01367	0.01154	0.01062	0.00808	0.00561	0.00387	0.00255	0.00156	9600000	0.00060	0.00040				_	0.01367	0.01154	0.01062	0.00808	0.00561	0.00387	0.00255	0.00156	960000	0.00060	0.00040			HR (lbs/lb) Unocchrs	0.01367	0.01154	0.01062	0.00808	0.00561	0.00387	0.00255	0.00156	0.00096	0.00060	0.00040
Unocc. VAV Box Min. Setback (New):		34	(l/s) HR (lbs/lb)			Н		H		L		H	H	-				(lps/lp) HR (lps/lp)		H	-		$\dashv$	Н	+	Н		Н		Occupied Hours:				Н		Н	+	Н	+	-	-	+	_
. VAV BOX M		P (psia): 14.34	) h (btu/lb)				23.19	18.08	13.77	9.93	6.47		H	-1.98				) h (btu/lb)			+		-		+		_		-1.98			) h (btu/lb)					+		+		3.42	+	~
ONOCC		P (p.	: DP (F)					41.4	32.0		13.0	3.4		4 -12.9				DP (F)		Ш	583								-12.9			(F)								13.0	3.4		-12.9
Coponent	- 10 deg. F1	Air	%hours	1.1%			4 17.7%	3 13.5%	3 16.9%	7 13.1%	8.0%	3.5%		.1 0.1%	0		۸ir	%hours	6 1.1%									8 1.5%	.1 0.1%	0	Air	%hours									6 3.5%		.1 0.1%
	Toledo Express TMY3 - 10 deg. F BIN!	Outside Air	) hours	96	812	1,338	1,554	1,183	1,483	1,147	702	306		_	8,760		Outside Air	) hours	96	812	1,338	1,554	1,183	1,483	1,147	702	306	128	11	8,760	Outside Air	) hours	96	812	1,338	1,554	1,183	1,483	1,147	702	306	128	11
	Toledo E.		DB (F)	06	80	70	09	29	40	30	20	10	0	-10	ion			DB (F)	8	80	02	09	S	40	8	50	10	0	-10			DB (F)	06	80	70	09	S	40	30	50	10	0	-10
Return VFD Offset:															Model - Previous Operation	Model - New Opeartion																											

Unit Analysis	ECM	HVAC.2	Add occup	HVAC.2 Add occupancy sensors to set zone into unoccupied mode during scheduled occupied times. Assume 30% run reduction during school year	node during sch	eduled occupied time	es. Assume 30% run reductio	n during school	year.					
	Onit		FPB Fans	Note: normally scheduled occupancy is 17 hours/day for 185 days during school year	7 hours/day for 3	185 days during school	olyear.						Savings Analysi	Analysi
				*Horsepower is total for (123) fan-powered boxes	ed boxes							Previous	L	
Fan Motor Information	Supply	Return				Operating Parameters	sters					Unit	s	Unit
*Nameplate HP:	34		dų	Annual Hours (Previous):	3,145 hrs/yr	w/s	Min OA % (Previous):	Fixed	% %0		Fan	002 6 9 005 00	0 0 0 0	002 59
Motor Efficiency:	75.0%		38	Annual Hours (New):	2,220 hrs/yr	N/s	Occ Min OA % (New):	Fixed	% %0		(kWh)	ל במכימב	997,0	20,750
Design Airflow:	0		сţш	Unocc. Hours % (New):	% %0		Unocc. Min OA % (New):	25% %			Gas	٠	_	
Design Fan SP:			in. WC	Control Type (Previous): Constant Speed	Constant Spee	3	SA Setpoint (Previous):	55.0		_	therm)	,		
Fan Efficiency:			28	Control Type (New):	Constant Speed	3	SA Setpoint (New):	55.0			Cooling	٠		
Calculated BHP:			dų	VFD? (Previous):	No		Space/RA Temperature:	55.0 deg.	F		(kWh)			
Method:	Motor	Motor		VFD? (New):	No	Spac	Space/RA Humidity (Low, High):	30%	55% % RH		Total	2003 ¢ 0 500		7 7 7 7
Calc. Full Load Power:	28.73		0.00 kW	Unocc. Static Reset (New):	No 3		Cooling Cutout Temp:	50.0 deg. F	. F	0	MMBtu)	5000		7.7.7
				Static Setback (New):	% %0		Heating Source:	HW from HE Boiler	3oiler 3					
Motor Load Factor:	85%	2.5	Power-flow Dpo nerk	Unocc. Speed Reset (New):	No		Cooling Source:	CHW Plant	nt 2	Previous Total kWh:	tal kWh:	90,369		Tota
VFD Efficiency:		,	Power-	Speed Setback (New):	% %0									

