STATE OF UTAH

STATE BUILDING ENERGY EFFICIENCY PROGRAM
FY 2016 ANNUAL REPORT

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STATE BUILDING ENERGY EFFICIENCY PROGRAM
ANNUAL REPORT TO THE GOVERNOR AND THE LEGISLATURE
FY 2016

Prepared by
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Division of Facilities Construction and Management

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MAKING STATE OF UTAH–OWNED BUILDINGS MORE EFFICIENT

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.

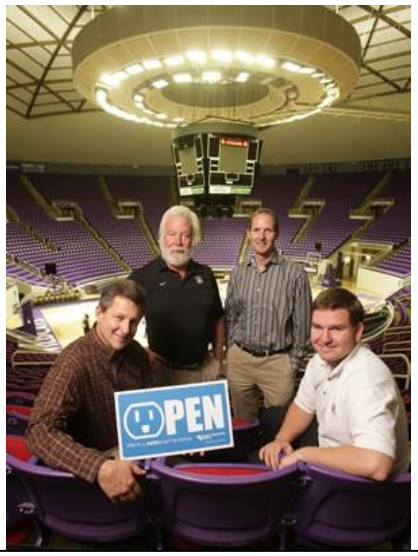
Energy Efficiency Incentive Programs for New and Existing Buildings

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 19 projects have utilized this funding with an **average simple payback to the fund of 4.25 years**. Current loans that have been approved by the Utah State Building Board have an **average annualized Return on Investment to the State of 27.89%.**

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 (AEE).

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

Bianca Shama, MPA, Energy Program Director/Interim Energy Manager

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 master's degree in psychology from

Adelphi University and in 2011 completed a master's 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 a member 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, CEM, Energy Program Director

John joined DFCM in the fall of 2011. His work includes overseeing the implementation of the State's High Performance Building Program for new construction, including the High Performance Building Standard (HPBS). In support of this effort, he is constantly analyzing the effects of the program and revising the standard as necessary to further enhance the performance of state owned buildings. As part of the HPBS program for new construction, John manages the energy engineering, building envelope commissioning, and building systems commissioning consulting efforts for each development project. This includes providing technical advice and facilitation of an integrated process to maximize the effort of each specialist. Additionally, he is actively engaged in providing training and informational presentations to private sector firms and companies that design and build the State's buildings. He works with the State agencies and institutions to develop agency-wide energy management plans and programs as well as identifying feasible energy efficiency projects, including Energy Savings Performance Contracts. He also works on State initiatives that measure facility energy performance and maximize available utility incentives.

John holds a master's degree in 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. He is currently on the national board of NASFA, the Building Enclosure Council of the AIA & NIBS, as well as the local AEE board.

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 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 to 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 AEE.

Kimberly Hood
DAS Executive Director

Eric Tholen
DFCM Division Director

Cee Cee Niederhauser
Administrative Assistant

Melissa Powers
Office Technician II

Development
Jim Russell
Assistant Director

Building Operation and Utilization
Bruce Whittington
Assistant Director

Construction Contracts
Denise Austin
Marla Workman
Purchasing Agents

VBS & Performance Ratings
Dana Edwards
Program Specialist

Document Management

Gail Youngblood
DFCM Support Specialist

Capital Improvement
Darrell Hunting
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Project Management

Bob Anderson
Tim Christensen
Lucas Davis
Brent Lloyd
Taylor Maxfield
Randy Mellor
Dwight Palmer
Tim Parkinson
Rob Robinson
Wayne Smith

Capital Development
Mike Ambre
Manager

Project Management

Brian Bales
Matt Boyer
Clint Bunnell
Brad Demond
Dave McKay
Matthias Mueller
Craig Wessman

Energy Development
John Burningham

Building Code Official
Patrick Tomasino
Manager

Thomas Peterson
Assistant Building Code Official

State Building Energy Efficiency
Vacant
Manager

Energy Improvement
Bianca Shama

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Real Estate
Lee Fairbourn
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Operation and Maintenance
Internal Service Fund

Jake Jacobson
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VACANT
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Service Contracts
Joanna Reese

Priscilla Anderson
Research Analyst

Allyson Spevak
Office Specialist

Rocio Briceno
Office Specialist

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 4/18/2016

ENERGY MANAGEMENT PROGRAMS AND STRATEGIES IN FY 2016

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 with 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. DFCM is working with the University of Utah to further refine small building standards and processes. Several projects have been built and several are underway that provide occupants a well built, comfortable, sustainable, energy efficient building, all while setting the stage for low operations and maintenance costs over the life of the building. 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. Energy Modeling and Engineering (EME) of new buildings is required by the HPBS section 5.0 of the DFCM Design

requirements. 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. To date, DFCM has implemented analytics on six development projects and partnered with SLCC in implementing analytics on their existing buildings.

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. To date, DFCM has completed and tested/verified the envelope performance of 32 new buildings with 26 currently in design or construction.

Building System Commissioning

Over the last six 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 properly installed, inspected, tested and optimized per DFCM's HPBS, energy savings are realized. Additionally, operating costs are lowered, warranty issues decline, occupants are more comfortable and building managers receive better training and record drawings. 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.

Additional components of the HPBS include guidelines for energy metering, benchmarking, life cycle cost analysis, facilities management training and proper development of owners requirements. These efforts will provide a holistic and comprehensive approach to designing, building and operating State buildings over their expected fifty-year life.

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 Developmental Center—DHS

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 2016 SBEEP continued to drive the installation of cost-effective solar projects and was able to complete another 2 installed solar projects in the State of Utah that are annually generating approximately 2,110,494 kWh with a 20-year average annual cost savings of $94,256.

Goals for Energy Efficiency for FY 2017

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 works to collaborate 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.

Utility Tracking for All State Agencies

In order to provide the best value to our customers, it is important we find an effective way to centralize all utility consumption information at DFCM for all State-owned facilities. Once we have this data, the critical role of SBEEP will be to use this information to guide focus and efforts into the poor performing buildings for each agency. By providing a centralized solution to collect and report utility data, the SBEEP can continuously monitor monthly data and use it to inform agencies on where resources might best be spent to reduce money spent on utility bills. The data we collect will determine how buildings compare to their usage over time and how they perform against other buildings of similar use, as well as how they compare nationally against peers using the 1-100 Energy Star score. SBEEP can prioritize efforts based on those agencies that have the poorest performing buildings and start collaborating with those agencies to assist in developing a plan to address why these facilities may be performing below expectations. **Not only will this information be useful in efforts to reduce energy expenses for agencies, but it will also offer a simplified way to report out annual O&M expenses per SB 217 requirements**.

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 has Energy Management Applied Science associate's 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 to 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 programs. 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 grant applications and 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 expense 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.

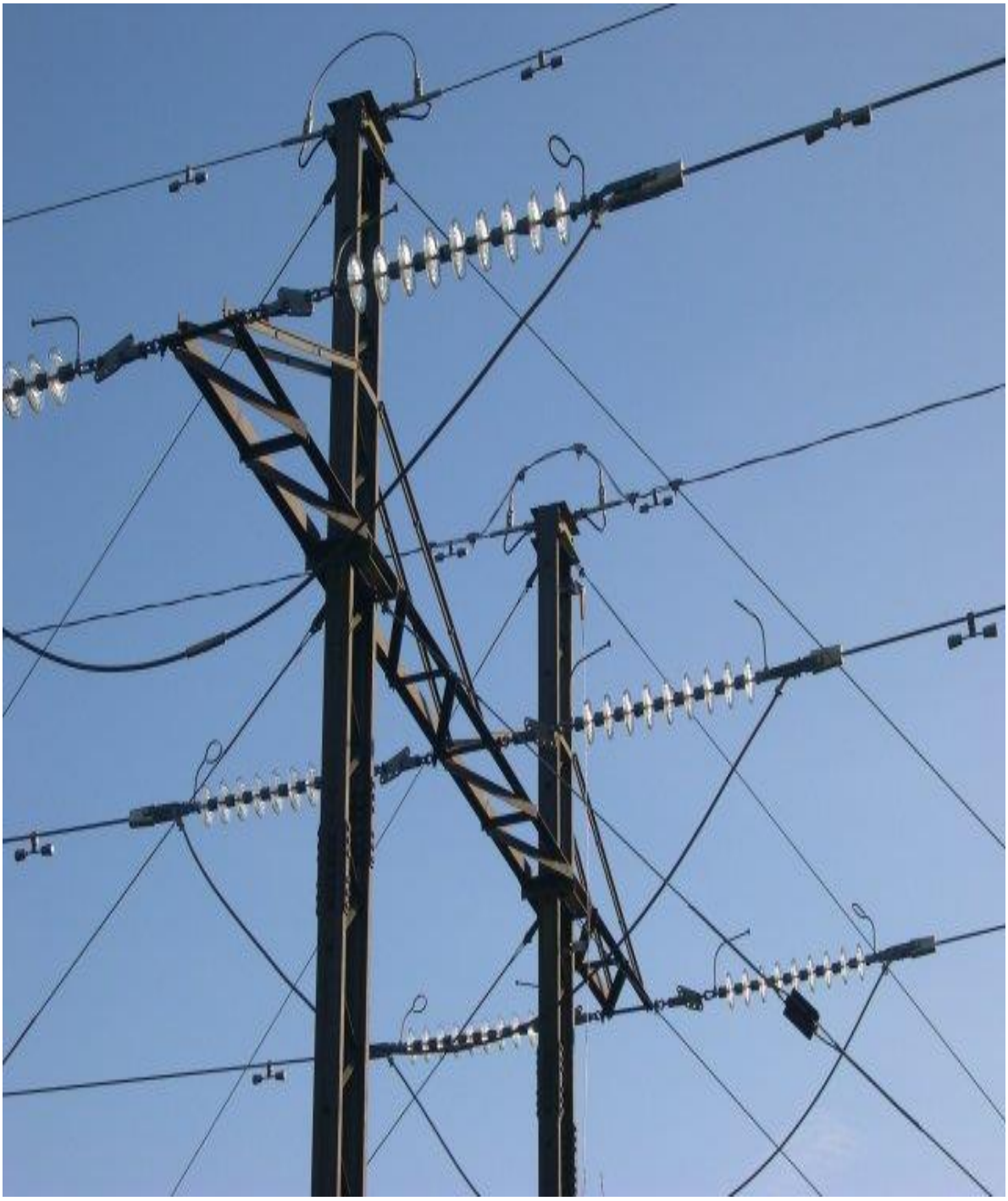
Ongoing education of DFCM consultants and service providers

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 high performance buildings. While the amount of time required implementing the HPBS has not diminished, the overall yield and long-term value has increased dramatically. With DFCM leading the way on building performance by leveraging the HPBS, it has the benefit to actively tailor its program, resulting in a well-fitted effort that focuses on the priorities and needs of those who use and operate State buildings.

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 $	# of pmts	Annual Savings	Simple Payback Years	Simple ROI
USU HPER Lighting Upgrade	$62,470.00	20	$12,281.00	5	19.66
JJS MILLCREEK LIGHTING/OGDEN O&A LIGHTING/HVAC (SFEEF)	$46,958.64	6	$6,910.00	5.7	14.72
UDOT MURRAY/WANSHIP MAIN ST LIGHTING (SFEEF)	$7,867.68	4-yearly	$2,046.00	3.3	26.01
USU Lighting Upgrades at Biotech, CPD, and Geology Buildings	$115,247.00	20	$23,278.00	5	20.20
WSU Steam Tunnel Repairs & Upgrades	$300,000.00	12	$96,000.00	4.4	32.00
UVU ESCO Phase II	$250,000.00	21	$16,200.00	5	6.48
USU Campus Wide Steam Line Improvements	$585,000.00	15	$164,000.00	2.58	28.03
USU Housing Lighting Efficiency Upgrade	$161,534.65	11	$59,222.51	3.9	36.66
Snow College Recommissioning	$100,000.00	8	$50,000.00	2	50.00
Weber State University- Recommissioning	$400,000.00	11	$150,000.00	2.75	37.50
University of Utah Evaporative Cooling	$300,000.00	6	$213,800.00	1.7	71.27
USU Central Utah Steam Pipe Insulation	$179,388.82	8	$89,991.00	2	50.17
SLCC Steampipe and Controls Upgrade	$100,000.00	13	$29,390.00	3.4	29.39
USH VFD Loan	$18,233.00	23	$3,266.00	5.58	17.91
DNR Nash Wash Wildlife Management Area	$35,400.00	2	$6,900.00	5	19.49
SLCC Lighting Upgrades	$700,000.00	28	$107,500.00	4.2	15.36
Heber Valley Railroad Lighting Upgrades	$20,560	20	$2,500	8.2	12.16
University of Utah RCx	$203,000	15	$54,000	3.75	26.60
Salt Lake Community College CHP	$519,930	29	$75,018	6.9	14.43

Utility Rebate Savings

FY 2016

Rocky Mountain Power and Questar Gas

Total Incentives Brought Back to Construction Projects:

$349,047.15

Total Annual kWh Savings:

2,814,345 kWh

Total Annual Dth Savings:

525.30 Dth

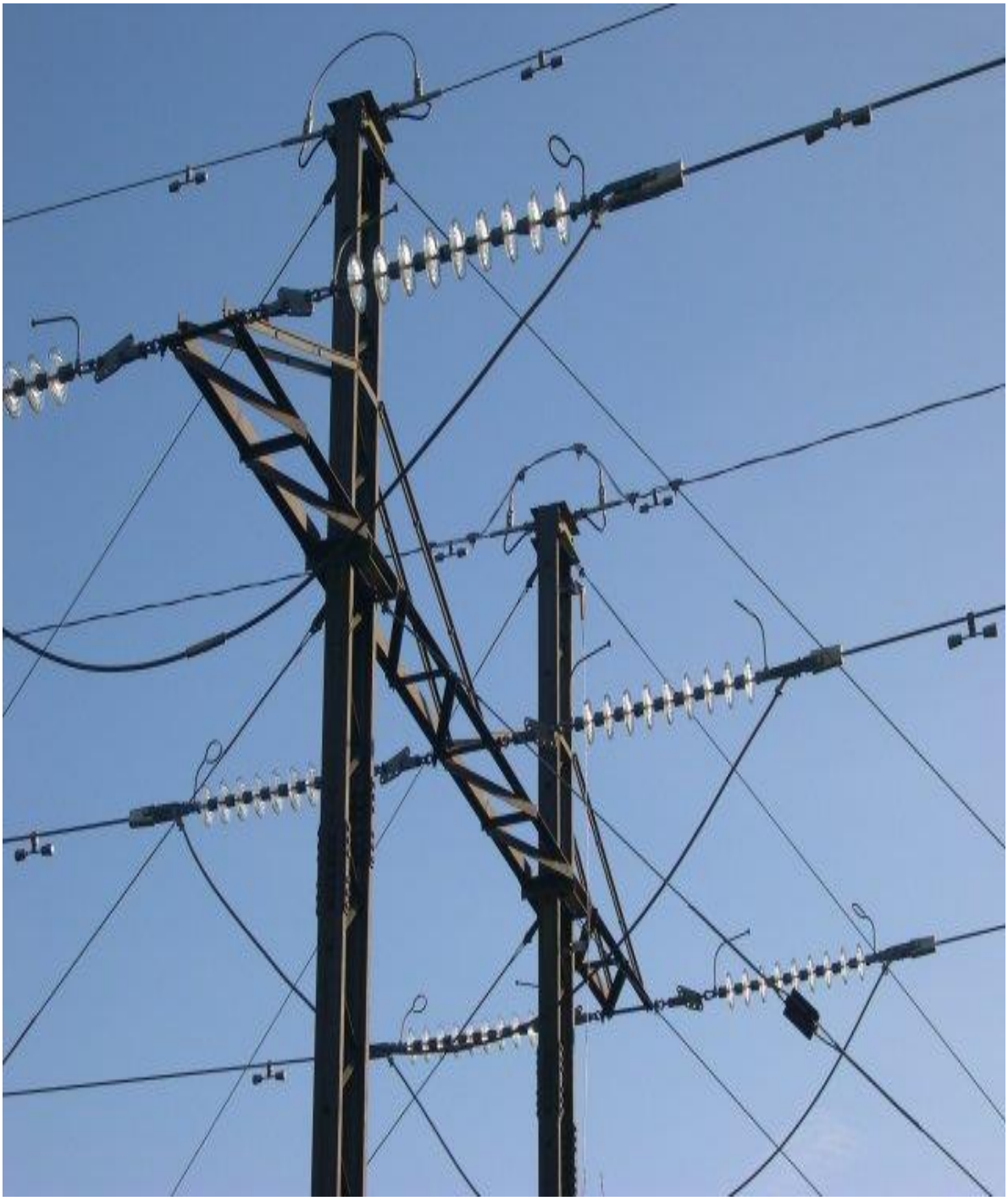
Total Ongoing Annual Savings:

$245,533.61

Renewable Projects

	Annual PV Generation kWh	Financial Structure	Grant funds
WSU Shepherd Union Solar Array	51,977.00	direct own	$221,000
WSU Davis Campus Solar Array	28,205.00	direct own	$68,000
DATC Solar Array	79,324.00	direct own	$279,315
Unified State Laboratories Solar Array	44,844.00	direct own	$400,000
UNG ESCO Phase 3	52,758.00	direct own	$170,000
UVU ESCO Phase 4	47,439.00	direct own	$430,000
USU Solar Array on New Ag Building	86,783.00	direct own	$700,000
SUU Solar PV Panels Addition	189,154.00	direct own	$160,000
Dixie ESCO Phase 3	25,032.00	direct own	$160,000
SLCC Miller Campus Solar Array	30,600.00	direct own	$147,061
UofU Campus Solar Project	802,000.00	PPA	$1,000,000
UofU Rio Mesa Solar Project	3,022.00	direct own	$39,900
UDOT Traffic Operations Center Solar Array	17,280.00	direct own	$73,000
UU Marriot Solar Array	52,920	PPA	$58,900
UU HPER N Solar Array	143,640	PPA	$73,270
SLCC Lifetime Activities Center Solar Array	509,796	PPA	$260,920
UNG Draper HQ Solar Array	517,650	direct own	$175,225
Olympic Oval Solar Array	1,147,356	PPA	$750,000
9 UNG Sites	4,000,000	direct own	$7,000,000
DNR Vernal Solar Array	82,000	direct own	$200,000
OWATC	1,966,972	PPA	$750,000
Moab Regional	143,522	Direct own	55,819.95

APPENDIX B



Fiscal Year 2016 Annual Energy Report

Prepared by: DFCM Energy Group

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State of Utah Energy Report July 1 2015 to June 30th 2016

Overview

The Division of Facilities and Construction Management is in the process of acquiring software to automatically track the usage of Electricity, Natural Gas and water. Usage and cost data will be analyzed to improve energy consumption for DFCM managed buildings. It will help us clearly identify which projects are most successful in reducing energy consumption and highlight the buildings need our attention the most. In the past we have hand entered utility bills. Because of the overwhelming utility accounts we have keeping it up to date has become impossible. Furthermore all the information is subject to human error. The new system proposed has identified all these challenges and we expect to have a fully functional system working in fiscal year 2017.

Totals

1. Energy Saved for fiscal Year 2016 in all DFCM managed project overseen or completed by the energy group:
   - Estimated ongoing Electricity savings
     - kWh Saved: 1,268,233
     - Cost Saved: $105,450.11
   - Estimated ongoing Natural Gas savings
     - Therms Saved: 490,600
     - Cost Saved: $8,738.71
2. Utility incentives collected in FY 2016: $140,137.44

Other projects we have started this year that were not reflected in fiscal 2016 numbers-

- Office of Education interior lighting project. The energy team used funds that were to be used to relamp this building with new florescent lights. We instead were able to change out every light with energy efficient LED lights as well as provide all new lighting automation throughout the building. RMP estimated the savings to be 517,031 kWh a year // that's over $32,000 saved annually from power charges alone. That does NOT include the savings from demand charges that are 35%-40% of every bill.
  Furthermore, several lights are dimmed 30% to create additional savings & longevity that are not included in these numbers.
  This project alone produced a $77,905.20 incentive check from RMP (NOT included in this fiscal year. Because check was received 10/12/2016 ie. Fiscal year 2017). This money will be used to re-light the parking lot using LED lights that will consume 64% less energy, not including the additional lighting controls that will be used to reduce energy consumption even further.
  All the lights and controls in that building are under warranty for the next 5 years and expected to be maintenance free for 10 years. Beyond great energy savings we no longer have high maintenance lights.
- Cannon Health lighting upgrade is estimated to save over 300,000 kWh/yr or $20,700+ every year. With an estimated incentive of $28,000
- DWS Admin, has committed to update the 3rd and 4th floor, starting end of January, and is considering having the 1st & 2nd floor, as well as 2 levels of parking done at the same time. All paid for out of DWS Agency funds, benefiting DWS, DFCM, and all Utah taxpayers.
- Regional 1 / DWS Call center will have the whole interior updated, paid by ISF O&M funds and DWS Agency funds.
- ABC#16 lighting project to start first week of January. We estimated utility incentive check of $7,542.78 // Saving $4,907.86 & 78,558 kWh a year.

- As of today we have 5 parking lots that will have updated lighting projects in process with huge savings projected.
- We are looking at several other buildings to add to this ever growing list of similar projects.
- We have and will continue to help other agencies to take advantage of all these programs.
- DNR east and west buildings. I'm in the process of working with RMP, and their elite engineers to design the building and lighting automation project. As of now we have identified roughly $80,000 in possible utility incentives we will be able to utilize in order to complete this underfunded project without cutting any corners. Increasing occupancy comfort, increased savings, utilizing the best technology.
- State Library HVAC upgrade project. We are utilizing RMP's elite engineers on this project as well. This project involves all HVAC equipment, and building automation. We have not been able to calculate all of the estimated energy savings in this project as of yet. But its already looking like it will be a VERY successful project.
- Calvin Rampton HVAC & controls project is another project we working with RMP on to achieve the best end result, and utilizing incentive money to stretch our tax dollars so much further.

Summary

- Extensive lighting retrofits have not only reduced energy consumption, but have also increased reliability, better light distribution and improved safety and comfort of building occupants. Due to exterior lighting improvements at Rio Grande, Art House, Heber Wells, Ogden Regional Parking, etc. are all experiencing less vandalism and crime as a result of better lit areas, as well as reduced energy costs and consumption.
- Upgraded HVAC equipment such as VFD's, "Fan-Wall" systems, up to date building automation, with proper sequencing has enabled the building to have better air distribution for increased occupancy comfort with less noise, reduced energy consumption, and increased reliability.
- Involving Rocky Mountain Powers engineers in our projects, not only gives us more money for the project utilizing the incentive money, but it also insures the best equipment for the money, drive's energy costs down, increases occupant comfort, security, and safety.
- Find-n-Fix Commissioning program
  - A continued commissioning program would better improve our building performance.
  - The continued work with facility managers to ensure all building automation is working correctly. Checking and adjusting building set points, schedules, and sequencing will reduce energy cost and longevity of equipment.
  - Identify components that need to be: adjusted, repaired or replaced with better equipment.
  - Identify funding sources that may be used for continued commissioning of facilities and oversight

Although fiscal year 2016 was a successful year, we are very excited for all the work lined up for fiscal year 2017 and beyond.

