Commercial SEM Final Report 2016

Portland Community College

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EnergyTrust of Oregon

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Engagement Overview

Portland Community College is a growing public education institution that serves the Portland metropolitan area. The Rock Creek Campus, opened in the Beaverton-Hillsboro area in 1976, educates over 23,000 students. The campus covers 260 acres and generates power with 35,000 square feet of solar arrays.

Kickoff Status/Goals

Portland Community College (PCC) is undertaking its Strategic Energy Management (SEM) initiative to continue to advance its energy management practices. In its second of program participation, PCC is looking for the SEM initiative to help ensure that PCC Rock Creek achieves its energy efficiency and sustainability goals and objectives. It will also contribute to improving its financial situation by reducing operating costs, reduce adverse impacts on the environment, and serve as an example to others.

In PY 2015 the Rock Creek Campus enrolled eight sites. In PY 2016 PCC added an additional 14 sites for a total of twenty-two. Sixteen of the sites were included in the overall program scope and effort. The summary table below outlines all the enrolled sites and inclusion in the program scope.

Rock Creek Sites	**Site Address**	**Included in Scope**
Building 2	17705 NW Springville Rd, Portland	**Yes**
Building 3	17705 NW Springville Rd, Portland	**Yes**
Building 6	17705 NW Springville Rd, Portland	**Yes**
Building 7	17705 NW Springville Rd, Portland	**Yes**
Building 9	17705 NW Springville Rd, Portland	**Yes**
Green House	17705 NW SPRINGVILLE RD	No
Parking Lot Lighting	17705 NW SPRINGVILLE RD	No
Vet Tech Building	17705 NW Springville Rd, Portland	**Yes**
Sylvania Sites	**Site Address**	**Included in Scope**
Automotive Building	12000 SW 49TH AVE	**Yes**
Bookstore	12000 SW 49TH AVE	**Yes**
College Center Building	12000 SW 49TH AVE	**Yes**
College Services Building	12000 SW 49TH AVE	**Yes**
Communication Technology	12000 SW 49TH AVE	No
Health Technology	12000 SW 49TH AVE	**Yes**
Heat Plant	12000 SW 49TH AVE	**Yes**
Learning Resource Center	12000 SW 49TH AVE	**Yes**
Performing arts Center (PAC)	12000 SW 49TH AVE	No
Science Technology Classroom	12000 SW 49TH AVE	**Yes**
Social Sciences Building	12000 SW 49TH AVE	**Yes**
South Classroom Building	12000 SW 49TH AVE	No
Technology Classroom building	12000 SW 49TH AVE	**Yes**

EMA/Organizational Assessment Highlights

A major milestone at the end of the first year of continuation is a second organizational energy management assessment (EMA) to show progress over the prior two years and provide a renewed focus moving forward. The EMA session with Rock Creek and Slyvania was conducted on October 25, 2016. The EMA report depicts a snapshot of current PCC energy management business practices.

PCC's overall profile has an LR score of 1.92, which is significantly above the original LR score of 0.86 two years ago. This change in overall LR score means PCC is improving its practices and is now applying a strategic approach to energy management. The overall balance rating of 1.17 indicates that current business practices associated with managing energy are highly unbalanced. This is not surprising given that PCC has made significant advances in certain areas and is still looking to advance in others.

PCC has advanced in each of the Strategic, Enabling, and Functional components. PCC has made significant advancements in the Strategic component (LR score improved from 0.67 to 1.55). Within the Strategic component, PCC has strengthened executive sponsorship, its energy management policy and objectives, and continues to advance its SEM plan for achieving its goals.

PCC's Enabling component LR score improved from 1.06 to 2.28, a big jump. Within the Enabling component, PCC has advanced its energy team at the Rock Creek campus, and has made strides in advancing data capture, recordkeeping, capital and expense budgeting, and training. PCC has also made meaningful advances in the Functional area (LR score improved from 0.78 to 1.76). Within the Functional component, PCC's understanding of it's building equipment and systems are much stronger, along with its operations and maintenance procedures. At the EMA session participants said that while good progress is being made at the Rock Creek campus in particular, extending SEM to Sylvania and other PCC campuses is a priority.

Based on the EMA results the following recommendations have been made to continue improving PCC's energy management business practices:

Organizational Commitment

PCC is focused on managing energy use as a key component of its organizational direction, and now has a policy in place for its Rock Creek campus, with an energy use reduction goal. Follow through on expanding PCC's energy management efforts to include Sylvania and other PCC campuses, and further development of campus specific energy teams, are priorities moving forward. Adopting and communicating the policy (including the goal) PCC wide, and refining campus facility plans by identifying projects and activities to meet the energy use reduction goal and achieve site specific reduction targets, will help build further support for and maintain the effectiveness of the initiative moving forward.

Facility Operations & Standards

PCC shoult continue to optimize operations by systematically completing building tune-ups or retro-commissioning for all key energy using systems and equipment. Results of optimization activities and subsequent operating adjustments can be used to further advance relevant O&M protocols, checklists and guidelines. Encouraging O&M staff to perform periodic energy walks with checklists to identify additional energy saving opportunities will help advance a healthy energy management culture. In energy intensive areas, the speed and effectiveness in responding to equipment efficiency issues can be tracked, and provisions in external maintenance service provider contracts can be used to incentivize energy efficient practices.

Facility Upgrades

The recommendation in this area is for PCC to keep moving forward with high priority facility upgrades and to correlate planned energy saving projects with its overall energy reduction goal and site specific energy reduction targets, highlighting this relationship in the capital budgeting and approval process. Work with finance personnel to evaluate the financial merits of facility upgrade projects, and use investment criteria based on standard appraisal methods (i.e., net-present-value) to evaluate and prioritize large capital projects. Continue to review actual project cost and performance against originally expected outcomes, and retain this information for use in future planning.

Purchasing & Procurement

PCC should establish review protocols to ensure its standards (specifications) to guide the routine procurement of energy using equipment are consistently used and followed. Instruction on the procurement standards, and procedures for the selection of heavy energy using systems and equipment (including use of life cycle cost), can be provided to relevant staff, contractors and vendors.

New Construction

PCC considers "best practice" standards and protocols, such as Leadership in Energy and Environmental Design, as part of its new construction practices. Setting aggressive energy performance goals in advance of each new construction project, and evaluating building design and equipment options based on life-cycle costs and total cost of ownership, will help drive the integrated design process. Including facility operating staff in the design process; building, systems and equipment commissioning, and training O&M staff on optimum use of new systems and equipment, will help assure a high performance building.

Occupant Awareness and Engagement

PCC has initiated employee awareness and engagement activities at its Rock Creek campus. Future phases of employee awareness, education and engagement can include expanding to Sylvania and other PCC campuses, more broadly disseminating energy use information to employees in general to help raise awareness, and senior management regularly communicating the importance of energy management to the entire organization. As PCC Rock Creek continues to develop and deliver employee

energy awareness, education and engagement activities as part of an ongoing strategy and campaign, encourage others at PCC to adapt the approach to their campuses.

Tracking & Reporting

PCC has a good understanding of its building systems and equipment. PCC needs to continue expanding campus and site specific tracking and analysis of energy use to all major sites, with data normalized for weather and other appropriate factors. PCC shout set campus and building specific reduction targets for key sites and regularly review facility energy use (i.e., monthly). Building specific reduction targets should aggregate to and align with the overall energy use reduction goal. PCC should share performance tracking results with key operations staff on an on-going basis so they can see their progress and be able to respond quickly to any developing problem areas with timely corrective action.

Executive Sponsor & Energy Champion Meeting Highlights

Sandra Fowler-Hill (Rock Creek) is the Executive Sponsor for the SEM initiative and Laura Ward is the SEM Energy Champion. SEM Executive Sponsor check-ins involve discussing SEM activities completed or underway, and key next steps. Areas of focus include strategic leadership, setting the direction, mobilizing the organization, a focus on core practices, and continuous improvement.

Energy Team Meeting Highlights

PCC 's Energy Team is led by Sandra Fowler-Hill and Laura Ward. Key members of the Energy Team include staff and faculty from the PCC Rock Creek Campus and PCC central staff. The team meets regularly and focuses on both technical and organizational energy management activities. Midway through the year PCC expanded SEM to also include the Sylvania campus.

Summary of progress with Energy Policy & SEMP

PCC developed and gained organizational approval and sign off for its Energy Policy with the Campus President in Sept. 2015. The Energy Team is focused on SEM Action Plan follow through, including specific actions associated with strengthening organizational commitment, improving facility operations, initiating employee engagement, and ongoing energy performance tracking and reporting.

Energy Awareness/Engagement Activities

PCC continues to advance its employee/occupant engagement efforts, building on activities initiated in September 2015. Recent actions include making use of the "Powering a Brighter Future" discussion course, recruiting three new Green Team members, meeting with IT to clarify computer upgrading strategy and shut down policy, light switch prompts, and highlighting new LEED building features. The Energy Team is continuing development and implementation of its employee engagement strategy, including additional occupant educational seminars for staff, faculty and students, and additional challenges and contests.

Building Opportunity Site Assessments

The table below lists the building opportunity assessments completed by site and date. No additional site assessments were conducted this year at the Rock Creek but three site assessments were conducted at the Sylvania campus. The focus consisted of mapping out the North Chiller Plant, campus HVAC schedule review, and Heat Recovery equipment. The Natatorium. concentrated on the College Center's HVAC equipment and reviewing the recent changes from Phase II renovation project. In addition, time was spent mapping out South Chiller Plant and the campus buildings system provides chilled water to.

Site Name	Date Transitioned
Health Technology Building	6/8/2016
College Center Building	6/30/2016
Heat Plant	6/30/2016

Energy Savings and Incentives

Final Savings & Incentives by Site & Utility

After normalizing energy consumption for seasonal weather and other impacts, the four sites in the overall scope showed significant savings and qualify for Energy Trust of Oregon's SEM energy savings incentives.

In addition to the energy savings incentives, four milestone incentives of $1000 each were available for Energy Actions, Energy Team, Occupant Engagement and Performance Tracking. The table below outlines the savings achieved by site, utility and incentive.

Site	PY 2016 SEM Savings					Incentives	
	PGE (kWh)	Pacific Power (kWh)	CNG (thms)	NWN Regular (thms)	NWN Rate 32 (thms)	Energy Incentive	Total Incentive
Building 2 (Rock Creek)	0	0	0	0	0	$0.00	$0.00
Building 3 (Rock Creek)	0	0	0	0	0	$0.00	$0.00
Building 6 (Rock Creek)	0	0	0	0	0	$0.00	$0.00
Building 7 (Rock Creek)	0	0	0	0	0	$0.00	$0.00
Building 9 (Rock Creek)	0	0	0	1,787	0	$357.38	$357.38
Vet Tech Building (Rock Creek)	264	0	0	0	0	$5.27	$5.27
Automotive Building (Sylvania)	0	0	0	0	0	$0.00	$0.00
Bookstore (Sylvania)	0	0	0	0	0	$0.00	$0.00
Central Heating Plant (Sylvania)	0	0	0	0	24,593	$4,918.66	$4,918.66
College Center Building (Sylvania)	0	0	0	0	0	$0.00	$0.00
College Services Building (Sylvania)	20,301	0	0	0	0	$406.01	$406.01

Site	PY 2016 SEM Savings					Incentives	
	PGE (kWh)	Pacific Power (kWh)	CNG (thms)	NWN Regular (thms)	NWN Rate 32 (thms)	Energy Incentive	Total Incentive
Health Technology Building (Sylvania)	0	0	0	0	0	$0.00	$0.00
Learning Resource Center (Sylvania)	3,391	0	0	0	0	$67.82	$67.82
Science Technology Building (Sylvania)	0	0	0	0	0	$0.00	$0.00
Social Sciences Building (Sylvania)	23,245	0	0	0	0	$464.89	$464.89
Technology Classroom Building (Sylvania)	16,356	0	0	0	0	$327.13	$327.13
Savings Incentive	63,557	0	0	1,787	24,593	$6,547.17	$6,547.17
Energy Actions							$0.00
Energy Team							$0.00
Occupant Engagement							$1,000.00
Performance Tracking							$0.00
Total Incentive							**$7,547.17**

Regression Modeling

For each site enrolled and included in the scope, a regression model was developed to describe the variation in energy usage at the site. Typical coefficients include ambient weather, holidays, and event days. In some cases, other variables may have been used. Models were selected primarily based on the following guidelines:

- 12 month baseline
- R^2 >0.75
- Coefficient absolute p-values <=0.05
- No or limited autocorrelation

Where applicable, the coefficients, regression statistics, and graphs can be found in the Appendix or the electronic MT&R model files. Due to interaction with capital projects or operational anomalies, in some cases the baseline period was taken prior to or sometimes after the start of the program period. In those cases, energy savings identified prior to the 'intervention period' were removed from the projected savings estimates.

Modeled sites and the baseline periods used are outlined in the table below.

Site	Electricity Baseline	Natural Gas Baseline
Building 2 (Rock Creek)	*1/28/2012 – 7/26/2013	10/26/2013 – 10/27/2014
Building 3 (Rock Creek)	9/27/2013 – 9/26/2014	N/A
Building 6 (Rock Creek)	9/27/2013 – 9/26/2014	N/A
Building 7 (Rock Creek)	*7/31/2012 – 11/25/2013	*8/25/2012 – 8/27/2013
Building 9 (Rock Creek)	11/1/2013 – 10/31/2014	10/25/2012 – 10/24/2014
Vet Tech Bldg. (Rock Creek)	7/30/2013 – 9/29/2014	N/A
Auto & Metal Bldg. (Sylvania)	10/2/2012 – 10/1/2014	N/A
Bookstore (Sylvania)	11/1/2013 – 10/30/2014	N/A
Heating Plant (Sylvania)	*2/9/2014 – 2/7/2015	12/1/2013 – 11/30/2014
College Center Building (Sylvania)	*10/31/2014 – 11/2/2015	N/A
College Services Building (Sylvania)	5/4/2012 – 5/1/2014	N/A
Health Technology Building (Sylvania)	10/2/2013 – 10/1/2014	N/A
Learning Resource Center (Sylvania)	11/1/2013 – 10/31/2014	N/A
Science Technology Building (Sylvania)	10/2/2013 – 10/1/2014	N/A
Social Sciences Building (Sylvania)	11/1/2013 – 10/30/2014	N/A
Technology Classroom Building (Sylvania)	11/9/2013 – 10/30/2014	N/A

*Electric baseline period for **Rock Creek, Building-2** is 18 months long and ends 15 months before SEM program. The period was chosen because it ends just prior to a significant HVAC operational change and better accounts for the temperature & usage relationship.

*Electric baseline period for **Rock Creek, Building-7** is 16 months long and ends 11 months before SEM program. The period was chosen because it ends just prior to a large expansion and renovation project that runs 11/2013 thru 10/2014.

*Gas baseline period for **Rock Creek, Building-7** is 12 months long and ends 14 months before SEM program. The period was chosen because it ends just prior to a large expansion and renovation project that runs 11/2013 thru 10/2014.

*Electric baseline period for **Sylvania, Heating Plant** ends three months after the beginning of SEM 10/2014. The interval data acquired from customer began 2/2014.

*Electric baseline period for **Sylvania, College Center Building** starts after the beginning of SEM program due to the completion of Phase I renovation project 11/2014. Significant operational changes are made.

Regression Model Savings Calculation Methodology

Regression models for Electricity and Natural Gas (where both fuels were present and enrolled at the site) were created and used to evaluate current operations versus baseline operations and estimate energy savings for the upcoming year. The variables used for each site are provided in the Appendix and the electronic MT&R models.

New for Program Year 2016, final savings reported is the absolute difference between the energy usage predicted by the performance tracking model and the actual energy usage by site. The savings equation can be written as:

$$Site\ Energy\ Savings = \sum_{1}^{m} Acutal\ Energy\ Usage - \sum_{1}^{m} Predicted\ Energy\ Usage$$

m=the number of periods in the post baseline (e.g. monthly bill dates m≈12.)

When participants have participated during prior Program Years, the reported SEM savings is incremental to previous savings claimed. For example, a site having total SEM savings of 100,000 kWh during the current Program Year and reported savings of 50,000 kWh over the prior three years, would report the net incremental SEM savings, 50,000 kWh for the current Program Year.

Other Savings Calculation Methodology

No other calculation methodologies were used.

Energy Trust Capital Project Savings Adjustments

Capital projects implemented and incented by the Energy Trust completed during the savings period, are prorated and deducted from the total energy savings. The proration of the project uses the working energy claimed by Energy Trust and establishes a linear rate of savings covering one entire year. The project impact on total energy savings for the Program Period equals the number of days in the period the project was installed multiplied by the calculated rate of savings.

Consider a new variable frequency drive installed January 16, 2016. The Program start date is October 15, 2015 and the ending bill read date for the site is November 1, 2016. If the project's claimed working energy savings is 109,500 kWh annually, 300 kWh per day, the impact on total savings for the program year is the number of days between November 1, 2016 and January 16, 2016 multiplied by the rate of savings or 290 days multiplied by 300 kWh per day = 87,000 kWh.

Site Energy Savings Summary

A summary of the savings in each building and the primary activities that generated savings are outlined below. The column "Total Savings" includes all the weather normalized savings achieved at the site, including energy efficiency projects that were incented through other Energy Trust demand side management programs. The SEM Program savings is the savings Energy Trust is able to attribute directly to the SEM Program based on the performance tracking tools used and the energy efficiency activities tracked by staff through the event log. Negative savings represent an increase in energy consumption that may be caused by a variety of events. For example, changes in occupancy, extreme weather events, or a major remodel could result in negative savings. Detailed information for each site including regression modeling statistics, energy savings calculations, and event logs can be found in the Appendices by building.

Site Savings Summary

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
Building 2 (Rock Creek)	2,847,200	56,951	140,354	(3,969)	0	0	0	0	No savings. Usage does not outperform previous year and estimated savings from capital lighting projects are not being realized at this time.	No savings. Increased usage occurs 1/2016 when automotive classes start back up. Believed to be from excessive exhaust use.
Building 3 (Rock Creek)	1,502,600	0	469,216	0	0	0	0	0	No savings. Value forced to Zero. Increase in performance can only be attributed to relocation of kitchen and reduced occupancy due to seismic upgrade capital project. capital lighting project completes late PY 2015.	
Building 6 (Rock Creek)	340,560	0	32,707	0	0	0	0	0	No savings. Previous lighting project accounts for savings this period. No SEM events activities recorded for any other savings.	

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
Building 7 (Rock Creek)	1,285,200	67,168	210,796	16,416	78,690	16,416	0	0	Savings do not outperform previous year. capital project deduction is pro-rated for replacement of two chillers. New equipment started up 6/2016. Savings also related to a higher awareness to energy use, tighter HVAC scheduling occurs about same time.	Winter heating setpoint is forgotten and not lowered until 6/2016. Otherwise, no other SEM events recorded this PY.
Building 9 (Rock Creek)	963,238	25,068	(36,986)	10,342	0	10,342	0	1,787	No savings. Unknown cause for increase in usage that occurs after 1/2016 but a renovation project coincides about same time frame. capital lighting project completes 10/2015. PV Array monitoring equipment loses communications 10/27/15 to 12/10/15 and daily consumption is estimated from 2014 data. A chiller sequence tune-up occurs prior to summer.	No new SEM events to account for additional savings this period other than previous years' operational changes, reduced summer boiler operation, and a higher awareness to energy usage.
Vet Tech Building (Rock Creek)	43,260	0	264	0	264	0	264	0	No SEM events identified during this period.	

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
Automotive Building (Sylvania)	628,320	0	(29,289)	0	0	0	0	0	No savings. Capital project - Additional DDC controls and DAT reset added. Parking lot lighting removed from this electrical system 6/2016 and now fed from Book Store electrical system.	
Bookstore (Sylvania)	321,680	0	(13,403)	0	0	0	0	0	No savings. Capital project pro-rated savings for DDC upgrade and DAT reset added 6/2016. *Note- Per customer, the beginning stages of relocating campus parking lot lighting systems from their current electric meters to the Bookstore's electric meter begins summer 2016. The impact of added load cannot be ascertained at this time nor apparent in Bookstore's CuSum. Notice sinusoidal shape of CuSum.	

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
Central Heating Plant (Sylvania)	754,440	439,374	(25,860)	47,458	0	24,593	0	24,593	No savings claimed. Multiple capital projects complete this period and though savings for cooling energy can be attributed to this electric meter (South Chiller), an increase in performance from the projects do not show up at this time. The capital savings are deducted from the individual site's savings calcs.	Multiple capital projects for Custom HVAC and DDC upgrade complete this period. In addition, DHW heat exchanger is replaced 1/2016. capital project savings are pro-rated for deduction.
College Center Building (Sylvania)	3,423,800	0	104,982	0	0	0	0	0	No savings claimed. Capital project for Phase II Renovation begins approx. 1/2016 and completes 10/2016. New HVAC equipment and duct work modification for new VAV occurs. Capital project savings are pro-rated for this period. Performance is expected to continue and baseline adjustment will need to be considered for PY 2017.	
College Services Building (Sylvania)	272,400	0	20,301	0	20,301	0	20,301	0	Tighter HVAC scheduling account for slight performance increase.	

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
Health Technology Building (Sylvania)	2,783,400	0	(25,190)	0	0	0	0	0	No savings claimed. Sporadic usage from two known issues: 1. For past year, main air handler runs 24/7 due to duct and building static issues. 2. Two Dessert Air heat recovery units that are stand alone controlled for Natatorium are operating questionably and currently being reviewed for contracted RCx. Staff are unfamiliar with servicing equipment.	
Learning Resource Center (Sylvania)	771,440	0	4,688	0	3,391	0	3,391	0	No savings for this period but Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Capital project deduction savings are pro-rated.	
Science Technology Building (Sylvania)	752,880	0	(13,064)	0	0	0	0	0	No savings this period. Previous year's capital project is under performing based on estimated savings. Capital project for	

Site	Baseline Annual Energy Consumption		Program Year 2016 Energy Savings						Notes Electricity	Notes Natural Gas
			Overall Savings Achieved		SEM Savings Achieved		Incremental SEM Savings			
	kWh	thms	kWh	thms	kWh	thms	kWh	thms		
									Pneumatic to DDC retrofit occurs this period. Savings are pro-rated.	
Social Sciences Building (Sylvania)	475,920	0	24,534	0	23,245	0	23,245	0	Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Project deducted savings are pro-rated for the period.	
Technology Classroom Building (Sylvania)	739,600	0	60,679	0	16,356	0	16,356	0	Capital project to upgrade DDC and add DAT reset strategy completes 6/2016. Claimed savings are pro-rated for this period.	
Totals	**17,905,938**	**588,561**	**924,729**	**70,247**	**142,246**	**51,351**	**63,556**	**26,380**		

Additional Capital Project Potential

Capital projects identified that may be eligible for Energy Trust of Oregon incentives through the Existing Buildings Program are outlined in the table below. Contact Lyn Schmidt with the Existing Buildings Program 503.351.1017 to discuss how these projects fit into your energy efficiency capital planning process.

PCC Rock Creek Campus		
Building	**Capital Opportunity**	**Next Steps**
Building 2	Investigate ways to shut off HW valves to HVAC in shops when high bay roll-up doors are open.	Once identified, install door switches and wire to local DDC controllers. Implement a DDC control strategy that shuts OFF HW valves and/or unit fans.
Building 2	Heating hot water boilers and pumps operate year around due to Victaulic fittings will leak when system is shut down and cools. If fittings were repaired (i.e. gasket replaced), significant savings in electric & gas would be realized.	Perform an energy audit for costs associated with running Heating System year around to also include simultaneous heating & cooling. Investigate costs associated with replacing bad gaskets.
Building 2	Replace existing boilers high with condensing hot water heaters	Contact your Energy Trust Representative to consider having a study performed
Building 2	Replace remaining pneumatic controls and tune up control devices	Contact your Energy Trust Representative to consider having a study performed
Building 2	Variable flow control of welding exhaust systems	Contact your Energy Trust Representative to consider having a study performed
Building 2	Heat recovery of welding system make up air	Contact your Energy Trust Representative to consider having a study performed
Building 2	Upgrade fluorescent lighting throughout building to LED	Contact your Energy Trust Representative to consider having a study performed
Building 2	Install ceiling fans in high bay shop areas to push wasted heat back down to floor level	Contact your Energy Trust Representative to consider having a study performed

PCC Rock Creek Campus		
Building	**Capital Opportunity**	**Next Steps**
Building 7	Verify if each boiler equipped with isolation valves to prevent convection heat going up flue stack	Through natural draft, the combustion burner inlet air may allow air to be drawn in and take boiler heat up the flue stack when boiler is not in use. Contact mechanical service provider for installing isolation valves and control strategy for each boiler.
Building 7	It was noted that multiple Terminal Unit reheat valves were incorrectly installed and leak hot water. Consequently, the discharge air setpoint for AHU-1 & AHU-2 must be set down to 50° F.	Repair reheat valves and verify if hot water is still leaking by. Once completed, allow discharge air setpoint for air handlers reset again.
Building 7	Replace existing boilers with condensing hot water heaters	Contact your Energy Trust Representative to consider having a study performed
Building 7	Install dedicated make up air system for laboratory hood exhaust	Contact your Energy Trust Representative to consider having a study performed
Building 7	Add heat recovery on laboratory exhaust system to preheat make up air	Contact your Energy Trust Representative to consider having a study performed
Building 7	Control hood exhaust fan speed by sash height / high performance hood solutions	Contact your Energy Trust Representative to consider having a study performed
Building 7	Retrofit air handlers with outdoor air monitoring devices and implement Demand Control Ventilation	Contact your Energy Trust Representative to consider having a study performed
Building 7	Upgrade fluorescent lighting throughout building to LED	Contact your Energy Trust Representative to consider having a study performed
Building 7	Implement daylight and occupancy sensors in areas that currently do not have it	Contact your Energy Trust Representative to consider having a study performed

PCC Sylvania Campus		
Building	**Capital Opportunity**	**Next Steps**
College Center Building	Lighting in Cafeteria fully lit during times of no occupancy	Install occupancy sensors to turn off lighting in areas when un-occupied.
College Center Building	Exhaust fans above individual cooking grills operate when no food prep or cooking occurring	Contact your Energy Trust Representative to consider having a study performed
College Center Building	Qty. 4 Make-up air units & 8 exhaust fans for Kitchen are left to operate all day when periods of no food prep or cooking occurs	Contact your Energy Trust Representative to consider having a study performed
Health Technology Building	Existing VFDs to control Pool Pumps are used for soft start only. Consider using VFDs to reduce flow & turn-over rate during periods when pool is not in use. It was observed in schedule that pool use is little to none over weekends.	Contact your Energy Trust Representative to consider having a study performed
Health Technology Building	Two Dessert Air heat recovery units for Natatorium require RCx and appear to not reduce air exchange rate during un-occupied periods	Contact your Energy Trust Representative to consider having a study performed
Health Technology Building	Dental Lab/classroom un-occupied with full lighting	Contact your Energy Trust Representative to consider having a study performed
Health Technology Building	Vacuum system for Dental Lab/classroom runs 24/7	Investigate a strategy to turn off system when not needed.
Health Technology Building	Natatorium lighting left on for egress is over lit. A number of high bay lighting could be turned off.	Measure light levels for sufficient egress and reduce number of fixtures left on during un-occupied hours.

Appendices

Definitions

Average Savings Rate: The rate of savings during the projected period (slope of CuSum graph), usually in units of (energy/day.) This quantity is used to project the current operating conditions over a 1 year period to determine the Projected Savings.

Baseline Period: The time duration that is taken to be representative of the baseline operations. The time may be significantly earlier than the program period, in which case adjustments to energy savings need to be made to account for the differences.

Baseline Data Points: The number of energy usage data points used to create the model, usually 12 or more.

Change-point Model: These models are used to align the energy use to temperature based on cooling only, neutral (float) and heating only. The model is straight linear regression (non-polynomial) and has a balance point where heating or cooling no longer occurs. These models were used in place of the polynomial models, when the p-values for the square of the temperature were greater than 0.05. The model takes the form:

Energy=a+b*(Temp)+c*(other energy drivers) +…

CuSum Savings: Cumulative sum of energy savings (electricity or natural gas) usually presented in a time series graph with kWh or natural gas as the vertical axis.

Incented Capital Savings: The total energy savings booked by the Energy Trust for providing incentives. These are usually capital projects completed during the program period, for which the program cannot claim savings (to avoid double counting.)

Measured Savings: The total savings measured by the MT&R model over the program period. This number is usually different then the Projected Savings.

Net Savings: The difference between the Projected Savings and any savings resulting from capital projects incented by the Energy Trust and implemented during the program period.

Net Incremental Savings: The difference between the Year 1 Net Savings and the Year 2 Net Savings. Used to determine the participant's energy incentive.

Polynomial Model: These models take the form:

Energy=a+b*(Temp)+c*(Temp^2)+d*(other energy drivers) +…

Savings Period: The time period over which the Projected Savings Rate is calculated from the CuSum graph.

Projected Savings: The product of Average Savings Rate and 365 days.

R2: R squared, describes how well a regression line fits a set of data.

Standard Error: The standard deviation of the data set, usually in units of (energy/day)

MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Building 2**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Classroom and high bay shops

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 School Closure Days	Y
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

The baseline period consists of 18 data points; however, the regression model consists of 17 data points (not a multiple of 12) with 1 data point removed. The regression is dependent on ambient weather, holidays, and school closure days. A single straight line regression is used.

Performance tracking for gas usage was completed through MT&R modeling, best results were achieved utilizing a:
Dual Changepoint (Heating season regression along with separate Cooling season Regression)

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion **(Rate 32CSF)**

The natural gas is a change point model that has both a summer and winter regression. The model covers Shop make up air units and specialized heaters for auto painting. The primary variable is ambient temperature.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
2142954468050	10382137AB		903384	706943	
0002 14295-789040-9	10382206AB		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		2,847,200	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		56,951

	Electricity		Natural Gas	
Baseline Period	1/28/2012	7/26/2013	10/26/2013	10/27/2014
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		Energy Trust Utility Query	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro Airport	

Program Period Electric Savings (kWh)	-	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	-	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

The baseline period was chosen because it showed the overall best R2 and p-values for gas usage for a period that showed the most consistent operations period closest to the start of the program period.