																۴															ř	П	П	П		
															_	Mbtu													- 2		Mbtu					
															Cooling Coi	a) Btu/hr				•	•	•	•	•	•			Previous:	New:	Cooling Coil	o) Btu/hr				•	
																h (btu/lb)	18.79	18.53	18.28	-	17.77	+	17.26	_	-	+	16.24				h (btu/lb)	Н	18.53	Н	-	17.77
																) DP (F)	39.2	38.0	Н	-	Н	+	31.1	-	$\dashv$	+	24.0				) DP (F)	Н	Н	Н	$\dashv$	34.1
																IS DB (F)	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0				IS DB(F)	55.0	55.0	55.0	55.0	55.0
																therms								İ					ľ		ı therms					
																ır Mbtu								İ				- :51	New:		ır Mbtu					
															Preheat	/lb) Btu/hr	. 6		. 8	_						6	4	Previous:	Ž	Preheat	/lb) Btu/hr	6	3			
																F) h (btu/lb)	2 18.79	0 18.53	Н	-	Н	+	17.26	-	$\dashv$	+	0 16.24				F) h (btu/lb)	Н	0 18.53	Н	-	17.77
																(F) DP (F)	.0 39.2	0.88.0	Н	-	Н	+	_		$\dashv$	+	.0 24.0				(F) DP (F)	Н	Н	Н	$\dashv$	.0 34.1
			2,526	Ι.			7	2.526	2		,526					(lp) DB(F)	79 55.0	18.53 55.0	Н	-	Н	+	17.26 55.0		+	+	24 55.0				(l) DB(F)	Н	Н	Н	+	77 55.0
	Savings		26,579 \$ 2	٠	٠.	\$		v	·		26,579 \$ 2,526					(F) h (btu/lb)	0 18.79		Н	+	Н	+	_	H	+	+	9 16.24				(F) h (btu/lb)	Н	Н	H	$\dashv$	77.77
		Unit					$\frac{1}{1}$	62 90.7	4					ou:	Air	(lb) WB (F)	15 47.0	91 46.5	Н	-	Н	+	_	_	-	+	30 41.9			Air	(lb) WB (F)	Н	91 46.5	Н	-	21 45.0
sis Result	New	s.	30 \$ 6,062	v		5		2 6 062	٠		Total kWh saved:			Peak kW reduction:	Mixed Ai	HR (lbs/lb)	0.00515	0.00491	Н	+	Н	$\dashv$	-	Н	$\dashv$	+	0.00280			Mixed Ai	HR (lbs/lb)	Н	Н	Н	$\dashv$	0.00421
Savings Analysis Result		Unit	88 63,790			_	4	7 7 7 7	$\dashv$		7			Pea		DB (F)	0.0% 55.0	0.0% 55.0									0.0% 55.0				DB (F)	Ш				0.0% 55.0
Sa	Previous	s.	985'8 \$ 6	v		5		\$ 8588	- 1		66					(b)															(b) OA %					
	•	Unit	90,369					3083	$\exists$		h: 90,369				Return Air	RH (%) HR (lbs/lb)	0.00515	0.00491	Н	-	Н	+	-	$\forall$	_	+	0.00280			Return Air	HR (lbs/lb)	Н	Н	Н	_	0.00421
			Fan (kwh)	Cas	(therm)	Cooling	(kWh)	Total	(MMBtu)		Previous Total kWh:					H	25.0%	7 52.5%	3 50.0%	_		_	_	$\Box$	_	4	30.0%				RH (%)	Ш	3 52.5%	Ш	_	5 45.0%
			1								Previo				Fan Energy	(kWh)	066	8,377	13,803		12,204		11,833					90,369	63,790	Fan Energy	(kWh)		5,913			8,615
			3K 3K					55% % RH		33	2				Fan Power (kW)	Return	0.00	00:00	00'0		00:00		0.00				0.00	28.73	28.73	Fan Power (kW)	Return		00:00			0.00
			%0	3R			deg. F	25%	50.0 deg. F	HW from HE Boiler	CHW Plant				Fan Po	Supply	28.73	28.73					28.73				28.	2		Fan Po	Supply					28.73
			Fixed	25%	55.0										Fan % Power	Return	%0.0	%0'0 9									%0.0%	Previous: Peak kW:	New: Peak kW:	Fan % Power	Return					%0.0%
			Min OA % (Previous):	Unocc. Min OA % (New):	SA Setpoint (Previous):	SA Setpoint (New):	Space/RA Temperature:	(Low, High):	Cooling Cutout Temp:	Heating Source:	Cooling Source:				Fan%	Supply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Previous:	New	Fan %	Supply	100.0%	100.0%	100.0%	100.0%	100.0%
/ear.		ers	Min OA	Unocc. Min	SA Setpoil	SASet	Space/RA	Space/RA Humidity	Cooling	웃	S					OAcfm		٠		•	•			•	•	•					OAcfm				•	
uring school)		Operating Parameters			3	3		Space/							Conditions	SA cfm	0	0	0	0	0	0	0	0	0	0	0			Conditions	SA cfm	0	0	0	0	0
r 185 days du		Operati	us/m	30	pa	pa				76		<b>39</b>			Operating Conditions	% Capacity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			Operating Condition:	% Capacity	100.0%	100.0%	100.0%	100.0%	100.0%
ours/day for	poxes		3,145 hrs/yr 2,220 hrs/yr	% %0	Constant Speed	Constant Speed	No	No	No	0%0	No	6 %0	No			Occ hrs	34	292	480	228	425	532	412	252	110	46	4	3,145			Occ hrs	24	206	339	394	300
pancy is 17 h	an-powered		revious):	% (New):			VFD? (Previous):	VFD? (New):	et (New):	ck (New):	et (New):	ck (New):	ck (New):			HR (lbs/lb)	0.01367	0.01154	0.01062	0.00808	0.00561	0.00387	0.00255	0.00156	96000'0	09000'0	0.00040				HR (lbs/lb)	0.01367	0.01154	0.01062	0.00808	0.00561
e duled occu	tal for (123)			Unocc. Hours % (New):	Control Type (Previous):	Control Type (New):	VFD? (	Ϋ́	Unocc. Static Reset (New):	Static Setback (New)	Unocc. Speed Reset (New):	Speed Setback (New):	x Min. Setba		14.34	l৯	36.66	31.85	28.40	23.19	18.08	13.77	9.93	6.47	3.42	0.64	-1.98				h (btu/lb) H	36.66	31.85	28.40	23.19	18.08
Note: normally scheduled occupancy is 17 hours/day for 185 days during school year	*Horsepower is total for (123) fan-powered boxes		An	_	ŏ				Oun		Unoc		Unocc. VAV Box Min. Setback (New):		P (nsia):		65.3	90.5	58.3	50.9	41.4	32.0	23.1	13.0	3.4	-5.5	-12.9				DP (F) h	Н	H	58.3	50.9	41.4
Note:	*Hors				61						ž		_	FRINC		L	1.1%	9.3% (					13.1%				0.1%									13.5% 4
FPB Fans		Return	dy %	cfm	in. WC	ж.	du	Motor	0.00 kW		2.5 Power-flor	1.8 statchesare		4Y3 - 10 dea	Outside Air	hours %hours	96	812					1,147 1					8,760		Outside Air	hours %hours					1,183 1
Unit:		Supply Ret	34	0			$\dashv$		28.73		85% 2			Toledo Express TMV3 - 10 dea E BIN	Outs	DB (F) ho	06	80		-		+	_	20	10	0	-10	~		Outs	DB (F) ho	06				50
		Ш		sign Airflow:	sign Fan SP:	Efficiency:		Σ	oad Power:		actor:	:iency:	Offset:	Toler		ä												us Operation	uo,		ă					
		formation	meplate HP or Efficiency	signAi	sign F.	n Effic	culate.	ž	Load F		Load Factor	D Efficiency	vFD Offset م															ns Ope	peartion							