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of Human Services

ANN SILVERBERG WILLIAMSON
Executive Director

MARK L. BRASHER
Deputy Director

Office of Fiscal Operations
JENNIFER C. EVANS
Director

The Department of Human Services (DHS) has taken an aggressive approach to energy conservation, beginning with energy conservation initiatives introduced department-wide in 2009. The following represents the actions taken to help reduce overall DHS consumption of electricity, as well as efficiency strategies and measures to continue reducing energy consumption in over 200 facilities located throughout the State.

Lighting Measures
DHS maintenance and staff, in cooperation with DFCM, have evaluated all State owned facilities occupied by DHS, and have either upgraded the lighting to LED, or are working toward upgrading the lighting, in an effort to improve and convert buildings to efficient lighting. DHS has educated staff on proper usage of lighting, including the elimination of halogen bulbs and lamps in all facilities. DHS also encourages these same efforts in employee's personal homes. DHS has worked with DFCM to reduce the amount of lighting in those areas where the amounts of lumens exceed standard lighting requirements. DHS also requires a completed DFCM light modification form from employees who request any modifications to office lighting. DHS continues to monitor offices where halogen bulbs have been present, and have worked with staff to have those removed. In an effort to reduce halogen bulbs, this measure was added to the annual preventative audit so these bulbs can be found and removed. This includes bulbs used in personal desk lamps or candle warmers. Most lighting in DHS buildings is now comprised of compact fluorescent lights, and many are switching to LED lighting. DHS has been successful in installing lighting control systems and educating employees regarding when to turn off lights, computers, monitors and copy machines. In the past, some employees disconnected the incandescent light bulbs from light ballasts, due to lights being too bright. To avoid spent energy being wasted, the bulbs have been reinstalled, and light shields and bulb sleeves were purchased and installed in appropriate areas to reduce the amount of light in individual offices or workstations. DHS has also taken measures to teach staff about energy saving and promoted turning off lights in offices or rooms when not in use.

Personal Computers and Appliance Measures
DHS continues to encourage employees to turn off printers and monitors when not in use. DHS also monitors all buildings for personal appliances. No personal appliances are allowed in individual offices. If personal appliances are found, employees are instructed to remove them from the building.

Energy Awareness Measures
In an effort to educate more tenured employees, DHS holds "table top" trainings during Division/Office staff meetings throughout the State. DHS also performs routine inspections of the facilities for compliance and awareness. The majority of DHS buildings are also participating in various forms of a recycling program. DHS continues to incorporate energy conservation measures into safety bulletins to provide education in energy awareness.

Partnerships and Reduction Measures
DHS has worked with several vendors that have audited and analyzed our energy consumption in the facilities. Over the past several years, DHS has worked with vendors to find ways to save money and reduce energy consumption. DHS has utilized the energy personnel within DFCM to perform efficiency testing in facilities equipped with boilers to ensure they are operating at peak efficiency. DFCM is also installing solar panels at the Moab facility with a savings estimate of 40-50%. We are currently discussing solar panel installation at the administration building with

DFCM as well. DHS has additionally partnered with the Department of Environmental Quality, and has a representative attend “green team” meetings in an effort to find ways to be more eco-friendly and recycle more everyday products.

Fleet Services

DHS has also incorporated energy savings in our fleet vehicles. With over 400 fleet vehicles throughout the state, DHS wanted to create goals that would result in savings. DHS utilizes hybrid vehicles where possible and carpooling for work needs when available. For FY17, DHS will again participate in the telematics pilot program and work with State Fleet to add telematics to all DHS fleet vehicles. The units will track idle time, appropriate use, and vehicle utilization. Part of the pilot includes educating employees on the effort to reduce fuel consumption by reducing overall idle time. Additionally, DHS encourages routine preventative maintenance checks, outside of suggested maintenance mileage. This helps track tire pressures, to make sure proper tire pressure is maintained and there is even wear on tires. DHS maintains a fleet vehicle maintenance record of 99% which helps save fuel.

UTAH DEPARTMENT OF CORRECTIONS

THE STATE OF UTAH

ENERGY REPORT FOR FY16 (YEAR 12)

Remit to: Utah Department of corrections
Attention: Greg Peay
14717 Minuteman Drive,
Draper, Utah 84020

Prepared By: Brian Tanahashi, ESPC II

Johnson Controls, Inc.

January 12, 2016

Johnson Controls

Contents

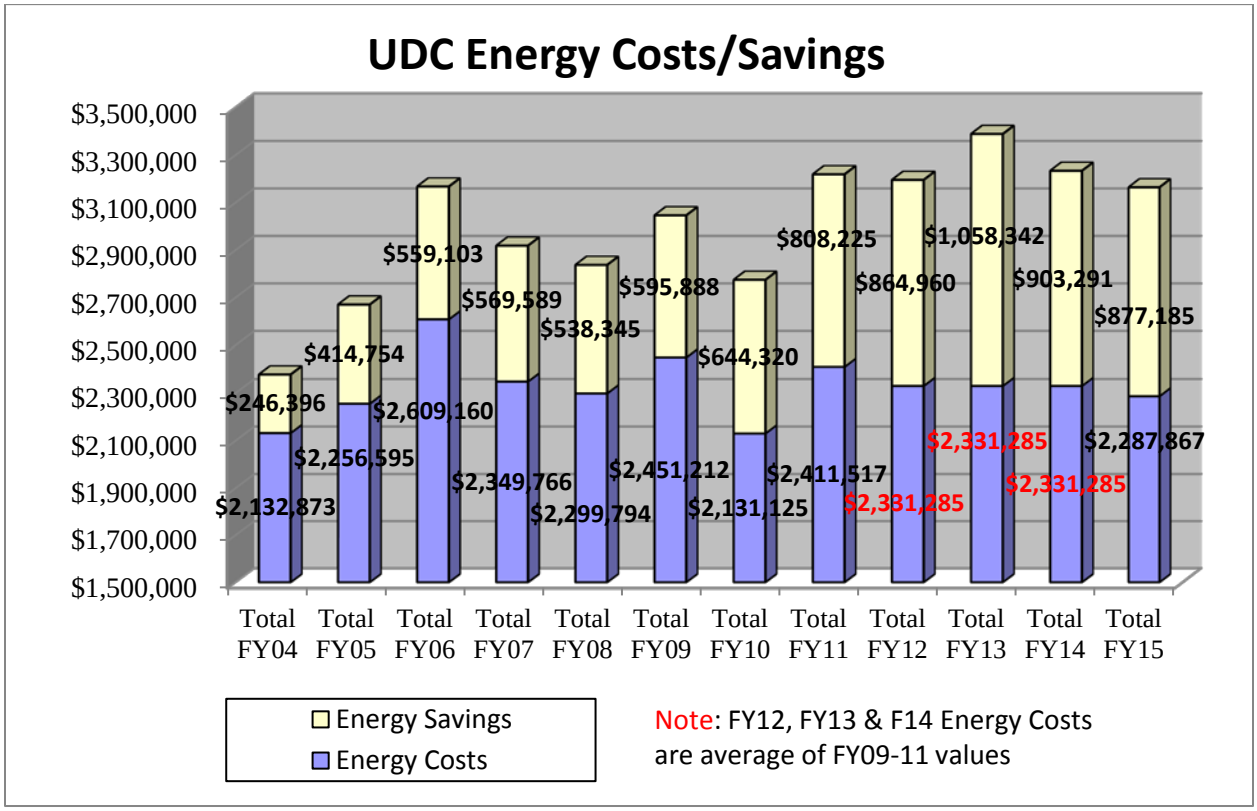
PART 1 - EXECUTIVE SUMMARY (2015)

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 for this report is from July 1, 2015 through June 30, 2016.

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

As seen in the Saving Summary Table text, which follows the Chart, the avoided costs for FY16 are $917,189 as compared to guaranteed amount of $1,035,966. **This leaves a shortfall amount of $118,777 for Year 12.** This includes adjustments of $445,797 to the verified savings of $471,392. The total savings for this project to date is $8,997,586. Savings details are presented in Appendix A.

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 chart below depicts the energy savings additive to the energy cost.



Savings Summaries

The tables below summarizes the Year 12 savings by building, by Measurement and Verification (M&V) measure, and by project. Savings values are based on Option C savings, which uses the higher of the contractual escalated utility rate or the actual utility rate, as well as agreed upon stipulated values. Values presented in these tables include baseline adjustments and stipulated values.

Source	Verified Savings			
	Energy Savings	Solid Waste	Water / Sewer	Total
Administration - Electric	$16,654			$16,654
Administration - Gas	$2,558			$2,558
South Point - Gas	$454,198			$454,198
North Point - Gas	$45,515			$45,515
FHA - Gas	$1,917			$1,917
Lighting Retrofit	*$137,919*			*$137,919*
Promontory Gas	*$3,272*			*$3,272*
Lone Peak Gas	*$3,557*			*$3,557*
Wasatch/Timpanogos		*$28,462*		*$28,462*
Facility Wide			*$223,137*	*$223,137*
Totals	$665,590	*$28,462*	*$223,137*	$917,189

Italics indicate Stipulated Values

Source	Verified Savings			
	Energy Savings	Solid Waste	Water / Sewer	Total
Measured Savings Electric and Gas (Option C Metrix)	$520,842			$520,842
Lighting Retrofit	*$137,919*			*$137,919*
Promontory Gas	*$3,272*			*$3,272*
Lone Peak Gas	*$3,557*			*$3,557*
Wasatch/Timpanogos		*$28,462*		*$28,462*
Facility Wide			*$223,137*	*$223,137*
Totals	$665,590	$28,462	$223,137	$917,189

Italics indicate Stipulated Values

	Energy Savings	Solid Waste	Water / Sewer	Total
Verified Savings	$665,590	$28,462	$223,137	$917,189
Guaranteed Savings	$742,721	$28,462	$264,783	$1,035,966
Variance	($77,131)	$0	($41,646)	($118,777)

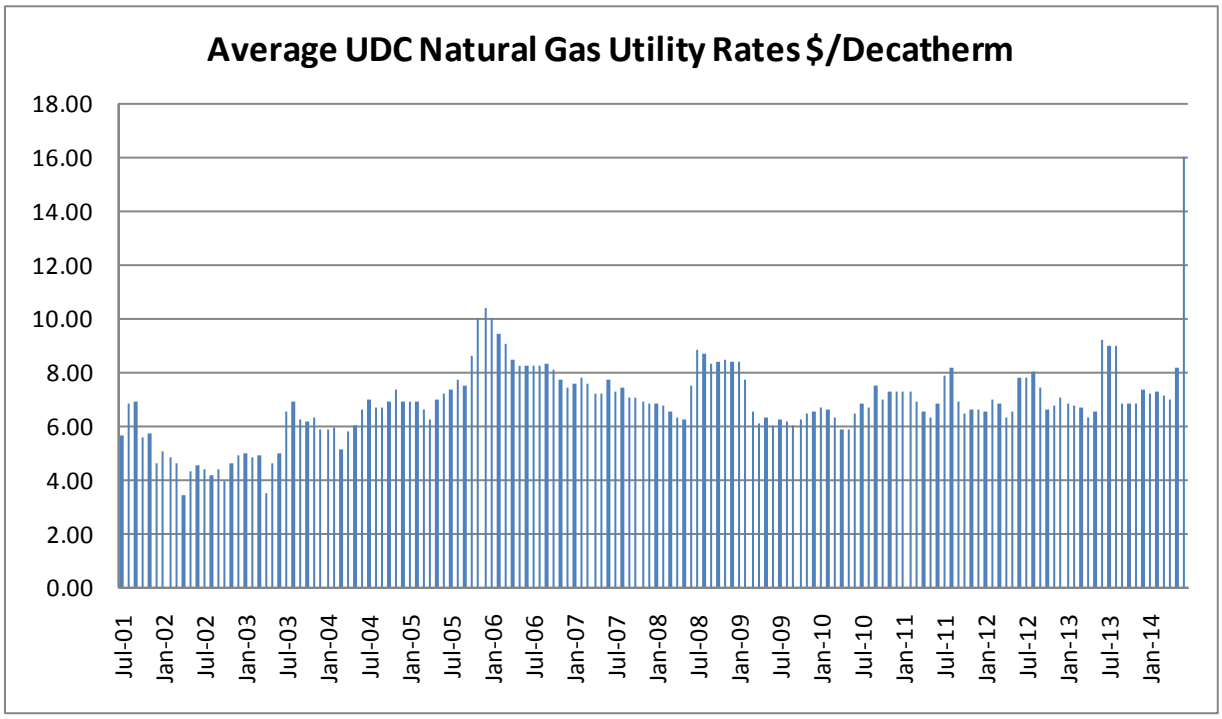
M&V Methods

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 both phases is Option C. Option C is an industry standard as defined by International Performance Measurement & Verification Protocol (IPMVP).

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 A.

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 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 colder 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 or 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)

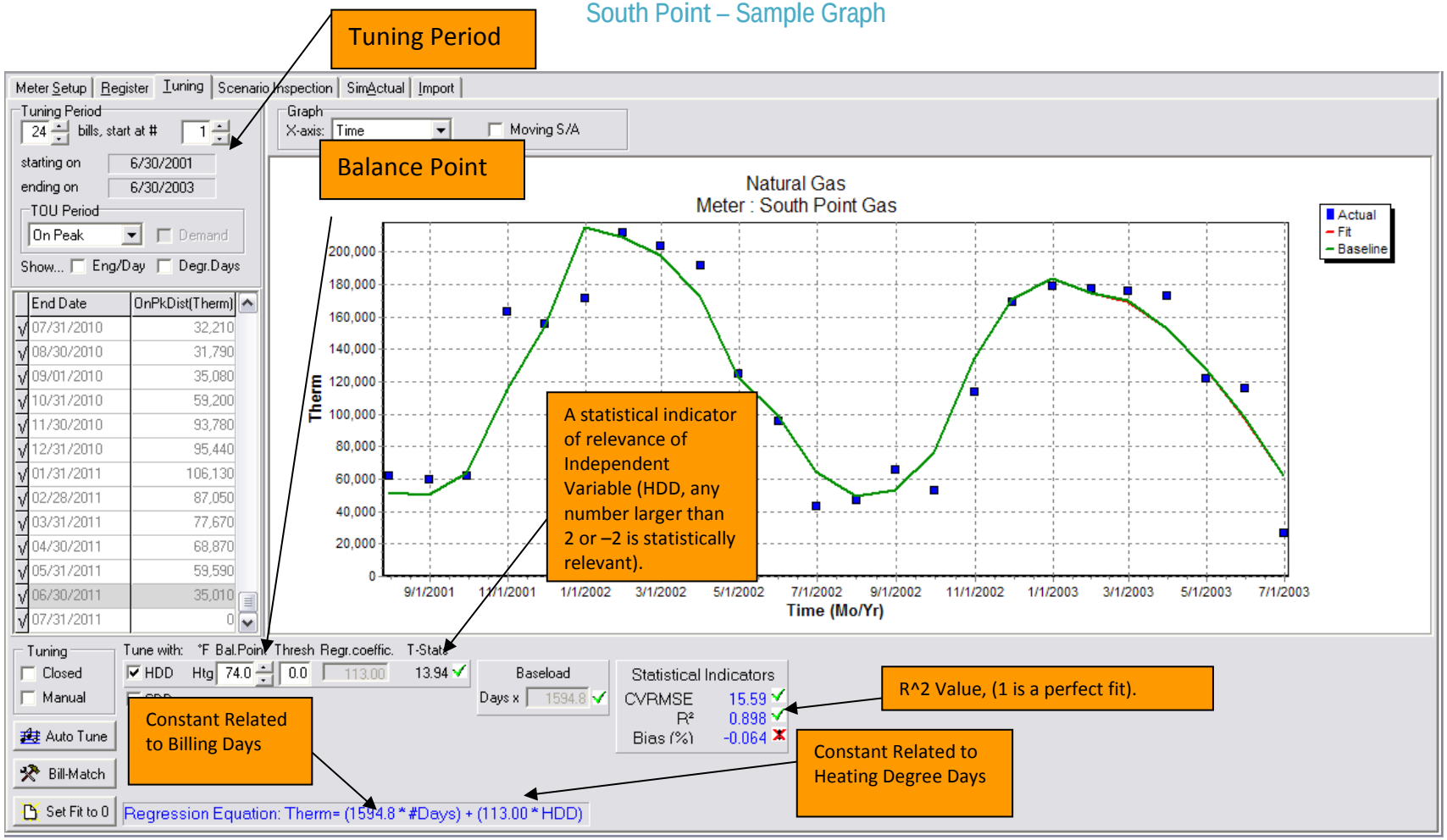
HDD is the actual, measured number of heating degree days for the current billing period (from a nearby weather data station).

Note that HDD changes every month, year after year. This is the link between the model and current conditions.

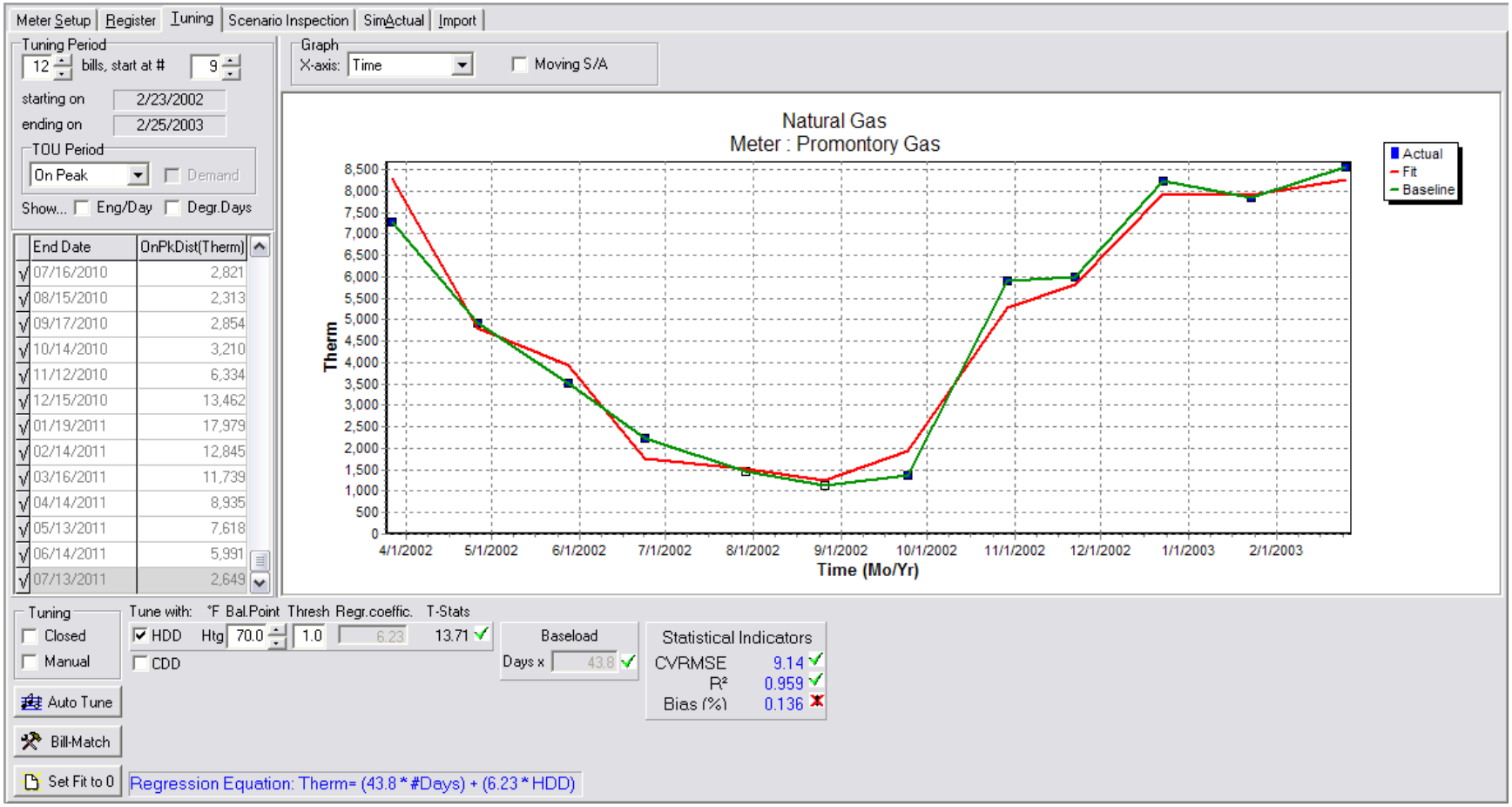
The following charts are the established regression equations associated to establish the baseline model and annual savings for the various meters