Adjusted Baseline Discussion:

Electric:

Adjusted baseline accounts for tighter HVAC scheduling on 1/6/14 which is prior to program start.

Natural Gas:

NO Adjusted Baseline Needed

Savings Discussion

Electric:

No savings.
Usage does not out perform previous year and estimated savings from capital lighting projects are not being realized at this time.

Gas:

No savings.
Increased usage occurs 1/2016 when automotive classes start back up. Believed to be from excessive exhaust use.

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

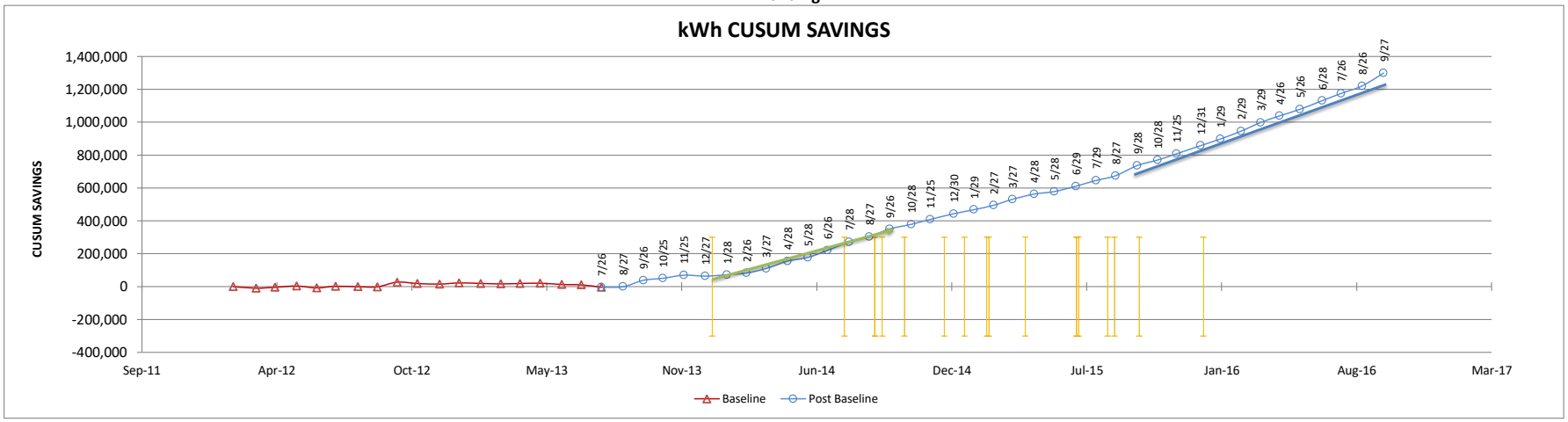
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
9/4/14	Custom LED Fixture	P00000917733	117,978			
9/4/14	Exterior LED Fixture, 90W or Less	P00000917734	12,767			
4/15/15	Occupancy sensing plug strip, self-install	P00001037557	2,196			
			132,941	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
9/18/15	Exterior LED Fixture, 40W or Less	P00001031629	79,772	0	0	0
			79,772	0	0	0

Portland Community College, Rock Creek

Building 2



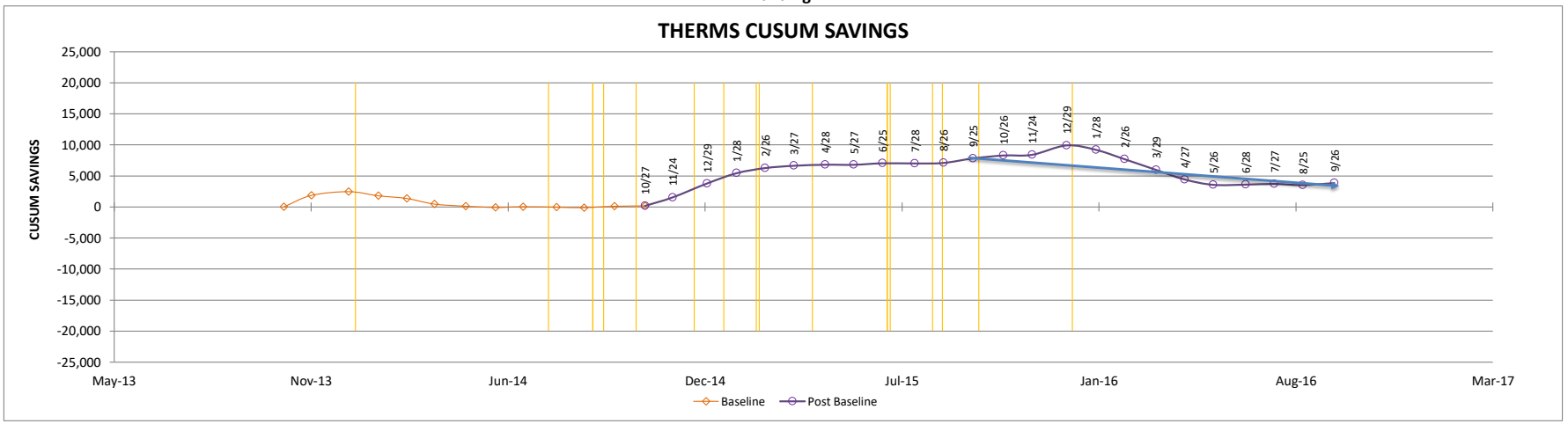
Electricity Savings Estimates

Baseline Period: Electric 1/28/2012 Thru 7/26/2013

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline	1/28/14	9/26/14	241	278,663	1,156.3	422,042	0	422042.1465		Adjusted baseline accounts for tighter HVAC scheduling on 1/6/14 which is prior to program start.
2015 Savings Period	9/26/14	9/28/15	367	385,952		-36,090	132,941	0	0	Several SEM opportunities were implemented during program period but savings did not out perform tighter HVAC scheduling that occurred prior to SEM program. No claimed savings at this time. Multiple opportunities exist and are expected through continual SEM effort. Capital savings removed from lighting project that ended just prior to SEM program.
2016 Savings Period	9/28/2015	9/27/2016	365	562,396		140,354	79,772	0	0	No savings. Usage does not out perform previous year and estimated savings from capital lighting projects are not being realized at this time.
2016 -- Participant Year 2						140,354	212,713	**-72,359**		

Portland Community College, Rock Creek

Building 2

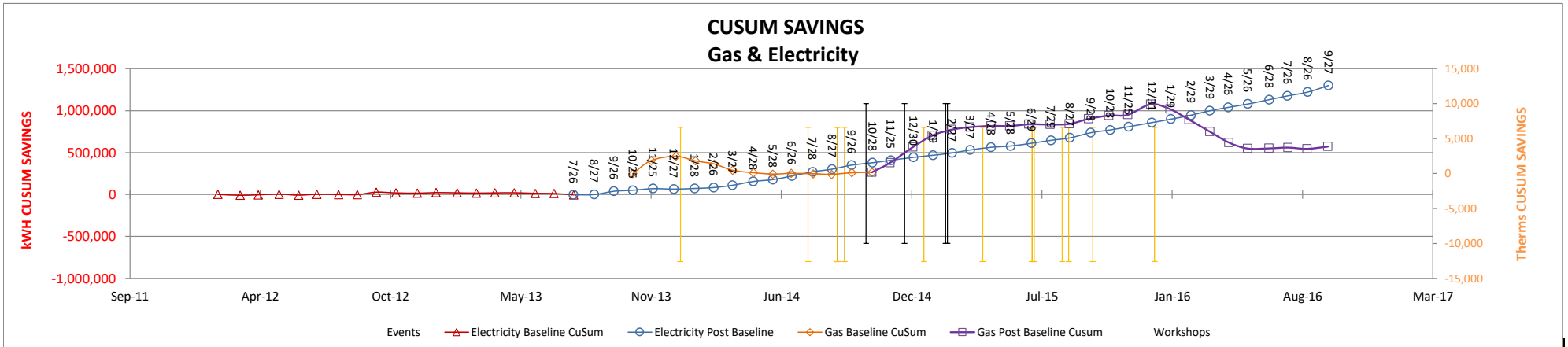


Natural Gas Savings Estimates

Baseline Period: Gas 10/26/2013 Thru 10/27/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline Needed
2015 Savings Period	10/27/14	9/25/15	333	7,649		8,384	0	8,384	8,384	Boiler PM and tighter HVAC scheduling has provided savings during heating season. More opportunities exist and additional savings are expected through better control of OSA air use.
2016 Savings Period	9/25/15	9/26/16	367	-3,969		-3,969	0	0	0	No savings. Increased usage occurs 1/2016 when automotive classes start back up. Believed to be from excessive exhaust use.
2016 -- Participant Year 2						-3,969	0	**-3,969**		

Portland Community College, Rock Creek **Building 2**



Operations Events and Projects Log (UPDATE MONTHLY!)

Enter operations actions/events and capital projects that are expected to affect energy consumption below

No.	Event/Project Type (pick from list)	Project / Event / Work order ID (if any)	Project Name / Event Description	Date	Scope of Project or Event	Energy Trust Incentives received for project? Y/N
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	SEM:		Change scheduling of AHU's to weekly from Monthly	01/06/14	Tighter look at AHU scheduling has reduced some run hours for equipment.	
15	SEM:		Doug has Boiler vendor do annual service on boilers	09/15/14	Boilers tuned up and serviced to make ready for heating season.	
16	SEM:		First meeting with Dean's and Admins to discuss SEM and energy savings	07/21/14	Leaders of the campus hear that emphasis will be on energy reductions thru SEM program	
17	SEM:		VAV Mall hallways shut off not needed (3 boxes)	07/03/15	Researched mall AHU's and found that boxes that fed other areas also fed mall. We shut these boxes off	
17	SEM:		RTU economizer tune-up	06/30/15	Test and verify	
18	SEM:		Boiler PM	01/15/15	Annual schedule and tune	
19	Ops:		Coil Cleaning	06/30/15	coils on AHU's cleaned.	
20	SEM:		Schedule Change on AHU Operation	08/25/15	1/2 hour shaved off run time per day for all AHU's in this building.	
21	SEM:		Occupant Engagement launched	08/15/15	In Service launch of campus wide energy savings campaign.	
22	SEM:	P00000917733	Custom LED Fixture	09/04/14	Working Electric Energy (kWh) 117,978	Y
23	SEM:	P00000917734	Exterior LED Fixture, 90W or Less	09/04/14	Working Electric Energy (kWh) 12,767	Y
24	SEM:	P00001037557	Occupancy sensing plug strip, self-install	04/15/15	Working Electric Energy (kWh) 2,196	Y
25	Ops:		Automotive & metals classes begin. Increase in space temp and exhaust operation	01/04/16		
26	Capital:	P00001031629	ETO Capital Project - Exterior LED Fixture, 40W or Less	10/01/15		Y

Portland Community College, Rock Creek **Building 2**

Baseline Period 1/28/2012 Thru 7/26/2013

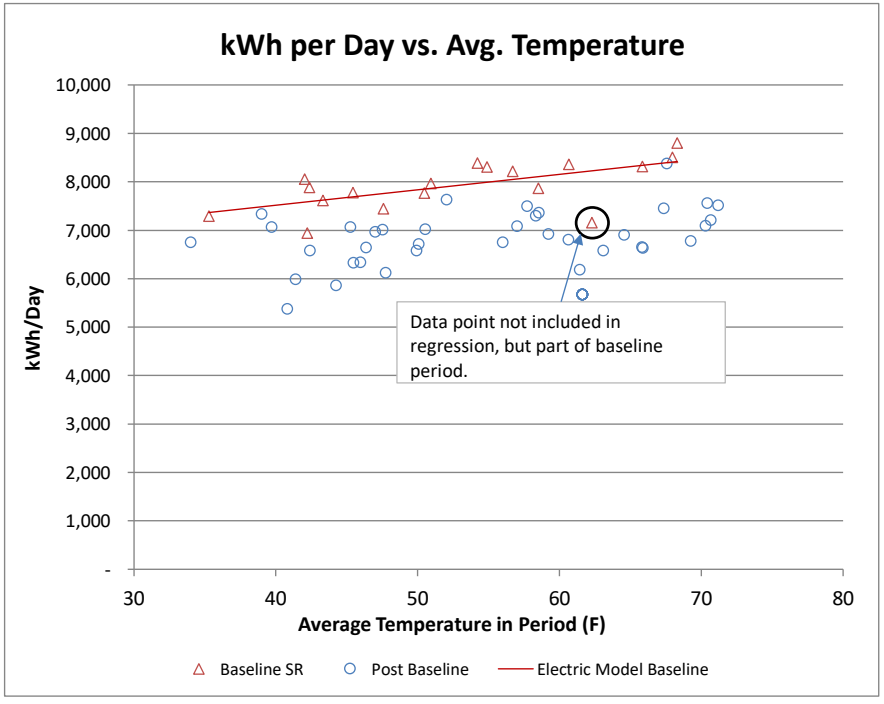
kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	179,947
Coefficients		***Units***	***P Values***
Constant	0.03677	kWh/SqFt-Day	9.85E-10
Variable 1 Averaged Mean Temperature	0.00015	kWh/SqFt-Day-F	0.007659938
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 School Closure Days	-0.00109	kWh/SqFt-Day-Holidays/Events	0.039022359
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

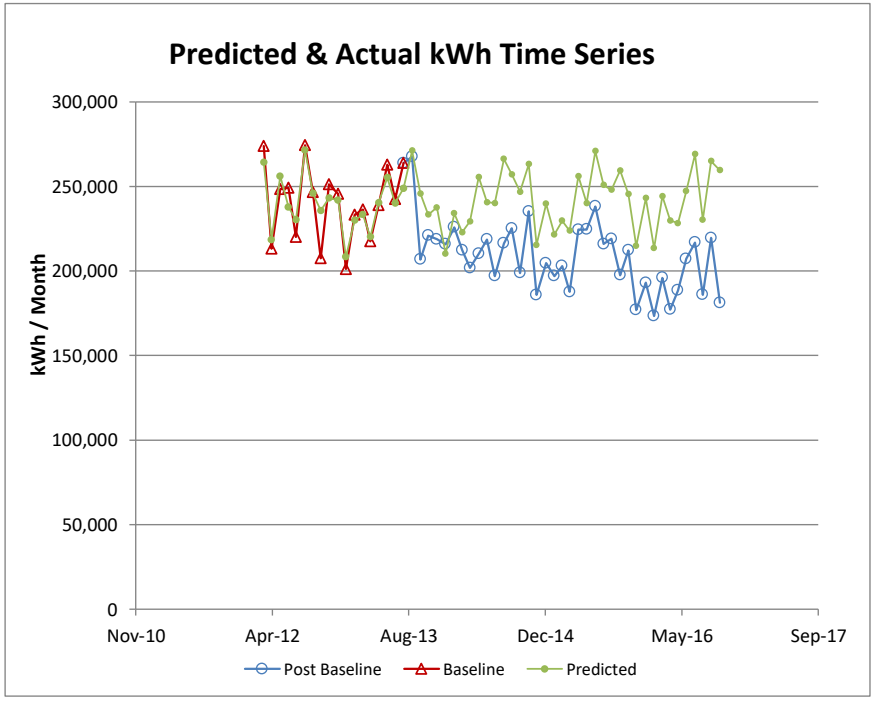
Regression Statistics	
Multiple R	0.7432
R Square	0.5523
Adjusted R Square	0.4926
Standard Error	355.97
Observations	18

Model Type: Simple Regression Model

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	179,947
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 School Closure Days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





Portland Community College, Rock Creek **Building 2**

Baseline Period 10/26/2013 Thru 10/27/2014

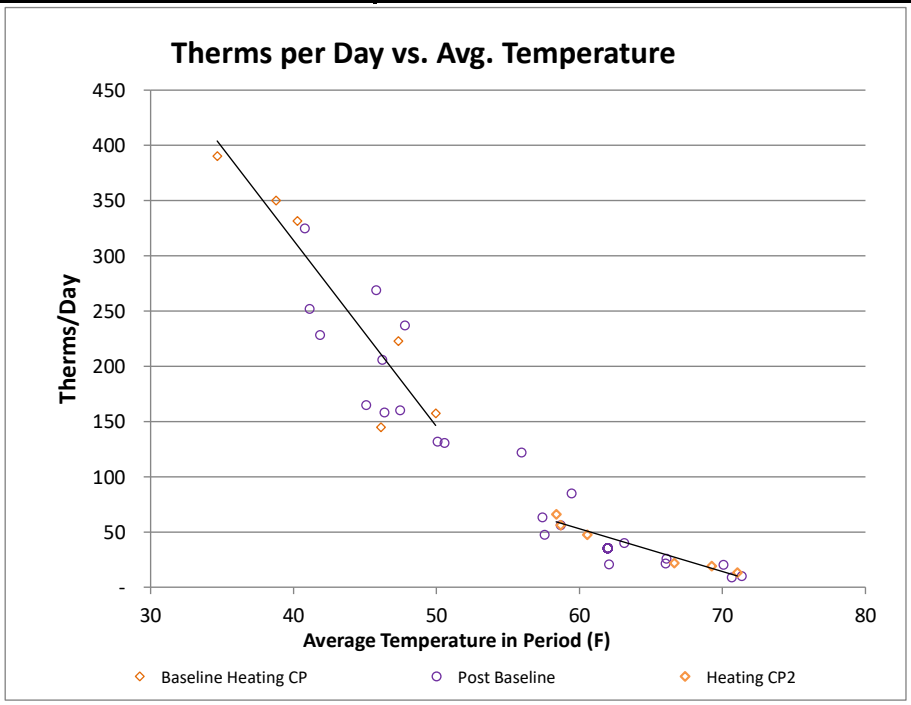
Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	179,947
Coefficients		***Units***	***P Values***
Base Load	0.005490935	Therms/SqFt-Day	0.001725323
Variable 1 Averaged Mean Temperature	-9.3658E-05	Therms/SqFt-Day-F	0.005350501
Variable 2 Temp²	0	Therms/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	0
Average of Variable 5	0	0	0

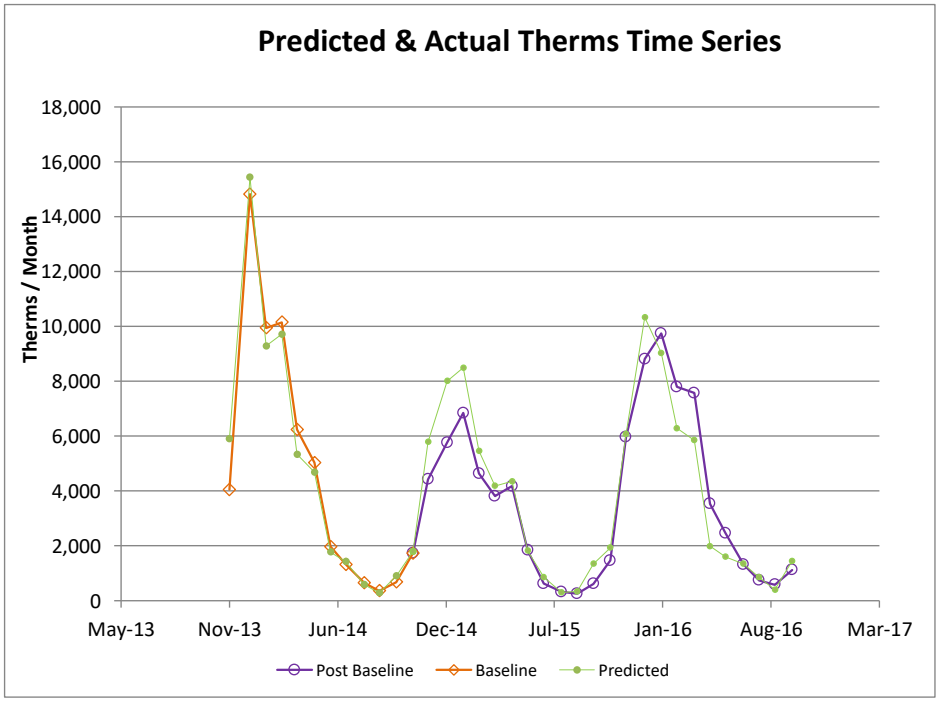
Regression Statistics	
Multiple R	0.9397
R Square	0.8830
Adjusted R Square	0.8537
Standard Error	40.16
Observations	6

Model Type: Dual Changepoint (Heating season regression along with separate Cooling season Regression)

Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	179,947
Coefficients		***Units***	***P Values***
Base Load	0.001584362	Therms/SqFt-Day	0.00038088
Variable 1 Averaged Mean Temperature	-2.15081E-05	Therms/SqFt-Day-F	0.000646166
Variable 2 Temp²	0	Therms/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	
Average of Variable 5	0	0	

Regression Statistics	
Multiple R	0.9792
R Square	0.9588
Adjusted R Square	0.9485
Standard Error	5.01
Observations	6





MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Building 3**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			classrooms and offices

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:

Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

The regression and baseline is for a 12 month period that best represents normal usage and was close to the beginning of SEM program. Ambient weather was the only variable used that had excellent P-values while Temp² ,holidays, and school closure dates did not have a strong enough correlation. A single straight line regression is used.

Performance tracking for gas usage was completed through MT&R modeling, best results were achieved utilizing a:

No Gas accounts were enrolled for this site.

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

No gas modeling for this report. Meter serves only gas fired kilms.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
0002 14295-787884-2	AB10382186		441671	974828	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		1,502,600	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		N/A

	Electricity		Natural Gas	
Baseline Period	9/27/2013	9/26/2014	10/27/2011	12/29/2011
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		N/A	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro, Oregon Airport	

Program Period Electric Savings (kWh)	**-**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

No Adjusted Baseline Used

Natural Gas:

N/A

Savings Discussion

Electric:

No savings. Value forced to Zero.
Increase in performance can only be attributed to relocation of kitchen and reduced occupancy due to seismic upgrade capital project. ETO capital lighting project completes late PY 2015.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

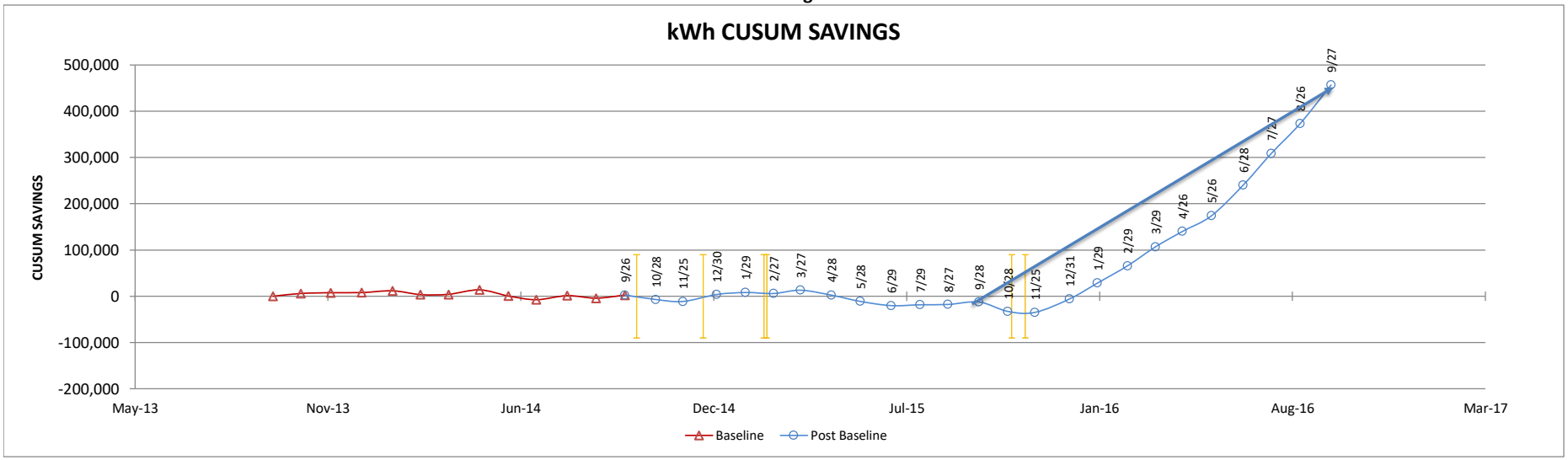
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
8/31/15	Exterior LED Fixture, 40W or Less	P00001031628	13,827			
			13,827	0	0	0

Portland Community College, Rock Creek

Building 3

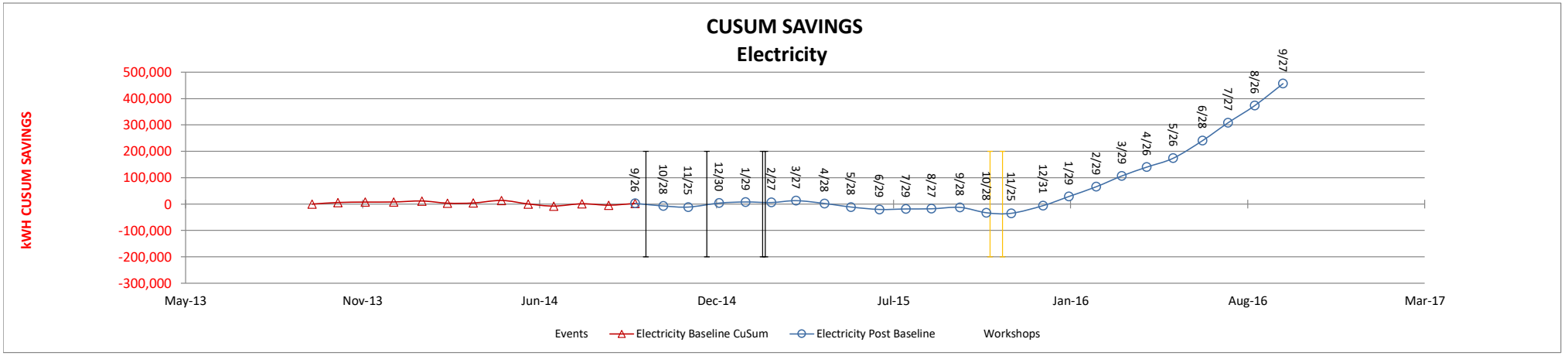


Electricity Savings Estimates

Baseline Period: Electric 9/27/2013 Thru 9/26/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Projected 12 month savings (adjusted ave daily savings rate * 365)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Total 12 Month SEM savings	Inc 12 Month SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		No Adjusted Baseline Used
2015 Savings Period	9/26/14	9/28/15	367	-15,237		-15,154	0	0	0	No SEM events OR savings identified.
2016 Savings Period	9/28/2015	9/27/2016	365	469,216		469,216	13,827	0	0	No savings. Value forced to Zero. Increase in performance can only be attributed to relocation of kitchen and reduced occupancy due to seismic upgrade capital project. ETO capital lighting project completes late PY 2015.
2016 -- Participant Year 2						469,216	13,827	**455,389**		

Portland Community College, Rock Creek **Building 3**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/08/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13	?		**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?					
15	SEM:		Tighter HVAC schedule implemented. Shortened daily schedule. Shortened Optimal Start by 1/2 hour	11/15/15		
16	Capital:		Renovation project begins. Kitchen re-located to building 5 and space renovated for classrooms. In addition, seismic upgrade co-incised with renovation.	11/01/15	Laura to check with Physical Plant to identify any SEM opportunities implemented.	

Portland Community College, Rock Creek **Building 3**

Baseline Period 9/27/2013 Thru 9/26/2014

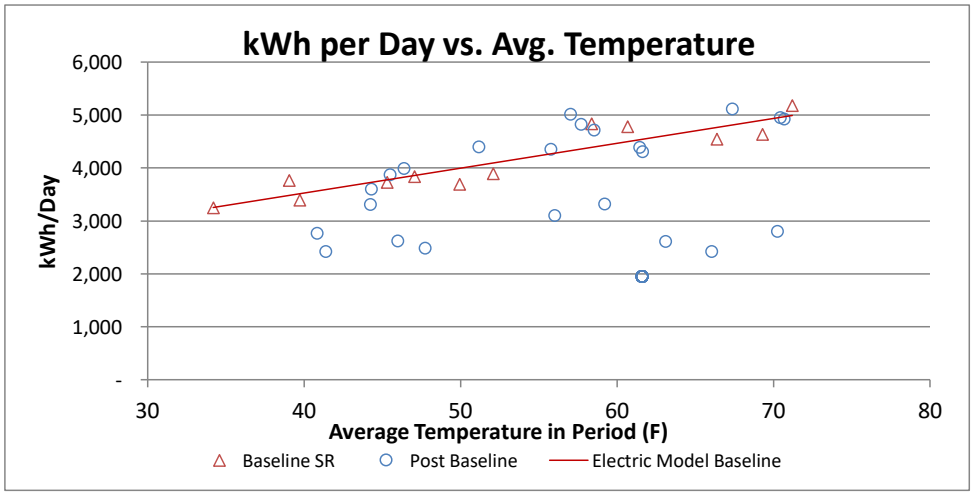
kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	80,877
Coefficients		***Units***	***P Values***
Constant	0.02030	kWh/SqFt-Day	0.000652224
Variable 1 Averaged Mean Temperature	0.00058	kWh/SqFt-Day-F	1.94549E-05
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

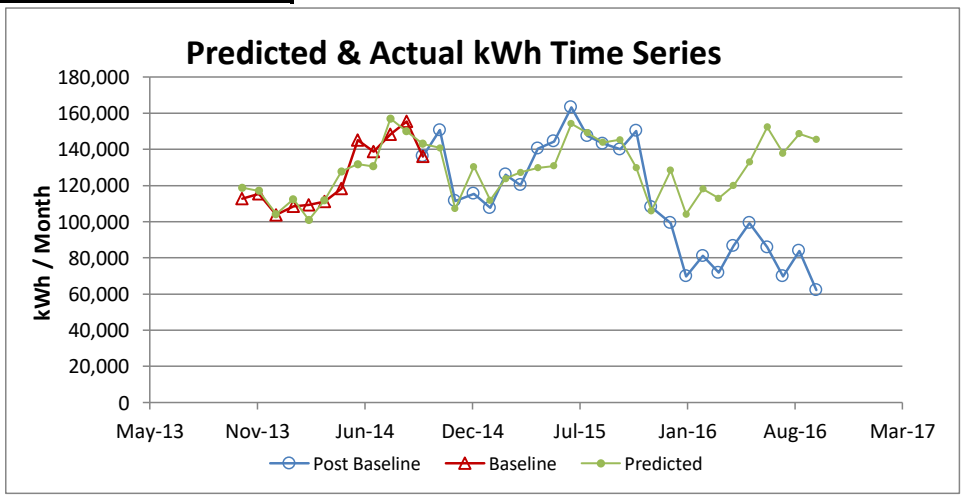
Regression Statistics	
Multiple R	0.9224
R Square	0.8508
Adjusted R Square	0.8359
Standard Error	256.22
Observations	12

Model Type: Simple Regression Model

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	80,877
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	
SUM of Variables 4	0.00000	0	
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Building 6**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Air craft hanger and classrooms

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:

Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	y
V2	Variable 2 Temp²	n
V3	Variable 3 Holidays, Break days or Event days per Month	y
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

Building runs year around and load mainly consists of lighting and shop equipment with little HVAC influence. Very flat usage throughout the year causes a poor R2 value and very poor P-values for temperature. Regression R2 is still substandard but improves when using Holiday and school closure dates only Nevertheless the regression likely provides better results than simply using a constant kWh/day.

