STATE OF UTAH

STATE BUILDING ENERGY EFFICIENCY PROGRAM
FY 2014 ANNUAL REPORT

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STATE BUILDING ENERGY EFFICIENCY PROGRAM
ANNUAL REPORT TO THE GOVERNOR AND THE LEGISLATURE
FY 2014

Prepared by
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Division of Facilities Construction and Management

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STATE BUILDING ENERGY EFFICIENCY PROGRAM

SBEEP

More than $5 million collected in rebates & incentives

Revolving loan funds average annualized return on investment (ROI) of 31.05%

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High Performance Building Standards in development projects show energy use 20–30% better than national average

MAKING STATE OF UTAH–OWNED BUILDINGS MORE

Under the direction of the Division of Facilities Construction and Management, the State Building Energy Efficiency Program's (SBEEP) primary goal is to improve energy efficiency and reduce energy costs for state facilities. The program finds the most effective methods to reduce operating cost, lower maintenance costs and extend the life of building equipment through efficiency measures.

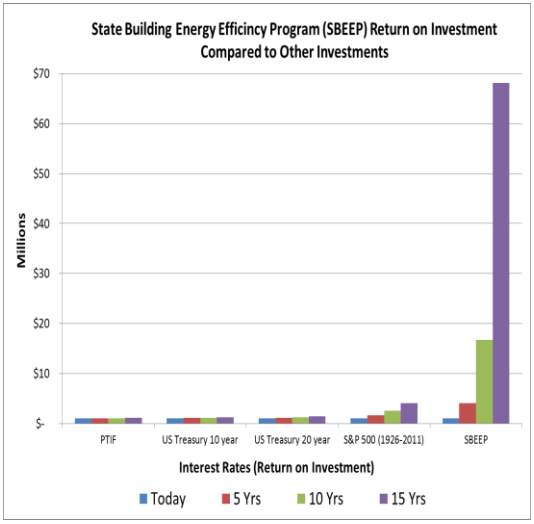
Energy Efficiency Incentive Programs for New and Existing Buildings

Since 2006, SBEEP has brought more than **$5 million** in rebates and incentives back to Utah construction projects. All construction work in the state is evaluated for potential incentives offered through the major state utilities.

State Facility Energy Efficiency Loan Fund

SBEEP manages a revolving loan fund in the amount of $2.45 million that is available for State agencies and institutions to borrow for energy efficiency projects at their facilities that have a strong payback. Since 2008, over 17 projects have utilized this funding with an **average simple payback to the fund of 3.75 years**. Current loans that have been approved by the Utah State Building Board have an **average annualized Return on Investment to the State of 31.05%.**

Efficiency in Construction for Development and Improvement



Since 2006 SBEEP has developed and implemented over $40 million in energy retrofits and exceeded **$12 million in energy avoided cost savings** to the state. From new buildings to retrofit work, the SBEEP works with project managers at DFCM and all agencies and institutions to ensure that the most efficient and cost effective decisions are being made for all buildings throughout the state. High Performance Building Standards are continuously being evaluated to ensure they provide the best value to the State to ensure that new buildings provide long lasting and efficient spaces throughout the life of a building.

98% of the state-owned building inventory has been retrofitted to more efficient lighting technology, saving the State up to 30% on the cost of lighting.

OVERVIEW

The State Building Energy Efficiency Program (SBEEP) was created in 1999 and moved to the Division of Facilities Construction and Management in 2006. The goal of SBEEP is to increase energy efficiency and reduce energy costs in state buildings. This report is provided annually to comply with statute. The following Utah Codes apply to the program:

Title 63A – Utah Administrative Service Code
Chapter 5 – State Building Board – Division of Facilities Construction and Management
Section 701 – State Building Energy Efficiency Program (SBEEP)
See code in following section

Title 63A – Utah Administrative Service Code
Chapter 5 – State Building Board – Division of Facilities Construction and Management
Section 603 – State Facility Energy Efficiency Fund (SFEEF)
See code in following section

Efforts to increase energy efficiency in response to the directives issued by both the Governor and the Legislature have focused on state-owned buildings. The Governor's Office acknowledges opportunities for improving energy efficiency which is articulated in Governor Herbert's Ten-Year Energy Plan. Together, the actions taken by Governor Herbert and the Legislature articulate an understanding that improving energy efficiency can provide long-term economic and environmental benefits to the state.

The State Building Energy Efficiency Program strives to carry out the goal of improving energy efficiency and reducing the energy costs for state facilities. The program looks at effective ways through energy efficiency to reduce operating costs, lower maintenance costs and extend the life of building equipment. The efficiency programs being targeted by the State Building Energy Efficiency Program are

- High Performance Building Standard for Capital Development Projects
- Building Systems Commissioning
- Building Envelope Commissioning
- Energy Retrofits to Optimize Energy Efficiency in Existing Buildings
- Energy Efficiency Incentives Programs for New and Existing Buildings
- Renewable Energy Projects
- State Facility Energy Efficiency Loan Fund
- Energy Saving Performance Contracts
- State Employee Behavior Partnership for Energy Efficiency

From design to operations, the costs incurred by the State in implementing energy efficient measures in state-owned buildings will, over time, yield monetary benefits that far exceed the

upfront costs of the energy measures. Additional measures that are of value and included in the portfolio of efficiency measures undertaken by SBEEP include efforts to educate and train employees regarding the critical role they play in meeting the State's energy efficiency goals. SBEEP serves as a resource for state facilities to help guide monetarily conscious energy efficiency decision. The program provides funding resources as well as tools and cost-effective methods for energy efficient design, construction and operations. SBEEP aims to reduce wasted energy impacts from building while creating and maintaining high quality spaces for state building occupants.

63A-5-701. State Building Energy Efficiency Program.

(1) For purposes of this section:

(a) "Division" means the Division of Facilities Construction and Management established in Section 63A-5-201.

(b) "Energy efficiency measures" means actions taken or initiated by a state agency that reduce the state agency's energy use, increase the state agency's energy efficiency, reduce source energy consumption, reduce water consumption, or lower the costs of energy or water to the state agency.

(c) "Energy savings agreement" means an agreement entered into by a state agency whereby the state agency implements energy efficiency measures and finances the costs associated with implementation of energy efficiency measures using the stream of expected savings in utility costs resulting from implementation of the energy efficiency measures as the funding source for repayment.

(d) "State agency" means each executive, legislative, and judicial branch department, agency, board, commission, or division, and includes a state institution of higher education as defined in Section 53B-3-102.

(e) "State Building Energy Efficiency Program" means a program established under this section for the purpose of improving energy efficiency measures and reducing the energy costs for state facilities.

(f) (i) "State facility" means any building, structure, or other improvement that is constructed on property owned by the state, its departments, commissions, institutions, or agencies, or a state institution of higher education.

(ii) "State facility" does not mean:

(A) an unoccupied structure that is a component of the state highway system;

(B) a privately owned structure that is located on property owned by the state, its departments, commissions, institutions, or agencies, or a state institution of higher education; or

(C) a structure that is located on land administered by the School and Institutional Trust Lands Administration under a lease, permit, or contract with the School and Institutional Trust Lands Administration.

(2) The division shall:

(a) develop and administer the state building energy efficiency program, which shall include guidelines and procedures to improve energy efficiency in the maintenance and management of state facilities;

(b) provide information and assistance to state agencies in their efforts to improve energy efficiency;

(c) analyze energy consumption by state agencies to identify opportunities for improved energy efficiency;

(d) establish an advisory group composed of representatives of state agencies to provide information and assistance in the development and implementation of the state building energy efficiency program; and

(e) submit to the governor and to the Infrastructure and General Government Appropriations Subcommittee of the Legislature an annual report that:

(i) identifies strategies for long-term improvement in energy efficiency;

(ii) identifies goals for energy conservation for the upcoming year; and

(iii) details energy management programs and strategies that were undertaken

in the previous year to improve the energy efficiency of state agencies and the energy savings achieved.

(3) Each state agency shall:

(a) designate a staff member that is responsible for coordinating energy efficiency efforts within the agency;

(b) provide energy consumption and costs information to the division;

(c) develop strategies for improving energy efficiency and reducing energy costs; and

(d) provide the division with information regarding the agency's energy efficiency and reduction strategies.

(4) (a) A state agency may enter into an energy savings agreement for a term of up to 20 years.

(b) Before entering into an energy savings agreement, the state agency shall:

(i) utilize the division to oversee the project unless the project is exempt from the division's oversight or the oversight is delegated to the agency under the provisions of Section 63A-5-206;

(ii) obtain the prior approval of the governor or the governor's designee; and

(iii) provide the Office of Legislative Fiscal Analyst with a copy of the proposed agreement before the agency enters into the agreement.

Amended by Chapter 242, 2012 General Session

63A-5-603. State Facility Energy Efficiency Fund -- Contents -- Use of fund money.

(1) As used in this section:

(a) "Board" means the State Building Board.

(b) "Division" means the Division of Facilities Construction and Management.

(c) "Fund" means the State Facility Energy Efficiency Fund created by this section.

(2) There is created a revolving loan fund known as the "State Facility Energy Efficiency Fund."

(3) To capitalize the fund, the Division of Finance shall, at the end of fiscal year 2007-08, transfer $3,650,000 from the Stripper Well-Petroleum Violation Escrow Fund to the fund.

(4) The fund shall consist of:

(a) money transferred under Subsection (3);

(b) money appropriated by the Legislature;

(c) money received for the repayment of loans made from the fund; and

(d) interest earned on the fund.

(5) The board shall make a loan from the fund to a state agency to, wholly or in part, finance energy efficiency measures.

(6) (a) (i) A state agency requesting a loan shall submit an application to the board in the form and containing the information that the board requires, including plans and specifications for the proposed energy efficiency measures.

(ii) A state agency may request a loan to fund all or part of the cost of energy efficiency measures.

(b) If the board rejects the application, the board shall notify the applicant stating the reasons for the rejection.

(7) (a) In accordance with Title 63G, Chapter 3, Utah Administrative Rulemaking Act, the board shall make rules establishing criteria to determine:

(i) loan eligibility;

(ii) energy efficiency measures priority; and

(iii) ways to measure energy savings that take into account fluctuations in energy costs and temperature.

(b) In making rules that establish prioritization criteria for energy efficiency measures, the board may consider:

(i) possible additional sources of revenue;

(ii) the feasibility and practicality of the energy efficiency measures;

(iii) the energy savings attributable to eligible energy efficiency measures;

(iv) the annual energy savings;

(v) the projected energy cost payback of eligible energy efficiency measures;

(vi) other benefits to the state attributable to eligible energy efficiency measures;

(vii) the availability of federal funds for the energy efficiency measures; and

(viii) whether to require a state agency to provide matching funds for the energy efficiency measures.

(8) (a) In reviewing energy efficiency measures for possible funding, the board shall:

(i) review the loan application and the plans and specifications for the energy

efficiency measures;

(ii) determine whether to grant the loan by applying the loan eligibility criteria; and

(iii) if the loan is granted, prioritize funding of the energy efficiency measures by applying the prioritization criteria.

(b) The board may condition approval of a loan application and the availability of funds on assurances from the state agency that the board considers necessary to ensure that the state agency:

(i) uses the proceeds to pay the cost of the energy efficiency measures; and

(ii) implements the energy efficiency measures.

(9) The State Building Energy Efficiency Program shall provide staff support when the board performs the duties established in this section.

Enacted by Chapter 334, 2008 General Session

State Building Energy Efficiency Staff

Staff Bios:

John Harrington, CEM, DFCM, Energy Director

John joined the State of Utah in 2006 and currently serves as manager of the State Building Energy Efficiency Program (SBEEP). He oversees and directs all aspects of the SBEEP program, including policies, design standards for new construction and energy efficiency improvements in existing state facilities. Prior to coming to the State, he spent 34+ years in the private sector working for two large energy firms. He worked in many capacities while in the private sector, including energy engineering, operations, sales, and multiple management positions. John was the general manager of the Los Angeles, California, office and later came to Utah to develop the energy services business for his firm.

John has received both state and national recognition for his work in the energy field. In 2006 he received the Lifetime Achievement Award from the Association of Professional Energy Managers. John was named the 2009 National Energy Manager of the Year by the Association of Energy Engineers. In 2010 John was the recipient of the Governor's Award for Excellence in Energy and the Environment. He is the past president of the Utah Chapter of the Association of Energy Engineers.

John is a certified energy manager (CEM) and holds a general contracting license in the state of Utah.

Bianca Shama, MPA, Energy Program Director

In 2009 Bianca joined the State to assist in the facilitation of a $10 million grant awarded to the Division of Facilities and Construction Management to do energy efficiency work. In August of 2011, Bianca's role shifted and expanded to focus on project management of energy conservation, efficiency, and renewable energy projects in state-owned facilities. Bianca's responsibilities with the DFCM include managing the allocation of the revolving loan fund, collaborating with State agencies and institutions to develop energy efficiency projects and assisting them in exploring resources with which to make efficiency work possible at their facilities. Bianca works on initiatives such as identifying and making best use of utility incentive programs for efficiency work and coordinating with other project managers at the State to ensure available incentives are collected from the utility companies. Bianca is working to refine best practices in the installation of energy efficient products in state-owned buildings. Prior to working for the State of Utah, Bianca worked as a consultant focusing on behavioral energy change and looking to find cost effective solutions to reducing utility usage without the disruption of occupant comfort. Bianca served as a member of the Climate Action Plan Task Force at the University of Utah in 2009. Bianca holds a masters in psychology from Adelphi

University and in 2011 completed a masters of public administration from the University of Utah. In 2010 Bianca was inducted into the National Honor Society for Public Affairs and Administration and serves as vice president of their Board. She is a member of the Energy Management Program Advisory Committee for Salt Lake Community College. Bianca is also an active member of the AEE Board for the local Utah Chapter.

 **John Burningham, LEED AP, Assoc AIA, Energy Program Director**

John joined DFCM in the fall of 2011. His work includes overseeing the implementation of the State's High Performance Building Standard, as well as analyzing the effects thereof and revising the standard as necessary to further enhance the performance of state-owned buildings. Additionally, he provides technical advice and support to design teams working on state buildings as it relates to energy and the High Performance Building Standard. He works with the state agencies and institutions developing agency-wide energy management plans and programs, as well as identifying feasible energy efficiency projects. He also works on state initiatives, such as state facility energy performance measurement, integrating and maximizing utility incentive programs; and participates on the Utah Building Energy Efficiency Strategies (UBEES) team, an entity charged with promoting energy performance measurement, above code programs, workforce development, and education.

John holds a masters of architecture from the University of Utah and has practiced architecture locally for several years. He is also a LEED Accredited Professional and worked as a consultant to the EPA, DOE, and United States Green Building Council prior to coming to DFCM.

 **Chris Ottley, Energy Program Specialist**

Chris joined the State in June 2014 to assist the Division of Facility and Construction Management in creating best practices in reporting and benchmarking of energy efficiency. Chris is driven to improve energy consumption statewide and integrate more efficient equipment into all state buildings. Additionally Chris is the point person for the division in the collection of utility incentives on capital improvement projects for the State. Chris held a broker license in residential Real Estate from 2001–2012 and completed the associate degree of applied science in energy management at Salt Lake Community College in 2012. Chris comes to the State from the private sector where he worked in building automation and controls. He brings to the State vast experience in programming, troubleshooting HVAC, lighting, building controls, as well as a knowledge and experience in the startup and commissioning of building control systems. Chris brings with him a wealth of certifications in a multitude of various building automation systems and is a member of the Association for Energy Engineers.

Kimberly Hood
DAS Executive Director

DFCM DIVISION DIRECTOR
P. Joshua Haines

Cee Cee Niederhauser
Administrative Assistant

Elizabeth Hernandez
Office Technician II

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Document Management
Joanie Aponte
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Brian Bales
Kurt Baxter
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Tim Christensen
Lucas Davis
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Brent Lloyd
Taylor Maxfield
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Matthias Mueller
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Tim Parkinson
Wayne Smith
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Northern Utah Complex
Rick Nauta

Capitol Hill Complex
Nick Radulovich

Salt Lake Courts Complex
Michael Butler

Downtown Complex
George Lewis

South County Complex
Scott Whitney

Redwood Road Complex
Bob Lund

Southern Utah Complex
Chad Browning

Grounds
Alan Olsen

Electronics Resource Group

Revised 8/7/2014

ENERGY MANAGEMENT PROGRAMS AND STRATEGIES IN FY 2014

Energy Efficiency in New Construction Projects

High Performance Building Standard for Capital Development Projects

As of July 1, 2014, DFCM implemented a new robust High Performance Building Standard (HPBS) to guide Capital Development Projects to an increased level of energy and operational performance. From 2009 to 2014 development projects were guided by the US Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) rating program. LEED was instrumental in increasing the sustainability and energy efficiency of state buildings. However, to the credit of the design, construction and building management teams that service state buildings, it became apparent that the LEED program was no longer the best program for state buildings. With the input of industry professionals, DFCM developed a comprehensive tailored program to cost effectively increase energy and operational performance. The standard focuses on reducing energy consumption as well as energy costs. It provides a tiered approach to metering and data inputs for equipment that help building operators better understand how efficient the building operates over the expected fifty-year life of the building. It includes some of the nation's most extensive building systems and envelope systems commissioning requirements. These requirements, when coupled with other sustainable requirements for water efficiency, materials, landscape and indoor environmental quality, provide state institutions buildings that are pleasant, effective, efficient, sustainable and valuable.

The HPBS also provides means for small projects and significant remodels to be designed and built to similar sustainability and energy performance standards. While keeping in mind smaller project budgets, the standard provides a path for these projects to also be built to the same level of quality, sustainability and operational performance. On occasion particular building users or donors request that a building be LEED Certified. The HPBS dovetails into LEED requirements while filling in performance areas usually omitted by LEED.

Energy Engineering

The HPBS requires extensive Energy Engineering including the leveraging of energy modeling and life cycle costs analysis during the design of all capital development projects. This process helps steer the design team to implement energy efficiency strategies that are effective and appropriate for the building owner, building type and budget. Not only does this process help steer the building systems at the time of design, but it does so by looking ahead at the years of actual operations by taking into account energy efficiency. Looking at energy efficiency in operation at the time of design allows us to know that down the line, when the building is operated effectively, it will save the State millions of

dollars in energy costs and operational costs over the life of the building. Generally for every dollar leveraged on energy engineering during design, it can be expected that a minimum of ten dollars will be saved in energy costs savings and/or operational and maintenance cost savings over the life of the building. Additionally, first cost savings are often yielded in a well-executed energy engineering effort when dollars can be directed towards the most cost effective energy efficiency strategies versus strategies that have paybacks beyond the life of the associated equipment.

Collaborative Design

One key element to the long-term success of a high performance building is to bring the building operators who will run the building to the table during the design process. This collaborative process, as outlined in the HPBS, is effective in helping bridge the gap that exists between design, construction and the operation of a building. This gap is one of the biggest reasons that designed energy savings and sustainability measures are not realized. When designers, owners, and operators can exchange ideas on what works, what doesn't, and what the latest technologies have to offer, designed energy savings are realized and the transition from construction to occupancy is much smoother.

Building Analytics

Every new development project will have the appropriate level of meters and data points, which, when the data generated is appropriately digested, can be used to develop a profile or history of how it is performing. Often, the problem is that the volume of data is immense and requires long hours of analysis by someone trained to interpret the data. Analytics programs allow this data to be digested by custom tailored software programs in a real-time scenario, creating profiles and alerts that are quickly interpreted and acted upon. When the analytics programs provide indicators to building operators that the internal systems are not operating correctly, energy can be saved immediately instead of going on unrecognized for weeks, months or even years. Not only is energy saved, but maintenance costs are reduced and occupant comfort is increased. Investigations into other organizations that have utilized these types of programs demonstrate immediate value and cost savings. Currently DFCM has three projects slated to receive these programs to help vet their value.

Building Envelope Commissioning

The building skin or envelope plays a major role in determining the energy efficiency, occupant comfort and indoor environment quality of buildings. Over the last five years, DFCM has been developing building envelope standards on over two dozen buildings. This process of designing and constructing a building to be as air tight as possible is providing significant energy savings, reduced first costs of mechanical systems, and high quality

construction. These efforts, coupled with guidelines to control heating and cooling loads before they enter a building by limiting the amount of glass, ensure that energy costs will be held in check over the life of the building. When attempts to find nationally recognized studies that quantified the energy savings of a high performing envelope failed, DFCM, with the assistance of consulting Energy and Envelope Engineers, developed a study to quantify the expected annual energy cost savings utilizing the energy models developed on past and current DFCM projects. The results varied due to the building massing, location, and Heating Ventilation and Air Conditioning (HVAC) systems. The savings ranged from 3% to 33% with the bulk of the 12 buildings analyzed landing in the 10% to 15% range—per year. Further analysis on the effort demonstrates the average ROI to be under five years. It is important to note that the savings will be realized year after year for the life of the building.

Building System Commissioning

Over the last five years, whole building system commissioning has proven to be a valuable step to ensuring that energy goals are realized once a building is occupied. When buildings systems are inspected at installation, calibrated per the Owner's Project Requirements and construction documents, and functionally tested, energy savings are realized. Additionally, operating costs are lowered, warranty issues decline, occupants are more comfortable and building managers receive better training and building as-builts. All building systems ranging from HVAC to security to electrical are commissioned. This process also supports efforts to maximize utility incentives by providing data verifying that the various energy efficiency strategies are installed and operating as expected. The utility companies use this information for a basis of the incentive amounts to be paid. Dozens of state buildings have benefited from this process and building operators are using this commissioning process as a basis for ongoing commissioning programs throughout the life of the building.

Incentive Programs for New and Existing Facilities

As one of the largest customers of the local utilities, the State participates in utility incentive programs wherever feasible. Major electric and gas utilities offer incentives for efficient new construction and retrofit projects in the form of cash, utility bill credits, and design assistance. Incentives often provide a means for projects to implement energy efficient strategies that result in energy efficiency levels beyond levels required by current energy codes. These higher levels also reduce yearly operating costs thus providing long-term savings to the State over the life of the building. Since 2006 the State has received over $5 million in utility incentives for energy efficiency projects in addition to any resulting energy savings over time. SBEEP facilitates the process to work with the utilities and take advantage of these programs by coordinating energy analysis, design and implementation of energy saving strategies that qualify for utility

incentives. Over the course of dozens of projects, DFCM and SBEEP have developed a healthy working relationship with each utility provider, allowing for both incentive dollars and energy savings to be maximized.

Improvements in Existing Buildings

Equipment and system upgrades, recommissioning, and conservation measures combine to reduce energy use and avoid unnecessary costs. DFCM strives to incorporate energy efficiency into all projects to provide the lowest cost for building operations to the State of Utah. It is the intent that all projects will consider using at least the minimum efficiency ratings for materials as outlined by the public utilities where applicable. All capital improvement projects prior to legislative funding are reviewed for energy efficiency measures and awarded points in the new Building Board scoring criteria when they are found to have an energy saving component for the agency or institutions making the request. The engineers, architects and/or contractor who work with DFCM are responsible for evaluating each project measure for energy efficiency potential at the time of design and construction.

State Facility Energy Efficiency Loan Fund

The State Facility Energy Efficiency Fund (SFEEF) was established in fiscal year 2008 to provide the State Building Energy Efficiency Program with a revolving loan fund from which agencies and institutions can borrow to complete energy efficiency improvement projects. Repayment of the loan is achieved by capturing cost savings from reduced energy use and demand and by capturing utility incentives. Borrowed funds are paid back into the SFEEF so that it can be lent out again. The fund total is $2.45 million. Funding requests must be approved by the SBEEP Manager and the Utah State Building Board. The Building Board approved projects are listed in Appendix A.

Energy Saving Performance Contracts

Larger campuses have bundled energy efficiency projects to maximize their impact without using State funds through Energy Saving Performance Contracts with guaranteed savings from Energy Services Companies (ESCO). An ESCO project uses third party financing. The typical funding source is a tax exempt municipal lease/purchase. Payment to the contractor is made through a guaranteed stream of future energy cost savings. The project is self-funded and does not require state appropriations to proceed. This public-private partnership provides an agency or institution with the following:

- A campus-wide energy audit

- Prioritization of energy projects relative to payback and maintenance needs
- An expedited project timeline to receive more immediate energy savings
- Bundled energy projects and cohesive project management
- A funding vehicle for needed infrastructure upgrades

Agencies That Have Implemented ESCO Projects

University of Utah (Multiple Phases)

Utah Valley University (Multiple Phases)

UDC—Draper Prison

Ogden Regional Center DHS—Utah State Hospital

Utah National Guard (Multiple Phases)

Salt Lake Community College

Dixie State College

To aid institutions and agencies in the selection of ESCOs, the State Building Energy Efficiency Program oversees the selection of a pre-qualified list of contractors to provide services in the Energy Performance Contract Program (EPCP). This was facilitated by SBEEP in order for agencies and institutions to be able to reduce their costs and time associated with solicitation and selection. This allowed for better quality control, and ESCO projects were able to be initiated more quickly to expedite receipt of cost savings from energy improvements. SBEEP is utilizing Energy Savings Performance Contracts with Energy Savings Companies as a means of implementing and financing large comprehensive energy efficiency projects. In addition, utility incentives will be used to help finance ESCO projects.

Several agencies and institutions went through campus-wide energy audits with ESCOs and ultimately decided that a performance contract was not the method they wished to pursue. These institutions and agencies, understanding the significant payback to their facilities by increasing efficiency, instead chose to do comprehensive energy efficiency projects at their facilities using alternate funding methods. The following agencies implemented projects using this method:

- Weber State University
- Capitol Complex
- Utah State University
- Southern Utah University

State Employee Behavior Partnership for Energy Efficiency

Even well-managed facilities that employ the most innovative technologies may experience unnecessary energy consumption as a result of building occupant behavior. Simple modifications to daily tasks or habits can lead to large energy savings.

SBEEP participated in launching a program to identify leaders within state agencies that can understand both office culture and its related energy impact. These leaders are tasked with finding employee behavior changes that will save energy over time.

In the program's pilot year, agencies stepped up and reduced energy consumption by changing their office cultures in terms of energy efficiency. As the program has moved forward, there is a continued effort from within the agencies to implement ground level changes to eliminate wasted energy. For example, plug loads are being reduced by ridding workplaces of unnecessary equipment and appliances, such as superfluous refrigerators.

Renewable Energy Projects

With the use of grant money and Power Purchase Agreements (PPA), SBEEP has been able to find cost effective methods to install renewable energy systems throughout the State (see APPENDIX A). In FY 2014 SBEEP was able to do a large scale RFP to even further drive down system costs and see the installation of over 330,000 watts of photo voltaic (PV) throughout the State.

Goals for Energy Efficiency for FY 2015

Support the Goals of Energy Efforts throughout the State

The SBEEP serves as a resource and liaison to the various public entities throughout the state whose focus is on energy efficiency and energy resources. SBEEP serves as a resource and works at collaborating the efforts of these various groups to maximize the impact of energy efficiency on state buildings by continually being involved in meetings throughout the state that address energy issues.

State Facility Energy Efficiency Loan Fund

The State Facility Energy Efficiency Loan Fund (SFEEF) will continue to be available to agencies that develop viable energy efficiency projects that show energy cost savings. SBEEP will work with the state agencies to identify opportunities for improved energy efficiency and assist them to define scope of work that will maximize on return. The loan is intended to remain fully allocated through the year and new loans will be presented for approval to the Utah State Building Board as funds are collected back to DFCM from existing loans.

Energy Internship

Salt Lake Community College created a new Energy Management Applied Science Associates degree. DFCM's intention is to support energy management needs within state facilities, as well as the College's program by hiring interns as there is a demand. Interns can assist with energy benchmarking, developing state facility case studies and collecting documentation needed for obtaining utility incentives. SBEEP has a sitting member on the Salt Lake Community College Energy Management Program Advisory Committee to help communicate the Energy Management needs from the program from the perspective of the State of Utah.

Continued Partnership with Agency Occupants

SBEEP continues to partner with agency staff and leaders throughout the State of Utah to ensure that the daily building occupant behavior is administered in a way that fosters an energy efficient environment. SBEEP continues to work with individuals and groups throughout a multitude of agencies to address energy relevant behaviors that can be modified in ways that will result in a reduction of unnecessary utility usage within agencies and institutions without disrupting occupant work flow. SBEEP intends continue to partner with the Office of Energy Development in the future to explore ways that these efforts can be expanded throughout the State.

Development of Agency Energy Programs

SBEEP will build upon existing relationships with agencies including the State's higher education institutions that have yet to develop their own energy programs. SBEEP will use

program examples from other agencies and institutions within the state to help administration identify values and priorities relating energy efficiency. These values and priorities will be used as basis for the agencies energy program. It is critical to have the support of the administration to ensure the successful implementation of an agency energy program. Each program will be unique and tailored to the priorities of the agency and institution.

C*ontinued Assessment of High Performance Building Standard (HPBS)*

SBEEP will continue to work with new buildings from the start of design as a resource in implementing the HPBS for the state. The SBEEP staff is also working with new building occupants and facilities managers to ensure that decisions made in the design process are translated into efficient operations once a building is occupied and running. Additionally, an increased effort will be made to bridge the gap between the building design and construction process and the actual day to day operations of the building. Efforts to promote a greater collaboration between designers and facilities managers will be explored within the HPBS. Current efforts to review and develop specific case studies of the effectiveness of the HPBS, HVAC commissioning, energy modeling and envelope commissioning will continue.

Building Performance Measurement

State agencies are implementing measures to improve energy efficiency. SBEEP, as a program tasked with coordinating statewide building efforts to improve energy efficiency, is working towards methods to support the organizational structure needed for a statewide effort to report and track progress towards further increasing the state's energy efficiency. Energy benchmarking efforts will continue in conjunction with a review of buildings recently completed under the HPBS. A statewide methodology for Higher Education is being explored to create a consistency with reporting among campuses, including good baseline information.

Renewable Projects

State agencies and Higher education institutions have expressed interest in exploring cost effective ways to use renewable energy. SBEEP is helping to coordinate RFPs that will allow facilities to look at ways that they might be able to build renewables either through their own means or through a Power Purchase Agreement (PPA) that make sense financially for the state and will allow for competitive rates that can be locked in for a period of time avoiding some of the costs of the rising cost of public utilities.

Incentive Programs for New and Existing Facilities

SBEEP is increasing the efforts to collect on incentives that often provide a means for projects to implement energy efficient strategies that result in energy efficiency levels beyond those required by current energy codes. DFCM and SBEEP will continue to develop a healthy working relationship with each utility provider allowing for both incentive dollars and energy savings to be maximized. SBEEP will also work with the industry partners to make certain that they are

aware of the incentive programs and that the most cost effective and energy efficient materials are specified in all Development and Capital Improvement work carried out through DFCM.

Strategies for Long-term Improvement in Energy Efficiency

Creative Financing

The State Building Energy Efficiency Program (SBEEP) strives to identify all potential sources of funding available for efficiency projects to maximize the impact for savings throughout state buildings. SBEEP continues to collaborate with other state agencies and non-profits to follow any potential sources of funding that might be applicable to state building energy efficiency work.

Construction management of energy projects

SBEEP strives to keep costs of energy projects low for all agencies and institutions by employing DFCM's procurement efficiency and credibility. SBEEP is staffed with knowledge of cost-effective energy project pricing and quality and works to keep the staff educated in all new technologies so that over the long term they are providing the most cost-effective solutions to energy efficiency in state-owned buildings. SBEEP has a continuous learning process in place.

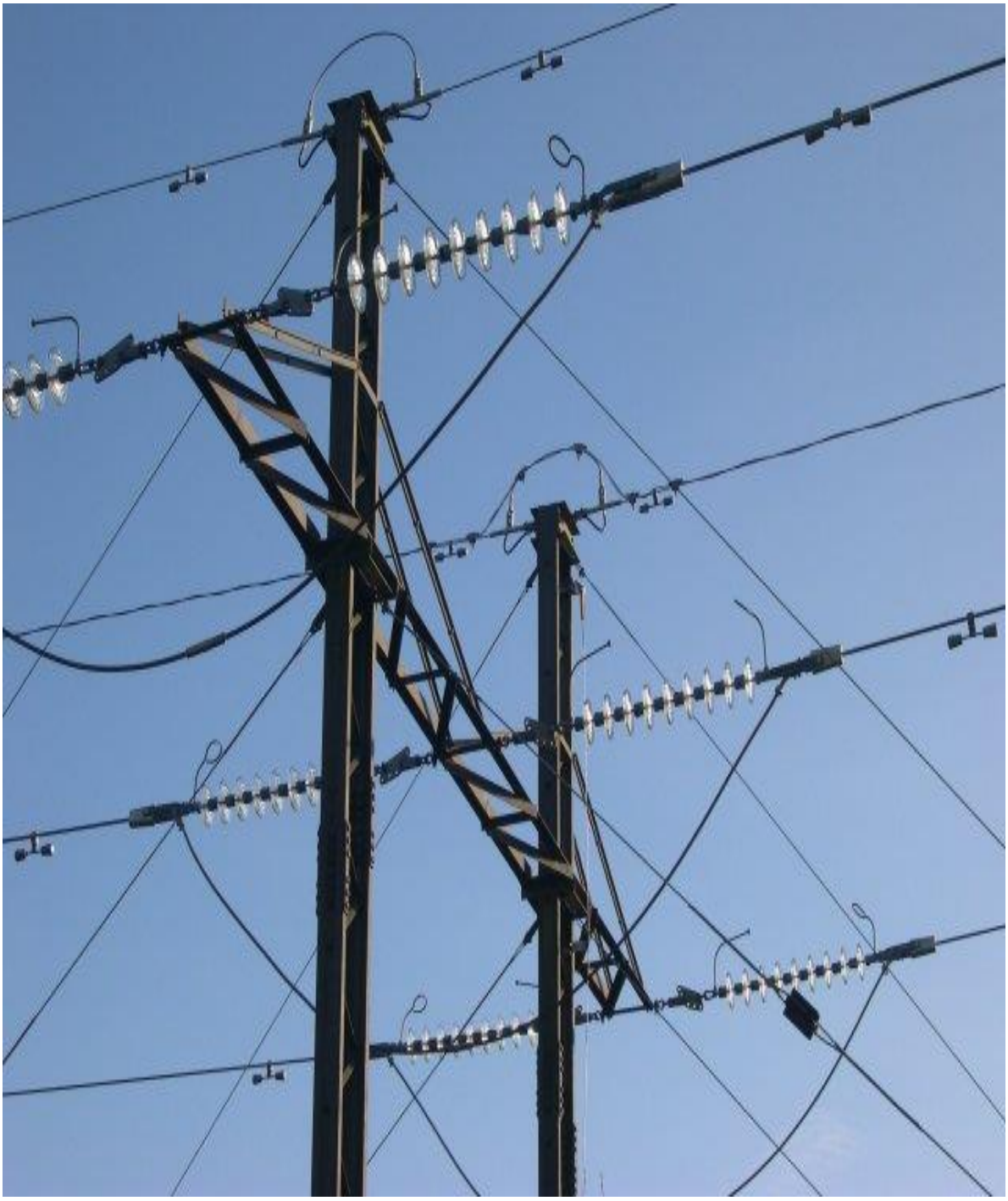
Ongoing education of DFCM consultants and service providers

Since the implementation of the HPBS and the LEED certification process in 2009, significant improvements in the service levels of DFCM's service providers have been made. Architects, engineers, contractors and related consultants are becoming experts in issues related to the HPBS. The amount of time required to implement the HPBS has diminished while the effectiveness of the energy efficiency measures has increased. The design and construction means and methods required by the standard are continually being improved as each new building is designed and built resulting in a significantly better building.

Integrated approach with DFCM Project Management to:

- Prioritize energy efficiency in all construction projects
- Reduce disruption related to renovations for energy needs
- Learn from facility performance and improve DFCM processes
- Connect with facility management to verify energy saving strategies
- Engage in early stages of design and construction
- Provide technical support and educational opportunities to each agency and design and construction team
- Create knowledge base and peer groups that understand how to do energy projects correctly and cost-effectively
- Disseminate lessons learned from energy projects across state institutions and agencies

APPENDIX A



BUILDING BOARD APPROVED LOANS

PROJECT	LOAN $	Annual Savings	Simple Payback Years	Simple ROI
USU HPER Lighting Upgrade	$62,470.00	$12,281.00	5	19.66
USU Lighting Upgrades at Biotech, CPD,AND Geology Buildings	$115,247.00	$23,278.00	5	20.20
WSU Steam Tunnel Repairs & Upgrades	$300,000.00	$96,000.00	4.4	32.00
UVU ESCO Phase II	$250,000.00	$16,200.00	5	6.48
USU Campus Wide Steam Line Improvements	$585,000.00	$164,000.00	2.58	28.03
USU Housing Lighting Efficiency Upgrade	$161,534.65	$59,222.51	3.9	36.66
Snow College Recommissioning	$100,000.00	$50,000.00	2	50.00
Weber State University- Recommissioning	$400,000.00	$150,000.00	2.75	37.50
University of Utah Evaporative Cooling	$300,000.00	$213,800.00	1.7	71.27
USU Central Utah Steam Pipe Insulation	$179,388.82	$89,991.00	2	50.17
SLCC Steampipe and Controls Upgrade	$100,000.00	$29,390.00	3.4	29.39
USH VFD Loan	$18,233.00	$3,266.00	5.58	17.91
DNR Nash Wash Wildlife Management Area	$34,400.00	$6,900.00	5	20.06
SLCC Lighting Upgrades	$700,000.00	$107,500.00	4.2	15.36

ROCKY MOUNTAIN POWER

State Of Utah DFCM Energy FinAnswer Projects

Completed 2006 to 2009

# Projects Completed	Energy Savings (KWH)	Demand Savings (KW)	Total Incentive Paid	Engineering Services Provided
196	22,990,498	4,366	$3,310,053	206,530

State Of Utah DFCM Energy FinAnswer Projects

Completed 2010 to 2014

# Projects Completed	Energy Savings (KWH)	Demand Savings (KW)	Total Incentive Paid	Engineering Services Provided
49	13,225,084	2,357	$1,757,589	$336,369

CAPITAL DEVELOPMENT ENERGY COST SAVINGS SINCE THE IMPLEMENTATION OF LEED SILVER CERTIFICATION IN 2009

Capitol Development Project	Site Energy Savings %	Energy Cost Savings %	Energy Cost Savings $	Energy Savings (MMBtu)
Utah Museum of Natural History	24.00%	16.00%	$ 68,000	
USTAR Logan	45.90%	36.60%	$ 210,307	25769
OWATC Health Technology Building	39.00%	40.00%	$ 38,000	
SLCC Center for New Media Annex Building	12.00%	29.00%	$ 11,000	
USU College of Agriculture	39.00%	36.00%	$ 176,248	
Marriott Honors Community		34.00%	$ 59,100	
Univ Neuropsychiatric Institute Exp	47.00%	39.16%	$ 67,014	6811
U of U David Eccles School of Business		23.00%	$ 60,121	
University of Utah College of Nursing	15.00%	17.00%	$ 72,000	
UVU New Science Building	32.00%	22.00%	$ 68,000	
Holland Centennial Commons	49.00%	36.70%	$ 55,950	4697
SLCC IAB	23.00%	16.00%	23,969	2390
Regional Campus Distance Education Bldg	15.00%	18.00%	$ 9,675	539
Tooele Applied Technology College	19.20%	17.60%	$ 32,217	2930
Residential Life - Building 1		22.00%	$ 15,657	
Residential Life - Building 2		34.00%	$ 39,205	
State Veterans Nursing Home - Ivins		32.00%	$ 60,500	
State Veterans Nursing Home - Payson		34.00%	$ 65,760	
UVU Student Life Center	30.00%	23.00%	$ 56,000	
University of Utah Football Center	8.00%	14.00%	$ 39,542	1908
Utah State Athletics	TBD - LEED model(s) in progress and no design assist models.			
WSU D3 Classroom Building	49.00%	40.00%	$ 60,000	
SJ Quinney College of Law	34.90%	48.00%	$ 70,601	4173
RTI TASS Complex Phase II Billets Bldg	31.00%	42.70%	$ 25,490	824
RTI TASS Complex Phase II Admin Bldg	29.10%	33.80%	$ 25,610	1783
UVU Classroom Building	12.70%	29.10%	$ 68,200	1533
Residential Life Building 3		23.00%	$ 15,415	
Ogden Juvenile Courthouse	11.20%	31.50%	$ 30,272	479
University of Utah Oral Health Sciences		36.00%	$ 58,400	
George S Eccles Student Life Center		32.00%	$ 84,639	
USU Huntsman School of Business	30.00%	30.00%	$ 53,000	
USU Eastern CIB	12.70%	20.00%	$ 16,194	957
USL Mod 2	8.20%	2.50%	11,235	1936
SUU SUMA	TBD - LEED model(s) in progress and no design assist models.			

SUU Shakespeare	TBD - LEED model(s) in progress and no design assist models.				
WSU Science Classroom Building	8.50%	14.20%	$	28,795	922
USU Kaysville Botanical Center		46.00%	$	9,900	
USU Student Life		43.00%	$	88,660	
USTAR - SMBB @ U of U	21.00%	21.00%	$	203,184	15736
U of U Mid Valley Clinic		32.00%	$	46,400	
AVERAGE SAVINGS & TOTAL SAVINGS SINCE 2009		**26.62%**	**$**	**2,124,260**	

NOTE - These annual estimated energy savings figures are per the ASHRAE 90.1 modeling protocol, which is largely accepted as the standard for building energy modeling. Please note that actual energy savings may vary per ACTUAL building use.

High Performance Building Case Studies

UVU Classroom Building & Central Plant Energy Engineering Case Study

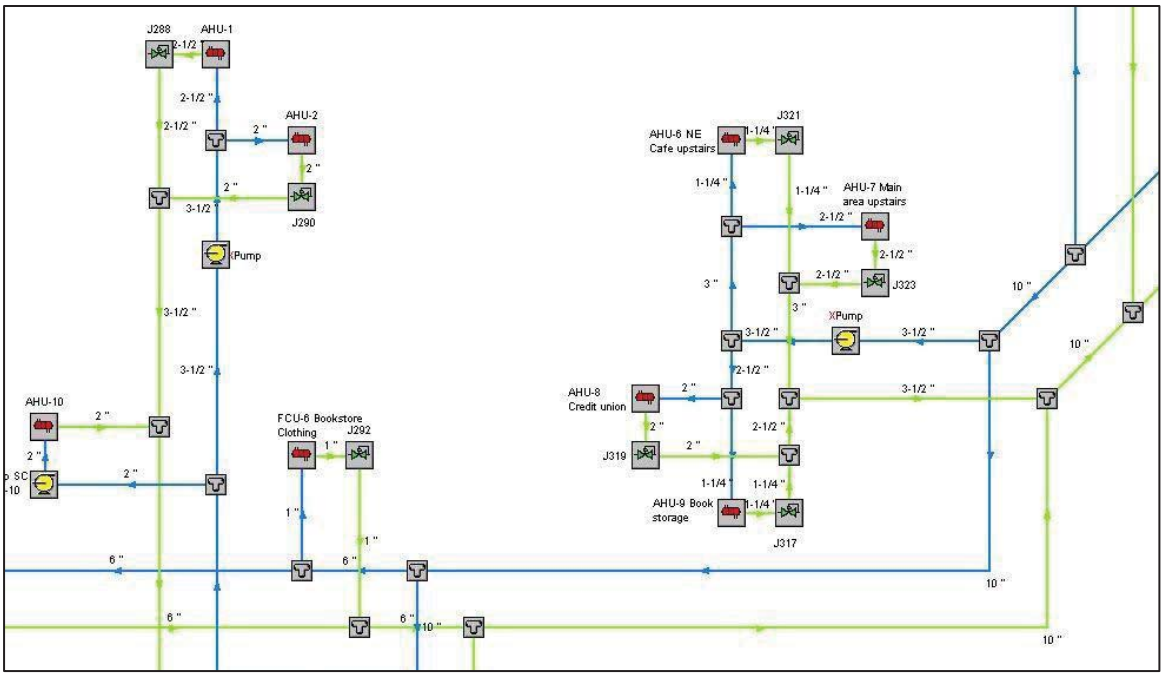
In 2012, design efforts began toward the construction of a new classroom building and central heating/chilled water plant, for Utah Valley University Campus. As part of these design and engineering efforts, energy analysis and engineering were utilized to evaluate four facets of the project, in order to reduce capital costs and minimize operational (utility/fuel) costs, over the expected life of the new classroom building and central plant. Parts of the analysis also dealt with the existing infrastructure, to determine the most efficient integration of the new central plant with the existing central plants, and to flush out any existing inefficiencies related to the existing central plants and distribution of the thermal energy produced in these plants.

Energy Engineering/Analysis of central plants and heating and cooling distribution (piping & pumps) systems

A hydraulic pipe-flow analysis was generated from field verifying the current systems. The following issues became apparent and can now be addressed.

- Inefficiencies in the current system
- Adequate & In adequate pipe sizes
- Identification of unwanted/unnecessary flow restrictions
- Improper control methods
- Problems in the existing piping distribution systems
- Other infrastructure and unnecessary operation cost issues

Once this information was discovered it was presented to facilities management and a collaborative process of determining the proper corrective actions began which will result in lower heating and cooling cost as well as improved campus wide performance.



UVU Campus Hydraulic Pipe Flow Analysis Schematic

The Hydraulic Pipe Flow Analysis was also used to project and optimize the inclusion of a new central plan within the existing central plants. This process included consideration of future buildings, as outlined in the campus master plan, and provided critical information to allow all three central plants to work in concert, rather than potentially conflict with each other, which can lead to operational inefficiencies and increased operational costs.

New Central Plant Design Options Analysis

Once the current plants and distribution system were understood, energy engineering efforts turned toward evaluation of design options for the new central heating and chilled water plant, through careful study of hour-by-hour weather data and buildings usage profiles. These plant options considered different types of chillers, boilers, heat rejection methods (including geothermal), and control options, and the data was used to perform life-cycle cost analysis for each option, in accordance with Federal Energy Management Program standards. Results of the life-cycle cost analysis showed that through optimizing the central plant design as shown in Option 2 below, **approximately $2.59 million could be saved, over the first 40 years of the plants existence**, when compared to industry standard central plant design.

Description	Code Baseline – Chillers & Boilers	Option 1 – Heat Recovery Chillers w/ground water wells	**Option 2 – Heat Recovery Chillers w/ground water wells**
Installed Cost, Total	$ 3,642,520	$ 1,245,240	$ 2,973,640
Expected Life of System (years)	27.6	22.3	28.8
Routine O&M Cost ($ / year)	$ 32,000	$ 27,500	$ 9,000
Non-Recurring Expense (year / $)	10 years / $ 50,000		10 years / $ 50,000
Annual Energy Cost ($)	$ 155,860	$ 169,560	$ 152,980
Other Cost ($ / year)	-	$ 30,000	-
Life Cycle Cost Over 40 Years	$8,253,629	$ 6,998,224	**$ 5,663,359**

Energy Modeling of Classroom Building

The central plant design (above) was coupled with a whole building energy simulation to evaluate how the building uses energy. Several iterations of potential energy efficiency measures, relating to the mechanical systems, lighting options, building envelope, and glazing options, were explored. The goal being to apply them to the building design in order to save energy costs, reduce capital and operational costs.

In one case, evaluation of the quantity of glass used in different building envelope options, during design development, showed that reduction of glass area, by twenty percent, **would reduce utility costs by slightly over $1.5 million, over the first 50 years of operation.**

Final Design with a Lower Window to Wall Ratio

While the description of energy engineering activities, offered above, is only a brief, oversimplified description of the extent of work that was conducted for a single project, related to energy cost, it does demonstrate the enormous potential for significant reduction of ongoing utility costs incurred by the state. Furthermore, these energy engineering efforts can eliminate costs due to existing infrastructure issues, and also contribute to reductions of capital costs and life-cycle costs associated with state funded buildings, district energy central plants, and central plant distribution systems.

U of U Quinney Law School - High Performance Building Case Study

During late 2012 and early 2013, DFCM and the University of Utah designed a new law building, to replace the existing, aging law building. One of the particular focuses of the modeling activities is the University of Utah's requirement for all new buildings to achieve 40% energy cost savings when compared to a Baseline building as prescribed by ASHRAE 90.1-2007 Appendix G. The project has secured additional funding to pursue the energy efficiency measure required to reach this goal. By utilizing energy modeling analysis, the design team is able to determine which energy efficiency measures are most life-cycle cost effective, and how the project will meet this goal.

As part of the preliminary design process, the architect created several massing options for the building, to be considered. Each massing option was analyzed to determine its relative impact on energy costs and consumption, and then used as an additional consideration when deciding on an overall look of the building. The figure below shows building key performance indicators, indicating a difference of 15% in energy consumption between the least effective and the most effective massing options. This fact combined with other design parameters was considered in choosing Option 4 as the final massing design.

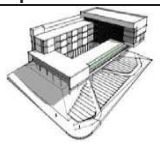
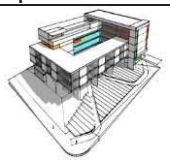
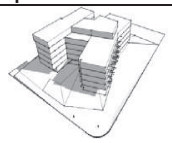
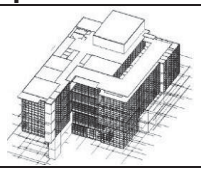
	Massing Option 1	Massing Option 2	Massing Option 3	**Massing Option 4**
				
Relative Annual Energy Consumption	107%	**113%**	100%	**98%**
Relative Annual Energy Cost	105%	110%	100%	**102%**
Relative EUI (kbtu/sqft/yr)	101%	105%	100%	**94%**

Figure 1: Results of massing options analysis

Ice Storage & Irrigation Water to Cool the Building

To achieve a reduction in the energy cost, the project utilized energy modeling analysis to determine the energy cost savings and feasibility of an ice storage system. Ice storage reduces energy costs by offsetting peak demand to the evening and early morning, when Rocky Mountain Power provides a reduced rate. The energy modeling analysis results show that approximately **$9,000** a year can be saved by utilizing an ice storage system.