Metrix Regression Equation and Key Parameters

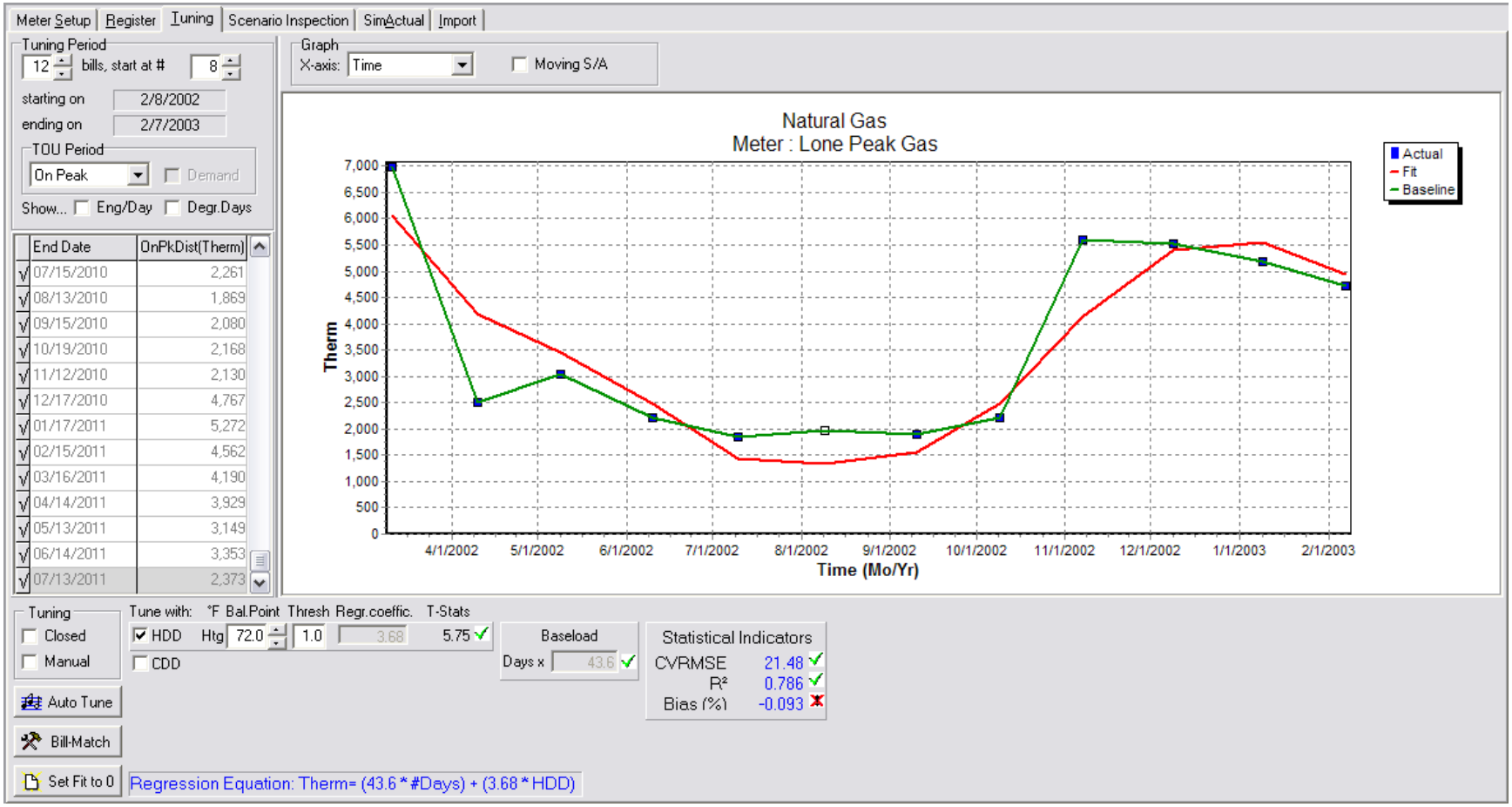
South Point – Sample Graph



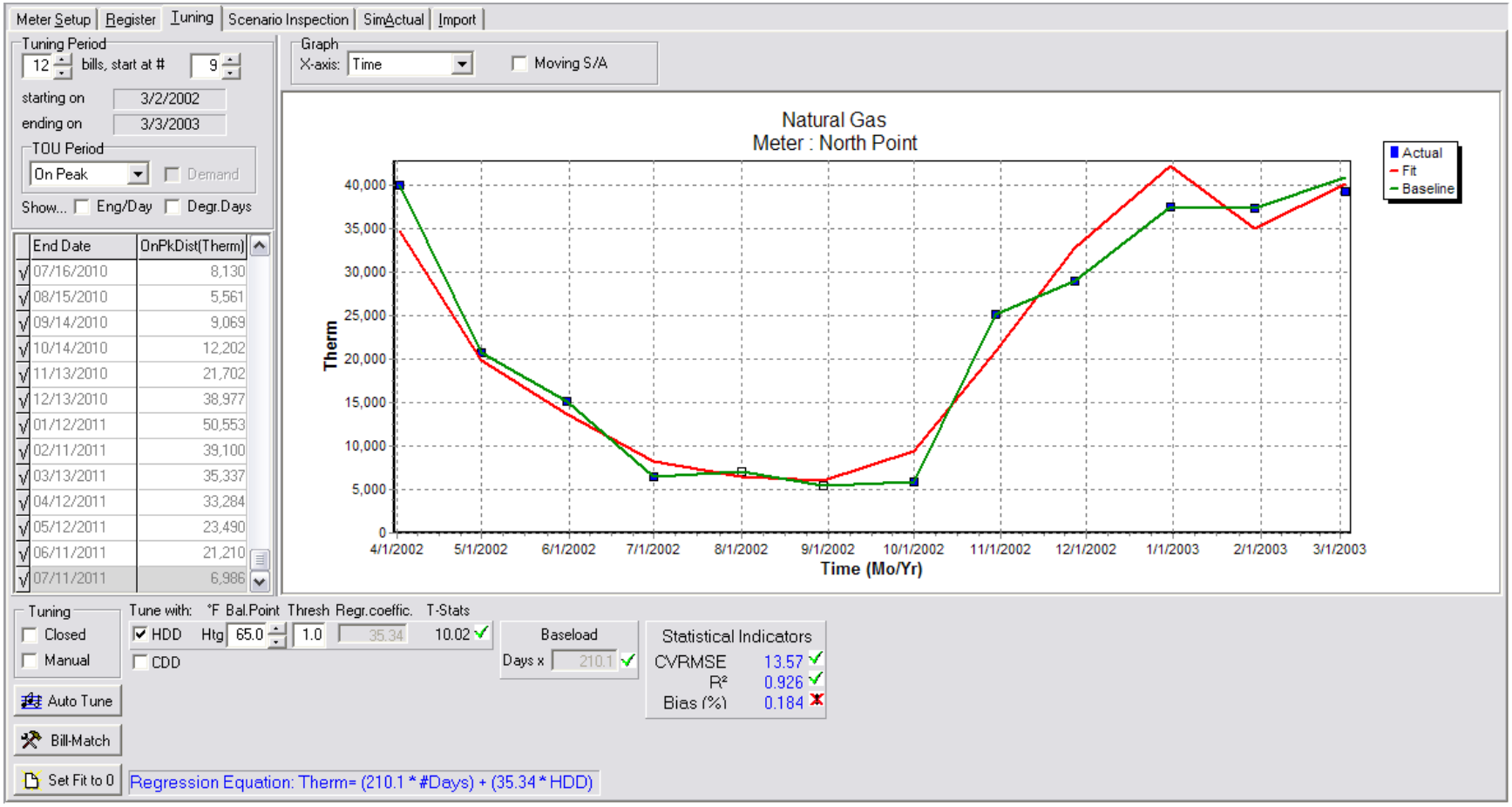
Promontory – Sample Graph



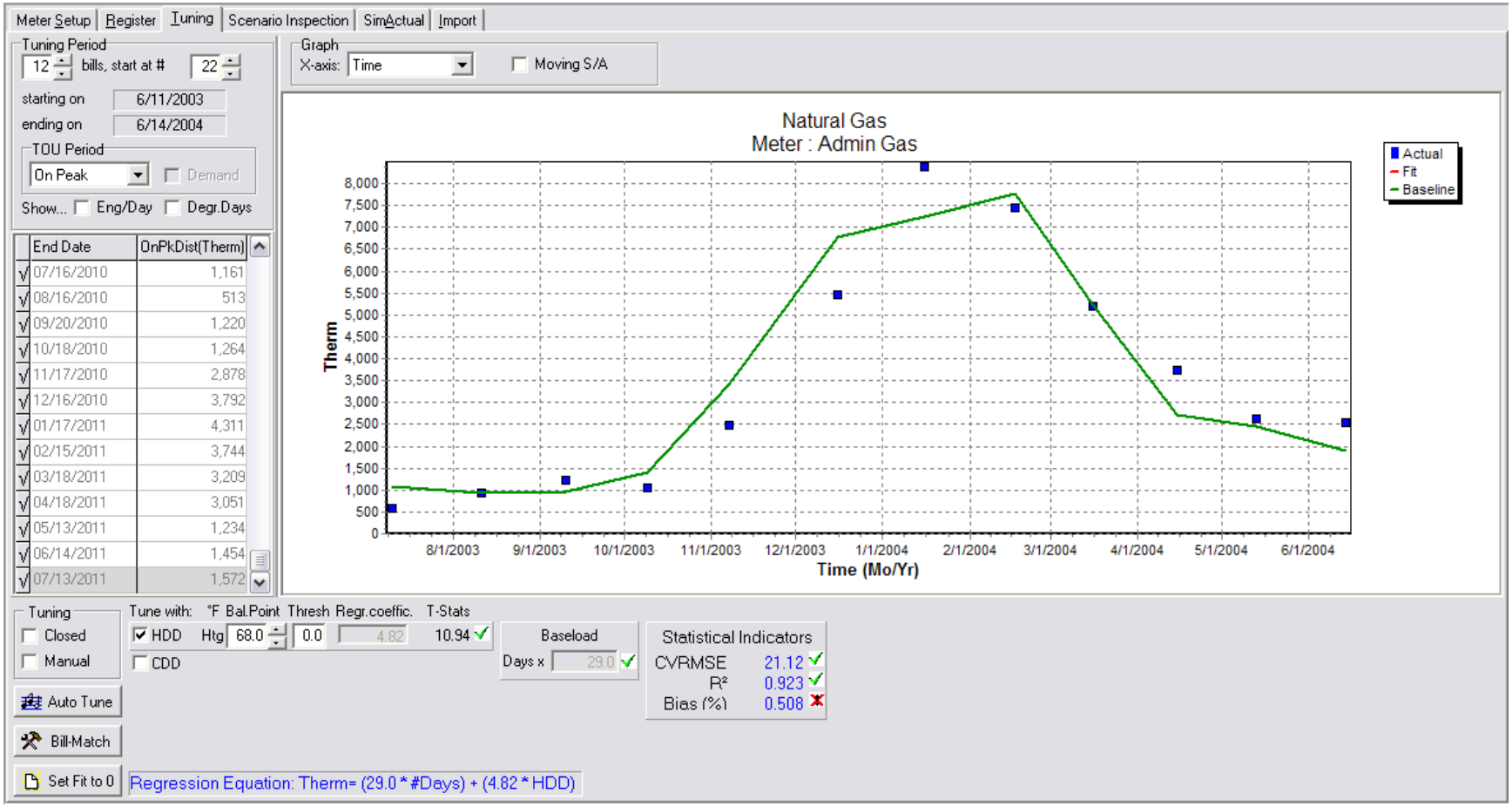
Lone Peak – Sample Graph



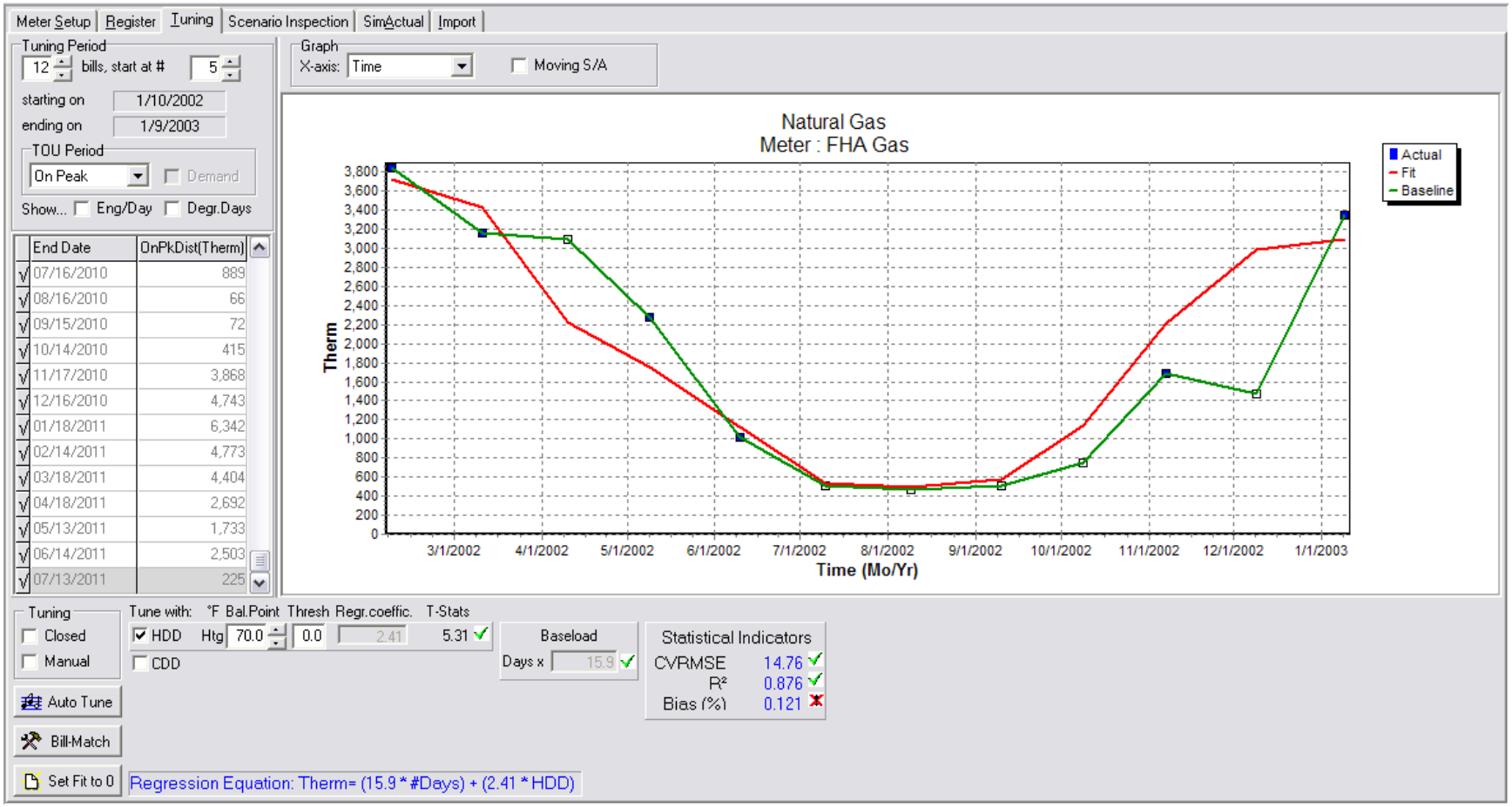
North Point – Sample Graph



Administration – Sample Graph



Fred House Academy – Sample Graph



Adjustments to Savings

Over the course of a project changes occur. The intent of Measurement and Verification is to ensure that the comparison is done from a point of reference to do the comparison for like conditions; or to use the euphemism "apples to 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, one needs 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 13 buildings then those same 13 buildings must exist in the current year. In addition, those same 13 buildings must operate as designed. If there are additions or deletions of buildings then the energy use is added or subtracted from the baseline utilities and must be accounted for in the billing information. Additional adjustments occur when energy usage sources are added to the meter or deleted from the meter, when changes not caused by Johnson Controls are made to the performance contract designed intent such as disabling a control strategy, or for changes in weather that impact HVAC measures. Table 1 below displays the adjustments to savings that occurred this year. Part 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® program.

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 two heat exchangers, thermal expansion tank, two secondary pumps, three VFDs (associated to the three pumps), flow meter, and Metasys® controller with associated control points and sensors.

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

- Replaced leaking heat exchangers during 9/2/15 PM.
- Replaced seals, valves, and insulation during 10/15/2015 PM.
- Reinstalled VFD under warranty during 6/24/2016 PM.

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

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Table 1 - Savings Adjustment Summary

Meter	Facility	FIM #	FIM Name	Reason for adjustment
South Point Gas	Facility Wide	N/A	Non FIM - this is for added or reduced load due to inmates population	Inmate population growth / decline. 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 a well leak. This leak was discovered in 2015 when the well was shut down. During this performance year, the well underwent an analysis to determine the condition. In May 2016 it was determined that the June 2016 the well partially collapsed. June 2016 it was decided that the well should be activated again at a reduced flow. At the publishing of this report system testing and check out is underway prior to bringing the system on line. The failure of the well is the responsibility of UDC.
	UCI Shops, Furniture Shop, Misc. Oquirrh	22	Night Setback	This system is tied to the geothermal FIM described above. Since JCI did not cause this change the full savings estimated during the development of this project shall be taken for 11 month of the is performance period. As described above the last month JCI shall take responsibility for lost savings.
	Wasatch Laundry	55	Water Efficiency - Ozone for 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	Non FIM - this is for added load due to a new building	This 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 1 (Con't) - Savings Adjustment Summary

Meter	Facility	FIM #	FIM Name	Reason for adjustment
South Point Gas	Facility Wide	N/A	Non FIM - this is for added load due to leaks in the steam system	Excess make up water in the boiler system causes waste in three areas. It wastes water, which adds to water and sewage costs, chemical treatment for treating new make up water, and energy from heating the colder water back into steam. Inspection of the make up water logs indicates a large excess amount of make up water.
	Facility Wide	37	Water Efficiency - Water Conservation	For the Water Efficiency scope of work shower heads were replaced with low flow showerheads and controls were installed to reduce the duration of showers. During interviews with maintenance personnel it was determined that sometime during 2011 the "Icon" controllers were disconnected after failure. In addition, a couple of showerheads were inspected in one of the cells and a 2.0 gpm shower head was found in place. For this FIM the original savings are no longer achieved when this equipment reverted to original conditions.
	Facility Wide	11, 49, 49	Recommission Controls and HVAC	JCI has been performing a Retro commissioning of the control system and has discovered controllers not functioning, communication lines disconnected, dampers, valves, and other end devices not operational. As a result, operation has been put in hand or overridden thus causing excess operation and energy use.
	Wasatch Boiler Plant	18	Install Boiler Stack Economizers (B-1 & B-3)	For the Water Efficiency scope of work shower heads were replaced with low flow shower heads and controls were installed to reduce the duration of showers. During interviews with maintenance personnel it was determined that sometime during 2011 the "Icon" controllers were disconnected after failure. In addition a couple of shower heads were inspected in one of the cells and a 2.0 gpm shower head was found in place. For this FIM the original savings are no longer achieved when this equipment reverted back to original conditions.

Table 1 (Con't) - Savings Adjustment Summary

Meter	Facility	FIM #	FIM Name	Reason for adjustment
North Point Gas	Facility Wide	N/A	N/A	Inmate population growth / decline. 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.
	Serving Time	N/A	N/A	A 1,200 building on the North Point gas meter campus was converted from storage space to a Café approximately December 2009. The kitchen equipment utilizes gas to heat and cook. Operation of the HVAC equipment went from an unoccupied mode to operate 24/7 M-F with the weekend operating in unoccupied mode. This conversion of space increase gas use from the original purpose.
	Facility Wide	37	Water Efficiency - Water Conservation	For the Water Efficiency scope of work shower heads were replaced with low flow showerheads and controls were installed to reduce the duration of showers. During interviews with maintenance personnel it was determined that sometime during 2011 the "Icon" controllers were disconnected after failure. In addition, a couple of showerheads were inspected in one of the cells and a 2.0 gpm shower head was found in place. For this FIM the original savings are no longer achieved when this equipment reverted to original conditions.
	Facility Wide	11, 49, 49	Recommission Controls and HVAC	JCI has been performing a Retro commissioning of the control system and has discovered controllers not functioning, communication lines disconnected, dampers, valves, and other end devices not operational. As a result operation has been put in hand or overridden thus causing excess operation and energy use.

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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, current Fiscal Year 2016 accounted for 75%, which is virtually the same as the baseline. This indicates that many of the FIMs are not operating, there is added gas equipment, or operation of equipment differs from the baseline.

Sometime in 2013 Questar, the natural gas supplier, determined that the natural gas meter was defective. The natural gas meter was replaced prior to January 2014 and is now reporting correctly. 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 was not used due to repairs to the well. Additionally there are other FIMs that are no longer operational such as Boiler 1 Stack Economizer, FIM 18, which has been out of service since 2009. Interviews with plumbing maintenance during this year indicate that water conservation controls are out of service since 2011 or earlier due to the inability to find replacement parts. Consequently, the water conservation measure, FIM 37, is defunct and no longer saving energy. Water conservation by implementation of FIM 55, Ozone Laundry, is no longer providing savings due to a safety issue that occurred around 2005.

Chart 1 which follows shows the annual natural gas consumption associated with the South Point meter with a line of heating degree days overlaying the gas consumption. The curve and graph should closely follow one another. Note that from 2009 – 2014 there was a known gas meter issue.

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

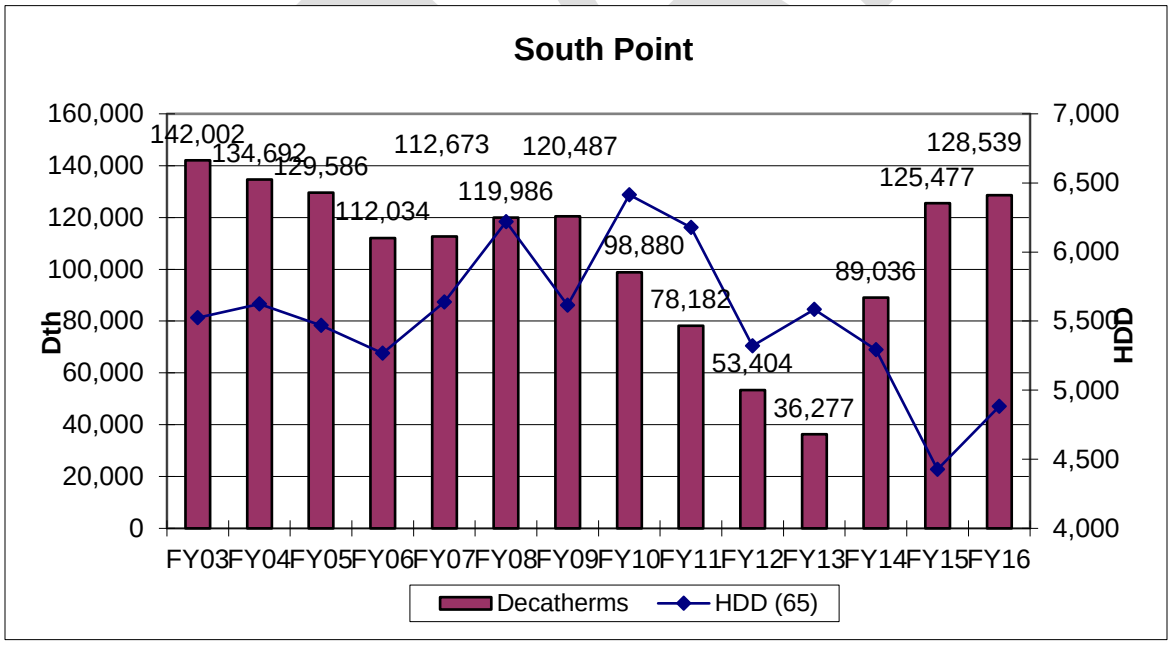
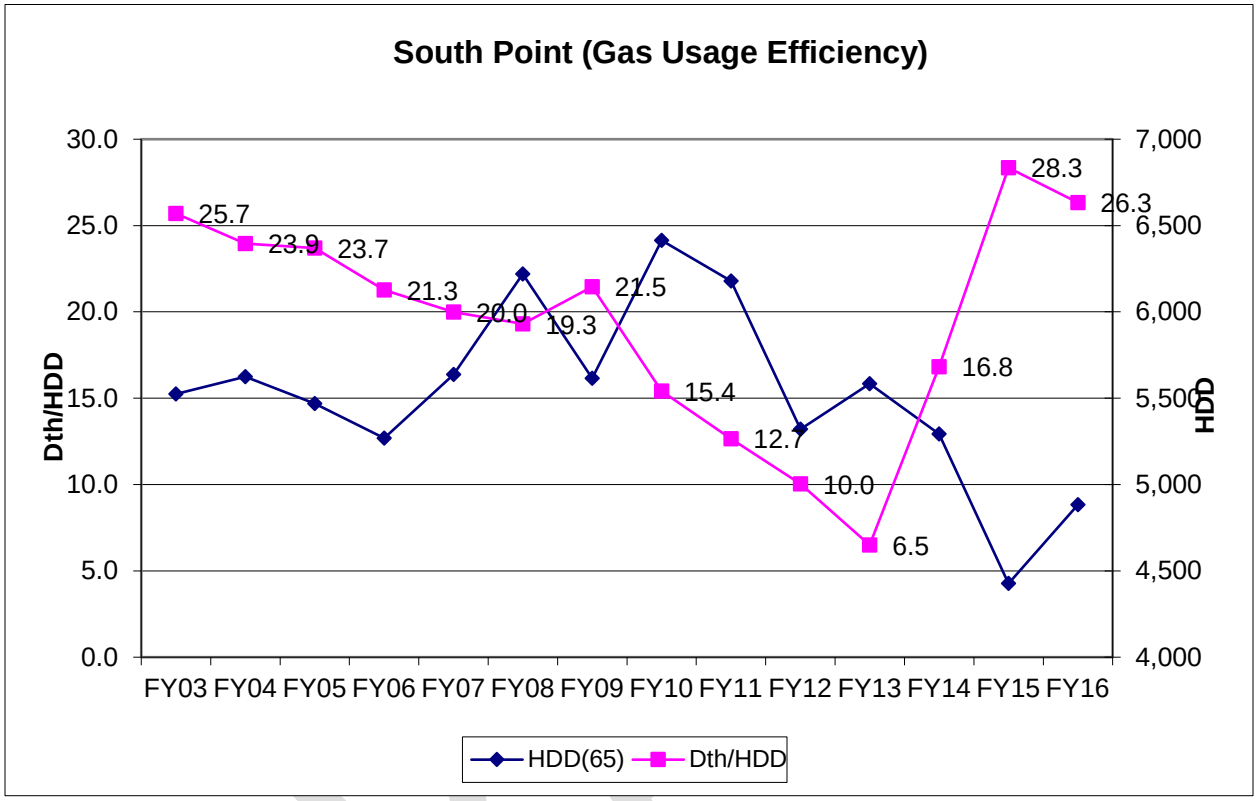


Chart 2 demonstrates how the South Point meter is utilizing gas as it relates to the heating demand driven by weather. This is an indicator of the trend in gas usage versus the weather. Note the spike in FY 2015 and 2016 is due to the several FIMs not operating.