	kWh							٠					
	Tons	0.00	0.00	0.00	ŀ								
	Mbtu				ŀ								
Cooling Coil	Btu/hr	1	1	0									
٥	h (btu/lb)	21.12	20.35	19.90	19.01	18.15	17.48	16.93	16.47	16.12	15.83	15.59	
	DP (F)	48.2	45.5	43.8	40.2	36.1	32.4	29.0	25.8	23.0	20.5	18.1	
	DB (F)	55.0	55.0	55.0	55.0	55.0	0.23	0'55	55.0	55.0	55.0	55.0	
	therms							٠					
	Mbtu												١.
Preheat	Btu/hr												
Pre	h (btu/lb)	23.23	21.85	20.80	19.01	18.15	17.48	16.93	16.47	16.12	15.83	15.59	
	DP (F)	48.2	45.5	43.8	40.2	36.1	32.4	29.0	25.8	23.0	20.5	18.1	
	DB (F)	63.8	61.3	58.8	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	
	h (btu/lb)	23.23	21.85	20.80	19.01	18.15	17.48	16.93	16.47	16.12	15.83	15.59	
	WB (F)	54.8	52.5	9.09	47.4	45.8	44.5	43.4	42.4	41.7	41.1	40.6	
Mixed Air	HR (lbs/lb)	0.00728	0.00657	0.00616	0.00535	0.00456	0.00395	0.00344	0.00302	0.00269	0.00242	0.00220	
	DB (F)	63.8	61.3	58.8	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	
	% VO	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	
n Air	(ll/sdl) HH	0.00515	0.00491	0.00468	0.00444	0.00421	76500.0	0.00374	0.00350	0.00327	0.00303	0.00280	
Return Air	RH (%)	55.0%	52.5%	20.0%	47.5%	45.0%	42.5%	40.0%	37.5%	35.0%	32.5%	30.0%	
Fan Energy	(kWh)												
(kW)	Return	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00:00	0.00	0.00	0.00	73
Fan Power	Supply	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73
ower -	Return	%0.0	90.0	90.0	90.0	%0.0	%0.0	%0'0	90.0	90.0	90.0	90.0	Peak kW:
Fan % Power	Supply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	OAcfm	0	0	0	0	0	0	0	0	0	0	0	
Conditions	SA cfm	0	0	0	0	0	0	0	0	0	0	0	
Operating Conditions	% Capacity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	Unocchrs %												
	HR (lbs/lb) U	0.01367	0.01154	0.01062	0.00808	0.00561	0.00387	0.00255	0.00156	96000'0	0900000	0.00040	Unoccupied Hours:
	h (btu/lb)	36.66	31.85	28.40	23.19	18.08	13.77	9.93	6.47	3.42	0.64	-1.98	Unoccup
	DP (F)	65.3	60.5	58.3	50.9	41.4	32.0	23.1	13.0	3.4	-5.5	-12.9	
	%hours	1.1%	9.3%	15.3%	17.7%	13.5%	16.9%	13.1%	8.0%	3.5%	1.5%	0.1%	
Outside Air	hours	96	812	1,338	1,554	1,183	1,483	1,147	702	306	128	11	8.760
٦	DB (F)	06	88	02	9	20	40	30	20	10	0	-10	