Due to the unique situation of this project being located adjacent to the main irrigation line for the university, the project is now focusing on using energy modeling analysis to determine the feasibility of using irrigation water to cool the building, before being utilized by the rest of the campus for irrigation purposes. By modeling the building, the design team is able to fully understand the load profile of the building, including the effects of changing building occupancy, lighting, and weather. A detailed understanding of this building load profile is critical to ensuring if, and to what extent, irrigation water can be used to cool the building. If the final building design is able to take advantage of using irrigation water, a savings of up to **$15,000** in annual energy costs could be realized.

COLVIN ENGINEERING ASSOCIATES

Project: DFCM Infiltration Study
Date: August 15, 2013

Summary:

By requiring building infiltration rates to be reduced from an average construction value of 0.5 cubic feet per minute per square foot (CFM/FT^2) of envelope area to 0.1 CFM/FT^2 of envelope area, utility costs can be reduced by $0.06-$0.19 per square foot of envelope area.

Synopsis:

Infiltration is defined as uncontrolled outside airflow into a building. Infiltration typically occurs through cracks in the building envelope, joints between building envelope types, such as walls and windows, and openings to the building, such as doors and windows. Variations in building design, construction industry personnel, as well as the means and methods by which buildings are constructed, cause tested building infiltration rates to vary by as much as 0.1 CFM/FT^2 to 2.25 CFM/FT^2 of envelope area.[1] Building infiltration is tested per ASTM STP719, which requires the building be negatively pressurized to 75 Pascal, at which the infiltration rate is measured in CFM/FT^2 of envelope area. Actual building infiltration varies considerably, and is affected by a wide variety of factors including, building construction, stack effect, wind speed, outside and inside temperature, different HVAC systems, and occupant behavior.

Utah Division of Facilities Construction & Management (DFCM) contracted with Colvin Engineering Associates Inc. (CEA) and Architectural Testing Inc. (ATI) to determine the feasibility and energy cost savings of including an infiltration requirement in the State of Utah's High Performance Building Standard (HPBS). Through a series of meetings with DFCM, ATI, and CEA it was determined that an infiltration rate of 0.1 CFM/FT^2 of envelope area was readily achievable without unnecessary burden on the design or construction team and would be used as the Baseline measurement for the study.

CEA analyzed nine DFCM projects and three private development projects that were in various stages of development, from early design to completed construction and occupied. To analyze these projects CEA used the energy modeling software Trane Trace™. Trane Trace is based off the Energy Plus[2] engine developed by the US Department of Energy, and is considered the most advanced energy modeling engine available at the time. When performing an energy model for a building, the building is created virtually, within the software, including all building components, such as the envelope areas, (walls, windows, and roof) construction and insulation types, internal loads, (ie. people, lights, and equipment) HVAC systems, and HVAC plant equipment. A schedule of each building component is applied, and the building is simulated for an entire year of operation using a typical weather data file from the National Renewable Energy Laboratory (NREL). Results from the energy model are useful to determine the relative difference and impact changes to the building will make, before constructing the building.

Each project was simulated using minimally code compliant envelope construction, lighting, and HVAC equipment, (Baseline) as well as actual or designed envelope construction, lighting, and HVAC equipment (Proposed). The projects were simulated using ASHRAE 90.1-2007 Appendix G protocol. ASHRAE 90.1-2007 Appendix G protocol is accepted as the most accurate to determine relative impacts of building changes be many organizations, including the IRS, US Green Building

[1] ASHRAE 2009 Fundamentals ISBN 978-1-933742-54-0
[2] www.trane.com

Council, and Designed for Energy Star. DFCM, ATI, and CEA analyzed three different infiltration rates, as defined by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), tight construction 0.1 CFM/FT^2 of envelope area, average construction 0.5 CFM/FT^2 of envelope area, and leaky construction 0.8 CFM/FT^2 of envelope area. Due to the complexity of infiltration, the wide variety of factors that can affect the infiltration rate, and the relatively new development of energy modeling software, the infiltration modules within all energy modeling software is not fully developed. Infiltration rates can only be entered into the energy modeling software as CFM/FT^2 of above grade exterior wall area. The energy modeling software then varies the infiltration volume by the outdoor wind speed, from the typical year weather file[3]. In addition to the simulations of 0.1 CFM/FT^2 of wall area, 0.5 CFM/FT^2 of wall area, and 0.8 CFM/FT^2 of wall area, two projects were simulated at additional infiltration rates, to determine if the results could be appropriately extrapolated from CFM/FT^2 of wall area to CFM/FT^2 of envelope area. This analysis showed that the results could be appropriately.

Infiltration can have a significant impact on not only the annual energy consumption, but also the size of the HVAC equipment required to condition the uncontrolled air introduced to the building. In addition to annual energy cost savings, the study also focused on the reduced HVAC conditioning capacity and the saving associated with reducing the equipment size.

Infiltration not only affects annual utility costs but also thermal comfort of the occupants. Drafts of more than 50 feet per minute across the occupants head can negatively affect occupant comfort and task performance[4]. The quantifiable savings from decreased thermal comfort due to infiltration is beyond the scope of this study. However, the importance should not be overlooked with developing a proposed infiltration rate for the HPBS.

Summary of results table:

A description of each column in the results table is offered below.

Project Name - Name of the project. Note that to protect the clients interest, private development projects have not been named explicitly.

Climate Zone - ASHRAE 90.1-2007 defined climate zone for each building location. Generally the lower the number the hotter the climate. The B represents a dry climate.

Gross Floor Area - Gross floor area of the entire building.

Floors - Number of floors on the project.

Gross Above Grade Wall area - Area of above grade walls adjacent to conditioned spaces.

Gross Wall Area (Above and Below Grade) - Area of above and below grade walls adjacent to conditioned spaces.

Roof Area - Area of all roofs.

Glazing Area - Percentage of above grade walls that is glazing. Glazing is defined by ASHRAE 90.1-2007.

Proposed or Baseline - If the results presented are from the Baseline model or Proposed model as defined by ASHRAE 90.1-2007 Appendix G.

[3] Typical Year Weather files are obtained in TMY3 format from NREL.gov
[4] ASHRAE 2009 Fundamentals ISBN 978-1-933742-54-0

Primary HVAC System - The predominate HVAC system installed on the building. Other smaller systems may be present on the project for specific individual rooms.

Infiltration Rate per Wall area - Simulated infiltration rate per unit of above grade exterior vertical wall area.

Electric Cost - Results of annual electricity costs.

NG Cost - Results of annual natural gas costs.

Purchased CHW - Results of annual purchased chilled water costs.

Purchased HTW/Steam - Results of annual purchased High Temperature Water or Steam costs.

Total Utility Cost - Total of all annual utility costs for the project.

Gross CLG Plant Size - Total required peak cooling capacity of the HVAC source equipment.

Gross Heating Plant Size - Total required peak heating capacity of the HVAC source equipment.

Comments: - Additional information about the project that may affect the results from what is expected.

Results Interpretation: - A short summary of the results, as well as an explanation of any abnormalities in the results.

Total Envelope Area - Total area of the building envelope within the air barrier. This information was not available for some projects, and therefore, it was assumed to be:

$$Total\ Envelope\ Area = \ 2x\ roof\ area + Gross\ Wall\ Area$$

Ratio of Wall area to Envelope Area - Ratio of wall area to Envelope Area:

$$\text{Ratio of Wall area to Envelope Area } = \ Total\ Envelope\ Area / Gross\ Wall\ Area$$

Infiltration rate per Envelope Area - Infiltration rate per unit of whole building (all exterior surfaces within the air barrier) envelope area.

Leakage per wall area - Equivalent leakage rate of infiltration per unit of wall area, given infiltration rate per unit of envelope area.

Extrapolated utility costs per envelope area - Extrapolated costs from simulations using infiltration rates in units of wall area to units of envelope area.

Additional Utility Costs per Envelope Area (0.1 CFM/FT^2 Baseline) - Additional annual energy cost with different rates of infiltration per unit of envelope area. 0.1 CFM/FT^2 was the Baseline comparison.

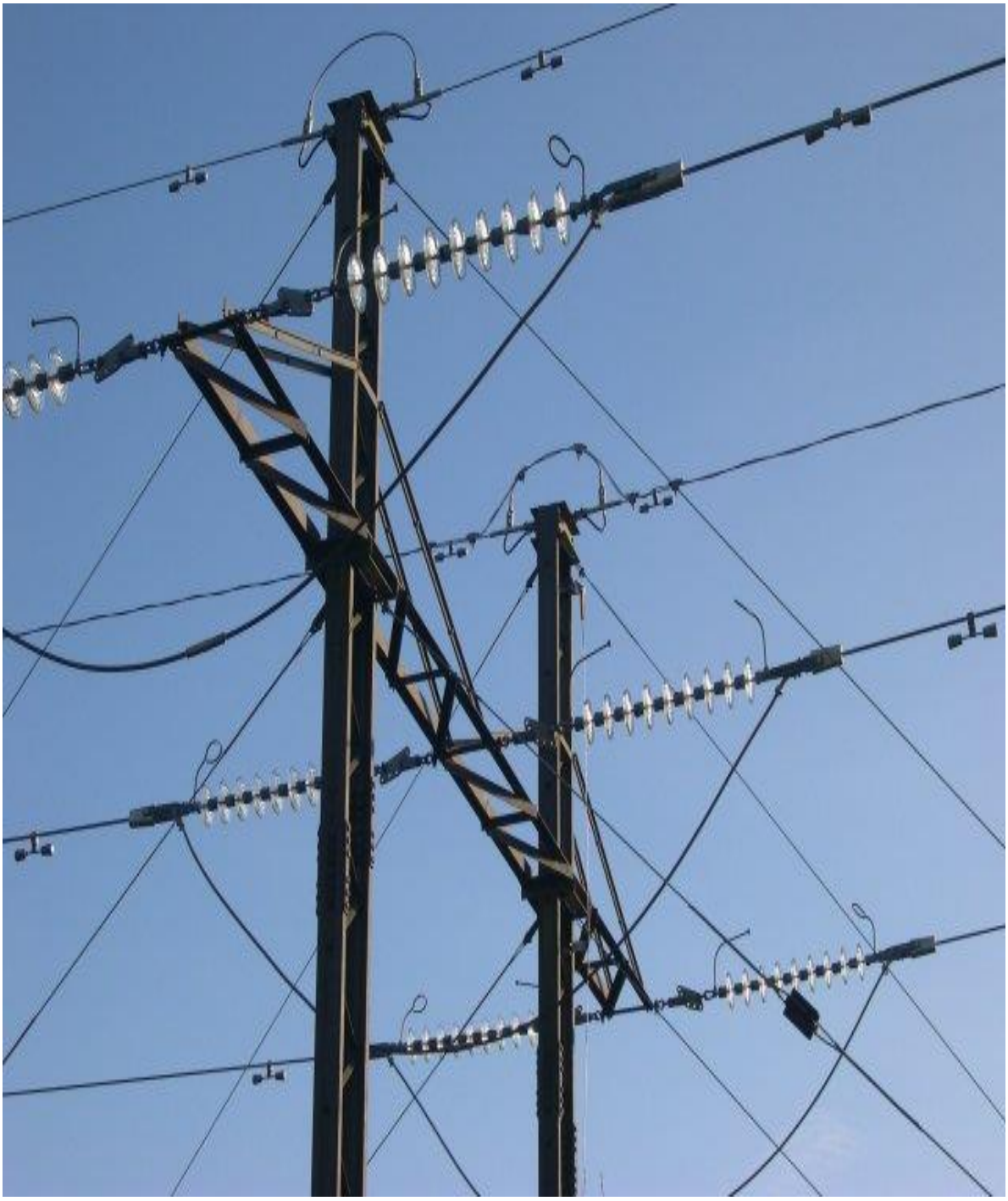
UT DFCM Infiltration Study Results
CEA 1/28/2013

Building Data										Modeling Results											Extrapolated Energy Cost Savings Results					
Project Name	Climate Zone	Gross Floor Area	Floors	Gross Above Grade **Wall** Area	Gross **Wall** Area (Above and Below Grade)	Roof Area	Glazing Area	Proposed or Baseline	Primary HVAC System	Infiltration Rate per **Wall** area	Electric Cost	NG Cost	Purchased CHW	Purchased HTW/Steam	Total Utility Cost	Gross CLG Plant Size	Gross Heating Plant Size	Comments:	Results Interpretation:	Total **Envelope** Area	Ratio of **Wall** area to **Envelope** Area	Infiltration rate per **Envelope** Area	Leakage per **wall** area	Extrapolated Utility Costs per envelope area	Additional Utility Costs per Envelope Area (0.1 CFM/FT2 Baseline)
(-)	(-)	(ft^2)	(#)	(ft^2)	(ft^2)	(ft^2)	(%)	(P/B)	(-)	(CFM/ft^2 of Wall)	(Annual $)	(Annual $)	(Annual $)	(Annual $)	(Annual $)	(Tons)	(Mbh)	(-)	(-)	(ft^2)		(CFM/ft^2 of Envelope)	(CFM/ft^2 of Wall)	($)	($/ft2)
UU Dee Glen Smith Athletic Center Expansion	5B	117,622	2 + Partial Basement	43,324	53,091	60,706	18.9%	B	Packaged VAV w/ reheat (90.1-2007 App. G System #5)	0.1	$184,551	$95,769	N/A	N/A	$280,320	447.5	8894.5	Unusually large process loads, extensive food service, and rather large exhaust volume.	For this size of building, the effects of infiltration appear less significant than actual, in terms of percentages, due to the unusually large utility cost, and plant sizing, which is a function of such high process loads and exhaust requirements.	174,503	4.03	0.1	0.403	$285,004	-
										0.5	$187,952	$98,957	N/A	N/A	$286,909	473.1	9609.3					0.5	2.014	$309,928	$0.14
										0.8	$190,323	$100,826	N/A	N/A	$291,149	489.7	10090.7					0.8	3.222	$328,622	$0.25
								P	IDEC VAV w/ reheat (condensing boilers)	0.1	$154,196	$87,474	N/A	N/A	$241,670	440.1	8640.6					0.1	0.403	$243,596	-
										0.5	$154,523	$89,655	N/A	N/A	$244,178	452.3	8736.8					0.5	2.014	$253,843	$0.06
										0.8	$155,019	$91,103	N/A	N/A	$246,122	457.8	8775.2					0.8	3.222	$261,528	$0.10
SLCC Instructional & Administration Building	5B	151,133	4 + Partial Basement	73,843	92,753	42,898	33.5%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$116,568	N/A	$19,160	$19,355	$155,083	501.9	10543.5	Model is based on LEED Treatment of District Thermal Energy Option 1.	Due to the unusually high ratio of wall to floor area, it was expected that more impact would be realized as a function of infiltration. However, a large number of perimeter zones have high occupant densities, and therefore, large internal thermal gains, which offset the effects of winter infiltration (and reduce winter cooling loads, in these spaces.) Additionally, there is a reduced occupancy, in summer months which also reduces the effects of infiltration, for occupied hours.	178,549	2.42	0.1	0.242	$157,013	-
										0.5	$117,434	N/A	$19,256	$23,973	$160,663	544.7	10967					0.5	1.209	$170,181	$0.07
										0.8	$118,214	N/A	$19,317	$27,082	$164,613	592.8	11642					0.8	1.934	$180,057	$0.13
								P	IDEC VAV w/ perimeter radiant heating	0.1	$104,504	N/A	$4,522	$26,042	$135,068	496.1	9752.2					0.1	0.242	$136,729	-
										0.5	$106,148	N/A	$4,993	$28,518	$139,659	516.5	10530.6					0.5	1.209	$148,056	$0.06
										0.8	$107,670	N/A	$5,339	$30,257	$143,266	533.5	11915.5					0.8	1.934	$156,551	$0.11
UVU Classroom Building	5B	223,949	5	81,550	81,550	67,380	40.0%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$182,423	N/A	$34,174	$31,247	$247,844	821.2	16201.4	Model is based on LEED Treatment of District Thermal Energy Option 1. Iterations performed using Design Assist hypothetical Proposed model that does not necessarily represent final Construction Documents.	Because the models' definition for infiltration is based on a CFM/ft^2 of exterior wall, and the exterior wall is reduced, due to the large quantities of curtain wall glass/spandrel, the effects of infiltration are somewhat diminished. The same building with a lower glass/spandrel percentage would demonstrate greater effects due to varying infiltration rates, as performed in this study.	216,310	2.65	0.1	0.265	$249,799	-
										0.5	$183,167	N/A	$34,457	$35,040	$252,664	898	17238.4					0.5	1.326	$262,350	$0.06
										0.8	$183,881	N/A	$34,662	$37,582	$256,125	958.9	18195.6					0.8	2.122	$271,764	$0.10
								P	IDEC VAV w/ reheat	0.1	$174,130	N/A	$4,097	$26,359	$204,586	644.5	11033.3					0.1	0.265	$206,559	-
										0.5	$174,816	N/A	$4,117	$30,189	$209,122	686.4	11175.3					0.5	1.326	$219,224	$0.06
										0.8	$176,117	N/A	$4,136	$32,689	$212,942	730.6	11257.3					0.8	2.122	$228,723	$0.10
Provo Office Building (Private Development)	5B	158,401	6	84,490	84,490	50,913	40.0%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$156,525	$39,413	N/A	N/A	$195,938	706.1	13714.6	Includes a significant sky-lit 4-story atrium that is served by radiant floor, in conjunction with displacement ventilation diffusers. Also includes a data center and some minor retail sales.	Due to the use of chilled beams, the heating plant size for the Proposed model iterations is relatively small, compared to more common primary HVAC system types.	186,316	2.21	0.1	0.221	$198,570	-
										0.5	$158,818	$45,492	N/A	N/A	$204,310	730.1	16324					0.5	1.103	$217,835	$0.10
										0.8	$160,711	$50,515	N/A	N/A	$211,226	758.3	18325.4					0.8	1.764	$232,283	$0.18
								46.5%	P	Active Chilled Beams	0.1	$151,049	$8,690	N/A	N/A	$159,739	683.2	7249.8					0.1	0.221	$161,724	-
										0.5	$151,717	$15,033	N/A	N/A	$166,750	708.4	10028.6					0.5	1.103	$176,253	$0.08
										0.8	$151,861	$19,408	N/A	N/A	$171,269	727.9	12012.3					0.8	1.764	$187,150	$0.14
Salt Lake City Office Building (Private Development)	5B	178,000	6	75,419	75,419	39,462	25.8%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$167,440	$14,814	N/A	N/A	$182,254	394.5	6076.8	Models are based on LEED Core & Shell program protocol, not full build-out.	Zoning protocol for core & shell projects (4 perimeter & 1 core zoning per floor) is not necessarily an accurate representation of the effects of infiltration, for the full tenant-finished condition.	154,343	2.05	0.1	0.205	$184,292	-
										0.5	$168,352	$21,328	N/A	N/A	$189,680	427.5	7967.9					0.5	1.023	$200,233	$0.10
										0.8	$169,404	$26,482	N/A	N/A	$195,886	454.1	9961.4					0.8	1.637	$212,189	$0.18
								P	IDEC VAV w/ reheat	0.1	$137,702	$13,282	N/A	N/A	$150,984	347.3	7154.4					0.1	0.205	$152,259	-
										0.5	$137,734	$17,902	N/A	N/A	$155,636	377.7	9336.2					0.5	1.023	$162,234	$0.06
										0.8	$137,783	$21,731	N/A	N/A	$159,514	398.1	11001.9					0.8	1.637	$169,716	$0.11
Utah County Office Building (Private Development)	5B	278,144	5 + Partial Basement	130,980	138,826	80,085	40.0%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$419,767	$55,571	N/A	N/A	$475,338	851.8	15,069.5	Project includes amenities building with cafeteria and gym.	The Proposed building includes a huge amount of glazing, and the perimeter zones are corridors. Both of which are not typical for office building construction.	298,996	2.28	0.1	0.228	$477,811	-
										0.5	$421,016	$62,422	N/A	N/A	$483,438	893.2	15,498.6					0.5	1.141	$495,416	$0.06
										0.8	$422,113	$66,721	N/A	N/A	$488,834	927.9	15,864.1					0.8	1.826	$508,619	$0.10
								64.3%	P	Parallel Fan Powered VAV Boxes w/ reheat and IDEC	0.1	$347,280	$19,386	N/A	N/A	$366,666	834.1	12,145.7					0.1	0.228	$369,107	-
										0.5	$348,704	$25,433	N/A	N/A	$374,137	981	14,986.9					0.5	1.141	$386,480	$0.06
										0.8	$348,818	$31,167	N/A	N/A	$379,985	1132.1	16,843.7					0.8	1.826	$399,511	$0.10
Dixie State Holland Centennial Commons	3B	170,070	5	66,158	68,918	36,300	40.0%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$126,511	$24,314	N/A	N/A	$150,825	643.7	4,163.7	Project is located in St. George, Utah, which is ASHRAE climate zone 3B.	The climate in St. George allows re-heating energy to be offset by bringing in outside air directly, through infiltration. This would not be a good design because the space would be drafty and uncomfortable, the majority of the year.	141,518	2.14	0.1	0.214	$152,824	-
										0.5	$133,166	$24,717	N/A	N/A	$157,883	791.7	5,342.0					0.5	1.070	$167,841	$0.11
										0.8	$138,471	$24,639	N/A	N/A	$163,110	904.8	6,283.8					0.8	1.711	$179,103	$0.19
								40.6%	P	IDEC VAV w/ Hot Water Reheat	0.1	$78,435	$16,247	N/A	N/A	$94,682	730.1	11,114.4					0.1	0.214	$98,186	-
										0.5	$89,791	$17,049	N/A	N/A	$106,840	735.1	11,120.2					0.5	1.070	$124,502	$0.19
										0.8	$92,342	$23,870	N/A	N/A	$116,212	803.7	10,907.0					0.8	1.711	$144,240	$0.33
Ogden Juvenile Courts	5B	88,201	5	66,033	66,033	22,892	39.2%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$82,095	$14,623	N/A	N/A	$96,718	329	4,902.9	Project is still under design and information presented is subject to change.	Because the building is tall and narrow, there is a high ratio of exterior wall to floor area. The potential savings for reduced infiltration, on equipment sizes, is higher than average.	111,817	1.69	0.1	0.169	$97,703	-
										0.5	$84,524	$17,975	N/A	N/A	$102,499	367.4	5,267.2					0.5	0.847	$107,325	$0.09
										0.8	$86,438	$20,224	N/A	N/A	$106,662	398.8	5,573.6					0.8	1.355	$114,542	$0.15
								P	IDEC VAV w/ Hot Water Reheat	0.1	$50,201	$16,082	N/A	N/A	$66,283	248.7	4,020.6					0.1	0.169	$66,691	-
										0.5	$49,157	$19,797	N/A	N/A	$68,954	287.1	4,396.8					0.5	0.847	$70,682	$0.04
										0.8	$48,429	$21,978	N/A	N/A	$70,407	320.2	4,745.1					0.8	1.355	$73,675	$0.06
SJ Quinney Law Building	5B	163,600	6	73,978	73,978	35,181	40.0%	B	VAV w/ reheat (90.1-2007 App. G System #7)	0.1	$149,615	$35,694	N/A	N/A	$185,309	540.5	10,466.9	Project is still under design and information presented is subject to change.	Due to the use of chilled beams, the heating plant size for the Proposed model iterations is relatively small, compared to more common primary HVAC system types.	144,340	1.95	0.1	0.195	$186,926	-
										0.5	$150,528	$42,129	N/A	N/A	$192,657	579.7	10,930.9					0.5	0.976	$200,192	$0.09
										0.8	$150,641	$46,567	N/A	N/A	$197,208	612.4	11,400.6					0.8	1.561	$210,142	$0.16
								48.1%	P	Chilled Beams	0.1	$82,788	$14,630	N/A	N/A	$97,418	289.2	3,097.8					0.1	0.195	$99,401	-
										0.5	$83,435	$21,218	N/A	N/A	$104,653	291.7	4,891.0					0.5	0.976	$115,670	$0.11
										0.8	$85,268	$26,742	N/A	N/A	$112,010	308.5	6,251.0					0.8	1.561	$127,871	$0.20
Utah National Guard TASS Building A	5B	60,311	2	32,817	32,817	23,404	12.3%	B	Packaged VAV w/ reheat (90.1-2007 App. G System #5)	0.1	$41,776	$33,201	N/A	N/A	$74,977	171.3	3,361.4	Project contains an unusually low percentage of glazing, and lots of densely occupied classrooms and meeting rooms.	Potential savings is due to the low amount of exterior glazing, which creates a lot of exterior wall area. Since the analysis is based on CFM/FT2 of wall area, the potential savings is higher than average.	79,625	2.43	0.1	0.243	$75,689	-
										0.5	$42,164	$34,768	N/A	N/A	$76,932	181.7	3,458.1					0.5	1.213	$80,533	$0.06
										0.8	$42,540	$35,931	N/A	N/A	$78,471	191.1	3,565.8					0.8	1.941	$84,167	$0.11
								P	IDEC VAV w/ Hot Water Reheat	0.1	$26,049	$24,033	N/A	N/A	$50,082	159.6	3,348.6					0.1	0.243	$50,517	-
										0.5	$25,972	$25,171	N/A	N/A	$51,143	160	4,145.0					0.5	1.213	$53,479	$0.04
										0.8	$25,709	$26,509	N/A	N/A	$52,218	163.4	4,726.2					0.8	1.941	$55,700	$0.07
Utah National Guard TASS Building B	5B	45,144	2	28,129	28,129	17,003	20.6%	B	Packaged VAV w/ reheat (90.1-2007 App. G System #5)	0.1	$56,303	$3,312	N/A	N/A	$59,615	86.2	1,612.6	Project is a billitings building which schedules are more typical of a residential building rather than a commercial building.	The cooling and heating load in the Proposed design caps out during 0.5 and 0.8 CFM/FT2 of wall area infiltration. The ground source heat pump well, in the Proposed design, has not been designed to handle the additional infiltration load, and therefore, the 0.5 scenario is using extreme pump and fan energy to try and offset the difference. A larger well would need to be designed to accommodate the additional load.	62,135	2.21	0.1	0.221	$65,705	-
										0.5	$74,134	$3,312	N/A	N/A	$77,446	131.2	2,120.7					0.5	1.104	$110,217	$0.72
										0.8	$91,567	$3,312	N/A	N/A	$94,879	175	2,621.6					0.8	1.767	$143,601	$1.25
								P	Ground Source Heat Pumps	0.1	$20,872	$2,451	N/A	N/A	$23,323	67.3	1,249.7					0.1	0.221	$25,626	-
										0.5	$67,372	$2,451	N/A	N/A	$69,823	94.3	2,428.3					0.5	1.104	$42,457	$0.27
										0.8	$34,206	$2,451	N/A	N/A	$36,657	94.3	2,428.3					0.8	1.767	$55,080	$0.47
SUU Gibson Science Center Addition	5B	44,891	4	25,684	45,547	14,412	25.5%	B	Packaged VAV w/ reheat (90.1-2007 App. G System #5)	0.1	$59,403	$40,616	N/A	N/A	$100,019	176.5	3,452.8	Project includes a large amount of lab and vivarium space. The labs and vivariums have a high requirement of air changes per hour, which make up the majority of the energy costs.	Due to the very high ventilation airflow requirements, the potential savings for infiltration is not realized, because the infiltration is an insignificant portion of the actual load to the space.	74,371	2.90	0.1	0.290	$101,172	-
										0.5	$59,811	$44,586	N/A	N/A	$104,397	183	4,154.0					0.5	1.448	$108,219	$0.09
										0.8	$60,034	$44,244	N/A	N/A	$104,278	189.2	4,686.0					0.8	2.316	$113,505	$0.17
								P	Direct Evaporative VAV w/ Hot Water Reheat	0.1	$54,080	$26,251	N/A	N/A	$80,331	161	2,705.8					0.1	0.290	$80,654	-
										0.5	$53,784	$27,025	N/A	N/A	$80,809	159.8	3,383.9					0.5	1.448	$82,628	$0.03
										0.8	$53,738	$27,786	N/A	N/A	$81,524	161.2	3,901.0					0.8	2.316	$84,109	$0.05

Renewable Projects
FY 2014

Project Name	Watts Installed	Estimated Generation (kWh/y)	Financial Structure
University of Utah-Marriott Library	37,800	52,920	PPA
University of Utah-HPER-N	102,600	143,640	PPA
Salt Lake Community College, Lifetime Activities Center	364,140	509,796	PPA
Utah Army National Guard UTARNG Draper	357,000	517,650	direct own
Oval Olympic Legacy Canopies	791,280	1,147,356	PPA
Vernal Field House of Natural History	56,200	82,000	direct own

APPENDIX B



AGENCY REPORTS

UTAH DEPARTMENT OF CORRECTIONS

THE STATE OF UTAH

ENERGY REPORT FOR FY14 (YEAR 10)

Prepared By: Brian Tanahashi, ESPC

Johnson Controls, Inc.

December 12, 2014

Contents

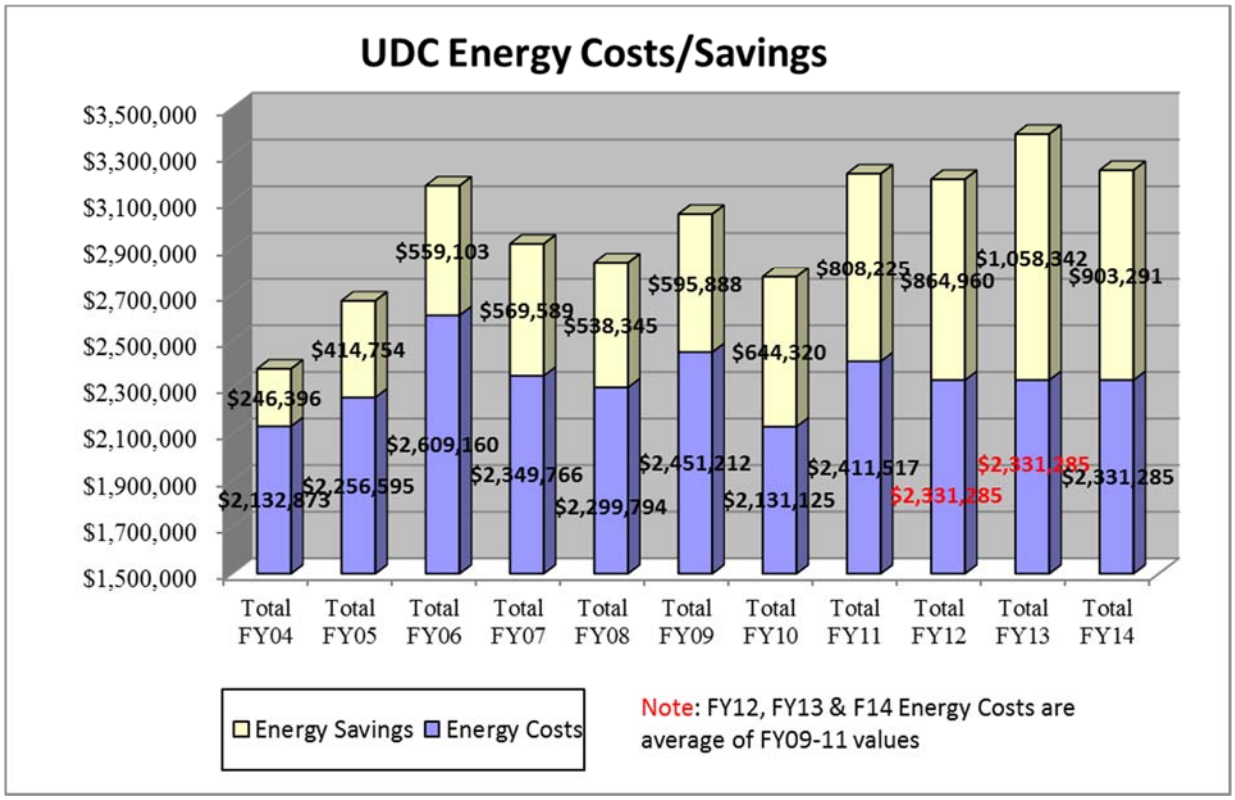
PART 1 - EXECUTIVE SUMMARY (2014)

This summary demonstrates the overall cost avoidance associated with Phases I and II of the Utah Department of Corrections capital improvement project numbers 047069 and 047435. Details outlining the operational improvements implemented and the calculations utilized to demonstrate their contributions to the facility's energy savings are provided in subsequent sections of this report. The performance period is from July 1, 2013 through June 30, 2014.

The chart titled "UDC Energy Costs/Savings" illustrates the costs the prison would have incurred (adding the Energy Costs and Energy Savings) had the facility improvements not been implemented.

The avoided costs for FY14 are $903,291 as compared to guaranteed amount of $970,083. **This leaves a shortfall amount of $66,792 for Year 10.** This includes adjustments of $217,191 to the verified savings of $686,100. The total savings for this project to date is $7,203,213.

The actual energy (kWh and Dth) savings have increased every year while the energy rates have fluctuated at times dramatically with natural gas costs peaking in FY06 and bottoming out during FY10. The graph below depicts the energy savings additive to the energy cost.



Savings Summaries

Presented below summarizes the Year 10 savings by building, by M&V measure, and by project. Savings values are based on Option C savings which use the higher of the contractual escalated utility rate and the actual utility rate and agreed upon stipulated values. This includes baseline adjustments and stipulated values.

Source	Verified			
	Energy Savings	Solid Waste	Water / Sewer	Total
Administration - Electric	$11,646			$11,646
Administration - Gas	($783)			($783)
South Point - Gas	$525,618			$525,618
North Point - Gas	($24,527)			($24,527)
FHA - Gas	$20,197			$20,197
Lighting Retrofit	*$129,148*			*$129,148*
Promontory Gas	*$3,064*			*$3,064*
Lone Peak Gas	*$3,331*			*$3,331*
Wasatch/Timpanogos		*$26,652*		*$26,652*
Facility Wide			*$208,946*	*$208,946*
Totals	$667,693	$26,652	$208,946	$903,291

Italics indicate Stipulated Values

Source	Verified Savings			
	Energy Savings	Solid Waste	Water / Sewer	Total
Measured Savings Electric and Gas (Option C Metrix)	$532,151			$532,151
Lighting Retrofit	*$129,148*			*$129,148*
Promontory Gas	*$3,064*			*$3,064*
Lone Peak Gas	*$3,331*			*$3,331*
Wasatch/Timpanogos		*$26,652*		*$26,652*
Facility Wide			*$208,946*	*$208,946*
Totals	$667,693	$26,652	$208,946	$903,291

Italics indicate Stipulated Values

	Energy Savings	Solid Waste	Water / Sewer	Total
Verified Savings	$667,693	$26,652	$208,946	$903,291
Guaranteed Savings	$695,487	$26,652	$247,944	$970,083
Variance	($27,794)	($0)	($38,998)	($66,792)

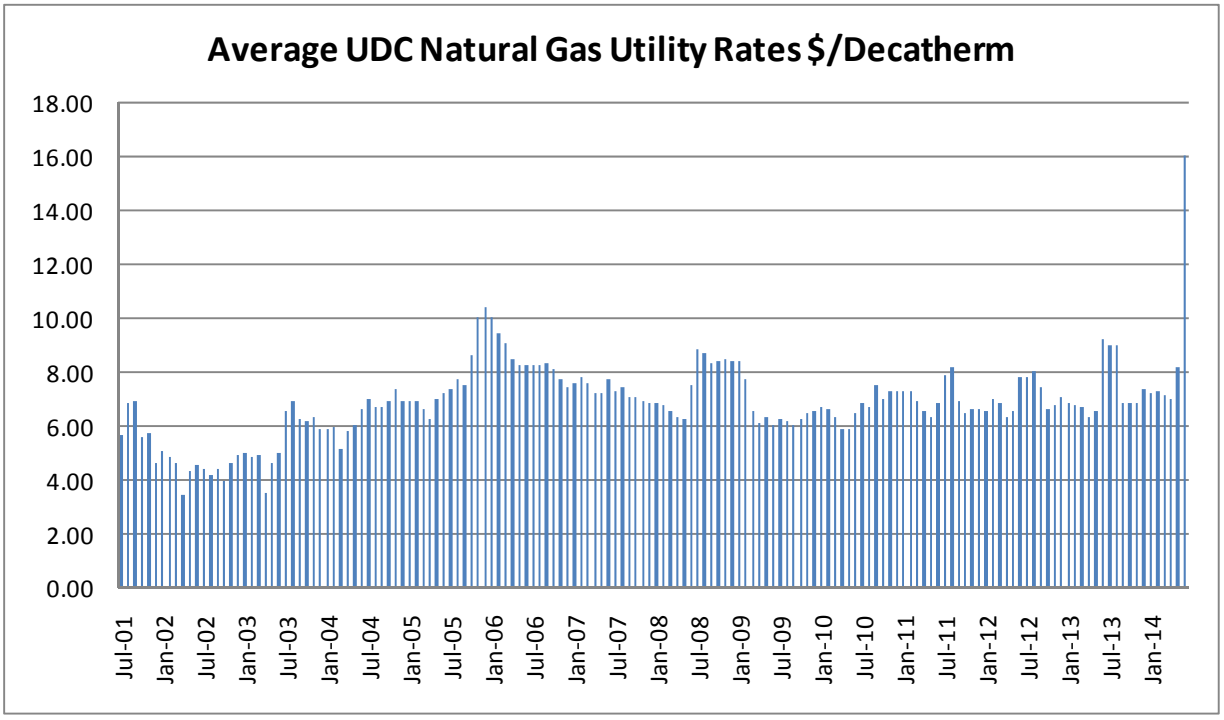
M&V Methods

The M&V methods used for these FIMs conform to those outlined in the performance contract. The M&V method selected for all measured FIMs included in this phase is Option C. Option C is an industry standard as defined by IPMVP (International Performance Measurement & Verification Protocol).

In Option C, also known as utility bill comparison, energy savings are determined by a comparison of pre-retrofit utility bills to the current utility bills after adjustments are made for weather and operational variations. The tool used by Johnson Controls on all Option C projects is Metrix®, which is an industry standard utility accounting software application. Detailed utility bill data, offsets and adjustments and equations are presented in the Appendix.

Utility Energy Rates Summary

The average energy unit costs presented in the contract are listed in the Appendix for each applicable utility, and were included in all savings calculations made under this schedule. The measurement and verification (M&V) process utilizes the actual utility rates (those being higher than the escalated rate schedule). The table below shows the progression of rates beginning in July 2001 to the present.



How Savings are Calculated

Energy savings for this project are calculated by comparing the actual usage with a model that projects what the usage would have been if the project had not been undertaken. In most cases, this model is the linear regression equation that describes the line that best fits a scatter plot of the actual usage of a representative 12-month period shortly before the project (the Reference Year), plotted against key variables that affect the usage in a predictable way. For example, a school may be expected to consume more heating fuel during a cold month of January than in September, so heating degree days are the key variable used to plot a graph.

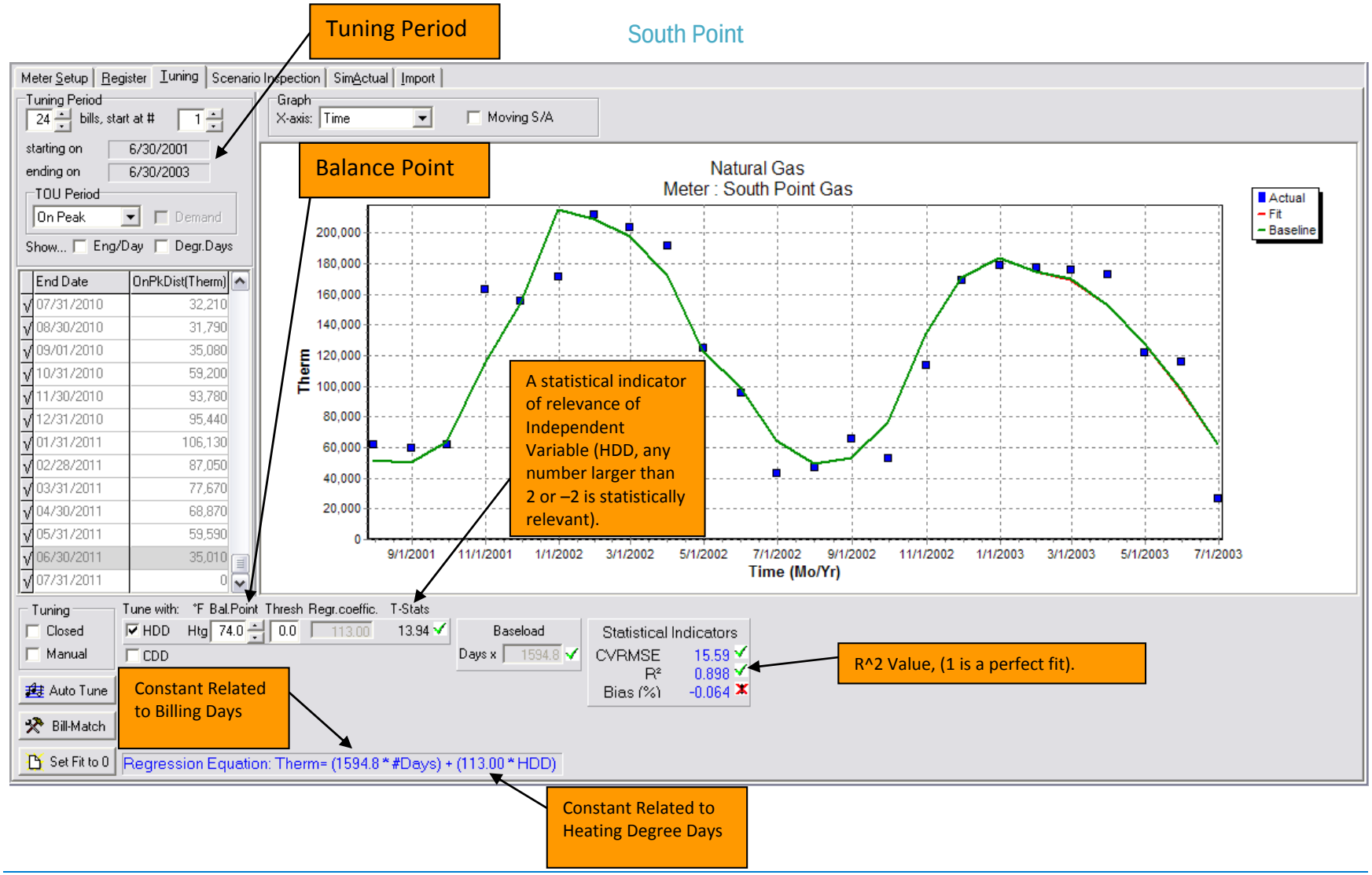
In the simplest case, there is one dependent variable and the equation is a linear regression. An example of such an equation would be:

#Therms = (7.0 * #Days) + (2.65 * HDD)

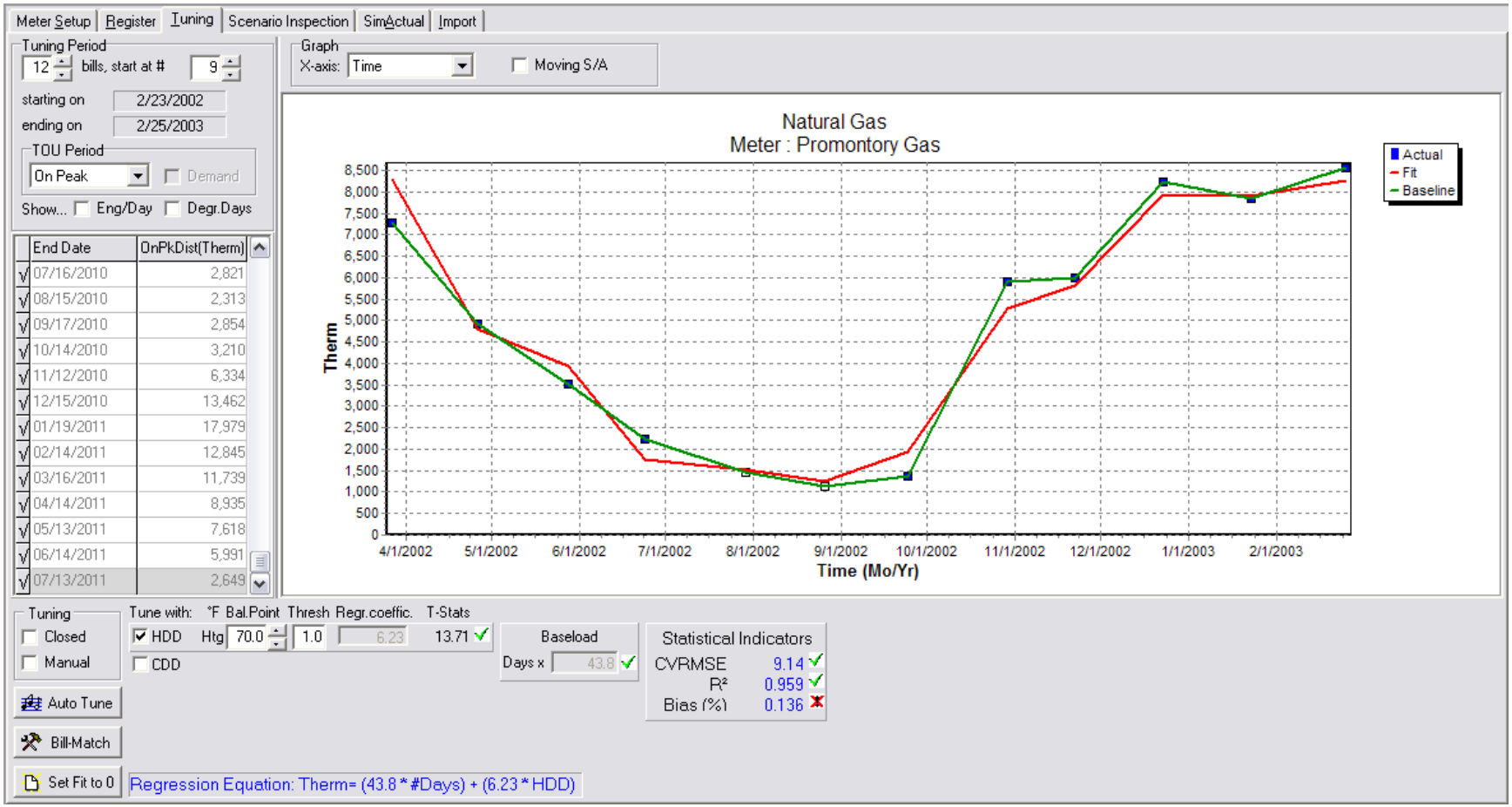
where #Therms is the total heating fuel energy consumed for the month, 7.0 represents a base amount of usage that occurs regardless of the outside temperature and weather, #Days is the number of days in the current billing period (usually 30 days or so), 2.65 is the Regression Coefficient (describes the slope of the line and the facility's dependence on temperature), and HDD is the actual, measured number of heating degree days for the current billing period (from a nearby weather data station). Note that this variable changes every month, year after year. This is the link between the model and current, actual conditions.

The following charts show the data and equations associated used to establish the baseline model and annual savings.