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



Adjustments to Savings for the South Point Meter

As explained above in Part 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 Table 2 which summarizes the energy units costs of the adjustments, will follow the detailed discussion below. The adjustments are categorized into three groups as follows:

1) **Adjustments required aligning the Baseline:** These adjustments are necessary and occur due to changes such as weather or an added building. These adjustments are necessary to align the current conditions with the baseline conditions.

2) **Adjustments due to a Positive Change in the Facility Baseline:** These adjustments occur due to a positive change in the facility such as improving the efficiency of equipment or operation. These improvements are measured against baseline such that the adjustment is made only if the improvement is better than the baseline condition.

3) **Adjustments to Baseline where Corrective Actions can Capture Savings:** These adjustments can be corrected by taking action such as repairing equipment or removing overrides. These adjustments are the ones that, as a partnership, should be focused on because this is where actual realized savings can be achieved.

In any adjustment scenario, assignment of responsibility is also necessary. If Johnson Controls caused the change, then the risk will be borne by Johnson Controls. Should it be determined that Johnson Controls did not cause the change then the risk shall be borne by UDC. This is necessary to determine when to make a physical adjustment to the savings. A change that improves baseline conditions shows up as a reduction to the baseline because the improvement has already improved the current bills. A change that increases the baseline such as adding a building will need to be added to the baseline because that new building has increased the current utility usage, which never existed during the baseline conditions. In general, the baseline will be added to if something occurs for which Johnson Controls did not cause the increase. Conversely, should UDC cause a change to improve from the baseline then the baseline will be reduced.

Adjustments required aligning to the baseline

Several adjustments are due to increases or decreases to the natural gas equipment. This category also includes situations for changes not caused by Johnson Controls, but a change to design that has changed from prior UDC baseline conditions or new requirements. For example if the design control strategy was put in place to efficiently operate an Air Handler Unit (AHU) by scheduling it to operate Monday through Friday from 5 am to 5 pm and it changed to operate on weekends also, an adjustment is needed to account for the additional usage created by the weekend schedule. The following are the adjustments made for this year's report.

1) 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 Part 1 above under the "How Savings Are Calculated" heading. These savings are automatically adjusted for in the software program. Depending on the monthly weather, the adjustment could increase or decrease the baseline. Months that are colder than the baseline will increase baseline usage and vice versa.

2) In addition, the prison population fluctuates from year to year. See Appendix C Supporting Adjustment Data. 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. The base load of the regression formula will be averaged out by population and will be multiplied by the number of prisoners that changed compared to the baseline population. To credit the additional heat load created by additional bodies, a heat load equation shall be utilized to determine the contribution of each additional body. Monthly population and HDD will be used to prorate savings. **This year the prison population has gone down compared to the baseline so a negative adjustment for the reduced inmate population is taken while a positive adjustment is made for reduced internal heat created by the bodies (more heating is needed to heat the space)**.

3) The Ozone Laundry Conversion FIM 55 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. Savings will be prorated monthly. This change will be added back to the baseline.

4) A new building has been added to the campus. This building was added in approximately 2010. Since the M&V is only tracking the gas savings the calculation adjustment shall only focus on the gas use of the equipment. To determine the additional usage from the HVAC equipment associated to this building a bin calculation was performed. During the Year 10 (FY 2014) report, the equipment name plate and controls were audited to determine size and schedule of equipment. An average weather profile was used to determine weather related loads. Savings will be prorated monthly by HDD.

Adjustments due to positive change to the Facility Baseline

This category of change will credit UDC for action taken where UDC has improved the efficiency of the facility above the baseline conditions. Determining what actions taken actually improved the facility from baseline conditions is somewhat subjective. This project was developed using 24 months of consecutive utility bills for the years 2001 – 2003. Therefore, the basis of baseline conditions needs to reflect these years. Choosing the changes in this category is consequently subjective and requires candid discussion as to what changed from the baseline. UDC also must determine these changes because, as operators of the facility, UDC has firsthand knowledge of these occurrences. This year there were three (3) actions caused by UDC that improved the efficiency of the facility at South Point.

1) UDC put the Wasatch B block into unoccupied mode. This wing of the facility was vacated and the prisoners were dispersed elsewhere. UDC should be commended for taking energy efficient action by changing the control sequences to place the equipment in unoccupied mode. This will ensure that the equipment does not condition the space unless freezing conditions occur where the zone will be tempered to minimum levels of heating. Based on discussions with UDC this change occurred on May 8, 2015. This adjustment used the square footage to prorate the savings. Note the proration takes into consideration that the set point was adjusted down to 55 F so there still is a minimum cooling load so as not to freeze the zones.

2) UDC put the SSD block into unoccupied mode. This wing of the facility was vacated and the prisoners were dispersed elsewhere. UDC should be commended for taking energy efficient action by changing the control sequences to place the equipment in unoccupied mode. This will ensure that the equipment does not condition the space unless freezing conditions occur where the zone will be tempered to minimum levels of heating. Based on discussions with UDC this change occurred on May 8, 2015. This adjustment used the square footage to prorate the savings. Note the proration takes into consideration that the set point was adjusted down to 55 F so there still is a minimum cooling load so as not to freeze the zones.

3) Also performed by UDC was a boiler tune up for the domestic hot water heating boilers. This practice should continue to keep the boilers running efficiently. The large steam boilers were not part of this tune up program. This was completed approximately February 2015. As it is unknown what the baseline condition of these boilers were at the time when the project was developed, it is uncertain how much improvement was made from the base condition. As such, UDC and Johnson Controls will need to discuss this further to determine what the impacts are in order to determine if there should be adjustments for this.

Adjustments to the baseline where corrective action can capture savings

There are adjustments that are required due to specific changes to the FIM. This category primarily covers changes due to failing to keep the FIM operating as designed. For example, if an AHU fan that operates on a schedule was temporarily put into override to test the fan and was then errantly left in hand causing it to operate 24/7, then any excess usage beyond the scheduled operation requires an adjustment. In this scenario, assignment of responsibility is also necessary. If Johnson Controls caused the change, then the risk will be borne by Johnson Controls. Should it be determined that Johnson Controls did not cause the change then the risk shall be borne by UDC. This year six (6) FIMs fall under this category.

1) FIM 2 was identified as not functioning due to a 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 and other processes in the kitchen and dairy plant. 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 in order to achieve savings for this FIM. Any savings loss due to this equipment not operating because of negligence on Johnson Controls is the responsibility of Johnson Controls. Once hot water leaves the pump house, UDC is responsible for savings loss due to failure of equipment serving the buildings because UDC is responsible for the maintenance and operation of this equipment. This includes the proper operation of the building heat exchangers for the domestic hot water and heating coils and all associated piping. For Year 12 Performance Period the geothermal did not operate for the entire period. The leak in the well that was identified last year is the reason for not operating the geothermal system. The well is the responsibility of UDC thus the risk for this is also borne by UDC. A positive adjustment to the baseline will be performed for the full estimated savings of this FIM.

2) FIM 22, Night Setback for the UCI unit heaters utilizes the geothermal heating. This same FIM was identified in last year's report as not functioning due to the unit heaters being disabled. However since the Geothermal system was down this system would not function properly anyhow. Consequently the savings shall be prorated the same as for the geothermal system, FIM 2 above.

3) FIM 18, Boiler Stack Economizer has been out of service since 2009. This was determined through interviews with the mechanical maintenance personnel during the Year 12 reporting period. Specifically only Boiler 1 is inactive. The maintenance and repair responsibility is with UDC therefore so is the loss of these savings. A positive adjustment to the baseline is taken for this.

4) FIM 37, the Water Conservation measure introduced reduced flow devices to save water. Although the underlining premise is to save water, devices installed on showers save therms in addition to water. By using less hot water, therms are saved. Unfortunately, the devices installed are no longer functioning. Interviews with the plumbing personnel during the Year 12 reporting period uncovered that the devices have been out of service since approximately 2010. The maintenance and repair responsibility is with UDC therefore so is the loss of these savings. A positive adjustment to the baseline is taken for this.

5) During 2013, Johnson Controls and UDC underwent discussions regarding the Recommissioning FIMs that were part of the project. FIMs included under this category are FIMs 11, 34, 42, 49, and 50. These FIMs involved ensuring the HVAC systems operated from both a controls and mechanical device perspective. Discussions lead to the conclusion that it was necessary to get the systems, both controls and mechanical devices, back to a starting point where the intended retrofit would achieve the savings. At this point Johnson Controls has committed to Recommission the control system and identifying which mechanical devices need repair or replacement. Johnson Controls has dedicated the resources to accomplish this at no additional cost to UDC. UDC however will be responsible to repair and replace

all identified mechanical devices that require fixing. As part of this arrangement Johnson Controls will calibrate sensors, perform point to point testing, and ensure programming and controls operate per design. UDC has responsibility to ensure end devices are operating and to replace failed equipment. Currently the recommissioning effort is still under way. To date a list of several end devices needing repair is developed, a communication line has been repaired, and there have been 43 controllers identified as bad. The combination of all these issues demonstrate that the system has not been operating as originally designed. Additionally last year it was acknowledged that many of the heating values were cracked open by UDC to avoid a freeze stat from turning off units. This will waste energy with heat unnecessarily leaking by continuously during the heating season. This will be a shared responsibility as Johnson Controls is committed to get the controls system back to the original design intent and UDC is responsible to ensure that the end devices such as valves and dampers function. Any kind of a loss due to the condition of the system already shows up in utility bills as a loss in savings. This work is still underway at the publishing of this report and is anticipated to be complete in FY2017. The adjustment for this condition will take a percentage of the calculated savings for the FIMs 11, 49, and 50 as these are associated to the South Point meter. Johnson Controls will split the responsibility for these savings at 50%. As these savings are not achieved, the remaining 50% will be taken as a positive adjustment to the baseline.

6) Not associated to a FIM but a large change from the baseline conditions is the make up water loss in the central plant. This year the excessive make up water loss is over 75% greater than the baseline. This make up water must be heated to steam again.

All of the above adjustments have been taken and applied to the baseline. The adjusted savings are presented in Table 3 below and represent an annual adjustment of $389,808 dollars (-$1,950 in electrical and $391,758 in natural gas). Supporting calculations are available for review upon request. This category are savings that if the underlying issue is addressed the savings should be achieved. Items 1, 2, and 5 are currently being addressed and should produce savings soon.

For item 1 and 2, FIM 2 and 22, it was determined to operate the well as is, with a lower depth. Due to the collapse of the well, the well depth is approximately 300 feet. Additionally the pump will operate at 300 gpm, which could affect the overall heat exchange, thus the heat load gain from the geothermal source. This should be operational sometime during FY 2017. During the publishing of this report, the system was being flushed out and plans to start up the system were underway. Note Item 2 is fed from the geothermal system.

Currently for this performance period, the RCx is still underway but the it is anticipated that it should be corrected by FY2017.

Remaining Items 3,4, and 6, are items that require repair and maintenance. Items 3 and 4 are FIMs that should be repaired so the savings can be achieved once again. Item 6, excessive make up water loss, requires identification of leaks so they can be repaired.

Table 2 summarizes the South Point adjustments. Table 3 summarizes their effect on energy units and costs associated to these adjustments.

Table 2 South Point Savings Adjustment Method

Meter	Facility	FIM #	FIM Name	Method of calculating adjustment
South Point Gas	Facility Wide	N/A	Non FIM - this is for added load due to additional inmates	Spreadsheet uses Metrix baseline regression equation as basis of savings. The base load component of the regression equation 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	The geothermal system was down for the Year 12 performance period due to failure of the well. The calculated savings from the estimates derived from the development of this project shall be used as the adjustment. It is assumed that the equipment serving the Oquirrhs and SSD buildings conditions / heats occupant space and is used for domestic hot water (DHW). These two buildings will have their savings divided in half and the DHW component will be distributed over 12 months and the heating related component will be distributed by the current year monthly HDD. The Wasatch estimate serves DHW only so will be distributed across 12 month, while the UCI estimate is heating related and will be distributed by monthly HDD.
	UCI Shops, Furniture Shop, Misc. Oquirrh	22	Night Setback	Take full credit of estimated savings for 12 months. This is prorated based on HDD
	Wasatch Laundry	55	Water Efficiency - Ozone for Laundry	Take full credit of estimated savings

Table 2 (Con't) South Point Savings Adjustment Method

Meter	Facility	FIM #	FIM Name	Method of calculating adjustment
South Point Gas	Reading for the Blind	N/A	Non FIM - this is for added load due to a new building	Spread sheet bin calculation using TMY weather data.
	Facility Wide	N/A	Non FIM - this is for added load due to leaks in the steam system	The boiler make up water analysis will identify excess use of make up water. The boiler system is utilized throughout the South Point campus. Steam is utilized to heat water for occupant space heating and process (laundry, dairy plant, etc.). Condensate is then returned to be heated again. Whatever does not get returned is made up by city water. Make up water logs are inspected and compared to a baseline condition. The current year makeup water logs are then subtracted from the base logs on a monthly basis to determine additional use. The quantity of water then is used in a spreadsheet calculation using thermodynamic properties of water to determine the annual energy required to heat water from approximately 55 degrees to steam at 100 psig.
	Facility Wide	37	Water Efficiency - Water Conservation	Take full credit of calculated savings and prorate based on base condition inmate population (South Point versus North Point inmate population).
	Facility Wide	11, 49, 49	Recommission Controls and HVAC	The calculated savings will be prorated based on a shared percentage; assumed 50%.
	Wasatch Boiler Plant	18	Install Boiler Stack Economizers (B-1 & B-3)	The calculated savings will be prorated based size of the boiler and months boiler is on line.

Table 3 South Point Savings Adjustments Energy Units and Costs

Meter	Facility	FIM #	FIM Name	Adjustment (kWh)	Adjustment kWh ($)	Adjustment (Therms)	Adjustment Therm ($)
South Point Gas	Facility Wide	N/A	Non FIM - this is for added or reduced load due to inmates population			-46,081	-$26,994
	Oquirrhs, Wasatch, UCI, & SSD	2, 2a, 2b, 2c	Geothermal Oquirrhs 1-4, Expand Geothermal Wasatch, UCI, & SSD	-97,335	($5,109)	441,867	$258,187
	UCI Shops, Furniture Shop, Misc. Oquirrh	22	Night Setback	91,200	$3,158	8,230	$4,948
	Wasatch Laundry	55	Water Efficiency - Ozone for Laundry			11,386	$6,584
	Reading for the Blind	N/A	Non FIM - this is for added load due to a new building			1,717	$1,032
	Facility Wide	N/A	Non FIM - this is for added load due to leaks in the steam system			88,802	$52,053
	Facility Wide	37	Water Efficiency - Water Conservation			108,056	$62,506
	Facility Wide	11, 49, 49	Recommission Controls and HVAC			28,681	$17,239
	Wasatch Boiler Plant	18	Install Boiler Stack Economizers (B-1 & B-3)			26,960	$16,204
				-6,135	**($1,950)**	**669,618**	**$391,758**

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Recommendations for Improvements to Gain Further Savings at the South Point Facility

There are many opportunities for improvement at a 24/7 facility. Identifying the opportunities is a function of both Johnson Controls and UDC working together and as individual entities to improve the facility. Outlined below are some recommendations that have been identified..

1) The Dairy Processing facility is currently conditioned and utilizes steam in the pasteurization process as well as some other hot water needs. This facility should be isolated from the rest of the facility and converted to gas heating. This facility has aging equipment and currently has been maintenance intensive. It has above ground piping and is the furthest from the steam plant. It has been noted by UDC that some of the steam equipment has been failing. Discussions continue on how to accomplish this

2) For FIM 37 it was stated that the device installed no longer had replacement parts. Also identified during this performance period was shower head that were rated at 2 gpm. Today's standards are 1.5 gpm. As a alternate to replacing the previously installed device, some of the savings can be achieved by replacing shower heads. Note a visual spot check of two shower heads performed by Brian Tanahashi and Shawn Anderson noted these shower heads in Baker Block.

North Point

The North Point gas meter serves 19% of the Draper site's total square footage and is the second largest gas consumer on site. In Fiscal Year 2003, it was accountable for 14% of the entire site's natural gas usage. In Fiscal Year 2016 it accounted for 16%, which exceeded the usage from Fiscal Year 2003 even though the Heating Degree Days are lower. This indicates that many of the FIMs are not operating, there is added gas equipment, or operation of equipment differs from the baseline.

Chart 3. North Point Natural Gas and Heating Degree Days versus Fiscal Year.

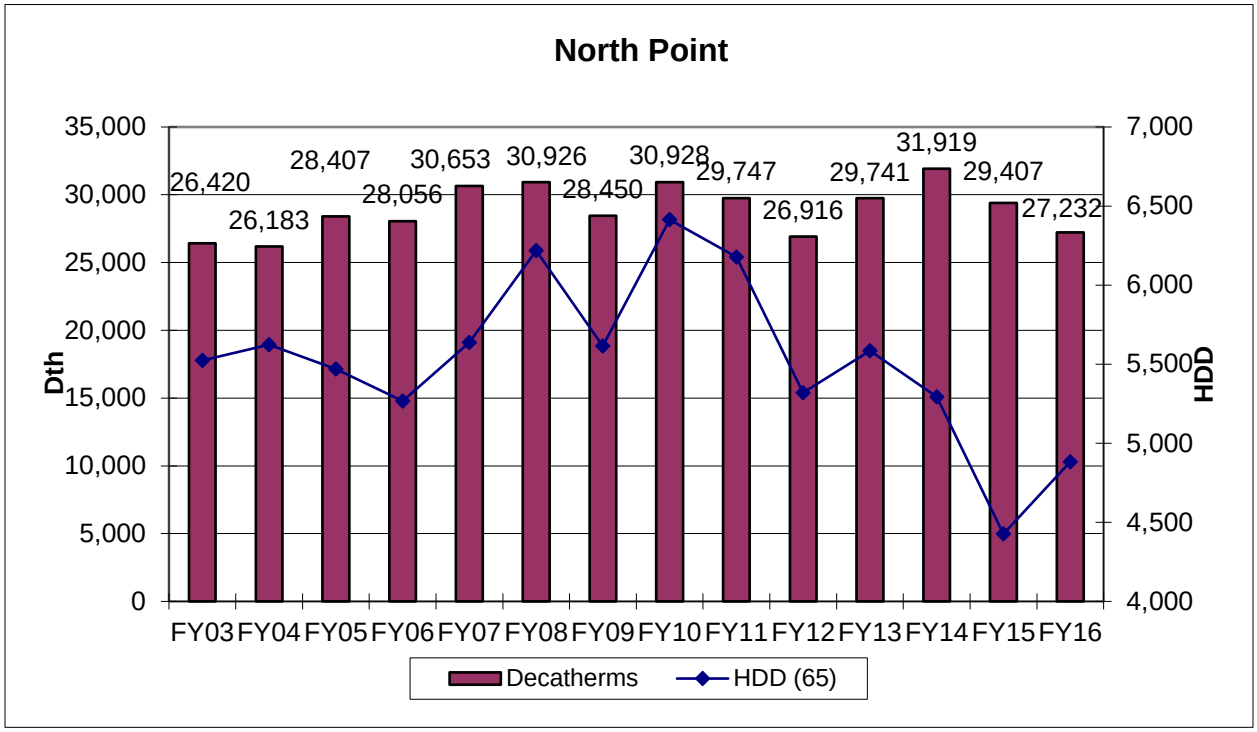
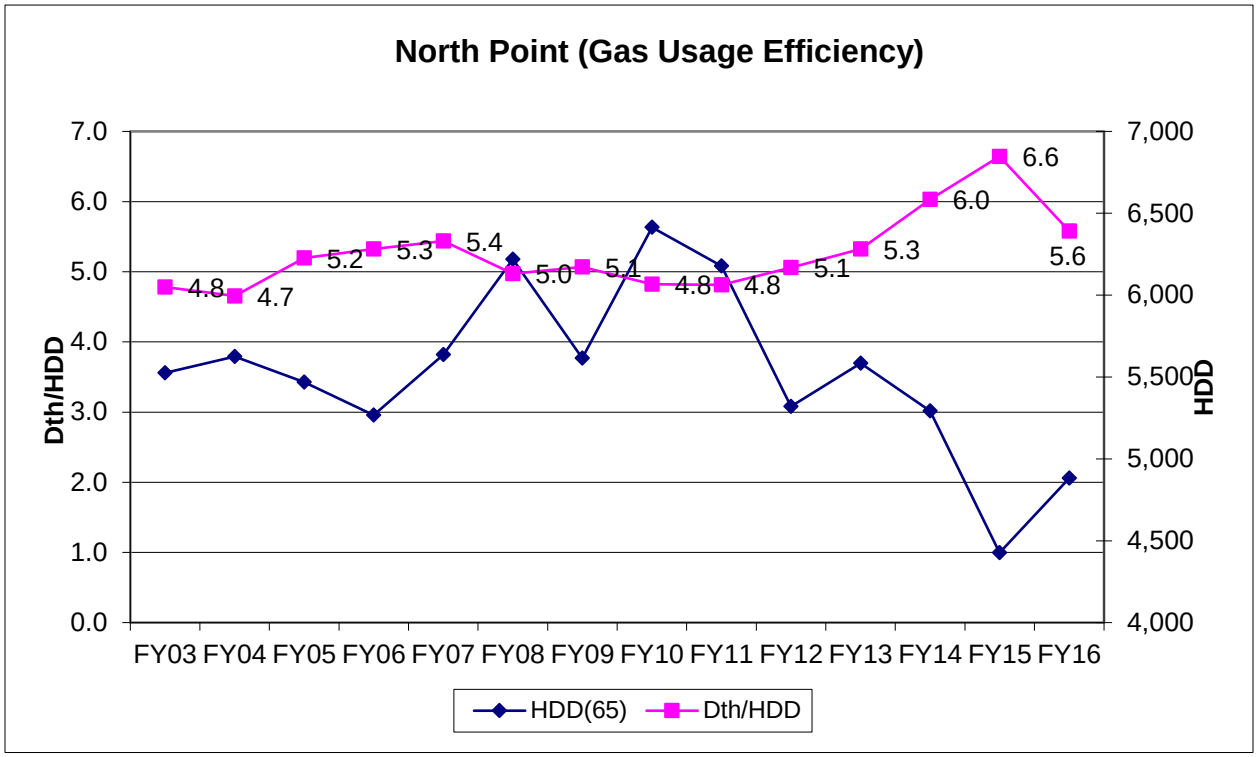