No Gas accounts were enrolled for this site.

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
0002 14295-789188-6	AB09833207		N/A	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		340,560	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		N/A

	Electricity		Natural Gas	
Baseline Period	9/27/2013	9/26/2014	3/1/2013	3/31/2013
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		N/A	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro, Oregon Airport	

Program Period Electric Savings (kWh)	**-**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

No Adjusted Baseline Used

Natural Gas:

N/A

Savings Discussion

Electric:

No savings.
Previous lighting project accounts for savings this period. No SEM events activities recorded for any other savings.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

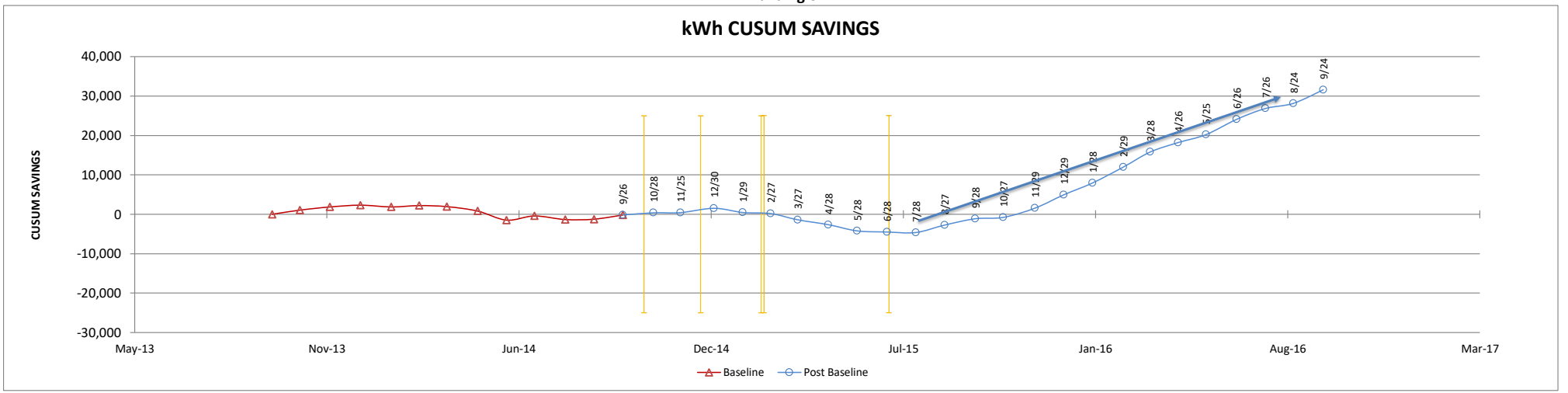
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
6/30/15	ETO lighting upgrade (High Bay lighting)	ETEBPS1530904579	35,028	0	0	0
			35,028	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0
			0	0	0	0

Portland Community College, Rock Creek

Building 6

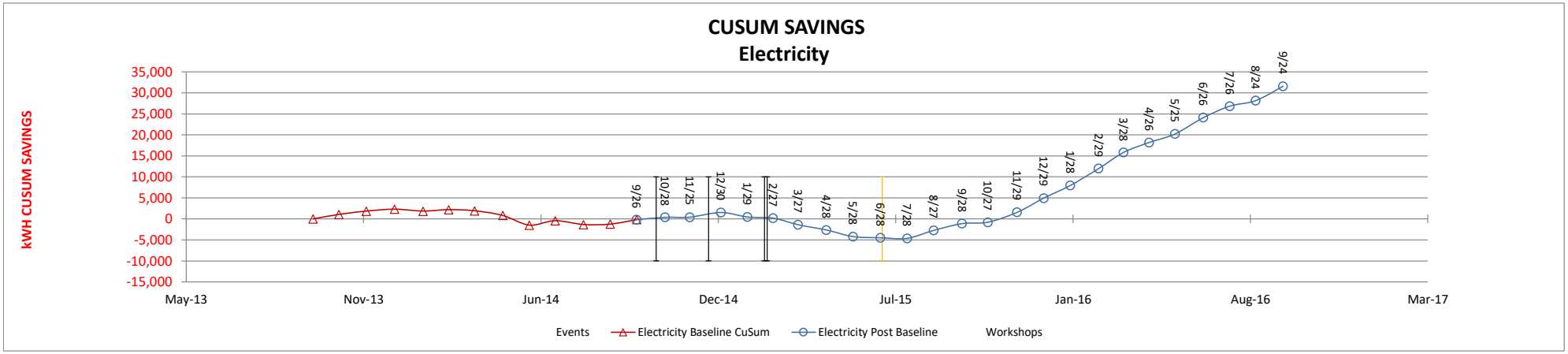


Electricity Savings Estimates

Baseline Period: Electric 9/27/2013 Thru 9/26/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		No Adjusted Baseline Used
2015 Savings Period	9/26/14	9/28/15	367	-949		-944	35,028	0	0	ETO incentived high bay lighting project completed 6/30/15. Project savings are subtracted and no SEM savings are identified. No other SEM events are recorded.
2016 Savings Period	9/28/2015	9/24/2016	362	32,707		32,707	0	0	0	No savings. Previous lighting project accounts for savings this period. No SEM events activities recorded for any other savings.
2016 -- Participant Year 2						32,707	35,028	**-2,321**		

Portland Community College, Rock Creek **Building 6**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13	?		**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	Capital:	ETEBPS1530904579	ETO lighting upgrade (High Bay lighting)	06/30/15	35,028 annual kWh saved	y

Portland Community College, Rock Creek **Building 6**

Baseline Period 9/27/2013 Thru 9/26/2014

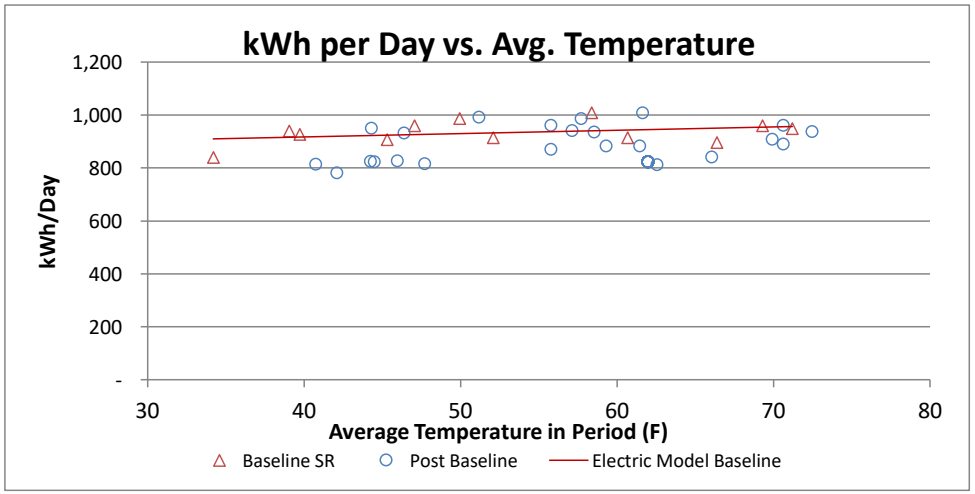
kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	32,692
Coefficients		***Units***	***P Values***
Constant	0.02909	kWh/SqFt-Day	3.88447E-15
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	-0.00059	kWh/SqFt-Day-Holidays/Events	0.028540745
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

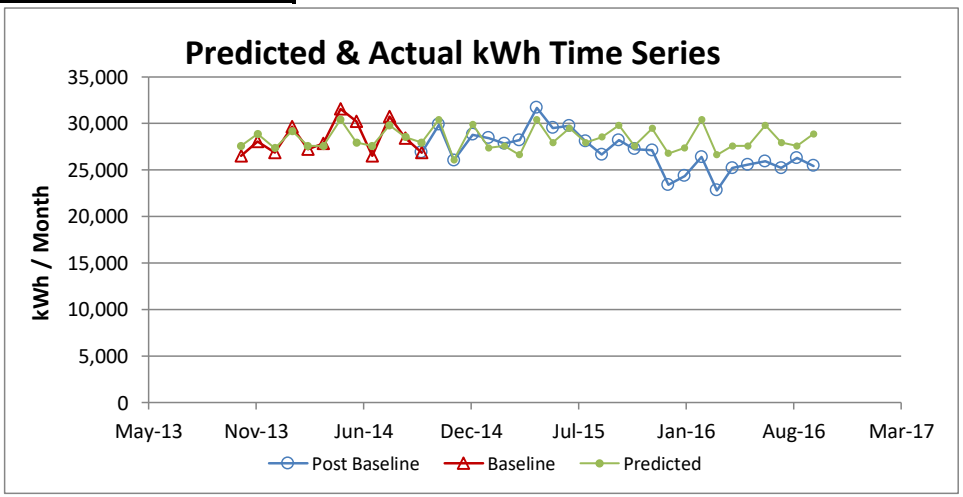
Regression Statistics	
Multiple R	0.6287
R Square	0.3953
Adjusted R Square	0.3348
Standard Error	36.20
Observations	12

Model Type: Simple Regression Model

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	32,692
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Building 7**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			2 story building with clasrooms and labs

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:

Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	Y
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

The regression model is 16 data points that begins in the summer of 2012 and ends the Fall of 2013. After the November 25, 2013 read date, there is a significant change in performance from an expansion/renovation project that lasts into the summer of 2014 and then takes full occupancy 10/2014. An adjusted baseline is required to account for increased square footage and usage.
The regreession model itself is a single reqression (quadratic) with weather as the only cause of energy variability.

Performance tracking for gas usage was completed through MT&R modeling, best results were achieved utilizing a:

Simple Regression Model

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	Y
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

This model is a single regression Quadratic using temp and temp2. Baseline period ends just prior to renovation project. During project, there is added square footage and significant increase in usage. Holiday and school closure days did not have enough correlation to be used.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
0002 14295-660185-6	AB10382205		1393228	834524	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		1,285,200	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		67,168

	Electricity		Natural Gas	
Baseline Period	7/31/2012	11/25/2013	8/25/2012	8/27/2013
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		Other	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro Airport	

Program Period Electric Savings (kWh)	**78,690**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**16,416**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

The baseline period was chosen because it showed the overall best R2 and p-values for gas usage for a period that showed the most consistent operations period closest to the start of the program period.

Adjusted Baseline Discussion:

Electric:

Post baseline adjusted for added square footage that was occupied October 2014

Natural Gas:

Post baseline adjusted for added square footage that was occupied October 2014

Savings Discussion

Electric:

Savings do not out perform previous year. ETO capital project deduction is pro-rated for replacement of two chillers. New equipment started up 6/2016. Savings also related to a higher awareness to energy use, tighter HVAC scheduling occurs about same time.

Gas:

Winter heating setpoint is forgotten and not lowered until 6/2016. Otherwise, no other SEM events recorded this PY.

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

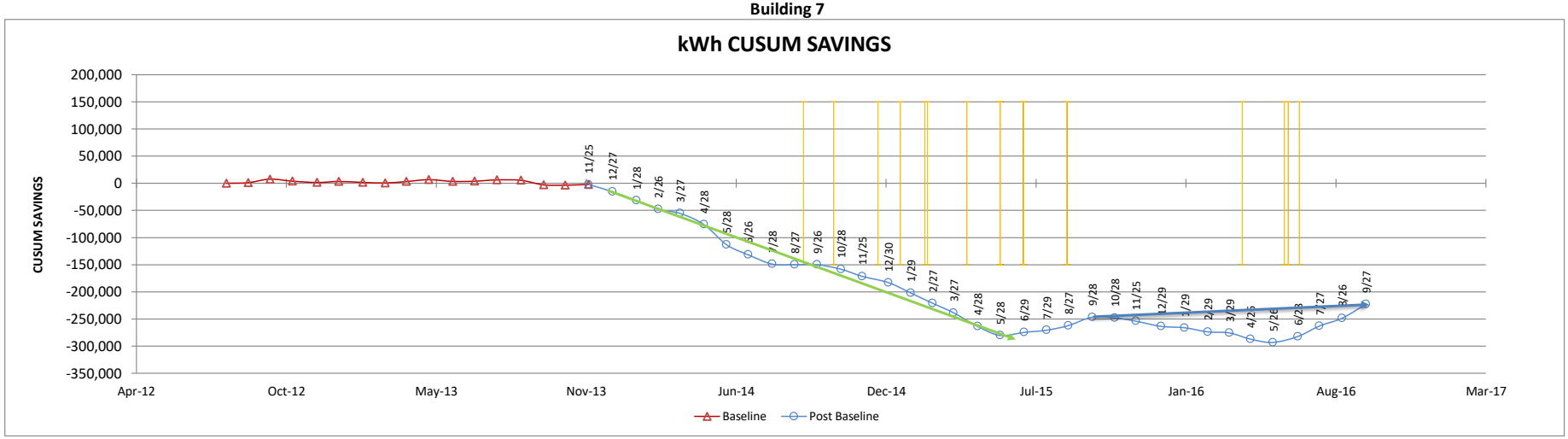
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
9/8/14	LEED - NC	P00000480087	28,185			
			28,185	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/15/16	PCC - Rock Creek Bldg 7 Chiller Upgrade	P00001032478	229,886	0	103,921	0
			229,886	0	103,921	0

Portland Community College, Rock Creek

Building 7



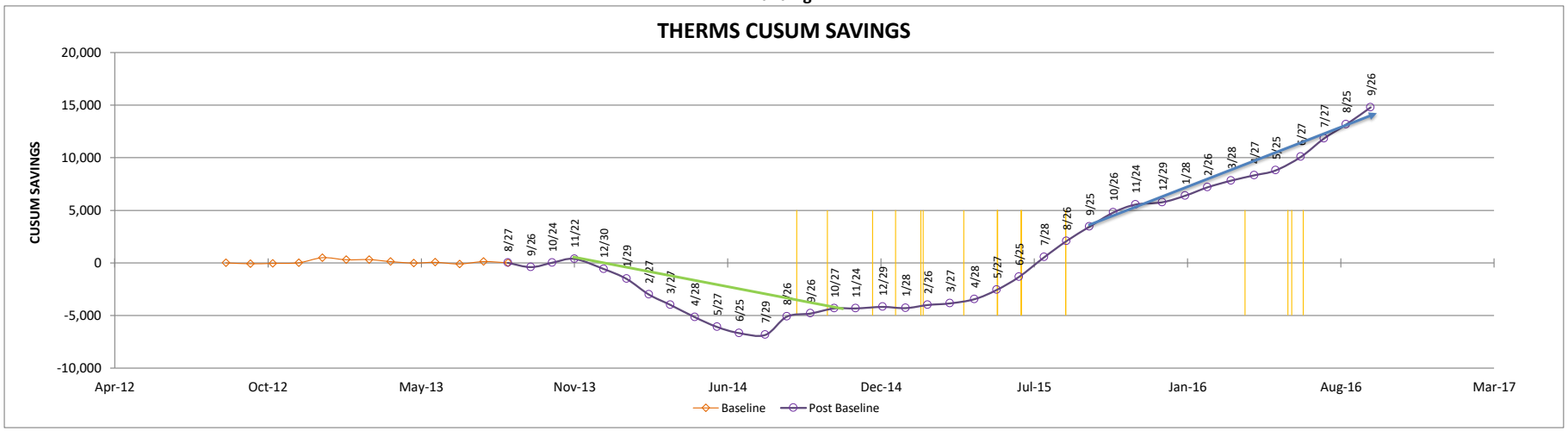
Electricity Savings Estimates

Baseline Period: Electric 7/31/2012 Thru 11/25/2013

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline	12/27/13	5/28/15	517	-264,826	-512.2	(186,966)	0	-186966.1274		Post baseline adjusted for added square footage that was occupied October 2014
2015 Savings Period	5/28/15	9/28/15	123	33,763		287,158	28,185	258,973	258,973	Tighter scheduling and PMs account for savings that begin 5/2015. It is expected that savings will continue and are not only seasonal.
2016 Savings Period	9/28/2015	9/27/2016	365	23,830		210,796	103,921	78,690	0	Savings do not out perform previous year. ETO capital project deduction is pro-rated for replacement of two chillers. New equipment started up 6/2016. Savings also related to a higher awareness to energy use, tighter HVAC scheduling occurs about same time.
2016 -- Participant Year 2						**210,796**	132,106	**78,690**		**0**

Portland Community College, Rock Creek

Building 7

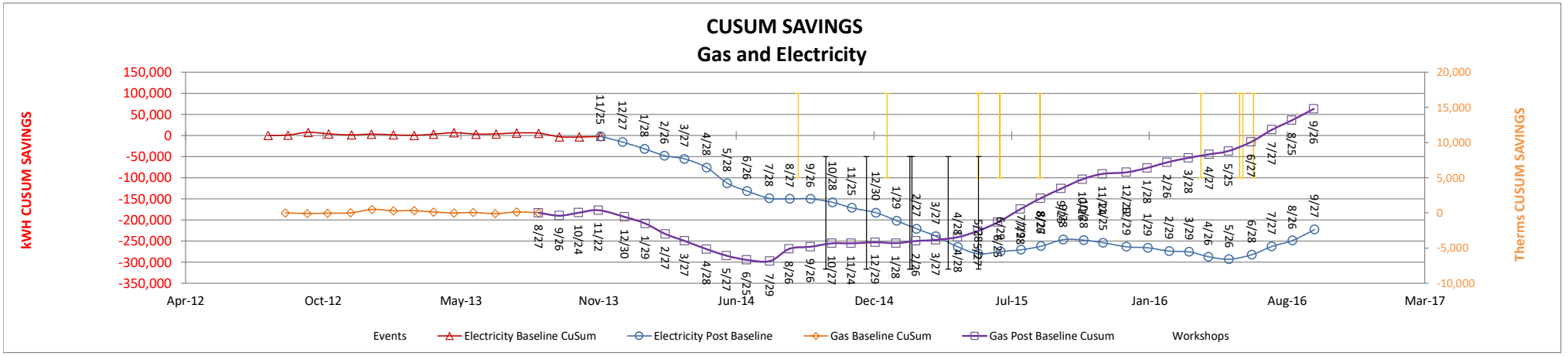


Natural Gas Savings Estimates

Baseline Period: Gas 8/25/2012 Thru 8/27/2013

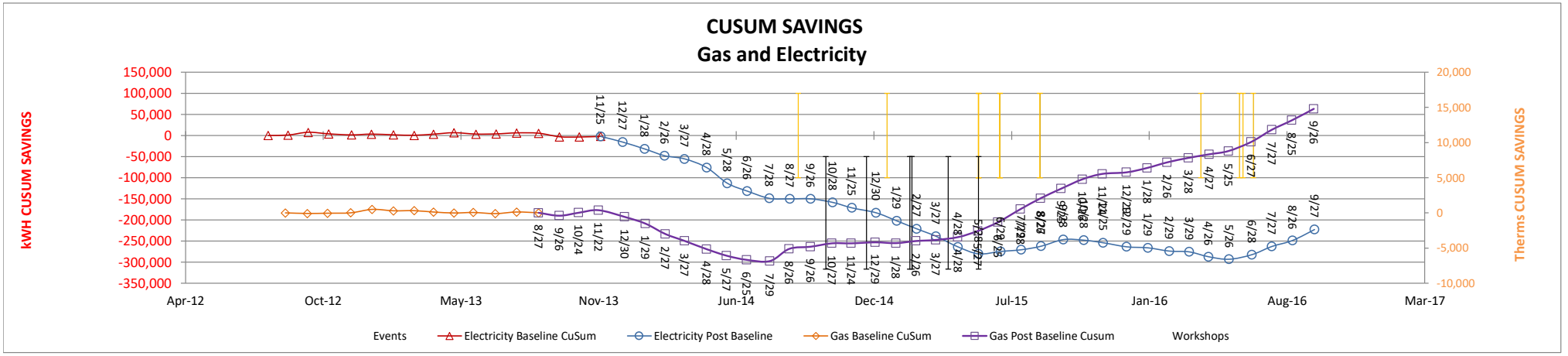
Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline	11/22/13	10/27/14	339	-4,707	-13.9	(5,068)	0	-5067.960971		Post baseline adjusted for added square footage that was occupied October 2014
2015 Savings Period	2/26/15	9/25/15	211	7,444		17,945	0	17,945	17,945	From event log, savings begin after 1/2015 boiler PM and then increase after tighter scheduling in 5/2015. Most of the savings will be consistent with seasonality usage but will continue throughout the year.
2016 Savings Period	9/25/15	9/26/16	367	11,348		16,416	0	16,416	0	Winter heating setpoint is forgotten and not lowered until 6/2016. Otherwise, no other SEM events recorded this PY.
2016 -- Participant Year 2						16,416	0	**16,416**		0

Portland Community College, Rock Creek **Building 7**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Workorder ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop	04/14/15	Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement	05/28/15	Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	SEM:		Schedule change on AHU-1	06/28/15	AHU-1 Modify hours of operation from 2am to 11pm M-Sunday to 7am to 6pm M-F Sat 8am to 5 pm	
15	SEM:		Schedule change on AHU-2	05/28/15	AHU-2 Modify hours of operation from 7am to 10pm M-F to 7am to 9:30pm M-F. Sat from 7am to 4:30 pm to 8am to 4:30 pm.	
16	SEM:		Schedule change AHU-3	05/28/15	AHU-3 Modify hours of operation from 6:30am to 9:30pm M-F to 7am to 9pm M-T. Weds- Thurs 7am to 10pm. Friday 7am to 5 pm. Sat from 7am to 6pm to Sat 8am to 5 pm.	
17	SEM:		Schedule change AHU-4	05/28/15	AHU-3 Modify hours of operation from 6:30am to 9:30pm M-F to 7am to 9pm M-T. Weds- Thurs 7am to 10pm. Friday 7am to 5 pm. Sat from 7am to 6pm to Sat 8am to 5 pm.	
17	SEM:		Coooling coils cleaned on all AHU's	06/28/15	cleaned coils. This should reduce fan energy as well as improve cooling coil performance and may decrease cooling load.	
18	SEM:		economizers and dampers tuned up	06/28/15	economizer damper function and programing checked and tuned up.	
19	SEM:		Boiler tune ups and checks	01/15/15	tuned and adjusted boilers	
20	SEM:		Heating coil on AHU 1 leaking thru. Fixed leak	05/28/15	lowered load on boiler and cooling load as well.	
21	SEM:		Schedule Change AHU-1	08/25/15	re adjusted schedule to shave 1/2 hour off of run time per day on AHU.	
22	SEM:		Schedule Change AHU-2	08/25/15	re adjusted schedule to shave 1/2 hour off of run time per day on AHU.	
23	Capital:	P00000480087	LEED - NC	09/08/14	Working Electric Energy (kWh) 28,185	Y

Portland Community College, Rock Creek **Building 7**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	Event/Project Type (pick from list)	Project / Event / Workorder ID (if any)	Project Name / Event Description	Date	Scope of Project or Event	Energy Trust Incentives received for project? Y/N
24	Capital:	P00001032478	ETO capital for two chiller replacement.	04/15/16	Estimated savings 229,886 kWh	Y
25	SEM:		schdeule some how got changed to 4am start changed back to 6:30 start	06/15/16	Should see Improvement in the electrical usage.	
26	SEM:		HWS Temp change	06/10/16	Found supply temp setpoint at 200 should be 180 reset to the 180.	
27	Ops:		Chiller-1 operational and Chiller-2 comes online. Operational issues resolved but not commissioned. Future date not set but will be commissioned.	06/30/16		

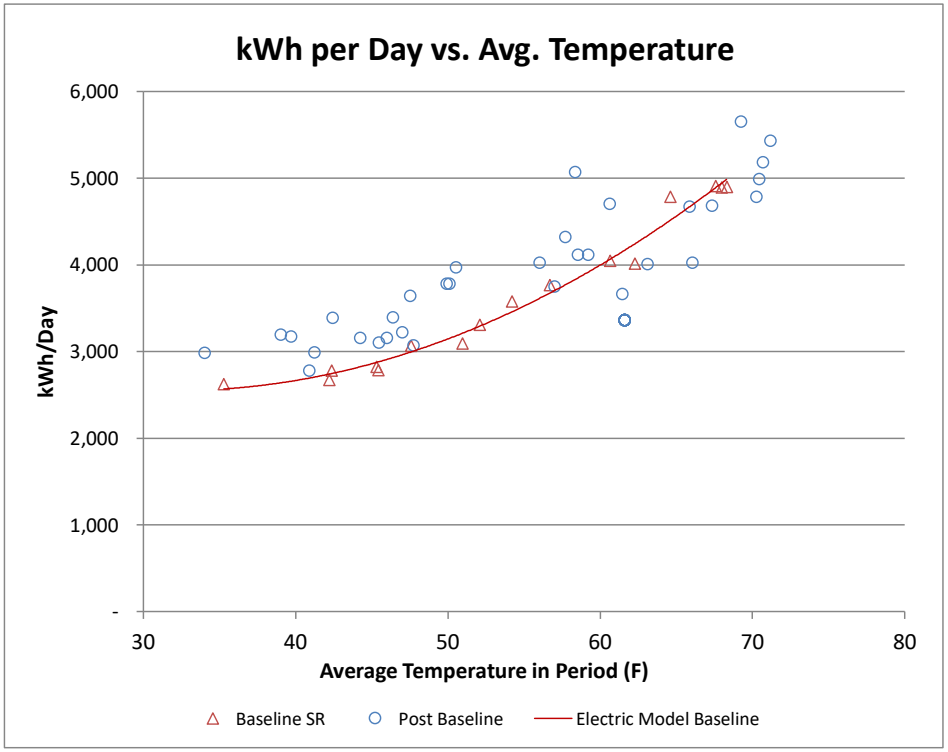
Portland Community College, Rock Creek **Building 7**

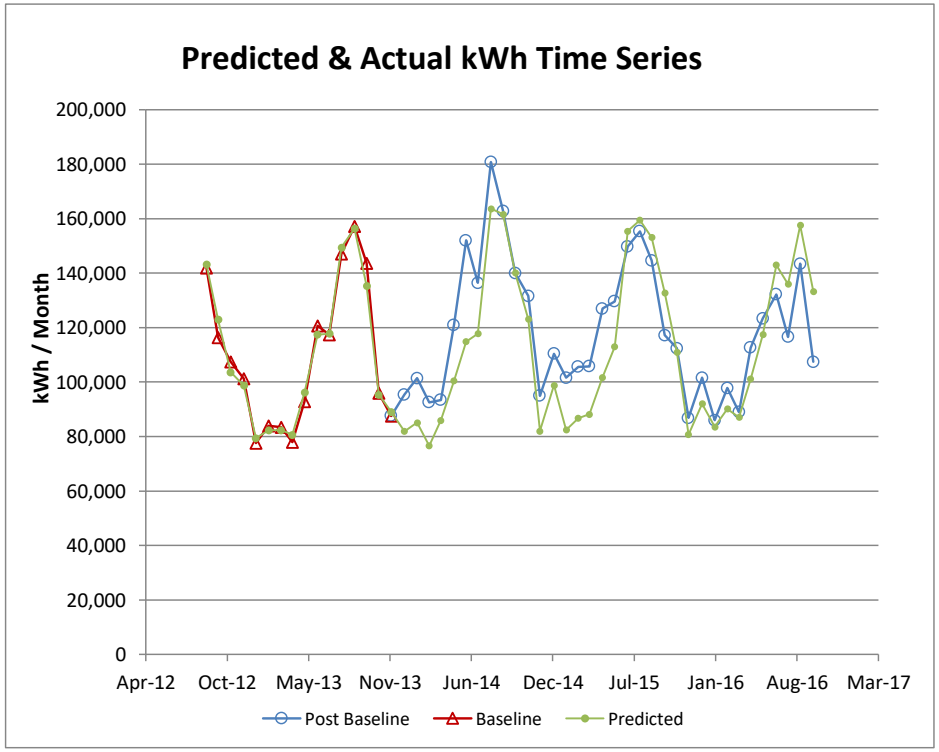
Baseline Period 7/31/2012 Thru 11/25/2013