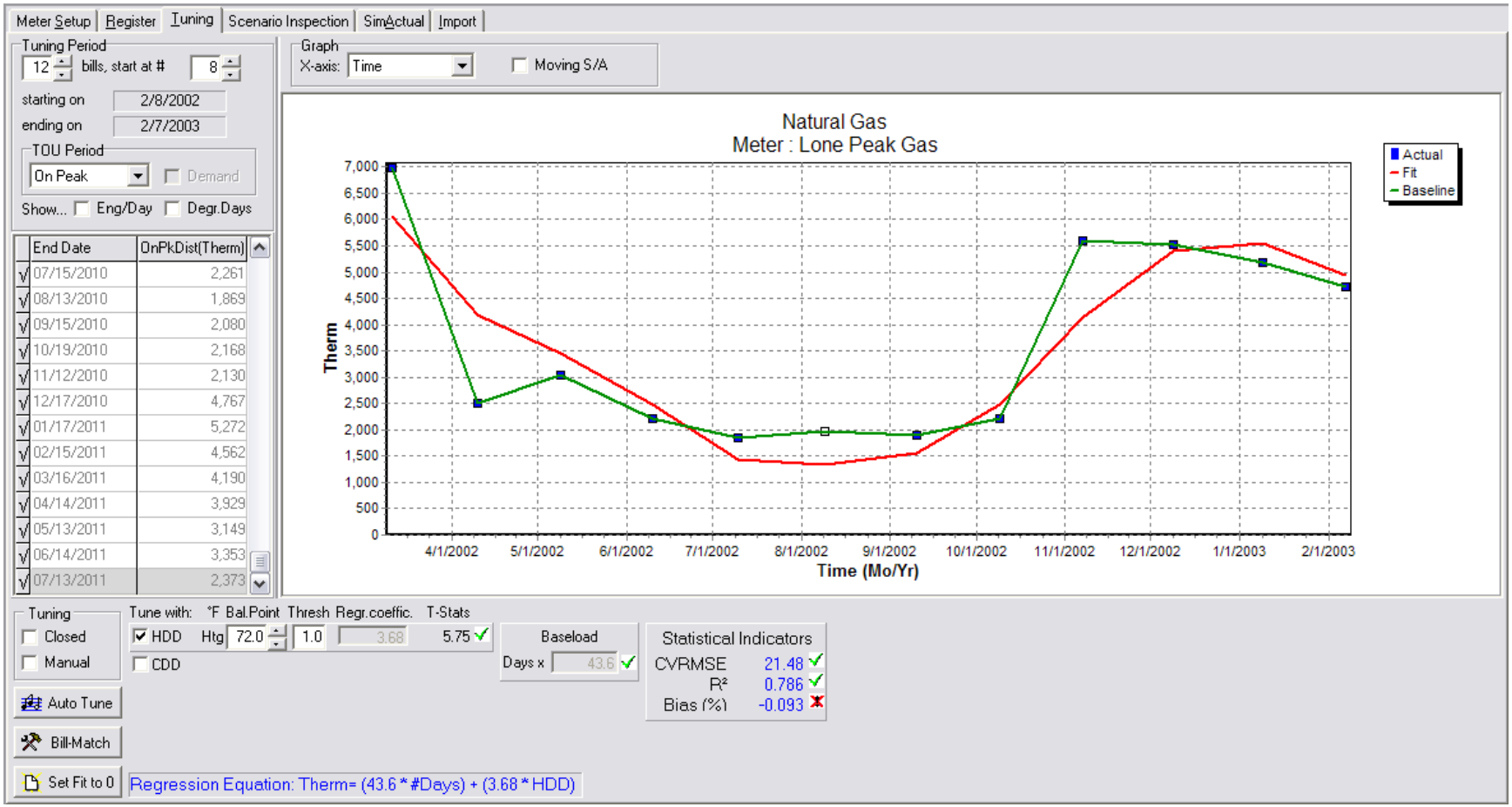
Metrix Regression Equation and Key Parameters



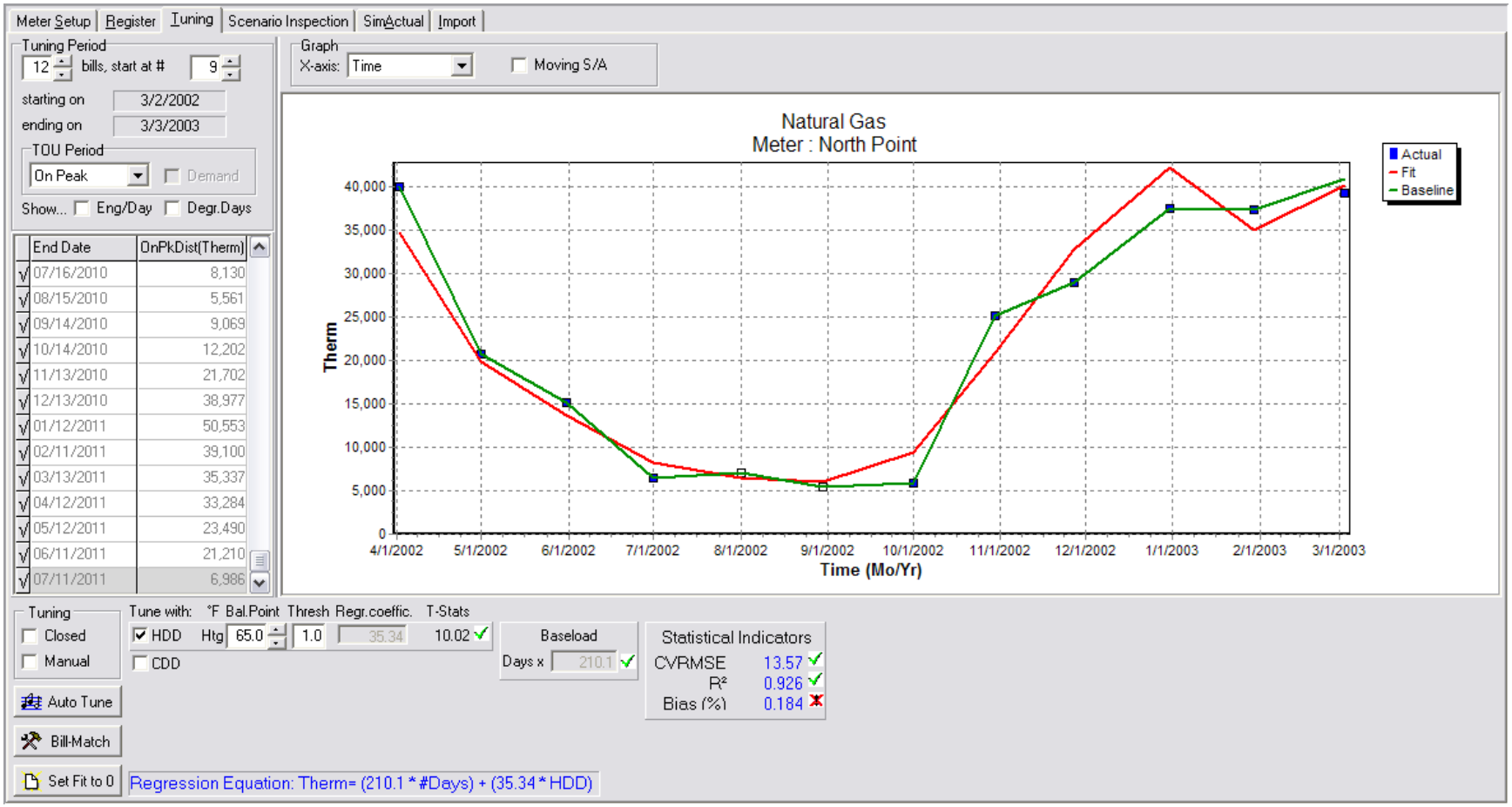
Promontory


Meter Setup
Register
Tuning
Scenario Inspection
SimActual
Import
Tuning Period
12 bills, start at # 9
starting on 2/23/2002
ending on 2/25/2003
TOU Period
On Peak
Demand
Show... Eng/Day Degr.Days
Graph
X-axis: Time
Moving S/A
Natural Gas
Meter : Promontory Gas
Actual
Fit
Baseline
Therm
Time (Mo/Yr)
End Date
OnPkDist(Therm)
07/16/2010 2,821
08/15/2010 2,313
09/17/2010 2,854
10/14/2010 3,210
11/12/2010 6,334
12/15/2010 13,462
01/19/2011 17,979
02/14/2011 12,845
03/16/2011 11,739
04/14/2011 8,935
05/13/2011 7,618
06/14/2011 5,991
07/13/2011 2,649
Tuning
Closed
Manual
Tune with: °F Bal.Point Thresh Regr.coeffic. T-Stats
HDD Htg 70.0 1.0 6.23 13.71
CDD
Baseload
Days x 43.8
Statistical Indicators
CVRMSE 9.14
R² 0.959
Bias (%) 0.136
Auto Tune
Bill-Match
Set Fit to 0
Regression Equation: Therm= (43.8 * #Days) + (6.23 * HDD)

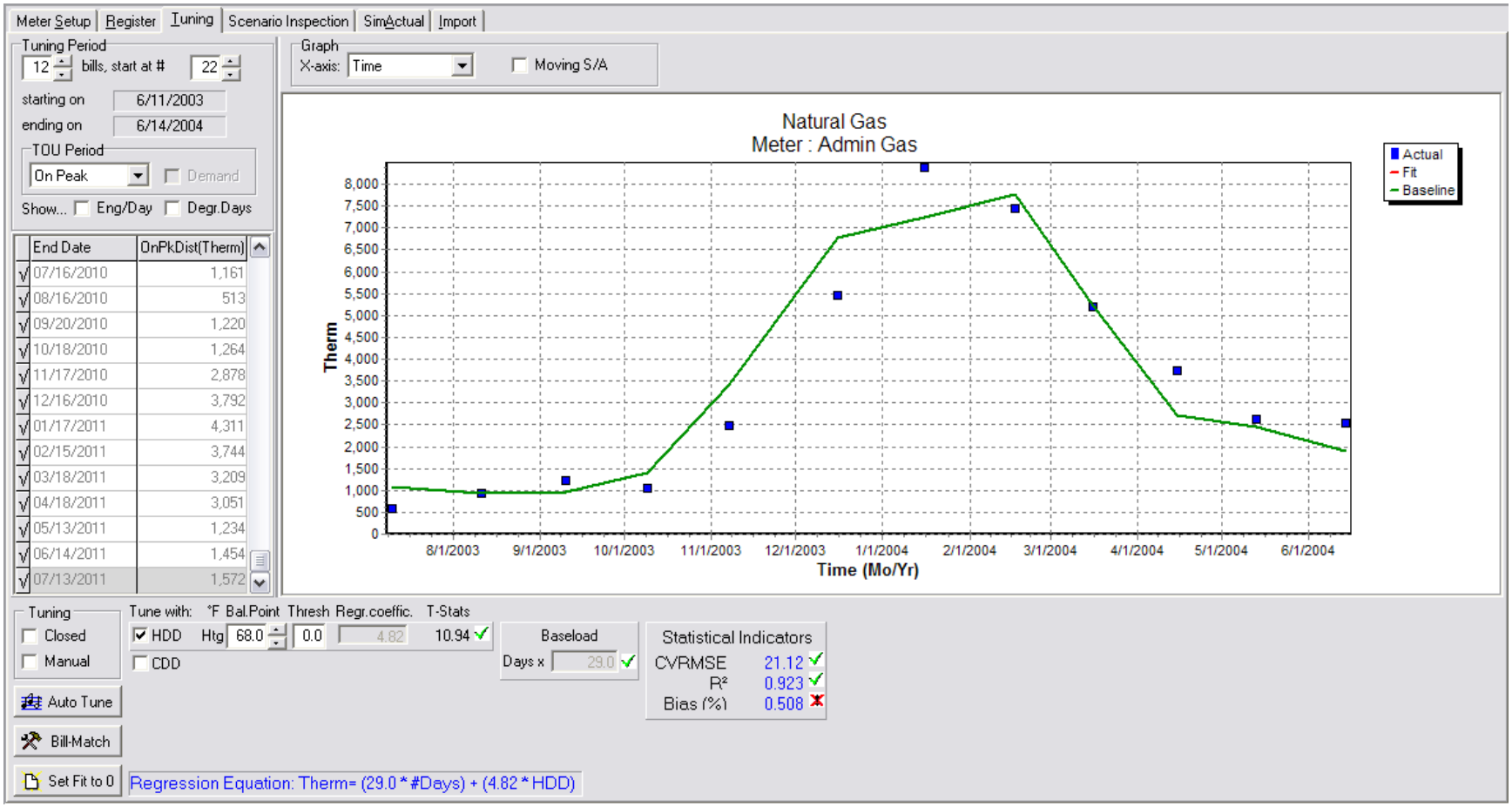
Lone Peak


Meter Setup
Register
Tuning
Scenario Inspection
SimActual
Import
Tuning Period
12 bills, start at # 8
starting on 2/8/2002
ending on 2/7/2003
TOU Period
On Peak
Demand
Show... Eng/Day Degr.Days
End Date
OnPkDist(Therm)
07/15/2010 2,261
08/13/2010 1,869
09/15/2010 2,080
10/19/2010 2,168
11/12/2010 2,130
12/17/2010 4,767
01/17/2011 5,272
02/15/2011 4,562
03/16/2011 4,190
04/14/2011 3,929
05/13/2011 3,149
06/14/2011 3,353
07/13/2011 2,373
Graph
X-axis: Time
Moving S/A
Natural Gas
Meter : Lone Peak Gas
Actual
Fit
Baseline
Therm
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
4/1/2002
5/1/2002
6/1/2002
7/1/2002
8/1/2002
9/1/2002
10/1/2002
11/1/2002
12/1/2002
1/1/2003
2/1/2003
Time (Mo/Yr)
Tuning
Closed
Manual
Auto Tune
Bill-Match
Set Fit to 0
Tune with: °F Bal.Point Thresh Regr.coeffic. T-Stats
HDD Htg 72.0 1.0 3.68 5.75
CDD
Baseload
Days x 43.6
Statistical Indicators
CVRMSE 21.48
R² 0.786
Bias (%) -0.093
Regression Equation: Therm= (43.6 * #Days) + (3.68 * HDD)

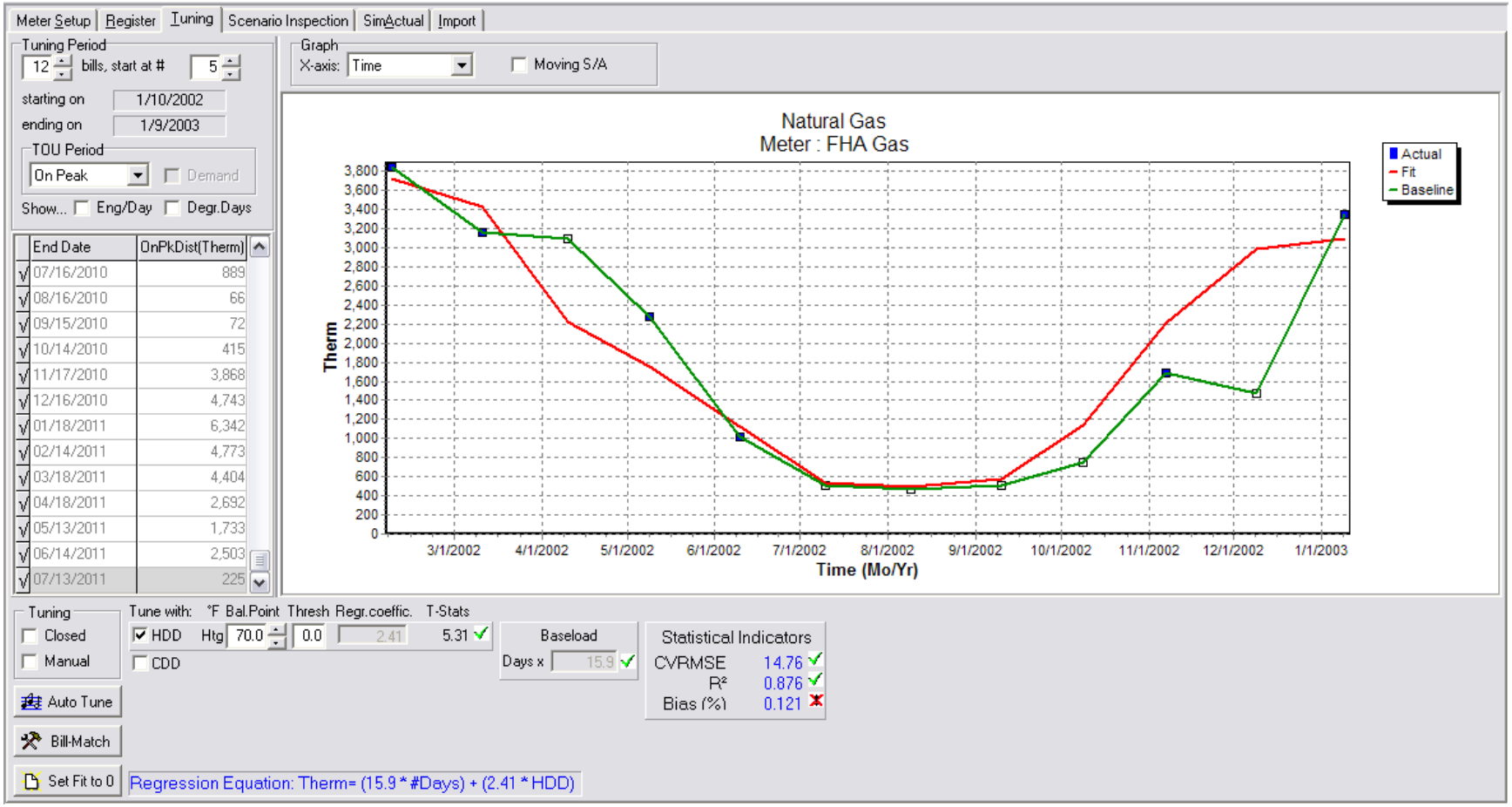
North Point


Meter Setup
Register
Tuning
Scenario Inspection
SimActual
Import
Tuning Period
12 bills, start at # 9
starting on 3/2/2002
ending on 3/3/2003
TOU Period
On Peak
Demand
Show... Eng/Day Degr.Days
Graph
X-axis: Time
Moving S/A
Natural Gas
Meter : North Point
Actual
Fit
Baseline
Therm
Time (Mo/Yr)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
4/1/2002
5/1/2002
6/1/2002
7/1/2002
8/1/2002
9/1/2002
10/1/2002
11/1/2002
12/1/2002
1/1/2003
2/1/2003
3/1/2003
End Date
OnPkDist(Therm)
07/16/2010 8,130
08/15/2010 5,561
09/14/2010 9,069
10/14/2010 12,202
11/13/2010 21,702
12/13/2010 38,977
01/12/2011 50,553
02/11/2011 39,100
03/13/2011 35,337
04/12/2011 33,284
05/12/2011 23,490
06/11/2011 21,210
07/11/2011 6,986
Tuning
Closed
Manual
Tune with: °F Bal.Point Thresh Regr.coeffic. T-Stats
HDD Htg 65.0 1.0 35.34 10.02
CDD
Baseload
Days x 210.1
Statistical Indicators
CVRMSE 13.57
R² 0.926
Bias (%) 0.184
Auto Tune
Bill-Match
Set Fit to 0
Regression Equation: Therm= (210.1 * #Days) + (35.34 * HDD)

Administration



Fred House Academy



Adjustments to Savings

Over the course of a project changes occur. The intent of Measurement of Verification is to ensure that the comparison is done from a point of reference; or to use the euphemism "apples for apples." In the case of an Option C utility bill comparison methodology, the utility meter is the point of reference. In order to do the proper comparison of the baseline utility data versus the current year utility data, you have to ensure the utility reading for the current year meter is serving the same conditions as the baseline year. For example, if the meter for the baseline year served 10 buildings then those same 10 buildings must exist in the current year. If there are additions or deletions of buildings then the energy use for the added or missing building must be accounted for and the billing information is adjusted up or down for the change. Additional adjustments occur when any added or deleted energy source is added to the meter or deleted from the meter, changes not caused by Johnson Controls to the performance contract designed intent such as disabling a control strategy, or changes in weather that impact HVAC measures. Below is a table of adjustments to savings that occurred this year. Section 2 below discusses each one in detail. Note that weather adjustments are accounted for in the Metrix® software. All other adjustments are calculated outside of the Metrix®.

Geothermal Well Maintenance

Johnson Controls has responsibility of maintenance through a Premium maintenance contract with UDC to maintain the geothermal well equipment. The coverage for this contact covers the geothermal well pump and continues with the piping that leads into the adjacent pump house. Within the pump house all associated equipment related to the geothermal system is covered under the maintenance contract. This includes the heat exchangers, thermal expansion tank, two secondary pumps, three VFDs, flow meter, and Metasys controller with associated control points and sensors.

This year besides the normal Preventative Maintenance service the following was repaired.

- Metasys controller was repaired and sensors and flow meter were calibrated during 4/2014 PM.
- During the 8/2013 PM a water sample was taken.
- VFD for pump 1 was diagnosed as defective during 9/2013 PM. This VFD was replaced 6/2014. VFD cannot be tested until piping leaks are repaired.
- During the 10/2013 PM the pump seal and coupling was replace.

For complete maintenance activities see the maintenance reports in Appendix B.

Savings Adjustment Summary

Meter	Facility	FIM #	FIM Name	Reason for adjustment
South Point Gas	All	N/A	N/A	Inmate population growth. All base load (DHW, Kitchen, Laundry, and Process) are directly related to inmate usage. Therefore it is assumed that there is a direct correlation of inmate to base load.
	Oquirrhs, Wasatch, UCI, & SSD	2, 2a, 2b, 2c	Geothermal Oquirrhs 1-4, Expand Geothermal Wasatch, UCI, & SSD	The geothermal system has been down due to pipe leaks. JCI has ownership of ensuring operation of the equipment inside the pump house as it relates to the geothermal well and the geothermal well pump. JCI operated the geothermal well at 1/3 the speed or flow continuous for this year and had only one hot water pump serving the buildings.
	UCI shops Oquirrhs	22	Night Setback	The Night Setback has been disabled. JCI did not cause this change.
	Wasatch	55	Ozone Laundry	This FIM was disabled early when an employee got injured somehow by the Ozone system. Draper safety issue caused the laundry to default back to hot water use.
	Reading for the Blind	N/A	N/A	Added building increases gas and electrical use. M&V only requires analyzing the gas meter. Therefore the adjustment will only apply to the gas meter.
North Point Gas	All	N/A	N/A	Inmate population growth. All base load (DHW, Kitchen, Laundry, and Process) are directly related to inmate usage. Therefore it is assumed that there is a direct correlation of inmate to base load.

PART 2 – DETAILED PERFORMANCE RESULTS

South Point

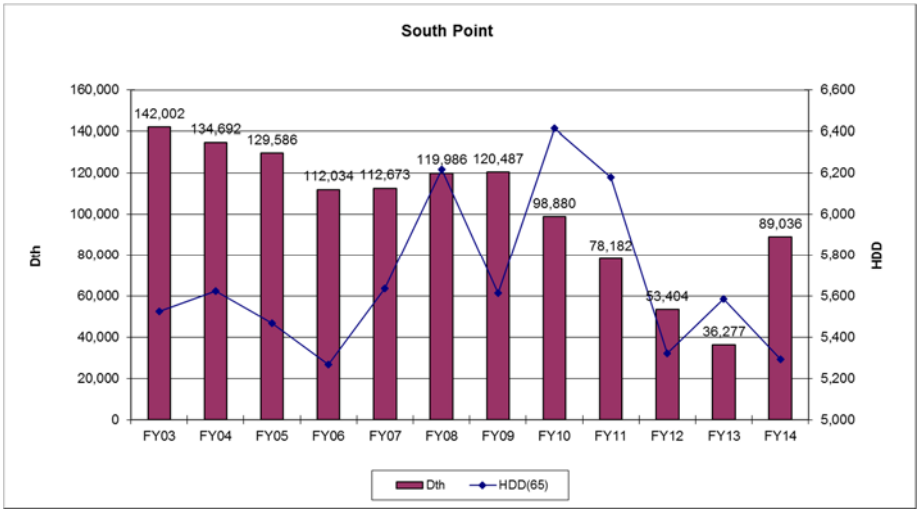
The South Point gas meter serves 63% of the Draper site's total square footage and is the largest gas consumer on site. In Fiscal Year 2003 it was accountable for 77% of the entire site's natural gas usage, subsequently dropping in Fiscal Year 2014. 16% of the drop off occurred between Fiscal Year 2003 and Fiscal Year 2006. Another 18% improvement occurred from FY–09 to FY–11 coincident with the minimized operation/reconstruction of the geothermal well. This drop off coincides with the gas meter change out at South Point and more efficient operation of the existing Wasatch steam boilers.

January of 2014 Johnson Controls was notified by UDC that the South Point gas meter was defective. UDC was notified by the Questar gas utility company that since July of 2009 the South Point gas meter was under reporting the actual gas usage. UDC and Johnson Controls worked together to determine how to deal with the failed meter. It was determined that since UDC's attorneys were working with Questar to resolve this issue we would await any result from that discussion. In June 2014, JCI received notice from Greg Peay with UDC, that Questar agreed that they would not back bill UDC. As a consequence of this decision, there are no adjustments required for past billings. Consequently the graphs and charts above are left as is with under reporting of natural gas use starting from July 2009.

The natural gas meter was replaced prior to January 2014. This year's report contains six months of correct gas usage and six months of under reported gas usage. Indications of the current natural gas use show the natural gas trending higher and is nearing baseline. There are a few reasons for this one of which is the fact that the geothermal heating system is minimally operational due to pipe leaks. Additionally inmate population has increased since the baseline. With a functioning meter, a closer look at utility usage will be performed on the utility bills.

The following chart shows the annual consumption associated with the South Point meter with a line overlay of heating degree days.

Chart 1. South Point Natural Gas and Heating Degree Days versus Fiscal Year.



Charts 2 and 3 demonstrate how the South Point meter is utilizing gas as it relates to the Wasatch heating demand driven by weather.

Chart 2. South Point Decatherms/HDD and Heating Degree Days versus Fiscal Year.

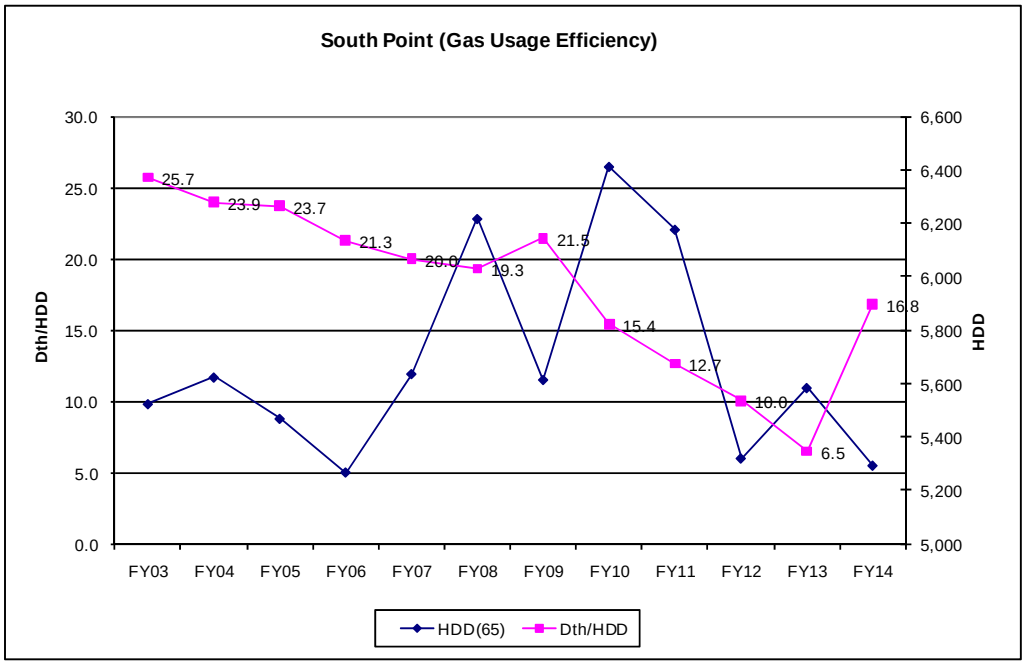
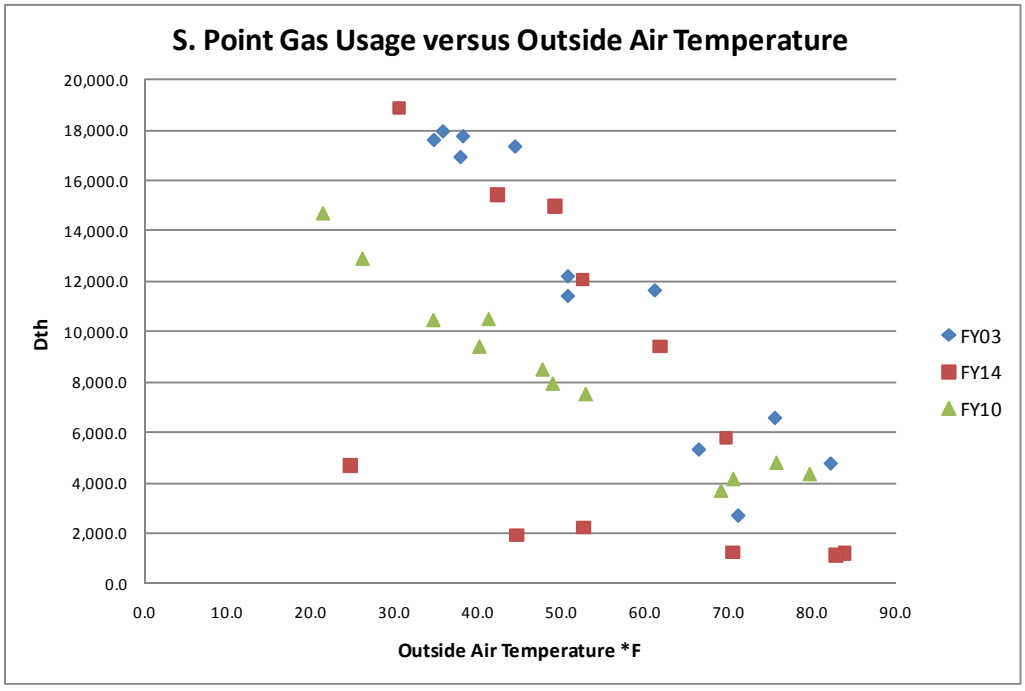


Chart 3. South Point Decatherms versus Outside Air Temperature.



Adjustments to Savings

As explained above in Section 1, over the course of a project changes occur. This year changes to the baseline conditions were identified that necessitate adjustments to the baseline utility bills. For the South Point natural gas meter the following Table 1 describes the adjustments.

In general there are two adjustments that are due to natural occurrences. Weather constantly changes and impacts HVAC related FIMs. Johnson Controls uses a software program that makes adjustments due to weather based on the Heating Degree Days (HDD). The software program compiles the utility bills where it will take the current year utility natural gas usage and the current year HDD and adjust the usage as it relates to the baseline HDD. This is described in Section 1 above under the "How Savings Are Calculated" heading. These savings are adjusted for in the software program. In addition the prison population fluctuates from year to year. Additional bodies affect both the base load and HVAC related loads. Base loads will go up due to additional DHW use and HVAC heating load will go down due to the additional heat that the bodies distribute to the internal load, causing the heating equipment to work less.

This year there were two (2) FIMs identified that have been disabled. As Johnson Controls did not disable these FIMs, the savings will need to be adjusted to account for this change. The two (2) FIMs identified are the Ozone Laundry Conversion and the Night Setback Strategy in the UCI Shop buildings. The Ozone Laundry Conversion was disabled in the first or second year of operation due to an accident. The full calculated credit will be used to adjust the savings. It was also determined that the programming for the Night Setback Strategy for the UCI shop buildings was no longer in place thus causing the unit heaters to operate 24/7. The full calculated credit will be used to adjust savings for this measure also.

One FIM was identified as not functioning due to failure. The geothermal system takes heated water from the ground, passes it through a heat exchanger to heat process water that is used to heat domestic hot water and provide hot water for space heating. Johnson Controls maintains the equipment in the pump house to the geothermal well. Consequently Johnson Controls has responsibility to ensure this equipment is functioning properly. Any savings loss due to this equipment not operation is the responsibility of Johnson Controls. Once the hot water leaves the pump house UDC is responsible for savings loss due to failure of equipment serving the buildings. This includes the proper operation of the heat exchangers for the domestic hot water and heating coils and all associated piping. There were two failures that caused this system to not operate to it full capability. One (1) VFD that provides hot water flow to the prison buildings failed and did not operate for most of the Year 10 performance period. This failure is Johnson Controls responsibility. In addition the main pipe run serving the equipment within each of the buildings developed a major leak. This occurred several times throughout the Year 10 performance period. The system was essentially considered in operable throughout the entire year. As such since Johnson Controls could only deliver half of the full capacity to the buildings, due to having one VFD not operating, the savings will be adjusted assuming that it could only deliver part load. It is known that the geothermal pump operated at a constant 1/3 speed. The reduced speed on the geothermal pump was partially due to the leaks what is unknown is the operating capacity and how much of this reduced operation is due to other issues such as inefficient operation or improper control sequences. Since at this time all we know is that the speed was held constant at 1/3 the speed this would translate to approximately 1/3 the capacity or load delivered. This would mean that 2/3 of the capacity or load is not delivered for some unknown reason. This could be the responsibility of either

UDC or Johnson Controls. At this time Johnson Controls will take responsibility of half this 2/3 reduction in capacity along with only being able to deliver half of this load because Johnson Controls did not repair the VFD. So this adjustment translates to 1/3 that should have been delivered given the pipe leaks did not occur.

With exception to the weather adjustment, which is adjusted for in the software, adjustment to savings for this natural gas meter shall be adjusted for annually instead of by the month. This is due to having a defective meter for six months of this performance year. In addition there are some electrical savings associated to the Night Setback Strategy that are not achieved because the fans are operating 24/7. This is slightly offset by additional electrical usage of pumps associated to the geothermal system. Both electrical savings will be adjusted annually since there are no electrical utility bills as part of an Option C analysis. In addition the electrical rate shall be escalated by the contractual 3.34%. The adjusted savings are presented in Table 2 below and represent an annual adjustment of $200,393 dollars.

Table 1 South Point Savings Adjustments Descriptions

Meter	Facility	FIM #	FIM Name	Reason for adjustment
South Point Gas	All	N/A	N/A	Inmate population growth. All base load (DHW, Kitchen, Laundry, and Process) are directly related to inmate usage. Therefore it is assumed that there is a direct correlation of inmate to base load.
	Oquirrhs, Wasatch, UCI, & SSD	2, 2a, 2b, 2c	Geothermal Oquirrhs 1-4, Expand Geothermal Wasatch, UCI, & SSD	The geothermal system has been down due to pipe leaks. JCI has ownership of ensuring operation of the equipment inside the pump house as it relates to the geothermal well and the geothermal pump. JCI operated the geothermal well at 1/3 the speed or flow continuous for this year and had only one hot water pump serving the buildings.
	UCI shops Oquirrhs	22	Night Setback	The Night Setback has been disabled. JCI did not cause this change.
	Wasatch	55	Ozone Laundry	This FIM was disabled early when an employee got injured somehow by the Ozone system. Draper safety issue caused the laundry to default back to hot water use.
	Reading for the Blind	N/A	N/A	Added building increases gas and electrical use. M&V only requires analyzing the gas meter. Therefore the adjustment will only apply to the gas meter.

Table 2 South Point Savings Adjustments Energy Units and Costs

Meter	Facility	FIM #	FIM Name	Adjustment (kWh)	Adjustment kWh ($)	Adjustment (Therms)	Adjustment Therm ($)	Method of calculating adjustment
South Point Gas	All	N/A	N/A			154,862	$94,611	Spread sheet uses Metrix baseline regression equation as basis of savings. The base load is divided by inmate population at base year to derive a Therm per person. This is projected and multiplied by current year population.
	Oquirrhs, Wasatch, UCI, & SSD	2, 2a, 2b, 2c	Geothermal Oquirrhs 1-4, Expand Geothermal Wasatch, UCI, & SSD	-32,445	($772)	147,289	$92,429	The geothermal system was down for the Year 10 performance period due to pipe leaks on piping serving the Draper equipment. Concurrently JCI had one VFD fail and was not repaired through the same period. The pumps are of equivalent size and operate lead lag. With one pump down it is assumed that only half the load could be delivered therefore half the savings will be claimed. On the geothermal side the pump operated at a constant 1/3 or 1/3 load. Savings will be prorated by this factor also.
	UCI shops Oquirrhs	22	Night Setback	91,200	$2,862	8,230	$5,118	Take full credit of estimated savings
	Wasatch	55	Ozone Laundry			11,386	$7,145	Take full credit of estimated savings
	Reading for the Blind	N/A	N/A			1,717	$1,077	Spread sheet calculation
Totals				**58,755**	**$2,090**	**323,484**	**$200,381**	

North Point

The North Point gas meter serves 19% of the Draper site's total square footage and is the 2nd largest gas consumer on site. In Fiscal Year 2003 it was accountable for 14% of the entire site's natural gas usage increasing in Fiscal Year 2014.

Chart 4. North Point Natural Gas and Heating Degree Days versus Fiscal Year.

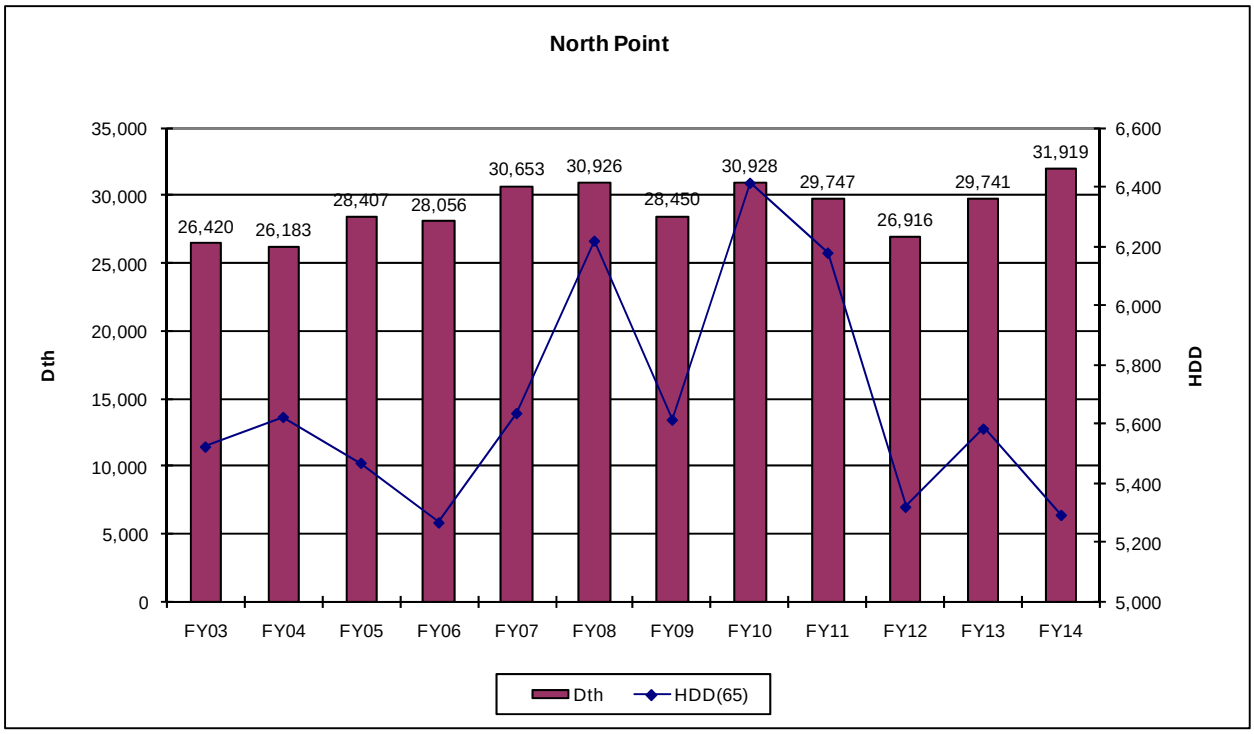


Chart 5. North Point Decatherms/HDD and Heating Degree Days versus Fiscal Year.

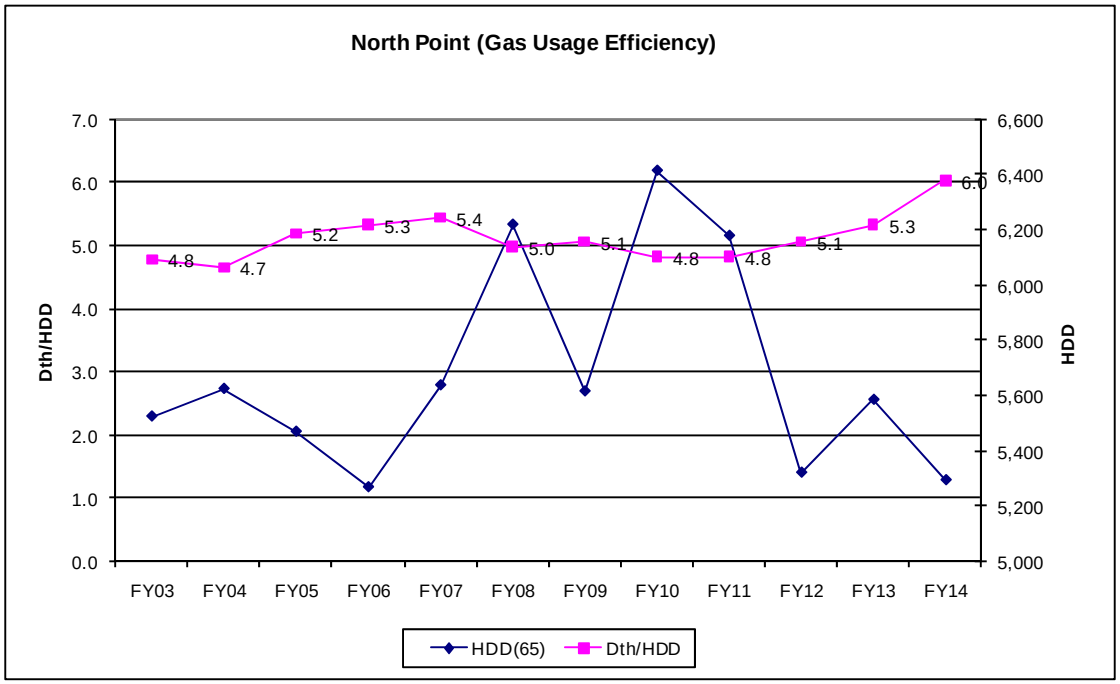
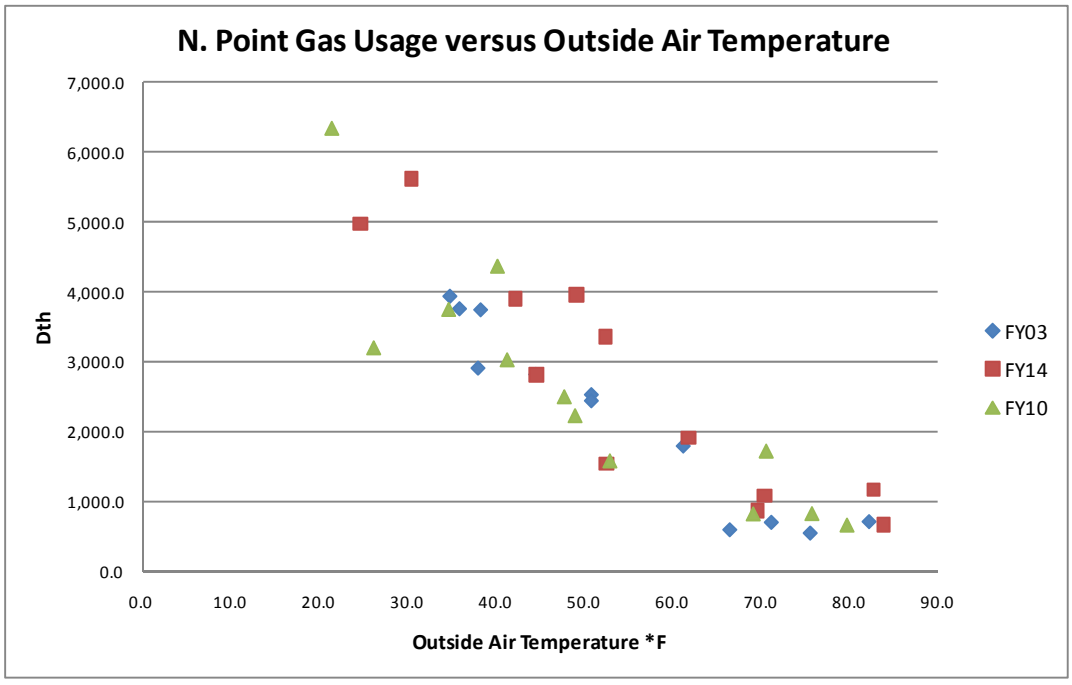


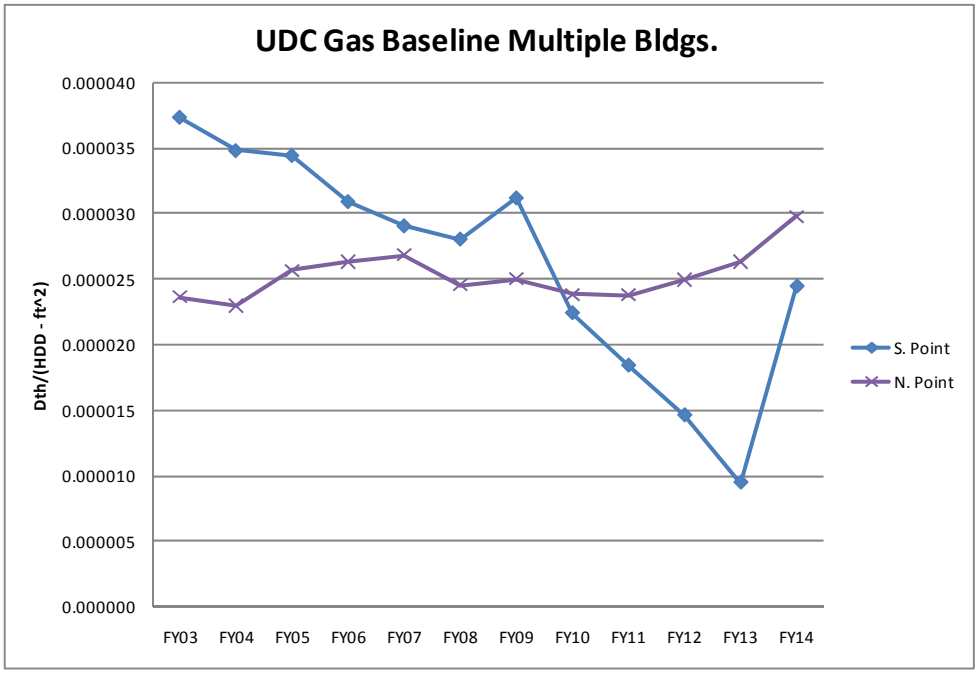
Chart 6. North Point Decatherms versus Outside Air Temperature.



The buildings associated with the North Point gas meter is relatively flat regardless of outside air temperature. There is an obvious dependence (See Chart 6) with outside air but according to the gas and weather data the operation of these facilities appear to not modulate as is expected with varying weather conditions. This is likely in part due to the condition of the VAV system located in the Timponogos building. It was learned that during construction there was damage to the underground ductwork where it got crushed therefore restricting the air flow to many of the zones. Consequently the HVAC maintenance staff fixed the air flow dampers to 100% open maximizing airflow and the tempering colder zones with reheat coils. The system essentially is a constant volume reheat since the air flow issue the dampers are fixed at 100%. Constant volume reheat is one of the highest energy consuming HVAC system.

The following chart is a comparison between South and North Point gas meters.

Chart 7. North and South Point Decatherms/(HDD – ft^2) versus Fiscal Year



Adjustments to Savings

As explained above in Section 1, over the course of a project changes occur. This year changes to the baseline conditions were identified that necessitate adjustments to the baseline utility bills. For the North Point natural gas meter the following Table 3 describes the adjustments.

In general there are two adjustments that are due to natural occurrences. Weather constantly changes and impacts HVAC related FIMs. Johnson Controls uses a software program that makes adjustments due to weather based on the Heating Degree Days (HDD). The software program compiles the utility bills where it will take the current year utility natural gas usage and the current year HDD and adjust the usage as it relates to the baseline HDD. This is described in Section 1 above under the "How Savings Are

Calculated" heading. These weather related savings are already adjusted for in the software. In addition the prison population fluctuates from year to year. Additional bodies affects the both the base load and HVAC related loads. Base loads will go up due to additional DHW use and HVAC heating load will go down due to the additional heat that the bodies distribute to the internal load, causing the heating equipment to work less.

Adjustment to savings for prison population increase is adjusted monthly. The adjusted savings are presented in Table 4 below and represent an annual adjustment of $12,267 dollars.

Table 1 South Point Savings Adjustments Descriptions

Meter	Facility	FIM #	FIM Name	Reason for adjustment
North Point Gas	All	N/A	N/A	Inmate population growth. All base load (DHW, Kitchen, Laundry, and Process) are directly related to inmate usage. Therefore it is assumed that there is a direct correlation of inmate to base load.

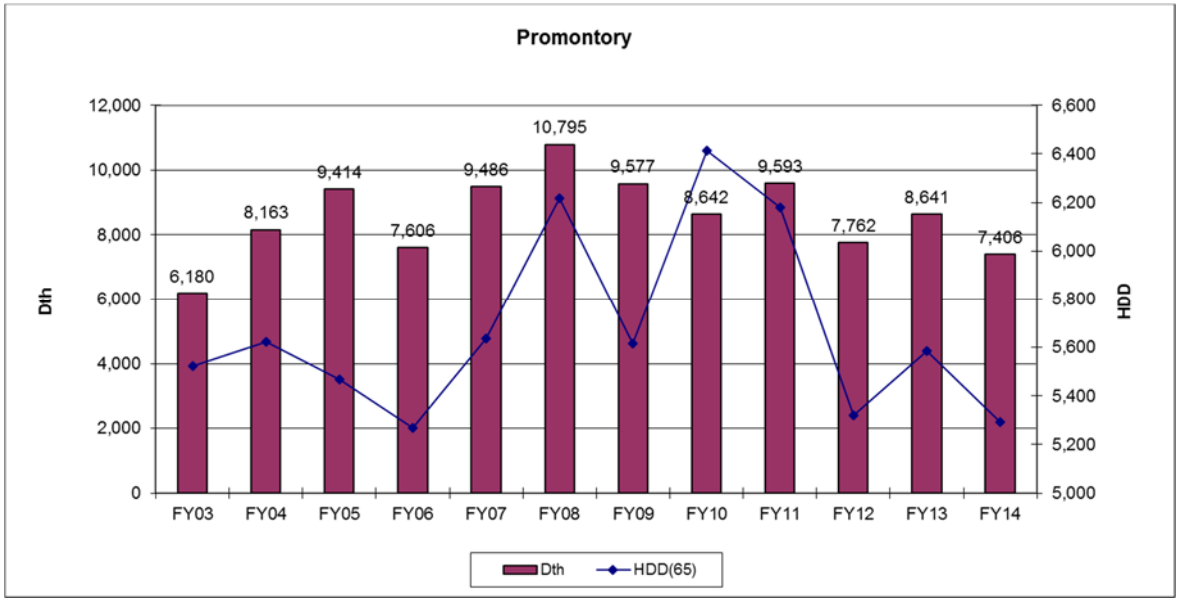
Table 2 South Point Savings Adjustments Energy Units and Costs

Meter	Facility	FIM #	FIM Name	Adjustment (kWh)	Adjustment kWh ($)	Adjustment (Therms)	Adjustment Therm ($)	Method of calculating adjustment
North Point Gas	All	N/A	N/A			20,330	$14,719	Spread sheet uses Metrix baseline regression equation as basis of savings. The base load is divided by inmate population at base year to derive a Therm per person. This is projected and multiplied by current year population.
Totals						**20,330**	**$14,719**	

Promontory

The Promontory gas meter serves 6% of the Draper site's total square footage and is the 3rd largest gas consumer. In Fiscal Year 2003 it was accountable for 3% of the entire site's natural gas usage where Fiscal Year 2014 exceeds FY03.