				ower & air fic	*Horsepower & air flow is total for (10) VAV AHUs serving fan-powered VAV boxes.	10) VAV AHUS	serving fan-po	oweredVAV	/ boxes.							Previous	New	New	Si	Savings										
Fan Motor Information	Supply	Return					Oper	Operating Parameters	neters						Unit	nit \$	CINIT	\$	Unit	Ş										
*Nameplate HP:		43 hp		Annua	Annual Hours (Previous):		3,145 hrs/yr		Min OA %	. % (Previous):	Econ	19% %		_	Fan 133	133.562 \$ 12.692	692 124.271	71 \$ 11.809	9 9.291	1 \$ 883	-									
Motor Efficiency:		89.5% %		¥	Annual Hours (New):		45 hrs/yr		Occ Min OA	.(New):	Econ	19% %		£ 6	+		+		4	.										
Design Airtiow:	97,400	dim di		Oun	Unocc. Hours % (New):	7/4//	30% %	,	Unocc. Mis	Unocc. Min UA % (New):	19%	70 O OL	, I birth!	- 4	(thorm)	1,562 \$ 2	232 730	30 \$ 108	832	2 \$ 124										
Fac Efficiency		M. W.C	J			MAN Curtom	1	V 4	od sector	Set point (Previous):	23.0	70.0 (low high)	w mign)	(1)	+		+				_									
Calculated BHP:		R R			VFD? (Previous):	-	T mot	ŧ	Space/RA	Space/RA Temperature:		/U.U (10	w lugu)	9 8	(kWh) 52	52,721 \$ 5,0	5,010 40,859	59 \$ 3,883	3 11,862	2 \$ 1,127	-									
Method:	Motor	Motor			VFD? (New):			Spac	ce/RA Humidit	y (Low, High):		55% %RH	Ξ.	ľ	╀	1	╀	1	╀	٠										
Calc. Full Load Power:	ш	30.45 kW		Unocc. \$	Unocc. Static Reset (New):	8			Cooling Cutout Temp:	Cutout Temp:	$\perp$	50.0 deg. F		(MA	_	791.8 \$17,934	934 635.4	15,800	155.4	\$ 2,134										
			7	Sta	Static Setback (New):		% %0		£	Heating Source:	主	1E Boiler 3																		
Motor Load Factor:		2.5 Power-Row	80	Unocc. S	Unocc. Speed Reset (New):	S	200		Ú	Cooling Source:	CHW Plant	lant 2		Previous Total kWh:		186,283	70	Total kWh saved:	£ 21,153	3 \$ 2,010	0									
Return VFD Offset:	10%	1.8 setores		opt Tr. VAV Box M	Speed Setback (New): Unocc VAV Box Min. Setback (New):	y dy	ŝ																							
	204				and wareness than												Peak	Peak kW reduction												
-	Toledo Expre.	Toledo Express TMY3 - 10 deg. F BINS		L																										
	П		ľ	ia):		_	Ľ		S	Fan % Power	Ţ	좡		2	2		H		J.									9	=	ŀ
	_	ķ		T	¥ (	OCC P	%		ò	2	Return	_	_	+	+	<u> </u>	4	+	1	-	-		G	Btu/hr Mb	Mbtu therms			2	+	+
	8 8		1.1% 65.3	+	36.66 0.01367			$\perp$			79.2%	103.33	24.12	4,393 55	55.0% 0.00879	4	19.0% 73.8	0.00972	4	28.34	73.8	+	28.34			55.0	+	+		53 186.79
	8 8	1 2 3 0 0 1 1	9.3% 50.5	+	31.85 0.01154		490 90 06			79.2%		79.40		_	$^{+}$	1	19.0%	+	90.6	2020	70.0	23.8	70.72	+		202	+	+	1,473,204 429,473	+
	8 8	$\perp$	17.7% 50.3	$^{+}$	+			1	12 95.4	1	$\perp$	39.13		$\perp$	$^{+}$	1	$\perp$	$^{+}$	+	2210	0.07	+	22.10			28.0	+	Ť	1	+
	8 5	$\perp$		$^{+}$	1808		475 60 0%	796 58.440		42.370	18.7%	78.81	5 55	14 595 45	45.0%	0.00738 100	450% 60.0	0.00000	5 0	21.68	61.0	30.9	21.68			610	45.1	21.68	30,309	00.7
	8 8	╙		+	+					L		18.27		$\perp$	+	╀		$^{+}$	+	21.58	62.5	+	21.58			62.5	+	21.58		
	30	1,147 13	13.1% 23.1		9.93 0.00255				30 8,328	L		14.04		$\vdash$	Н	L	19.0% 62.4	H	L	21.12	64.0	H	H	75,738 31,	31,189 328		L	21.50		ľ
	20						252 40.0%				5.1%	10.46	1.55	3,025 37	37.5% 0.00		Ш	0.00513	49.4	20.10	65.5	39.1	21.30 2	Ц	53,023 558	65.5	10	21.30		
	10											10.46	1.55	Н	$\forall$			Н		19.16	67.0	Н			Щ		Н	21.18		
	0		1.5% -5.5	+	+		46 40.0%				5.1%	10.46	1.55	_	32.5% 0.00	0.00516 15	19.0% 56.7	+		18.27	68.5	34.6	T	496,506 22,	22,817 240	68.5	+	21.11		-
	-10	11 (	0.1% -12.9	-	-1.98 0.00040			38,960	7,402	_		10.46	1.55	47 30	$\forall$			0.00393	44.3	17.42	70.0	+	21.07 6	╝.	2,526 27	4	32.4	+		-