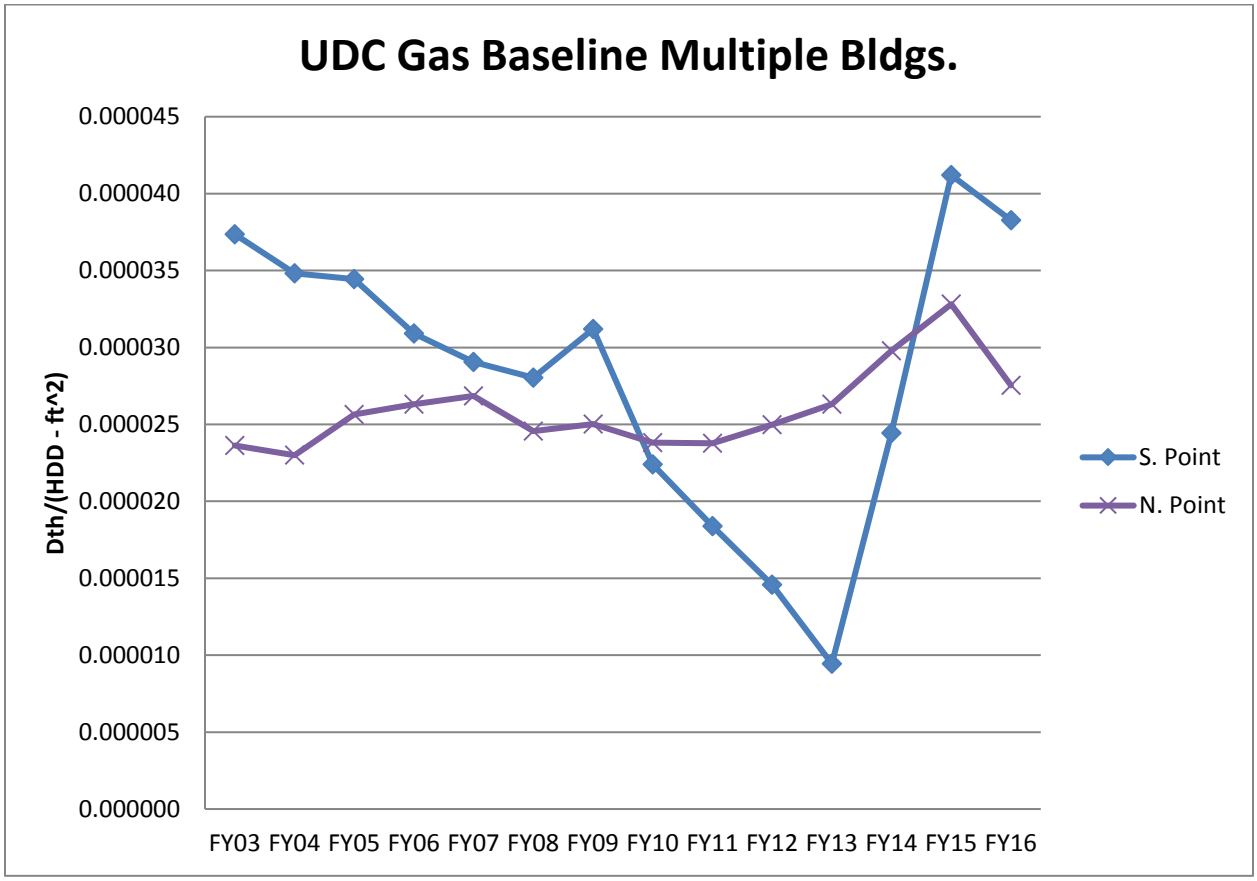
Chart 4. North Point Decatherms/HDD and Heating Degree Days versus Fiscal Year.



The gas usage of buildings associated with the North Point gas meter is relatively flat regardless of outside air temperature. Despite an obvious inter-dependence with outside air (see Chart 4), according to the gas and weather data the operation of these facilities appear to not track with varying weather conditions as expected. This is likely in part due to the condition of the VAV system located in the Timponogos building. It was learned that during construction of this building there was damage to the underground ductwork where it was crushed therefore restricting the airflow to many of the zones. Consequently, the HVAC maintenance staff had fixed the airflow dampers to 100% open maximizing airflow and then tempering colder zones with reheat coils. This was reported to have occurred prior to 2013. However, after further inspection of the annual graphs in Chart 3, it appears that the natural gas has increased from the Fiscal Year (FY) period of 2004 – 2007 where the natural gas does not track with the HDD. Starting FY 2008 the natural gas seems to track with HDD with exception to FY 2014 and FY 2015. By forcing the system to deliver 100% air, the system is now essentially is a constant volume reheat. Constant volume reheat is known as one of the highest energy consuming HVAC systems to operate. It was determined that the air volume has been fixed from near inception of the building and that the maintenance staff would manually operate the heating valves during the winter months (December through February) to maintain temperature in the zones.

The following chart is a comparison between South and North Point gas meters. It is intended to demonstrate that the North Point facility gas usage should track HDD like the South Point meter does. This should be true given that the North Point facility is also primarily heated by natural gas, however North Point usage does not track like South Point.

Chart 5. North and South Point Decatherms/ (HDD – ft^2) versus Fiscal Year



Adjustments to Savings for the North Point Facility

As explained above in Part 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. Table 4, which summarizes the energy units and costs of those adjustments, will follow the detailed discussion below. The adjustments are categorized into three groups as follows:

1) **Adjustments required aligning the Baseline:** These adjustments are necessary and occur due to changes such as weather or an added building. These adjustments are necessary to align the current conditions with the baseline conditions.

2) **Adjustments due to a Positive Change in the Facility Baseline:** These adjustments occur due to a positive change in the facility such as improving the efficiency of equipment or operation. These improvements are measured against baseline such that the adjustment is made only if the improvement is better than the baseline condition.

3) **Adjustments to Baseline where Corrective Actions can Capture Savings:** These are adjustments that can be corrected by taking action such as repairing equipment or removing overrides. These adjustments are

the ones that, as a partnership, should be focused on because this is where actual realized savings can be achieved.

In any adjustment scenario, assignment of responsibility is also necessary. If Johnson Controls caused the change, then the risk will be borne by Johnson Controls. Should it be determined that Johnson Controls did not cause the change then the risk shall be borne by UDC. This is necessary to determine when to make a physical adjustment to the savings. A change that improves baseline conditions shows up as a reduction to the baseline because the improvement has already improved the current bills. A change that increases the baseline such as adding a building will need to be added to the baseline because that new building has increased the current utility usage, which never existed during the baseline conditions. In general, the baseline will be added to if something occurs, for which Johnson Controls did not cause the increase. Should UDC cause a change to improve from the baseline then the baseline will be reduced.

Adjustments required aligning to the baseline

There are three adjustments that are due to occurrences to the natural gas equipment. This category also includes changes not caused by Johnson Controls, but a change to design that has changed from prior UDC baseline conditions or new requirements. For example if a packaged HVAC unit was installed as part of the project with a certain efficiency and a new one was installed as a replacement to that packaged unit, then an adjustment is required to account for the change in efficiency. Likely, in this scenario the new unit will have better efficiency as technology improves, so the adjustment would be in favor of UDC. The following are the actual adjustments that occurred this performance year.

1) 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 Part 1 above, under the "How Savings Are Calculated" heading. These savings are automatically adjusted for in the software program. Depending on the monthly weather, the adjustment could increase or decrease the baseline. Months that are colder than the baseline will increase baseline usage and vice versa.

2) In addition, the prison population fluctuates from year to year. See Appendix C Supporting Adjustment Data. 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. Average out the base load portion of the regression formula by population and multiply by the number of additional prisoners compared to the baseline population to adjust for these additional prisoners. To credit the additional heat load created by additional bodies, a heat load equation shall be utilized to determine the contribution of each addition. Monthly population and HDD will prorate savings.

3) As learned through discussions in 2015 it was determined that, an existing facility was converted to a diner where gas cooking equipment was installed. In addition the building was used initially as storage where conditioning was provided by a gas electric unit. The thermostat was essentially put in unoccupied mode. Currently the control on this unit is operating it twenty-four hours during M-F and goes to unoccupied mode during the weekend. There will be two adjustments here one for the cooking equipment and one for the additional heating. This new base load is the added adjustment that represents the additional gas use.

Adjustments due to positive change to the baseline

This category of change will credit UDC for action taken where UDC has improved the efficiency of the facility above what the baseline conditions were. Determining what actions taken actually improved the facility from baseline conditions is somewhat subjective. This project was developed using 12 months of consecutive utility bills for the years 2002 – 2003. Therefore, the basis of baseline conditions needs to reflect these years. Choosing the changes in this category is consequently subjective and requires candid discussion as to what changed from the baseline. UDC also must determine these changes because as operators of the facility, UDC better recognizes firsthand knowledge of these occurrences. This year, there were no actions that improved the efficiency of the facility at North Point.

Adjustments to the baseline where corrective action can capture the savings

There are adjustments that are required due to specific changes to the FIM. This category primarily covers changes due to failures to keep the FIM operating as designed. For example if a chiller failed and a temporary chiller was brought in for two months and the temporary chiller was less efficient, then an adjustment is required for those two months. This year there are two (2) FIMs that fall under this category.

1) FIM 37, the Water Conservation measure introduced reduced flow devices to save water. Although the underlining premise is to save water, devices installed on showers save therms in addition to water. By using less hot water, therms are saved. Unfortunately, the devices installed are no longer functioning. Interviews with the plumbing personnel during the Year 12 reporting period uncovered that the devices have been out of service since approximately 2010. The maintenance and repair responsibility is with UDC therefore so is the loss of these savings. A positive adjustment to the baseline is taken for this.

2) During 2013, Johnson Controls and UDC underwent discussions regarding the Recommissioning FIMs that were part of the project. FIMs included under this category are FIMs 11, 34, 42, 49, and 50. These FIMs involved ensuring the HVAC systems operated from both a controls and mechanical device perspective. Discussions lead to the conclusion that it was necessary to get the systems, both controls and mechanical devices, back to a starting point where the intended retrofit would achieve the savings. At this point Johnson Controls has committed to Recommission the control system and identifying which mechanical devices need repair or replacement. Johnson Controls has dedicated the resources to accomplish this at no additional cost to UDC. UDC however will be responsible to repair and replace all identified mechanical devices that require fixing. As part of this arrangement Johnson Controls will calibrate sensors, perform point to point testing, and ensure programming and controls operate per design. UDC has responsibility to ensure end devices are operating and to replace failed equipment. Currently the recommissioning effort is still under way. To date a list of several end devices needing repair is developed, a communication line has been repaired, and there have been 43 controllers identified as bad. The combination of all these issues demonstrate that the system has not been operating as originally designed. Additionally last year it was acknowledged that many of the heating values were cracked open by UDC to avoid a freeze stat from turning off units. This will waste energy with heat unnecessarily leaking by continuously during the heating season. This will be a shared responsibility as Johnson Controls is committed to get the controls system back to the original design intent and UDC is responsible to ensure that the end devices such as valves and dampers function. Any kind of a loss due to the condition of the system already shows up in utility bills as a loss in savings. This work is still underway at the publishing of this report and is anticipated to be complete in FY2017. The adjustment for this condition will take a percentage of the calculated savings for the FIMs 11 and 34 as these are associated to the North Point meter. Johnson Controls will split the responsibility for these savings at 50%. As these savings are not achieved, the remaining 50% will be taken as a positive adjustment to the baseline.

All of the above adjustments have been taken and applied to the baseline. The adjusted savings are presented in Table 6 below and represent an annual adjustment of $55,989 dollars. Supporting calculations are available for review upon request. This category are savings that if the underlying issue is addressed the savings should be achieved. Item two is currently being addressed and should produce savings soon.

Currently for this performance period the RCx is still underway but the it is anticipated that it should be corrected by FY2017.

Table 5 summarizes the North Point adjustments and their effect on energy units and costs follow in Table 6.

Table 5 North Point Savings Adjustment Method

Meter	Facility	FIM #	FIM Name	Method of calculating adjustment
North Point Gas	Facility Wide	N/A	N/A	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.
	Serving Time	N/A	N/A	Spread sheet bin calculation using TMY weather data for additional heating. Plus kitchen equipment estimate using manufacture's equipment rating.
	Facility Wide	37	Water Efficiency - Water Conservation	Take full credit of calculated savings and prorate based on base condition inmate population (South Point versus North Point inmate population).
	Facility Wide	11, 49, 49	Recommission Controls and HVAC	The calculated savings will be prorated based on a shared percentage; assumed 50%.

Table 6 North Point Savings Adjustments Energy Units and Cost

Meter	Facility	FIM #	FIM Name	Adjustment (kWh)	Adjustment kWh ($)	Adjustment (Therms)	Adjustment Therm ($)
North Point Gas	Facility Wide	N/A	N/A			16,681	$11,580
	Serving Time	N/A	N/A			5,787	$4,107
	Facility Wide	37	Water Efficiency - Water Conservation			42,895	$29,973
	Facility Wide	11, 49, 49	Recommission Controls and HVAC			13,843	$10,329
						79,206	**$55,989**

Recommendations for Improvements to Gain Further Savings at the North Point Facility

There are many opportunities for improvement at a 24/7 facility. Identifying the opportunities is a function of both Johnson Controls and UDC working together and as individual entities to improve the facility. Outlined below are some recommendations that have been identified.

1) Currently Johnson Controls committed resources to Recommission (RCx) the controls system. This work is performed at no cost to UDC in order to get the system restored to the initial conditions intended to achieve savings. The RCx of the control system performed by Johnson Controls initiated around November 2014 and is still under way as of the publishing of this report. The RCx involves a point-to-point commissioning of all input and outputs of the on the Metasys® system, communication troubleshooting, and programing review and optimization. Also included are graphics repair. The intention of the RCx is to establish a fresh starting point where UDC can then confidently take over the control system to ensure optimal control of the systems. As part of this RCx, UDC is taking responsibility to repair the end devices associated to the input and output points monitored and controlled by Metasys®. This effort will put the control system back into optimal condition and achieving the savings as intended. In addition to this Johnson Controls installed a proprietary Facilities Performance Index (FPI) interface that overlays over the Metasys® to provide continuous commissioning. This was also done by Johnson Controls at no cost to UDC and will be used in the future to help UDC keep the system operating efficiently. The FPI system has been installed and began implementation of training. The remaining training has been postponed until such point that the Recommissioning is complete. This major effort by Johnson Controls to restore the control of the HVAC back to the original design conditions has several purposes. One is to restore the system back to the original design intent. In addition, UDC has expressed difficulty using the system due to programming inconsistencies and unreliable point validations. This has been an issue since the inception and possibly due to additions to the system after the initial adjustments created by the Performance Contract. This RCx is also intended to achieve consistency and restore confidence in the Metasys® system. This process should also enhance staff awareness of how the system is intended to operate. More importantly, the RCx was done to bridge the gap in trust of Johnson Controls commitment to UDC.

2) As mentioned above, one situation that has influenced the efficient operation of the HVAC system at the North Point facility is the problem with the crushed ductwork, which caused the Operations, and Maintenance staff to force the system into what is essentially a constant volume reheat system. There may be nothing that can be done about the crushed duct but restoring the system back to the VAV system as intended could improve the efficiency of the system. To accomplish this Johnson Controls has discussed over the course of this performance period the possibility of performing a Test and Balance (TAB) of the VAV system at Timpanogos building. On the airside, this will establish airflow to the design values for areas not affected by the crushed ductwork. Air volume can then modulate to optimize the delivery of conditioned air to the zones. Further discussions will have to take place after the airside TAB to determine what to do with the areas affected by the crushed duct. Given the age of the system, the waterside TAB should improve conditioning and optimizing energy efficiency to the spaces. Johnson Controls at the request of UDC provided a budgetary estimate for a TAB. This was in effort to help UDC plan for the upcoming FY repair budget. Johnson Controls will assist and aid UDC in future matters regarding improving the efficiency of this VAV system.

Promontory

The Promontory gas meter serves 6% of the Draper site's total square footage and is the third largest gas consumer. In Fiscal Year 2003, it was accountable for 3% of the entire site's natural gas usage. Fiscal Year 2016 exceeds FY03 and the gas usage accounts for 4% of the total usage.

Note: The Promontory meter is an agreed upon savings amount per the original contract. The below information is for reference only.

Chart 6. Promontory Natural Gas and Heating Degree Days versus Fiscal Year.

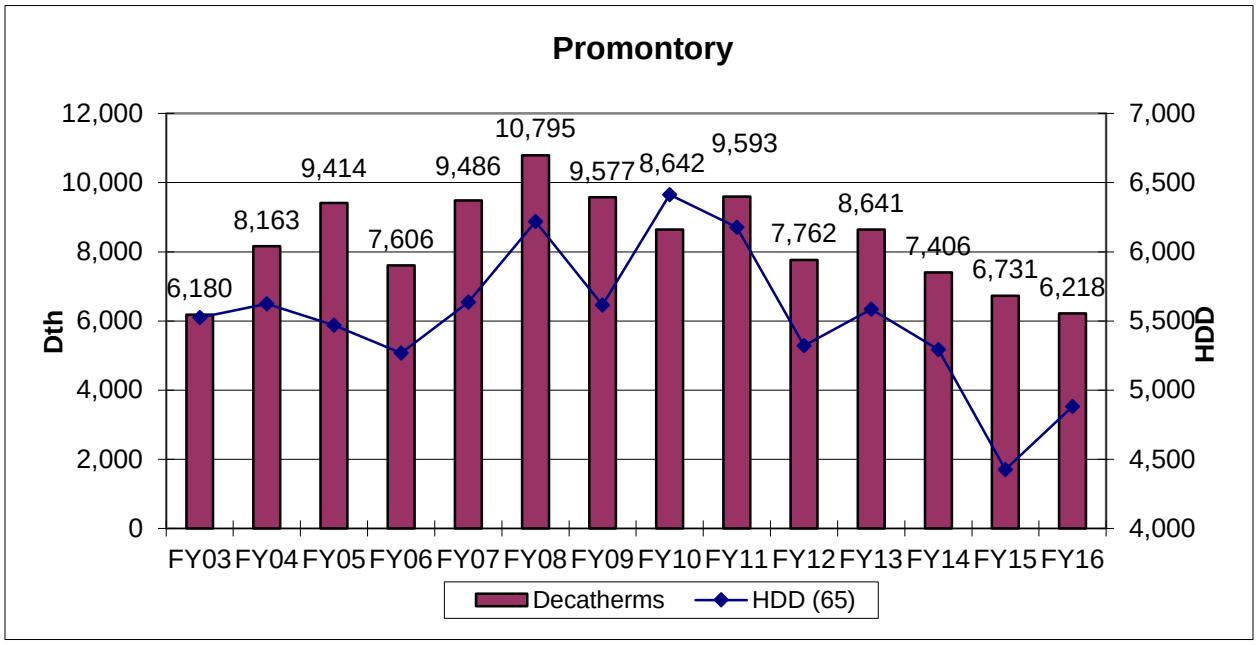
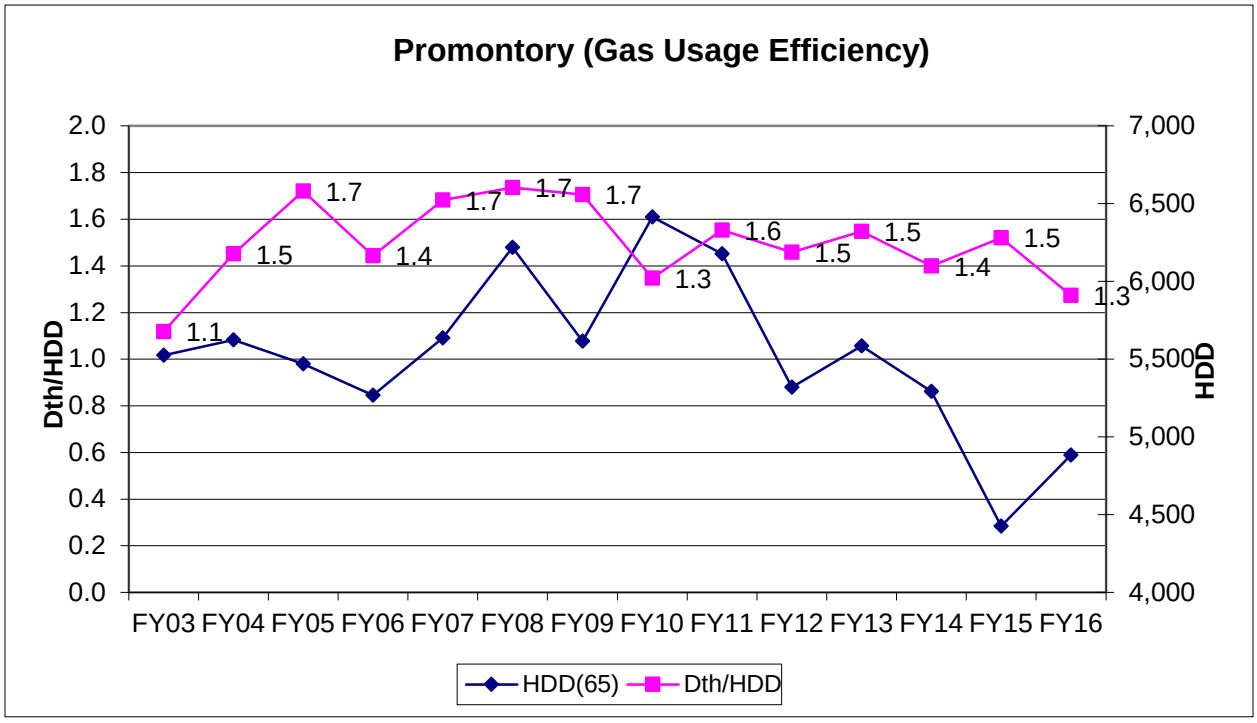


Chart 7. Promontory Decatherms/HDD and Heating Degree Days versus Fiscal Year.