Chart 8. Promontory Natural Gas and Heating Degree Days versus Fiscal Year.



Up until FY10 the Promontory facility's usage followed Heating Degree Days. Please note that FY10 had more Heating Degree Days than FY11, but FY11 used more gas. Note: The Promontory meter is an agreed upon savings amount per the original contract. The above information is for reference only.

Chart 9. Promontory Decatherms/HDD and Heating Degree Days versus Fiscal Year.

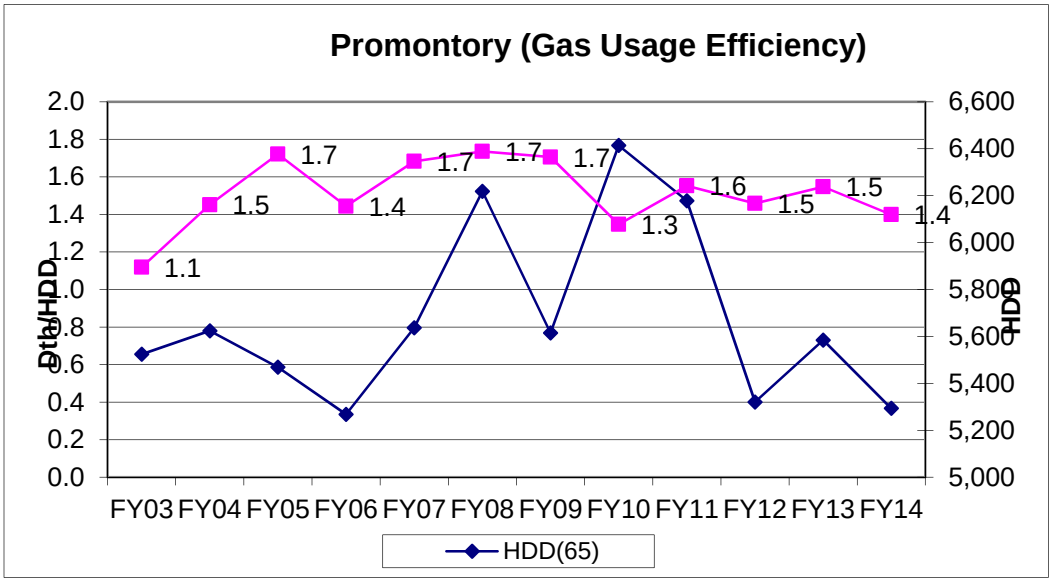
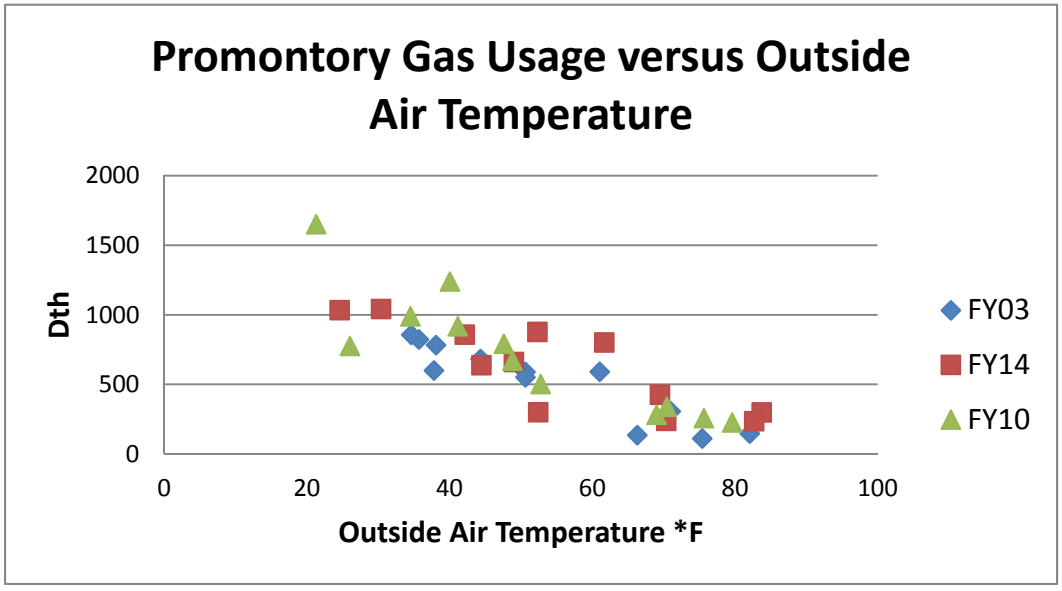


Chart 10. Promontory Decatherms versus Outside Air Temperature.

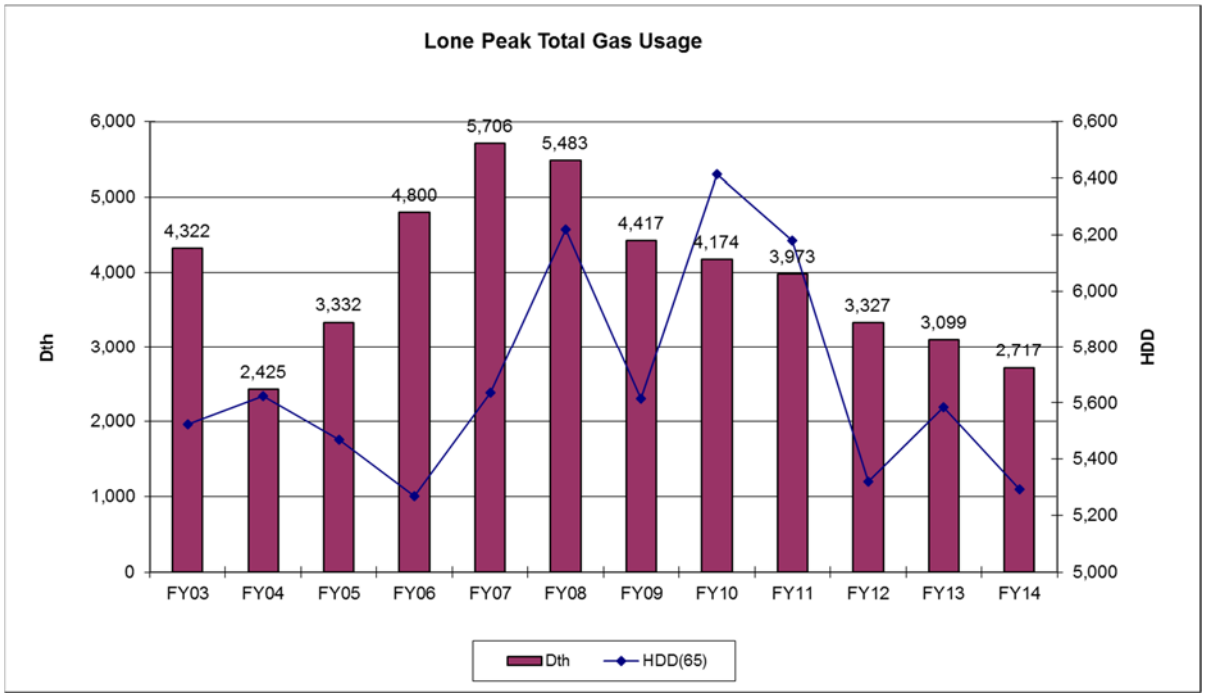


Comparing FY03 and FY014 the Promontory facility seems to be operating less effectively. According to Chart 9 this facility seemed to be operating less effectively than it has previously. Note how much more closely the data points are for FY03 and FY11 as compared to FY13.

Lone Peak

The Lone Peak gas meter serves 4% of the Draper site's total square footage and is tied with the Administration and Fred House Academy's gas usage. In Fiscal Year 2003 it was accountable for 2% of the entire site's natural gas usage slightly fluctuating between 1% and 3% over the years.

Chart 11. Lone Peak Natural Gas and Heating Degree Days versus Fiscal Year.



Of all the gas meters on site this meter is the least dependent on apparent weather demands. There was a period during FY04 to FY05 when the facility was under construction which likely accounts for the increase up to FY07. From FY08 until present the usage has been trending down. Note: The Lone Peak meter is an agreed upon savings amount per the original contract. The above information is for reference only.

Chart 12. Lone Peak Decatherms/HDD and Heating Degree Days versus Fiscal Year.

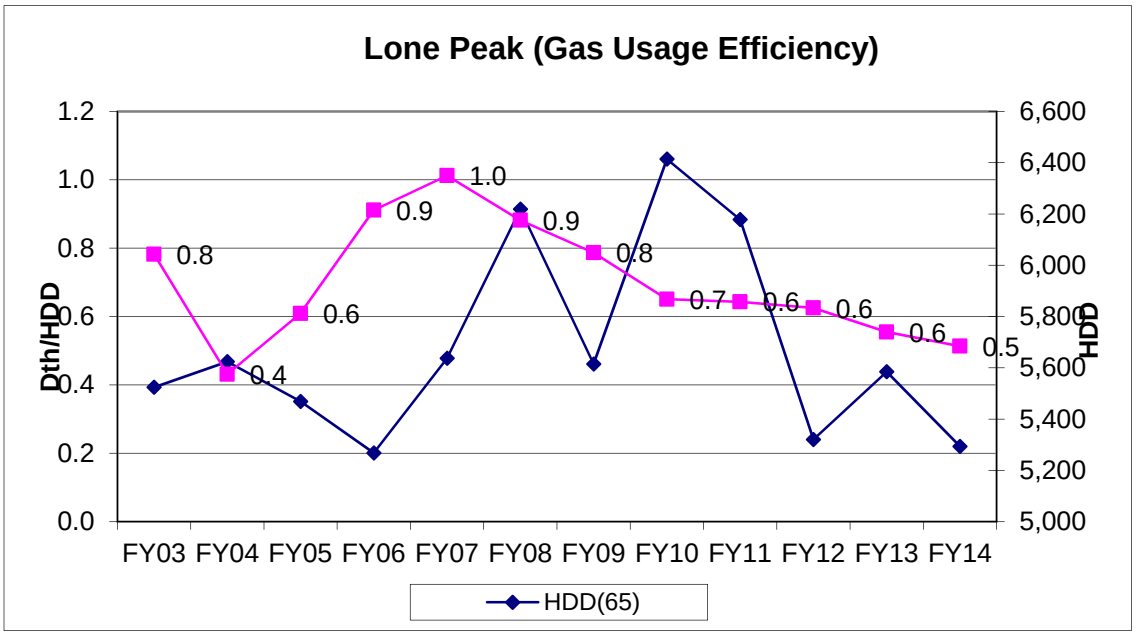


Chart 13. Lone Peak Decatherms versus Outside Air Temperature.

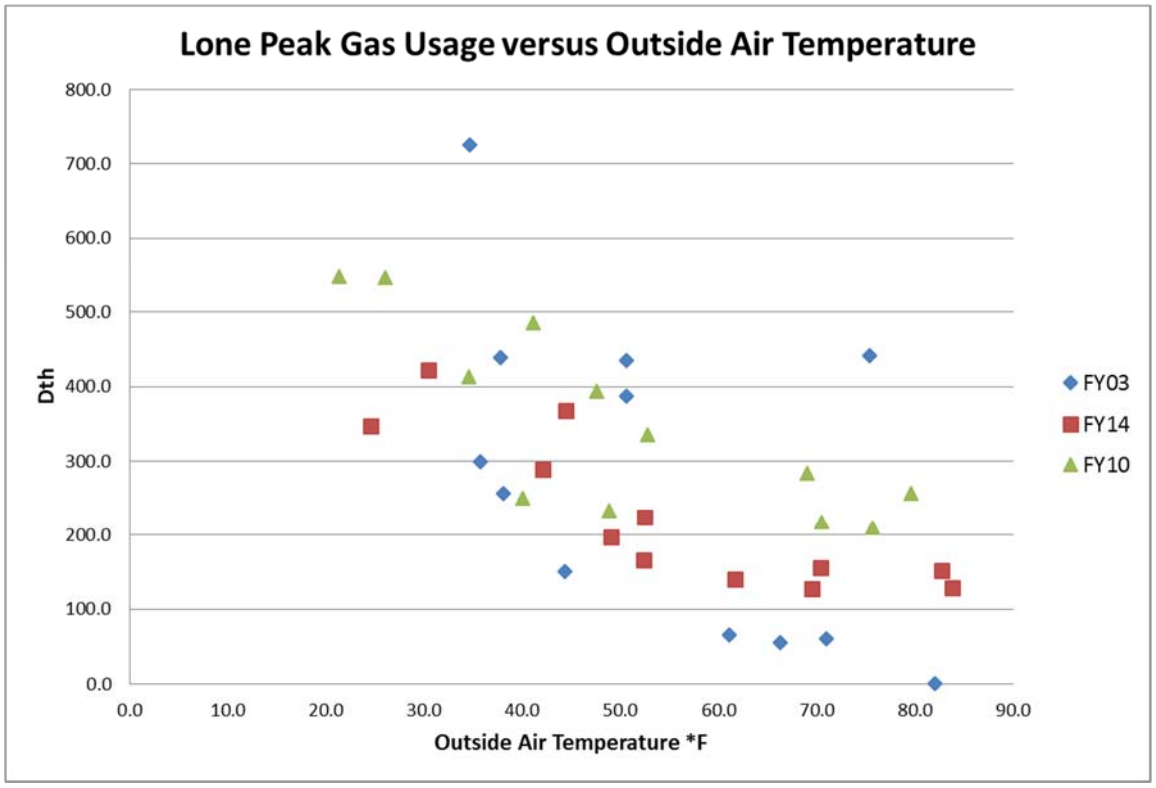
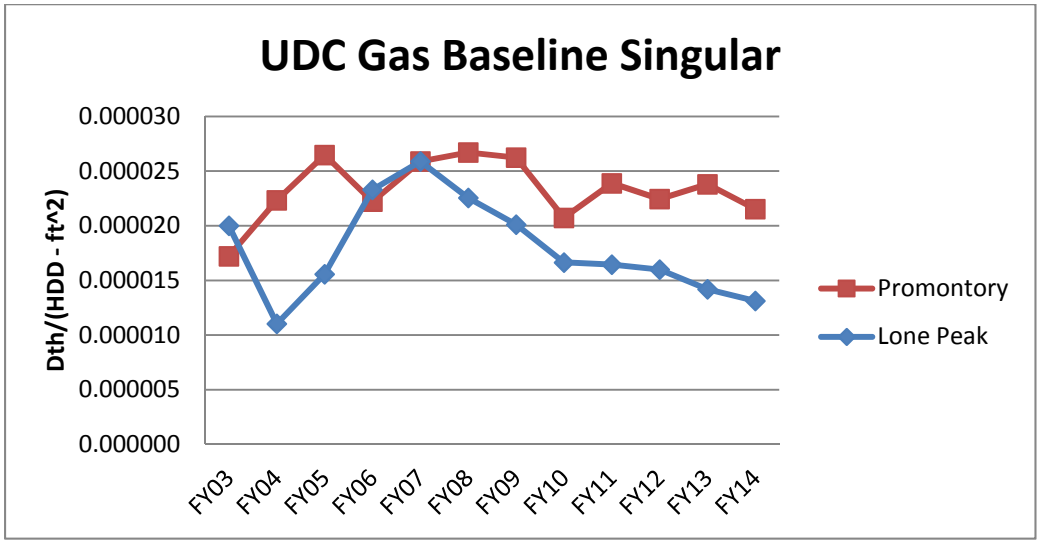


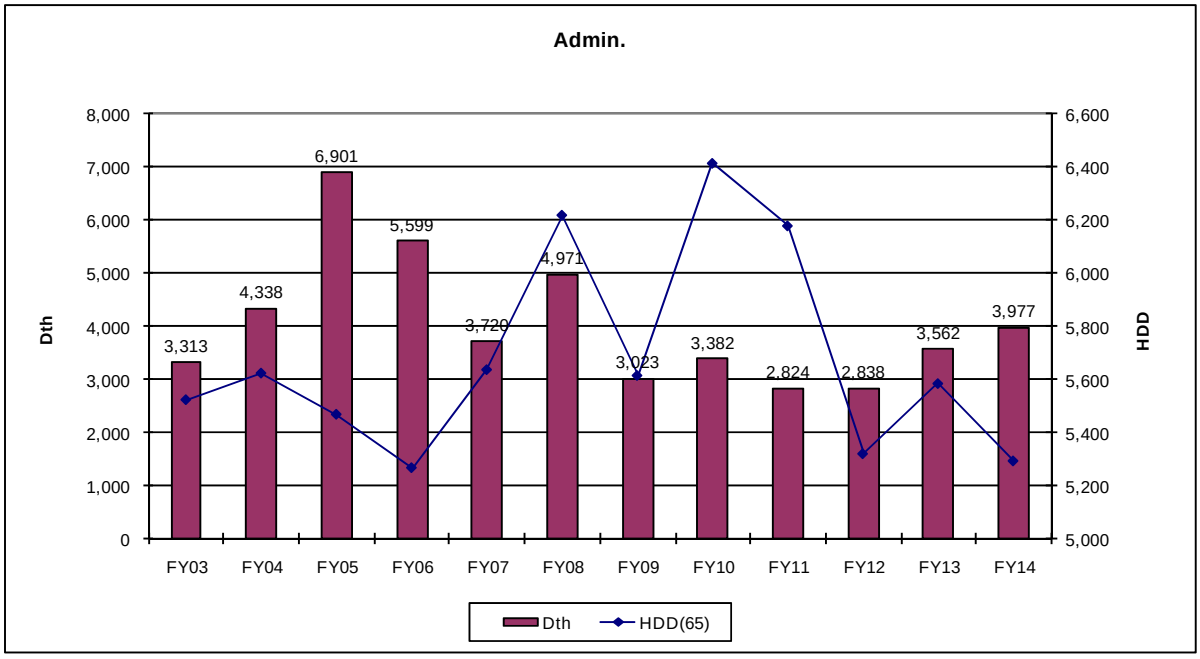
Chart 14. Promontory and Lone Peak Decatherms/(HDD – ft^2) versus Fiscal Year



UDC Administration Natural Gas

The Administration gas meter serves 6% of the Draper site's total square footage and is in a three way tie with Lone Peak and the Fred House Academy for gas consumption. In Fiscal Year 2003 it was accountable for 2% of the entire site's natural gas usage slightly fluctuating between 2% and 4% over the years.

Chart 15. UDC Administration Natural Gas and Heating Degree Days versus Fiscal Year.



A substantial drop off in usage occurs following FY08 which coincides with newly installed boilers. Prior to the boiler replacement there was a noticeable vacillation seemingly independent of outside air temperatures.

Chart 16. Administration Decatherms/HDD and Heating Degree Days versus Fiscal Year.

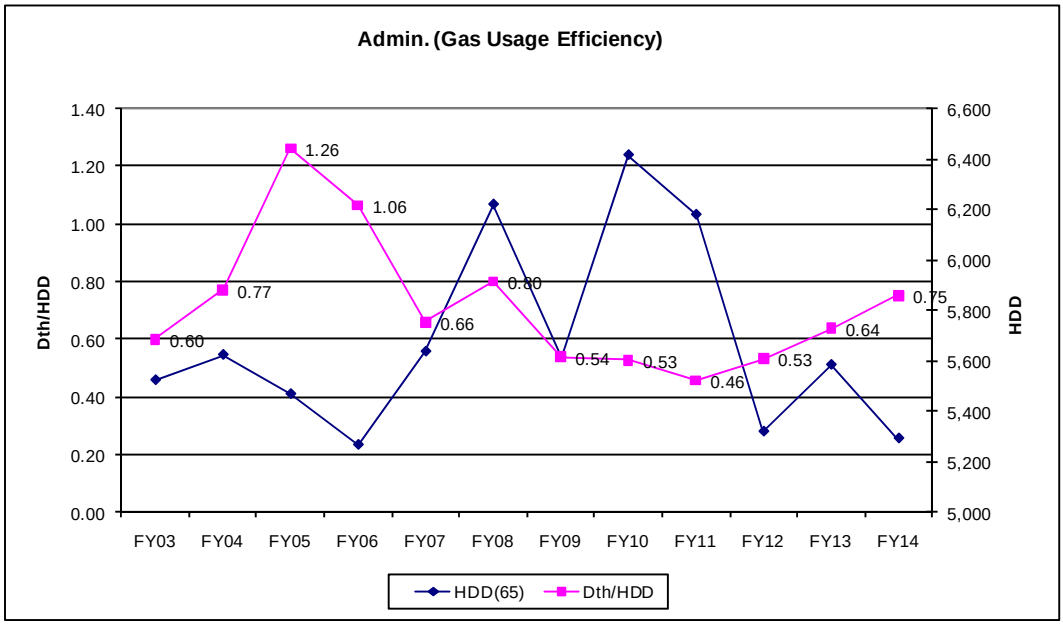
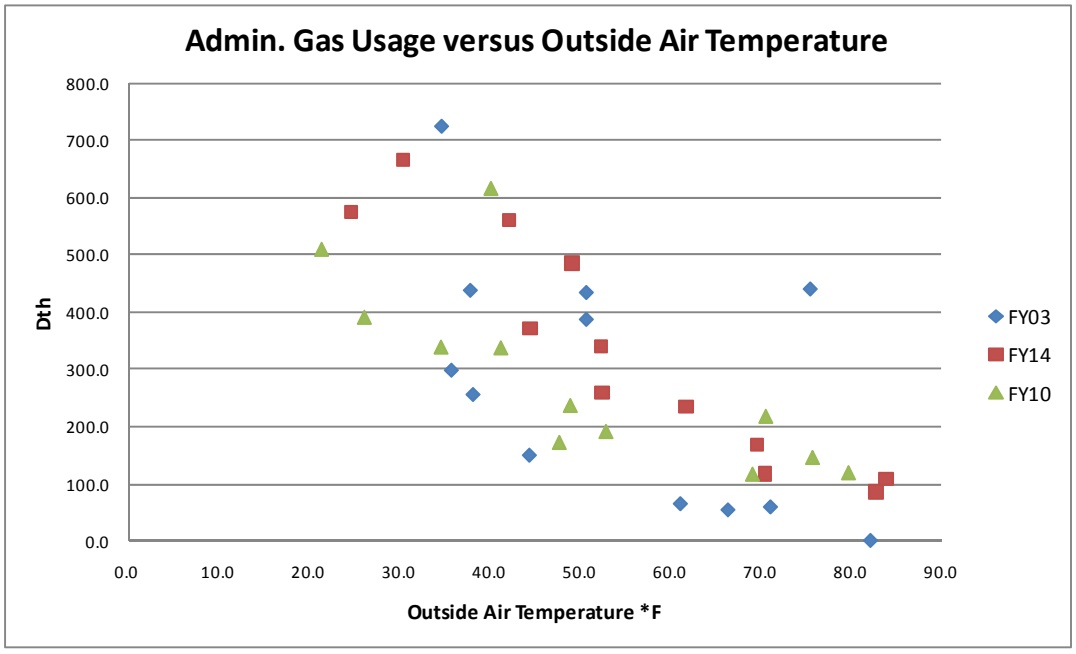


Chart 17. Administration Decatherms versus Outside Air Temperature.

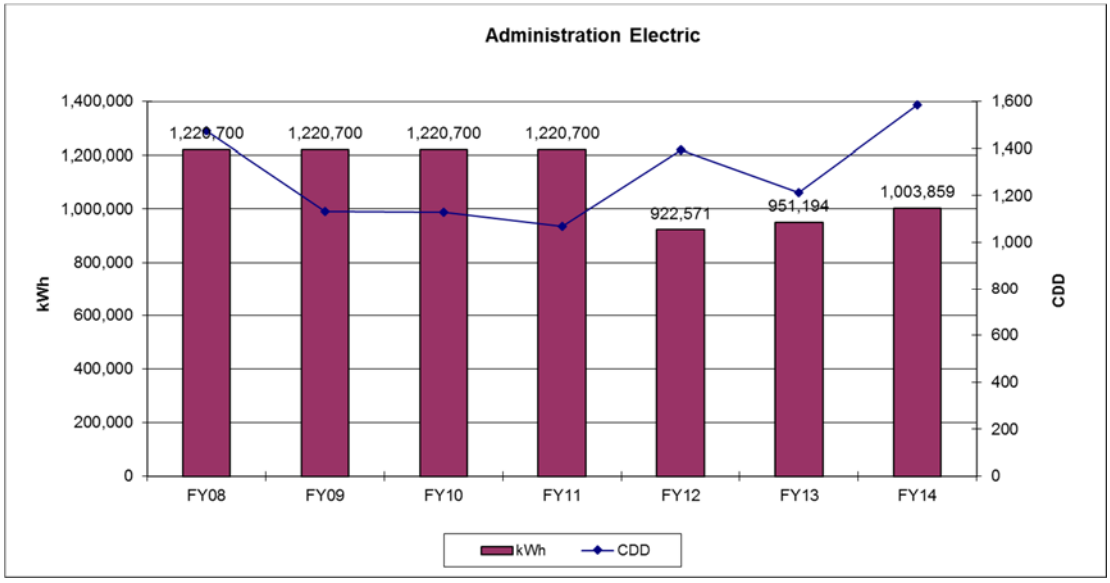


Observation of the gas usage versus outside air temperature data shows a much tighter building operation based on heating demand however the data suggests that it could still be improved.

UDC Administration Electric

The Administration electric meter serves 6% of the Draper site's total square footage.

Chart 18. UDC Administration Electric and Cooling Degree Days versus Fiscal Year.



A substantial drop off in usage occurs following FY12.

Chart 19. UDC Administration Electric kWh/CDD and Cooling Degree Days versus Fiscal Year.

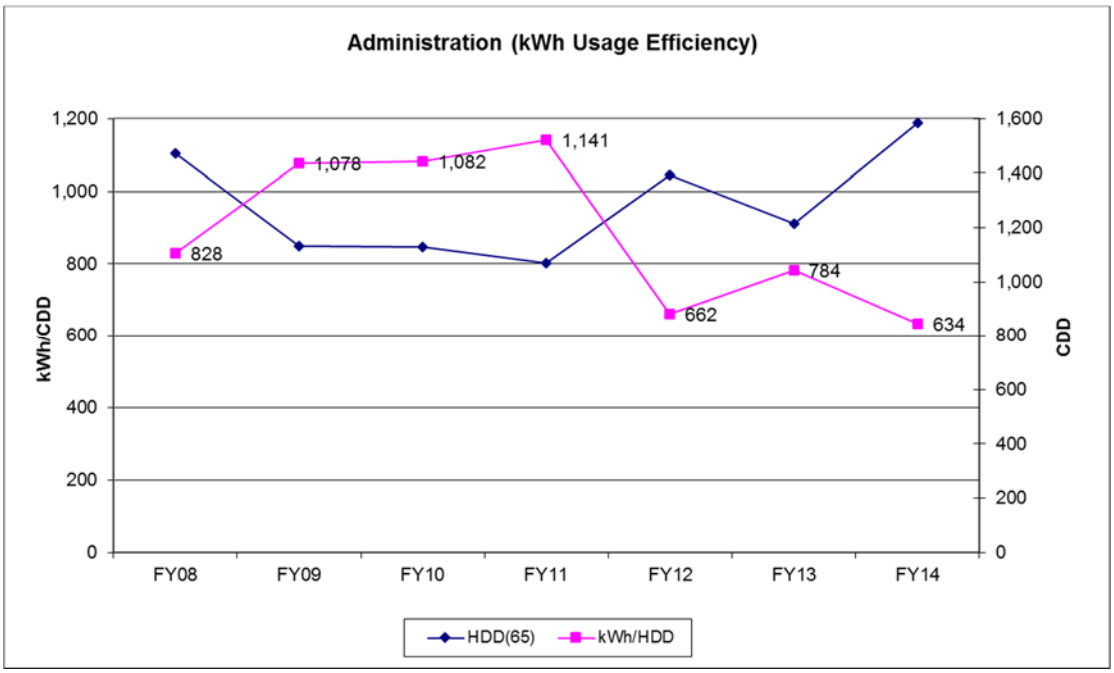
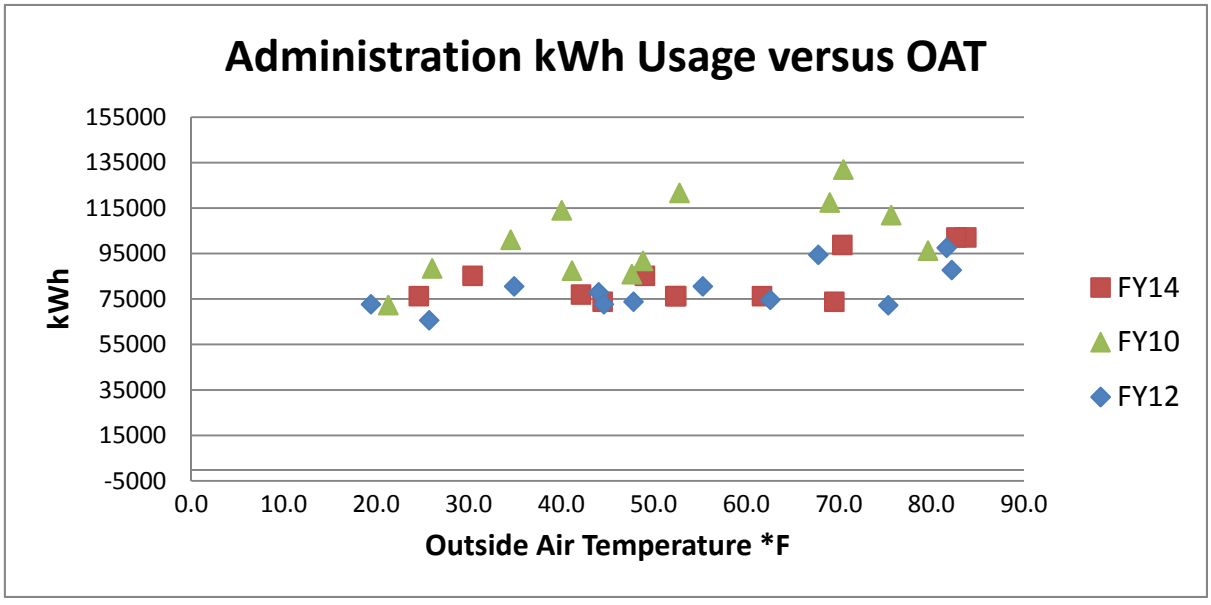


Chart 20. UDC Administration Electric kWh versus Outside Air Temperature.



Fred House Academy

The Fred House Academy gas meter serves 2% of the Draper site's total square footage and is in a three way tie with Lone Peak and the UDC Administration for gas consumption. In Fiscal Year 2003 it was accountable for 1% of the site's total gas consumption but in FY14 it accounts for approximately 1%.

Chart 21. UDC Administration Natural Gas and Heating Degree Days versus Fiscal Year.

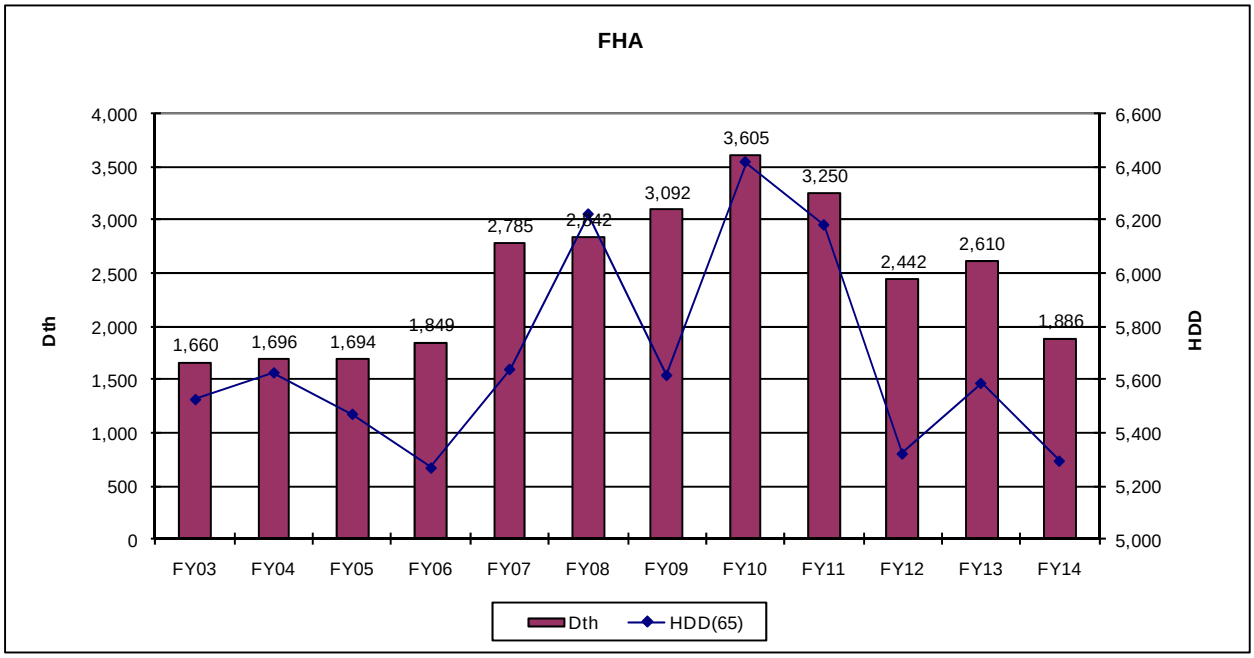


Chart 22. Fred House Academy Decatherms/HDD and Heating Degree Days versus Fiscal Year.

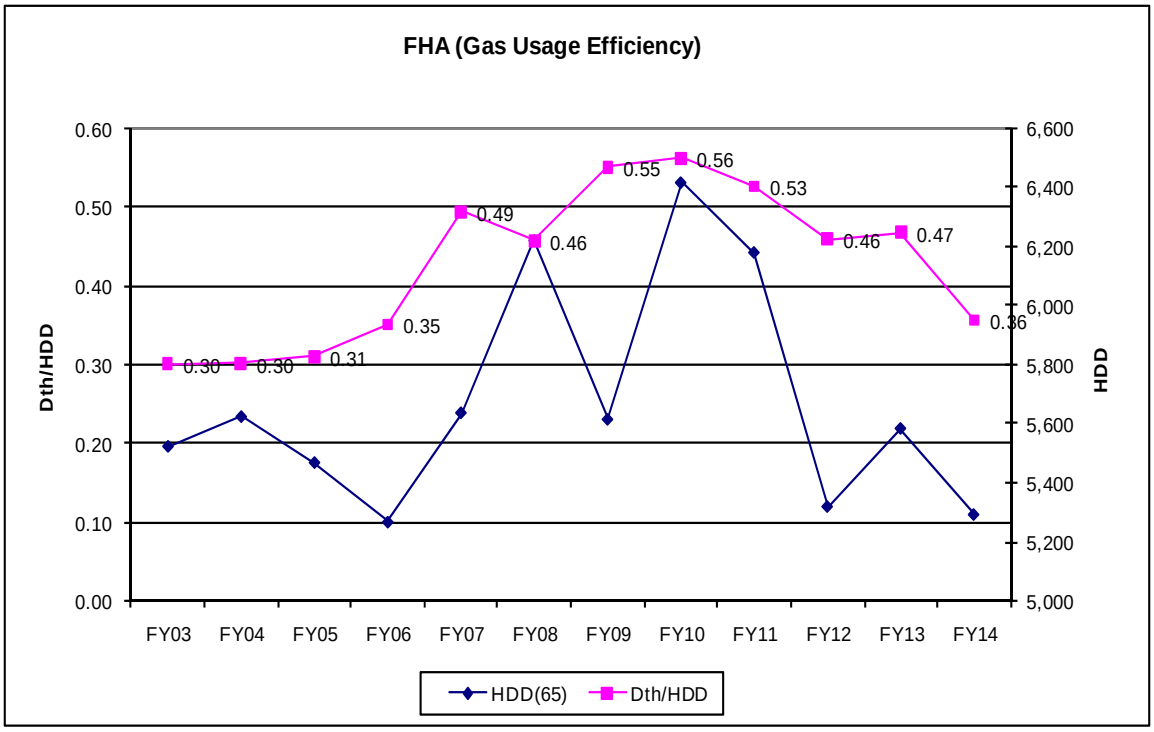


Chart 23. Fred House Academy Decatherms versus Outside Air Temperature.

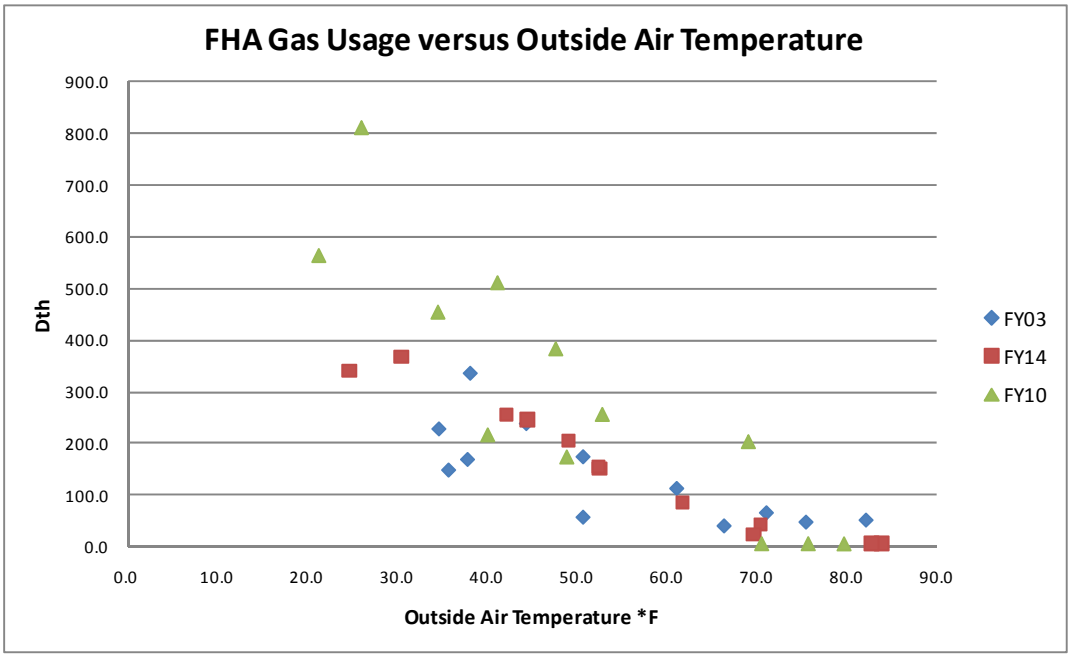
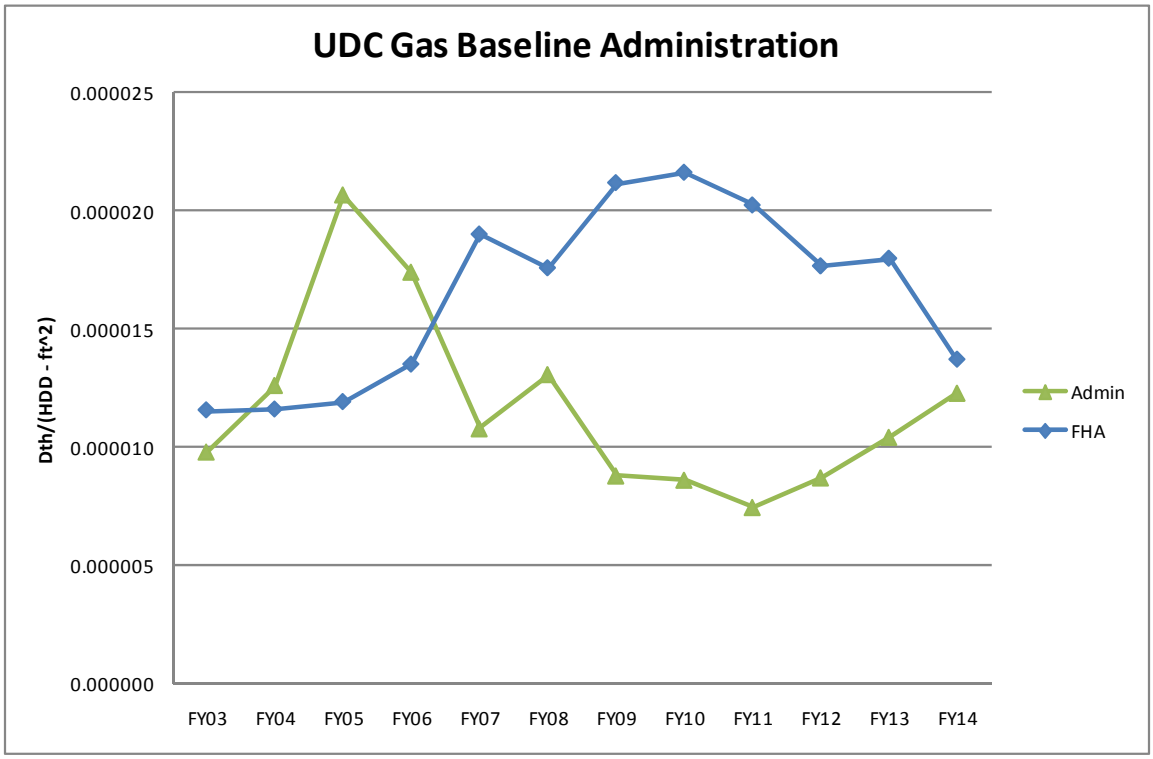


Chart 24. Admin. and FHA Decatherms/(HDD – ft^2) versus Fiscal Year



APPENDIX A

UDC Metrix Output Year 10

Metrix Cost/Energy Savings

Administration - Electric

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Baseline kWh	104,030	101,942	101,942	88,395	75,355	77,595	94,372	83,071	85,061	103,857	134,494	129,066	1,179,178
Actual kWh	102,158	102,158	98,863	76,342	73,879	76,342	85,267	77,016	85,267	76,343	76,343	73,880	1,003,859
Savings	1,872	-217	3,079	12,053	1,476	1,253	9,105	6,056	-207	27,514	58,152	55,186	175,320
$/kWh*	0.0688	0.0688	0.0688	0.0585	0.0585	0.0585	0.0587	0.0587	0.0587	0.0680	0.0680	0.0680	**$/Year**
$/Month	$129	-$15	$212	$705	$86	$73	$534	$355	-$12	$1,871	$3,954	$3,753	**$11,646.04**

Administration - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Baseline Therms	1,340	2,135	2,417	2,717	4,228	5,322	5,309	3,657	3,173	3,305	2,672	1,844	38,118
Actual Therms	1,092	867	1,170	2,599	3,722	5,758	6,666	5,609	4,851	3,408	2,344	1,683	39,771
Savings	248	1,267	1,247	117	506	-436	-1,358	-1,951	-1,679	-103	328	161	-1,652
$/Therm	$0.712	$0.805	$0.833	$0.616	$0.652	$0.669	$0.671	$0.677	$0.672	$0.812	$0.612	$0.704	**$/Year**
$/Month	$176	$1,020	$1,039	$72	$330	-$291	-$910	-$1,321	-$1,128	-$84	$201	$113	**-$783**

South Point - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Baseline Therms	49,037	49,037	62,689	109,972	143,466	244,809	216,607	144,365	126,455	108,703	74,938	53,428	1,383,508
Actual Therms	12,240	11,450	12,590	22,250	19,330	46,810	188,800	154,160	149,890	120,830	94,265	57,745	890,360
Savings	36,797	37,587	50,099	87,722	124,136	197,999	27,807	-9,795	-23,435	-12,128	-19,327	-4,317	493,148
$/Therm	$0.646	$0.647	$0.645	$0.599	$0.670	$0.658	$0.650	$0.650	$0.642	$0.539	$0.545	$0.640	**$/Year**
$/Month	23,763	24,336	32,320	52,555	83,130	130,210	18,070	-6,371	-15,038	-6,537	-10,530	-2,762	**$323,146**

North Point - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Baseline Therms	6,368	5,677	9,595	21,014	31,511	43,191	46,377	31,653	26,960	23,490	13,980	6,995	266,812
Actual Therms	6,703	11,690	10,873	15,462	28,147	49,855	56,280	39,109	39,683	33,602	19,126	8,664	319,195
Savings	-334	-6,012	-1,278	5,551	3,364	-6,665	-9,903	-7,456	-12,723	-10,112	-5,146	-1,669	-52,383
$/Therm	$0.689	$0.679	$0.669	$0.686	$0.730	$0.737	$0.740	$0.818	$0.786	$0.711	$0.688	$0.763	**$/Year**
$/Month	-$230	-$4,081	-$855	$3,810	$2,455	-$4,914	-$7,325	-$6,099	-$10,005	-$7,190	-$3,539	-$1,273	**-$39,246**

FHA - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Baseline Therms	747	702	913	1,511	1,952	3,179	3,828	2,624	2,685	2,597	1,575	851	23,165
Actual Therms	55	66	435	1,515	2,459	3,413	3,678	2,564	2,046	1,542	856	230	18,859
Savings	693	636	479	-4	-507	-234	150	60	639	1,055	719	621	4,306
$/Therm	$1.910	$1.750	$1.497	$0.883	$0.769	$0.763	$0.771	$0.897	$0.803	$1.009	$1.737	$23.548	**$/Year**
$/Month	$1,323	$1,112	$717	-$3	-$390	-$179	$116	$54	$513	$1,064	$1,249	$14,621	**$20,197**

Total Measured Savings **$314,960**

Total Measured Savings

$314,960

Stipulated Savings - Energy

Lighting Retrofit	$129,148
Promontory	$3,064
Lone Peak	$3,331
Total	$135,542

Total Stipulated Energy Saving **$135,542**

Stipulated Savings - Solid Waste and Water/Sewer

Solid Waste	$26,652
Water/Sewer	$208,946
Total	$235,598

Total Stipulated Solid Waste and Water/Sewer **$235,598**

Total Validated Savings (Measured +Stipulated)

$686,100

Total Guaranteed Savings (Per Contract)

$970,083

Savings Surplus / Shortfall (Validated - Guaranteed)

($283,983)

Savings adjustments

Administration - Electric

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Savings	0	0	0	0	0	0	0	0	0	0	0	0	0
$/kWh*	0.0688	0.0688	0.0688	0.0585	0.0585	0.0585	0.0587	0.0587	0.0587	0.0680	0.0680	0.0680	**$/Year**
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0.00**

Administration - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Savings	0	0	0	0	0	0	0	0	0	0	0	0	0
$/Therm	$0.712	$0.805	$0.833	$0.616	$0.652	$0.669	$0.671	$0.677	$0.672	$0.812	$0.612	$0.704	**$/Year**
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**

South Point - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Savings	0	0	0	0	0	0	0	0	0	0	0	0	323,484
$/Therm	$0.646	$0.647	$0.645	$0.599	$0.670	$0.658	$0.650	$0.650	$0.642	$0.539	$0.545	$0.640	**$/Year**
$/Month	0	0	0	0	0	0	0	0	0	0	0	0	**$200,381**

North Point - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Savings	1,727	1,727	1,671	1,727	1,671	1,727	1,727	1,560	1,727	1,671	1,727	1,671	20,330
$/Therm	$0.689	$0.679	$0.669	$0.686	$0.730	$0.737	$0.740	$0.818	$0.786	$0.711	$0.688	$0.763	**$/Year**
$/Month	$1,191	$1,172	$1,118	$1,185	$1,220	$1,273	$1,277	$1,276	$1,358	$1,188	$1,187	$1,275	**$14,719**

FHA - Gas

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Total
Savings	0	0	0	0	0	0	0	0	0	0	0	0	0
$/Therm	$1.910	$1.750	$1.497	$0.883	$0.769	$0.763	$0.771	$0.897	$0.803	$1.009	$1.737	$23.548	**$/Year**
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**

Savings Adjustments meters - Option C — **Total Savings Adjustments** **$215,100**

Savings Adjustments South Point meter - electrical — **Miscellaneous Electrical Savings Adjustments** **$2,090**

Total Savings Adjustments **$217,191**

Savings Surplus / Shortfall (Validated - Guaranteed) **($283,983)**

Adjusted Savings Surplus / Shortfall (Validated - Guaranteed +/- Savings Adjustment) **($66,792)**

Consolidated Phase I & II Annual Guaranteed and Actual Savings Comparison

Year	Guaranteed Energy Savings	Actual Energy Savings	Guaranteed Water Savings	Actual Water Savings	Guaranteed Solid Waste Savings	Actual Waste Savings	Total Guaranteed Savings	Validated Total Savings	Savings Adjustments	Total Adjusted Savings	Variance
0	$109,488	$107,279	$72,812	$130,163	$8,954	$8,954	$191,254	$246,396			$55,142
1	$379,954	$189,564	$172,856	$205,361	$19,829	$19,829	$572,639	$414,754			($157,885)
2	$534,738	$346,473	$190,636	$192,139	$20,491	$20,491	$745,865	$559,103			($186,762)
3	$552,598	$352,113	$197,003	$196,300	$21,176	$21,176	$770,777	$569,589			($201,188)
4	$571,055	$344,899	$203,583	$171,563	$21,883	$21,883	$796,521	$538,345			($258,176)
5	$590,129	$395,981	$210,383	$177,293	$22,614	$22,614	$823,126	$595,888			($227,238)
6	$609,839	$437,736	$217,409	$183,215	$23,369	$23,369	$850,617	$644,320			($206,297)
7	$630,208	$594,741	$224,671	$189,334	$24,150	$24,150	$879,029	$808,225			($70,804)
8	$651,257	$644,346	$232,175	$195,658	$24,956	$24,956	$908,388	$864,960			($43,428)
9	$673,008	$830,359	$239,930	$202,193	$25,790	$25,790	$938,728	$1,058,342			$119,614
10	$695,487	$450,502	$247,944	$208,946	$26,652	$26,652	$970,083	$686,101	$217,191	$903,291	($66,792)

APPENDIX B – Geothermal Well Preventative Maintenance Reports

Report Date 02/21/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-6925904707
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:
Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
07/12/2013	PM in Geothermal Well	Colby Dankief
	Activity Number 1-36JI6H9	

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-6925904707
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-6925904707
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

Johnson Controls, Inc. (JCI) warrants that original equipment, parts or components manufactured or labeled by JCI shall be free from defects in material and workmanship under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment. Equipment, parts or components not manufactured or labeled by JCI shall carry a warranty from defects in material and workmanship under normal usage and proper installation and maintenance for a period of ninety (90) days from the date of shipment. Notwithstanding the foregoing, in the event JCI is reasonably able to identify a warranty for a period longer than the ninety (90) days applicable to equipment, parts or components not manufactured or labeled by JCI, it will assign all assignable rights under such warranty to Customer and reasonably cooperate in the enforcement of any warranty claim. Recertified or replacement parts installed on equipment and still under the original equipment manufacturer's warranty are covered for ninety (90) days or the remainder of the original equipment manufacturer warranty period, whichever is longer. For large tonnage chillers, JCI will warrant under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment: screw compressors, motors, control panels and components, VFD's and components and Liquid Cooled Solid State Starters and components. For small tonnage chillers, JCI will warrant under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment: scroll compressors, condenser coils, control panels and components, screw compressors (DXS and Mustang), and fan motors. In the event of a valid warranty claim, the Customer's remedy shall, at JCI's sole discretion and subject to the exclusions herein, be limited to repair or replacement of the subject equipment, part or component conditioned upon the return to JCI of any defective equipment, part or component. This Parts Warranty does not cover any shipping, handling or transportation charges or any associated labor costs.