Previous Operation		09/'0				3,143				Previous:	Pedk kw.	103.33		133,362										1	140,304 1,302			Na.	- 1	
Model - New Opeartion		Outside Air					Oneratir	Operating Conditions	36	New: Peak	Peak kW:	103.33		124,2/1 Fan Fnerov	Return Air			Mived					Prohost	New: 69,				Cooli	New: 785,	90
	DB (F)	hours %hours	ours DP (F)	t	h (btu/lb) HR (lbs/lb)	s/lb) Occ hrs	le.	ty SAcfm	n OA cfm	Supply	Return	Supply	۱,	-	H (%) HR (lbs/lb	bs/lb) OA:	% DB(F)	F	o) WB (F)	h (btu/lb)		DP(F) h		Btu/hr Mb	Mbtu therms	_	DP (F)	h (btu/lb) Btu/hr	/hr Mbtu	Н
	8	10		T			_	-	-			+	7	2	55.0% 0.00	L	19.0% 73.8	Т	1	28.34	73.8		28.34	$\vdash$		-	t	+		77 186.79
_	88			Н	Н			Ш		Ш		79.40		Н	Н	Ц		Н	9.09	27.07	71.9	ш	27.07			56.5	Н	Н	1,473,204 300,631	ш
	70		15.3% 58.3		28.40 0.01062		336 80.0%			5 59.0%	42.3%	59.15	12.87		50.0% 0.00	0.00798 15	19.0% 70.0	0.00848	_	26.06	70.0	52.2	26.06			58.0	-	23.16 1,01	~	
	9			+	+							42.36		$\dashv$	_			+	_	23.19	0.09	+	23.19			59.5	+	$\dashv$	,969 12,094	94 2.58
	3 3			+	+		297 59.0%			1		27.63	5.28	_	+	4	45.0% 61.0	+	52.2	21.68	61.0	+	21.68	+		61.0	+	21.68		1
	90 90	1	15.9% 32.0		13.77 0.00387		3/3 4/.0%	78 45,778		15.6%	8.0%	15.65	7.00	5,80b 42	42.5% 0.00	0.00677	$\perp$	0.00504	4	21.58	64.0	43.3	+	4	4	640	43.3	21.58		
	98	707	13.1% 23.1	1	+				1 6477		$\perp$	7.49	0.38	$\perp$	+	1	$\perp$	+	+	2017	0.40	+	+	58,908 Ib	16,980 1.79	$\perp$	+	21.50		1
	01	1			+			$\perp$		1	$\perp$	1.85	0.10	+	+	+	190% 586	+	+	1916	67.0	+	+	+	+	+	+	21.18		1
	0			<u> </u>	+						0.3%	1.85	0.10	$\perp$	32.5% 0.00	ļ	$\perp$	+	46.0	18.27	68.5	+	t	╀	╀	68.5	+	21.11		ľ
	-10	L	ľ.	H	H							1.85	0.10	╙	+	L		+	H	17.42	0.07	$\vdash$	╁	L	L	⊢	╀	21.07		ľ
		8,760			Occupied Hours:	ours: 2,202	2(				Peak kW:	103.33		686'98										62	62,638 659	1			709,123	23
		:																												
	0 (1) 00	Outside Air	(1) (0)	t	h (her. (lib)	(h)	L.	Operating Conditions	ns On offer	Fan % Power	1	Fan Power	Fan Power (kW) Fan Energy	-	Hetum Air	Pro / Illes	/a/ a/ //	Mixed Air		h (htt://b/	100 (c)	13/00	Preheat h (htt://h) p	Designation and	P. Chat.	-	137 00	٩,	poling Coil	Total
	(1)	2	Ļ	Ť	т			1	5	1	70.02	+	ç	0	10 o o o o o o o o o o o o o o o o o o o	2	6	T	1	11 (014/10)	+		-	+	Т	+	$^{+}$	-	-	+
	8 8	1	0.2% 60.5	+	35.55 0.01357		10 100.0%	700 24,350	150 4,627	70.70.7	79.2%	70.40	17 07	0 515 55	+	0.00879	19.0% 71.0	0.00972	60.5	28.34	71.0	55.9	17.07	-		25.0	24.5	23.23	350 301 33 37 30	+
	8 %	1		$^{+}$	+					1		79.40		_	+	+		$^{+}$	+	26.06	70.0	+	20.72			20.0	+	+	1	1
	5 8		17.7% 50.0	+	23.19 0.01062		167 70.0%	17,480		A2 3%	287%	42 36	8 75	8 555 47	47 5%	1	1000% 600	0.00848	23.1	23.19	0.07	27.75	23.10			200	277	23.10	7 747 1 206	17.12 06 0.65
	8 5	1		t	+							17.63	0.70	$\perp$	+	1		$^{+}$	+	23.13	0.00	+	23.23			610	+	+	1	1
	8 4			+	+					1		15.65	3.20	$\perp$	$^{+}$	1		+	+	2158	0.10	+	21.58			625	+	21.00		1
	2 5	1		+	+			$\perp$			3.2%	7 49	20.2	$\perp$	$^{+}$	1	190% 624	+	$\perp$	2112	64.0	+	+	14727	1819 19	640	+	21.50		1
	20	L			+							3.23	0.27	$\perp$	+	ļ.	$\perp$	+	╀	20.10	65.5	+	╀	1	L	╄	+	21.30		ľ
	10	L	3.5% 3.4		$\vdash$							1.85	0.10	╙	Н	L		$\vdash$	H	19.16	0.79	36.8	┝	L	L	67.0	$\vdash$	21.18		ľ
	0			Н	Н							1.85	0.10	Ш	Н			Н		18.27	68.5	Н	Н			Ш	Н	21.11		
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		8,760		_	Unoccupied Hours:		944				Peak kW:	103.33		37,281										9	6,711 71				75,977	7.1