Up until FY10, the Promontory facility's usage followed Heating Degree Days as seen in Chart 6. Please note that FY10 had more Heating Degree Days than FY11, but FY11 used more gas. Comparing FY03 and FY016 the Promontory facility seems to be operating less effectively. According to Chart 7 this facility seemed to be operating less effectively than it has previously where the overall decatherms per HDD is higher than the base year. The increases could be in part due to increases in prison population or other operational additions or changes in usage patterns.

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 during baseline. 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.

Note: The Lone Peak meter is an agreed upon savings amount per the original contract. The below information is for reference only.

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

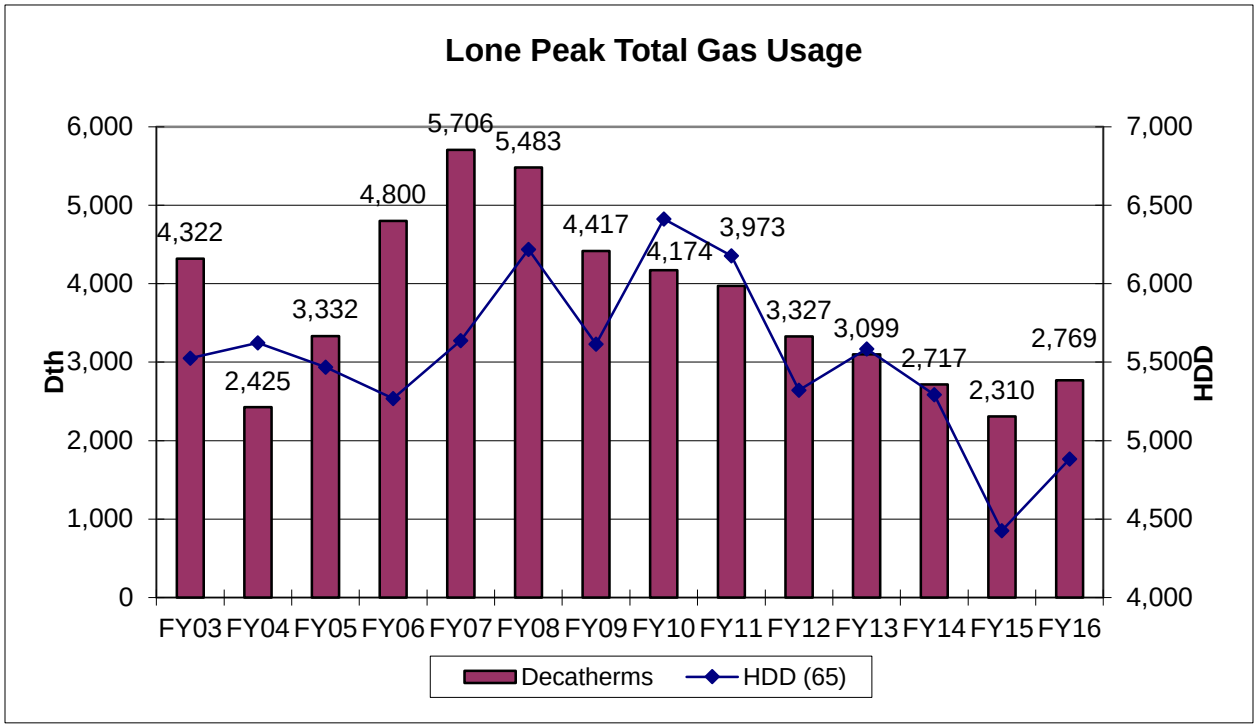


Chart 9. Lone Peak Decatherms/HDD and Heating Degree Days versus Fiscal Year.

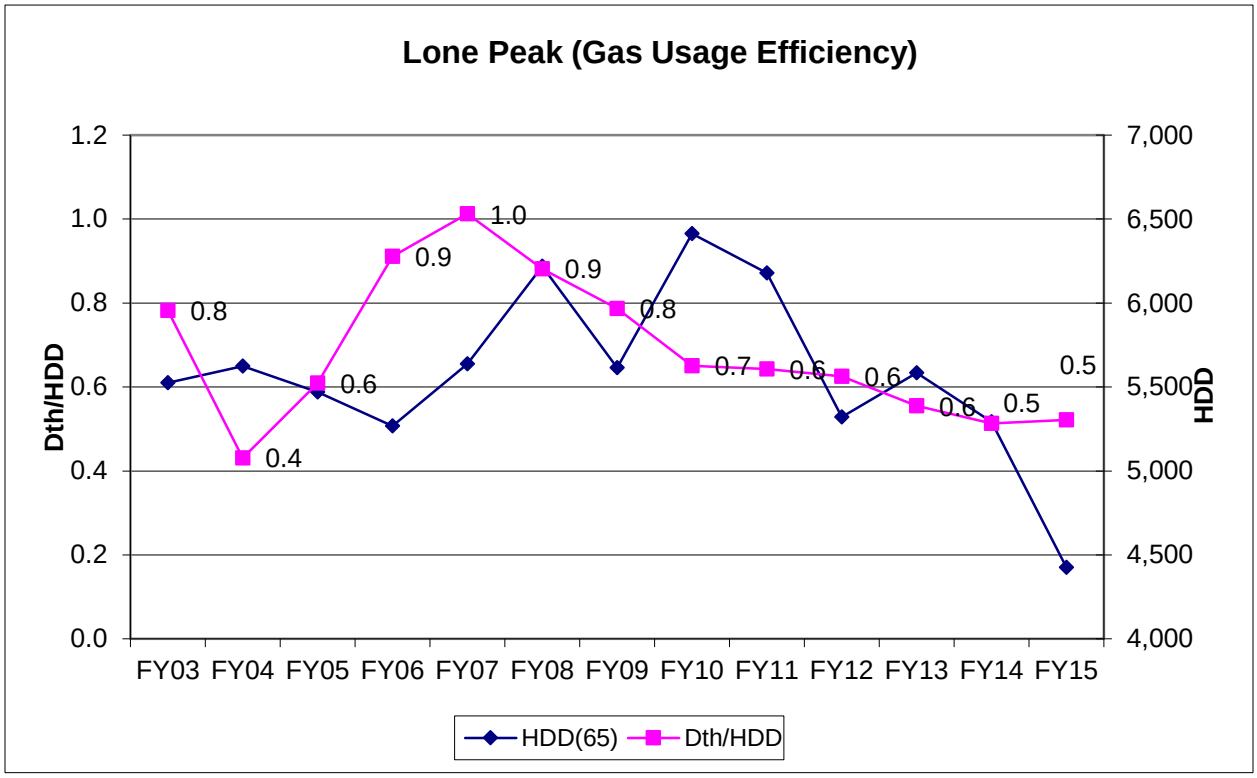
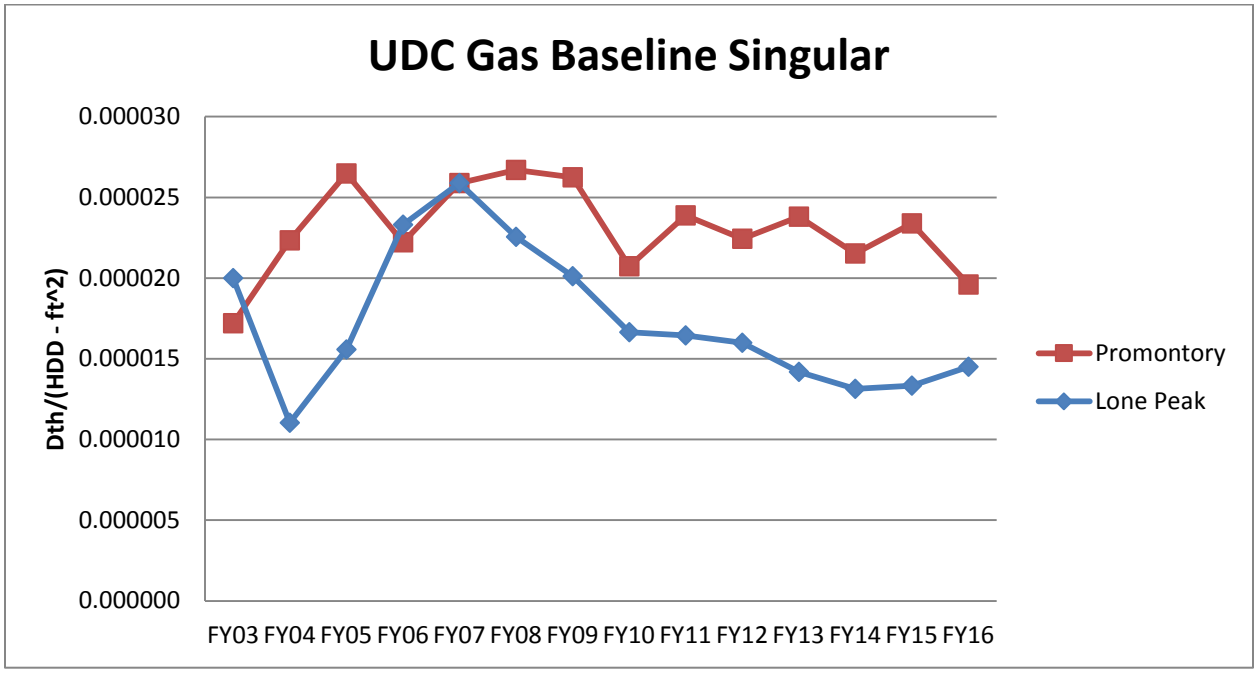


Chart 10. Promontory and Lone Peak Decatherms/ (HDD – ft^2) versus Fiscal Year



During FY04 to FY05, the facility was under construction, which likely accounts for the increase in gas usage up to FY07, which does not show a strong correlation to weather. From FY08 until present the usage has been trending down and tracking better with HDD. The construction may have added to the energy intensity of this facility during the FY 2007 however both now appear to track with weather.

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 during baseline. 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 11. UDC Administration Natural Gas and Heating Degree Days versus Fiscal Year.

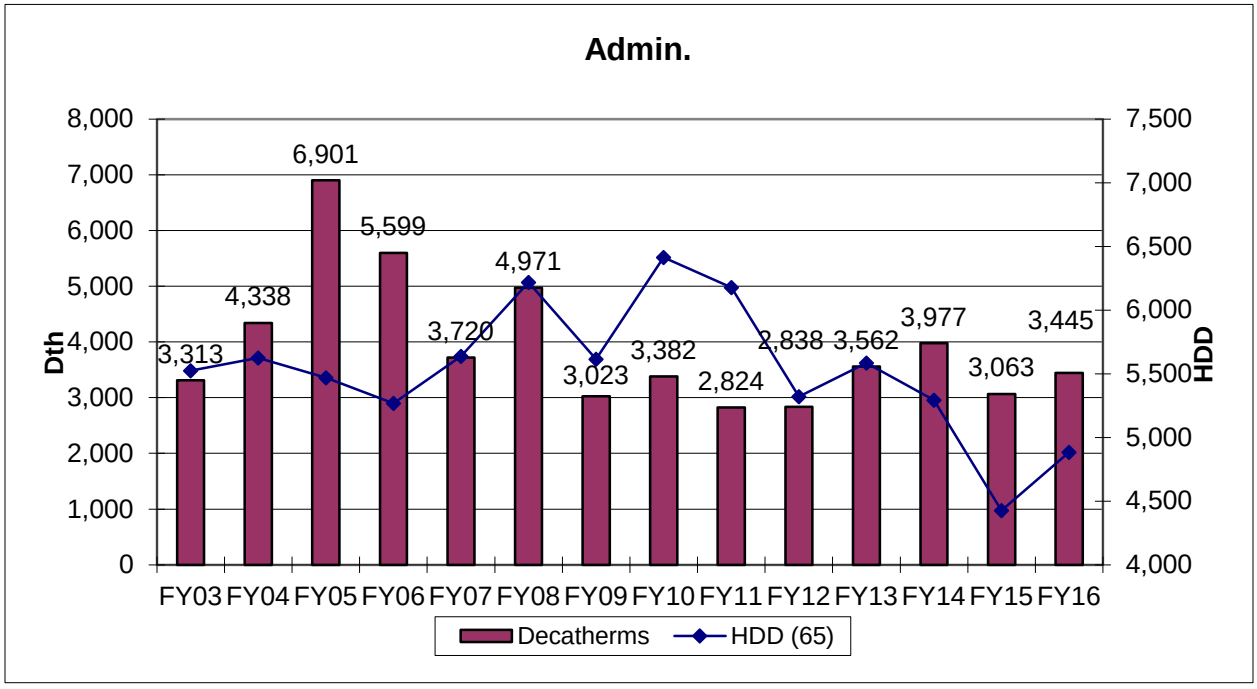
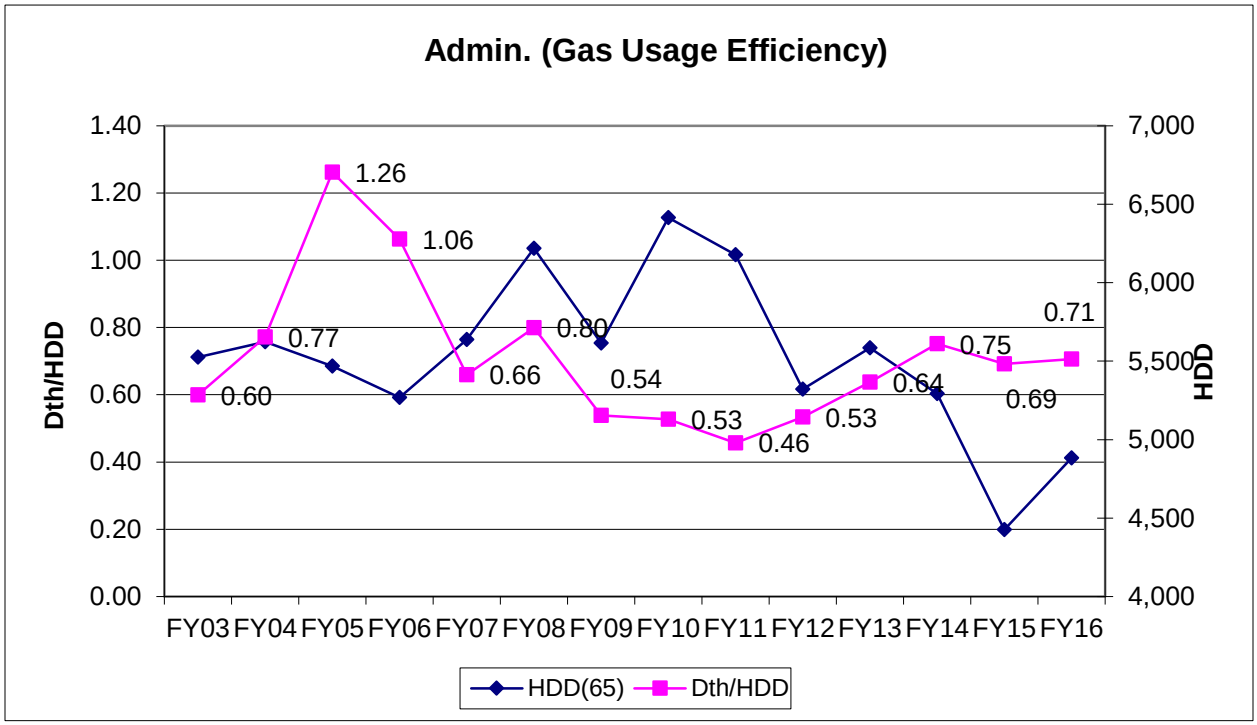


Chart 12. Administration Decatherms/HDD and Heating Degree Days versus Fiscal Year.



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. The administration building was expected to achieve minimal savings, less than 10% of the baseline. Normally for Option C M&V methodology, FIM savings should be greater than 15% of the baseline. Because building gas usage fluctuate from year to year, small fluctuations can offset small savings such as those below the 10% and give the appearance that no savings are achieved. Normally in this situation and Option A or B would be suggested. Future consideration for tracking savings for this meter should be explored.

UDC Administration Electric

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

Chart 13. UDC Administration Electric and Cooling Degree Days versus Fiscal Year.

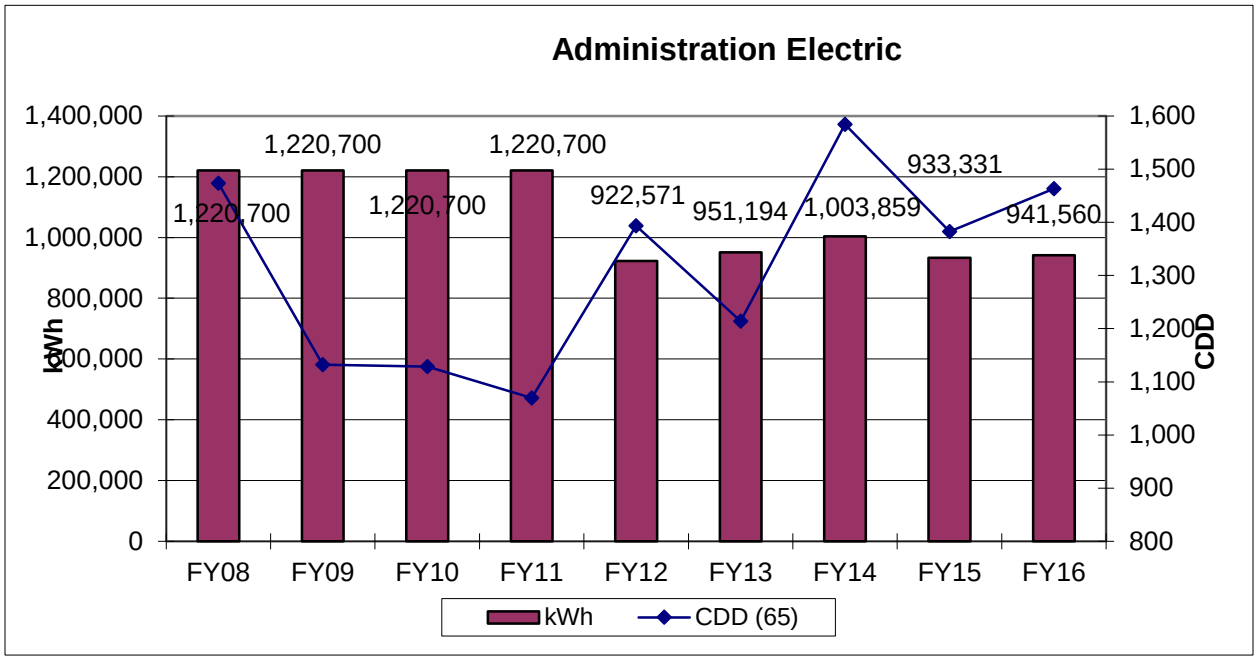
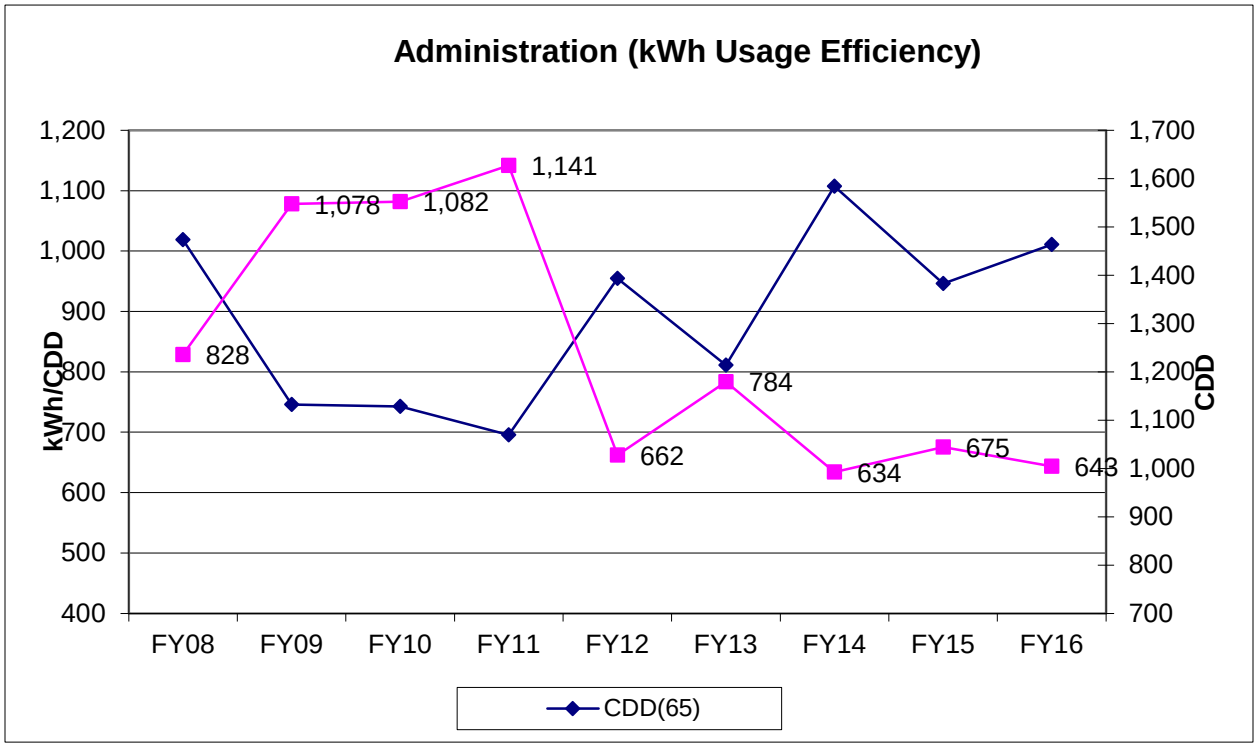


Chart 14. UDC Administration Electric kWh/CDD and Cooling Degree Days versus Fiscal Year.



A substantial drop off in usage occurs following FY12.

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 FY16, it accounts for approximately 1%.

Chart 15. UDC Fred House Academy Natural Gas and Heating Degree Days versus Fiscal Year.