LABOR WARRANTY:

Johnson Controls, Inc. (JCI) warrants its workmanship or that of its agents in relation to installation of materials for a period of ninety (90) days from date of installation or with respect to service work for a period of ninety (90) days from the date of service. Customer acknowledges that re-performance shall be its exclusive and only remedy with regards to any services provided by JCI. Customer shall bear all labor costs associated with the repair or replacement of failed material that is outside the scope of this express labor warranty. All warranty labor shall be executed during JCI normal business hours.

These warranties do not extend to any equipment which has been repaired by others, abused, altered, or misused in any way, or which has not been properly and reasonably maintained.

THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY AND FITNESS FOR A SPECIFIC PURPOSE. UNDER NO CIRCUMSTANCES SHALL JCI BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES ARISING FROM OR RELATING TO ANY DEFECT IN MATERIAL OR WORKMANSHIP OF EQUIPMENT OR THE PERFORMANCE OF SERVICES.

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 02/21/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
08/01/2013	PM on geothermal well and pump house. **Activity Number** 1-38DAEUM	Colby Danklef
08/12/2013	PM. Found a motor that is possibly grounded. Took water sample to chemtech ford. **Activity Number** 1-38UR6FN	Colby Danklef
09/03/2013	PM on well pump **Activity Number** 1-39X9XLW	Colby Danklef
09/27/2013	Performed preventative maintenance on geothermal well. Domestic hot water pumps are now running. VFD for domestic hot water pump 1 reads alarm 14 earth fault. Diagnosed the issue, found that the contactor is welded closed on Pump 1. Submitted quote to replace contactor. **Activity Number** 1-38DAESR	Colby Danklef

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Materials Used:

Activity #	Qty	UOM	Description
1-36DAESR	1	Each	

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

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For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 10/03/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
08/01/2013	PM on geothermal well and pump house. **Activity Number** 1-38DAEUM	Colby Danklef
08/12/2013	PM. Found a motor that is possibly grounded. Took water sample to chemtech ford. **Activity Number** 1-38UR6FN	Colby Danklef
09/03/2013	PM on well pump **Activity Number** 1-39X9XLW	Colby Danklef
09/27/2013	Performed preventative maintenance on geothermal well. Domestic hot water pumps are now running. VFD for domestic hot water pump 1 reads alarm 14 earth fault. Diagnosed the issue, found that the contactor is welded closed on Pump 1. Submitted quote to replace contactor. **Activity Number** 1-38DAESR	Colby Danklef

PREVENTATIVE MAINTENANCE SERVICE REPORT

Report Date 10/03/2014
Page 2 of 3

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Materials Used:

Activity #	Qty	UOM	Description
1-36DAESR	1	Each	

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7036397007
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

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Version: Release # PHL 3

Report Date 02/21/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-7152640791
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	

Service Provided:

Date	Work Performed	By
10/18/2013	Performed PM and changed overload relay on VFD. VFD still not working. Need to troubleshoot further. **Activity Number** 1-3AAHX06	Colby Danklef
10/23/2013	No Comments **Activity Number** 1-3AAHWYL	Colby Danklef
10/29/2013	New seal will be here 10/30 **Activity Number** 1-3DKF90W	Colby Danklef

Johnson Controls

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7152640791
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Provided:

Date	Work Performed	By
10/30/2013	Changed out shaft seal and coupling. Performed PM and took water sample. **Activity Number** 1-3DNT36K	Colby Danklef
10/31/2013	Gathered operations manual for the affected Danfoss frequency drive which powers the heat exchanger fluid pumps. Talked to Colby and found the drive was "trip locked" on an Alarm #14 (earth) Ground Fault. Suspect bad ground internal to the drive. Motor was checked for continuity to ground. Currently there is no line voltage power to the drive. The power pole has been knocked down which is located by guard tower which powers the geothermal substation. Emergency power (generator) for the downed lines is anticipated to be operational within the next 24-48 hrs. Anticipated utility power to be estimated to be restored in a week. Will need to return to do operational checks on the VFD to complete problem diagnostics. **Activity Number** 1-3DRDQTE	Joshua Erickson
11/12/2013	Condemned vfd **Activity Number** 1-3DTBYLA	Nicholas Hardy
11/12/2013	Diagnosed issues with VFD and well pump **Activity Number** 1-3DTBYMZ	Colby Danklef
11/13/2013	**Activity Number** 1-3DTBYJL	Cami Graves

Materials Used:

Activity #	Qty	UOM	Description
1-3DTBYMZ	1	Each	
1-3DNT36K	1	Each	GASKET
1-3AAHX06	1	Each	OVERLOAD RELAY

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

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PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7152640791
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7152640791
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

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Version: Release # PHL 3

Report Date 02/21/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-7260012720
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
11/25/2013	Condemned pump vfd **Activity Number** 1-3I72FJN	Nicholas Hardy
11/25/2013	Found bad DC bus on VFD. Needs to be replaced. **Activity Number** 1-3C2F9TG	Colby Dankief
12/02/2013	PM tasking **Activity Number** 1-3C2FA29	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7260012720
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7260012720
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964060

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

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Version: Release # PHL 3

Report Date 02/21/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-6816575842
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed		By
11/26/2013		Activity Number 1-34QEVL4	Barbara Carlson

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ Disposal, Environmental & Usage Charges * ☐ Fuel Surcharge: ☐ Miscellaneous: ☐

Zone/Trip/Truck Charges: ☐ Shipping /Handling Charges: ☐ Per Diem: ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-6816575842
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
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Service Request Number: 1-6816575842
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Shawn Anderson
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
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Version: Release # PHL 3

Report Date 02/21/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

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Service Request Number: 1-7372649432
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed		By
12/04/2013	Originally had wrong VFD onsite	**Activity Number** 1-3KT2HXT	Colby Danklef
12/04/2013		**Activity Number** 1-3KT2I17	Nicholas Hardy
12/20/2013		**Activity Number** 1-3KT2HUF	Colby Danklef
12/23/2013		**Activity Number** 1-3DXHGPQ	Colby Danklef

Johnson Controls

PREVENTATIVE MAINTENANCE SERVICE REPORT

Johnson Controls

Service Request Number: 1-7372649432
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Provided:

Date	Work Performed	By
12/24/2013	Crack is on the valve itself. Have to shut down system, remove valve, replace piping, and insulate to keep from freezing in the future. **Activity Number** 1-3PNWI6F	Colby Dankief
12/26/2013	Crack is on the valve itself. Have to shut down system, remove valve, replace piping, and insulate to keep from freezing in the future. **Activity Number** 1-3QA9J86	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
1-3PNWI6F	1	Each	8 150# ZN NA 1/16 RNG NBG SET
1-3DXHGPQ	1	Each	

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7372649432
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

Johnson Controls, Inc. (JCI) warrants that original equipment, parts or components manufactured or labeled by JCI shall be free from defects in material and workmanship under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment. Equipment, parts or components not manufactured or labeled by JCI shall carry a warranty from defects in material and workmanship under normal usage and proper installation and maintenance for a period of ninety (90) days from the date of shipment. Notwithstanding the foregoing, in the event JCI is reasonably able to identify a warranty for a period longer than the ninety (90) days applicable to equipment, parts or components not manufactured or labeled by JCI, it will assign all assignable rights under such warranty to Customer and reasonably cooperate in the enforcement of any warranty claim. Recertified or replacement parts installed on equipment and still under the original equipment manufacturer's warranty are covered for ninety (90) days or the remainder of the original equipment manufacturer warranty period, whichever is longer. For large tonnage chillers, JCI will warrant under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment: screw compressors, motors, control panels and components, VFD's and components and Liquid Cooled Solid State Starters and components. For small tonnage chillers, JCI will warrant under normal usage and proper installation and maintenance for a period of one (1) year from the date of shipment: scroll compressors, condenser coils, control panels and components, screw compressors (DXS and Mustang), and fan motors. In the event of a valid warranty claim, the Customer's remedy shall, at JCI's sole discretion and subject to the exclusions herein, be limited to repair or replacement of the subject equipment, part or component conditioned upon the return to JCI of any defective equipment, part or component. This Parts Warranty does not cover any shipping, handling or transportation charges or any associated labor costs.

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These warranties do not extend to any equipment which has been repaired by others, abused, altered, or misused in any way, or which has not been properly and reasonably maintained.

THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY AND FITNESS FOR A SPECIFIC PURPOSE. UNDER NO CIRCUMSTANCES SHALL JCI BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES ARISING FROM OR RELATING TO ANY DEFECT IN MATERIAL OR WORKMANSHIP OF EQUIPMENT OR THE PERFORMANCE OF SERVICES.

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 02/21/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-7721180105
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:
Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
01/24/2014	Helped Colby perform pm **Activity Number** 1-3JOZRDZ	Nickolas Mortensen
01/24/2014	Perform PM on geothermal well. Taught Nick M. what to do for PM. **Activity Number** 1-3YISNTG	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7721180105
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Refrigerant Tracking:									
Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-7721180105
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

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For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 02/21/2014
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PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-8239095492
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Scheduled
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:
Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	

Service Provided:

Date	Work Performed		By
02/10/2014	PM	**Activity Number** 1-3S9CF0S	Colby Danklef
01/01/9999		**Activity Number** 1-3S9CEX4	Colby Danklef

Materials Used:

Activity #	Qty	UOM	Description
1-3S9CF0S	1	Each	RAPTOR FOLD KN
1-3S9CF0S	2	Each	2 WOOD HDL CHIP BRSH

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-8239095492
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Scheduled
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-8239095492
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Scheduled
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

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For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 10/03/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-8779350683
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
03/31/2014	PM on Geothermal Well. Filled oil reservoir, readjusted oil drip to between 45-60 drips per min as specified by manufacturer. Greased top and bottom bearings of well pump. Checked strainers, no additional cleaning needed. Greased bearings on domestic pumps inside pump house. Ramped up VFD on Geothermal well and allowed to run 5-10 mins at 40%, 50%, 75%, and 100%. Pump seemed to handle each speed with no problems. P1a still not running, VFD needs to be replaced. Domestic hot water still has no pressure.	Colby Danklef

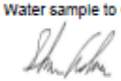
Accepted by SHAWN ANDERSON **Activity Number** 1-416ZYKV

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-8779350683
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Provided:

Date	Work Performed	By
04/28/2014	Ball valve is now installed for water samples. Performed PM on Geothermal Well Pump. Geothermal Pump- 20hz 96 GPM P1A- Not running P2A- 20 Hz, but no pressure. Need to have leaks fixed. Water sample to Chemtech Ford. 	Colby Danklef

Accepted by SHAWN ANDERSON **Activity Number** 1-416ZYQH

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-8779350683
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

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For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 10/03/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-9230073739
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:

Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes
3148560	USR-M-LABOR / 0001		TECHNICAL -CALIBRATE TEMP SENSOR AND FLOW METER ON PIPING. INVESTIGATE STATUS POINT OF GEO PUMP	Yes
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	

Service Provided:

Date	Work Performed	By
03/20/2014	Worked on pump status for well pump installed a CT for status and tested. Looked at flow meter to calibrate. No doccumentation and wires disconnected. Customer will research anc call when ready.  **Accepted by** SHAWN ANDERSON **Activity Number** 1-4AUB529	Allan Griffin
04/03/2014	Calibrated flow meter added items to graphics tested control to vfd start stop does not work bad DO' s on dx9100. Will check on drive n2 capability.  **Accepted by** SHAWN ANDERSON **Activity Number** 1-48NCIS9	Allan Griffin

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-9230073739
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Provided:

Date	Work Performed	By
05/28/2014	PM tasking on Geothermal Well	Colby Danklef
	Activity Number 1-4GBYJR4	

Materials Used:

Activity #	Qty	UOM	Description
1-4GBYJR4	1	Each	GREEN HI-TEMP GREASE CAR
1-4GBYJR4	1	Each	MULTI PURPOSE LITHIUM GR
1-4AUB529	1	Each	SPLT/ADJ LED 1.25A W/O RY / CSD-CA1G0-1

Tool Charges: ☐ **Disposal, Environmental & Usage Charges *** ☐ **Fuel Surcharge:** ☐ **Miscellaneous:** ☐

Zone/Trip/Truck Charges: ☐ **Shipping /Handling Charges:** ☐ **Per Diem:** ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-9230073739
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Order Warranty Terms and Conditions

PARTS WARRANTY:

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For Questions Regarding Service, Please Contact: Barbara Carlson (866) 468-1486
Version: Release # PHL 3

Report Date 10/03/2014
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-9803532763
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: SHAWN ANDERSON
Agreement Reference: 1-6664964080

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
UTAH DEPT OF CORRECTIONS FINANCE BUREAU
1295295
14717 S Minuteman Dr
Draper, UT 84020

Service Requested:
Preventive Maintenance

Equipment Serviced For This Request:

Asset	Customer Tag	Serial Number	Type of Service	Tasking Complete
3148560	USR-M-LABOR / 0001		BLOCK HOURS - MECHANICAL HEAVY	Yes

Service Provided:

Date	Work Performed	By
06/13/2014	PM on Geothermal Well. New sample. Got models and serials on all equipment to assign to assets. **Activity Number** 1-4I4RRIN	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ Disposal, Environmental & Usage Charges * ☐ Fuel Surcharge: ☐ Miscellaneous: ☐

Zone/Trip/Truck Charges: ☐ Shipping /Handling Charges: ☐ Per Diem: ☐

* Disposal, Environmental & Usage Charges may include one or more of the following: miscellaneous electrical, pneumatic, welding supplies, hardware materials, cleaning supplies, or refrigerant reclaim disposal.

Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

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Version: Release # PHL 3

Report Date: 06/25/2014
Page 1 of 3

*Scan the QR Code to see new offerings

SERVICE REPAIR REPORT

Service Request Number: 1-10171048893
Status: Scheduled
Requestor: Greg Peay

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Site:
UTAH DEPARTMENT OF CORRECTIONS - DRAPER - UDC
UDC - DRAPER PRISON COMPLEX
14425 Bitterbrush Ln
Draper, UT 84020-9501

Bill To:
JCI US SS INTERCOMPANY SUBCONTRACT
1365838
Attn Accounts Payable Ld33
Po Box 2012
Milwaukee, WI 53201

Purchase Order:
Blanket Purchase Order:
Customer Authorization:
Customer Work Order:

Service Requested:

LABOR FOR REPLACING VFD- 3240-7080

Service Provided:

Date	Activity Number	Activity Status	Work Performed	By
06/16/2014	1-4O7KVY0	Completed	Replace VFD	Colby Danklef
06/17/2014	1-5B3O9GC	Completed	Replace VFD	Colby Danklef
06/19/2014	1-5BRB70E	Completed	Purchase wire. Pull new wire. Wire VFD. Start-up VFD.	Colby Danklef
06/20/2014	1-5COG6NV	Completed	Finished conduit. Finished pulling wire and wiring VFD. Cannot actually run pump until piping leaks are fixed.	Colby Danklef

Labor Details:

Date	Activity #	Hours	Type	Miles	Asset ID	Customer Tag	Serial Number	Model Number
	1-4O7KVY0			30				
06/16/2014		8	Regular					
	1-5B3O9GC			30				
06/17/2014		8	Regular					
	1-5BRB70E			25				
06/18/2014		2	Regular					

Johnson Controls

SERVICE REPAIR REPORT

Report Date: 06/25/2014
Page 2 of 3

Service Request Number: 1-10171048893
Status: Scheduled
Requestor: Greg Peay

Salt Lake City UT Service - 0121
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Labor Details:

Date	Activity #	Hours	Type	Miles	Asset ID	Customer Tag	Serial Number	Model Number
06/19/2014		3	Regular					
	1-5COG6NV			25				
06/20/2014		6	Regular					
TOTALS TO DATE		27		110				

Materials Used:

Activity #	Qty	UOM	Description
No Material recorded to Date			

Tool Charges: ☐ Disposal, Environmental & Usage Charges * ☐ Fuel Surcharge: ☐ Miscellaneous: ☐

Zone/Trip/Truck Charges: ☐ Shipping /Handling Charges: ☐ Per Diem: ☐

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Refrigerant Tracking:

Activity #	Action Taken	Type	Amount	Asset ID	Customer Tag	Serial Number	Model Number	Leak Location	Leak Rate
No Refrigerant Activity Recorded To Date									

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Version: Release # PHL 3

Johnson Controls

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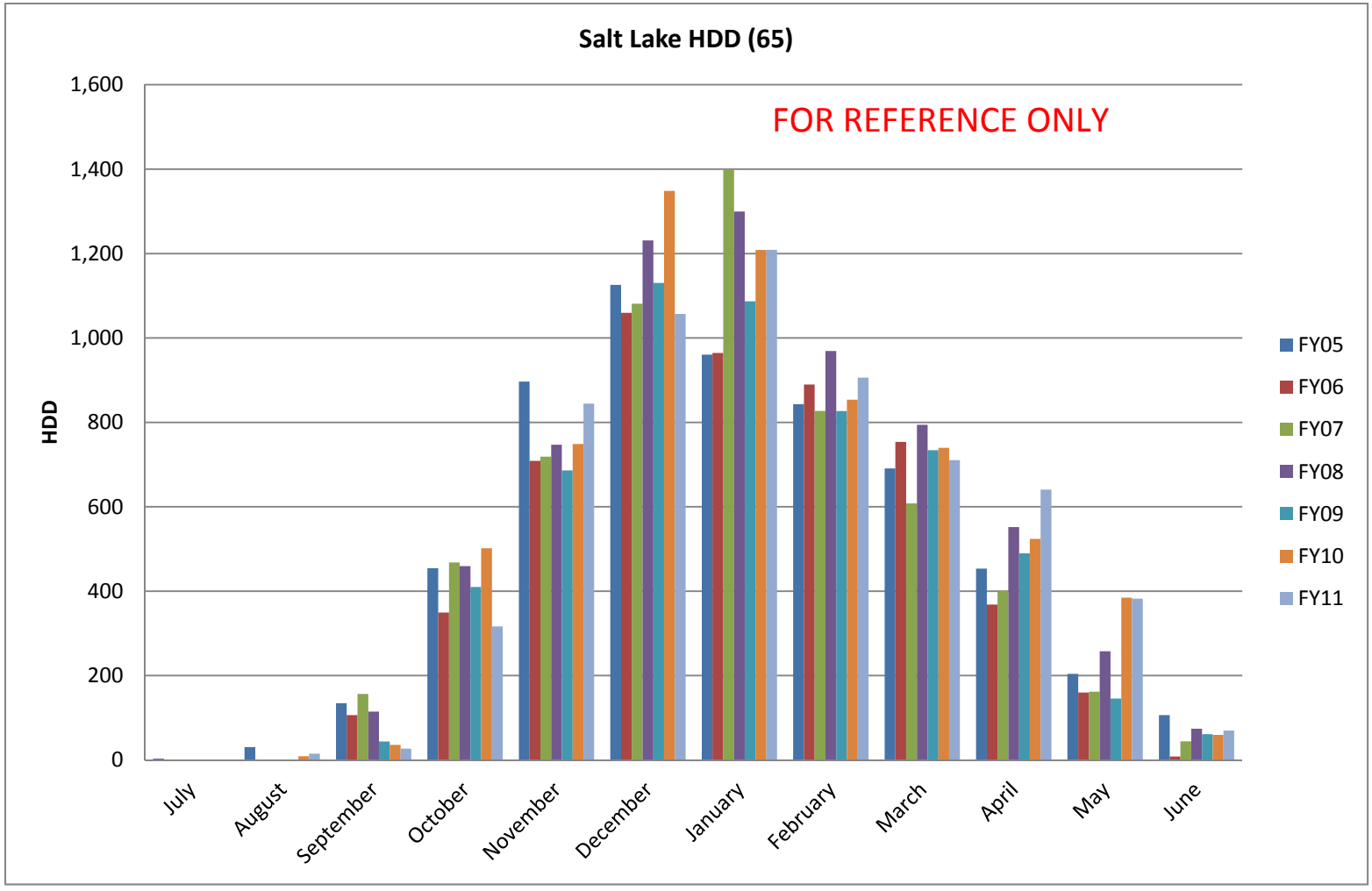
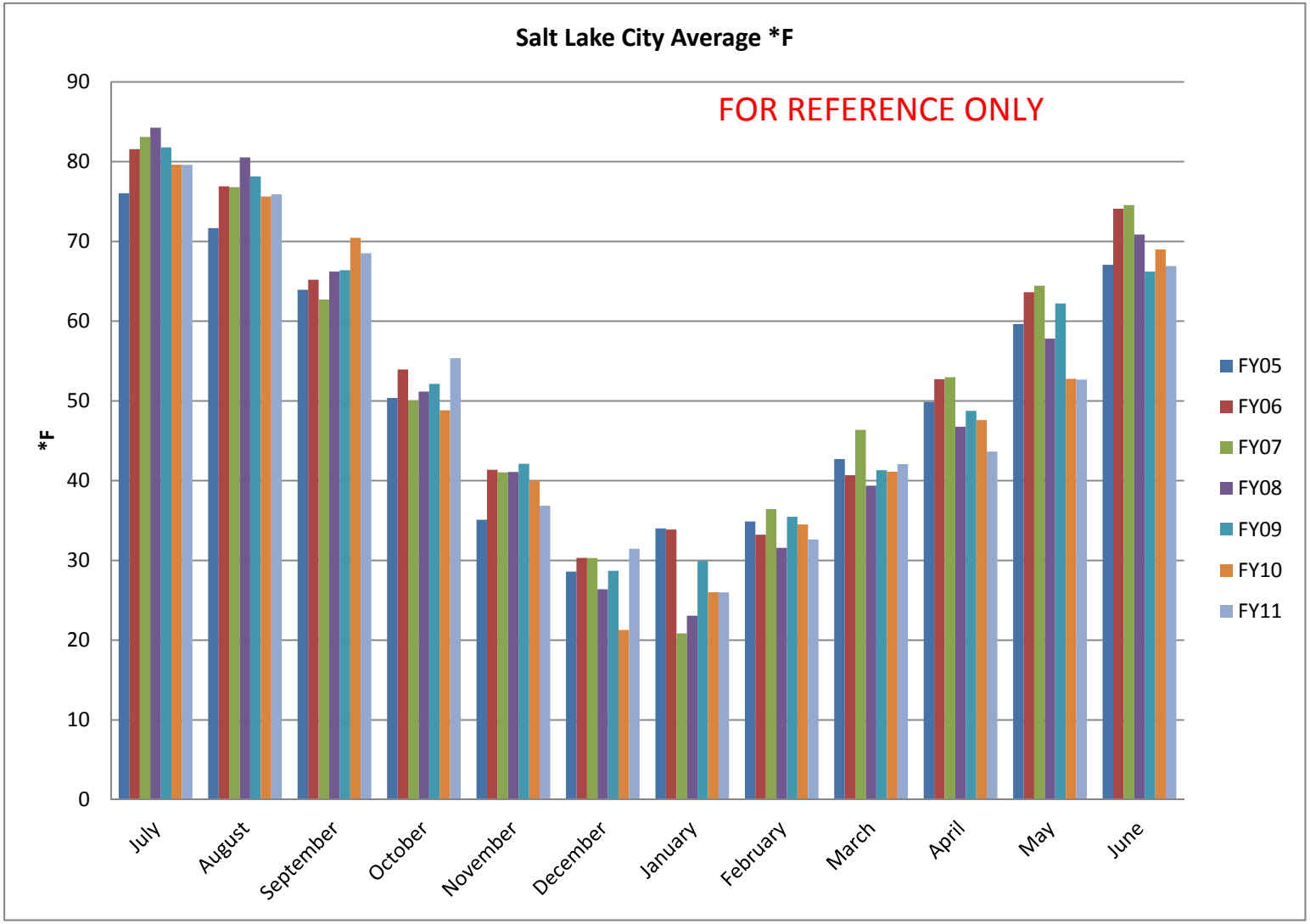
Version: Release # PHL 3

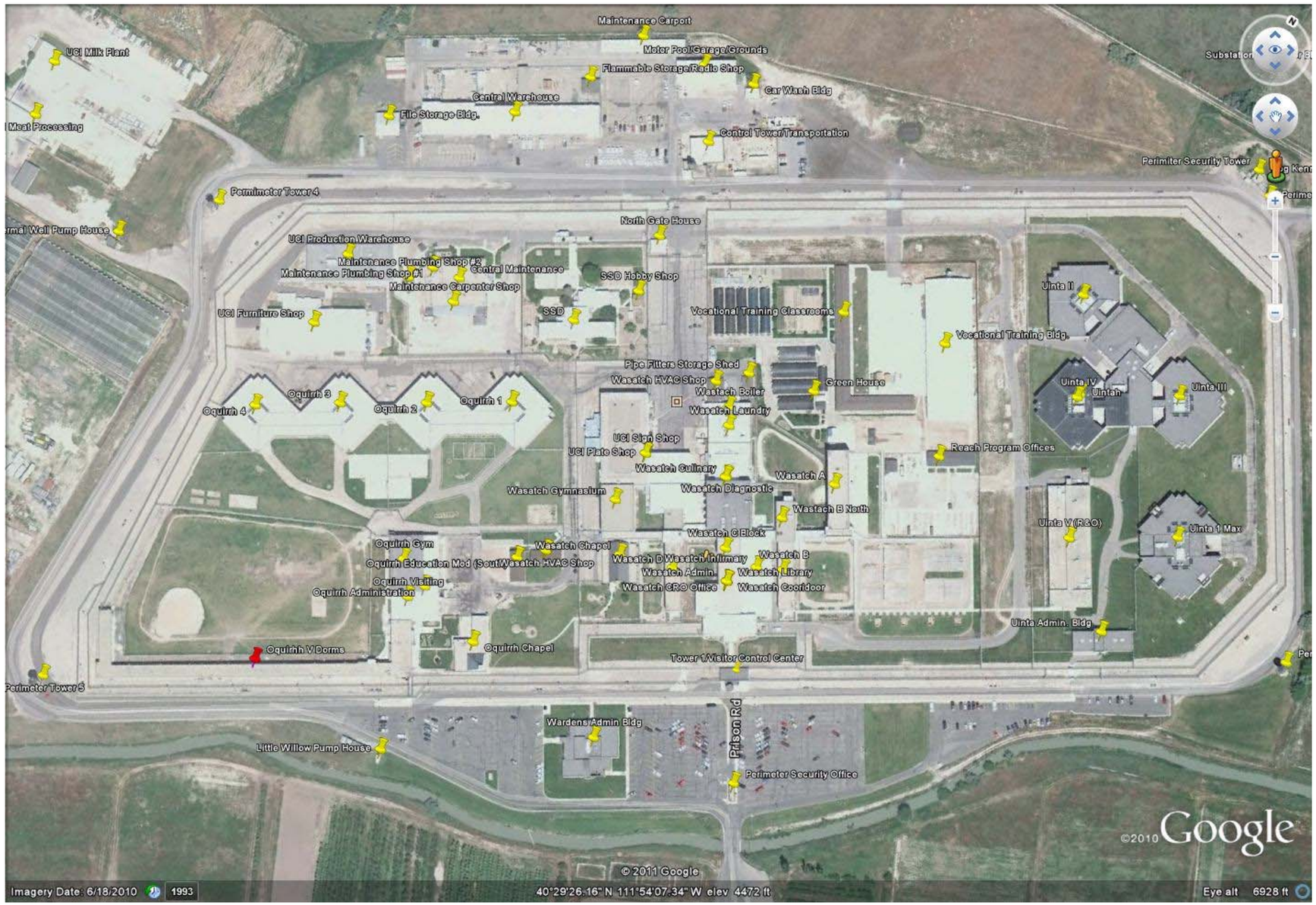
Appendix C: Salt Lake Valley Weather



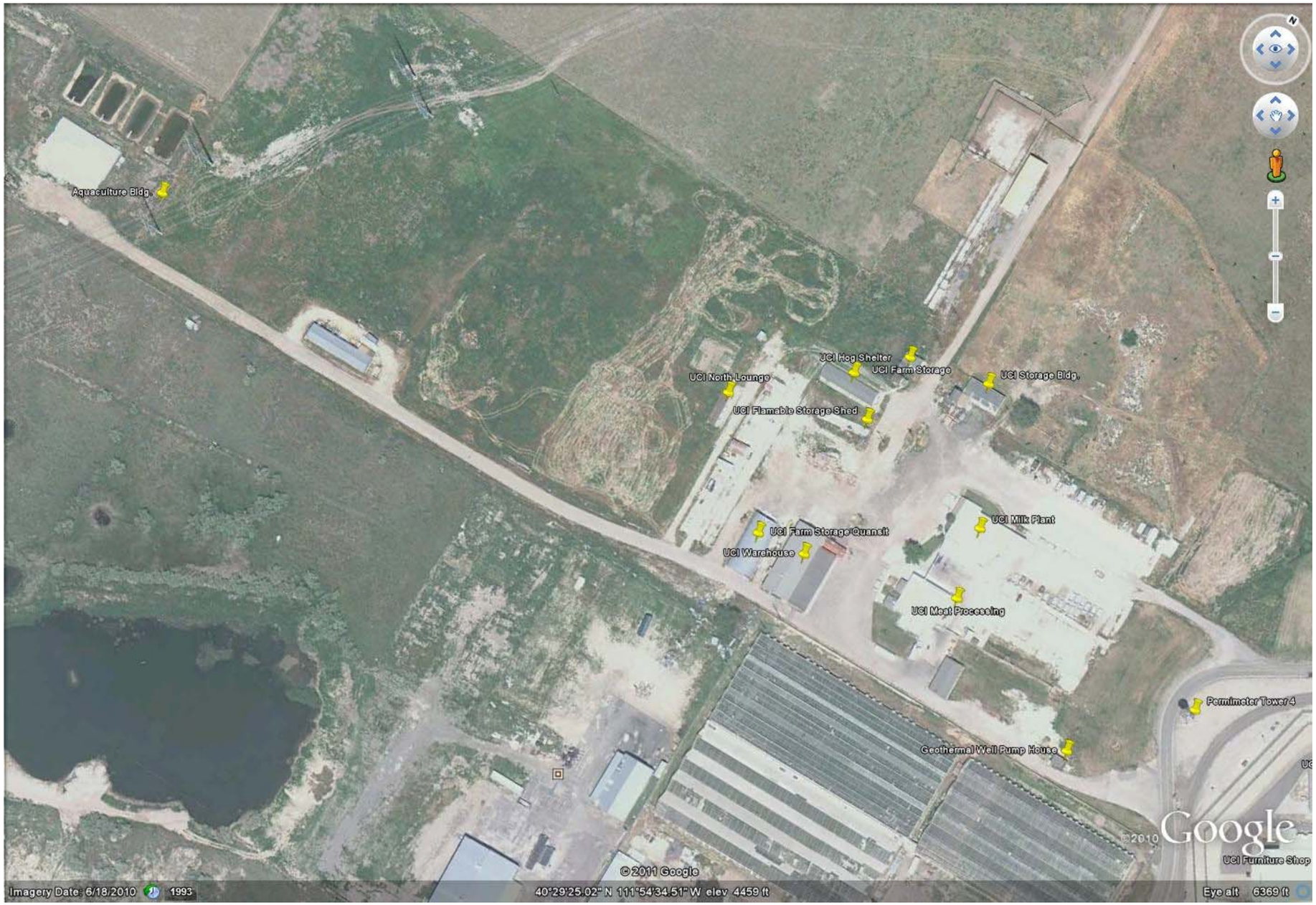

Salt Lake City Average *F
FOR REFERENCE ONLY
*F
90
80
70
60
50
40
30
20
10
0
July
August
September
October
November
December
January
February
March
April
May
June
FY05
FY06
FY07
FY08
FY09
FY10
FY11

Appendix D: Google Earth Images

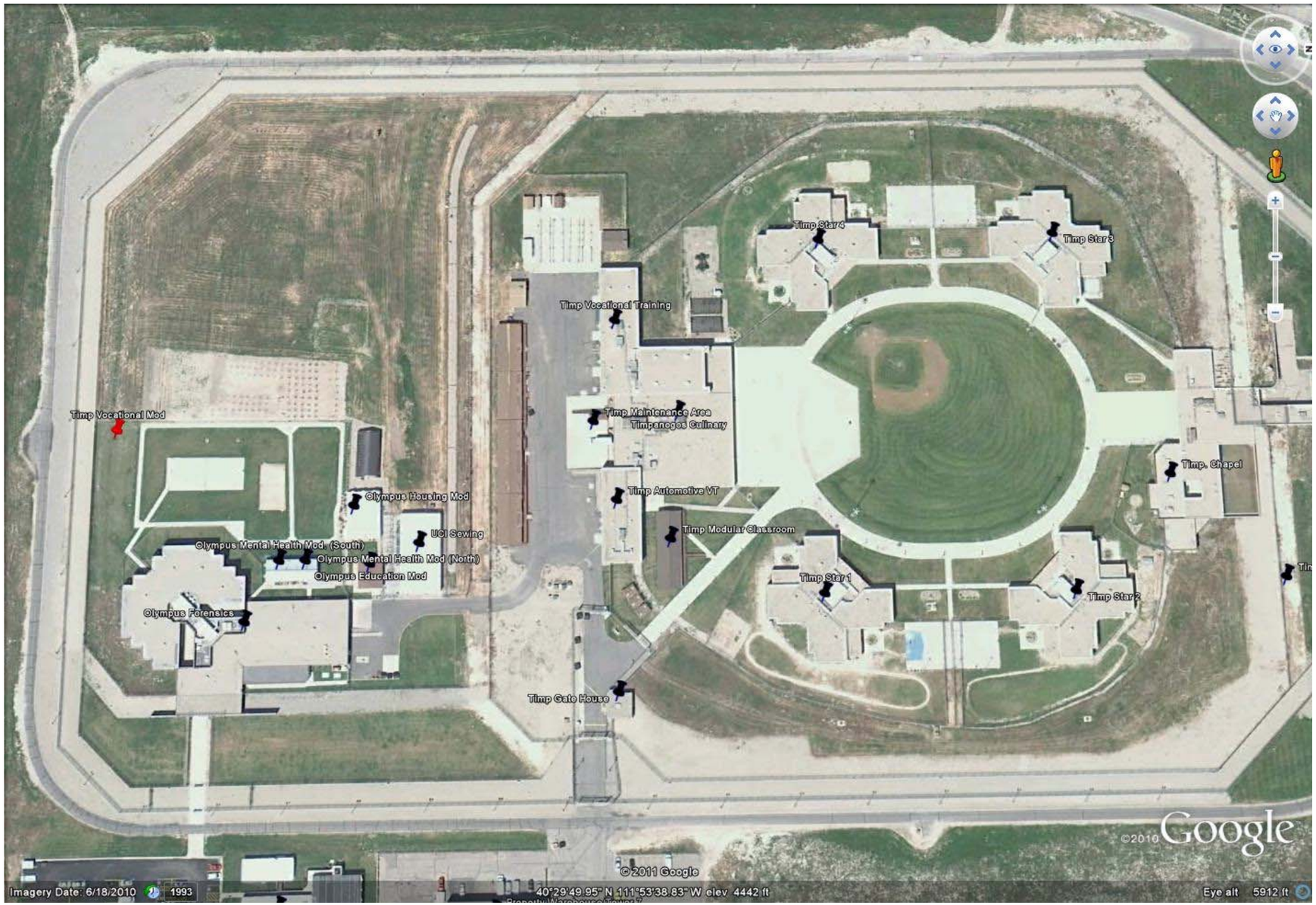
South Point



Milk Processing Etc.



North Point


Timp Star4
Timp Star3
Timp Vocational Training
Timp Vocational Mod
Timp Maintenance Area
Timpanogos Culinary
Timp. Chapel
Timp Automotive VT
Olympus Housing Mod
UCI Sewing
Timp Modular Classroom
Olympus Mental Health Mod (South)
Olympus Mental Health Mod (North)
Olympus Education Mod
Timp Star1
Timp Star2
Olympus Forensics
Timp Gate House
©2010 Google
© 2011 Google
Imagery Date: 6/18/2010 1993
40°29'49.95" N 111°53'38.83" W elev 4442 ft
Eye alt 5912 ft

Lone Peak/Promontory

Lone Peak/Promontory

UDC Administration/FHA

UDC Facility

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

December 11, 2014

To: John Harrington, C.E.M
DFCM Energy Director

From: Tim Ularich, P.E.
Deputy Maintenance Engineer

Subject: UDOT Energy Projects Update and Summary

Please find attached an update on UDOT's Renewable Energy (RE) and Energy Efficiency (EE) initiatives, related to facilities, over the past few years. These are organized into Past/Current Projects, and Tentative Projects/Initiatives.

UDOT has tapered back their small renewable energy projects, but is pursuing larger, more comprehensive opportunities that have not yet developed.

Renewable Energy Projects:

2007
- 3.6 kilowatt photovoltaic array at Murray Maintenance Station
- 1.8 kilowatt wind turbine at Milford Maintenance Station

2008
- 3.8 kilowatt photovoltaic array at Wanship Maintenance Station
- 5.9 kilowatt photovoltaic array at Moab Construction Office

2009
- 10 kilowatt photovoltaic array at Centerville Maintenance Station
- 10 kilowatt photovoltaic array at Clearfield Maintenance Station

2011
- 270 Watt Navigation Beacon Antelope Island (UDOT responsibility)
- 700 Watt power and light system for remote salt shed (SR-20)

2012/2013
- 17.28 kilowatt photovoltaic array on Traffic Operations Center
- Conclude Study of the Weber Canyon Wind Feasibility Study

2014
- Fish Lake/Monticello Salt Station Remote Power (lights/power)

Energy Efficiency Projects:

FY 2009

- UDOT Aeronautics Office Lighting Upgrade
- Region I Main Office Lighting Upgrade

FY 2010

- Wanship Maintenance
- Murray Maintenance Lighting Upgrades

FY 2012

- Cedar City District Office light upgrade
- Wanship Maintenance Station window upgrade
- Rest Area street lighting upgrade to LED Lighting

FY 2013

- Continue LED lighting upgrades at Rest Areas
- Bluffdale Maintenance Station Lighting Upgrade
- Silver Summit (Park City) Maintenance Station Lighting Upgrade

FY 2014

- Centerville Maintenance Station Lighting Upgrade
- LED Rest Area Light Installs (Grassy Mountain (both sides), Salt Flats (both sides), Lunt Park (both sides)
- SR24/ Mile Post 39.1 Solar Powered Equipment/Salt Station
- US191/ Mile Post 106.3 Solar Powered Equipment/Salt Station

FY 2015 (IN PROGRESS)

- EV Charging Stations Region I, II and III
- Grantsville Maintenance Station Lighting Upgrade
- Cottonwood Maintenance Station Lighting Upgrade
- LED Rest Area Light Installs, Bear Lake Overlook, Bear Lake, Kanaraville (both sides).

Energy Initiatives in the Planning Phase

- Development of new Facilities Management System/Database
- Continue Rest Area LED lighting Upgrade ($100,000)
- Solar Thermal hot water at Grassy Mountain Rest Area
- Wind/PV at Grassy Mountain Rest Area
- Sponsor a Rest-Area program

Utah National Guard 2014 Energy Report

The Strategic Energy Security Goals (ESGs) of the Army's Energy Security and Implementation Strategy:

- **INSTITUTIONALIZE:** Sustainability as an organizing and management principle
- **INCRESE:** Awareness, cooperation and support for sustainable practices
- **INSTILL:** A sustainability ethic in Soldiers and Civilians
- **IMPLEMENT:** Sustainability initiatives across the organization

'"Sustainability' and 'sustainable' mean to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.

— Executive Orders 13423 and 13514

Utah National Guard 2014 Energy Report

Overview:

The Utah Army National Guard (UTANG) energy conservation actions support The Energy Policy Act of 2005 (EPAct 2005), signed into law on August 8, 2005, Executive Order (E.O.) 13423, Strengthening Federal Environmental, Energy and Transportation Management, signed on January 24, 2007, which supersedes E.O. 13123 and E.O. 13149, State of Utah House Bill (H.B.) 80. More specifically, we are to achieve a 20% increase in energy efficiency by 2015 and reduce energy consumption annually by 3% with a baseline year of 2003.

To measure our energy performance the UTANG utilizes the utility tracking software as directed by the National Guard Bureau. Additionally, all utility information is reported to Congress through the Army Energy and Water Reporting System (AEWRS).

Energy Conservation Efforts:

Fiscal Year 2014 has been a very productive year for the Utah Army National Guard's Energy Conservation endeavors. The UTANG is working with DFCM as a strategic partner in maximizing our conservation strategies and goals. We have funded over $7 Million dollars in renewable energy projects this year utilizing Federal, State, ARRA and Utility incentives.

Policy: Our Chief of Staff (CoS) issued a policy letter on 15 December 2006 (Utah Army National Guard Energy Conservation Guidance) addressing energy conservation measures for all employees of the department. This guidance letter emphasizes conservation efforts ranging from non essential load shedding to interior climate control measures.

Lighting: UTANG has upgraded, or are currently in the process of upgrading, our lighting systems in the majority of our facilities to energy efficient lighting. We have educated our staff on proper usage, and the conservation of this asset. We have installed occupancy sensors in common areas which has decreased consumption. Additional LED lighting projects are on the horizon for the near future.

Personal Computers and Appliances: As part of our CoS Guidance letter, personal appliances and computers are not allowed in individual offices.

Energy Awareness Measures: We are in the process of expanding our Energy Awareness Program at the UTANG. Our intention is to bring awareness to conservation efforts, provide a sustainable work environment and to reduce energy consumption. These policies are implemented and monitored by our senior command staff who are provided policy and training guidance on energy awareness measures.

Partnerships and Reduction Measures: UTANG has formed strategic partnerships with DFCM, RMP, Questar Gas, Jordan Valley Water Conservancy District, Department of Energy and the National Guard Bureau to save money and reduce consumption. These are ongoing alliances and will continue to provide energy audits and performance recommendations to improve our energy efficiencies into the future.

Utah National Guard 2014 Energy Report

Recycling and Sustainability Program:

With the creation of our Recycling Program we have in effect moved up to the next level with our oversight and management of this program. I am please to demonstrate some highlights of that effort:

Our DOD Measure of Merit was 16.4% this year for non-hazardous solid waste and 91.3% for construction and demolition. We are working towards 50% diversion for non-hazardous solid waste, but that will take some time and a lot of changes. Some of the highlights of the program this year have to do with the C&D recycling of 1,790 tons of asphalt, green waste/wood recycling, and the profits from the sale of ammo cans.

2014 Energy Related Projects:

- **Camp Williams Bachelors Enlisted Quarters (LEED Silver)**
- **Camp Williams TASS Training Center (LEED Silver)**
- **Camp Williams 1.5 –2.0 MW Wind Turbine Feasibility Study**
- **Camp Williams Jacobs Canal 311.85 KW Solar PV #1**
- **Camp Williams Jacobs Canal 311.85 KW Solar PV #2**
- **Camp Williams 9000 Series 311.85 KW Solar PV**
- **Camp Williams South West 311.85 KW Solar PV**
- **West Jordan Armory 260.82 KW Solar PV**
- **West Jordan Hangar 300.51 KW Solar PV**
- **St George Armory 204.12 KW Solar PV**
- **Blanding Armory 39.69 KW Solar PV**
- **Draper West Roof 357 KW Solar PV**
- **Draper North Canopy 300.51 KW Solar PV**

Conclusion:

The UTANG has met the requirements of Executive Order 13423

UTANG continues to make Energy Management a top priority through Executive Order, Energy Training, Energy Auditing, Performance Modeling and Project Development. UTANG recognizes that the "*future readiness of the Army National Guard relies on today's effort to use resources efficiently, protect training areas, employ technology and improve quality of life*".

Division of Utah State Parks and Recreation
Summary of energy efficiency/conservation measures FY2014

- All lights in the Utah Field House Museum were upgraded to LED high efficiency lights.
- Solar panels were installed at Utah Field House Museum.
- Upgraded HVAC system at Dead Horse Point State Park to a high efficiency unit.
- Goblin Valley State Park is an ongoing effort of energy efficiency because the park is run solely on solar energy.
- Upgraded the electrical system at Red Fleet State Park to be more efficient.
- (6) solar powered light poles were installed in the new parking lot at Utah Lake State Park
- Upgraded generator and solar panels including additional controls at Fielding Garr Ranch to be more efficient.
- Replaced Deer Creek State Park residence windows with new eglass.
- New restroom at Starvation State Park was constructed with zone radiant heating to be more energy efficient.
- New Programmable thermostats installed at Willard Bay, Hyrum and Jordan River OHV Center.
- At Palisade State Park the golf clubhouse HVAC system was upgraded to a high efficiency unit.

Fiscal Year 2014 Annual Energy Report
Prepared by: DFCM Managed buildings
Chris Ottley
January 2015

Bruce Whittington
Interim Director
801-538-3574
bwhittington@utah.gov

John Harrington
DFCM Energy Director
801-652-2888
jharrington@utah.gov

Jake Jacobson
Facilities Program Director
801-538-3303
jjacobson@utah.gov

Chris Ottley
Energy Specialist
801-573-7500
cottley@utah.gov

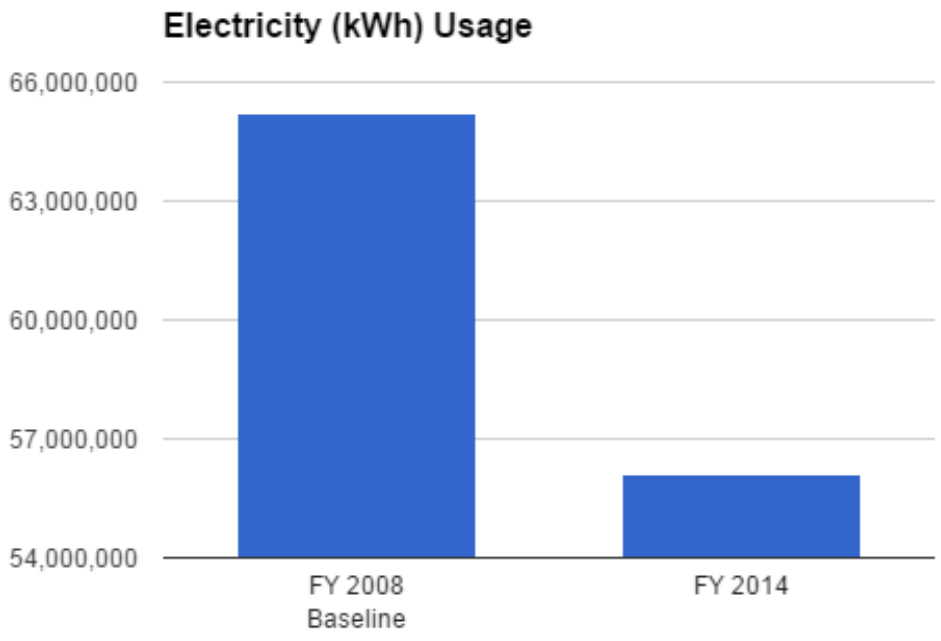
Overview

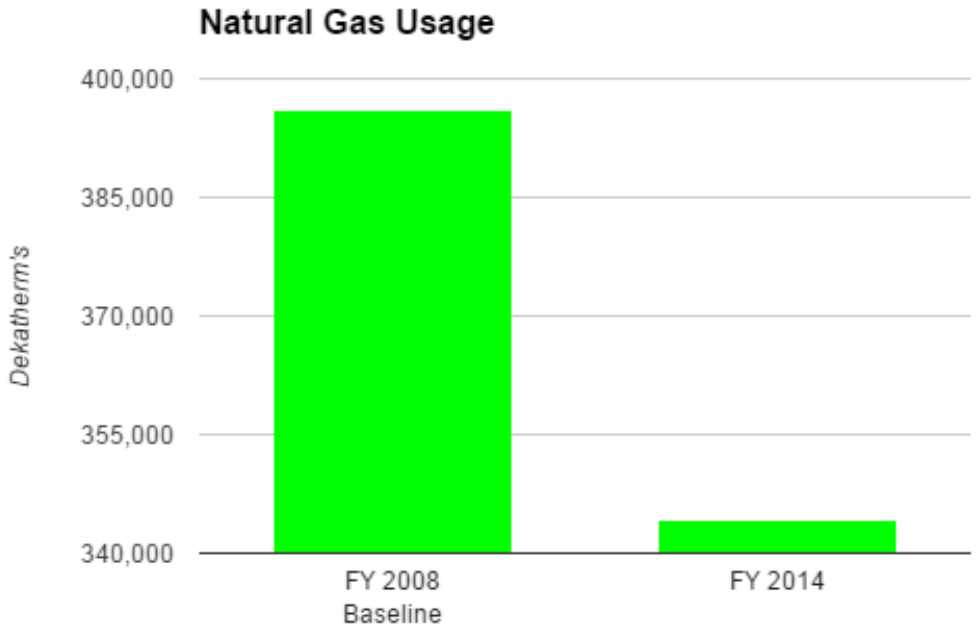
The Division of Facilities, Construction & Management utilizes EPA Portfolio Manager and UM Pro. Natural Gas and Electricity usage data is entered into these systems to reflect the following info for fiscal years 2008-2014 to create a history of energy usage for DFCM managed buildings.