			/pe	2	က	4	2	9	7	80				
		Ref. Index	Fan System Type	VAV	<b>Constant Speed</b>	VAV Custom 1	Custom 2	Custom 3	Custom 4	Custom 5				
		∞	Custom 5											
		7	Custom 4											
		9	Custom 3											
		2	Custom 2											
	% Capacity	4	VAV Custom 1	100%	%06	%08	%02	%69	47%	35%	25%	20%	20%	20%
		က	Constant Speed	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		2	VAV	100%	%06	%08	%02	%09	20%	45%	40%	40%	40%	40%
•			DB (F)	06	80	70	09	20	40	30	20	10	0	-10

Cooling Systems	Custom 1 3	Custom 2 4	Custom 3 5	Custom 4 6	Custom 5 7	Custom 6 8	Custom 7 9											+20% for balance of plant																				
															8			% for balar	0.810	0.660	0.570	0.456	0.480															
															7			kW/ton +20	0.675	0.550	0.475	0.380	0.400															
															9			OAT (F) KW	06	80	70		20															
fficiencies															2			O								\	Γ			ed drive								
Cooling System Efficiencies															4										\	30% Annual Savings		40 20		an OptiSpe								
Cooli														PLV-based)	m						- Constant Speed	peed				30% Ann	-		Load (%)	y savings whe I chiller.								
		CHW Plant	0.810	0.660	0.570	0.456	0.480	0.000	0.000	0.000	0.000	0.000	0.000	(Trends-based) IPLV-based)	2		York YK w/Optispeed				Cons	- OptiSpeed						. 80		This graph shows typical energy savings when an OptiSpeed drive is installed on a constant-speed chiller.								
		OAT (F)	06	80	70	09	20	40	30	20	10	0	-10				York YK w		1.3	17000	1.1		uo1//	KM		0.5	0.3	100		This graph s is installed								
	therm		kWh				l	l				on/Costs	Cost (\$)	\$6,778	\$6,799	\$3,931	\$2,060	\$816	\$590	\$560	\$630	\$69\$	\$88\$	\$2,009	\$2,935	\$28,788	Cost (\$)	\$25,506	\$28,756	\$26,072	\$25,767	\$30,005	\$26,518	\$19,976	\$25,144	\$31,305	\$25,972	\$23,582
	\$ 0.149 \$/therm		\$ 0.0950 \$/kwh			75%	%02	95%	80%	1		Recent Utility Consumption/Costs	Therms	43,656	43,727	24,674	12,485	5,834	3,937	3,692	4,274	4,825	7,252	15,708	23,756	193,820	kWh	286,200	318,600	279,000	264,600	303,300	271,800	212,400	251,100	334,800	268,200	250,200
Energy Costs	Natural gas rate:	1	Electricity rate: \$	I	Heating Sources / Efficiencies	_	2	က	4	5	9	Recent U		1/31/2015	2/28/2015	3/31/2015	4/30/2015	5/31/2015	6/30/2015	7/31/2015	8/31/2015	9/30/2015	10/31/2015	11/30/2015	12/31/2015			1/31/2015	2/28/2015	3/31/2015	4/30/2015	5/31/2015	6/30/2015	7/31/2015	8/31/2015	9/30/2015	10/31/2015	11/30/2015
	Z				Heating Sour	Plant Steam	HW from Steam	HW from HE Boiler	Nat. Gas Fired	None	Custom																											

# Mercantile Customer Project Commitment Agreement Cash Rebate Option

THIS MERCANTILE CUSTOMER PROJECT COMMITMENT AGREEMENT ("Agreement") is made and entered into by and between The Toledo Edison Company, , its successors and assigns (hereinafter called the "Company") and Penta Career Center, Taxpayer ID No. 34-0946365 its permitted successors and assigns (hereinafter called the "Customer") (collectively the "Parties" or individually the "Party") and is effective on the date last executed by the Parties as indicated below.

## WITNESSETH

WHEREAS, the Company is an electric distribution utility and electric light company, as both of these terms are defined in R.C. § 4928.01(A); and

WHEREAS, Customer is a mercantile customer, as that term is defined in R.C. § 4928.01(A)(19), doing business within the Company's certified service territory; and

WHEREAS, R.C. § 4928.66 (the "Statute") requires the Company to meet certain energy efficiency and peak demand reduction ("EE&PDR") benchmarks; and

WHEREAS, when complying with certain EE&PDR benchmarks the Company may include the effects of mercantile customer-sited EE&PDR projects; and

WHEREAS, Customer has certain customer-sited demand reduction, demand response, or energy efficiency project(s) as set forth in attached Exhibit 1 (the "Customer Energy Project(s)") that it desires to commit to the Company for integration into the Company's Energy Efficiency & Peak Demand Reduction Program Portfolio Plan ("Company Plan") that the Company will implement in order to comply with the Statute; and

WHEREAS, the Customer, pursuant to the Public Utilities Commission of Ohio's ("Commission") September 15, 2010 Order in Case No. 10-834-EL-EEC, desires to pursue a cash rebate of some of the costs pertaining to its Customer Energy Project(s) ("Cash Rebate") and is committing the Customer Energy Project(s) as a result of such incentive.

WHEREAS, Customer's decision to commit its Customer Energy Project(s) to the Company for inclusion in the Company Plan has been reasonably encouraged by the possibility of a Cash Rebate.

WHEREAS, in consideration of, and upon receipt of, said cash rebate, Customer will commit the Customer Energy Project(s) to the Company and will comply with all other terms and conditions set forth herein.

**NOW THEREFORE**, in consideration of the mutual promises set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound, do hereby agree as follows:

- 1. Customer Energy Projects. Customer hereby commits to the Company and Company accepts for integration into the Company Plan the Customer Energy Project(s) set forth on attached Exhibit 1. Said commitment shall be for the life of the Customer Energy Project(s). Company will incorporate said project(s) into the Company Plan to the extent that such projects qualify. In so committing, and as evidenced by the affidavit attached hereto as Exhibit A, Customer acknowledges that the information provided to the Company about the Customer Energy Project(s) is true and accurate to the best of its knowledge.
  - a. By committing the Customer Energy Project(s) to the Company, Customer acknowledges and agrees that the Company shall control the use of the kWh and kW reductions resulting from

said projects for purposes of complying with the Statute. By committing the Customer Energy Project(s), Customer has the ability to either:

- i. Take ownership of the Energy Efficiency resource credits resulting from their Customer Energy Project(s) and may be able to bid or sell the Energy Efficiency resource credits into the market operated by the grid operator, PJM Interconnection, Inc. (PJM), provided several prerequisites are met; or
- ii. Allow the Company to take ownership of the Energy Efficiency resource credits associated with their Customer Energy Project(s). The Company shall, at its sole discretion, aggregate said capacity into the PJM market through an auction. Any proceeds from any such bids accepted by PJM will be used to offset the costs charged to the Customer and other of the Company's customers for compliance with state mandated energy efficiency and/or peak demand requirements.