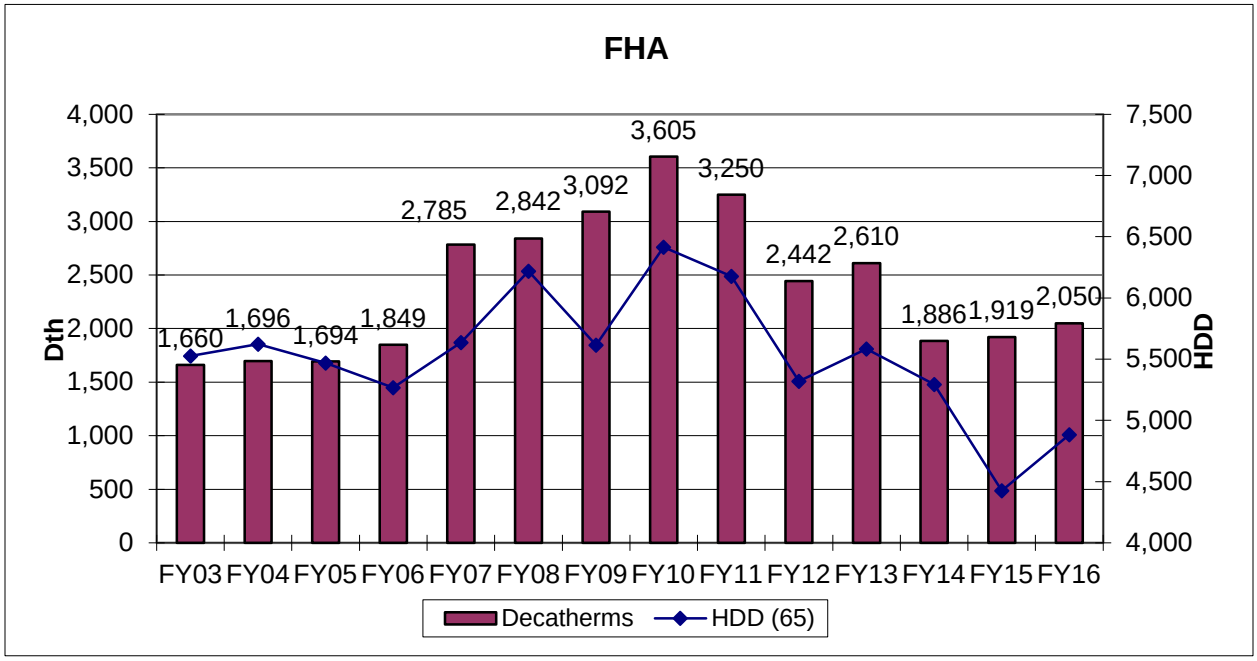


Chart 16. Fred House Academy Decatherms/HDD and Heating Degree Days versus Fiscal Year.

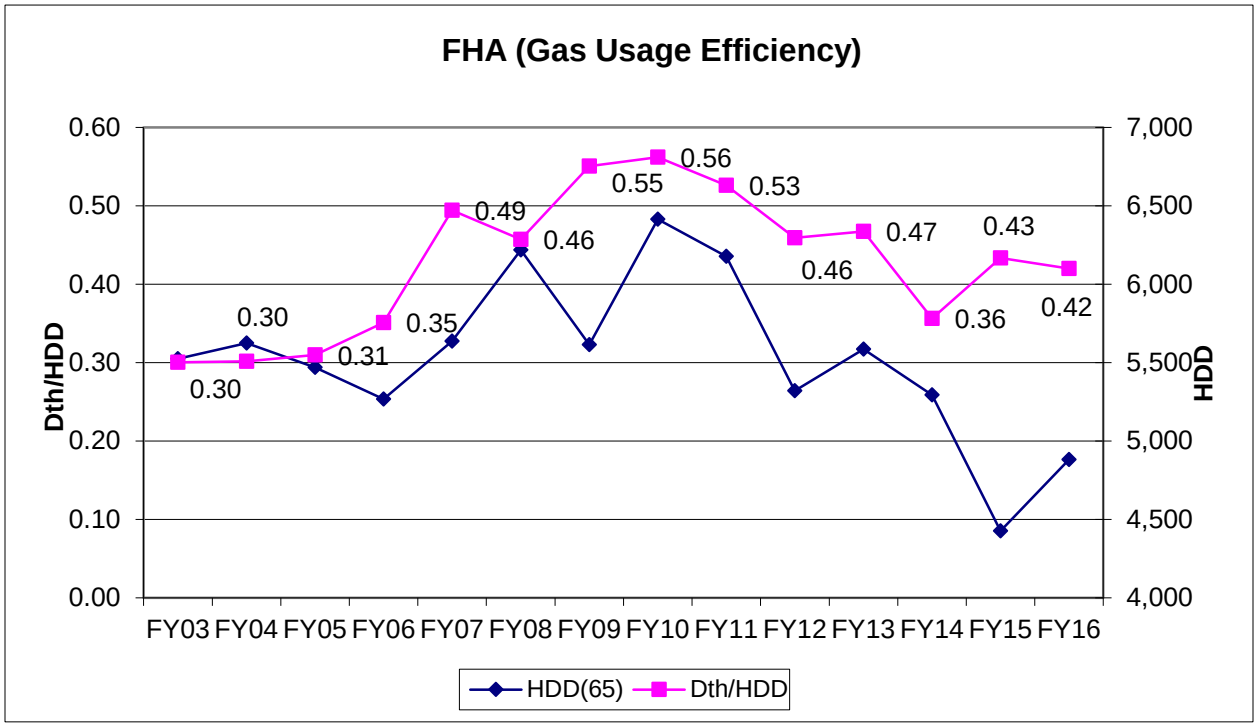
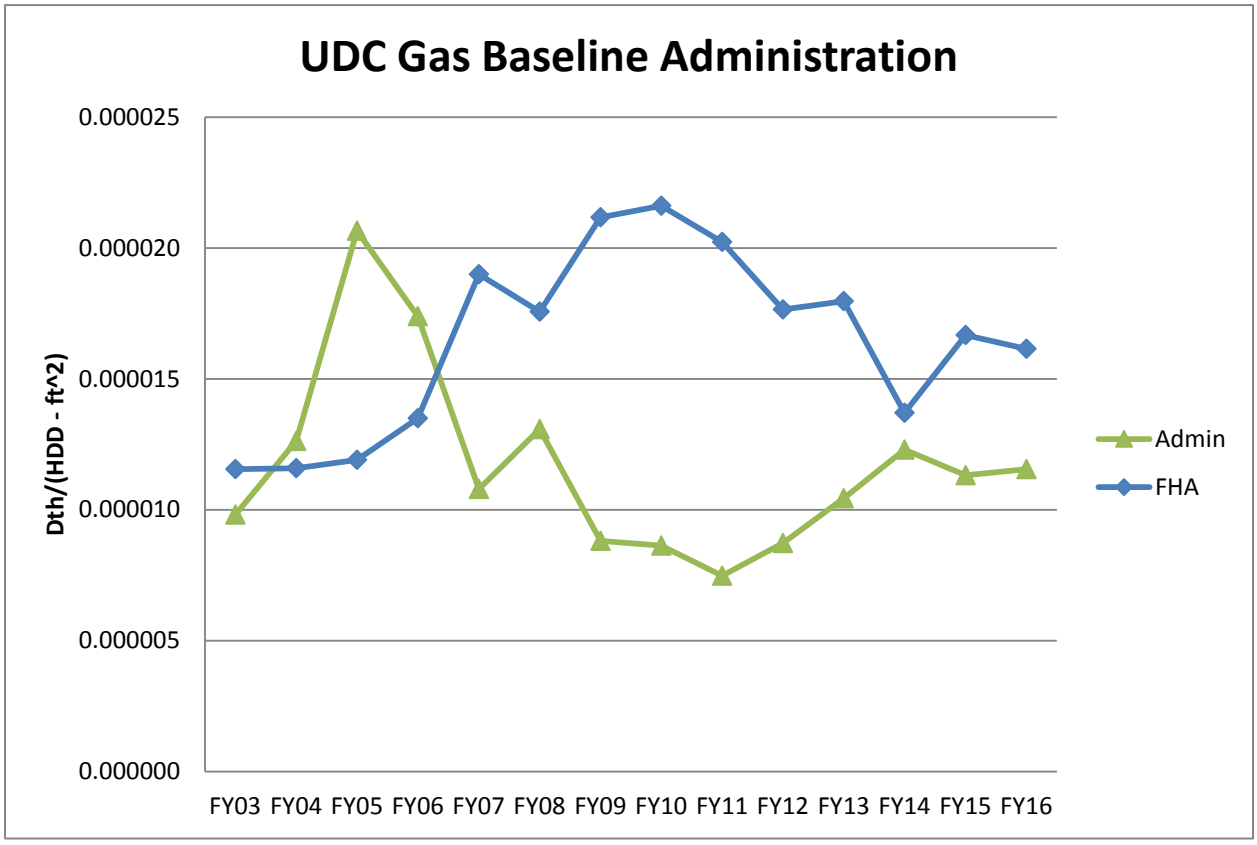


Chart 17. Admin. And FHA Decatherms/ (HDD – ft^2) versus Fiscal Year



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APPENDIX A

UDC Metrix Output Year 12

Metrix Cost/Energy Savings

Administration - Electric

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	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	84,501	87,318	84,501	79,612	77,044	79,612	74,028	66,864	74,028	77,160	79,732	77,160	941,560
Savings	19,529	14,624	17,440	8,783	-1,689	-2,017	20,344	16,207	11,033	26,697	54,762	51,906	237,618
$/kWh*	0.0761	0.0761	0.0761	0.0638	0.0638	0.0638	0.0623	0.0623	0.0623	0.0708	0.0708	0.0708	**$/Year**
$/Month	$1,486	$1,113	$1,327	$560	-$108	-$129	$1,266	$1,009	$687	$1,890	$3,877	$3,675	**$16,654**

Administration - Gas

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Total
Baseline Therms	957	879	1,022	1,358	4,303	4,736	7,052	5,538	4,361	3,783	2,500	1,185	37,673
Actual Therms	1,164	642	644	1,585	4,274	3,951	4,759	3,340	5,214	3,437	4,125	1,318	34,453
Savings	-207	237	378	-227	29	785	2,293	2,198	-853	346	-1,625	-133	3,220
$/Therm	$0.665	$0.785	$0.785	$0.617	$0.720	$0.720	$0.720	$0.720	$0.720	$0.638	$0.609	$0.620	**$/Year**
$/Month	-$138	$186	$296	-$140	$21	$565	$1,651	$1,582	-$614	$221	-$990	-$82	**$2,558**

South Point - Gas

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Total
Baseline Therms	52,658	52,314	51,679	64,321	97,443	164,561	200,156	203,166	168,019	144,121	112,208	93,002	1,403,647
Actual Therms	46,210	43,830	45,020	45,550	64,870	156,920	193,210	204,460	168,860	136,180	109,230	73,950	1,288,290
Savings	6,448	8,484	6,659	18,771	32,573	7,641	6,946	-1,295	-841	7,941	2,978	19,052	115,357
$/Therm	$0.551	$0.552	$0.551	$0.551	$0.538	$0.625	$0.624	$0.624	$0.625	$0.627	$0.538	$0.538	**$/Year**
$/Month	3,549	4,684	3,671	10,342	17,532	4,772	4,336	-808	-526	4,979	1,603	10,254	**$64,390**

North Point - Gas

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Total
Baseline Therms	5,942	6,319	5,365	8,150	22,047	32,963	57,167	37,633	31,226	25,752	17,174	8,742	258,480
Actual Therms	6,226	6,184	6,524	7,332	22,587	39,390	58,663	36,363	35,530	27,267	17,501	8,753	272,320
Savings	-284	135	-1,159	818	-540	-6,427	-1,496	1,270	-4,304	-1,515	-327	-11	-13,840
$/Therm	$0.641	$0.641	$0.640	$0.677	$0.720	$0.756	$0.750	$0.757	$0.808	$0.717	$0.637	$0.645	**$/Year**
$/Month	-$182	$86	-$742	$553	-$389	-$4,862	-$1,123	$961	-$3,477	-$1,086	-$208	-$7	**-$10,474**

APPENDIX A (Continued)

UDC Metrix Output Year 12

FHA - Gas

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Total
Baseline Therms	778	666	785	846	1,361	2,170	4,253	3,220	2,723	3,011	1,948	1,004	22,763
Actual Therms	246	121	200	295	1,717	3,208	4,123	3,243	2,697	2,347	1,541	764	20,502
Savings	532	545	585	551	-356	-1,038	130	-23	26	664	407	240	2,261
$/Therm	$0.829	$0.895	$0.845	$0.924	$0.744	$0.776	$0.762	$0.781	$0.837	$0.742	$0.693	$0.743	**$/Year**
$/Month	$441	$488	$494	$509	-$265	-$806	$99	-$18	$21	$492	$282	$178	**$1,917**

Total Measured Savings **$75,045**

Total Measured Savings

Stipulated Savings - Energy

Lighting Retrofit	$137,919
Promontory	$3,272
Lone Peak	$3,557
Total	$144,748

Total Stipulated Energy Saving **$144,748**

Stipulated Savings - Solid Waste and Water/Sewer

Solid Waste	$28,462
Water/Sewer	$223,137
Total	$251,599

Total Stipulated Solid Waste and Water/Sewer **$251,599**

Total Validated Savings (Measured +Stipulated) **$471,392**

Total Guaranteed Savings (Per Contract) **$1,035,966**

Savings Surplus / Shortfall (Validated - Guaranteed) **($564,574)**

APPENDIX A (Continued)

UDC Metrix Output Year 12

Savings adjustments

Administration - Electric

	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Savings Adj	0	0	0	0	0	0	0	0	0	0	0	0	0
$/kWh*	0.0761	0.0761	0.0761	0.0638	0.0638	0.0638	0.0623	0.0623	0.0623	0.0708	0.0708	0.0708	$/Year
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00

Administration - Gas

	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Savings Adj	0	0	0	0	0	0	0	0	0	0	0	0	0
$/Therm	$0.665	$0.785	$0.785	$0.617	$0.720	$0.720	$0.720	$0.720	$0.720	$0.638	$0.609	$0.620	$/Year
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

South Point - Gas

	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Savings Adj	51,117	46,325	44,938	53,012	66,820	82,693	74,858	65,702	58,018	51,614	41,865	32,653	669,614
$/Therm	$0.551	$0.552	$0.551	$0.551	$0.538	$0.625	$0.624	$0.624	$0.625	$0.627	$0.538	$0.538	$/Year
$/Month	28,140	25,578	24,775	29,208	35,964	51,643	46,730	40,986	36,259	32,365	22,533	17,575	$391,758

North Point - Gas

	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Savings Adj	5,407	5,507	5,729	6,027	6,559	7,810	9,111	7,152	7,503	6,875	6,366	5,159	79,206
$/Therm	$0.641	$0.641	$0.640	$0.677	$0.720	$0.756	$0.750	$0.757	$0.808	$0.717	$0.637	$0.645	$/Year
$/Month	$3,465	$3,531	$3,668	$4,078	$4,723	$5,908	$6,837	$5,413	$6,061	$4,926	$4,053	$3,325	$55,989

FHA - Gas

	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Savings Adj	0	0	0	0	0	0	0	0	0	0	0	0	0
$/Therm	$0.829	$0.895	$0.845	$0.924	$0.744	$0.776	$0.762	$0.781	$0.837	$0.742	$0.693	$0.743	$/Year
$/Month	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Savings Adjustments meters - Option C	**Total Savings Adjustments**	**$447,747**
Savings Adjustments South Point meter - electrical	**Miscellaneous Electrical Savings Adjustments**	**-$1,950**
Total Savings Adjustments		**$445,797**
Savings Surplus / Shortfall (Validated - Guaranteed)		**($564,574)**
Adjusted Savings Surplus / Shortfall (Validated - Guaranteed +/- Savings Adjustment)		**($118,777)**

APPENDIX A (Continued)

UDC Metrix Output Year 12

12 Mo. Ending	Year	Guaranteed Energy Savings	Actual Energy Savings	Guaranteed Water Savings	Actual Water Savings	Guaranteed Solid Waste Savings	Actual Waste Savings	Total Guaranteed Savings	Actual Total Savings	Savings Adjustments	Total Adjusted Savings	Variance	MV
	0	$109,488	$107,279	$72,812	$130,163	$8,954	$8,954	$191,254	$246,396		$246,396	$55,142	
Jun-05	**1**	$379,954	$189,564	$172,856	$205,361	$19,829	$19,829	$572,639	$414,754		$414,754	($157,885)	$85,154
Jun-06	**2**	$534,738	$346,473	$190,636	$192,139	$20,491	$20,491	$745,865	$559,103		$559,103	($186,762)	$87,998
Jun-07	**3**	$552,598	$352,113	$197,003	$196,300	$21,176	$21,176	$770,777	$569,589		$569,589	($201,188)	$90,937
Jun-08	**4**	$571,055	$344,899	$203,583	$171,563	$21,883	$21,883	$796,521	$538,345		$538,345	($258,176)	$93,975
Jun-09	**5**	$590,129	$395,981	$210,383	$177,293	$22,614	$22,614	$823,126	$595,888		$595,888	($227,238)	$97,113
Jun-10	**6**	$609,839	$437,736	$217,409	$183,215	$23,369	$23,369	$850,617	$644,320		$644,320	($206,297)	$100,357
Jun-11	**7**	$630,208	$594,741	$224,671	$189,334	$24,150	$24,150	$879,029	$808,225		$808,225	($70,804)	$103,709
Jun-12	**8**	$651,257	$644,346	$232,175	$195,658	$24,956	$24,956	$908,388	$864,960		$864,960	($43,428)	$107,173
Jun-13	**9**	$673,008	$830,359	$239,930	$202,193	$25,790	$25,790	$938,728	$1,058,342		$1,058,342	$119,614	$110,752
Jun-14	**10**	$695,487	$450,502	$247,944	$208,946	$26,652	$26,652	$970,083	$686,100	$217,191	$903,291	($66,792)	$114,451
Jun-15	**11**	$718,717	$187,630	$256,225	$215,925	$27,542	$27,542	$1,002,484	$431,097	$446,088	$877,185	($125,299)	$118,274
Jun-16	**12**	$742,721	$219,793	$264,783	$223,137	$28,462	$28,462	$1,035,966	$471,392	$445,797	$917,189	($118,777)	$122,224

APPENDIX B – Geothermal Well Preventative Maintenance Reports

Report Date: 11/05/2015
Page 1 of 5

*Scan the QR Code to see new offerings

SERVICE REPAIR REPORT

Service Request Number: 1-24469741066
Status: Completed
Requestor: Greg Peay

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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

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

Service Requested:
REPLACING HEAT EXCHANGER

Service Provided:

Date	Activity Number	Activity Status	Work Performed	By
08/27/2015	1-B8OZL4L	Completed	Cleaned up pipe an materials left on job site	Nickolas Mortensen
08/27/2015	1-B8OZL50	Completed	Help Colby clean up trash, pipe,tools. Take garbage to the dump and tools to the shop.	Clintyn Trutzel
08/27/2015	1-B8OZL5F	Completed	Clean up area and start removing piping	Colby Danklef
08/28/2015	1-B9UJS3P	Completed	Removing piping. Trying to bypass heat exchangers.	Colby Danklef
08/31/2015	1-BAY5TEI	Completed	Heat exchanger piping.	Colby Danklef
09/02/2015	1-BAZRSNS	Completed	Replace heat exchanger	Nickolas Mortensen
09/02/2015	1-BAZRSKQ	Completed	Remove old heat exchanger and install new one. Load old heat exchanger on trailer. Clean up site return rental tools.	Robert Goeltz
09/02/2015	1-BAZRSMT	Completed	Remove and replace heat exchanger.	Brady Smith
09/04/2015	1-BD6QL7A	Completed	Ordered gaskets and valves. Valves ordered through Flotech Inc.	Colby Danklef

SERVICE REPAIR REPORT

Report Date: 11/05/2015
Page 2 of 5

Service Request Number: 1-24469741066
Status: Completed
Requestor: Greg Peay

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Service Provided:

Date	Activity Number	Activity Status	Work Performed	By
09/16/2015	1-BAZRSFV	Completed		Colby Dankief
09/30/2015	1-BQKRIWZ	Completed	Assembling the piping, found that there are issues with old bolts. Found and ordered replacement bolts.	Colby Dankief
10/01/2015	1-BQKRISY	Completed	Pick up new bolts for piping.	Colby Dankief
10/02/2015	1-BSST98B	Completed	Assembling piping. Moved HX to allow piping to fit back into place.	Colby Dankief
10/08/2015	1-BUXXMNW	Completed	Work on piping HX.	Colby Dankief

Labor Details:

Date	Activity #	Hours	Type	Miles	Asset ID	Customer Tag	Serial Number	Model Number
	1-B8OZL4L			15	1-K3R-4948	USR-M-LABOR / 0002		
08/26/2015		8	Regular					
	1-B8OZL50			0	1-K3R-4948	USR-M-LABOR / 0002		
08/26/2015		8	Regular					
	1-B8OZL5F			65	1-K3R-4948	USR-M-LABOR / 0002		
08/25/2015		2	Regular					
08/26/2015		8	Regular					
	1-B9UJS3P			35	1-K3R-4948	USR-M-LABOR / 0002		
08/27/2015		3.5	Regular					
	1-BAY5TEI			45	1-K3R-4948	USR-M-LABOR / 0002		
08/30/2015		8	Regular					

SERVICE REPAIR REPORT

Report Date: 11/05/2015
Page 3 of 5

Service Request Number: 1-24469741066
Status: Completed
Requestor: Greg Peay

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
	1-BAZRSFV			25	1-K3R-4948	USR-M-LABOR / 0002		
09/14/2015		2	Regular					
09/15/2015		2	Regular					
09/16/2015		4	Regular					
	1-BAZRSKQ			20	1-K3R-4948	USR-M-LABOR / 0002		
09/01/2015		4	Regular					
	1-BAZRSMT			20	1-K3R-4948	USR-M-LABOR / 0002		
09/01/2015		4	Regular					
	1-BAZRSNS			20	1-K3R-4948	USR-M-LABOR / 0002		
09/01/2015		6	Regular					
	1-BD6QL7A			40	1-K3R-4948	USR-M-LABOR / 0002		
09/02/2015		2	Regular					
09/03/2015		8	Regular					
	1-BQKRISY			10	1-K3R-4948	USR-M-LABOR / 0002		
09/30/2015		2	Regular					
	1-BQKRIWZ			30	1-K3R-4948	USR-M-LABOR / 0002		
09/29/2015		6	Regular					
	1-BSST98B			30	1-K3R-4948	USR-M-LABOR / 0002		
10/01/2015		4	Regular					
	1-BUXXMNW			25	1-K3R-4948	USR-M-LABOR / 0002		
10/07/2015		4	Regular					

SERVICE REPAIR REPORT

Report Date: 11/05/2015
Page 4 of 5

Service Request Number: 1-24469741066
Status: Completed
Requestor: Greg Peay

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
10/08/2015		5.5	Regular					
TOTALS TO DATE		91		380				

Materials Used:

Activity #	Qty	UOM	Description
1-BSST98B	1	Each	
1-BD6QL7A	4	Each	COMPOSIT VALVE
1-BD6QL7A	4	Each	VALVE HANDLE
1-BAZRSFV	1	Each	
1-BAZRSKQ	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, 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									