Total Energy Usage Per Year-

From the monthly data provided by the UM Pro system the following information is provided to show how much energy was consumed by DFCM managed buildings each fiscal year.

Year	Electricity (kWh)	Natural Gas (Dtherms)	Annual kBTU Totals	Site Annual EUI	Annual Source EUI
2008	65,210,469	395,967	729,323	85	285
2014	56,101,293	344,090	794,509	75	251

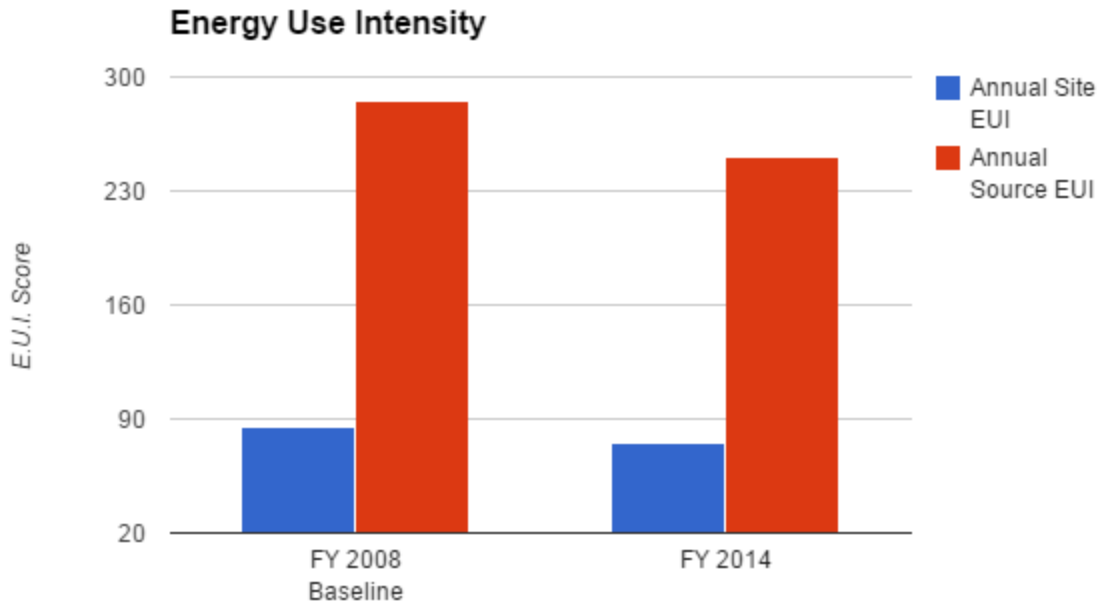



Natural Gas Usage
400,000
385,000
370,000
355,000
340,000
Dekatherm's
FY 2008
Baseline
FY 2014

Energy Performance

DFCM computes an Energy Usage Intensity (EUI) based on kBtu's per square foot. Using this method and tracking the changes in square feet maintained by DFCM during this time period, an EUI (Energy Use Intensity) was computed for each year in the analysis period. The results of this computation are shown

Site Energy Performance (Kbtu/Sq Ft)* = EUI

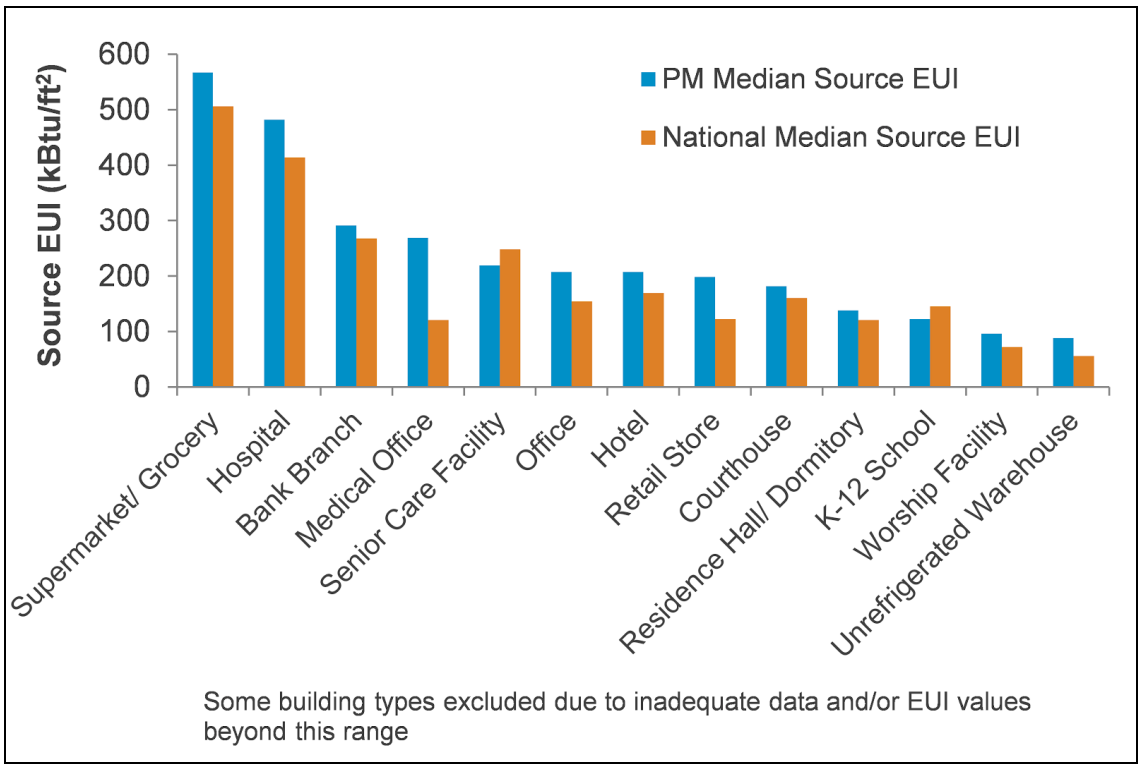


Some property types are more energy intensive than others

Generally, a low EUI signifies good energy performance.

However, certain property types will always use more energy than others. For example, an elementary school uses relatively little energy compared to a hospital.

See the graph below for some typical EUI values.



This graph is based on research EPA conducted on more than 100,000 buildings benchmarking in Portfolio Manager to develop its Portfolio Manager DataTrends series. See the Portfolio Manager DataTrends: Energy Use Benchmarking report for additional EUI comparisons.

Energy Conservation Efforts

DFCM has robust initiatives to reduce building energy consumption.
Efforts include-

- Extensive lighting retrofits, including the Calvin Rampton building, DWS Midvale, and the campus lighting at the Capitol in FY 2014
- HVAC and Equipment Improvements
- Retro commissioning of buildings
- Technical training of building operators
- Aggressive control strategies
- Other robust energy strategies and initiatives

HIGHER EDUCATION REPORTS

Salt Lake Community College

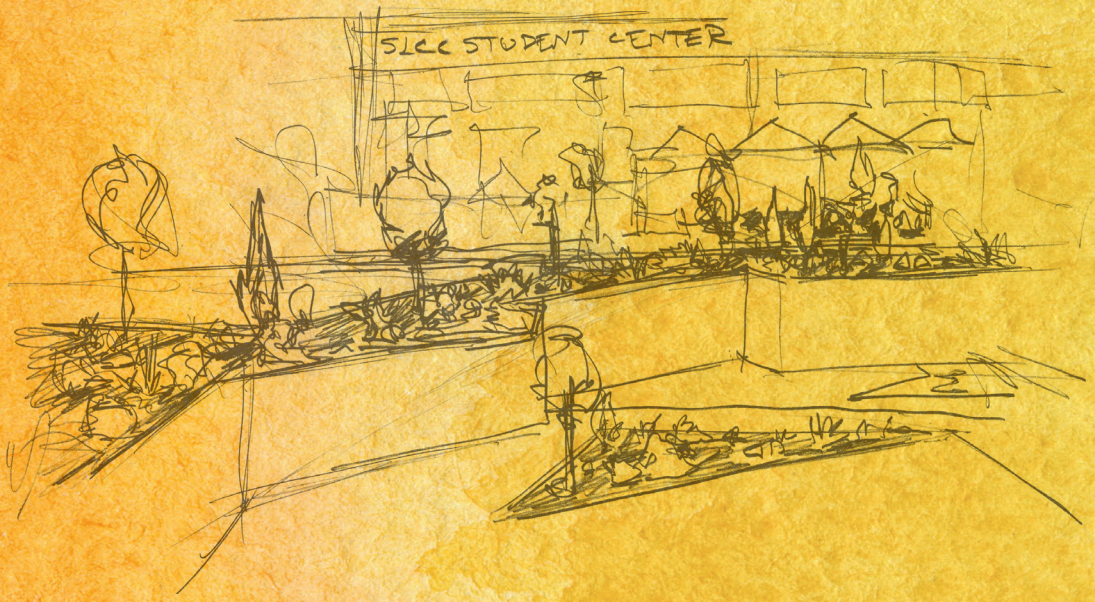
Step Ahead.

Annual Energy Report 2013-2014

Prepared by:

Facilities Services

Ezra Nielsen, Energy Technician



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Overview

Over the last year, Salt Lake Community College has taken steps towards sustainability. This includes reducing our overall energy consumption, water usage, and waste. The most important steps we have been taken are in sub metering, and with the new monitoring abilities we hope to identify operating problems and prioritize each individual building based off its normalized energy usage. We are just now wrapping up another multi campus efficiency project and continue to track and analyze past and current efforts. We utilize Energy Star Portfolio Manager to track building energy usage, but we want to expand off that to a more comprehensive approach that utilizes diagnostics. Our involvement with utility incentive programs to increase energy efficiency continues to grow. We have participated in many new programs such as Energy Manager Co funding and look forward to entering into a long term continuous commissioning effort. Many of the following measures were supplemented in the payback and made viable through rebates and incentives from Rocky Mountain Power's (RMP) Wattsmart and Questar Gas's Thermwise programs.

FY 2013 Internal measures:

Sub Metering

We have been pursuing sub metering for individual buildings and central plants. This includes electrical, natural gas, water, and BTU meters. This allows us to compare individual buildings to each other and also to the overall main campus meter totals. Individual building BTU metering is where we are lacking so, that is where much of our efforts are being directed. HW & CHW BTU usage for our central plant campuses is a critical component of the individual buildings overall energy usage. We can use this information in a variety of ways such as controlling central heating/cooling equipment based off building demand, and calculating a cost per BTU for tenant sub billing.
Our Jordan Campus has been completely sub metered and created standardization for how we want to collect and display metering info through tools like dashboards and diagnostics software. We have started on completely sub metering our South City Campus and have plans to start on our Redwood Road Campus in the near future. Meters have taken a real priority as of late and we are ponying up and investing a lot with loans & capital improvement. It is so essential that we be able to measure and verify the energy savings from project we have undertaken, and that means extensive costly sub metering.

Energy Team

Salt Lake Community College hired a full time Energy Manager in December of 2013. This is the first and most important step to start successfully tracking and managing our institutions energy. The new manager position was filled only for the latter half of the fy2013. He helped to pave the way for further energy efficiency efforts within the college, but with no current Energy Manager the college needs to ensure dedicated support to bring Salt Lake Community College into a leadership position in Energy Efficiency among Higher Education Facilities. We are doing that by hiring energy management interns.

Onsite Renewable Generation

Our Solar capacity increased from 32 KW to 422KW (+1200%) thanks to lottery incentives from RMP, DFCM facilitation, and creative financing (PPA). Numerous benefits are realized from the addition of these systems. We are generating clean and pollution free electricity, it is helping to offset our main campus peak demand, we have locked in relatively low utility rates (a form of hedging), and it serves as an excellent example of higher education experimenting and leading the way with its infrastructure development.

New Buildings

No new buildings have been constructed since last year. We demolished the original Administration building once it was replaced by the new Academic and Administration building. We are still tuning the new building but in the near future we will be able to compare it to the limited data we have on the one it replaced, old vs new.

Lighting

Over the last year our scope and development of our Aggregate Lighting project that targets all 5 major campuses, was completed. Rocky Mountain power provided audits and then reports which was the basic documentation that we needed to get financing. It was made possible by a $700,000 loan from DFCM's revolving energy fund, as well as participating in RMP's Energy Manager Co-funding and various other incentive programs. Products were thoroughly researched and then ordered internally. Labor was the only aspect where bids were acquired. Comprehensive exterior LED lighting retrofit including parking lots, walkways, and wall packs as well as some misc. interior spaces in various buildings. This retrofit will provide higher quality light for an aesthetic upgrade, decreased maintenance parts and labor as well as significant energy/cost savings, $\geq$ 1,000,000 kwh/year.

Mechanical

We are constantly assessing the efficiency of our systems and operation techniques to ensure peak performance and energy efficiency. There are two basic ways of improving our mechanical systems. The first is actual equipment upgrades and replacements. During the past year we have been working on installing VFD's on our Redwood chiller plants, continuing the progress from last year's efforts to retrofit motors with VFD's. Our Technology Building made the change from pneumatic zone controls to a complete DDC retrofit. This will enable us to control and monitor the zones better, identify and troubleshoot problems, and ultimately use less energy. At our Redwood Boiler Plant we upgraded one of the older steam boilers to a brand new instantaneous fired boiler. It is much more responsive and fuel efficient. Also, all of the valves on our steam system were fitted with insulation to help conserve the heat and make the overall steam loop more efficient. We are still in the process of actually implementing many of these measures and we will have more information and numbers this following year. The second way to improve our mechanical systems is by undertaking commissioning and

sequencing efforts to ensure correct operation. The Redwood Chiller Plants are being re-sequenced to operate at the most efficient configuration possible with the added VFD's. We are also implementing, in house, a powerful building diagnostics tool called SkySpark. It trends all of our building automation system points in separate software that has the capabilities of running rules against all the points to find operating issues that would otherwise be unknown to us. We are very excited about using this program, especially since we will be participating in Rocky Mountain Powers commissioning program which incentivizes us upon identifying and correcting these operational issues.

Envelope

No significant developments with any of our buildings envelopes. The high performance building standard however is a great new document put together by the DFCM energy team. Specifically I look forward to see what comes of the work that was done on builder methods necessary to obtain envelopes with very little infiltration or air leakage.

Water

The past water conservation measures that were implemented at SLCC (see previous years) did a lot to decrease our usage and lower costs. We experimented with various low flow plumbing devices in our public bathrooms and had a bad experience. Our focus now has turned to the measurement side as we actively pursue sub metering for culinary water at all of our buildings, so we can compare them side by side to each other.

Data Center:

Our new data centers are being built with hot aisle containment. We have been continually swapping out traditional PC computers with thin client ones that are 50% more efficient. What this means is decreased power consumption as well less heat dissipated into the surrounding areas.

Recycling:

We have a comprehensive award winning recycling program. Every year our recycled totals increased since we started. The figures for 2013-14 are as follows: total recycled pounds 1,702,145 as compared to last year at 1,158,649. We also recycled various other liquids such as paint, antifreeze, oil, etc. at a total of 1407 gallons last year. Various other items (i.e. cell phones, glasses, lead acid/rechargeable batteries, tires and toner cartridges) are recycled on a per item basis and not included in the total tonnage. Our goal in the near future is to recycle 80% of all solid waste.
Avoidance of harmful chemicals: No electronic waste, low VOC paints, and biodegradable cleaning compounds.

Fuel Consumption & Emissions:

No new changes to our fleet profile. We continue to purchase low emission vehicles in order to do our part to help keep the air clean.

FY 2014-15 Current and Upcoming Conservation Efforts

Sub Metering

We plan on continuing our extensive sub metering initiatives in order to have all of our buildings at our 5 major campuses to be individually sub metered. The substantial funds that will be needed for this to happen have been allocated to us through capital development as well as DFCM energy initiatives.

Lighting

This year the aggregate lighting project will be completely installed and we can start to measure actual savings achieved. The project ran from June of 2013 until January of 2014. Our requirements for future lighting retrofits are ones that are easily accomplished and cost effective. Now that we got the majority of the old inefficient lighting changed and put standards in place, we will continue with a steady pace forward, carefully analyzing and implementing new energy saving lighting technologies where it makes most sense.

Mechanical

There are quite a few projects wrapping up this year including the chiller VFD and re-sequencing, upgrade to instantaneous boiler, and integration of SkySpark building diagnostics. Funds pending, we also want to continue retrofitting pneumatic controls to DDC ones at our older campuses.

Past Energy Conservation Efforts, FY13

Overview

Salt Lake Community College has taken steps to improve Energy Efficiency and sustainability on every campus. The initial energy efficiency and sustainability efforts were started by dedicated staff and past Energy Management interns. Salt Lake Community College has shown its commitment to Energy Efficiency and Sustainability by hiring a full time Energy Manager as one of the highest priorities for 2013. We will be participating in Rocky Mountains Powers (RMP) energy manager co-funding incentive program in 2014. This program requires 1,000,000 kWh savings in a one year period to participate. We plan on funding the various efficiency projects with the state's interest free revolving energy loan. Currently our sub metering effort is ongoing with some recent additions to our Jordan Campus. We have plans for additional meters as funding allows. We are currently using Energy Star Portfolio manager to assist in tracking our energy usage and for benchmarking purposes. Our current efforts focus on energy, water and waste reduction and a plan to expand to a comprehensive sustainability effort.

FY13 Conservation Efforts

Energy Conservation Efforts

Salt Lake Community College has taken initiatives in reducing building energy use. Funding to complete these projects is thanks to the State Revolving Energy Efficiency loan and internal funding options. Below is a list of energy conservation efforts implemented in FY13.

Table 1: FY13 Completed Projects

Project Name	Project Cost	Incentives	
Lighting Retrofits	$ 9,133.00	$ 3,310.00	
HVAC upgrades – VFD on pumps	$ 38,000	$ 8,000	
VFDs on Cooling Towers	$ 52,000	$ 5,900	
Upgrade air compressors with VFD	$ 38,000	$ 3,690	
Miscellaneous Projects	$ 83,400.00	$ -	
	$ 220,533.00	**$ 20,900.00**	**TOTAL**

In addition to the above mentioned efforts, Salt Lake Community College will continue employing interns from the SLCC Energy Management program to assist the current Energy Management department in constantly investigating, designing, and fulfilling new energy conservation measures within the scope of Salt Lake Community College.

Water Conservation Efforts

There were no significant water conservation efforts in FY13 but we will continue to identify and target any water conservation opportunities.

Waste Reduction Efforts

Waste reduction is the key to reducing greenhouse gas emissions, consumption of natural resources and energy. We had an increase in both items recycled by pound (62%) and by gallon (55%) compared to

FY12. We experienced a drop of items recycled by quantity when compared to FY12 (-18%). Below is a list of accomplishments we had in FY12.

Table 3 – FY13 Recycled Items by Pounds

Aluminum	2,785
Alkaline Batteries	298
Cardboard	109,131
Clothing	1,366
Concrete	314,916
Electrical Ballast	135
Electronics Scrap	17,303
Fluorescent Lights	19,076
Glass Mix	13,987
Green Waste	90,436
Metal Scrap	236,480
Paper Mix	241,068
Plastic Mix	25,076
Styrofoam	2,664
Wood Waste	39,096
TOTAL POUNDS	**1,113,817**
Percentage Increase	**62**

Table 4 – FY13 Recycled Items by Gallons

Used Paint	595
Used Oil / Antifreeze	1810
TOTAL GALLONS	**2,405**
Percentage Increase	**55**

Table 5 – FY13 Recycled Items by Each

Cell Phones	30
Eye Glasses	135
Lead Acid Batteries	272
Rechargeable Batteries	95
Tires	162
Toner Cartridges	1576
TOTAL EACH	**2,270**
Percentage Increase	**-18**

SUU SOUTHERN UTAH UNIVERSITY
LEARNING LIVES FOREVER

Annual Energy Report FY 2014

prepared by: Southern Utah University
Facilities Management
December 2014

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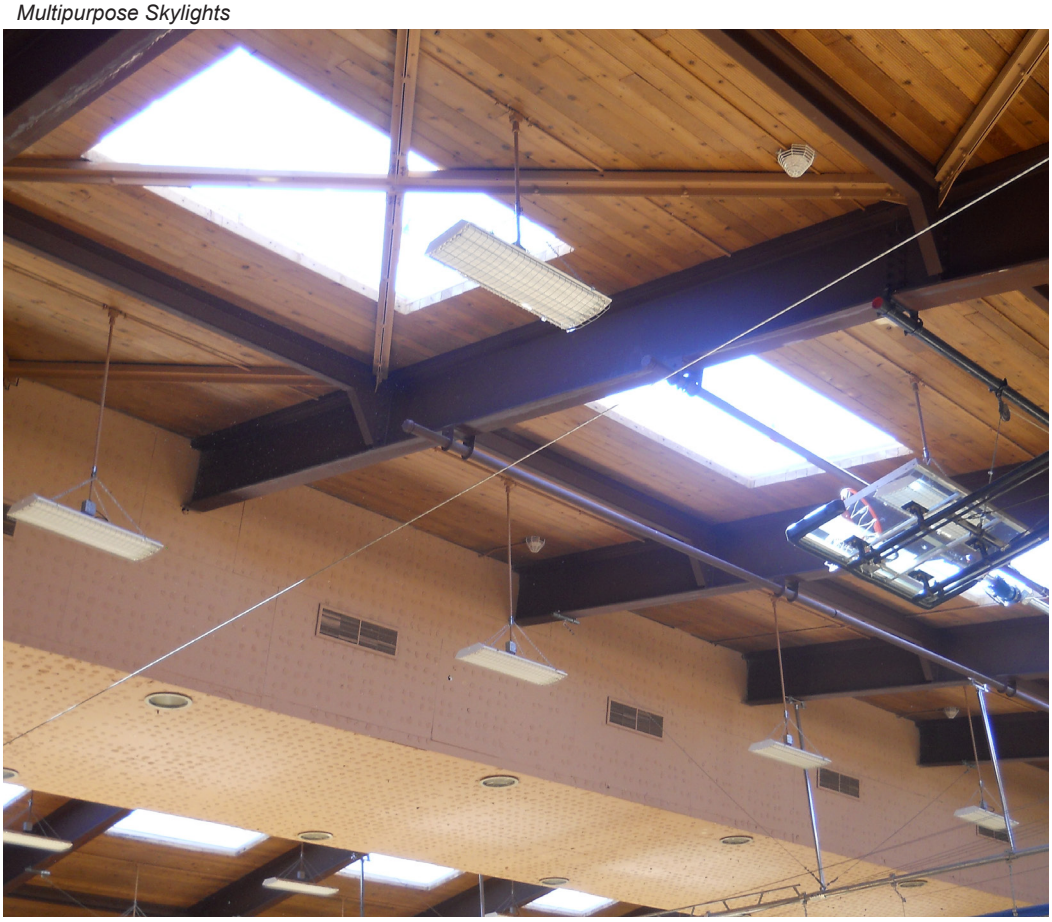
Southern Utah University Annual Energy Report FY 2014

Overview

Southern Utah University utilizes Natural Gas trend charts and Power trend charts in order to track utility usage for the campus. In 2014 Natural gas and electricity usage data were entered into the trend charts monthly from utility bills. Usage numbers for campus dating back to 2007 have been included in these charts in order to create a history of energy usage for the campus. In an effort to streamline the information presented in the report, the data for 2008-2011 has been averaged.

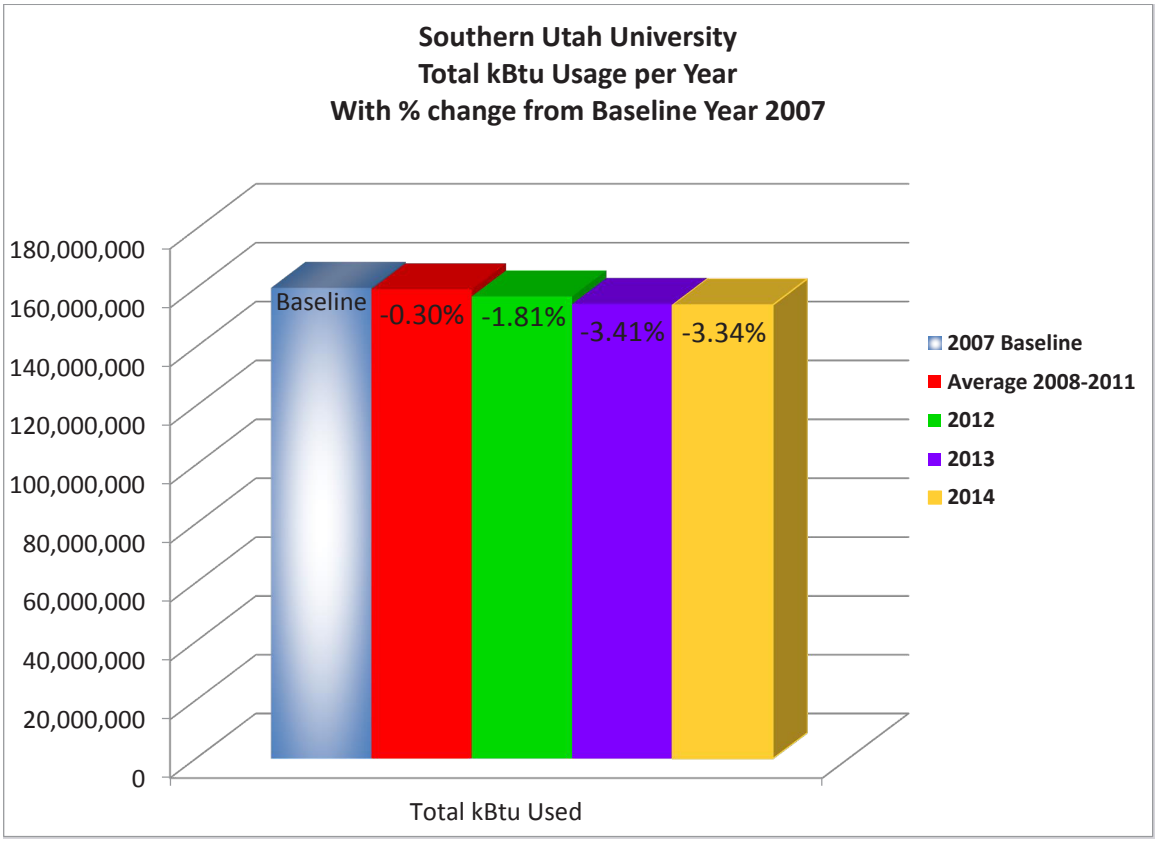
To verify the accuracy of the report information, kBtu for power and natural gas were calculated. Power usage was converted to kBtu by multiplying kWh by a factor of 3412.1416. Natural gas usage was converted to kBtu by multiplying MBtu by 1,000. The results of these independent calculations are in the following sections.

Multipurpose Skylights



Total kBtu Usage per Year

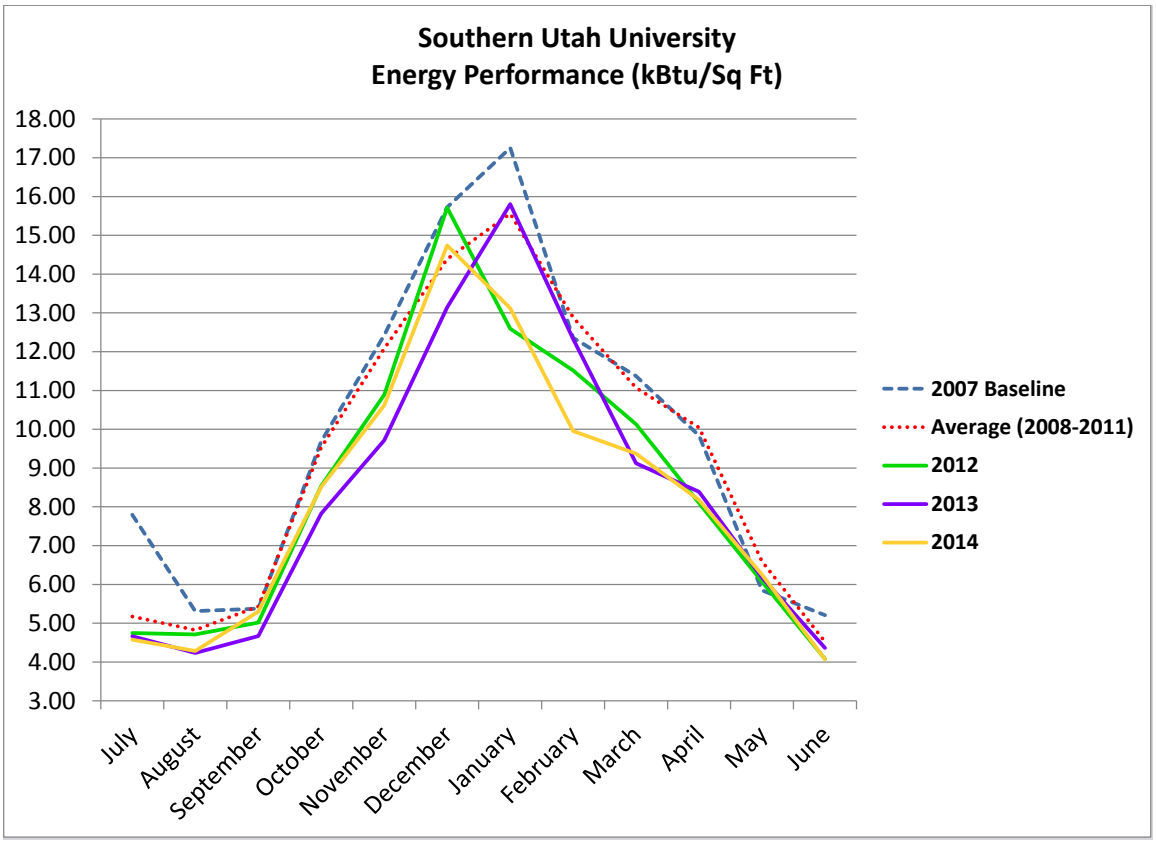
Total kBtu consumed by SUU each fiscal year was computed by aggregating the monthly data. These yearly totals and the computed percentage change from the baseline year are shown below.



	Total kBtu Used	% Change from Baseline Year
2007 Baseline	160,110,792	
Average 2008-2011	159,633,271	-0.30%
2012	157,212,631	-1.81%
2013	154,647,673	-3.41%
2014	154,304,959	-3.34%

Energy Performance

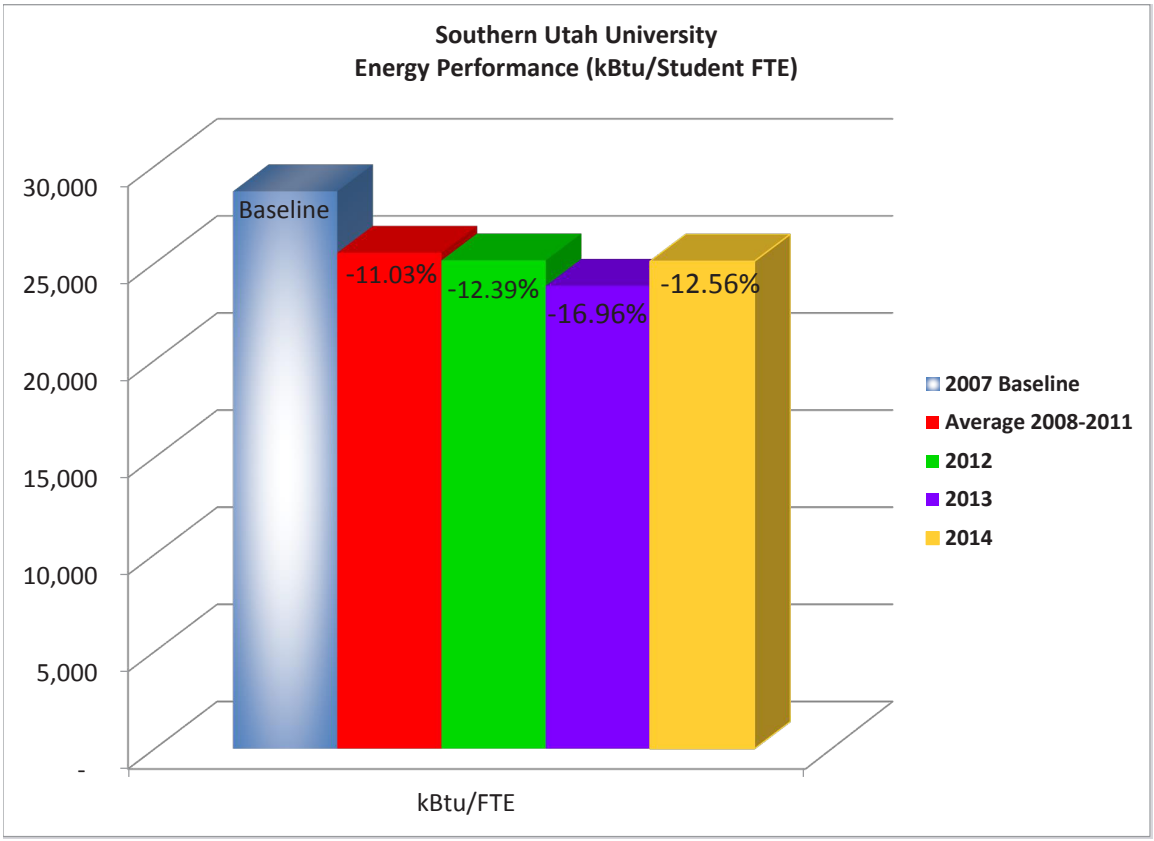
KBtu usage per month divided by the campus square footage results in an EUI (Energy Use Intensity) factor as defined by Portfolio Manager. EUI was computed for each month in the analysis period. The results of this computation are shown below.



	2007 Baseline	Average (2008-2011)	2012	2013	2014
Prevalent Sq Ft	1,354,675	1,424,008	1,539,759	1,539,759	1,494,653
July	7.80	5.18	4.75	4.66	4.58
August	5.31	4.82	4.71	4.23	4.28
September	5.37	5.43	5.02	4.67	5.30
October	9.68	9.53	8.54	7.83	8.51
November	12.43	12.08	10.89	9.72	10.62
December	15.72	14.39	15.71	13.14	14.74
January	17.25	15.56	12.59	15.80	13.12
February	12.36	12.88	11.52	12.33	9.95
March	11.37	11.07	10.13	9.12	9.37
April	9.84	10.04	8.10	8.39	8.17
May	5.85	6.60	6.07	6.18	6.25
June	5.21	4.52	4.08	4.36	4.07

* KBtu/Sq Ft calculation does not account for variation in temperature between years

Southern Utah University's energy usage is influenced by more than just changes in overall campus square footage. Using student FTE data from the Fall semester of each year, kBtu's per student FTE were computed. The results of this computation are shown below.



	Total kBtu Used	Student FTE	kBtu/FTE	% Change from Baseline Year
2007 Baseline	160,110,792	5,580	28,694	
Average 2008-2011	159,633,271	6,253	25,528	-11.03%
2012	157,212,631	6,254	25,138	-12.39%
2013	154,647,673	6,490	23,829	-16.96%
2014	154,304,959	6,150	25,090	-12.56%

Energy Conservation Efforts

Southern Utah University has made a proactive effort to reduce campus energy consumption. Some of these efforts are highlighted below.

- **Photovoltaic Solar Array installation at the Facilities Management Buildings** – 94.07 kilowatts of photovoltaic solar arrays installed at the Facilities Management Administration Building and Shops producing 252,860 kilowatt-hours per year. This is enough to run 72 average homes and offset the production of over 346,418 pounds of CO2 per year.
- **Preventive Maintenance Program** – Mechanical equipment in the buildings is most energy efficient when running in the way it was designed and built to operate. SUU's Utility Services division performs routinely scheduled preventive maintenance inspections, cleaning, and tune-ups to keep mechanical equipment running at peak efficiency.
- **Heat Plant Lighting Replacement** – Installed twenty-four 90 watt high bay LED light fixtures that replaced an equal number of 320 watt metal halide fixtures.
- **CFL Purchase to eliminate incandescent lights on campus** - Purchased 500 compact fluorescent lamps for installation in the Hunter Conference Center and the Library as a step toward our goal of eliminating incandescent lights on campus, purchased as part of a program supplemented by Rocky Mountain Power.
- **Auditorium** – 260 incandescent lamps (25 watts) were replaced by 260 (5 watt) LED lamps in the main house of the Auditorium, resulting in a savings of over 5,000 watts. Previous total wattage: 6,500; new total wattage: 1,300.
- **Water Conservation** – Utilized the Maxi-com irrigation system to water only when necessary, lowering usage of irrigation water whenever it rains.
- **Water Conservation** – Utilized secondary water from 800 W to the freeway for irrigation purposes. (Currently assessing the use of secondary water in other areas of campus.)

Energy conservation efforts are continually underway on campus with a variety of projects being pursued. Many projects are targeted at lighting retrofits which typically yield the highest rate of return. Other energy projects involve electrical motor retrofits, building automation modifications, and water conservation. Additionally, efforts to help with occupant behavior modification are paramount, encouraging people on campus to help with things such as turning off classroom and office lights when not in use.

ENERGY MANAGEMENT
ANNUAL REPORT

September 5, 2014

September 5, 2014

The purpose of this mid-year report is to update the university's administration on the activities and performance of Energy Management's energy and utility-cost savings program during fiscal year 2014. In addition to financial and project information this report provides a summary of other Energy Management activities and an update on energy consumption for FY14. The time frame for all current activity summarized in this report is July 2013 through June 2014.

The contents of this report include:

1. History of Energy Management

Energy Management was organized within Facility Operations in 2001 at the completion of five phases of Energy Savings Performance Contract (ESPC) work performed by Viron Energy Services. The purpose of Energy Management was initially to:

- Ensure performance of the ESPC by coordinating with Viron to perform measurement and verification (M&V) activities
- Identify additional energy saving opportunities
- Provide analytical support to Facilities
- Manage the campus metering system.

In the beginning Energy Management projects included building retrocommissioning, miscellaneous energy efficiency projects (mostly lighting), and management of a behavioral program. Funding for projects came from a variety of one-time sources including maintenance budgets, capital improvement funding and State energy efficiency grants and no mechanism was in place to capture avoided costs. The behavioral program was paid from the energy cost savings it produced.

Between 2001 and 2007 energy efficiency projects saved the University $293,000 while the ESPC and behavioral program brought about an excess of $1.25 million in avoided utility cost. Based on this success, Energy Management proposed to start a dedicated Energy Management Fund that could capture future avoided costs and recycle them to help fund more projects. The proposal suggested canceling Viron's M&V contract and instead allocating that budget to Energy Management. It also outlined a shared savings model that would return 80% of annual cost savings to Energy Management until projects paid themselves back. The Fund was approved and has allowed Energy Management to fulfil its purposes and increase its budget with reduced impact to Facilities' operating budgets.

Since the establishment of the Energy Management Fund in fiscal year 2008 Energy Management has retained its original functions but has also grown to include functions such as:

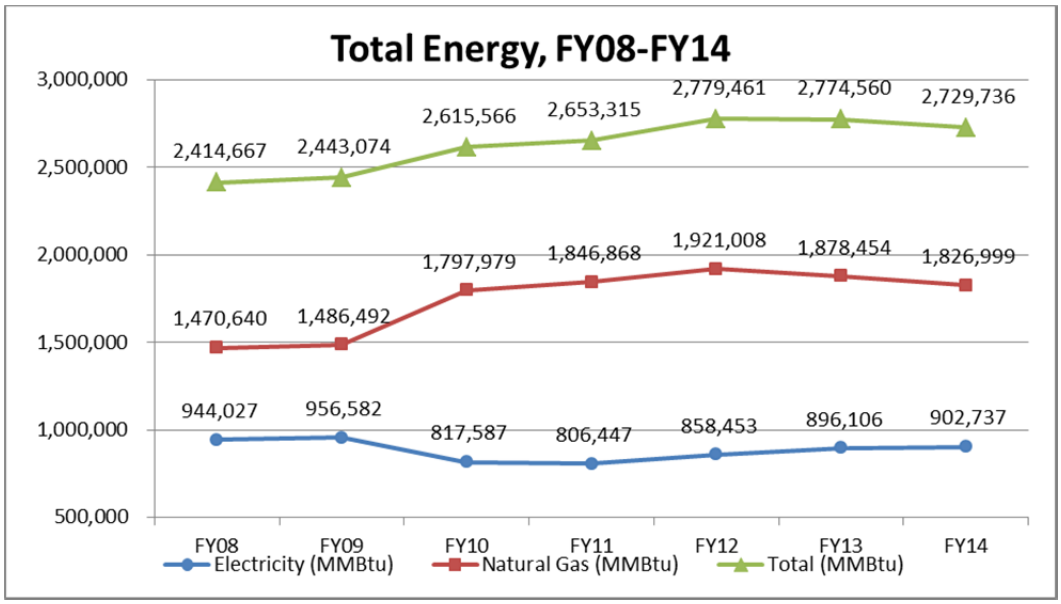
- Help Facility Operations set long term utility cost reduction goals and develop strategies to achieve them, for example, the Better Buildings Challenge and its retrofit, retrocommissioning and behavioral components.
- Coordinate with Planning and Construction Project Delivery to promote energy savings in new construction and renovation projects.

2. Energy Trends

Following are a variety of charts that illustrate trends in our power and fuel consumption between fiscal years 2008 and 2014. (FY 2008 serves as our baseline for internal purposes.) The basis of these charts is the utility level fuel and power that serve main campus, health sciences, Fort Douglas and surrounding buildings including the Natural History Museum, Dumke HPEB, University Villages and the Guardsman Way sports complex.

Chart 1 provides an overview of gross annual energy consumption between fiscal year 2008 and fiscal year 2014. Total energy consumption has been on the rise over the last 7 years, growing by 15% between FY08 and FY12, but fortunately consumption has levelled off over the last two years and has even decreased by about 1.5%. As can be seen in the chart, stabilization in total energy growth has been a result of reduced natural gas consumption, which has gone down since FY12 while consumption of electricity has steadily increased.

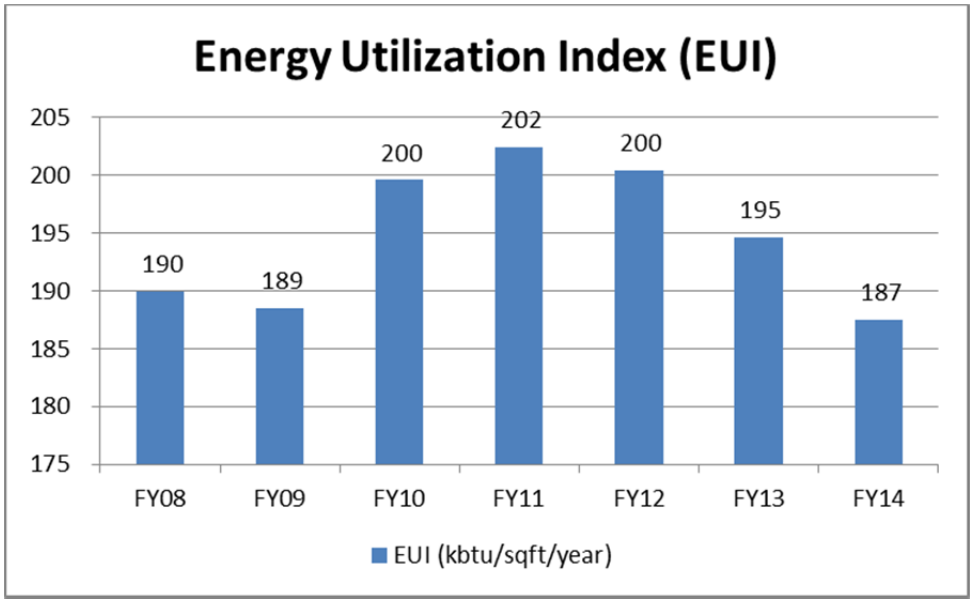
Chart 1: Annual Total Energy Use



A more fitting and informative method of comparing year over year energy consumption is looking at Energy Utilization Index (EUI). EUI is defined as energy per square foot per year and helps by taking building size out of any comparison. Chart 2 shows overall campus EUI from FY08 through FY14, and although its pattern is similar to that of overall consumption, rising sharply after FY09, it also shows a more noticeable and promising downward trend over recent years. This analysis shows that the total

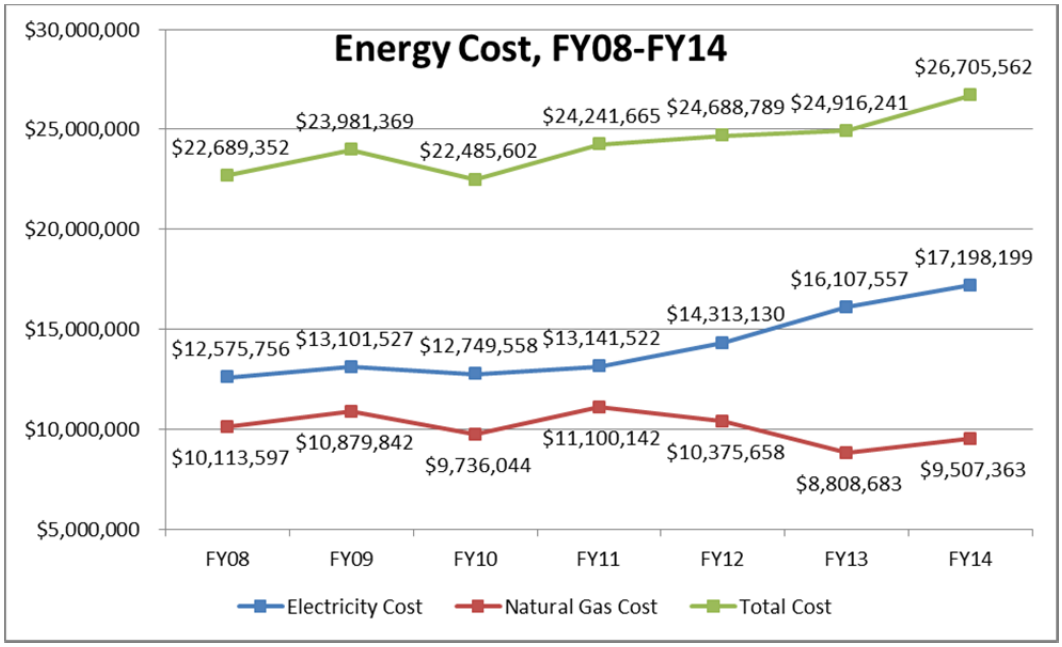
campus energy use per square foot is now lower than it was in FY08, and is down 8% from the FY11 peak.

Chart 2: EUI



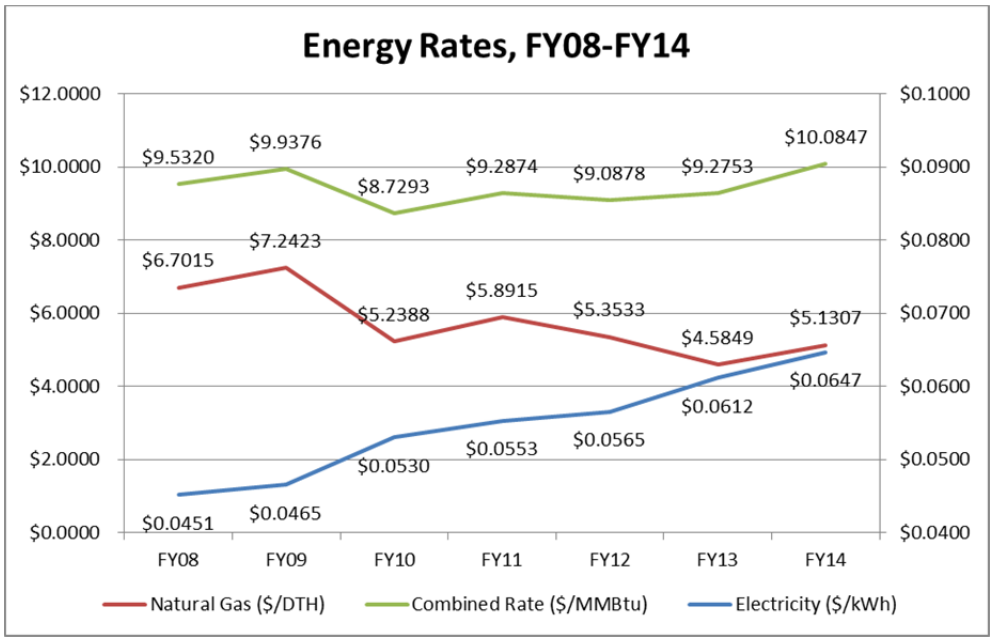
In terms of energy cost trends have been much more unpredictable, especially when it comes to natural gas. Chart 3 shows energy cost, broken down into total annual costs for gas, power and their sum. The cost of electricity has been steadily rising over the last 7 years while the total cost of natural gas has recently gone down. Nevertheless, total cost is still rising with the cost of electricity having a more dominant effect.