Please indicate :	your preference :	as to the t	reatment of	your	Energy	Efficiency	resource
credits:							

Customer would like to retain ownership of its Energy Efficiency resource credits.
☐ Customer assigns ownership of its Energy Efficiency resource credits to Company for purposes of hidding these credits into PJM.

- b. The Company acknowledges that some of Customer's Energy Projects contemplated in this paragraph may have been performed under certain other federal and/or state programs in which certain parameters are required to be maintained in order to retain preferential financing or other government benefits (individually and collectively, as appropriate, "Benefits"). In the event that the use of any such project by the Company in any way affects such Benefits, and upon written request from the Customer, Company will release said Customer's Energy Project(s) to the extent necessary for Customer to meet the prerequisites for such Benefits. Customer acknowledges that such release (i) may affect Customer's cash rebate discussed in Article 3 below; and (ii) will not affect any of Customer's other requirements or obligations.
- c. Any future Customer Energy Project(s) committed by Customer shall be subject to a separate application and, upon approval by the Commission, said projects shall become part of this Agreement.
- d. Customer will provide Company or Company's agent(s) with reasonable assistance in the preparation of the Commission's standard joint application for approval of this Agreement ("Joint Application") that will be filed with the Commission, with such Joint Application being consistent with then current Commission requirements.
- e. Upon written request and reasonable advance notice, Customer will grant employees or authorized agents of either the Company or the Commission reasonable, pre-arranged access to the Customer Energy Project(s) for purposes of measuring and verifying energy savings and/or peak demand reductions resulting from the Customer Energy Project(s). It is expressly agreed that consultants of either the Company or the Commission are their respective authorized agents.
- 2. Joint Application to the Commission. The Parties will submit the Joint Application using the Commission's standard "Application to Commit Energy Efficiency/Peak Demand Reduction Programs" ("Joint Application") in which they will seek the Commission's approval of (i) this Agreement: (ii) the commitment of the Customer Energy Project(s) for inclusion in the Company Plan; and (iii) the Customer's Cash Rebate.

The Joint Application shall include all information as set forth in the Commission's standard form which, includes without limitation:

- i. A narrative description of the Customer Energy Project(s), including but not limited to, make, model and year of any installed and/or replaced equipment;
- ii. A copy of this Agreement; and
- iii. A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results.
- 3. Customer Cash Rebate. Upon Commission approval of the Joint Application, Customer shall provide Company with a W-9 tax form, which shall at a minimum include Customer's tax identification number. Within the greater of 90 days of the Commission's approval of the Joint Application or the completion of the Customer Energy Project, the Company will issue to the Customer the Cash Rebate in the amount set forth in the Commission's Finding and Order approving the Joint Application.
  - a. Customer acknowledges: i) that the Company will cap the Cash Rebate at the lesser of 50% of Customer Energy Project(s) costs or \$250,000; ii) if the Customer Energy Project qualifies for a rebate program approved by the Commission and offered by the Company, Customer may still elect to file such project under the Company's mercantile customer self direct program, however the Cash Rebate that will be paid shall be discounted by 25%; and
  - b. Customer acknowledges that breaches of this Agreement, include, but are not limited to:
    - i. Customer's failure to comply with the terms and conditions set forth in the Agreement, or its equivalent, within a reasonable period of time after receipt of written notice of such non-compliance;
    - ii. Customer knowingly falsifying any documents provided to the Company or the Commission in connection with this Agreement or the Joint Application.
  - c. In the event of a breach of this Agreement by the Customer, Customer agrees and acknowledges that it will repay to the Company, within 90 days of receipt of written notice of said breach, the full amount of the Cash Rebate paid under this Agreement. This remedy is in addition to any and all other remedies available to the Company by law or equity.
- 4. **Termination of Agreement**. This Agreement shall automatically terminate:
  - a. If the Commission fails to approve the Joint Agreement;
  - b. Upon order of the Commission; or
  - c. At the end of the life of the last Customer Energy Project subject to this Agreement.

Customer shall also have an option to terminate this Agreement should the Commission not approve the Customer's Cash Rebate, provided that Customer provides the Company with written notice of such termination within ten days of either the Commission issuing a final appealable order or the Ohio Supreme Court issuing its opinion should the matter be appealed.

5. Confidentiality. Each Party shall hold in confidence and not release or disclose to any person any document or information furnished by the other Party in connection with this Agreement that is designated as confidential and proprietary ("Confidential Information"), unless: (i) compelled to disclose such document or information by judicial, regulatory or administrative process or other

provisions of law; (ii) such document or information is generally available to the public; or (iii) such document or information was available to the receiving Party on a non-confidential basis at the time of disclosure.