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	126,500
Coefficients		***Units***	***P Values***
Constant	0.03552	kWh/SqFt-Day	0.000245525
Variable 1 Averaged Mean Temperature	-0.00095	kWh/SqFt-Day-F	0.003880004
Variable 2 Temp²	0.00001	kWh/SqFt-Day-F²	5.60748E-05
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.9919
R Square	0.9839
Adjusted R Square	0.9815
Standard Error	117.95
Observations	16

Model Type: Simple Regression Model





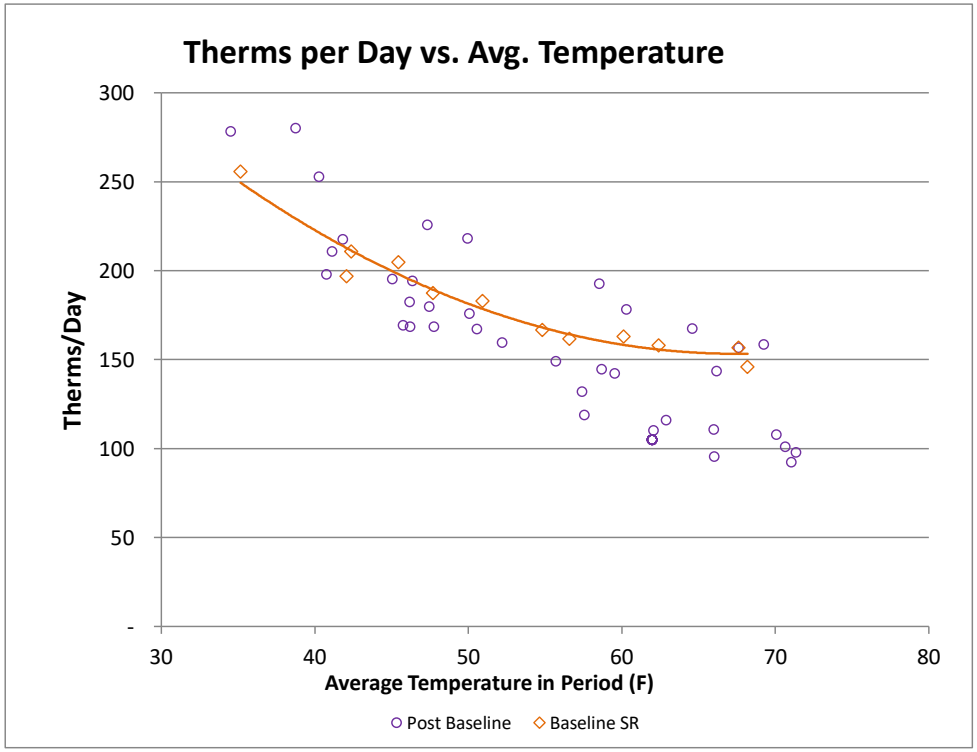
Portland Community College, Rock Creek **Building 7**

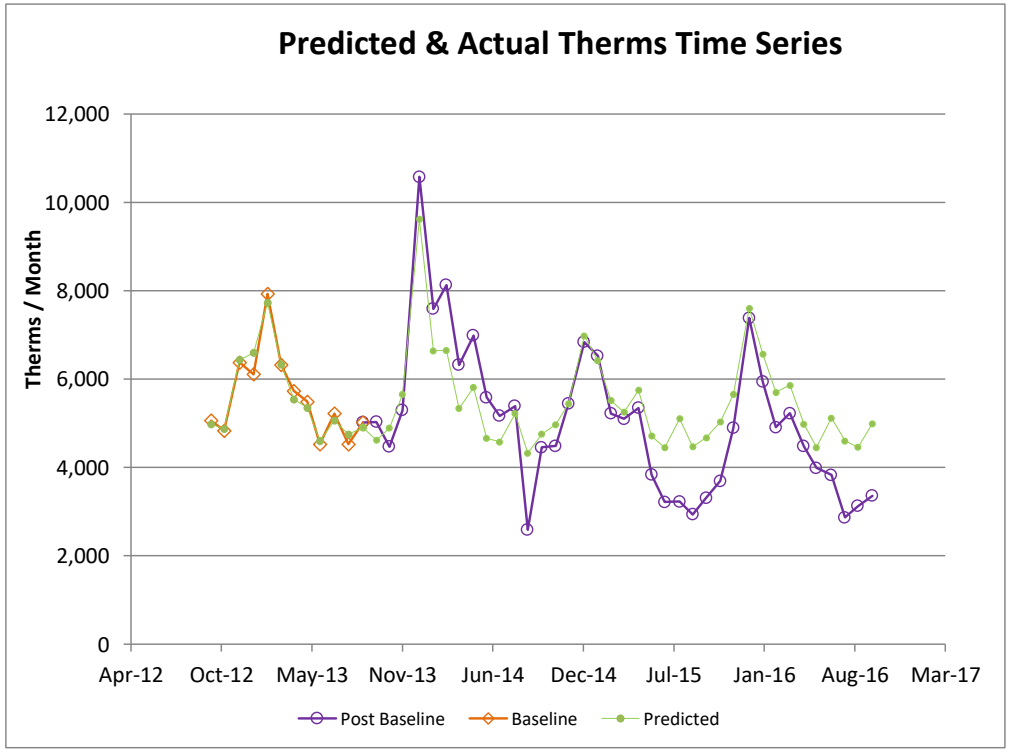
Baseline Period 8/25/2012 Thru 8/27/2013

Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	126,500
Coefficients		***Units***	***P Values***
Constant	0.00452255	Therms/SqFt-Day	4.02803E-06
Variable 1 Averaged Mean Temperature	-9.81069E-05	Therms/SqFt-Day-F	0.000376966
Variable 2 Temp²	7.26767E-07	Therms/SqFt-Day-F²	0.001932182
Variable 3 Holidays, Break days	0	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	0
Average of Variable 5	0	0	0

Model Type: Simple Regression Model

Regression Statistics	
Multiple R	0.9779
R Square	0.9562
Adjusted R Square	0.9465
Standard Error	7.16
Observations	12





MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Building 9**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Library, Event Center, Classroom

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:

Single Changepoint Model with Cooling Season Regression

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

12 month Cooling Changepoint model using only ambient temp. Temp² and holidays had no correllation in regression and are not used.
PV Array farm came online 5/2012. Due to the seasonal ability of PV Array farm to produce more than building consumes, kWh data beginning 6/2012 (pre-baseline) is taken from the PV Array monitoring website and not from PGE utility bill.

Performance tracking for gas usage was completed through MT&R modeling, best results were achieved utilizing a:

Single Changepoint Model with Heating Season Regression

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

*Note - PY 2015 used 12 month Single Regression model. PY 2016 uses new gas model as a Heating single changepoint using 24 months with two outliers removed from regression. Ambient Temp only significant correlation to regression. Holidays verified but provide low P-value and removed.
Heating season changover occurs below 52°F however, over cooling of building in summer requires boiler use year around and sporadic summer usage indicates continous operational changes.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
0002 14295-797298-3	10380164		1281051	882854	
SolarCity PV Array	MONITORED Daily kWh PV Array		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		963,238	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		25,418

	Electricity		Natural Gas	
Baseline Period	11/1/2013	10/31/2014	10/25/2012	10/24/2014
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		Energy Trust Utility Query	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro, Oregon Airport	

Program Period Electric Savings (kWh)	**-**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**10,342**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

The baseline period was chosen because it showed the overall best R2 and p-values for gas usage for a period that showed the most consistent operations period closest to the start of the program period.

Adjusted Baseline Discussion:

Electric:

No Adjusted Baseline Used

Natural Gas:

NO Adjusted Baseline used

Savings Discussion

Electric:

No savings.
Unknown cause for increase in usage that occurs after 1/2016 but a renovation project coincides about same time frame.
ETO capital lighting project completes 10/2015. PV Array monitoring equipment loses communications 10/27/15 to 12/10/15 and daily consumption is estimated from 2014 data.
A chiller sequence tune-up occurs prior to summer.

Gas:

No new SEM events to account for additional savings this period other than previous years operational changes, reduced summer boiler operation, and a higher awareness to energy usage.

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

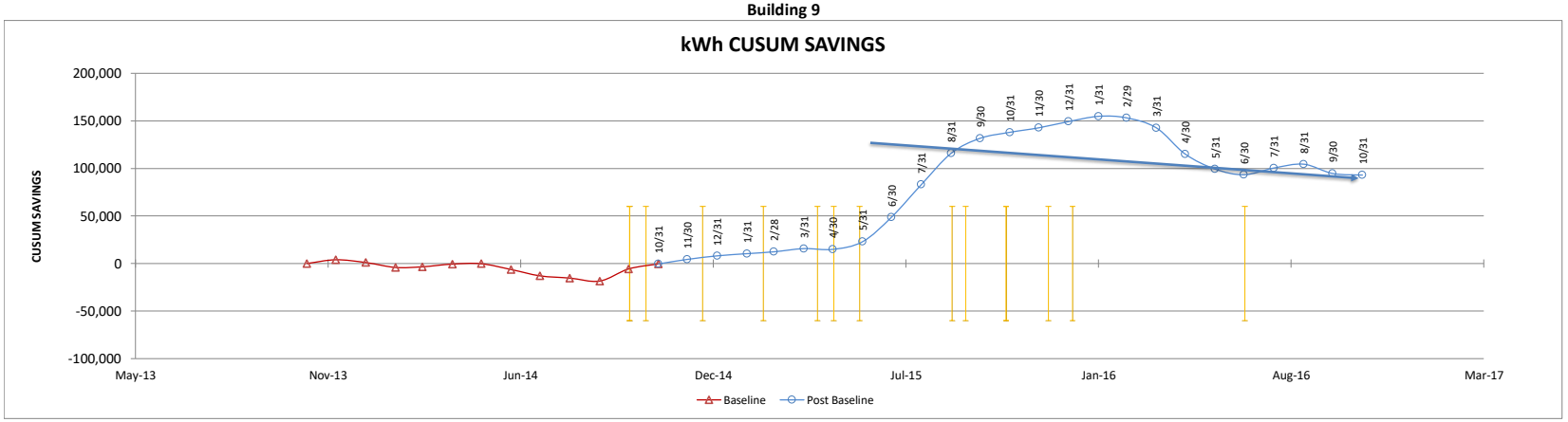
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
9/1/15	LED fixture or fixture kit, 60W or less	P00001042758	15,785	0	0	0
			15,785	0	0	0

Portland Community College, Rock Creek

Building 9

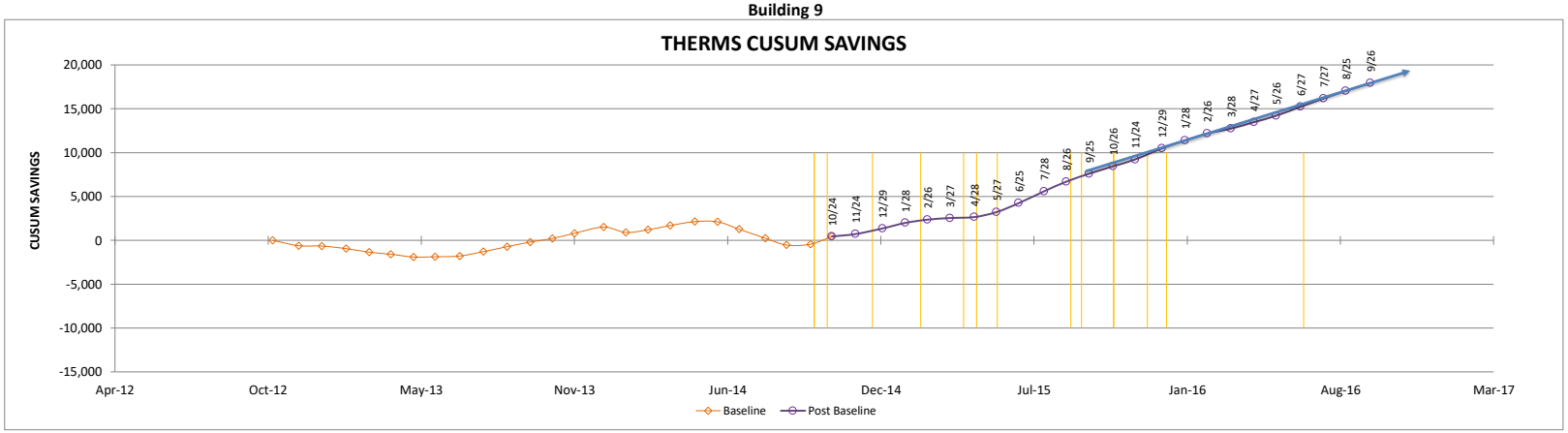


Electricity Savings Estimates

Baseline Period: Electric 11/1/2013 Thru 10/31/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		No Adjusted Baseline Used
2015 Savings Period	10/31/14	9/30/15	334	132,083		144,342	0	144,342	144,342	2 chillers replaced 10/2014. AHU tune-up around beginning of SEM program account for savings. New chillers come on-line 4/2015.
2016 Savings Period	9/30/2015	9/30/2016	366	-36,986		-36,986	15,785	0	0	No savings. Unknown cause for increase in usage that occurs after 1/2016 but a renovation project coincides about same time frame. ETO capital lighting project completes 10/2015. PV Array monitoring equipment loses communications 10/27/15 to 12/10/15 and daily consumption is estimated from 2014 data. A chiller sequence tune-up occurs prior to summer.
2016 -- Participant Year 2						-36,986	15,785	**-52,771**		0

Portland Community College, Rock Creek
Building 9

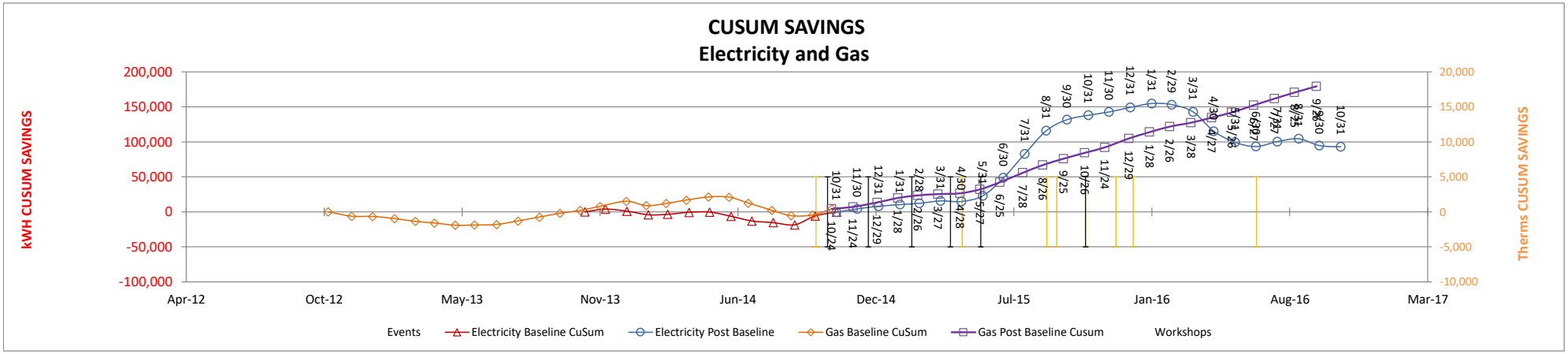


Natural Gas Savings Estimates

Baseline Period: Gas 10/25/2012 Thru 10/24/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline used
2015 Savings forecast	9/26/14	9/25/15	364	8,555		8,555	0	8,555	8,555	New discussion ADDED 1-6-16. During the baseline period and subsequent year after, the boiler was allowed to operate during the summer months due to space overcooling. Though there was an air-handler tune-up & annual boiler PM that occurs at the beginning of the SEM program, the savings this period come from not allowing boiler to operate during summer months. The decision to eliminate summer boiler use was from continual SEM guidance and education that resulted in addressing the root cause of earlier overcooling by making multiple (albeit small) adjustments at the VAV and BMS level.
2016 Savings Period	9/25/15	9/26/16	367	10,342		10,342	0	10,342	1,787	No new SEM events to account for additional savings this period other than previous years operational changes, reduced summer boiler operation, and a higher awareness to energy usage.
2016 -- Participant Year 2						10,342	0	**10,342**		0

Portland Community College, Rock Creek **Building 9**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop	04/14/15	Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement	05/28/15	Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out	10/27/15	1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop		Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13	?		Customer identify and log contributors to savings below		Please update the Operations Logs monthly before they are forgotten	
14	Capital:		No ETO incentives	10/01/14	Replaced two chillers	
	SEM:			10/01/14	Tuned up air handler operation.	
15	Ops:			05/01/15	New chillers come online	
16	SEM:			10/01/14	Boiler serviced and tuned up reset schedule updated for better performance. Completely modified their tune-up process to include control valves reset schedules and boiler lead/lag control.	
17	?			09/15/15	Occupant engagement launched at in service meeting.	
17	Capital:		Book Store emptied out and being remodeled??? Book Store moved to Bldg. 5	01/04/16		
18	Ops:		PV Array monitoring equipment loss power from 10-27-15 to 12-10-15. Since the data is lost between this time frame, the daily consumption was estimated by using the same time frame from 2014.	10/27/15		
19	Ops:		Power restored to PV Array monitoring equipment.	12/10/15		
20	SEM:		Resequenced lead chiller. Program change.	07/01/16		
21	Capital:	P00001042758	ETO lighting project	09/01/15		Y

Portland Community College, Rock Creek **Building 9**

Baseline Period 11/1/2013 Thru 10/31/2014

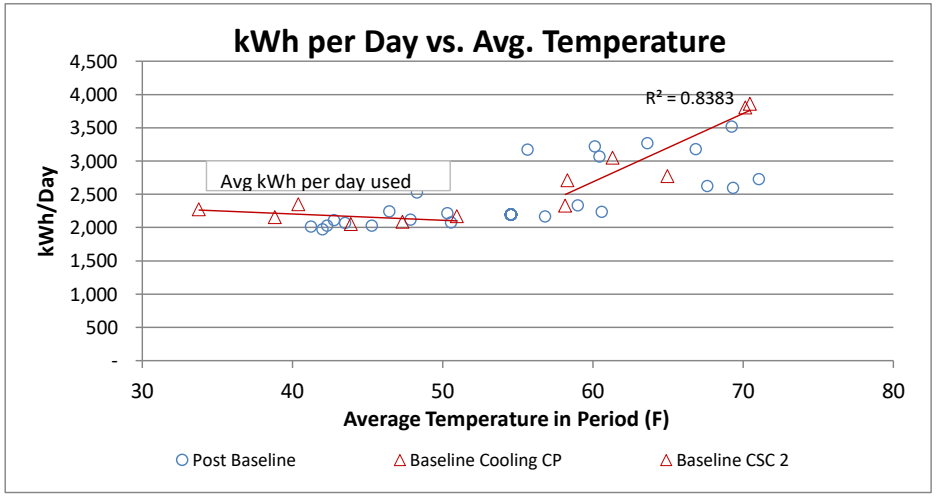
kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	72,000
Coefficients		***Units***	***P Values***
Constant	-0.04832	kWh/SqFt-Day	0.073950386
Variable 1 Averaged Mean Temperature	0.00143	kWh/SqFt-Day-F	0.010390602
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

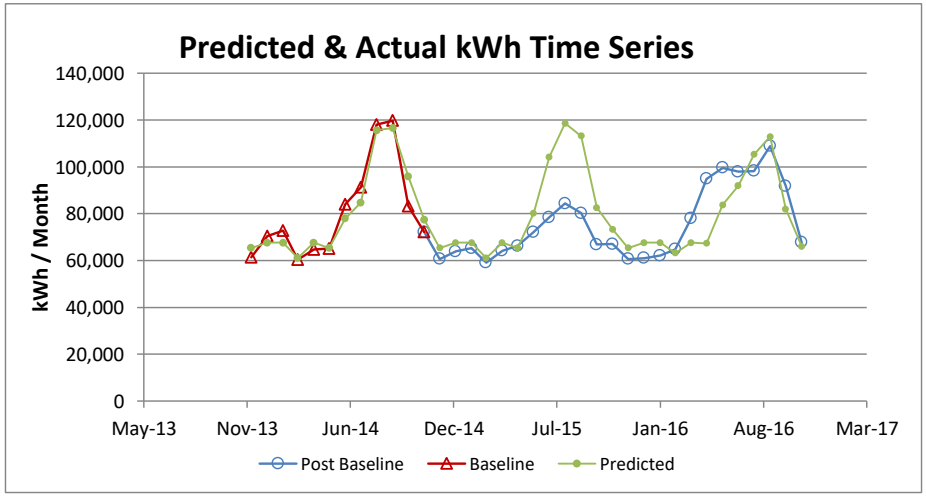
Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0

Model Type: Single Changepoint Model with Cooling Season Regression

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	72,000
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	
SUM of Variables 4	0.00000	0	
Average of Variable 5	0	0	

Regression Statistics	
Multiple R	0.9156
R Square	0.8383
Adjusted R Square	0.7978
Standard Error	279.96
Observations	6





Portland Community College, Rock Creek **Building 9**

Baseline Period 10/25/2012 Thru 10/24/2014

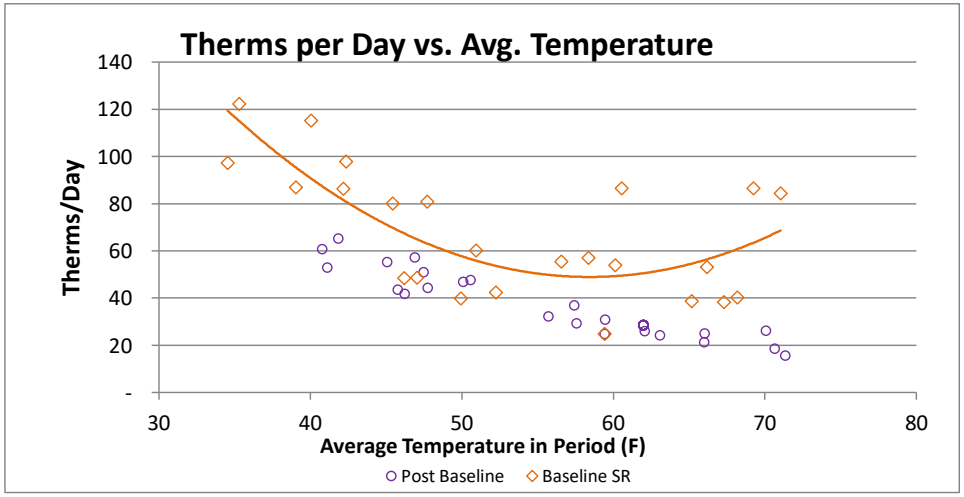
Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	72,000
Coefficients		***Units***	***P Values***
Constant	0.00354963	Therms/SqFt-Day	1.31939E-05
Variable 1 Averaged Mean Temperature	-5.61701E-05	Therms/SqFt-Day-F	0.000286795
Variable 2 Temp²	0	Therms/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	0
Average of Variable 5	0	0	0

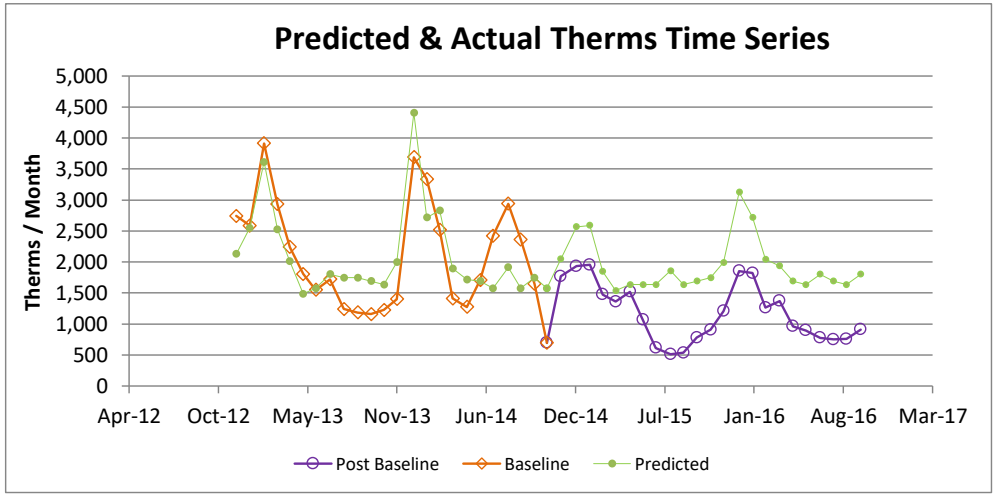
Regression Statistics	
Multiple R	0.8439
R Square	0.7122
Adjusted R Square	0.6860
Standard Error	15.37
Observations	13

Model Type: Single Changepoint Model with Heating Season Regression

Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	0
Coefficients		***Units***	***P Values***
Constant	0	Therms/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0	Therms/SqFt-Day-F	0
Variable 2 Temp²	0	Therms/SqFt-Day-F²	
Variable 3 Holidays, Break days	0	Therms/SqFt-Day-Holidays/Events	
SUM of Variables 4	0	0	
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College, Rock Creek**	Building:	**Vet Tech Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Classroom & lab space

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Dual Changepoint (Heating season regression along with separate Cooling season Regression)

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

A 14 month baseline was chosen that best represents seasonal usage and was close to the beginning of SEM program. The two additional months are included to capture further summer time usage in this DC model. Temp² and break days had no correlation to regression and are not used.

No Gas accounts were enrolled for this site

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

No gas model for this report.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
0002 14295-489678-9	IN23814521		N/A	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	

Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff	43,260	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff	N/A

	Electricity		Natural Gas	
Baseline Period	7/30/2013	9/29/2014	3/1/2013	3/31/2013
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		N/A	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Hillsboro, Oregon Airport	

Program Period Electric Savings (kWh)	**264**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

No Adjusted Baseline Used

Natural Gas:

N/A

Savings Discussion

Electric:

No SEM events identified during this period.