Chart 3: Annual Energy Cost, FY08-FY14



Looking at energy rates is understandably similar to looking at total energy cost. Chart 4 shows recent trends in rates with electricity rising predictably while natural gas rates have dropped and remained quite low. The overall effect has been generally stable overall energy rates, but this trend is not likely to last as natural gas shows signs of increasing in price.

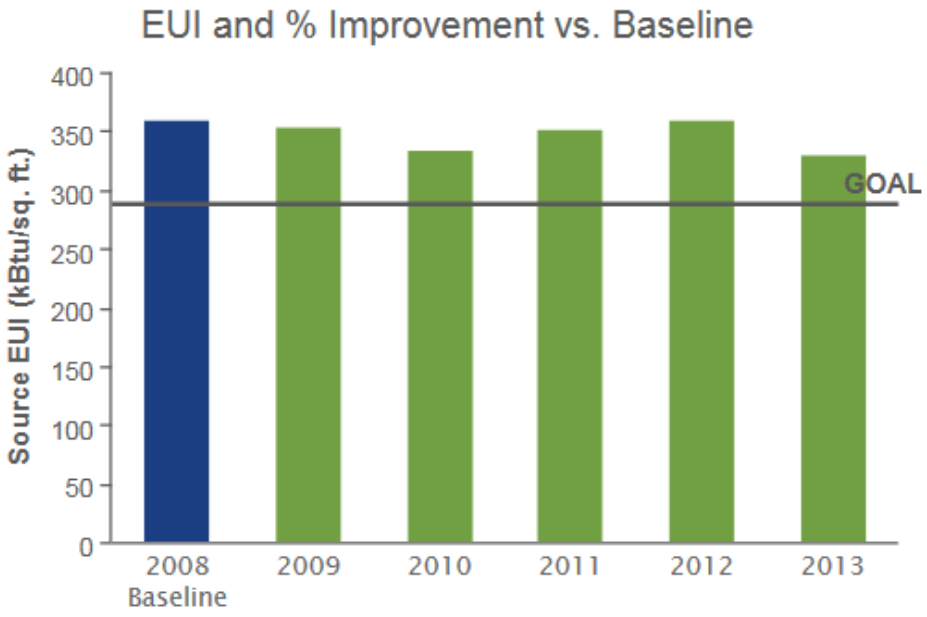
Chart 4: Annual Average Rates, FY08-FY14



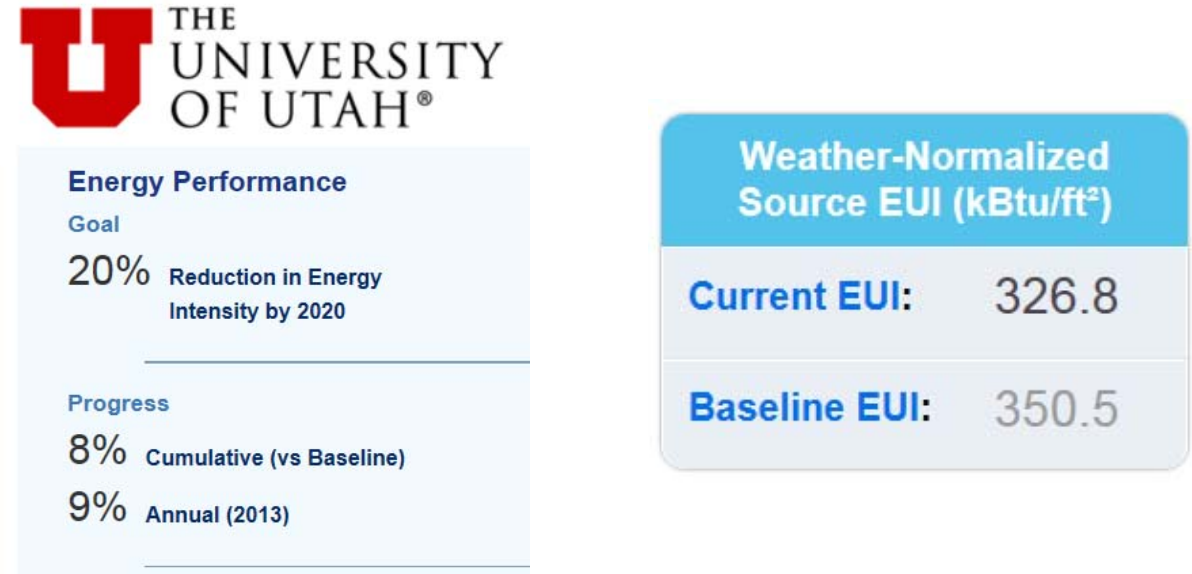
Participation in the Better Buildings Challenge requires a slightly different look at energy consumption. Progress toward our 20% energy savings goal is being tracked and reported in Energy Star Portfolio Manager (an online tool) and it takes a different approach to measuring building energy consumption. There are two unique factors: one, energy data entered into the system is normalized for weather, and two, it is adjusted to take the source of energy into account. Normalizing for weather is similar to EUI in that it provides an opportunity to compare different buildings regardless of the effect of outside temperature conditions. Looking at source energy is a little different. It takes into account all energy lost in the production and distribution of energy. This has a large effect on electricity because a lot of energy is lost before power ever leaves a power plant. Using this method adds weight to electrical energy totals and makes numbers substantially higher than looking at straight energy.

Chart 5 shows a six year history of our total energy consumption and shows progress toward our 20% energy reduction goal. In comparison with the above EUI chart, it shows much larger per-square-foot consumption. For example, the BBC chart shows an EUI of nearly 350 for 2013 while the chart above shows an internally calculated EUI of 195 for 2013. According to Department of Energy and Energy Star, the university is nearly halfway to meeting the 20% goal. Much of this progress is due to the cogen unit because more heavily weighted purchased electricity has been replaced with natural gas.

Chart 5: University of Utah EUI According to Energy Star/DOE



Below are screen shots from Energy Star showing our current status toward our goal:



3. Major Energy Management Programs

This section of the Annual report will take a look at several programs Facility Operations and Energy Management have in place to reduce energy consumption starting with the Energy Management Fund.

3.1. Energy Management Fund

3.1.1 Energy Management Fund Performance, 2007-2014

The following tables summarize the financial activity and performance of the Energy Management Fund from FY08 through FY14.

Table 1 summarizes cash flow into the Energy Management Fund broken down by source. The annual "Measurement and Verification" transfer (M&V) has been the greatest single source of funding but represents only 45% total inflows. Energy Management has been able to leverage that money to bring in nearly $2 million is energy savings and incentives.

Table 1: Energy Management Fund Inflow History

	M&V	Energy Savings	Incentives	Other In	Total Inflows
FY08	$ 220,000.00	$ 5,000.00			$ 225,000.00
FY09	$ 222,200.00	$ 137,062.87	$ 303,012.30	$ 10,000.00	$ 672,275.17
FY10	$ 224,422.00	$ 176,269.94	$ 48,594.78	$ (252,100.00)	$ 197,186.72
FY11	$ 226,666.22	$ 232,023.83	$ 68,137.10	$ 53,756.41	$ 580,583.56
FY12	$ 228,932.66	$ 217,337.18	$ 74,041.55	$ 103,529.89	$ 623,841.28
FY13	$ 231,211.32	$ 233,403.68	$ 209,868.32	$ 3,076.90	$ 677,560.22
FY14	$ 233,533.53	$ 109,678.79	$ 165,223.21	$ 10,065.00	$ 518,500.53
TOTAL	$ 1,586,965.73	$ 1,110,776.29	$ 868,877.26	$ (71,671.80)	$ 3,494,947.48

Table 2 summarizes by category how the fund has been used over the past 7 years. In accordance with Energy Management's purpose and the Fund's rules, the Fund has primarily been used to pay for energy efficiency projects (71% of money spent), ongoing metering projects (18%) and ongoing ESPC measurement and verification (8%).

Table 2: Summary of Energy Management Fund Outflows

Category	Type	Outflows	% of Total
(Projects with returns)	EE Projects	$ 2,398,001.32	70.7%
(Projects without returns)	Metering	$ 592,627.67	17.5%
	M&V	$ 277,121.29	8.2%
	Other	$ 122,429.35	3.6%
TOTAL PROJECTS		$ 3,390,179.63	

Tables 3 and 4 provide summaries of the energy and energy cost savings that energy efficiency projects have yielded over the past 7 years. Table 3 shows cumulative, to-date energy savings grouped by the years in which projects were completed.

Table 3: Project Energy Savings Summary (Savings to Date)			
Project Group	kWh Savings	Avg Monthly kW Savings	DTH Savings
FY08	13,096,816	107.6	35,613
FY09	3,876,761	145.5	-
FY10	14,109,859	676.6	21,817
FY11	2,691,772	143.3	44,683
FY12	3,647,179	292.9	12,724
FY13	729,761	57.8	2,340
FY14	859,300	199.4	43
TOTAL	39,011,448	1,623.1	117,219.5

Table 4 shows cumulative, to-date cost savings, also grouped by years in which projects were completed. It also breaks out projects that have reached their payback to Energy Management and those that are retired, or are no longer contributing savings.

Table 4: Project Energy Cost Savings Summary				
Project Group	Energy Savings to Energy Mgmt	Energy Savings to Fuel & Power	Maximum Savings to Energy Mgmt	% Paid Back
Retired Projects (no longer saving)	$ 220,440	$ 534,634	$ 220,440	100%
Repaid Projects (still savings to Fuel & Power)	$ 402,114	$ 637,345	$ 402,114	100%
Projects Still in Payback				
FY09	$ 83,937	$ 20,984	$ 83,937	100%
FY10	$ 223,619	$ 55,905	$ 242,243	92%
FY11	$ 138,166	$ 34,542	$ 230,360	60%
FY12	$ 165,397	$ 41,349	$ 245,116	67%
FY13	$ 31,520	$ 7,880	$ 127,117	25%
FY14	$ 13,500	$ 3,375	$ 281,222	5%
TOTAL	$ 1,278,693	$ 1,336,014	$ 1,832,549	70%

Finally, tables 5 and 6 summarize project simple paybacks. Table 5 shows simple paybacks in terms of overall project cost and total cost savings and demonstrates the effectiveness of our projects based on their own merit. Factors like utility incentives and the 80/20 split are not taken into account.

Table 5: Simple Payback by Fiscal Year (Total Project Cost ÷ Annual Cost Savings)			
Project Completed	Project Cost	Annual Cost Savings	Simple Payback (years)
FY08	$ 480,345	$ 154,230.90	3.1
FY09	$ 161,672	$ 40,123.20	4.0
FY10	$ 604,974	$ 184,818.30	3.3
FY11	$ 425,710	$ 147,294.60	2.9
FY12	$ 436,200	$ 109,922.40	4.0
FY13	$ 171,574	$ 38,272.53	4.5
FY14	$ 940,377	$ 67,572.39	13.9
Totals	$ 3,220,852	$ 742,234	4.3

Table 6 shows simple paybacks in terms of Energy Management's project cost (total project cost less utility incentives and other contributions – typically department matches and contributions) and Energy Management's 80% share of annual cost savings.

Table 6: Simple Payback by Fiscal Year (Cost to EMF ÷ 80% Cost Savings)			
Project Completed	Net Project Cost	Annual Cost Savings	Simple Payback (years)
FY08	$ (67,706.35)	$ 123,384.72	-0.5
FY09	$ 38,920.74	$ 32,098.56	1.2
FY10	$ 490,670.31	$ 147,854.64	3.3
FY11	$ 291,342.67	$ 117,835.68	2.5
FY12	$ 51,113.20	$ 87,937.92	0.6
FY13	$ 135,447.73	$ 30,618.02	4.4
FY14	$ 279,930.60	$ 54,057.91	5.2
Totals	$ 1,219,719	$ 593,787	2.1

3.1.2. Fiscal Year 2014 Financial Activity

Table 7 provides an overview of funding received and disbursed by Energy Management in fiscal year 2014.

Table 7: FY14 Energy Management Fund Financial Activity		
Inflows	FY14	
Measurement &Verification	$	233,534
Electrical Energy Savings	$	83,519
Gas Energy Savings	$	26,160
Utility Incentives	$	165,223
Transfers from Other Departments	$	10,065
Carryover From Previous Year	$	148,712
Available FY14 Funds	$	667,212
Outflows		
Energy Efficiency Project Expenses	$	449,077
Metering Project Expenses	$	39,412
Measurement & Verification	$	25,200
Other	$	61,543
Total Outflows, Projects	$	575,232
Year End Balance	**$**	**91,980**

3.1.3. FY14 Projects

Table 8 summarizes all projects completed during FY14. Not all were started during that year, but they all closed out during that time frame.

Table 8: Projects Completed in FY14				
Project Name	Project Cost	Incentives	Annual Energy Cost Savings	Post Incentive Simple Payback
049 LNCO Occupancy Sensors (SCIF)[1]	$ 17,978		$ 3,596	5.00
303 Plant Office Insulation	$ 2,554		$ 510	5.01
570 Evaporative Cooling	$ 70,849		$ 10,121	7.00
004 HeatT Exchanger (contribution)	$ 130,000		$ 9,800	13.27
575 Evap Cooling (DFCM loan)	$ 205,853		$ 3,823	53.84
086 Marriott Recommissioning	$ 55,543		$ 13,886	4.00
040 Lighting Phase 2	$ 142,983	$ 113,095	$ 13,500	2.21
064 MEB VFDs - Penthouse AHUs	$ 37,363		$ 7,230	5.17
025 BEH Computer Management	$ 1,638		$ 5,107	0.32
212 SEFH LED Lighting	$ 275,617	*$ 212,000*	$ -	
TOTAL	$ 940,377	$ 325,095	$ 67,572	9.11
Italicized numbers are estimates				

3.1.4. FY15 Financial Projections

Table 9 shows the Energy Management Fund's budget for FY15 based on projected inflows.

Table 9: FY15 Energy Management Fund Projections	
FY15 Inflows	
Carryover from FY14	$ 91,980
Measurement &Verification	$ 235,869
Energy Savings	$ 225,000
Utility Incentives	$ 300,000
Total Inflows	$ 852,849
FY15 Outflows	
Energy Efficiency Project Expenses	$ 752,649
Metering Project Expenses	$ 75,000
Measurement & Verification	$ 25,200
Total Outflows	$ 852,849

3.1.5. FY15 Projects

There are currently only 2 projects underway using the Energy Management Fund (077 RCx and campus stream traps) but the majority of this year's budget will be going toward retrocommissioning.

Table 10: FY15 Projects

Project Name	Estimated Cost
077 CRCC Retrocommissioning	$ 30,000
Campus Steam Traps	$ 50,000
Lighting	$ 150,000
Retrocommissioning	$ 500,000
Other	$ 122,849
Total Projects	$ 852,849

3.2 Better Buildings Challenge

We are now entering the third year of our involvement in the Department of Energy's Better Buildings Challenge. Nearly all of our activity to this point has been centered around 1) developing an overall strategy to reach our 20% energy reduction goal, and 2) developing the first phases of building retrofit projects.

Phase 1 of building retrofit projects focuses on 3 buildings: Henry Eyring Chemistry (0085), Skaggs Biology (0082), and the Biology (0084) buildings. Phase 1 is now in final design and upon project and funding approval will be ready to go to bid. The budget for Phase 1 is $8.9M and it is expected to generate $677,000 in annual energy cost savings.

Phase 2 is early in the development phase and is focusing on the Health Sciences campus. This project is split into two parts with one focused on Facility Operations managed buildings and the other focused on University Health Care managed buildings. UUHC has not yet committed to undertaking their part but we are working with them to identify potential measures and savings that will hopefully establish the justification to move forward.

4. Additional Information

On the following pages are summaries of the Power and Fuel accounts for fiscal year 2014, showing a breakdown of the funding that moved through those accounts during the year.

Table 4.1: FY14 Power Account Summary		
Revenue/Transfers In		
	Base Funding	$ 14,457,469
	Tuition & Fees Distribution	$ 364,736
	One Time O&M Funds	$ 159,193
Table 4.1: FY14 Program Budget		**$ 14,981,398**
Expenses		
	Electricity	$ 16,824,104
	Contra Accounts	$ (12,452,137)
	CHW Plant O&M	$ 196,564
	Renewable Energy Credits	$ 75,000
	Energy Engineering	$ 64,295
	U Community Solar	$ 25,000
	Misc	$ (11,783)
Transfers Out		
	Energy Savings	$ 5,607,743
	Chilled Water R&R, Infrastructure Fees	$ 2,300,515
	Energy Savings and Incentives to Energy Management Fund	$ 248,742
	DFCM Loan Payment (for 575 Evap Project)	$ 166,969
	Student Utility Fees	$ 148,508
	Behavioral Program	$ 8,600
Total Outflows		**$ 13,202,120**
Net Balance, Power Account		**$ 1,779,278**

Table 4.2: FY14 Fuel Account Summary		
Inflows		
Base Funding	$	10,970,378
Tuition & Fees Distribution	$	364,736
Total Inflows	**$**	**11,335,114**
Expenses		
Natural Gas	$	9,479,865
Contra Accounts	$	(3,200,846)
Fuel Oil	$	35,544
Misc	$	3,392
Transfers Out		
Energy Savings	$	2,067,567
Balancing Funds	$	1,000,000
High Temp Water R&R	$	847,125
Student Utility Fees	$	148,508
Energy Savings to Energy Management Fund	$	26,160
Total Outflows	**$**	**10,407,315**
Net Balance, Fuel Account	**$**	**927,800**

Annual Energy Report

Fiscal Year 2014

WEBER STATE UNIVERSITY
Facilities Management

ENERGY &
SUSTAINABILITY
—OFFICE—

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LEADERSHIP STATEMENT

Leadership Statement

Weber State is committed to improving the learning environment in every way. One of those ways is by careful investment in long term sustainability programs that represent both sound business practices and decisions, but also sensitivity to and actions to support an improved natural environment. We feel that long term sustainability, improving our natural environment, and sound business decisions are not mutually exclusive, but are instead synergistic in making our university more attractive to students, more cost effective overall, and provide the greatest value overall for our financial and human resource investments. We are in this for the long term.

Kevin P. Hansen
Associate Vice President for Facilities & Campus Planning

ENERGY EFFICIENCY & RENEWABLE ENERGY PROJECTS AT WSU

Energy Efficiency & Renewable Energy Projects at WSU

ENERGY EFFICIENCY PROJECT STATUS

In 2009, AMERESCO (an energy services company) completed an investment grade audit for WSU that identified a number of projects that, once completed, would reduce energy consumption, improve efficiency, or otherwise save natural resources. Construction on these projects began in July 2010. Table 1 below provides a list of the projects and their current status.

Table 1: Energy Conservation/Efficiency Project Status (12/1/2014)

Interior Lighting Upgrade - Campus Wide	Construction - 60% complete
DEC Chiller Replacement	Complete
Replace DHW Tanks with HX	Complete
Steam powered condensate pumps	Complete
Steam Energy Upgrades Phase 1	Complete
Steam Tunnel Support Repair	Complete
Replace Piping Insulation on AHUs	In progress
Boiler 2 Economizer	Complete
VFDs for Central Plant Cooling Towers	Complete
TE Convert Inlet Vanes to VFD	Awaiting In-House Labor
Davis 2 VAV Upgrade and IDEC	Complete
Recomission Sky Suites, ED, SS	Complete
Domestic Water Conservation	Construction - 20% complete
Solar Water Heating – GYM	Complete
Solar PV Davis – Phase I	Complete
Solar PV Davis – Phase II	Complete
Solar PV Union	Complete
Weatherproofing - SS, LI, SL	Complete
Computer Controls	In Progress
Swimming Pool Cover	Complete
Electric Meters	Complete
Steam Meters	Complete
Chilled Water Meters	Complete
Irrigation Water Meters	Complete
High Efficiency Transformers	30% Complete
HV Switches	Out for Bid
Exterior Lighting	Complete
DEC Power Factor Correction	Complete
Building scheduling and commissioning	Ongoing
FM Building upgrade	Design
Campus Services VRF	Complete
Steam system improvements	Ongoing
Public Safety Solar	Complete

Building scheduling	Ongoing
Building mechanical and control upgrades	Ongoing
Large Scale Davis Solar Project	Design
Campus Services VRF	Complete
Wildcat Center RCx	Complete

RENEWABLE ENERGY

WSU has completed a number of renewable energy projects. (see Table 1). 40 KW of solar PV have been installed at the Davis Campus in two phases. At the Ogden Campus, a solar thermal array on the gym heats the pool and another solar thermal array on a new residence hall provides domestic hot water for the building. The Shepherd Union also has a 40 KW array and the new Public Safety building has an array of just over 20 KW.

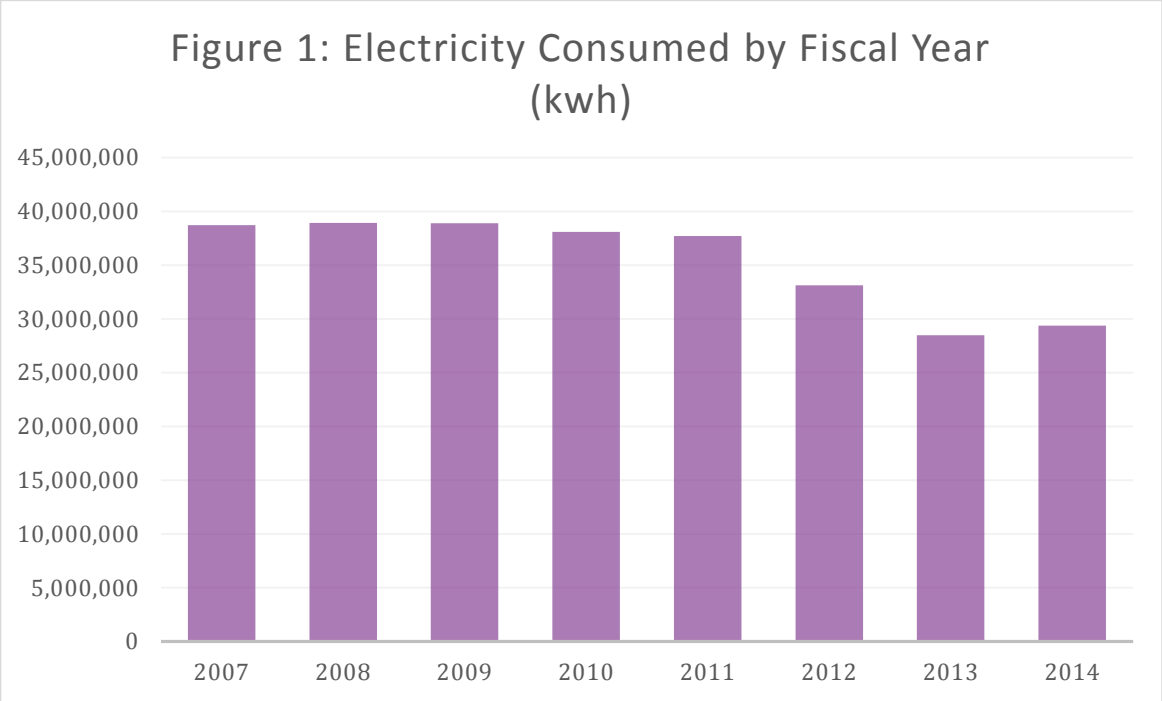
In addition to on-campus production, over the past few years Weber State University has subscribed to the Rocky Mountain Power Blue Sky program which supports renewable energy power production. This past fiscal year, WSU purchased approximately 14.7% of the University's electrical power from renewable energy resources (wind power) through that program.

University Building Energy Consumption

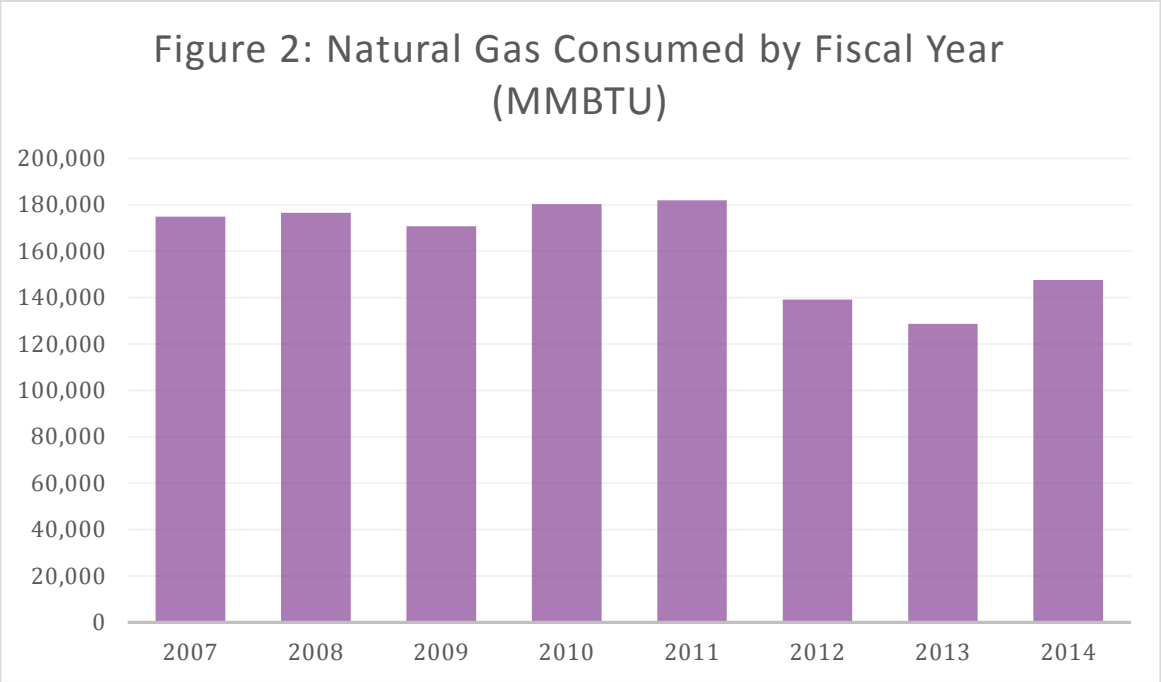
Table 2 depicts WSU's electricity and natural gas consumption figures. From the baseline year of 2007, WSU has reduced its electricity consumption by 24% (Figure 1) and its natural gas consumption by over 15% (Figure 2) thanks to the completion of several key energy efficiency and renewable energy projects. Increases in electricity and natural gas consumption in FY 2014 can be attributed to the addition of over 200,000 square feet.

Table 2: WSU Building Energy Consumption

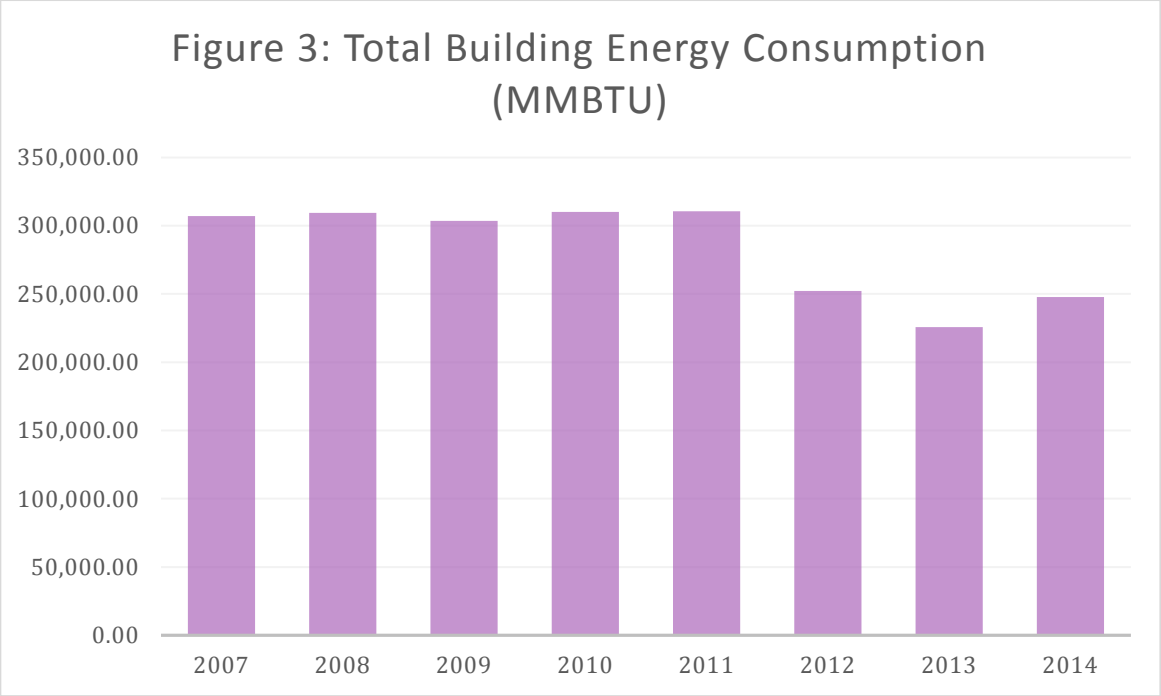
Fiscal Year	Electricity (kwh)	Natural Gas (MMBTU)
2007	38,714,341	174,846
2008	38,927,520	176,545
2009	38,905,072	170,782
2010	38,082,772	180,215
2011	37,717,473	181,921
2012	33,131,629	139,214
2013	28,478,606	128,673
2014	29,384,002	147,638



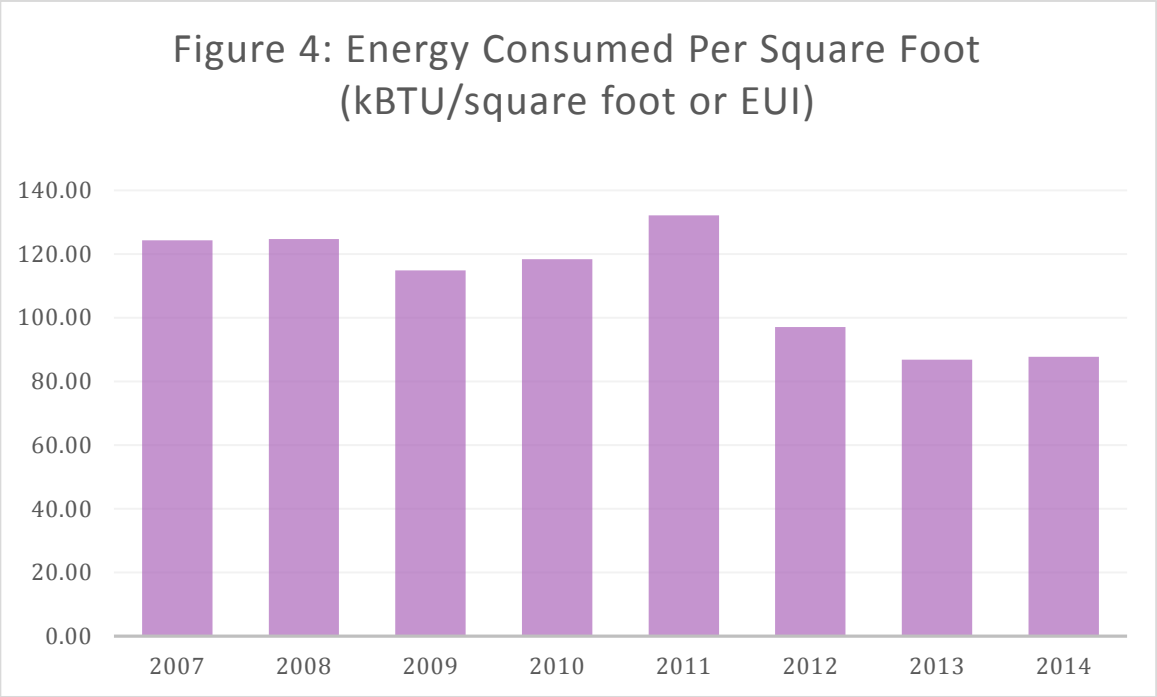
UNIVERSITY BUILDING ENERGY CONSUMPTION

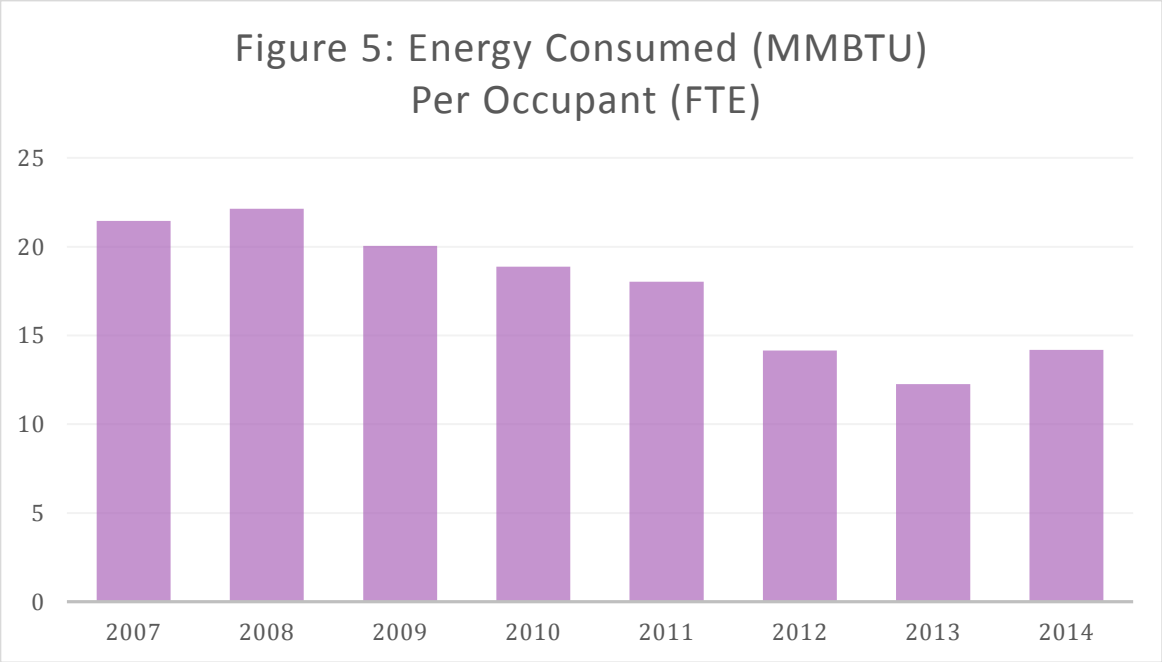


Since fiscal year 2007 WSU has reduced its total building energy consumption by 19.3% (see Figure 3). WSU's energy consumption per square foot dropped by 29.4% and WSU's energy consumption per occupant was reduced by about 34% since fiscal year 2007 (see Figures 4 & 5).



UNIVERSITY BUILDING ENERGY CONSUMPTION



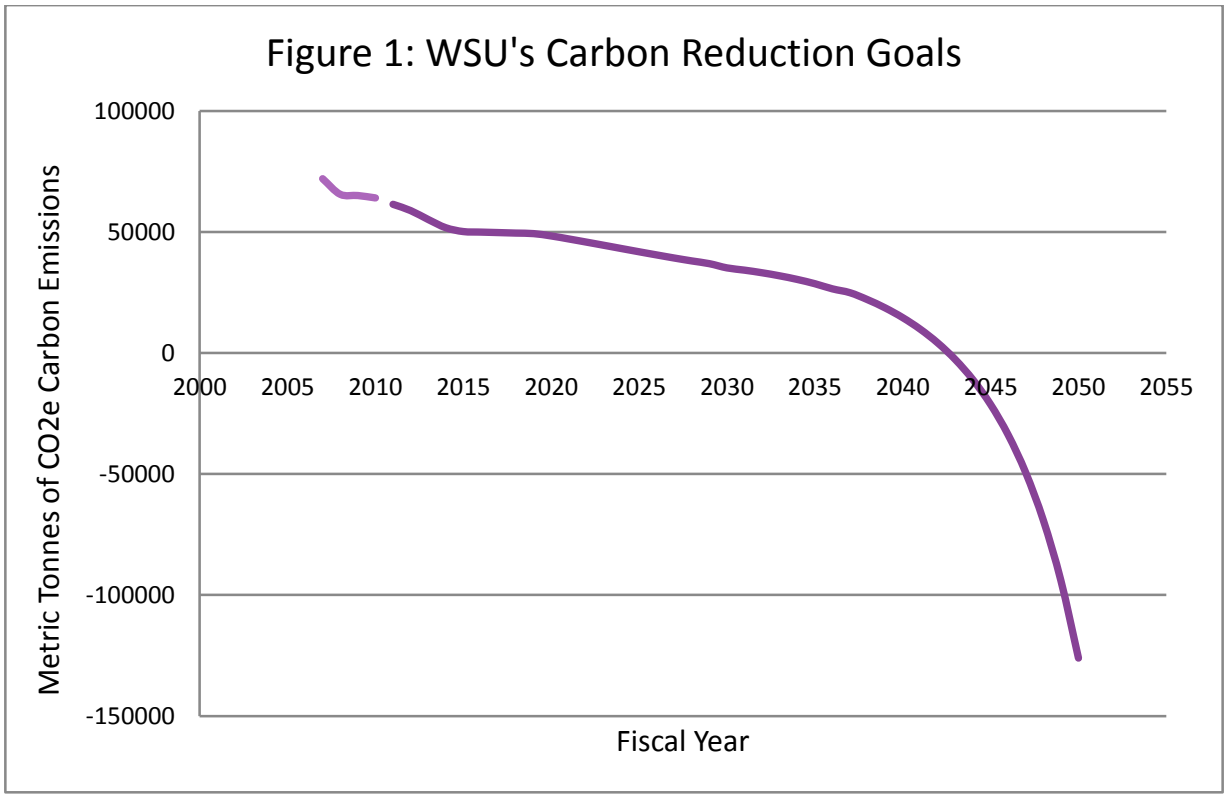


GREENHOUSE GAS (GHG) EMISSIONS

Greenhouse Gas (GHG) Emissions

CARBON REDUCTION GOALS

WSU's Climate Action Plan, adopted in 2009, states that the University's ultimate goal is to be carbon neutral by the year 2050. Figure 1 below is a model developed by WSU's Energy Manager, Jacob Cain, that provides details on WSU's intermediate emissions reduction targets. Per this model, WSU should have reduced its emissions by 30% this fiscal year to stay on track towards meeting the 2050 goal. WSU's progress on this intermediate goal is reported in the sections below.



SCOPE 1 EMISSIONS

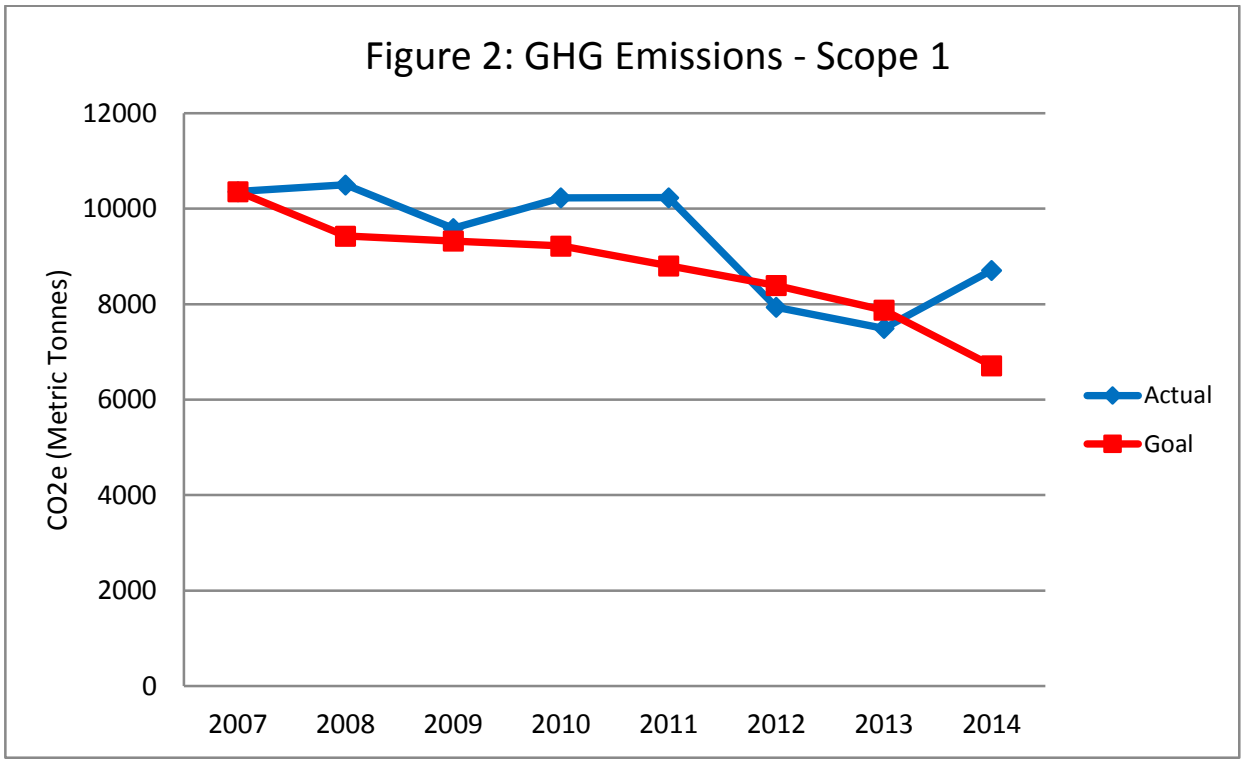
Carbon emissions are typically reported in three categories: Scope 1, Scope 2 and Scope 3 emissions. Scope 1 emissions are defined as those emissions occurring from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles, and "fugitive" emissions. For Weber State University, Scope 1 emissions are primarily derived from the central heat plant which runs on natural gas (diesel during emergencies) and the University fleet which runs on traditional gasoline, diesel and compressed natural gas (CNG).

GREENHOUSE GAS (GHG) EMISSIONS

In FY 2012, emissions associated with fertilizer application were added to WSU's Scope 1 footprint. While fertilizer has been applied to WSU's landscape in years past, the historical data is not available. Emissions data for future applications will be collected now that this data is available.

This fiscal year refrigerant emissions have also been added to the Scope 1 report. Refrigerant data (available back to FY 2011) was added to the Scope 1 emissions totals for previous years.

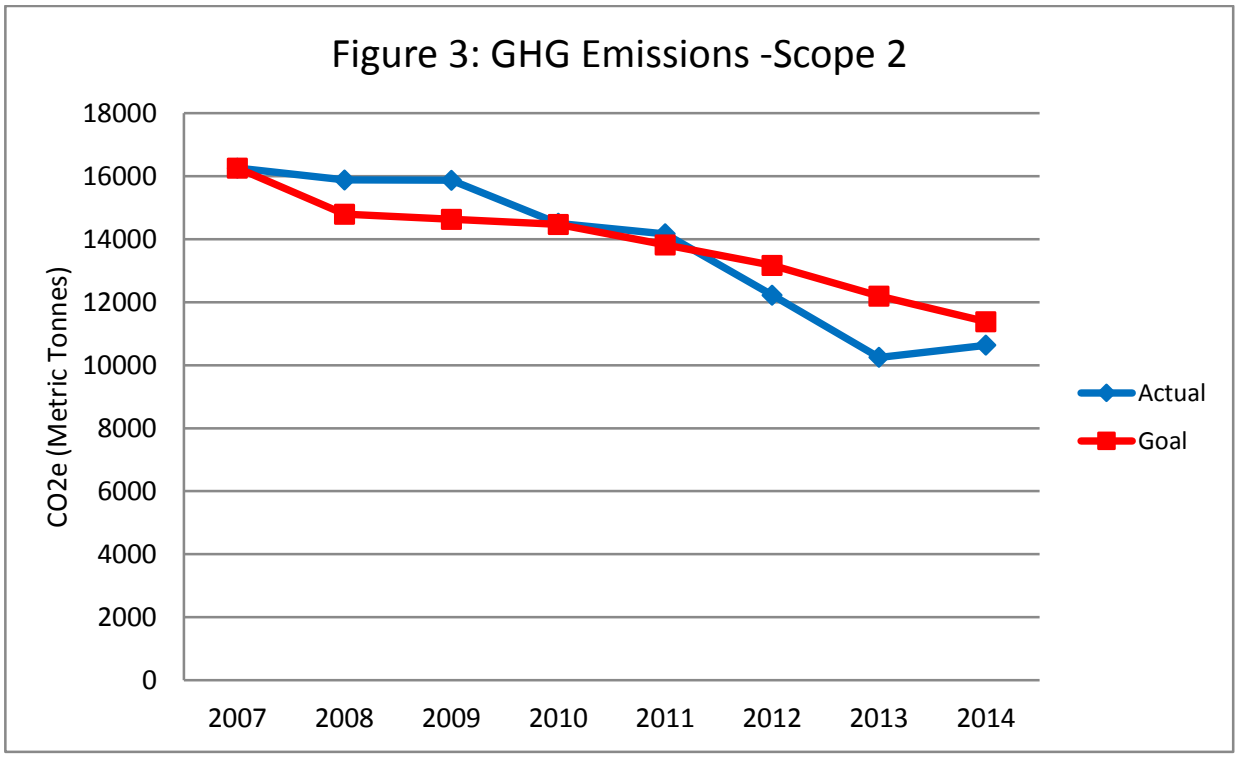
As can be seen from the figure below, WSU's Scope 1 emissions reductions were on target for fiscal years 2012 and 2013 but rose slightly in FY 2014. The vast majority of the increase in emissions can be attributed to the fact that WSU has added over 200,000 square feet to its campuses. A minor portion of the emissions increase can be attributed to increases in vehicle fuel use, increases in fertilizer use, and the addition of refrigerant data.



SCOPE 2 EMISSIONS

Scope 2 emissions are defined as indirect emissions generated in the production of electricity consumed by the institution. Figure 3 below shows that WSU surpassed its emissions reduction goal by 5%. These savings can largely be attributed to campus-wide interior and exterior lighting upgrades. Additional completed energy efficiency projects are noted under the Energy Efficiency & Renewable Energy Projects at WSU Section of this report.

GREENHOUSE GAS (GHG) EMISSIONS



SCOPE 3 EMISSIONS

Scope 3 emissions are defined as other indirect emissions that are a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution. Scope 3 emissions include University-related air travel, student, faculty, and staff commuters, and solid waste generation.

For previous years' reports, air travel data was collected by multiplying total WSU flights (obtained from WSU's Purchasing Department) by national average flight miles (see http://www.bts.gov/press_releases/). In FY 2012, WSU's Purchasing Department used WSU purchasing reports to collect destination and mileage data for each flight. Therefore the data from FY 2012 on is more accurate because it is based on actual WSU trips and not an estimate of national average flight miles.

WSU's solid waste generation was obtained from the University's contractor, Waste Management. Emissions associated with solid waste production are significantly higher starting in FY 2010 because WSU used to send all of its waste to an incinerating facility with energy recovery and now the University waste is simply sent to the landfill.

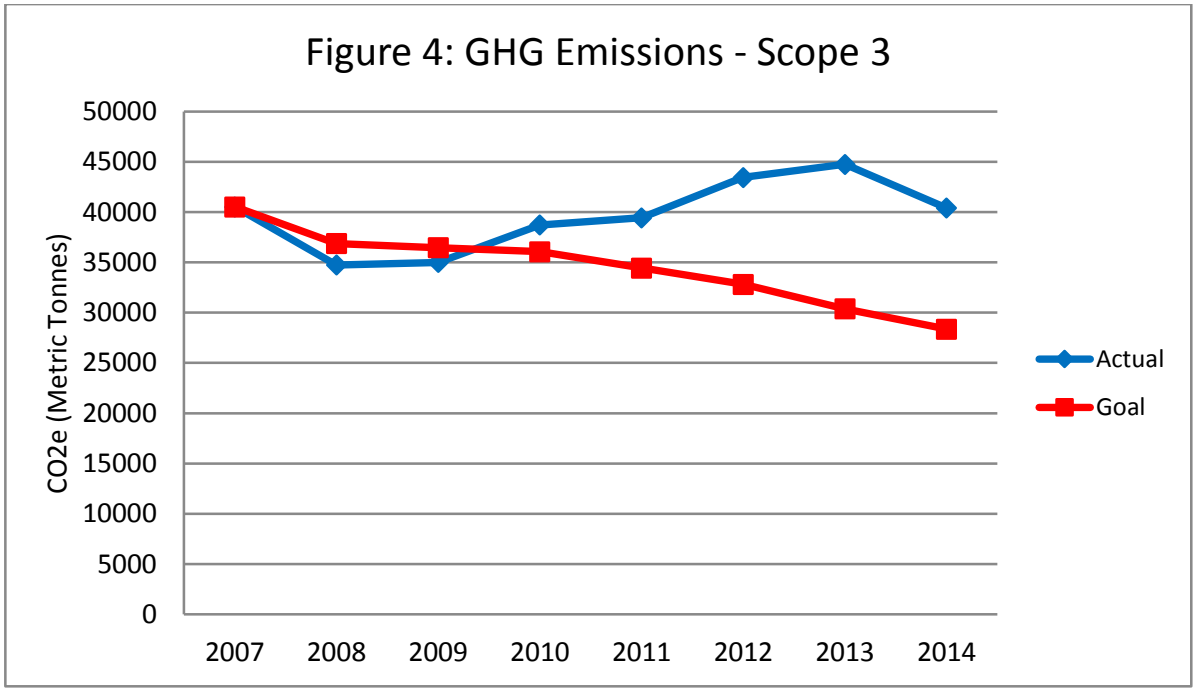
Commuting emissions data are derived from a survey conducted every few years by the Energy & Sustainability Office. The first survey was conducted in the spring of 2011 and the second was conducted in the spring of 2014. In both instances, surveys were sent to a random sample of students, faculty and staff through WSU's Student Voice. Survey participants were asked to

report on the mode(s) of transportation used to travel to campus, the distance from their home to campus, and the average number of days per week traveled to campus. If respondents indicated that they traveled to both the Ogden and Davis Campuses, then data for travel to both campuses was collected. Using the survey data, the commuting emissions for students, staff and faculty were calculated. See Table 1 below.