- a. Notwithstanding the above, a Party may disclose to its employees, directors, attorneys, consultants and agents all documents and information furnished by the other Party in connection with this Agreement, provided that such employees, directors, attorneys, consultants and agents have been advised of the confidential nature of this information and through such disclosure are deemed to be bound by the terms set forth herein.
- b. A Party receiving such Confidential Information shall protect it with the same standard of care as its own confidential or proprietary information.
- c. A Party receiving notice or otherwise concluding that Confidential Information furnished by the other Party in connection with this Agreement is being sought under any provision of law, to the extent it is permitted to do so under any applicable law, shall endeavor to: (i) promptly notify the other Party; and (ii) use reasonable efforts in cooperation with the other Party to seek confidential treatment of such Confidential Information, including without limitation, the filing of such information under a valid protective order.
- d. By executing this Agreement, Customer hereby acknowledges and agrees that Company may disclose to the Commission or its Staff any and all Customer information, including Confidential Information, related to a Customer Energy Project, provided that Company uses reasonable efforts to seek confidential treatment of the same.
- Taxes. Customer shall be responsible for all tax consequences (if any) arising from the payment of the Cash Rebate.
- 7. **Notices.** Unless otherwise stated herein, all notices, demands or requests required or permitted under this Agreement must be in writing and must be delivered or sent by overnight express mail, courier service, electronic mail or facsimile transmission addressed as follows:

### If to the Company:

FirstEnergy Service Company 76 South Main Street Akron, OH 44308

Attn: Mercantile Energy Efficiency Program A-GO-8

Telephone: 330 384 4504 Fax: 330 777 6051

Email: mercantile@firstenergycorp.com

If to the Customer:

Penta Career Center 9301 Buck Road Perrysburg, OH 43551 Attn: Kevin Baker

Telephone: 419-661-6348 Fax: 419-661-6635

Email: kbaker@pentacc.org

- or to such other person at such other address as a Party may designate by like notice to the other Party. Notice received after the close of the business day will be deemed received on the next business day; provided that notice by facsimile transmission will be deemed to have been received by the recipient if the recipient confirms receipt telephonically or in writing.
- 8. Authority to Act. The Parties represent and warrant that they are represented by counsel in connection with this Agreement, have been fully advised in connection with the execution thereof, have taken all legal and corporate steps necessary to enter into this Agreement, and that the undersigned has the authority to enter into this Agreement, to bind the Parties to all provisions herein and to take the actions required to be performed in fulfillment of the undertakings contained herein.
- 9. Non-Waiver. The delay or failure of either party to assert or enforce in any instance strict performance of any of the terms of this Agreement or to exercise any rights hereunder conferred, shall not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights at any later time or on any future occasion.
- 10. Entire Agreement. This Agreement, along with related exhibits, and the Company's Rider DSE, or its equivalent, as amended from time to time by the Commission, contains the Parties' entire understanding with respect to the matters addressed herein and there are no verbal or collateral representations, undertakings, or agreements not expressly set forth herein. No change in, addition to, or waiver of the terms of this Agreement shall be binding upon any of the Parties unless the same is set forth in writing and signed by an authorized representative of each of the Parties. In the event of any conflict between Rider DSE or its equivalent and this document, the latter shall prevail.
- 11. Assignment. Customer may not assign any of its rights or obligations under this Agreement without obtaining the prior written consent of the Company, which consent will not be unreasonably withheld. No assignment of this Agreement will relieve the assigning Party of any of its obligations under this Agreement until such obligations have been assumed by the assignee and all necessary consents have been obtained.
- 12. Severability. If any portion of this Agreement is held invalid, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, and the Parties further agree to substitute for the invalid portion a valid provision that most closely approximates the economic effect and intent of the invalid provision.
- 13. Governing Law. This Agreement shall be governed by the laws and regulations of the State of Ohio, without regard to its conflict of law provisions.
- 14. Execution and Counterparts. This Agreement may be executed in multiple counterparts, which taken together shall constitute an original without the necessity of all parties signing the same page or the same documents, and may be executed by signatures to electronically or telephonically transmitted counterparts in lieu of original printed or photocopied documents. Signatures transmitted by facsimile shall be considered original signatures.

**IN WITNESS WHEREOF,** the Parties hereto have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year set forth below.

The Toledo Edison Company_
(Company)
By: John C. Darge
Title: VA. Of Energy Efficiency
Date:
Penta Career Center
By: Customer)
Title: Eupervisor of Buildings and brounds
Date: 4/17/2017

# Affidavit of Penta Career Center - Exhibit \_A\_

STATE OF OHIO		)	SS:
COUNTY OF WOOD	)		

I, Kevin Baker, being first duly sworn in accordance with law, deposes and states as follows:

- 1. I am the Supervisor of Operations of Penta Career Center ("Customer") As part of my duties, I oversee energy related matters for the Customer.
- 2. The Customer has agreed to commit certain energy efficiency projects to The Toledo Edison Company ("Company"), which are the subject of the agreement to which this affidavit is attached ("Project(s)").
- 3. In exchange for making such a commitment, the Company has agreed to provide Customer with Cash ("Incentive"). This Incentive was a critical factor in the Customer's decision to go forward with the Project(s) and to commit the Project(s) to the Company.
- 4. All information related to said Project(s) that has been submitted to the Company is true and accurate to the best of my knowledge.

Kein Boh

FURTHER AFFIANT SAYETH NAUGHT.

Sworn to before me and subscribed in my presence this 7 day of April, 2017.

This foregoing document was electronically filed with the Public Utilities

**Commission of Ohio Docketing Information System on** 

8/25/2017 4:46:39 PM

in

Case No(s). 17-0787-EL-EEC

Summary: Application to Commit Energy Efficiency/Peak Demand Reduction Programs of The Toledo Edison Company and Penta Career Center electronically filed by Ms. Jennifer M. Sybyl on behalf of The Toledo Edison Company and Penta Career Center