Gas:

N/A

Capital Projects Interaction Discussion

No capital projects receiving incentives are known to have been implemented this past year

2015 Program Year 1 Capital Projects

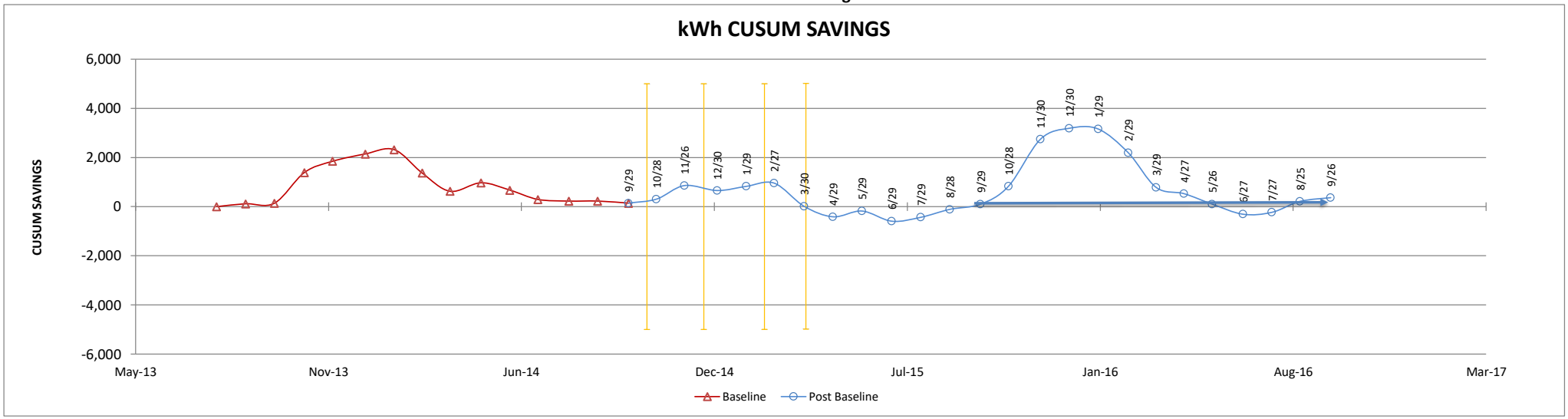
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0
			0	0	0	0

Year 2 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Portland Community College, Rock Creek

Vet Tech Building

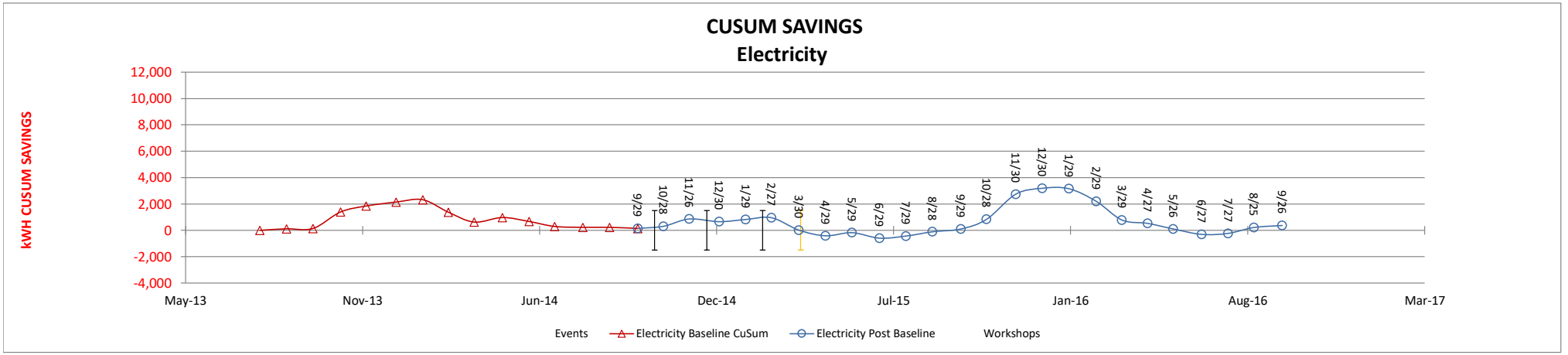


Electricity Savings Estimates

Baseline Period: Electric 7/30/2013 Thru 9/29/2014

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		No Adjusted Baseline Used
2015 Savings Period	9/29/14	9/29/15	365	-42		-42	0	0	0	No SEM events OR savings identified during this period.
2016 Savings Period	9/29/2015	9/26/2016	363	264		264	0	264	264	No SEM events identified during this period.
2016 -- Participant Year 2						264	0	**264**		0

Portland Community College, Rock Creek **Vet Tech Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	N
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop		Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13	?		Customer identify and log contributors to savings below		Please update the Operations Logs monthly before they are forgotten	

Portland Community College, Rock Creek **Vet Tech Building**

Baseline Period 7/30/2013 Thru 9/29/2014

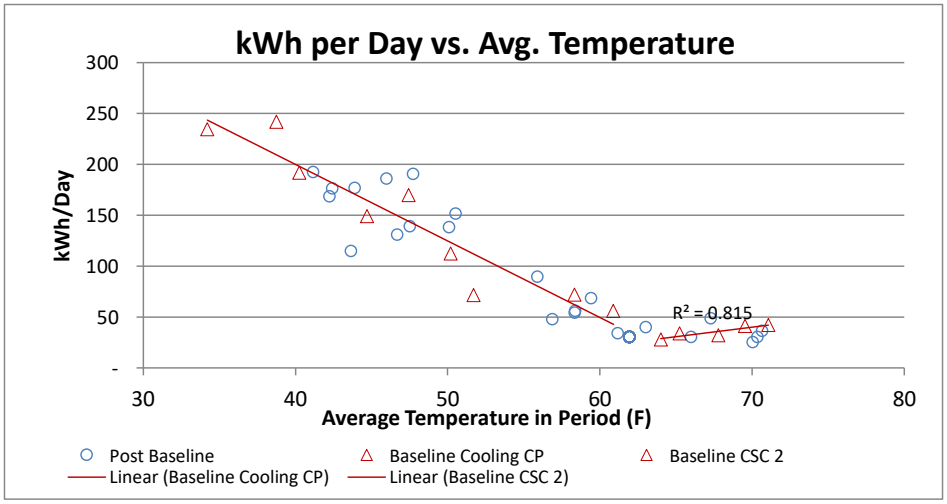
kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	1
Coefficients		***Units***	***P Values***
Constant	500.73095	kWh/SqFt-Day	1.26426E-05
Variable 1 Averaged Mean Temperature	-7.51990	kWh/SqFt-Day-F	0.00010492
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

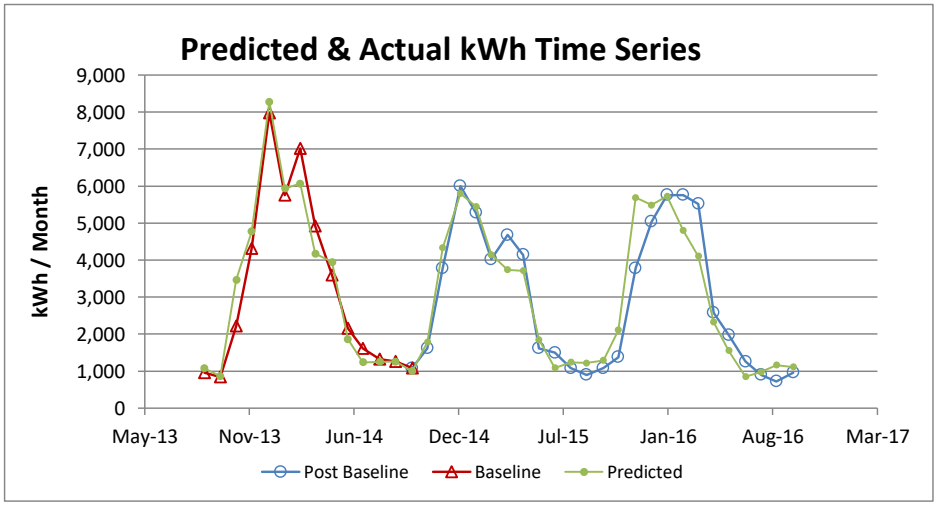
Regression Statistics	
Multiple R	0.9473
R Square	0.8974
Adjusted R Square	0.8828
Standard Error	24.22
Observations	9

Model Type: Dual Changepoint (Heating season regression along with separate Cooling season Regression)

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	1
Coefficients		***Units***	***P Values***
Constant	-90.83451	kWh/SqFt-Day	0.079401377
Variable 1 Averaged Mean Temperature	1.86932	kWh/SqFt-Day-F	0.035851124
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	
SUM of Variables 4	0.00000	0	
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.9028
R Square	0.8150
Adjusted R Square	0.7534
Standard Error	3.01
Observations	5





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Automotive & Metal Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			High bay shops with offices and classrooms

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

24 month baseline with temperature as the only variable found with strong P-value. Holidays and break days were verified but found to have weak P-Value. The bulk of shop area heating is supplied via HotWater from Heat Plant HW Boilers. Classroom heated from onsite gas RTUs and electric HeatPumps. Same scenario with cooling where shop area served by Central Plant South Chiller and classrooms served by onsite DX RTUs and electric Heatpumps.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197477997420	08450546AB		HW provided from Central Plant	0	
12197477997404	07933314AB		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		632,640	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		N/A

	Electricity		Natural Gas
Baseline Period	10/2/2012	10/1/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	-	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion

Electric:

No savings.
Capital project - Additional DDC controls and DAT reset added.
Parking lot lighting removed from this electrical system 6/2016 and now fed from Book Store electrical system.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates. Site not enrolled until PY 2016 but year 1 2015 savings are included in overall total of capital savings.

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
6/8/15	Custom HVAC	P00000916766	78,903	-	-	-
			78,903	0	0	0

Year 2 Capital Projects

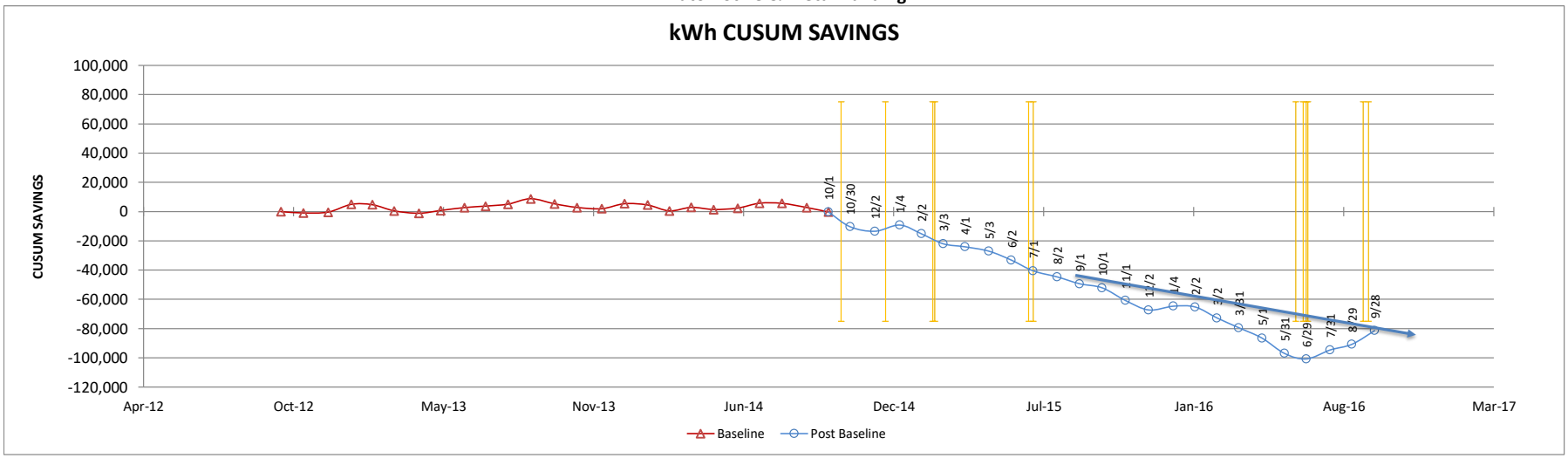
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	DDC upgrade & DAT reset added	P00001093424	8,469	-	3,550	-
4/28/16	Pneumatic to DDC	P00001093424	3075		1289	
			11,544	0	4,839	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Automotive & Metal Building

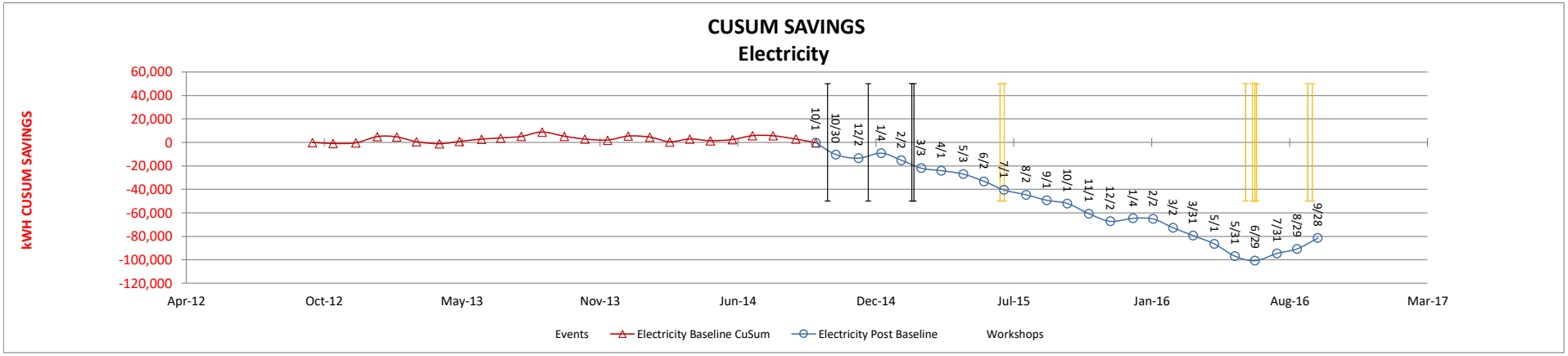


Electricity Savings Estimates

Baseline Period: Electric **10/2/2012** **Thru** **10/1/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	78,903	0	0	Site enrolled in PY 2016. Two Capital projects occur in 2015. Pnuematic to DDC retrofit and custom HVAC for damper replacement and economizer controls. No gas savings are associated with either project.
2016 Savings Period	10/1/2015	9/28/2016	363	-29,289		-29,289	4,839	0	0	No savings. Capital project - Additional DDC controls and DAT reset added. Parking lot lighting removed from this electrical system 6/2016 and now fed from Book Store electrical system.
2016 -- Participant Year 2						-29,289	83,742	**-113,031**		

Portland Community College - Sylvania Campus **Automotive & Metal Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		**Please update the Operations Logs monthly before they are forgotten**	
14	?		Added VFD and Motors to supply and return fan. Operates as soft start only.	06/29/16		
15	?		Parking lot lighting off during replacement of fixtures	07/01/16		?
16	?		New LED Parking lot lighting got turned on	09/20/16		?
17	?		Some rooms (5 fan coils) got taken off main system and operate stand alone.	07/01/15		?
17	Capital:		Removed parking lot lighting off meter. Lighting now controlled off of Book Store	06/15/16		?
18	Capital:	P00000916766	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg	06/25/15	Custom HVAC (estimated savings 78,903 kWh)	Y
19	Capital:	P00001093424	Pneumatic to DDC controls	06/25/16	Per customer - this project completes summer 2015 but capital project report shows it completing summer 2016	Y
20	Capital:	P00001093424	DDC upgrade and DAT reset	09/13/16	Per customer - this project completes summer 2016	Y

Portland Community College - Sylvania Campus **Automotive & Metal Building**

Baseline Period 10/2/2012 Thru 10/1/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	71,667
Coefficients		***Units***	***P Values***
Constant	0.03393	kWh/SqFt-Day	2.54256E-18
Variable 1 Averaged Mean Temperature	-0.00018	kWh/SqFt-Day-F	5.04155E-08
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.8647
R Square	0.7478
Adjusted R Square	0.7363
Standard Error	89.32
Observations	24

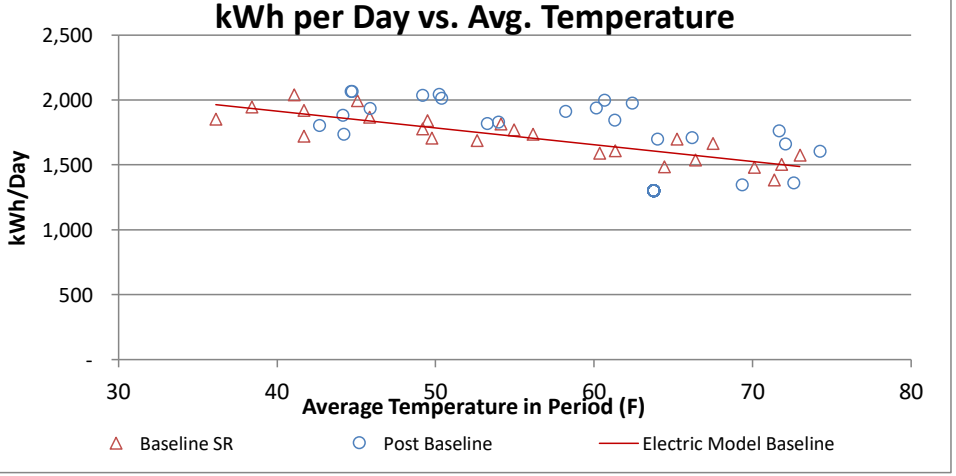
Model Type: Simple Regression Model

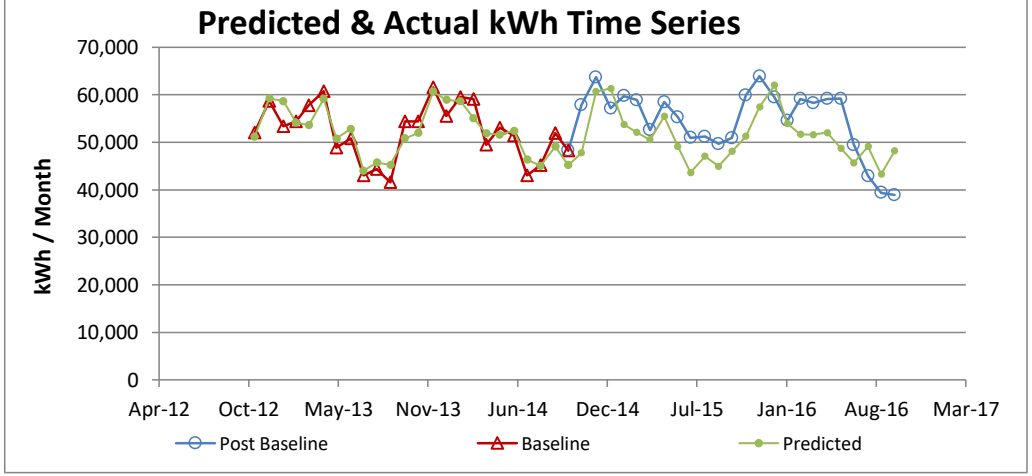
Total # of Monthly Samples	24

Confirm the proper graph is displayed below for the type of modeling used

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	71,667
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Bookstore**
Program Period:		10/8/2014 -	10/27/2015
Primary Building Usage or Occupancy Type:		Retail book store	

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Single Changepoint Model with Cooling Season Regression

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	Y
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

Cooling change point model with 12 month baseline. This campus building utilizes its own cooling system and switch occurs over 55°. Temperature found to be the significant driving variable but holidays also included with a permissible p-value

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	n
V2	Variable 2 Temp²	n
V3	Variable 3 Holidays, Break days or Event days per Month	n
V4	SUM of Variables 4	n
V5	Average of Variable 5	n

Gas Model Discussion

0

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197477999301	05907639AB		HW provided from Central Plant	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		321,680	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	11/1/2013	10/30/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		?
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	-	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion

Electric:

No savings.
Capital project pro-rated savings for DDC upgrade and DAT reset added 6/2016.
*Note- Per customer, the beginning stages of relocating campus parking lot lighting systems from their current electric meters to the Bookstore's electric meter begins summer 2016. The impact of added load cannot be ascertained at this time nor apparent in Bookstore's CuSum. Notice sinusoidal shape of CuSum.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

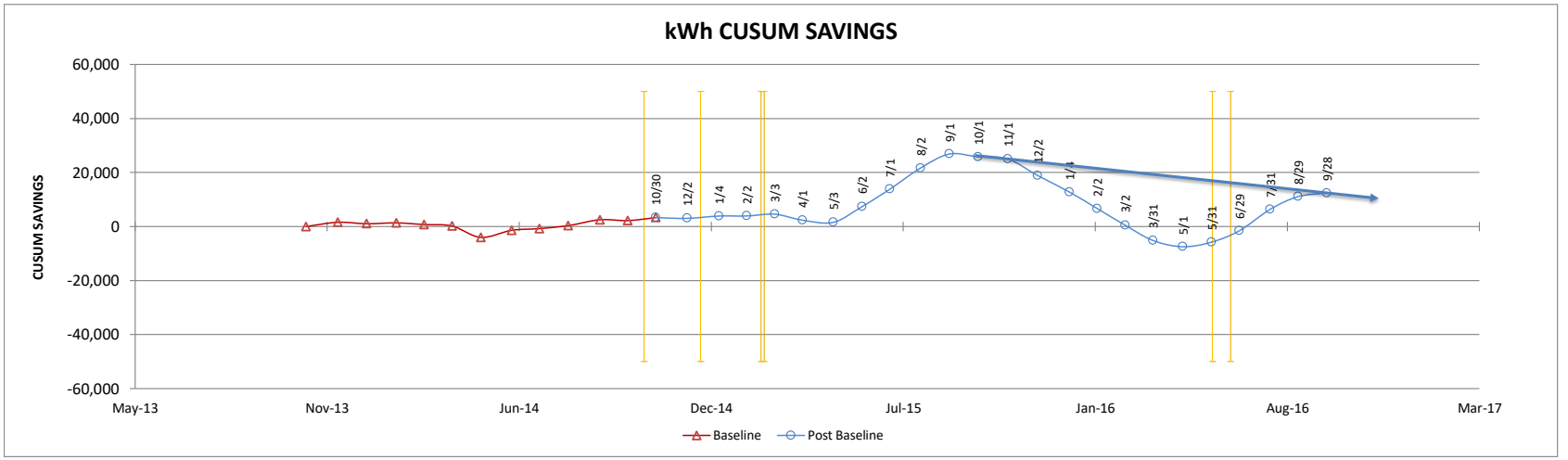
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
6/1/16	Custom Building Controls	P00001093424	15,958	-	6,689	-
			15,958	0	6,689	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Bookstore

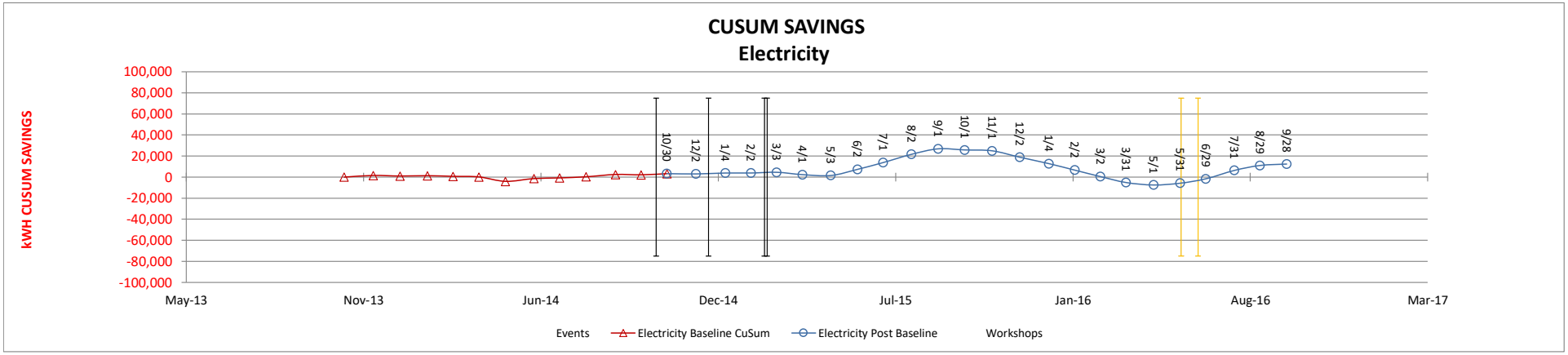


Electricity Savings Estimates

Baseline Period: Electric **11/1/2013** **Thru** **10/30/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/1/2015	9/28/2016	363	-13,403		-13,403	6,689	0	0	No savings. Capital project pro-rated savings for DDC upgrade and DAT reset added 6/2016. *Note- Per customer, the beginning stages of relocating campus parking lot lighting systems from their current electric meters to the Bookstore's electric meter begins summer 2016. The impact of added load cannot be ascertained at this time nor apparent in Bookstore's CuSum. Notice sinusoidal shape of CuSum.
2016 -- Participant Year 2						-13,403	6,689	**-20,092**		

Portland Community College - Sylvania Campus **Bookstore**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	Capital:		Campus wide parking lot lighting switched over to Book Store's electric meter.	06/20/16	Per customer, the beginning stages of relocating campus parking lot lighting systems from their current electric meters to the Bookstore's electric meter begins summer 2016. The impact of added load cannot be ascertained at this time nor apparent in Bookstore's CuSum. Notice sinusoidal shape of CuSum.	N
15	Capital:	P00001093424	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus	06/01/16		Y

Portland Community College - Sylvania Campus **Bookstore**

Baseline Period 11/1/2013 Thru 10/30/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	26,000
Coefficients		***Units***	***P Values***
Constant	-0.01179	kWh/SqFt-Day	0.037389206
Variable 1 Averaged Mean Temperature	0.00080	kWh/SqFt-Day-F	0.000196697
Variable 2 Temp²	-0.00214	kWh/SqFt-Day-F²	0.044092768
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

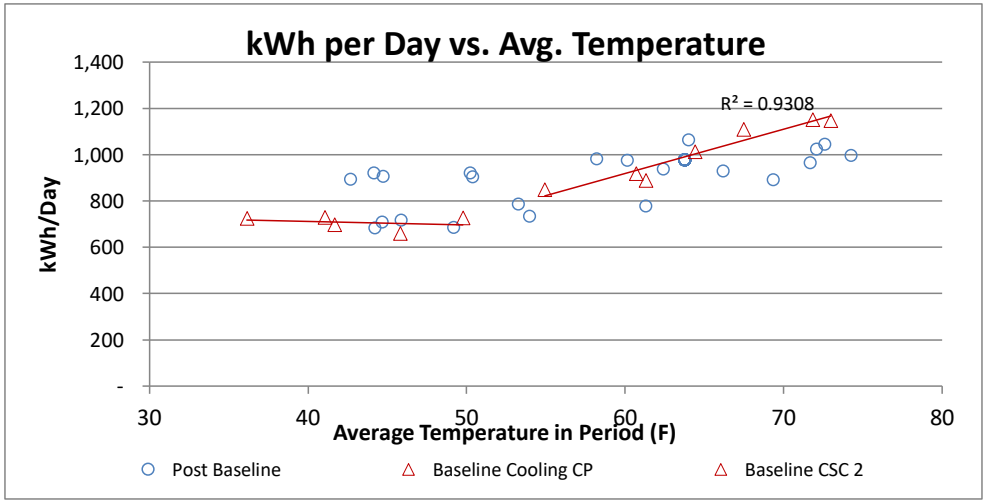
Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0

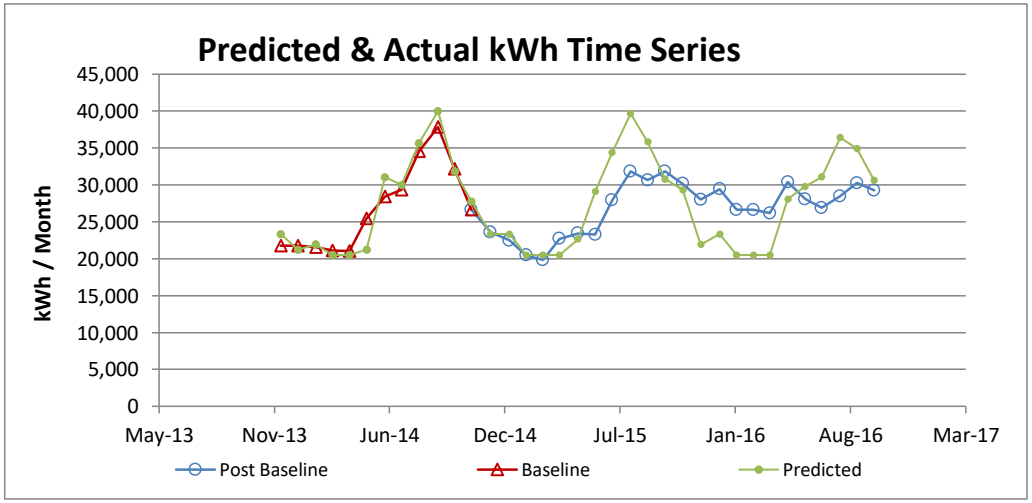
Model Type: Single Changepoint Model with Cooling Season Regression

Total # of Monthly Samples	12

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	26,000
Coefficients		***Units***	***P Values***
Constant	-0.01179	kWh/SqFt-Day	0.037389206
Variable 1 Averaged Mean Temperature	0.00080	kWh/SqFt-Day-F	0.000196697
Variable 2 Temp²	-0.00214	kWh/SqFt-Day-F²	0.044092768
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.9888
R Square	0.9777
Adjusted R Square	0.9666
Standard Error	23.40
Observations	7





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**College Center Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Student common area, Cafeteria

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

Large capital project Phase I completes 11/2014 and Phase II completes 10/2016. Both projects incurr additional HVAC equipment.
12 month baseline used. Temperature found to be the only significant variable. Holidays were verified and found to not have a strong enough P-value and are removed.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197478021469	09292752AB		HW provided from Central Plant	0	
12197478002816	31033448AB		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		3,423,800	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas	
Baseline Period	10/31/2014	11/2/2015	N/A	N/A
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		N/A	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Portland, Oregon Airport	

Program Period Electric Savings (kWh)	**-**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it was approximately the duration of time in between two large renovation capital projects and showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion
Electric:

Site enrolled in PY 2016.
Capital Project Phase I Custom HVAC completes 11/2014 whereas baseline begins 10/2014

Gas:

N/A

.

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates.
*NOTE - The Gas savings (24,665 therms) associated with Year 2 project are deducted from PCC Sylvania Heat Plant

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

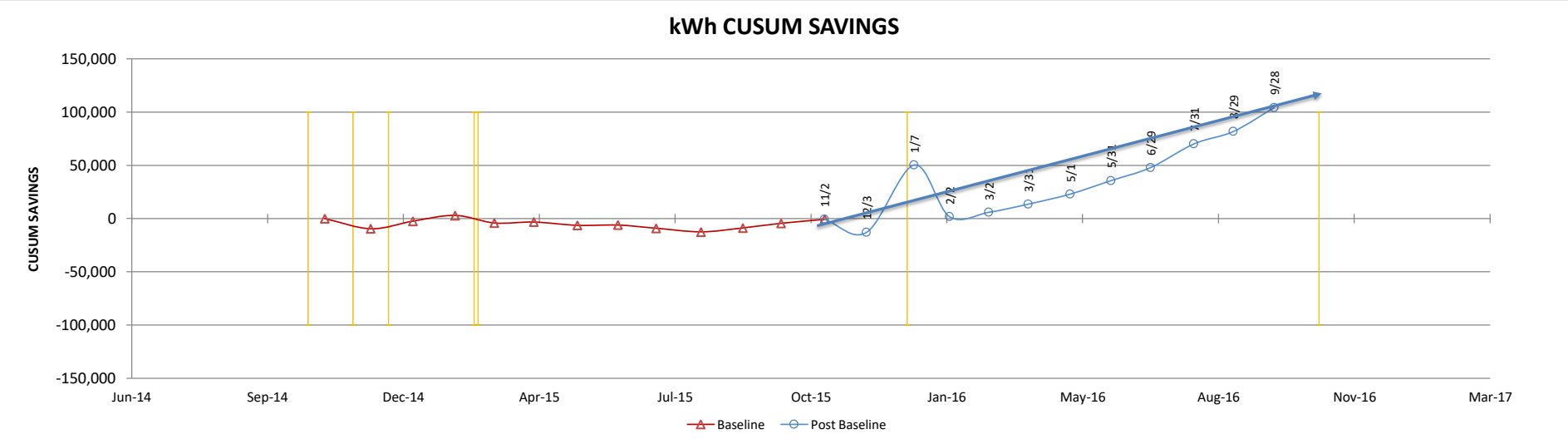
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
1/1/16	Phase II renovation - Custom HVAC	P00000987838	541,428	-	401,992	-
			541,428	0	401,992	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

College Center Building

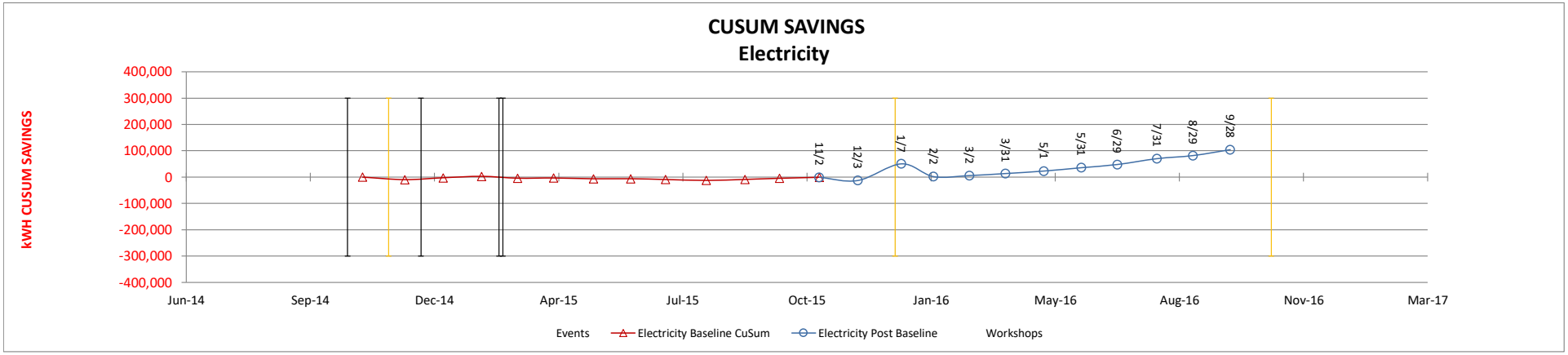


Electricity Savings Estimates

Baseline Period: Electric **10/31/2014** **Thru** **11/2/2015**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Projected 12 month savings (adjusted ave daily savings rate * 365)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Total 12 Month SEM savings	Inc 12 Month SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled in PY 2016. Capital Project Phase I Custom HVAC completes 11/2014 whereas baseline begins 10/2014
2016 Savings Period	11/2/2015	9/28/2016	331	104,982		104,982	401,992	0	0	No savings claimed. Capital project for Phase II Renovation begins approx. 1/2016 and completes 10/2016. New HVAC equipment and duct work modification for new VAV occurs. Capital project savings are pro-rated for this period. Performance is expected to continue and baseline adjustment will need to be considered for PY 2017.
2016 -- Participant Year 2						104,982	401,992	**-297,010**		

Portland Community College - Sylvania Campus **College Center Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?					
15	Capital:	P00000941933	Renovation Project Phase I - AHU-1 & 2 connected to partial duct system with VAV with HW re-heat	11/20/14	ETO incented project for Custom HVAC. (673,949 kWh estimated annual saving)	Y
16	Capital:	P00000987838	Renovation Project Phase II - Connecting AHU-1 & 2 connected to full capacity (additional VAVs now added to system)	10/31/16	This project is estimated at 541,428 kWh and 24,655 Therms estimated savings	Y
17	?		Building partial shutdown for capital project.	01/02/16		?