Table 1: Commuting Emissions

Year	Students/Staff/Faculty (CO_2e metric tonnes)
2007	33,617.66
2008	32,838.88
2009	33,085.40
2010	34,845.15
2011	35,016.94
2012	37,611.45
2013	37,882.11
2014	33,543.74

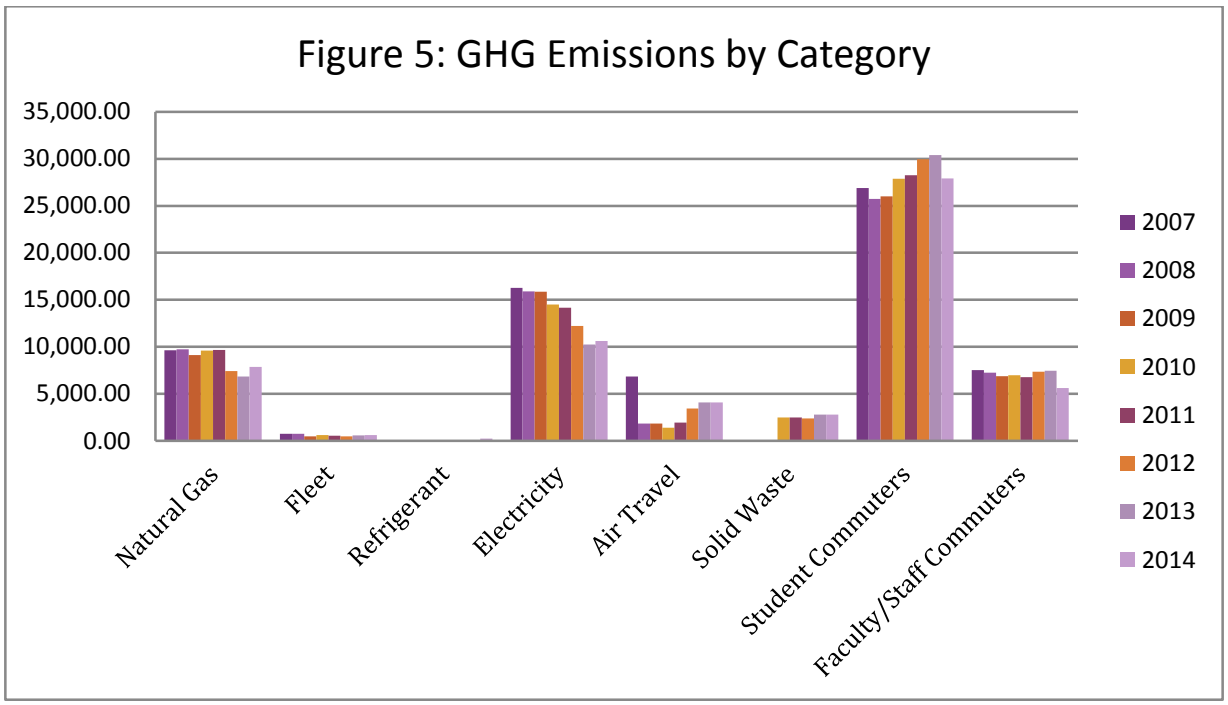
Total scope 3 emissions are depicted in Figure 4. As can be seen from the graph below, Scope 3 emissions have been increasing up until this fiscal year. The decrease this year can be attributed to a smaller student population and fewer faculty trips to campus.



GREENHOUSE GAS (GHG) EMISSIONS

TOTAL GHG EMISSIONS

Figure 5 compares the primary sources of Scope 1, Scope 2, and Scope 3 emissions sources side by side. As can be seen from the chart, student commuting represents the largest source of emissions followed by electricity and natural gas consumption.

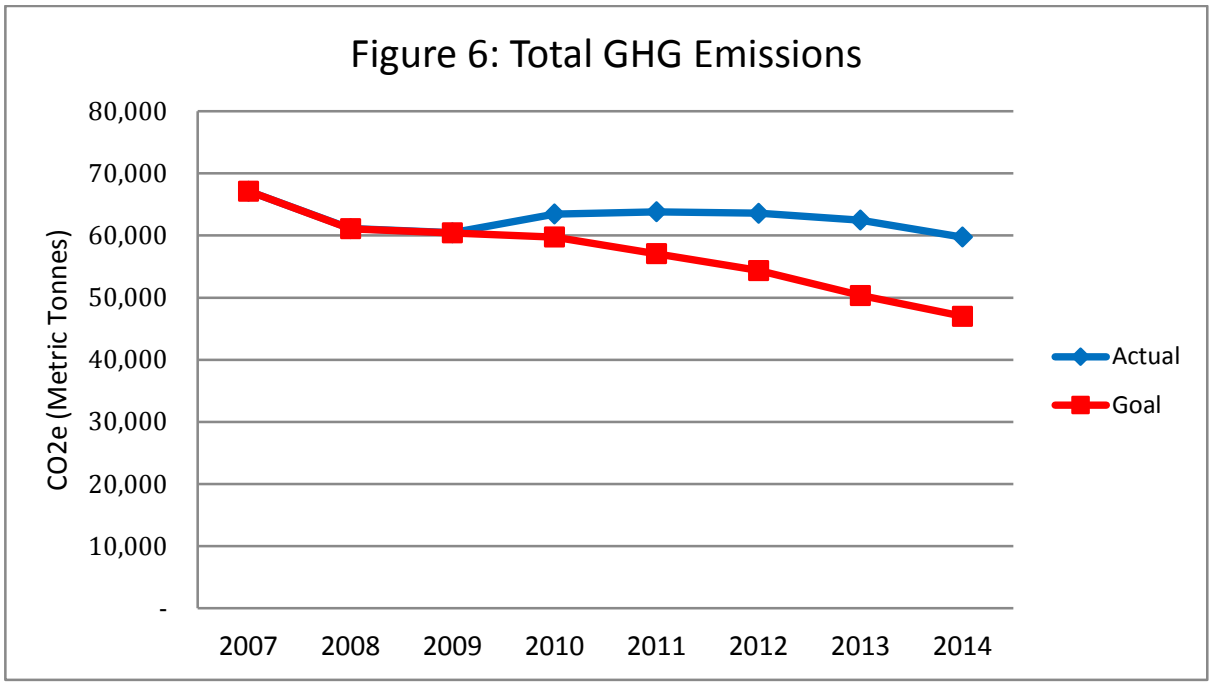


- The change in air travel from 2007 to 2008 is due to decreased air travel and due to a change in how the data is collected
- Solid waste emissions increased in Fiscal Year 2010 not because overall waste generation increased, but because the University decided to send the waste to a new landfill that does not have methane recovery capabilities.

Figure 6 shows WSU's total emissions reduction progress. While WSU is not currently meeting its goal of 30% reduction this fiscal year, significant progress has been made. Total emissions have been reduced by 11% from the baseline year.

Overall progress is being impeded by Scope 3 emissions. As long as the vast majority of the WSU community chooses to travel to campus in a single-occupancy vehicle, it is given that emissions from University commuters will remain high and will rise as population increases.

GREENHOUSE GAS (GHG) EMISSIONS



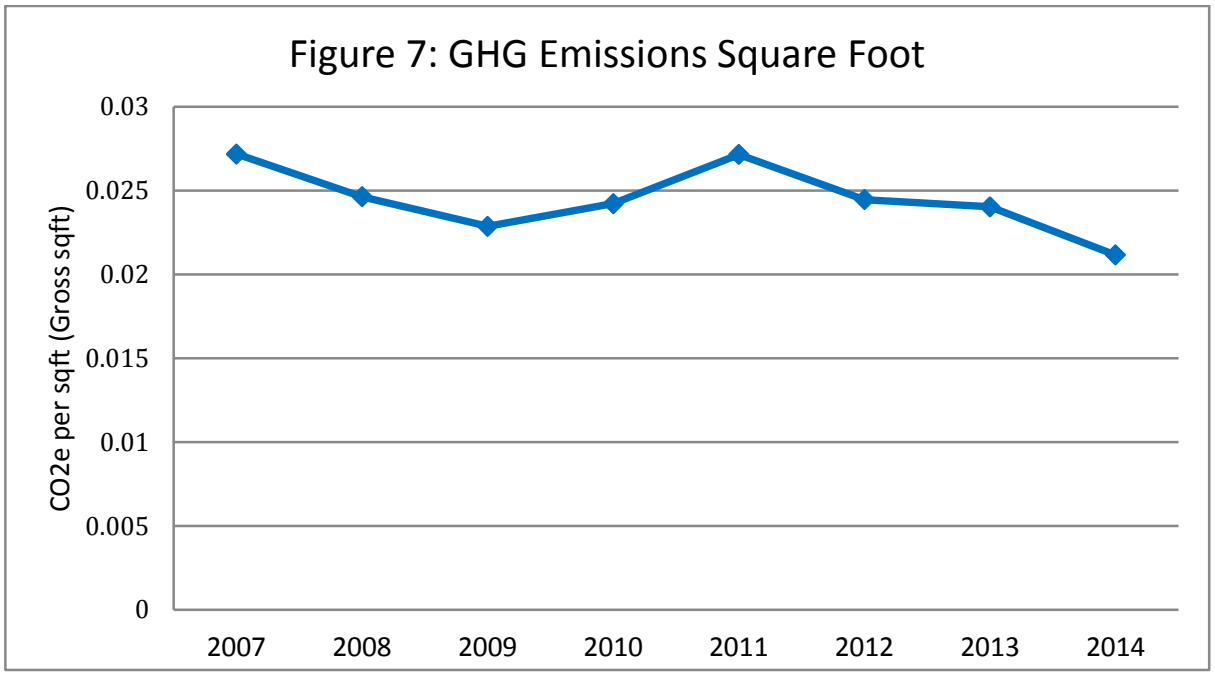
GHG EMISSIONS PER BUILDING SQUARE FOOT

As can be seen in Table 2 below, WSU added 224,158 square feet in FY 2014. Figure 7 depicts emissions per square foot and shows a decrease in emissions this past fiscal year. This decrease can partially be attributed to the completion of energy efficiency projects as discussed previously. However, it can also be attributed to the replacement of old buildings with new, more energy efficient, buildings.

Table 2: WSU Gross Building Square Footage by Year

Fiscal Year	Gross Building Square Footage
2007	2,469,079
2008	2,480,723
2009	2,642,600
2010	2,619,259
2011	2,350,587
2012	2,599,201
2013	2,599,573
2014	2,823,731

GREENHOUSE GAS (GHG) EMISSIONS



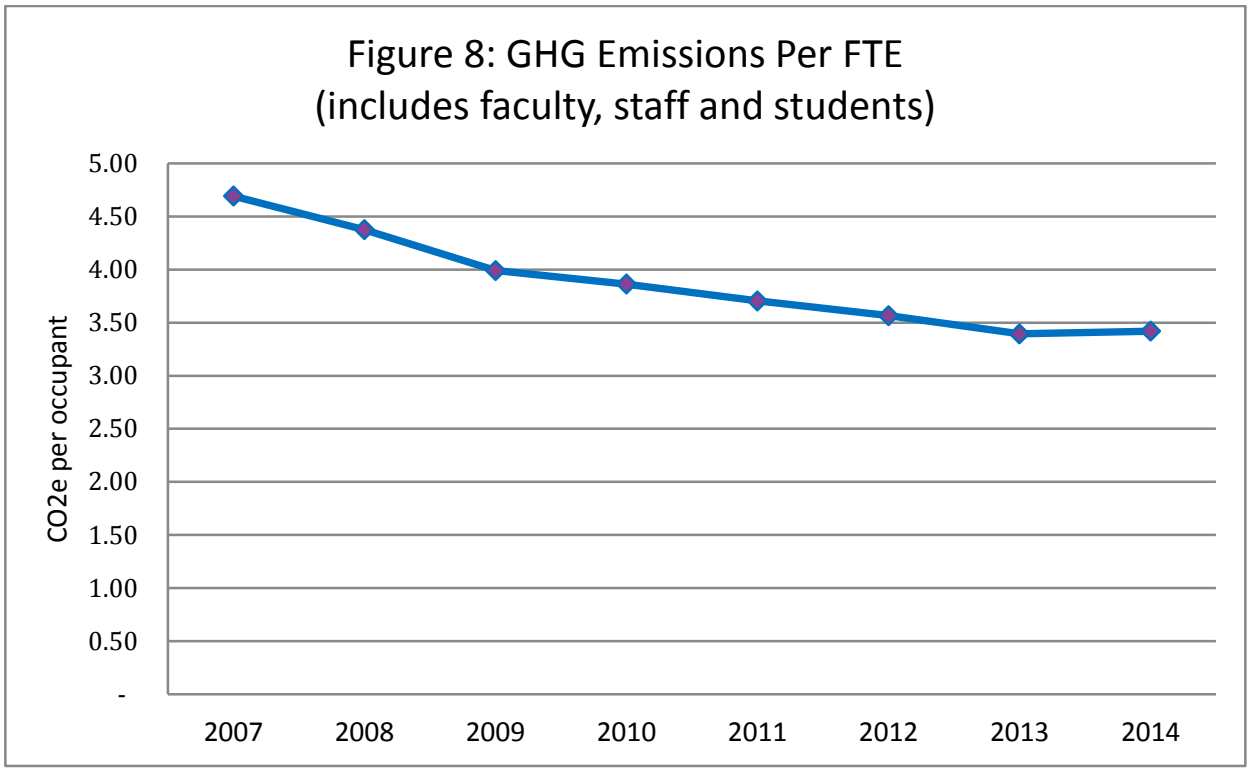
GHG EMISSIONS PER PERSON

Table 3 and Figure 8 show that WSU's population decreased this fiscal year and emissions per FTE increased slightly.

Table 3: WSU Population by Year (in FTE)

Fiscal Year	FTE Students, Faculty, and Staff
2007	14,308
2008	13,972
2009	15,148
2010	16,430
2011	17,232
2012	17,834
2013	18,408
2014	17,474

GREENHOUSE GAS (GHG) EMISSIONS



CONTACT INFORMATION

Contact Information

Please feel free to contact us with any questions you might have! Additional information can be found at: www.weber.edu/sustainability

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State Building Energy Efficiency Program (SBEEP) ENERGY REPORT FOR 2014

UVU's energy report is presented in selected graphic format.

This aids in faster interpretation of information and data.

All energy usage is converted to BTU/Therms and Starts Oct. 1 each year.

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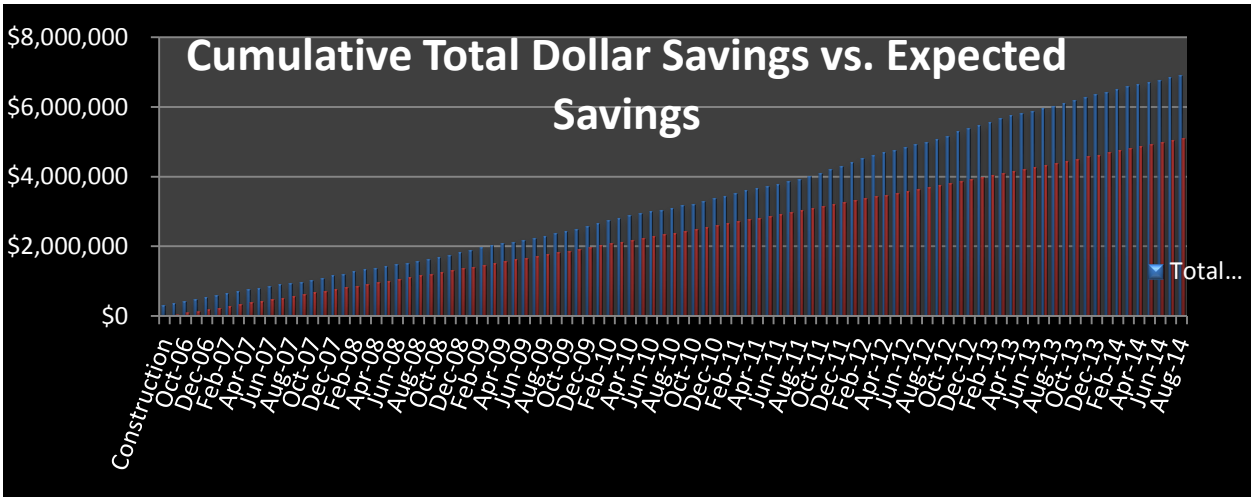
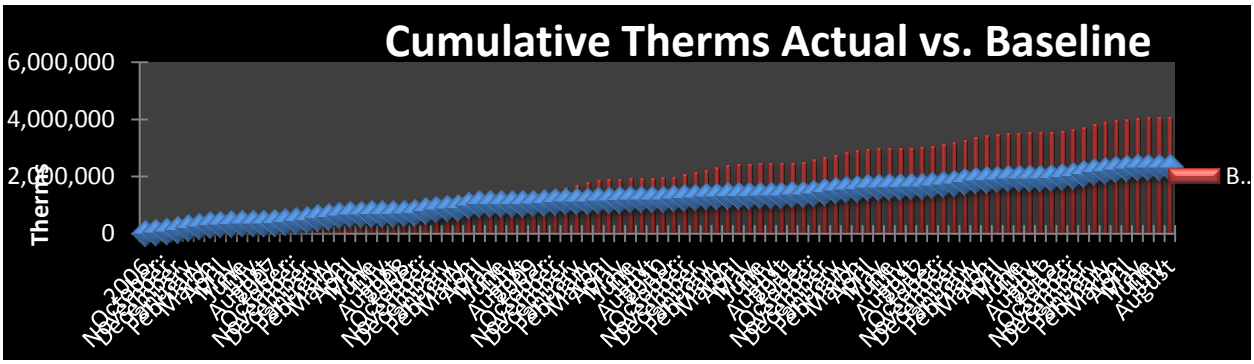
$6.9M savings past 8 years.



Energy saved 2.34MM BTU / Therms above Std.

Each bump represents new buildings added to main campus.

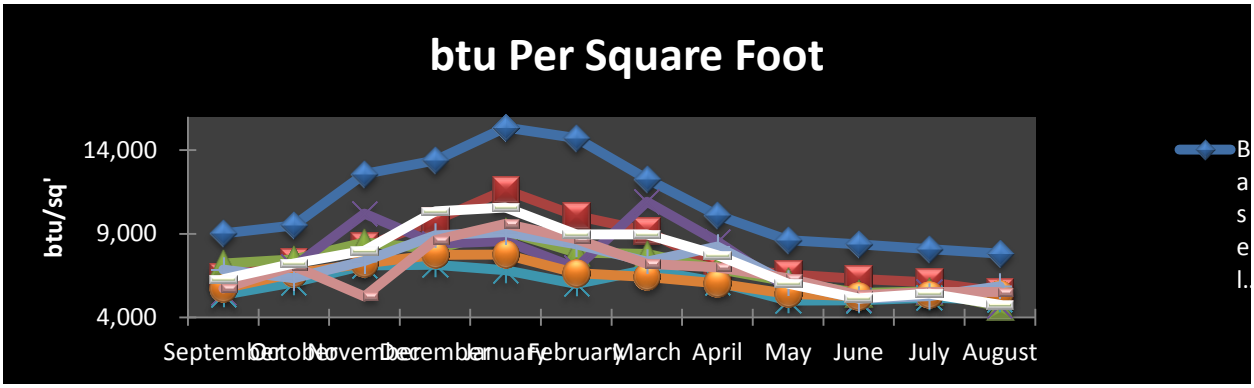
Red line shows std. conservation base line, Blue shows extra reduction efforts.



One Therm equals 100,000 Btu

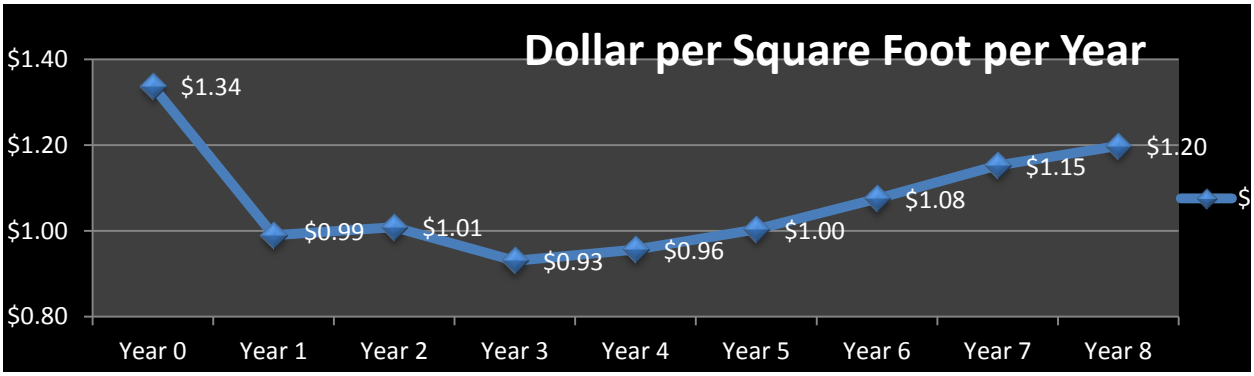
Per sq. ft. allows seasonal & yearly comparisons.

NOTE: That energy consumption is trending down except for abnormal weather conditions. Blue = base year



COST OF ENERGY PER SQ. FT.

NOTE: Even with constant downward energy consumptions, Utilities costs are climbing, far exceeding any conservation efforts.



End of report.

FY 2013 Annual Energy Report

USU Facilities

January 13, 2014

Overview

Utah State University Logan Campus has nearly 4 million square feet of usable space that is maintained and operated by state O&M funding. Most buildings on campus are metered individually for electrical, steam, and chilled water usage. All of the meter data can be viewed and monitored remotely. Meters are manually read monthly, but the long term goal is to have an automated read of the meters.

With new leadership, several changes have been made to the organizational layout. This has included the Universities' Energy Manager overseeing the HVAC shop and commissioning efforts. This has provided for a more cooperative effort and better decision making based on both maintenance needs and energy savings.

USU Energy Reduction Measures

Re-commissioning of buildings has reduced maintenance calls, improved comfort, and improved the overall performance of the buildings. USU's Energy Management team has set the goal to commission every building on campus every five years. To achieve this goal an additional HVAC technician has been dedicated to the commissioning efforts. Over the past year the primary commissioning efforts have focused on laboratory buildings. Laboratory consultants have been hired to help ensure that the air change rates are in compliance with current codes. In many labs it has been possible to reduce the number of air changes. Also, in collaboration with Environmental Health and Safety, occupancy sensors have been installed in lab spaces to control lighting and HVAC to reduce the air change rates even lower during unoccupied periods. Re-evaluating sequences of operations and implementing reset schedules has been found to be very effective as well.

Mechanical and controls upgrades of the Fine Arts Visual Building and the Bee Lab Research Facility converted ventilation systems from constant volume systems to variable air volume systems. The controls upgrades in Old Main, Eccles Conference Center, Engineering Lab, and the Sculpture Lab are currently in progress.

Analytics will allow for better use of the data that the building automation systems gather to monitor building operation and performance. Over time, savings from energy project or re-commissioning projects start to be lost due to modifications made by maintenance personnel or building occupants. USU has purchased a license for Sky Spark and is receiving training to use the software to monitor the energy building energy usage and flag equipment that is operating incorrectly or changes to the system that result in inefficiencies.

Lighting upgrade projects have included de-lamping over lit areas in the HPER Campus Recreation Building. In the Merrill Library a daylight harvesting project is underway.

The Steam trap maintenance program is ongoing and the results from the most recent audit showed a failure rate of less than 5%.

USU Photovoltaic Project

USU in partnership with Rocky Mountain Power's Blue Sky Program is in the process of installing a 56 kW solar array at the Matthew Hillyard Building. This will provide over half of the buildings yearly electrical consumption and will be a visible renewable energy project for the community and educational tool for students.

Energy Usage

To validate the energy savings from the above measures and those of previous years, all utility data was converted to Btu's and the total energy usage was calculated. The energy usage intensity (kBtu/ft^2) was calculated for each O&M funded building and averaged. This yearly data, from fiscal years 2004 to 2013, is presented in the graph below.

Historical weather data has been gathered to provide more insight into the impact of building cooling and heating on the energy consumption. Salt Lake City weather data was used due to the lack of historical data for Logan. National Climatic Data Center's data of monthly cooling and heating degree days (65 degree base temperature) were used to determine the total number of degree days each year over the past eight years. This will relate how much of the year that the temperature was above or below 65 degrees and provide insight into yearly variations.

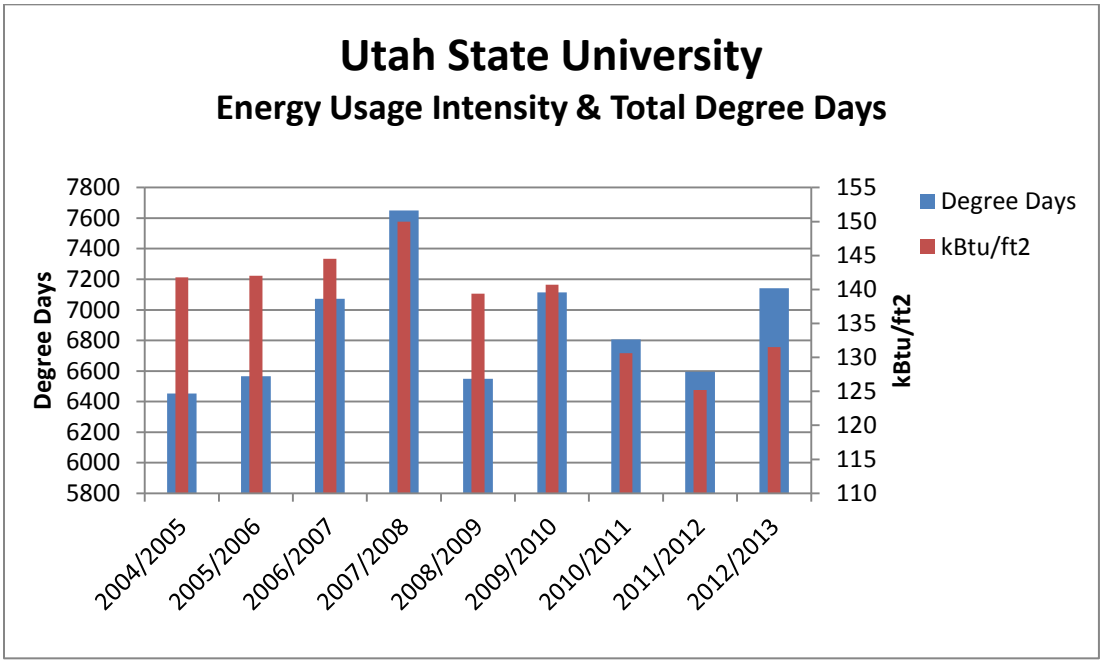


Figure 1. The average energy usage intensity for buildings on campus over the past 8 years and the number of degree days for each given year.

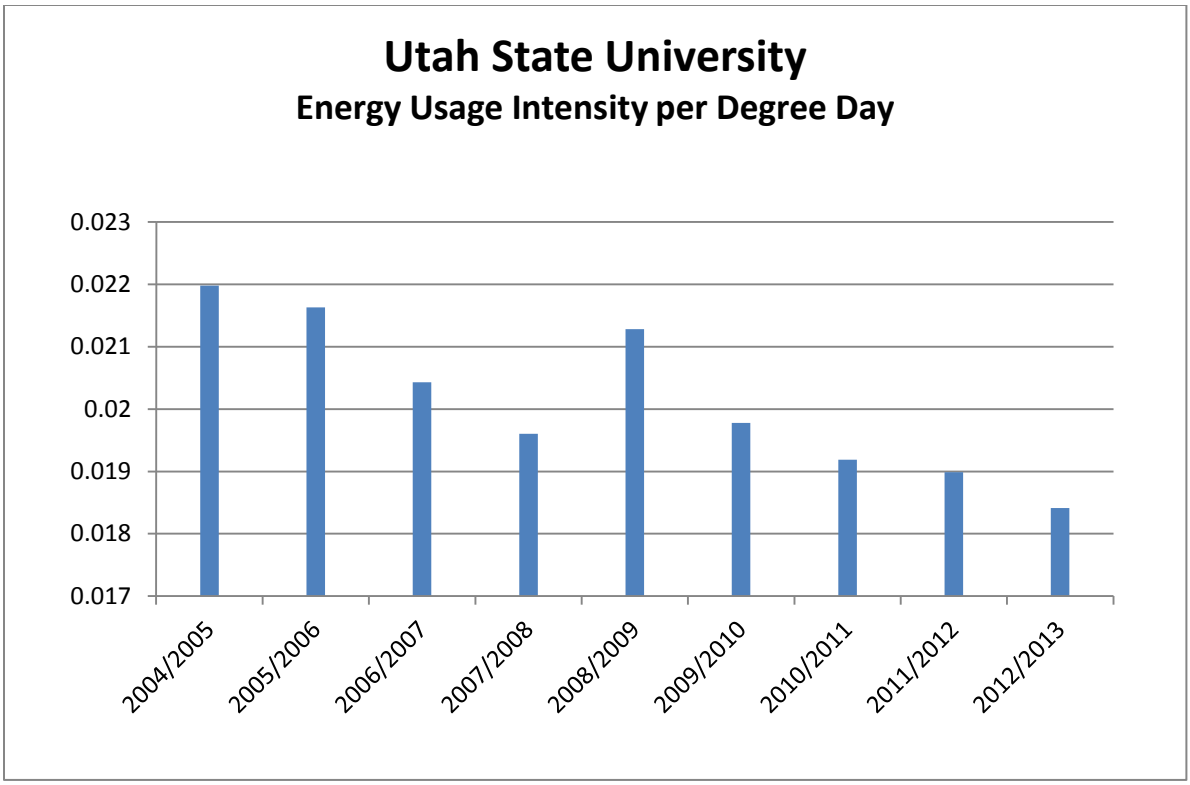


Figure 2. The average energy usage intensity per degree day for buildings on campus over the past 8 years.

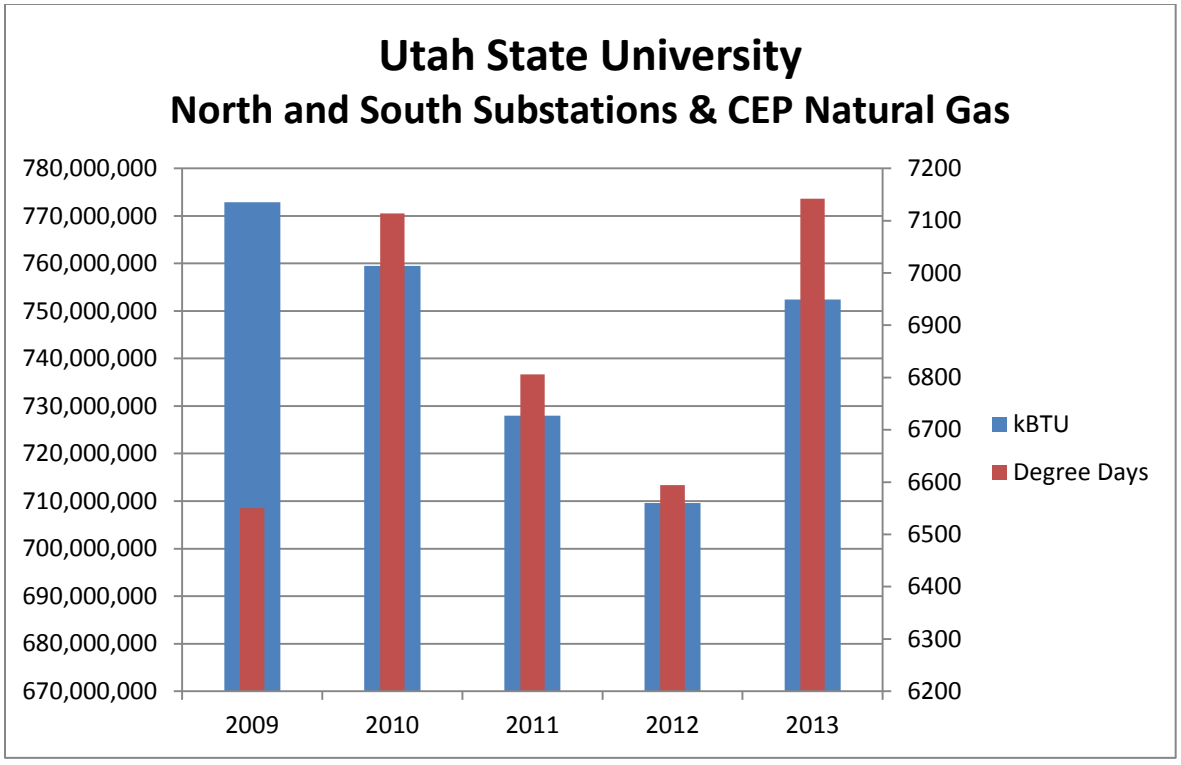


Figure 3. The average energy usage intensity per degree day for buildings on campus over the past 8 years.

The kBTU data was gathered from the natural gas meter at the Energy Plant, which feeds the steam boilers and the Co-Gen unit. Energy data in Figure 3 also incorporates the electrical data from the Universities' north and south substations which feed power to the main campus. The sudden increase in 2013 may be explained in part by the weather in 2013 which had 7114 degree days. Another impact on the data above is the growth of campus. The Early Childhood building was completed in 2009 (65,966 ft^2). Other buildings added to the utility system were the College of Agriculture (131,019 ft^2) in latter part of 2010 and in 2013 the Regional Campuses and Distance Education (41,000 ft^2) and Strength and Conditioning (28,000 ft^2) Buildings were connected.

DIXIE STATE UNIVERSITY
ST. GEORGE, UTAH

Annual Energy Report FY 2014

Prepared by: Bart Peacock
DSU Energy Controls Manager
December 3, 2014

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Overview

During fiscal year 2014, DSU has continued with its efforts with, and been successful in continuing to improve in energy efficiency. Employment of modern technologies, practices and controls has helped us to accomplish this as budgets have allowed. An emphasis on a change of mind-set and habits is gradually helping in this effort as well.

FY14 Points of Emphasis

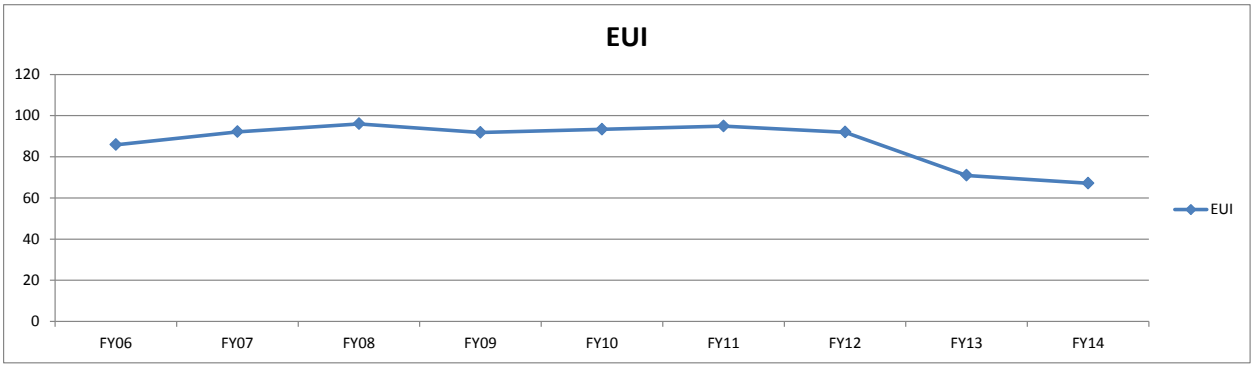
- Continued use and maintenance of improvements made in the ESCO project completed in FY2013
- HVAC event scheduling to closely monitor the times that equipment needs to run outside of normal daily schedules
- LED lighting upgrades and retrofits at the Eccles Fine Arts building.
- Smith Computer Center relief air damper replacement to maintain building static pressure and to correlate with outside air intake
- LED exterior lighting for the lower Encampment Mall
- Thermostat upgrade at the Hurricane Center to employ scheduling and night/weekend setback
- Retrofit of exterior lighting at the Taylor Health Science building
- LED lamp upgrade in the Dunford Auditorium at the Browning Learning Center
- Continued retrofit and replacement of campus wallpack fixtures

FY06-FY14 Usage Data

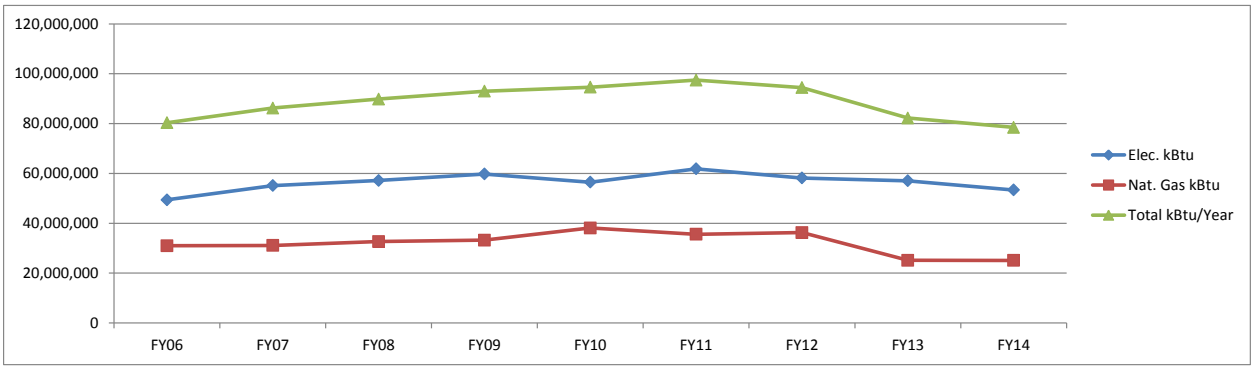
Fiscal Year	$ Electricity	Elec. Usage	Elec. kBtu	$ Nat. Gas	Nat. Gas Dth	Nat. Gas kBtu	Bldg. ft²	$/kWh	kWh/ft²	$/Dth	Dth/ft²	EUI	Total kBtu/Year
FY06	$1,044,663	14,473,451	49,383,415	$313,326	30,966	30,966,300	935,941	$0.07	15.46	$10.12	0.0331	85.85	80,349,715
FY07	$1,062,909	16,158,955	55,134,353	$251,957	31,115	31,114,820	935,941	$0.07	17.26	$8.10	0.0332	92.15	86,249,173
FY08	$1,106,361	16,757,119	57,175,290	$241,299	32,662	32,661,600	935,941	$0.07	17.9	$7.39	0.0349	95.99	89,836,890
FY09	$1,172,445	17,516,284	59,765,563	$261,835	33,242	33,241,590	1,013,265	$0.07	17.29	$7.88	0.0328	91.79	93,007,153
FY10	$1,188,869	16,550,265	56,469,504	$259,794	38,127	38,127,100	1,013,265	$0.07	16.33	$6.81	0.0376	93.36	94,596,604
FY11	$1,192,584	18,127,244	61,850,157	$266,656	35,601	35,600,500	1,027,165	$0.07	17.65	$7.49	0.0347	94.87	97,450,657
FY12	$1,183,738	17,050,963	58,177,886	$248,283	36,277	36,276,900	1,027,444	$0.07	16.6	$6.84	0.0353	91.93	94,454,786
FY13	$1,271,844	16,723,573	57,060,831	$208,337	25,149	25,149,100	1,158,783	$0.08	14.43	$8.28	0.0217	70.95	82,209,931
FY14	$1,324,054	15,641,635	53,369,259	$246,218	25,109	25,109,000	1,168,649	$0.09	13.38	$9.81	0.0215	67.15	78,478,259

Tables

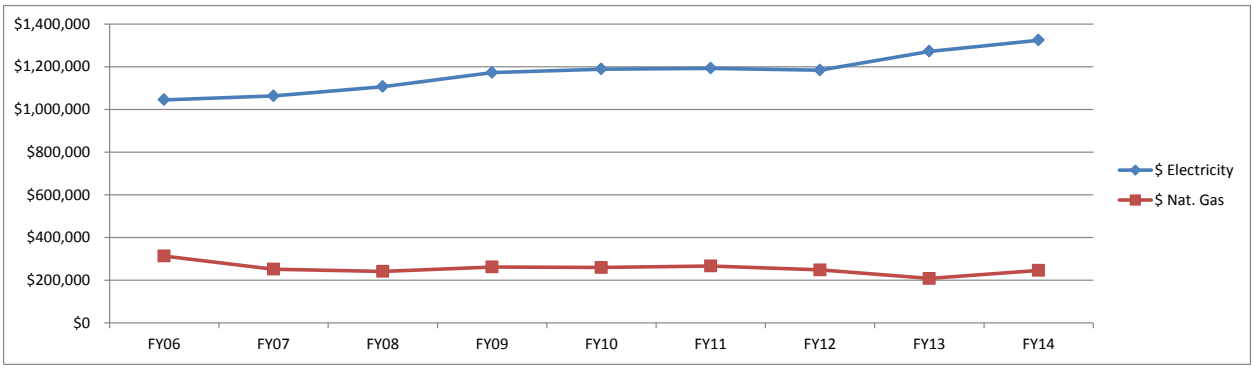
EUI (kBtu/Sq.ft)



Energy Usage (kBtu/Year)



Energy Cost



Conclusion

As one can see from the tables and the data shown, DSU continues to make strides toward better use of energy and its resources. Energy usage is substantially less over time even with 20% more square footage and an increase in student body of over 30%. As energy rates continuing to rise, it's more important than ever to make efforts toward conservation. With continued support, we plan to further implement strategies and technologies through retro-commissioning, improvements and upgrades in order to become more sustainable, energy efficient and better stewards of those resources.

SNOW COLLEGE

PHYSICAL FACILITIES

Energy Report Summary

The energy-saving projects on the Ephraim Campus in FY 2014/15 are as follows.

Ephraim Campus completed projects

- Upgraded 200' of steam and condensate line at Anderson and Nuttall Halls where we will save roughly 1,000 gallons of water every day.
- We installed a small cooling tower at the Humanities building as well as a new 200 ton air cooled chiller. In that project we had new VSD installed for the cooling pumps at the Humanities building and we will be installing VSD's at the Greenwood Student Center on the cooling side since the two buildings share the same chillers.
- Have changed out most of our lighting on campus to T8 lighting. Only a couple low use areas left with T12.
- We have also started to upgrade outside lights with LED bulbs

Ephraim Campus has the following projects planned for 2015

- DFCM exterior lighting project that should go out to bid in December 2014 where we will be upgrading all of our light poles and wall packs on the main part of campus to LED.
- In the process of trying to sub-meter our buildings. We have one that we are going to install at the Huntsman Library as soon as time permits, so we can see how it works and it will give us an idea of how we want to proceed with the metering.

Attachments:

- Pictures of completed projects

Anderson/Nuttall Hall Steam and Condensate Line Replacement

Humanities Building 200 ton air cooled chiller installation

MOUNTAINLAND
APPLIED TECHNOLOGY COLLEGE
American Fork • Orem • Spanish Fork • Thanksgiving Point • Wasatch

MATC Energy Report 2014

Building Upgrade Projects: In May of 2014 the MATC Orem Campus underwent Phase 3 of its renovation of a 3 phase project. The Overall project upgraded lighting systems, heating and cooling systems, insulation R values, networking systems, and building controls to increase efficiencies and reduce energy costs for the 27 year old building. Prior to the renovation, in September 2013 a solar array system was added to the rooftop of this facility. It has produced the energy equivalent to that of the consumption of 5 average households over this past year. At our Orem Campus we had an unusually high amount of cost for our gas utilities in the winter. We brought in Utility Cost Management Consultants found on the State Contract Registry to help us determine a better route in reducing costs for our facility.

1. Orem Campus Phase 3 Remodel contracted amount was $579,241. The new interior design was drafted to increase efficiencies in the following areas:
    - Building Automation System Controls added to the Orem Campus to help monitor HVAC efficiencies.
    - Lighting controls w/occupancy sensors added to regulate lighting efficiencies. New LED fixtures along with high efficiency lighting products were added.
    - Exterior Window added to increase natural daylight
    - Hazardous Waste Management: The following hazardous materials were removed prior to construction for Phase 2
        1)PCB Ballast Throughout
        2)Fluorescent Light Throughout
        3)Refrigeration Units
        4)Thermostats
2. Mountainland Applied Technology College Orem Campus Solar Array:
    - Blue Sky is a renewable energy program sponsored by Rocky Mountain Power. MATC pursued and was awarded a grant for the College from the Blue Sky program in 2013 for an amount of $86.648 to fund a photo-voltaic solar grid that was placed on the roof top

of the MATC Orem Campus. This solar array produces on average over 52,262 kilowatt hours of energy.

The MATC is proud to take an active part in producing and using renewable energy. We are also appreciative to Rocky Mountain Power and its efforts in helping to encourage the development of new renewable energy facilities and reduce the need for other, non-renewable sources of energy through its Blue Sky program.

3. Utility Cost Management Consultants has a cooperative contract with the State of Utah to work on cost saving utility projects. They analyze utility usage and make suggestions on how to lower costs. If we implement their suggestions, we pay them 50% of our cost savings for a predetermined amount of time.
    - At our Orem facility we had a high rate of natural gas usage. UCMC first made sure that there weren't any billing errors. Then they suggested that we buy natural gas for Orem on the open market instead of from Questar. UCMC projects that we will save $40,000 this year on natural gas. We are able to buy natural gas from the BP (British Petroleum) State of Utah Cooperative Contract. Switching from Questar to BP required paperwork and telemetry equipment, but we had the change done in 3 months.

Energy Report 2014

Ogden=Weber Tech College **12/1/2014**

Energy 2014

Performance Energy Management

OWATC Facilities Director

Campus Perspective

"Where are we now, where are we going"

"Energy cannot be created or destroyed; it can only be changed from one form to another."
— Albert Einstein

The College is the process of transforming our existing infrastructure into a new and improved model. We are always looking and searching for ways to improve our energy consumption and use habits. Updating our aging infrastructure will allow the College to become better steward of our energy consumption and usage.

We have used the Capital improvement dollars that are allocated to the College to upgrade a campus that on average is 40 to 50 years of age.

As quoted by Einstein we are changing our energy use from one form to another. We have used DFCM Energy funding to re-commission our campus system to perform more efficiently and effectively to best support our mission here at the college. This re-commissioning has saved on most of our utilities.

New Projects slated for FY 2015 are Campus Wide

Exterior Lighting conversion to LED from incandescent. This is projected to reduce our cost for Exterior Lighting by 50% or better. We are also replacing two old 4 compressor chiller banks that are located in our Business Tech Bldg. with a two new scroll compressor modular units that are expected to reduce our energy load by 33% for that building.

We are continually looking for ways to reduce our energy consumption and be good stewards of the tax payer's dollars.

Solar Water and Photo Voltaic are on our horizons. We would like to isolate some of our lighting systems in our buildings and work to using solar to generate our needs power for lighting. We are also investigating the use of solar water heating to be used in our reheat coils during the summer, thus providing us the opportunity to shut down our heat plant during the summer months. This would help reduce out carbon foot print during a part of the year thus saving energy.

Our Campus continues to grow. The most recent growth has come in the form of a new building, an 85,000 Sq.Ft. Health Technology building. During programing and construction we embraced the LEED standards and work with our Architects , 'GSBS' and General Contractor 'Okland Construction' to make a building that was both appealing and functional. We followed the LEED processes and came away with a wonderful' LEED GOLD' rated facility. The LEED process has now been incorporated into all facets of our improvements to College facilities. We had been having some dirty power issues and we were not meeting our demand from Rocky Mountain Power, so when we brought this new building on line we anticipated a large bump in our power consumption, but interestingly enough the bump was much smaller than anticipated. With the power factor modifications we were able clean up our campus wide power grid.

New technology that we are looking into is a whole campus energy monitoring system, like the one be used by our local government 9 story office building. We want to make sure that all utility sources and use is monitored on a minute by minute, hour by hour and day by day, to come up with realistic improvement areas. This will truly paint a graphic that will allow us to truly visualize the savings implemented across our campus. We feel that we need to understand where we are before we make an attempt to steer the future.

PATRICK DEAN
OWATC Facilities Director

DXATC
Dixie Applied Technology College

DXATC Energy Report 2014

Building Upgrade Projects:

- In September of 2014, the DXATC added the Emergency Response Training Center to its educational facilities. The building was a remodel of the previous home of the St. George Municipal Airport. Working closely with DFCM, DXATC installed a variety of energy efficient and sustainable systems for lighting, upgraded heating and cooling, and networking as well as programmable building lighting, parking lot lighting, and HVAC controls in an effort to increase energy efficiencies and reduce energy costs for the operations of the remodeled building.

- With funding from DFCM, DXATC was also fortunate in being to install a new foam board and rubber membrane roofing system at the old airport, replacing a deteriorating and leaking roof.

- Being a year one building, baseline energy consumptions will be monitored in order to provide preliminary information on the efficiency of these systems and will be used for future energy saving initiatives.

Thank you,
Vic Hockett
Vice President of Operations