Portland Community College - Sylvania Campus **College Center Building**

Baseline Period 10/31/2014 Thru 11/2/2015

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	181,552
Coefficients		***Units***	***P Values***
Constant	0.02656	kWh/SqFt-Day	1.02303E-08
Variable 1 Averaged Mean Temperature	0.00043	kWh/SqFt-Day-F	1.75518E-08
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

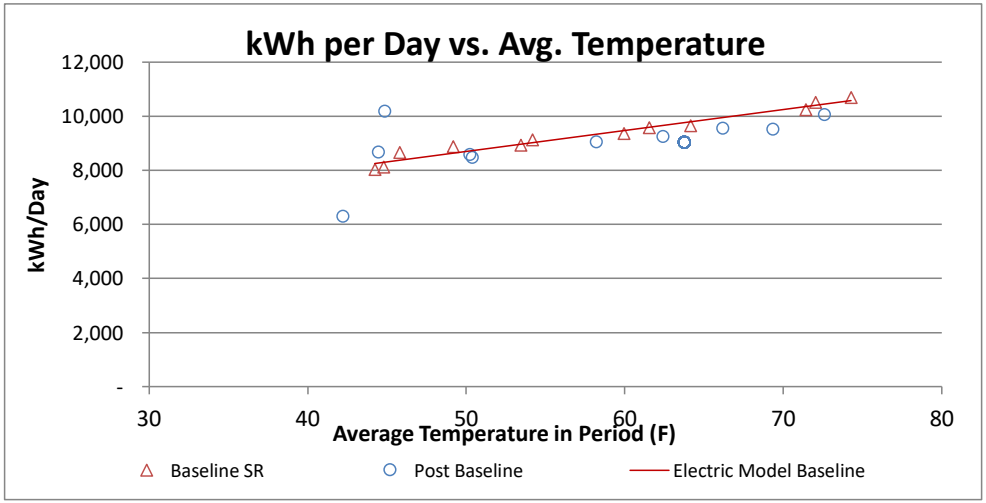
Regression Statistics	
Multiple R	0.9813
R Square	0.9629
Adjusted R Square	0.9592
Standard Error	174.92
Observations	12

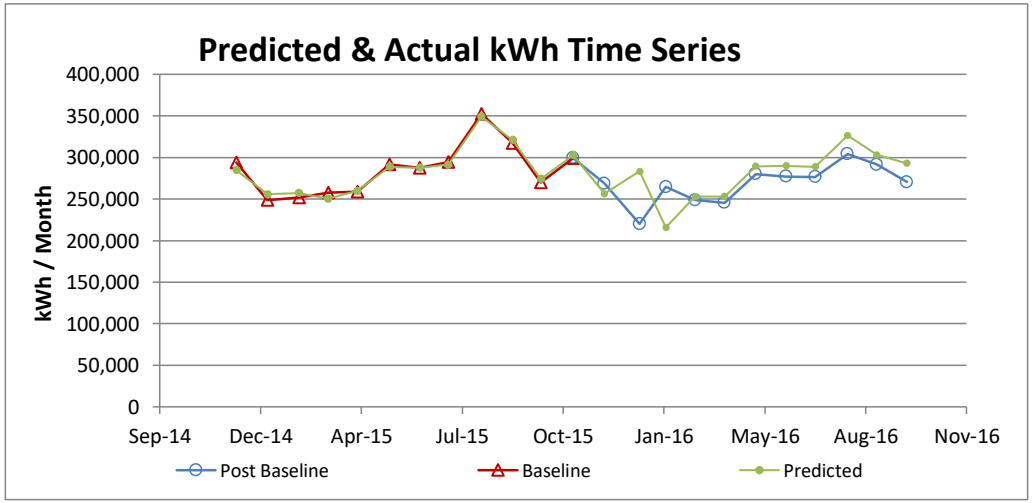
Model Type: Simple Regression Model

Total # of Monthly Samples	12

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	181,552
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**College Sevices Building**
Program Period:			1/1/2016 - 12/31/2016
Primary Building Usage or Occupancy Type:			Office Building (2 story)

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Single Changepoint Model with Cooling Season Regression

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

Cooling changepoint model using 24 month baseline with one month (6/2013) removed from regression for abnormaly low usage. Cooling occurs over 56°F. Holidays were verified but show poor P-value.
When trying to end baseline close to the beginning of SEM 10/2014, there is a large spike in summer usage beginning 6/2014 & ending 9/2014. When compared to data set of other months with comparable average ambient temperatures, the excessive usage indicates a one time change in operation with no other events to account for. Baseline moved back to end prior to summer 2014.
Cooling provided by onsite RTUs with DX cooling. Heating source provided by Heat Plant HW Boilers.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
2142958379618	10381634AB		HW provided by Central Plant	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		268,400	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	5/4/2012	5/1/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	**20,301**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion

Electric:

Tighter HVAC scheduling account for slight performance increase.

Gas:

N/A

Capital Projects Interaction Discussion

No known projects receiving Energy Trust savings show up in the capital projects summary

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

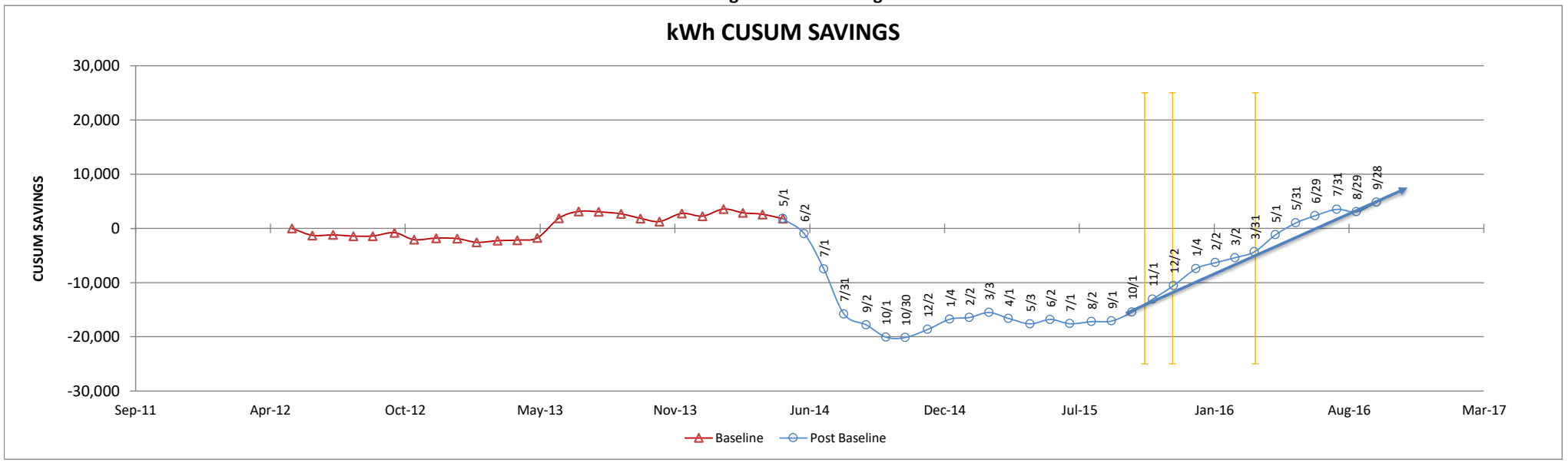
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

College Sevices Building

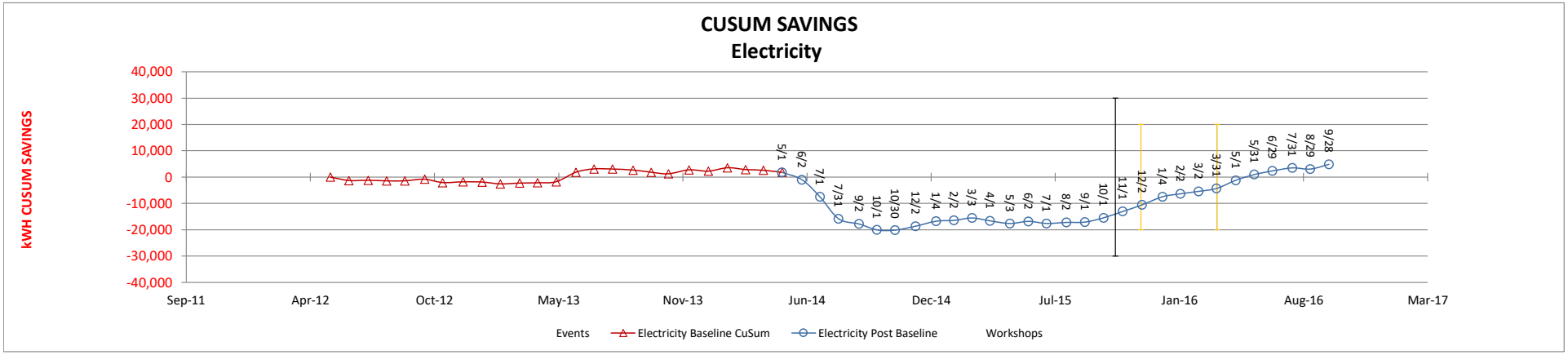


Electricity Savings Estimates

Baseline Period: Electric **5/4/2012** **Thru** **5/1/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/1/2015	9/28/2016	363	20,301		20,301	0	20,301	20,301	Tighter HVAC scheduling account for slight performance increase.
2016 -- Participant Year 2						20,301	0	**20,301**		

Portland Community College - Sylvania Campus **College Sevices Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:					
2	SEM:		Cohort 8 Kickoff Workshop	10/20/15	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop		Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop		Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop		Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	Ops:		cleaned coils and changed filters	04/01/16		
15	SEM:		implemented tighter schedule control on building	11/30/15		?

Portland Community College - Sylvania Campus **College Sevices Building**

Baseline Period 5/4/2012 Thru 5/1/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	27,000
Coefficients		***Units***	***P Values***
Constant	0.01738	kWh/SqFt-Day	0.002856745
Variable 1 Averaged Mean Temperature	0.00020	kWh/SqFt-Day-F	0.013841387
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

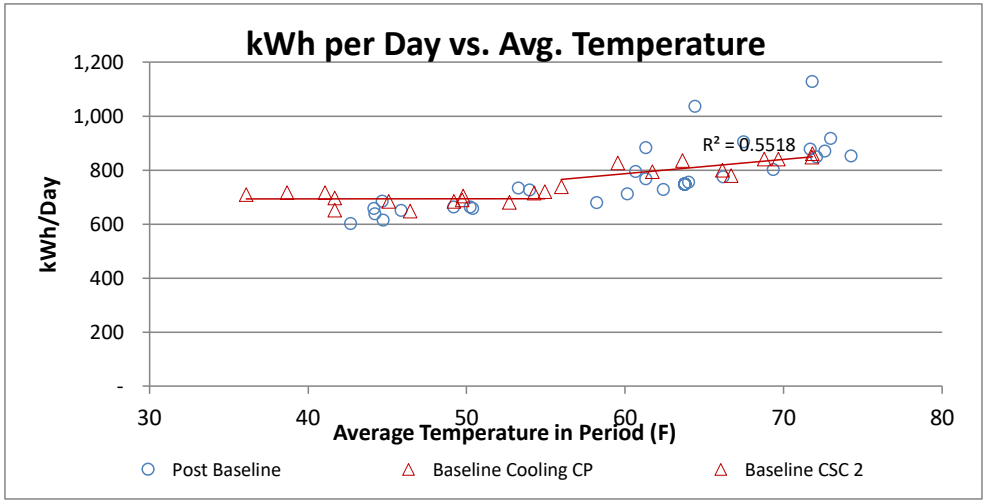
Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0

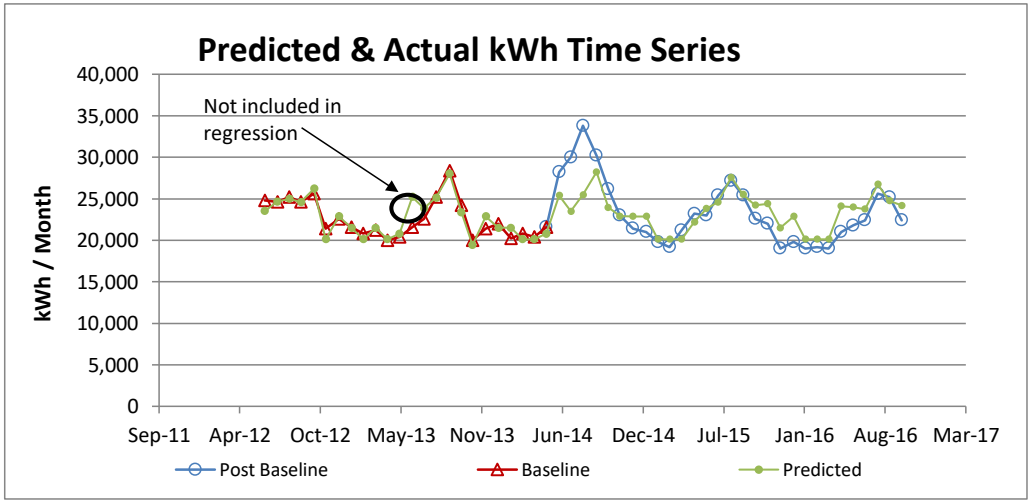
Model Type: Single Changepoint Model with Cooling Season Regression

Total # of Monthly Samples	24

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	27,000
Coefficients		***Units***	***P Values***
Constant	0.01738	kWh/SqFt-Day	0.002856745
Variable 1 Averaged Mean Temperature	0.00020	kWh/SqFt-Day-F	0.013841387
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.7428
R Square	0.5518
Adjusted R Square	0.4958
Standard Error	26.82
Observations	10





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Heat Plant**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Central Plant - Campus heating HW and Chiller for several buildngs

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	V1 Averaged Mean Temperature	N
V2	V2 Holidays, Break days or Event days per Month	N
V3	V3 CDD	Y
V4	V5 SUM of Variables	Y
V5	V6 Average of Variable	N

Electric Model Discussion

Baseline 52 week interval data set to best account for when South Chiller Plant is operational. Variables CDD and Sum of Monthly (Monthly Holiday, Break, & Event) used.

Performance tracking for gas usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable2 Holidays, Break days or Event days per Month	Y
V3	HDD	Y
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

12 month baseline chosen to begin when capital project completed with the installation of new condensing boilers. Temperature found to be the only significant variable.

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
2142954436545	09832948AB		562269	512010	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		737,917	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		439,374

	Electricity		Natural Gas	
Baseline Period	2/9/2014	2/7/2015	12/1/2013	11/30/2014
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		Energy Trust Utility Query	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Portland, Oregon Airport	

Program Period Electric Savings (kWh)	**-**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**24,593**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

The baseline period was chosen because it showed the overall best R2 and p-values for gas usage for a period that showed the most consistent operations period closest to the start of the program period.

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

NO Adjusted Baseline needed

Savings Discussion

Electric:

No savings claimed.
Multiple capital projects complete this period and though savings for cooling energy can be attributed to this electric meter (South Chiller), an increase in performance from the projects do not show up at this time. The ETO capital savings are deducted from the individual site's ETO savings calcs.

Gas:

Multiple capital projects for Custom HVAC and DDC upgrade complete this period. In addition, DHW heat exchanger is replaced 1/2016. ETO capital project savings are pro-rated for deduction.

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates.
*Note - Electrical savings have been deducted from the individual site's ETO Savings Calc.

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

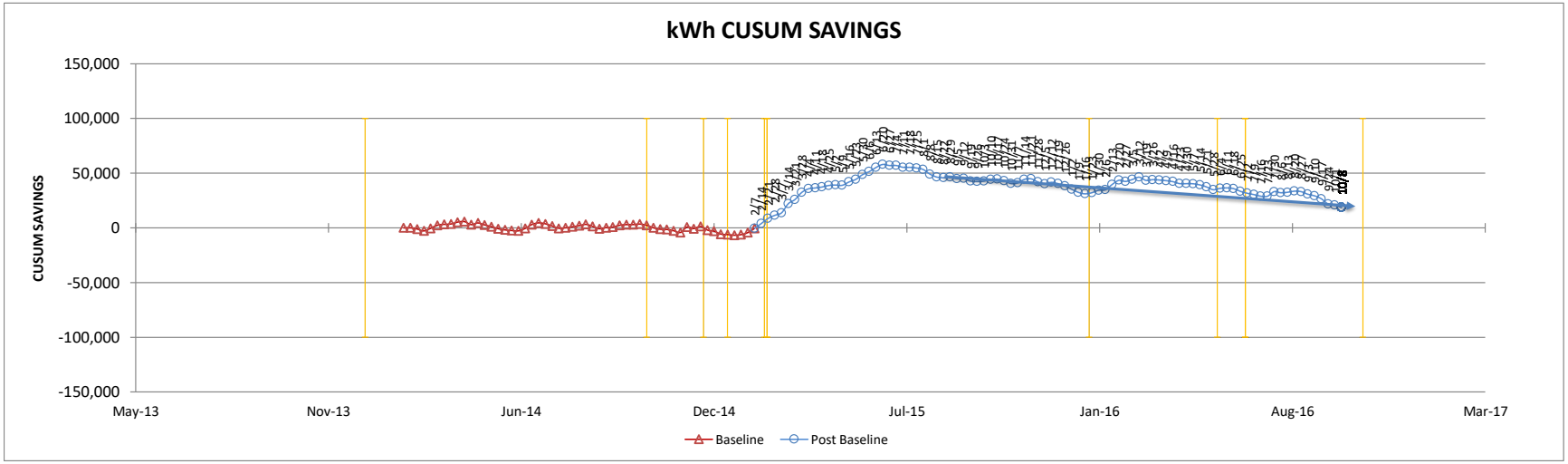
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	Custom Building Controls (TCB)	P00001093424	-	3,340	-	1,418
4/28/16	Custom Building Controls (AMB)	P00001093424	-	167	-	71
4/28/16	Custom Building Controls (PAC)	P00001093424	-	1,450	-	616
4/28/16	Custom Building Controls (BOOK Store)	P00001093424	-	4,100	-	1,741
1/20/16	Custom HVAC (CCB Phase II Renovation)	P00000987838	-	24,655	-	17,157
1/26/15	Condensing Tank (Heat Plant)	P00001008968	-	2,740	-	1,862
			0	36,452	0	22,865

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Heat Plant



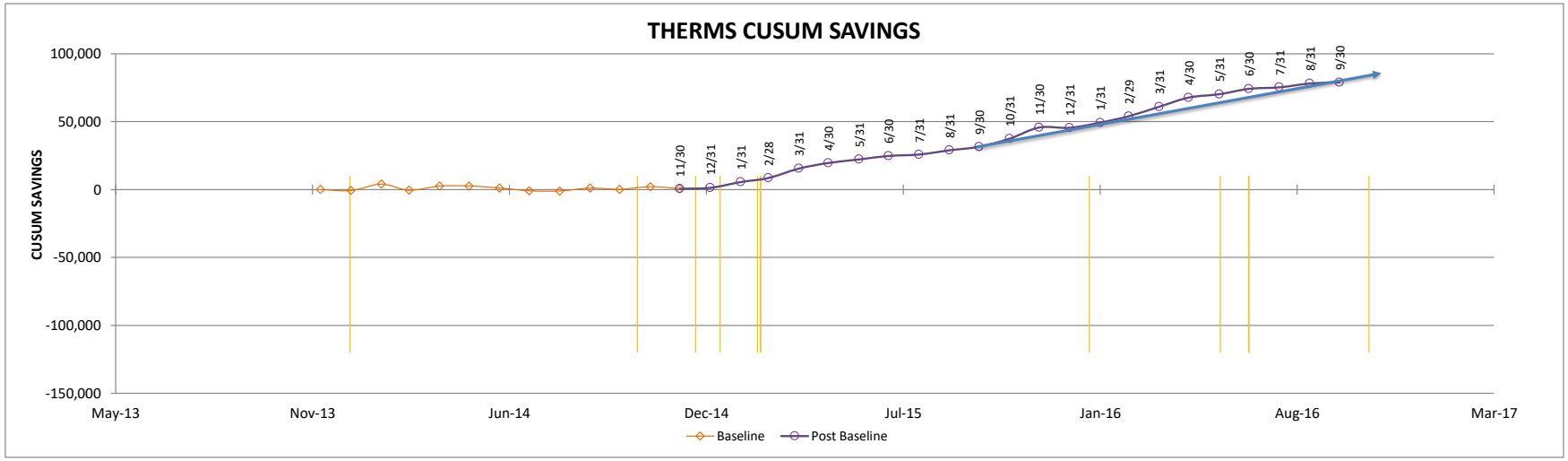
Electricity Savings Estimates

Baseline Period: Electric **2/9/2014** **Thru** **2/7/2015**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/10/2015	10/8/2016	364	-25,860		-25,860	0	0	0	No savings claimed. Multiple capital projects complete this period and though savings for cooling energy can be attributed to this electric meter (South Chiller), an increase in performance from the projects do not show up at this time. The ETO capital savings are deducted from the individual site's ETO savings calcs.
2016 -- Participant Year 2						-25,860	0	**-25,860**		

Portland Community College - Sylvania Campus

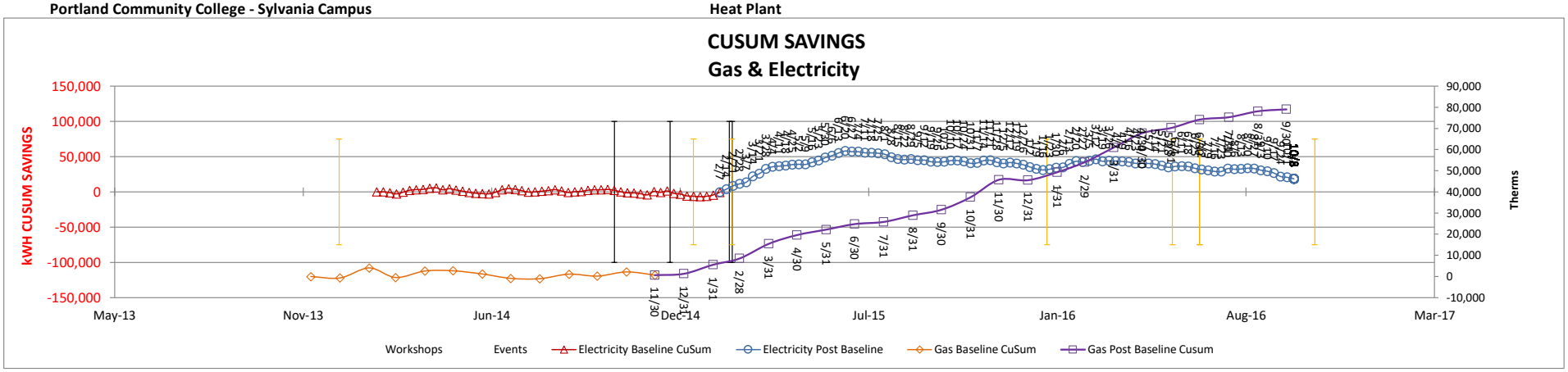
Heat Plant



Natural Gas Savings Estimates

Baseline Period: Natural Gas		12/1/2013	Thru	11/30/2014						
Program Period (Year Savings Claimed)	**Read Date (last read date prior to the start of THIS period)**	**Period Ending Read Date**	**Days**	**Actual Measured Savings**	**Adj. Baseline Daily average savings rate**	**Measured savings - Adjusted baseline savings (if any)**	**Energy Trust Annual Capital Project Savings Claimed in the Program Period**	**Annual MEASURED SEM savings minus Total Capital savings**	**Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings**	**Savings Discussion Notes for Report**
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	9/30/15	9/30/16	366	47,458		47,458	22,865	24,593	24,593	Multiple capital projects for Custom HVAC and DDC upgrade complete this period. In addition, DHW heat exchanger is replaced 1/2016. ETO capital project savings are pro-rated for deduction.
2016 -- Participant Year 2						47,458	22,865	**24,593**		

Portland Community College - Sylvania Campus **Heat Plant**



No.	Event/Project Type (pick from list)	Project / Event / Workorder ID (if any)	Project Name / Event Description	Date	Scope of Project or Event	Energy Trust Incentives received for project? Y/N
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			Customer identify and log contributors to savings below		Please update the Operations Logs monthly before they are forgotten	
14	Capital:	P00000987838	College Center Building - Phase II renovation begins	01/20/16		Y
15	?		Fixed and re tuned economizers in several buildings	06/30/16		?
16	Capital:	P00001008968	Removed single wall HX and installed HW heaters for domestic HW.	01/10/15	Condensing Tank	Y
17	?		turned off pneumatic air compressor	06/30/16		?
17	?		adjusted HW reset to go to 140 deg	06/01/16		?
18	?		resolved HW valves that are hunting	02/20/15		?
19	Capital:					?
20	Capital:		HW loop - Isolation valves for each building installed and constant volume loop becomes variable flow loop	12/30/13		?
21	Capital:		College Center Building - Phase II renovation completes	10/30/16		?

Portland Community College - Sylvania Campus **Heat Plant**

Baseline Period 2/9/2014 Thru 2/7/2015

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	13,999
Coefficients		***Units***	***P Values***
Constant	0.44054	kWh/SqFt-Day	8.51602E-19
V1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
V2 Holidays, Break days or Event days pe	0.00000	kWh/SqFt-Day-F²	0
V3 CDD	0.00672	kWh/SqFt-Day-Holidays/Events	6.16172E-25
V5 SUM of Variables	-0.03528	0	0
V6Average of Variable	0	0	3.95984E-05

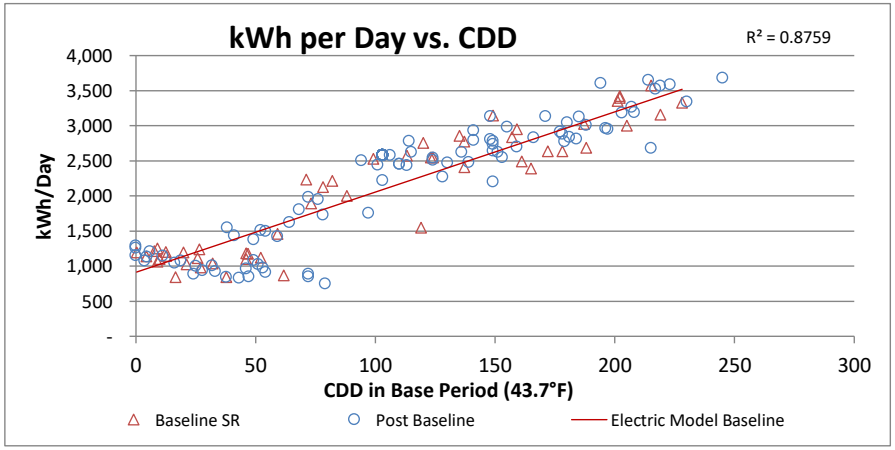
Regression Statistics	
Multiple R	0.9552
R Square	0.9124
Adjusted R Square	0.9088
Standard Error	1857.11
Observations	52

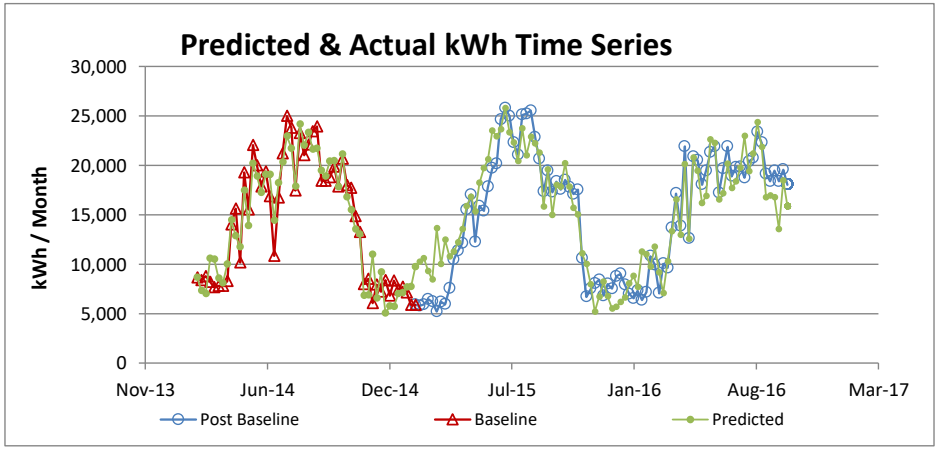
Model Type: Simple Regression Model

Total # of Weekly Samples	52

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	13,999
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
V1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
V2 Holidays, Break days or Event days pe	0.00000	kWh/SqFt-Day-F²	0
V3 CDD	0.00000	kWh/SqFt-Day-Holidays/Events	0
V5 SUM of Variables	0.00000	0	0
V6Average of Variable	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





Portland Community College - Sylvania Campus **Heat Plant**

Baseline Period 12/1/2013 Thru 11/30/2014

Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	13,999
Coefficients		***Units***	***P Values***
Constant	0.035263507	Therms/SqFt-Day	1.21215E-06
Variable 1 Averaged Mean Temperature	0	Therms/SqFt-Day-F	0
Variable2 Holidays, Break days or Event	-0.003785537	Therms/SqFt-Day-F²	0.097634142
HDD	-0.000135198	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	0
Average of Variable 5	0	0	0

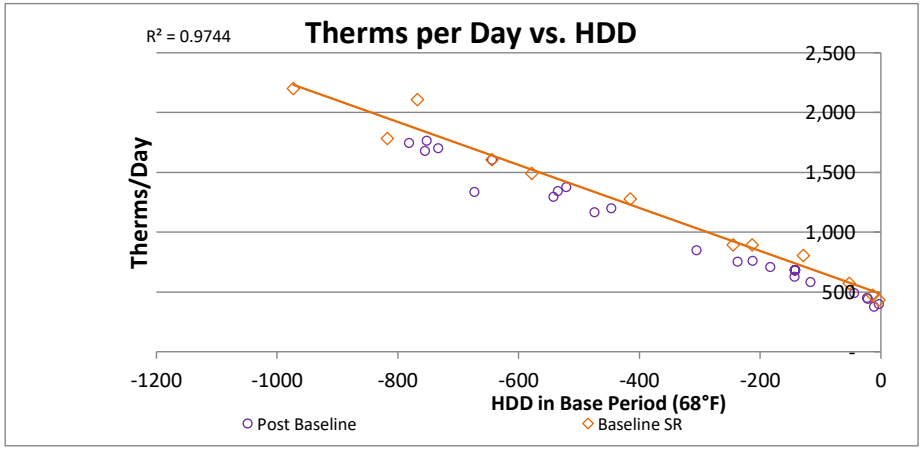
Model Type: Simple Regression Model

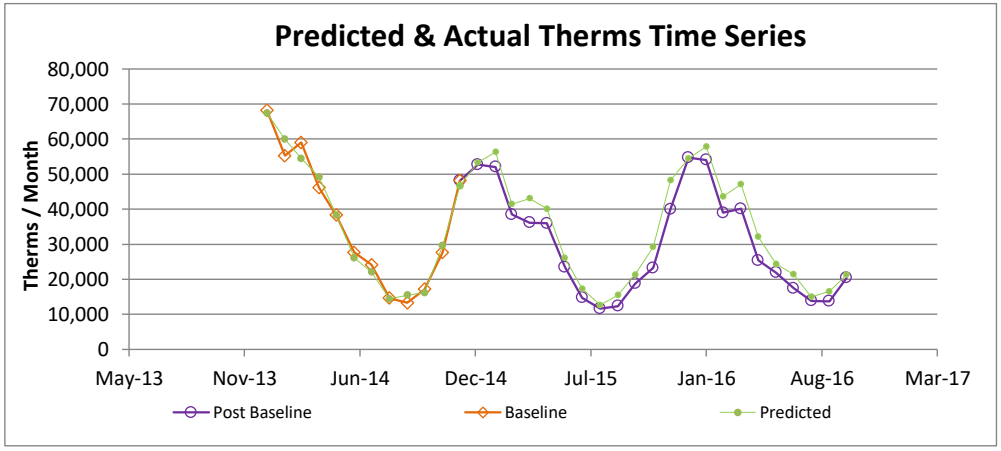
Regression Statistics	
Multiple R	0.9907
R Square	0.9814
Adjusted R Square	0.9773
Standard Error	93.99
Observations	12

Total # of Monthly Samples	12

Therms = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	0
Coefficients		***Units***	***P Values***
Constant	0	Therms/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0	Therms/SqFt-Day-F	0
Variable2 Holidays, Break days or Event	0	Therms/SqFt-Day-F²	0
HDD	0	Therms/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Health Technology Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Classroom, Workout Rooms, Gymnasium, & Natatorium

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 3 Holidays, Break days or Event days per Month	N
V3	CDD	Y
V4	SUM of Variables 5	Y
V5	Average of Variable 6	N

Electric Model Discussion

12 month baseline using variables CDD and Sum of Monthly (Monthly Holiday, Break, & Event). Though variable Sum of Monthly provides a low P-value (0.139) it is retained in regression to provide a better P-value for CDD variable.
Facility provides multiple purposes for North Chiller Plant, two pools in Natatorium, Gymnasium, work-out center, and dental classrooms.
North Chiller Plant provides cooling to HTB and CTB

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 3 Holidays, Break days or Event days per Month	N
V3	HDD	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
2142957994623	31029689AB		N/A	0	
12197477999343	31031785NMNM		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		365	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas	
Baseline Period	10/2/2013	10/1/2014	N/A	N/A
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:	
	Energy Trust Utility Query		N/A	
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month			
	Weather Station Location:		Portland, Oregon Airport	

Program Period Electric Savings (kWh)	-	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion
Electric:

No savings claimed.
Sporadic usage from two known issues:
1. For past year, main air handler runs 24/7 due to duct and building static issues.
2. Two Dessert Air heat recovery units that are stand alone controlled for Natatorium are operating questionably and currently being reviewed for contracted RCx. Staff are unfamiliar with servicing equipment.

Gas:

N/A

Capital Projects Interaction Discussion

No known projects receiving Energy Trust savings show up in the capital projects summary

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

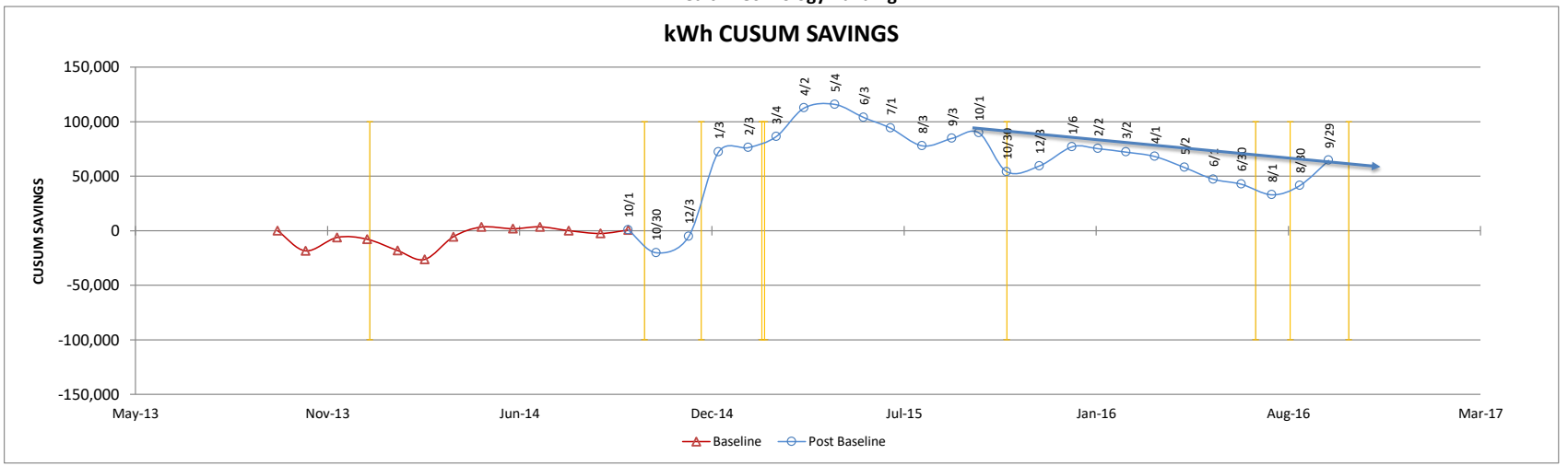
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Health Technology Building

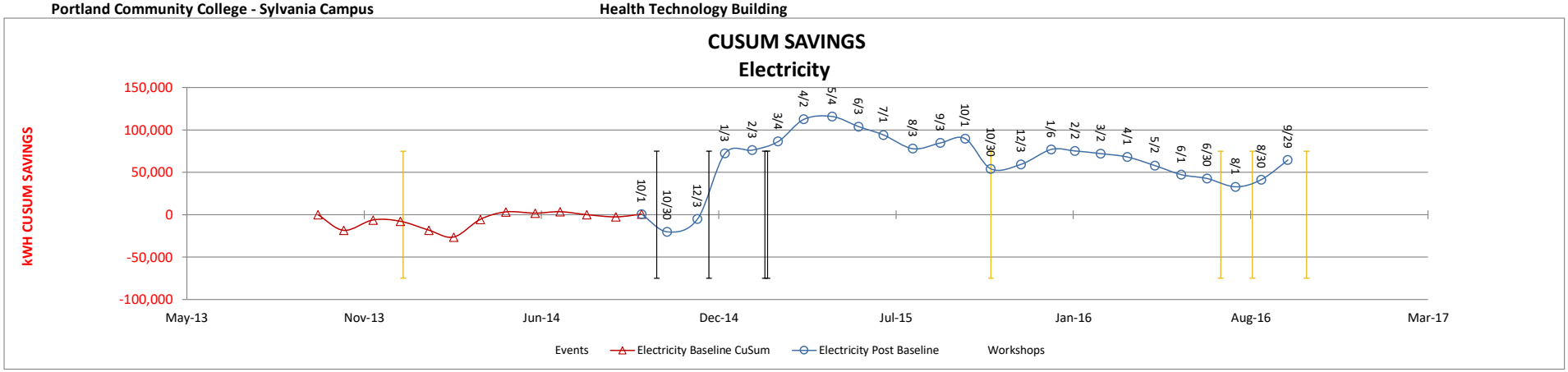


Electricity Savings Estimates

Baseline Period: Electric **10/2/2013** **Thru** **10/1/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/1/2015	9/29/2016	364	-25,190		-25,190	0	0	0	No savings claimed. Sporadic usage from two known issues: 1. For past year, main air handler runs 24/7 due to duct and building static issues. 2. Two Dessert Air heat recovery units that are stand alone controlled for Natatorium are operating questionably and currently being reviewed for contracted RCx. Staff are unfamiliar with servicing equipment.
2016 -- Participant Year 2						-25,190	0	**-25,190**		0

Portland Community College - Sylvania Campus **Health Technology Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?		AHU East side rebuilt to dual duct VAV.	10/30/15		
15	?		AHU East Side - running with 100% OSA	08/20/16		?
16	?		AHU East Side - still running with 100% OSA	10/20/16		?
17	?		Occluded filters in west side AHU changed. These filters were 100% occluded and had very little air getting thru them.	07/15/16		?
17	?		remove HX supplying DHW to showers etc. and install DHW heaters	01/05/14		?

Portland Community College - Sylvania Campus **Health Technology Building**

Baseline Period 10/2/2013 Thru 10/1/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	199,612
Coefficients		***Units***	***P Values***
Constant	0.03205	kWh/SqFt-Day	1.54927E-10
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 3 Holidays, Break days or Event	0.00000	kWh/SqFt-Day-F²	0
CDD	0.00001	kWh/SqFt-Day-Holidays/Events	0.000252058
SUM of Variables 5	-0.00012	0	0
Average of Variable 6	0	0	0.139285323

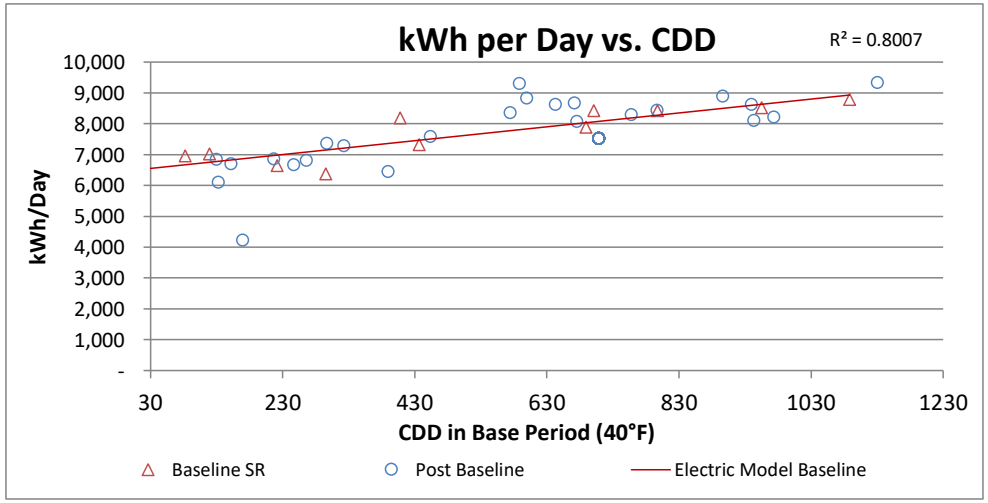
Regression Statistics	
Multiple R	0.9197
R Square	0.8458
Adjusted R Square	0.8115
Standard Error	387.34
Observations	12

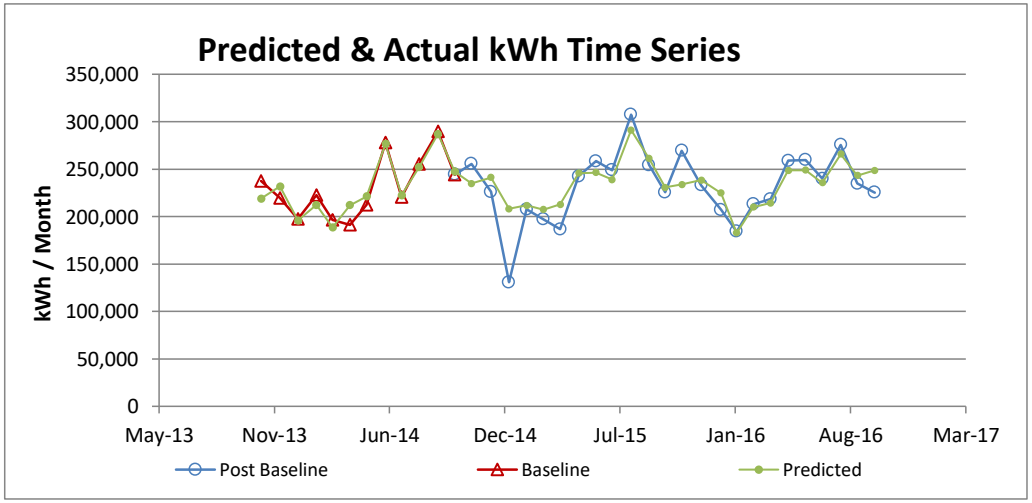
Model Type: Simple Regression Model

Total # of Monthly Samples	12

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	199,612
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 3 Holidays, Break days or Event	0.00000	kWh/SqFt-Day-F²	0
CDD	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 5	0.00000	0	0
Average of Variable 6	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Learning Resource Center (Library)**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Library

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Single Changepoint Model with Cooling Season Regression

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

Cooling change point model using 12 month baseline. Cooling changeover occuring above 55°F. Temperature found to be the only significant variable. Holidays were verified but found to have a low P-value.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
2142957984855	31031574AB		HW provided from Central Plant	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		771,440	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	11/1/2013	10/31/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	**3,391**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion

Electric:

No savings for this period but
Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Capital project deduction savings are pro-rated.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

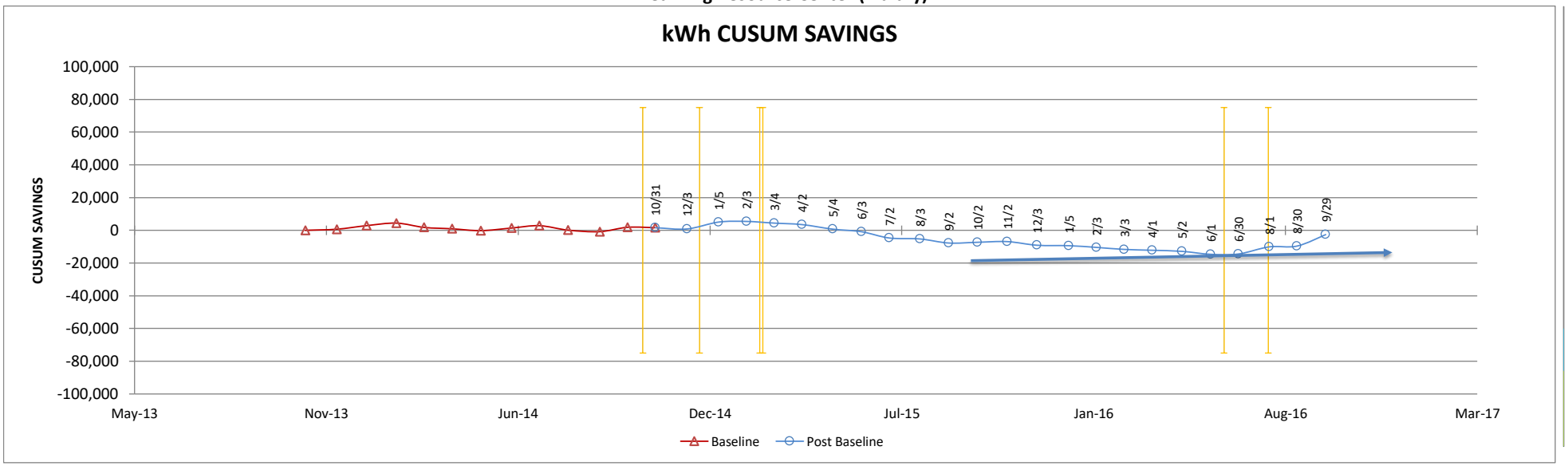
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	Pneumatic to DDC retrofit	P00001093424	3,075	-	1,297	-
			3,075	0	1,297	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Learning Resource Center (Library)

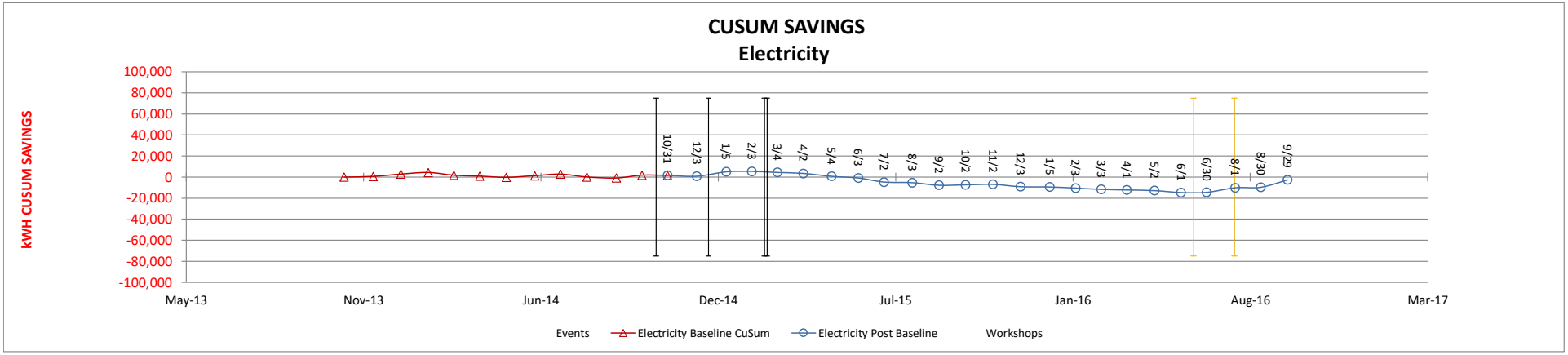


Electricity Savings Estimates

Baseline Period: Electric **11/1/2013** **Thru** **10/31/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/2/2015	9/29/2016	363	4,688		4,688	1,297	3,391	3,391	No savings for this period but Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Capital project deduction savings are pro-rated.
2016 -- Participant Year 2						4,688	1,297	**3,391**		0

Portland Community College - Sylvania Campus **Learning Resource Center (Library)**

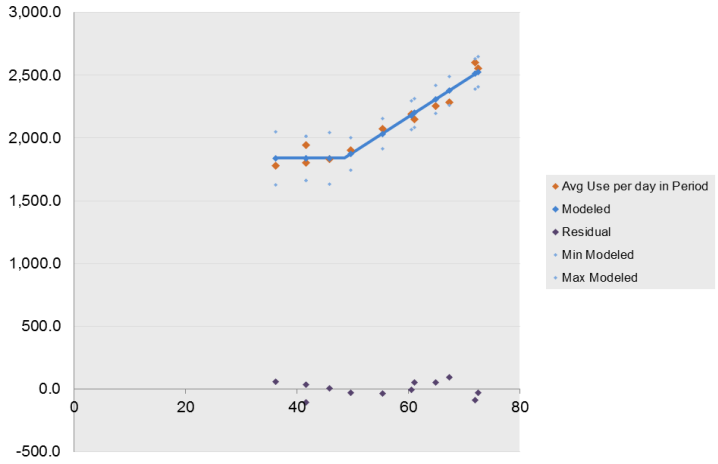


Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Workorder ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?		Had to lower supply temp to accomodate computer room added.	07/31/16		
15	Capital:	P00001093424	Pneumatic to DDC retrofit	06/15/16	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7)	Y

Model Type	**3P cool**			
Change Point Values	All Data		48.51	48.51
Residuals squared		40,392.0		
RMSE		66.99		
R^2		0.953	0.110	0.936
CV(RMSE) or Standard Error %		3.2%		
Fractional Savings Uncertainty		0.12		
Savings Range from FSU	5.0% ± 0.3%			
Net Determination Bias		0.000%		
Intercept at X=0			1838.212944	448.4467474
Slope			0	28.64644267
Average Y		2113.821	1838.577	2251.443
Average X		55.727	41.328	62.927
Standard Error		88.939	83.111	64.377
Standard Error, % of Avg.		4.2%	4.5%	2.9%
Autocorrelation coeff.		0.050	0.110	0.155
Count of Points		12	4	8
Pts.Ct.Adj. for Autocorrel.		11	3	6
critical t-statistic		1.415	1.886	1.638
Sum squared diffs. X-Xavg		1,730.4	46.4	440.0
Standard Dev. of Residuals		60.597	71.938	59.602
Total Y-values		25,366	7,354	18,012

Residuals					36.22580645	1838.212944
Min	-112.6523058	Max	97.5337263		48.51444255	1838.212944
#bins	10	Increment	21.01860321		48.51444255	1838.212944
SigDigits	2	Formatted	#,##0		72.54545455	2526.615952

	Residual Range	Count
-112.6523058	<-113	0
-91.63370257	-113 to -92	1
-70.61509936	-92 to -71	1
-49.59649616	-71 to -50	0
-28.57789295	-50 to -29	2
-7.559289742	-29 to -8	2
13.45931347	-8 to 13	1
34.47791667	13 to 34	0
55.49651988	34 to 55	3
76.51512309	55 to 77	1
97.5337263	77 to 98	1
	>=98	

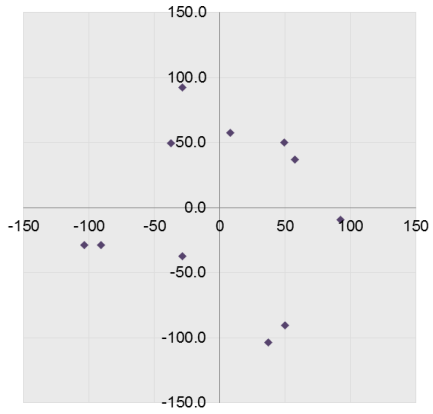


DateRng (blank)
Daytypes2 MoTuWeThFrSaSuHo

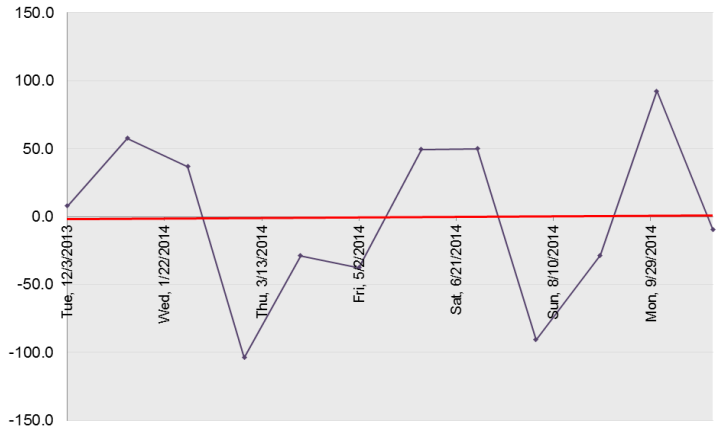
Points

Date	Avg Temp	Avg Use per day in Period	Modeled	Residual	Prediction half-interval	Min Modeled	Max Modeled	Days	Use	Use Calc	Residual2
12/3/2013	45.8	1830.3	1838.21	7.91	203.41	1634.80	2041.62	33	60,400	60,661	261
1/3/2014	36.2	1780.6	1838.21	57.57	210.91	1627.30	2049.13	31	55,200	56,985	1,785
2/3/2014	41.6	1801.3	1838.21	36.92	175.34	1662.88	2013.55	31	55,840	56,985	1,145
3/4/2014	41.7	1942.1	1838.21	-103.86	175.38	1662.84	2013.59	29	56,320	53,308	-3,012
4/2/2014	49.7	1900.7	1871.88	-28.81	130.13	1741.75	2002.00	29	55,120	54,284	-836
5/2/2014	55.4	2072.0	2034.50	-37.50	118.11	1916.40	2152.61	30	62,160	61,035	-1,125
6/3/2014	61.1	2150.0	2199.46	49.46	112.20	2087.27	2311.66	32	68,800	70,383	1,583
7/2/2014	64.9	2256.6	2306.51	49.96	112.25	2194.26	2418.77	29	65,440	66,889	1,449
8/1/2014	72.0	2602.7	2511.95	-90.72	120.83	2391.11	2632.78	30	78,080	75,358	-2,722
9/3/2014	72.5	2555.2	2526.62	-28.54	121.83	2404.78	2648.45	33	84,320	83,378	-942
10/2/2014	67.3	2284.1	2376.65	92.51	113.98	2262.67	2490.63	29	66,240	68,923	2,683
10/31/2014	60.5	2190.3	2181.06	-9.28	112.50	2068.56	2293.56	29	63,520	63,251	-269

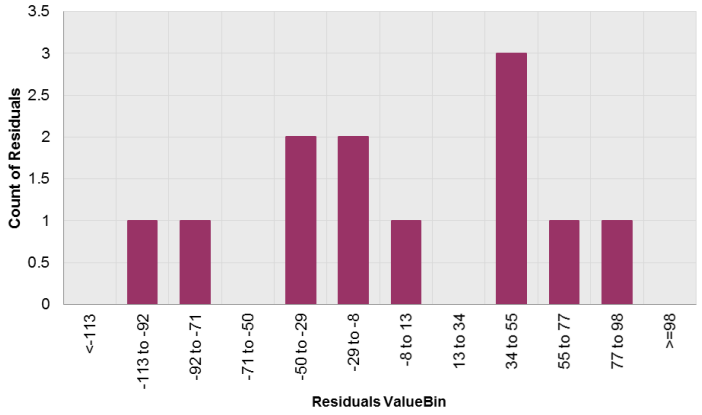
Residuals Lag Chart



Residuals vs. Time



Distribution of Residuals



MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Social Sciences Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			2 Story office & Classroom

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

12 month baseline used. Temperature found to be the only significant variable. Holidays were verified but found with low P-value and not used.
Cooling provided by Heat Plant South Chiller and heating provided by Heat Plant HW Boilers.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197477997370	08450544AB		HW provided from Central Plant	0	
12197477997396	07933321AB		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		475,920	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	11/1/2013	10/30/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	**23,245**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion

Electric:

Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Project deducted savings are pro-rated for the period.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

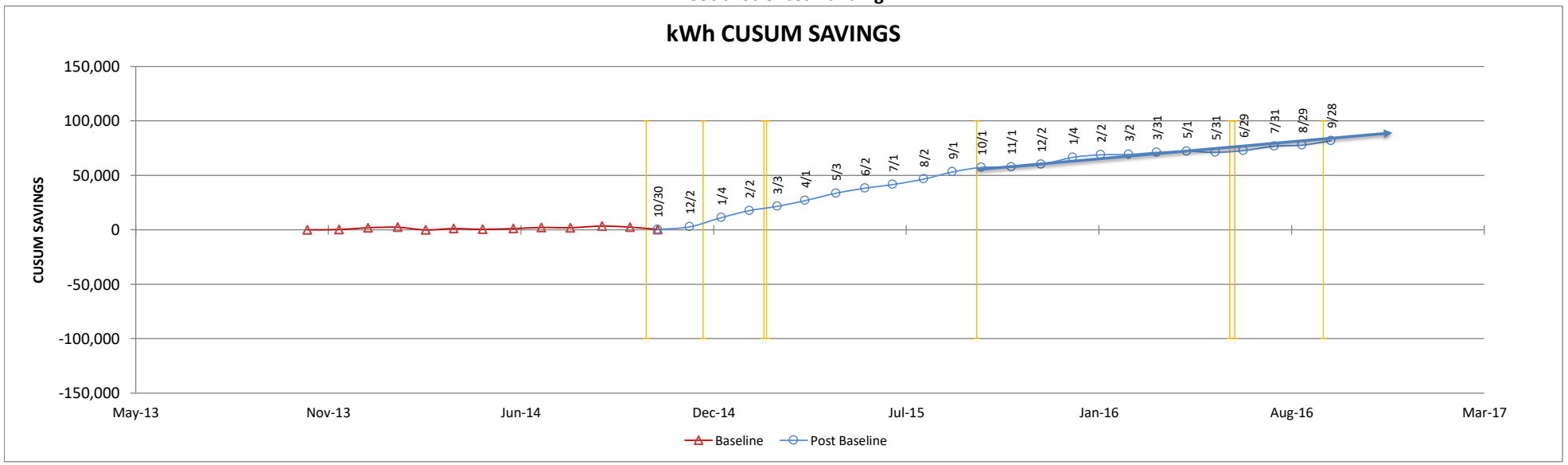
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	Pneumatic to DDC retrofit	P00001093424	3,075	-	1,289	-
			3,075	0	1,289	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Social Sciences Building

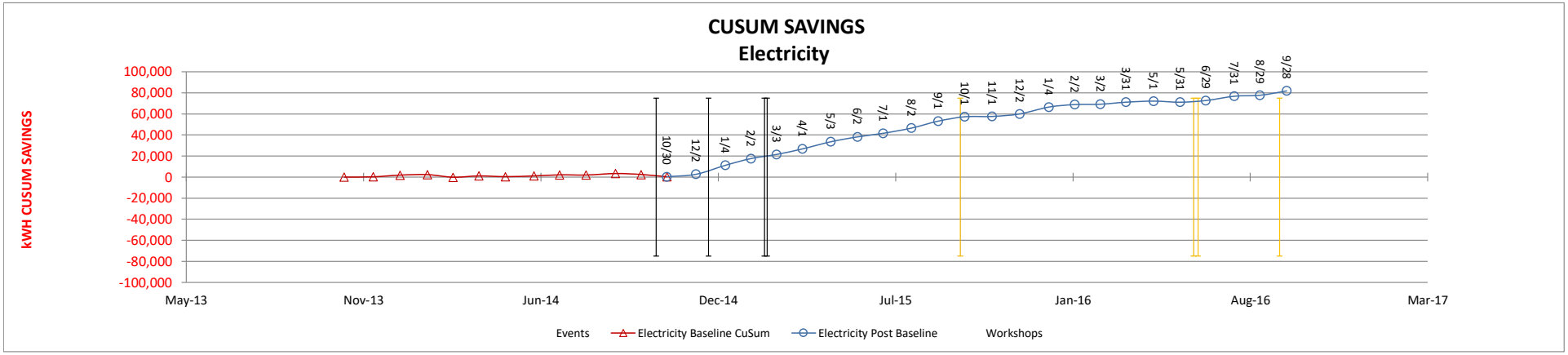


Electricity Savings Estimates

Baseline Period: Electric **11/1/2013** **Thru** **10/30/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/1/2015	9/28/2016	363	24,534		24,534	1,289	23,245	23,245	Capital project to retrofit pneumatic controls to DDC completes 6/2016 and performance is expected to continue to increase. Project deducted savings are pro-rated for the period.
2016 -- Participant Year 2						24,534	1,289	**23,245**		0

Portland Community College - Sylvania Campus **Social Sciences Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Work order ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?		New VAV boxes and rezoned Bond.	09/26/15		
15	?		Parking lot lighting turned off	06/20/16		?
16	?		New LED parking lot lighting turned on	09/20/16		?
17	Capital:	P00001093424	Pneumatic to DDC retrofit	06/15/16	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7)	Y

Portland Community College - Sylvania Campus **Social Sciences Building**

Baseline Period 11/1/2013 Thru 10/30/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	61,899
Coefficients		***Units***	***P Values***
Constant	0.03011	kWh/SqFt-Day	6.26392E-11
Variable 1 Averaged Mean Temperature	-0.00016	kWh/SqFt-Day-F	5.44494E-06
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

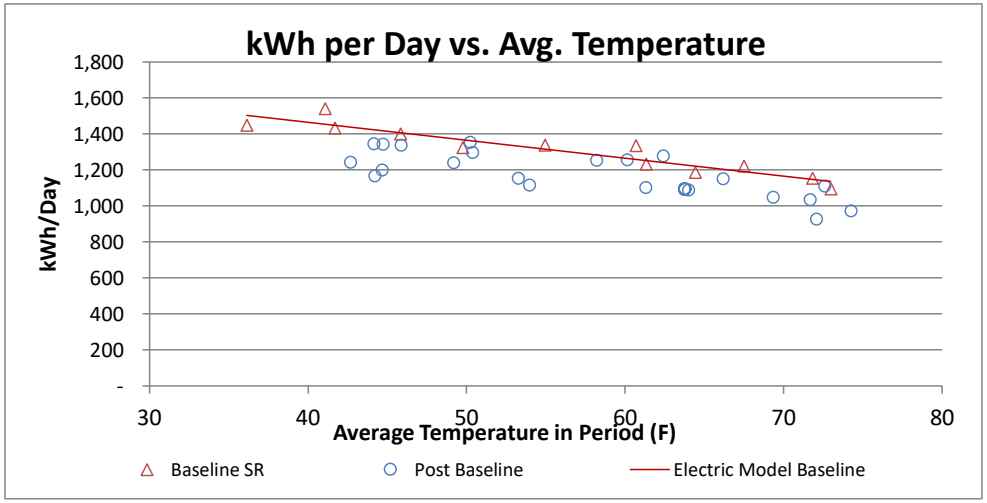
Regression Statistics	
Multiple R	0.9402
R Square	0.8840
Adjusted R Square	0.8724
Standard Error	47.87
Observations	12

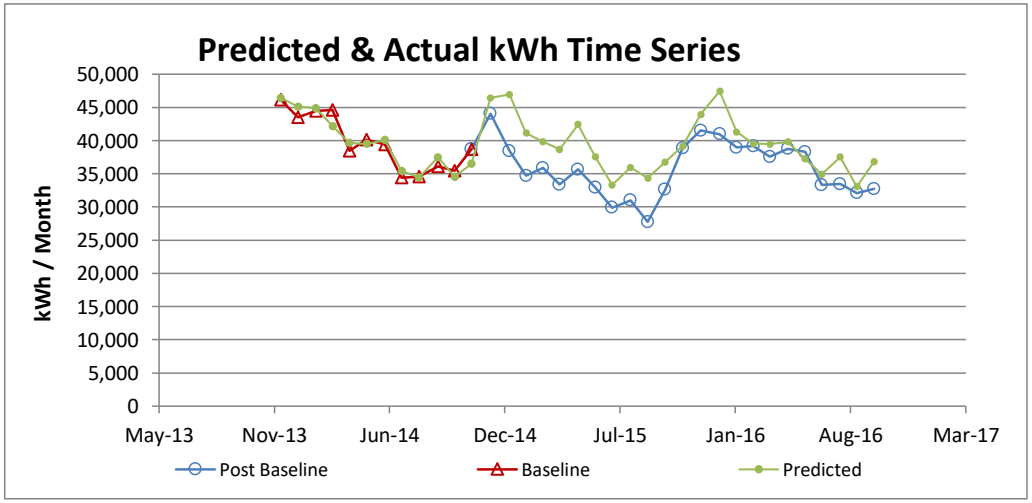
Model Type: Simple Regression Model

Total # of Monthly Samples	12

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	61,899
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Science Technology Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Office & Classroom

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

12 month baseline used. Temperature found to be the only significant variable. Holidays were verified but found with low P-value and not used.
Cooling provided by Heat Plant South Chiller and heating provided by Heat Plant HW Boilers.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197478000638	31012667AB		HW provided from Central Plant	0	
12197478000604	08450545AB		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		752,880	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	10/2/2013	10/1/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	-	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion
Electric:

No savings this period.
Previous year's capital project is under performing based on estimated savings.
Capital project for Pneumatic to DDC retrofit occurs this period. Savings are pro-rated.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
6/8/15	Custom HVAC	P00001066982	125,869	0	0	0
			125,869	0	0	0

Year 2 Capital Projects

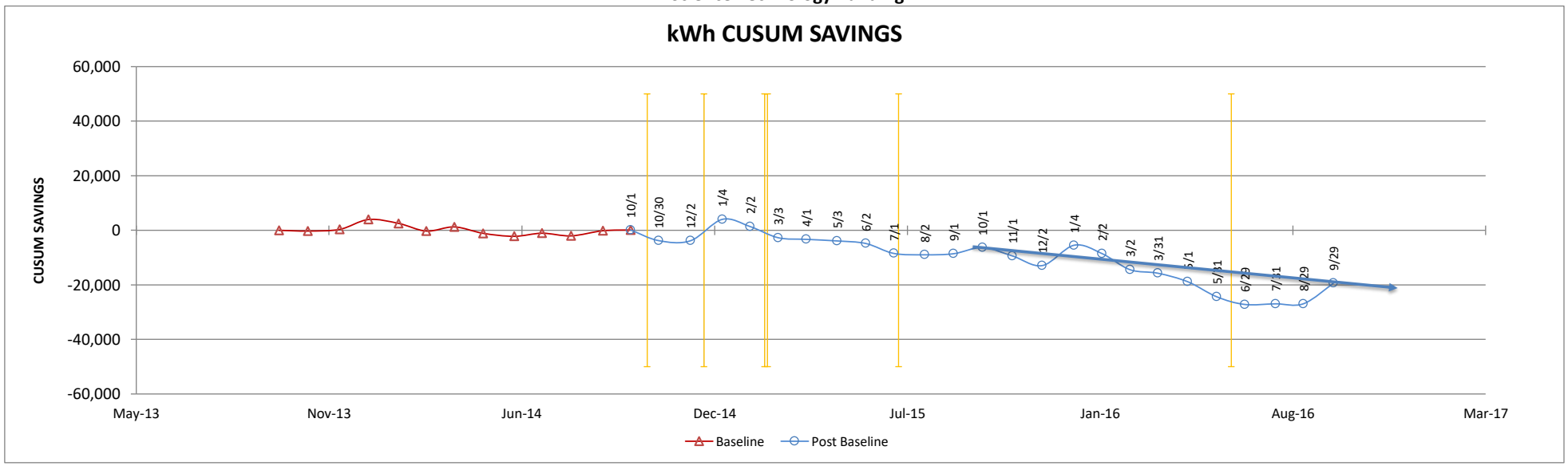
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	Custom Controls	P00001093424	3,075		1,297	
			3,075	0	1,297	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pneumatic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Science Technology Building

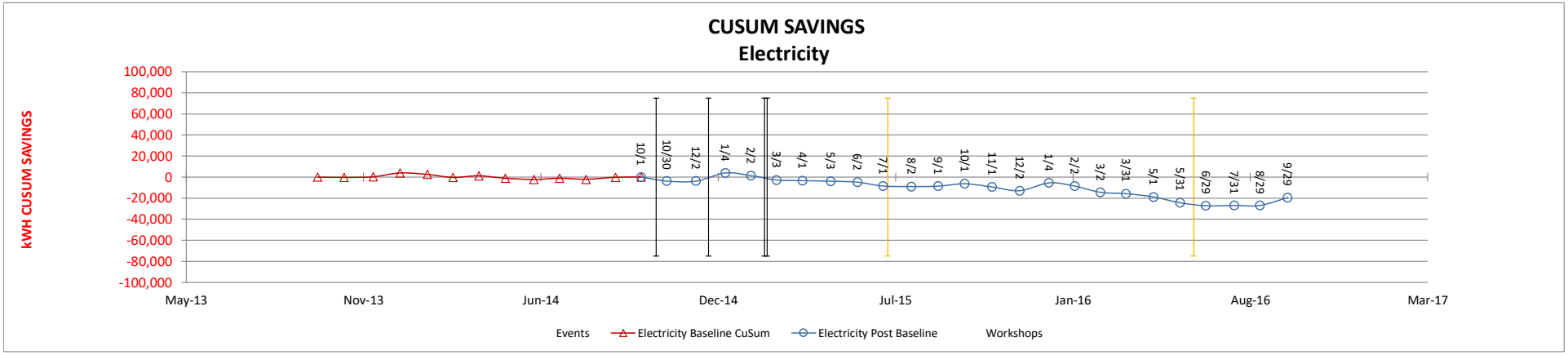


Electricity Savings Estimates

Baseline Period: Electric **10/2/2013** **Thru** **10/1/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 savings Period			0			0	125,869	0	0	Site enrolled PY 2016. ETO Capital Project for Custom HVAC completes 7/2015
2016 Savings Period	10/1/2015	9/29/2016	364	-13,064		-13,064	1,297	0	0	No savings this period. Previous year's capital project is under performing based on estimated savings. Capital project for Pneumatic to DDC retrofit occurs this period. Savings are pro-rated.
2016 -- Participant Year 2						-13,064	127,166	**-140,230**		0

Portland Community College - Sylvania Campus **Science Technology Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Workorder ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	Capital:	P00001066982	ETO - Capital Project Custom HVAC	07/06/15		Y
15	Capital:	P00001093424	ETO - Custom Controls	06/15/16	Pnuematic to DDC retrofit	Y

Portland Community College - Sylvania Campus **Science Technology Building**

Baseline Period 10/2/2013 Thru 10/1/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	73,321
Coefficients		***Units***	***P Values***
Constant	0.03547	kWh/SqFt-Day	4.84157E-11
Variable 1 Averaged Mean Temperature	-0.00013	kWh/SqFt-Day-F	9.95691E-05
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.8912
R Square	0.7943
Adjusted R Square	0.7737
Standard Error	65.23
Observations	12

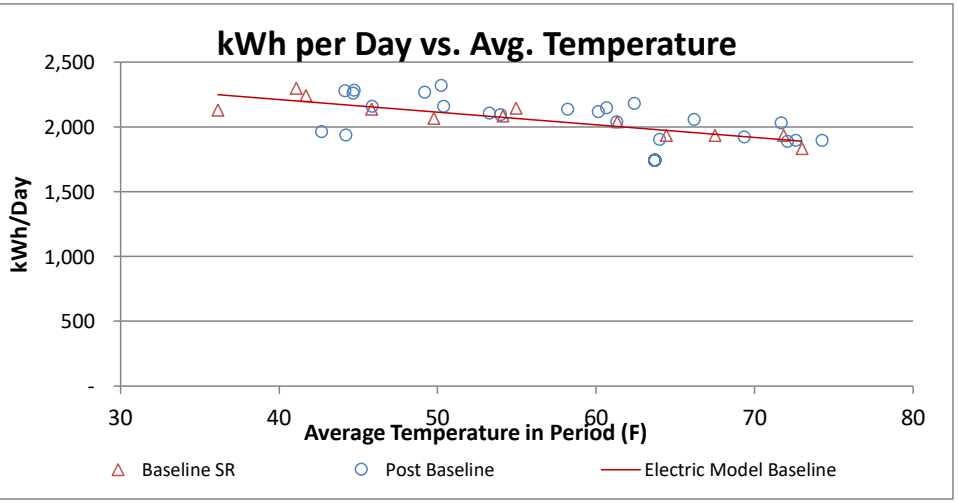
Model Type: Simple Regression Model

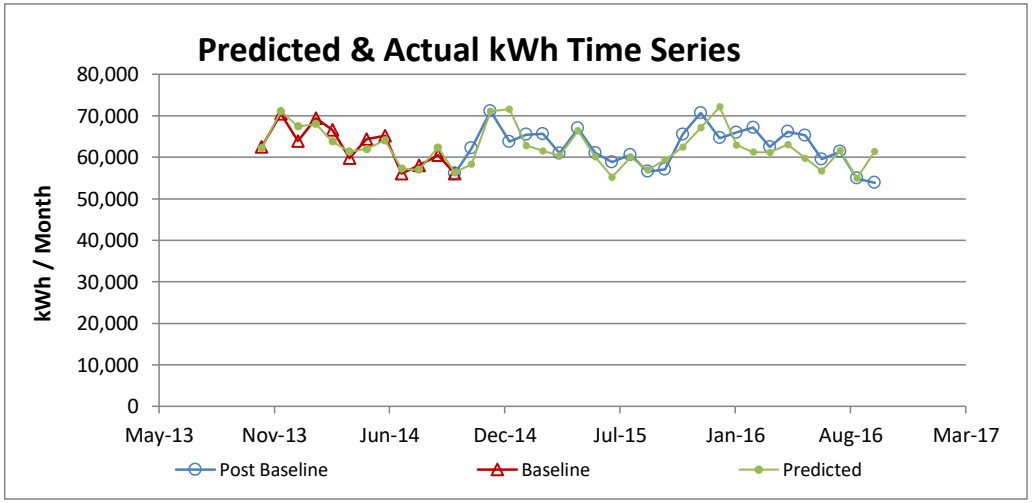
Total # of Monthly Samples	12

Confirm the proper graph is displayed below for the type of modeling used

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	73,321
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0





MT&R Report For:	**Portland Community College - Sylvania Campus**	Building:	**Technology Classroom Building**
Program Period:			10/8/2014 - 10/27/2015
Primary Building Usage or Occupancy Type:			Office & Classroom

Building MT&R Discussion

Performance tracking for electric usage was completed through MT&R modeling, best results were achieved utilizing a:
Simple Regression Model

Electric Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	Y
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Electric Model Discussion

12 month baseline chosen. Temperature found to be the only significant driver. Holidays were verified but found to have a low P-value and not used.

No Gas accounts were enrolled for this site
N/A

Gas Model	Independent Variables	Is variable used in this model?
V1	Variable 1 Averaged Mean Temperature	N
V2	Variable 2 Temp²	N
V3	Variable 3 Holidays, Break days or Event days per Month	N
V4	SUM of Variables 4	N
V5	Average of Variable 5	N

Gas Model Discussion

N/A

Electric Account	**Electric Meter**	**Annual (kWh)**	**Natural Gas Account**	**Natural Gas Meter**	**Annual Consumption (Therms)**
12197477997438	31030366AB		HW provided from Central Plant	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
0	0		0	0	
Annual Electricity Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		739,600	Annual Gas Usage Sum of the most recent 12 month period BEFORE the SEM Program Kickoff		0

	Electricity		Natural Gas
Baseline Period	11/9/2013	10/30/2014	
Utility Data Source	Monthly Electrical use data was obtained through:		Monthly Gas use data was obtained through:
	Energy Trust Utility Query		N/A
Weather Data Source	Daily Weather Data was obtained through the web site for the Weather Underground then consolidated and averaged to align with read dates for each month		
	Weather Station Location:		Portland, Oregon Airport

Program Period Electric Savings (kWh)	**16,356**	**2016 Participant Year 2**
Program Period Natural Gas Savings (therms)	**N/A**	

Baseline Discussion

Electric:

The baseline period was chosen because it showed the overall best R2 and p-values for electric usage for a period that showed the most consistent operations period closest to the start of the program period.

Gas:

N/A

Adjusted Baseline Discussion:

Electric:

NO Adjusted Baseline needed

Natural Gas:

N/A

Savings Discussion
Electric:

Capital project to upgrade DDC and add DAT reset strategy completes 6/2016. Claimed ETO savings are pro-rated for this period.

Gas:

N/A

Capital Projects Interaction Discussion

The following Capital Projects are known to have received Energy Trust Incentives. Their estimated savings have been subtracted from the SEM savings estimates

2015 Program Year 1 Capital Projects

Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
			0	0	0	0

Year 2 Capital Projects

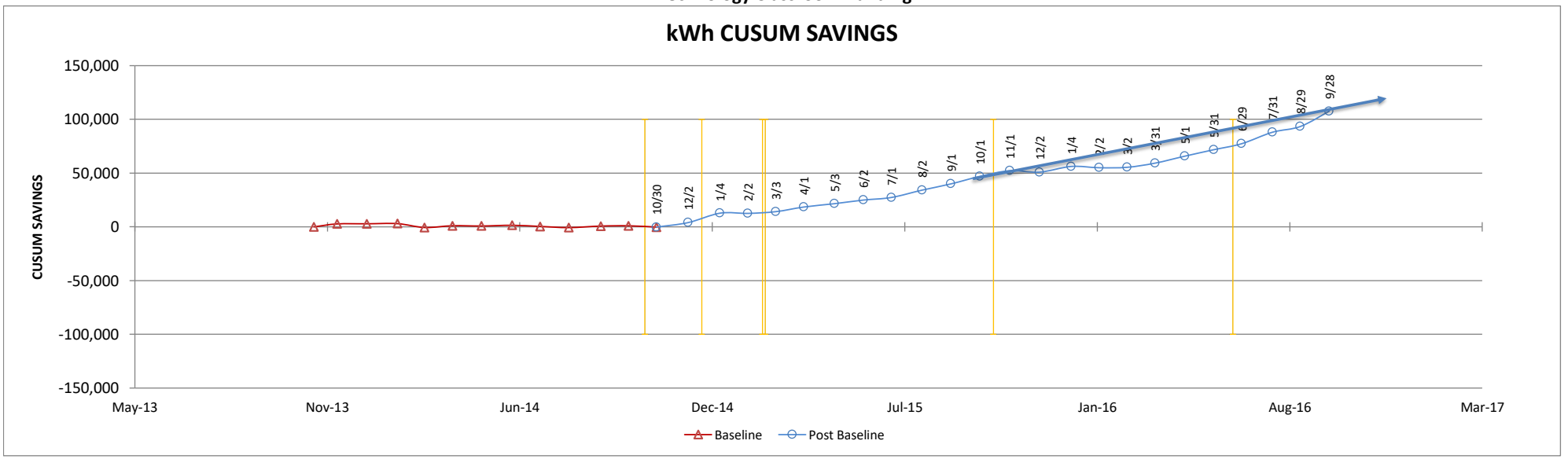
Install Date	Description	Project ID	Project Annual Estimated Savings: Electric (kWh)	Project Annual Estimated Savings: Gas (Therms)	Project Prorated Electric Savings: (kWh)	Project Prorated Gas Savings: (Therms)
4/28/16	Custom Building Controls	P00001093424	105,738	-	44,323	-
			105,738	0	44,323	0

PCC Sylvania Campus Capital Project Time Line
2015-2016

Project ID	Building Name	Performance Tracking Tool Y or N	Project	Measure Description	Estimated kWh Savings Associated with Electric Model	Estimated Therm Savings Associated with Heat Plant	Install Date	Status	Completion Date
P00000916766	AMB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - AM Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	78,903	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	8,469	167	4/28/2016	COMPLETE	6/30/2016
P00001093424	AMB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	Bookstore	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	15,958	4,100	4/28/2016	COMPLETE	6/30/2016
P00000941933	CCB	Y	College Center Building Phase 1 Renovation	Custom HVAC	673,949	30,690	5/2/2014	COMPLETE	11/18/2014
P00000987838	CCB	Y	College Center Building Phase 2 Renovation	Custom HVAC	541,428	24,655	1/15/2016	COMPLETE	10/1/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	2,191	-	4/28/2016	COMPLETE	6/30/2016
P00001093424	CTB	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001008968	Heat Plant	Y	Heat Plant	DHW Heat Exchanger replaced	-	2,740	1/26/2015	COMPLETE	06/21/2015
P00001093424	LRC	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	9/13/2016
P00001093424	PAC	N	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	4,297	1,450	4/28/2016	COMPLETE	6/30/2016
P00001093424	SSB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001066982	STB	Y	PCC Sylvania Controls Ph 1 - Economizer (EEM3) - ST Bldg Economizer dampers replaced and economizer controls installed	Custom HVAC	125,869	-	6/8/2015	COMPLETE	6/30/2015
P00001093424	STB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus Pnuematic to DDC	Custom Building Controls	3,075	-	4/28/2016	COMPLETE	09/13/2016
P00001093424	TCB	Y	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus DDC upgrade & DAT Reset	Custom Building Controls	105,738	3,340	4/28/2016	COMPLETE	6/30/2016

Portland Community College - Sylvania Campus

Technology Classroom Building

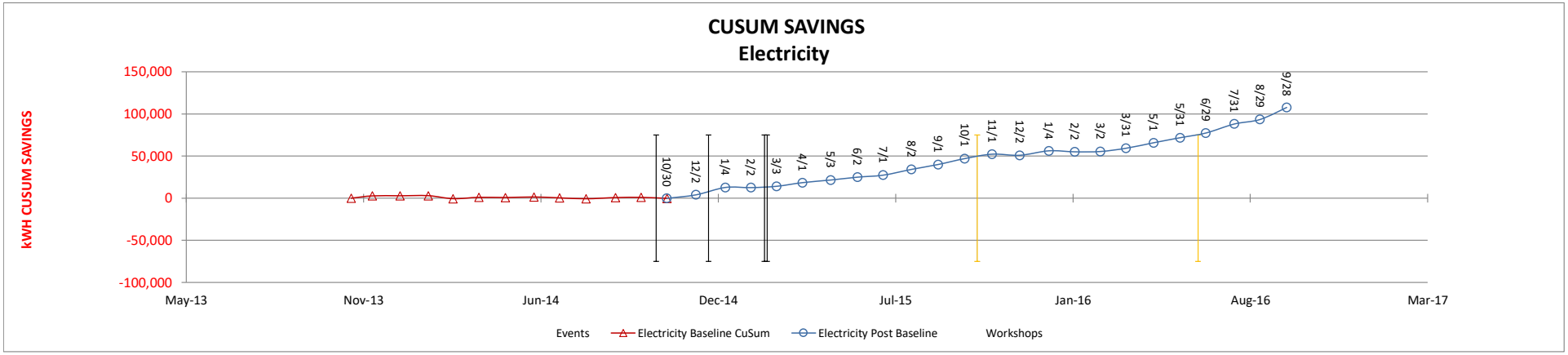


Electricity Savings Estimates

Baseline Period: Electric **11/9/2013** **Thru** **10/30/2014**

Program Period (Year Savings Claimed)	Read Date (last read date prior to the start of THIS period)	Period Ending Read Date	Days	Actual Measured Savings	Adj. Baseline Daily average savings rate	Measured savings - Adjusted baseline savings (if any)	Energy Trust Annual Capital Project Savings Claimed in the Program Period	Annual MEASURED SEM savings minus Total Capital savings	Inc 12 Month SEM savings Current SEM minus the highest previously claimed SEM savings	Savings Discussion Notes for Report
Adjusted Baseline			0	0	0.0	-	0	0		NO Adjusted Baseline needed
2015 Savings Period			0			0	0	0	0	Site enrolled PY 2016
2016 Savings Period	10/1/2015	9/28/2016	363	60,679		60,679	44,323	16,356	16,356	Capital project to upgrade DDC and add DAT reset strategy completes 6/2016. Claimed ETO savings are pro-rated for this period.
2016 -- Participant Year 2						60,679	44,323	**16,356**		0

Portland Community College - Sylvania Campus **Technology Classroom Building**



Operations Events and Projects Log (UPDATE MONTHLY!)						
Enter operations actions/events and capital projects that are expected to affect energy consumption below						
No.	**Event/Project Type (pick from list)**	**Project / Event / Workorder ID (if any)**	**Project Name / Event Description**	**Date**	**Scope of Project or Event**	**Energy Trust Incentives received for project? Y/N**
1	SEM:		Signed SEM Enrollment		Began discussions with SEG about energy management	
2	SEM:		Cohort 5 Kickoff Workshop	10/18/14	Year 1 of SEM program begins	
3	SEM:		Effective Energy Team Workshop	12/16/14	Attended Workshop. Energy management awareness increased through program involvement	
4	SEM:		Energy Wastes & Opportunities Workshop		Attended Workshop. Energy management awareness increased through program involvement	
5	SEM:		Energy Tracking and Performance Workshop	02/17/15	Attended Workshop. Energy management awareness increased through program involvement	
6	SEM:		Engagement		Attended Workshop. Energy management awareness increased through program involvement	
7	SEM:		Sustaining		Attended Workshop. Energy management awareness increased through program involvement	
8	SEM:					
9	SEM:		Report-out		1st year wrap up	
10	SEM:		1st On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
11	SEM:		2nd On Site Building Ops Assessment		SEG site walk to assess and identify operational energy savings opportunities	
12	SEM:		Operators Building Opportunities Workshop	02/20/15	Workshop for facility operators to help them assess and identify operational energy savings opportunities	
13			**Customer identify and log contributors to savings below**		Please update the Operations Logs monthly before they are forgotten	
14	?		removed old split and reconfigured room and installed new split system.	10/15/15		
15	Capital:	P00001093424	Custom Controls	06/20/16	PCC Sylvania Controls Ph 2 - Supply Air & DDC (EEM2&7) - Campus	y

Portland Community College - Sylvania Campus **Technology Classroom Building**

Baseline Period 11/9/2013 Thru 10/30/2014

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	46,394
Coefficients		***Units***	***P Values***
Constant	0.02970	kWh/SqFt-Day	1.54261E-08
Variable 1 Averaged Mean Temperature	0.00027	kWh/SqFt-Day-F	7.32107E-06
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.9365
R Square	0.8770
Adjusted R Square	0.8647
Standard Error	62.55
Observations	12

Model Type: Simple Regression Model

Total # of Monthly Samples	12

Confirm the proper graph is displayed below for the type of modeling used

kWh = sum (Coefficients*variable) + Base Load		BUILDING SQ FT	46,394
Coefficients		***Units***	***P Values***
Constant	0.00000	kWh/SqFt-Day	0
Variable 1 Averaged Mean Temperature	0.00000	kWh/SqFt-Day-F	0
Variable 2 Temp²	0.00000	kWh/SqFt-Day-F²	0
Variable 3 Holidays, Break days	0.00000	kWh/SqFt-Day-Holidays/Events	0
SUM of Variables 4	0.00000	0	0
Average of Variable 5	0	0	0

Regression Statistics	
Multiple R	0.0000
R Square	0.0000
Adjusted R Square	0.0000
Standard Error	0.00
Observations	0