Report Date 11/05/2015
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-24401602687
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
09/02/2015	Remove old heat exchanger. Placed onto trailer. Put in new heat exchanger. Remove old heat exchanger from site.	Colby Dankief
	Activity Number 1-B7K31HH	

Materials Used:

Activity #	Qty	UOM	Description

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

Report Date 11/05/2015
Page 2 of 3

Service Request Number: 1-24401602687
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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									

Report Date 11/05/2015
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-24649553601
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
10/13/2015	Pm on VFD's and strainers. No geothermal well in use. **Activity Number** 1-BBNPHIE	Colby Dankief
10/15/2015	Piping installation. Need to order two more gaskets to finish the last valve. Will pressure test after last valve is installed. Reinsulate damaged pipe insulation. Cannot do pm on well because it is currently not in the ground. Waiting for decision on how to proceed. **Activity Number** 1-BBNPHKM	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-24649553601
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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:** ☐

* 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									

Report Date 11/05/2015
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-25622838885
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Service Requested
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
11/18/2015		**Activity Number** 1-BRR6G7Y	Colby Dankief
11/18/2015		**Activity Number** 1-BRR6GAQ	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description

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: 1-25622838885
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Service Requested
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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									

Report Date 11/05/2015
Page 1 of 2

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-26579220048
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Service Requested
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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	

Service Provided:

Date	Work Performed		By
12/01/2015		**Activity Number** 1-C7KL2XL	Cami Graves

Materials Used:

Activity #	Qty	UOM	Description

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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-27342695551
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
01/22/2016	PM. Do final leak check before finishing insulation. **Activity Number** 1-CK74V46	Colby Danklef
02/04/2016	Catch up on pms that have been held back until some of the equipment is back in operation. Thursday: Replaced gasket on leaking flange found during pm. Need to get a few new bolts for flanges. Checked on status of VFD warranty. Julie from Control Equipment has not heard anything from GE, but will email and try to get a status update. **Activity Number** 1-D7YUVIR	Colby Danklef

Materials Used:

Activity #	Qty	UOM	Description

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-27342695551
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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:** ☐

* 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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-28144904392
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
02/24/2016	Gathering info for status update on VFD. Found out that there has been no progress. PM portions of system that are running or capable of running. **Activity Number** 1-CXGQZDF	Colby Dankief
03/24/2016	Reassembling piping that was removed to stop leak. Widdison onsite to setup and start fishing pipe from well **Activity Number** 1-CXGQZF3	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
1-CXGQZDF	1	Each	1/2X1429 BLUE MONSTER TEF TAPE
1-CXGQZDF	1	Each	DISPN TUB W/ CLEANING TWL
1-CXGQZDF	1	Each	1/2X1/8 BLK STL HEX BUSH
1-CXGQZDF	1	Each	1/2X1/4 BLK STL HEX BUSH
1-CXGQZDF	1	Each	3/4X1/2 BLK STL HEX BUSH

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-28144904392
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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:** ☐

* 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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-28955439015
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
03/23/2016	PM tasking	**Activity Number** 1-DAVBTRC	Colby Dankief
04/05/2016	Pm tasking. No updates on VFD warranty.	**Activity Number** 1-DAVBTUE	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description
1-DAVBTRC	1	Each	Flange Sealant,50mL Tube,Red

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-28955439015
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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:** ☐

* 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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-31345844438
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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	

Service Provided:

Date	Work Performed		By
04/18/2016		Activity Number 1-EEEIGFF	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description

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: 1-31345844438
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-32248982294
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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
05/12/2016	PM tasking. Pressure test was stopped by someone else, not sure why. Started pressure test again. No news on new VFD. Activity Number 1-ETC7M8F	Colby Dankief

Materials Used:

Activity #	Qty	UOM	Description

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: 1-32248982294
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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									

Report Date 07/11/2016
Page 1 of 3

PREVENTATIVE MAINTENANCE SERVICE REPORT

*Scan the QR Code to see new offerings

Service Request Number: 1-33645946195
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
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	Yes

Service Provided:

Date	Work Performed	By
06/15/2016	Spent morning at control equipment trying to track down VFD. Drive was sent back to the factory under warranty in September 2015. After a few deadend phone calls the issue was figured out. New VFD is being shipped second day. **Activity Number** 1-FGFXI1K	Colby Dankief
06/21/2016	Picked up VFD. Completed GE warranty procedures. **Activity Number** 1-G76V95G	Colby Dankief
06/24/2016	Install warrantied VFD. Check operation. **Activity Number** 1-G9S63EK	Colby Dankief
06/30/2016	Pick up wire **Activity Number** 1-GDEQ4MZ	Colby Dankief

PREVENTATIVE MAINTENANCE SERVICE REPORT

Service Request Number: 1-33645946195
Service Request Type: PSA
Service Request Sub-Type: Scheduled Service
Status: Completed
Requestor: Greg Peay
Agreement Reference: 1-22613468121

JOHNSON CONTROLS SALT LAKE CITY UT CB - 0N55
2255 Technology Pkwy
West Valley City, UT 84119-1144
(866) 468-1486

Materials Used:

Activity #	Qty	UOM	Description

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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Appendix C: Supporting Savings Adjustment Data

The Following pages include the following:

- Base Condition Prison Population versus current year Population for South Point and North Point facilities

Base Condition and Current Year Prison Population for South Point and North Point Facilities

Below Baseline population statistics was requested 8/2015 source file name is "NORTH SOUTH POINT ADP BY MONTH - AUG 2015 (00000002).xlsx"

Monthly Average Daily Population (ADP) for South Point complex, July 1, 2001 through June 30, 2003:			Monthly Average Daily Population (ADP) for North Point complex, March 1, 2002 through March 31, 2003:	
DATE	MONTHLY ADP		DATE	MONTHLY ADP
Jul-01	2340		Mar-02	924
Aug-01	2404		Apr-02	920
Sep-01	2412		May-02	931
Oct-01	2375		Jun-02	934
Nov-01	2327		Jul-02	931
Dec-01	2294		Aug-02	923
Jan-02	2346		Sep-02	928
Feb-02	2385		Oct-02	925
Mar-02	2392		Nov-02	945
Apr-02	2364		Dec-02	957
May-02	2370		Jan-03	966
Jun-02	2315		Feb-03	971
Jul-02	2296		Mar-03	966
Aug-02	2323			
Sep-02	2337			
Oct-02	2329			
Nov-02	2363			
Dec-02	2365			
Jan-03	2394			
Feb-03	2417			
Mar-03	2433			
Apr-03	2423			
May-03	2401			
Jun-03	2422			

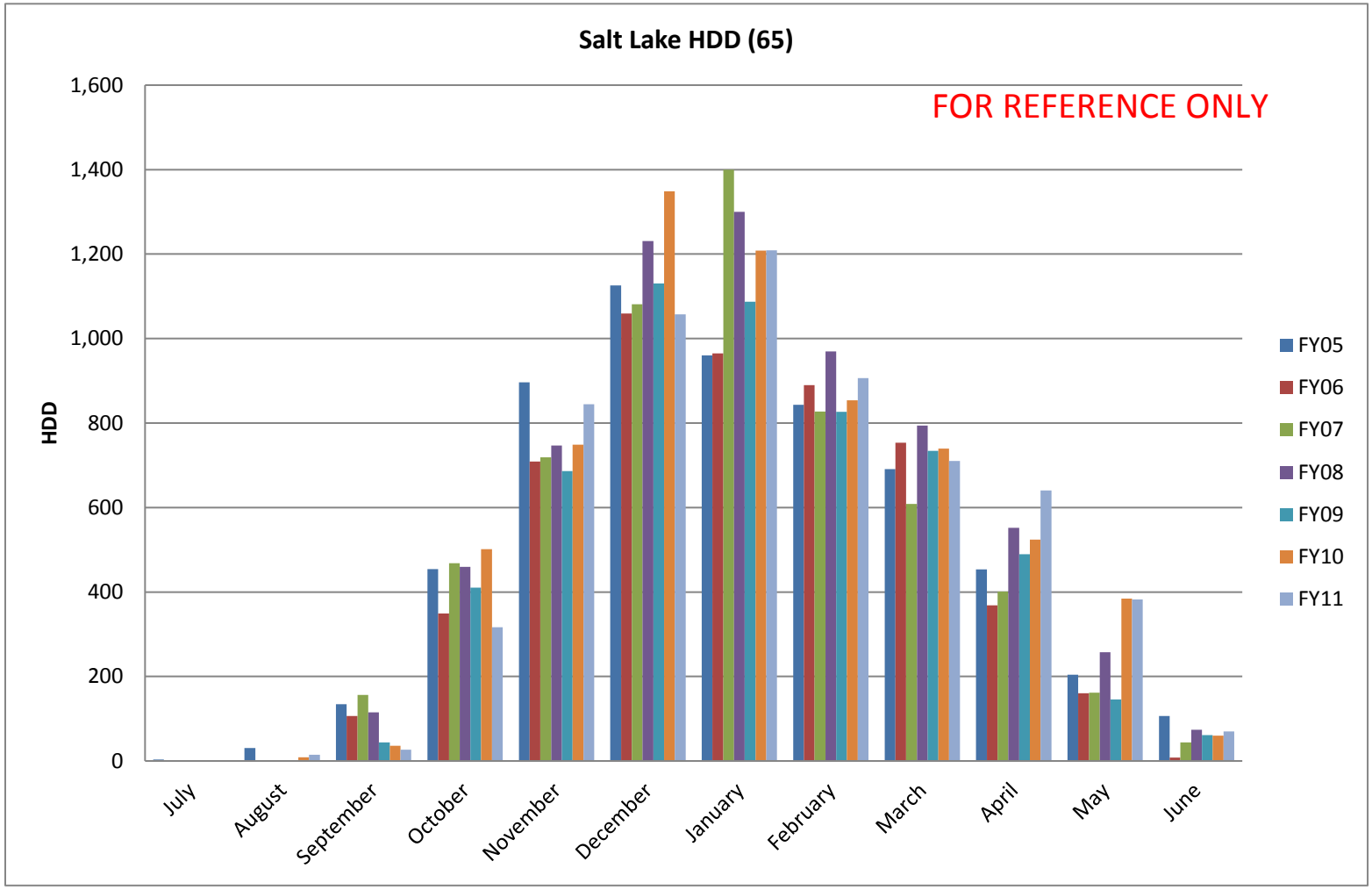
Below Current Year population statistics was requested quarterly source file names are "Avg Pop Count 2015.xls" & "South n North Point Monthly Averages 5-23-2016.doc"&"April-June 2016 Northpoint Monthly Counts.pdf"& "Apr-Jun 2016 Monthly Count Southpoint.pdf"

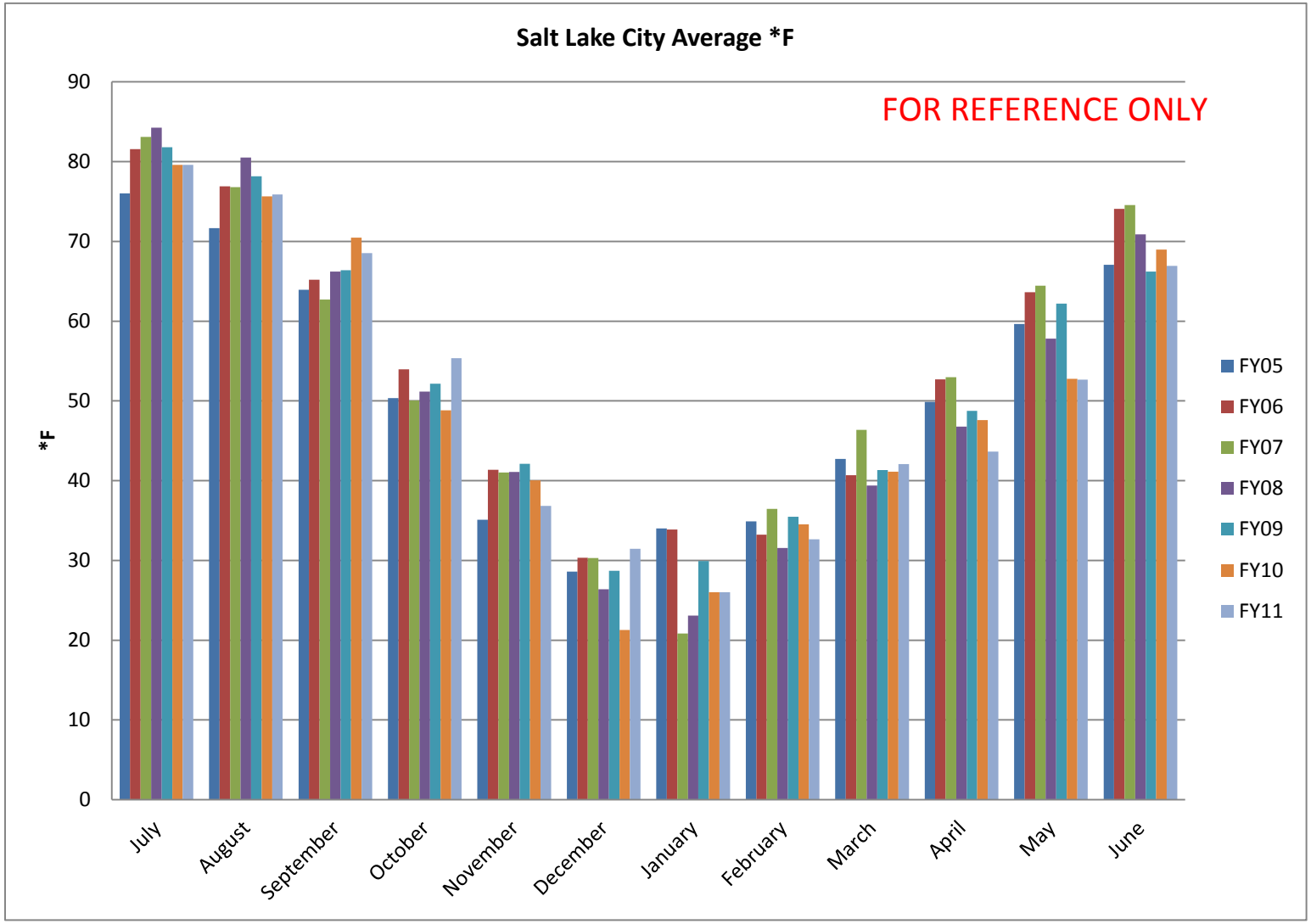
Inmate population of Draper Prison June 2015-June 2016

The population changes each day, I used the first or second day of each month for this chart.

DATE	North point population		DATE	South point population
July 2015	1,129		July 2015	2,412
Aug. 2015	1,138		Aug. 2015	2,356
Sept. 2015	1,198		Sept. 2015	2,265
Oct. 2015	1,191		Oct. 2015	2,189
Nov. 2015	1,170		Nov. 2015	2,170
Dec. 2015	1,152		Dec. 2015	2,157
Jan. 2016	1,126		Jan. 2016	2,129
Feb. 2016	1,133		Feb. 2016	2,128
Mar. 2016	1,164		Mar. 2016	2,131
April. 2016	1,169		April. 2016	2,118
May. 2016	1,161		May. 2016	2,022
June. 2016	1,099		June. 2016	2,040

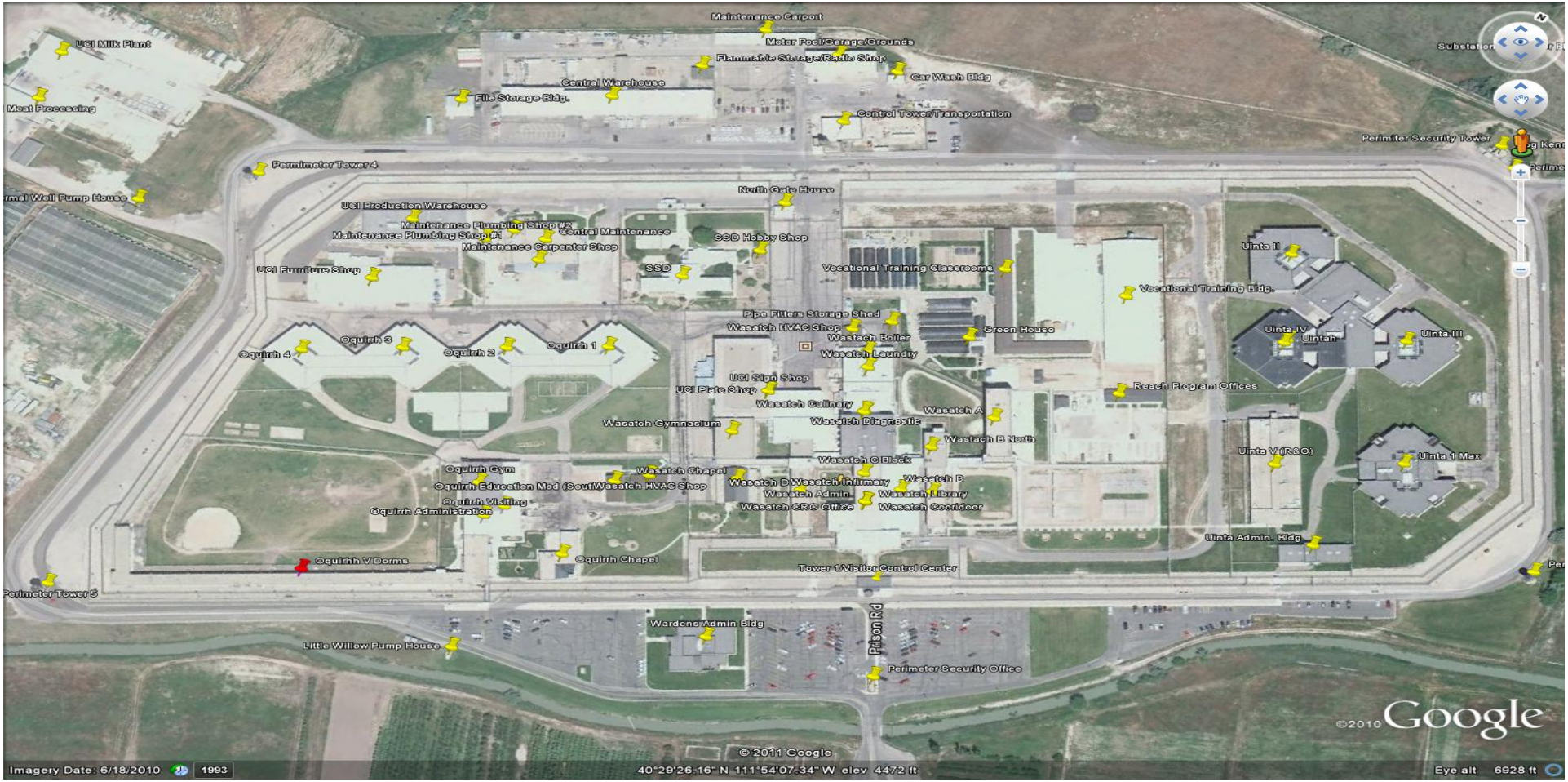
Appendix D: Salt Lake Valley Weather



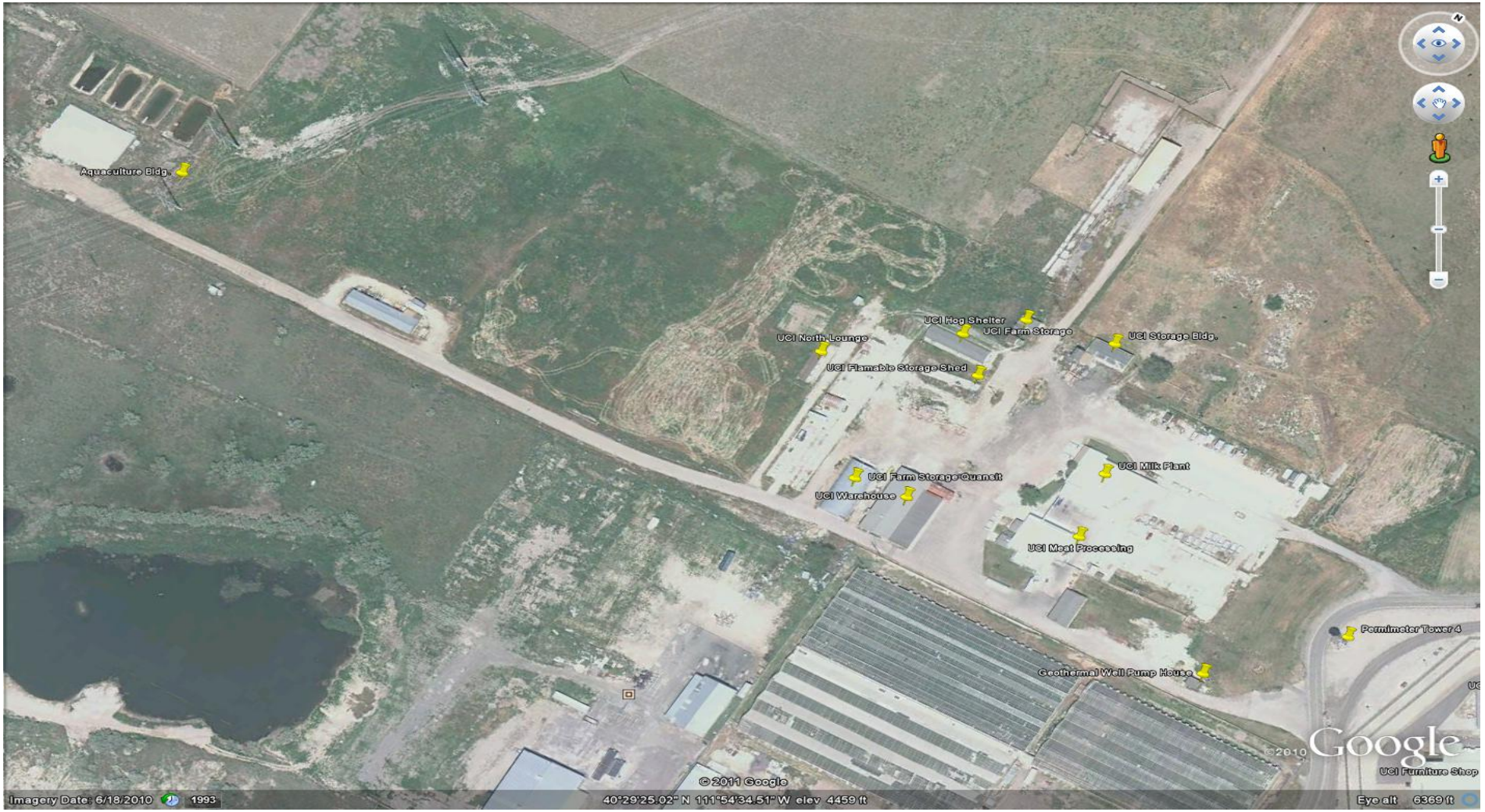


Appendix E: Google Earth Images

South Point



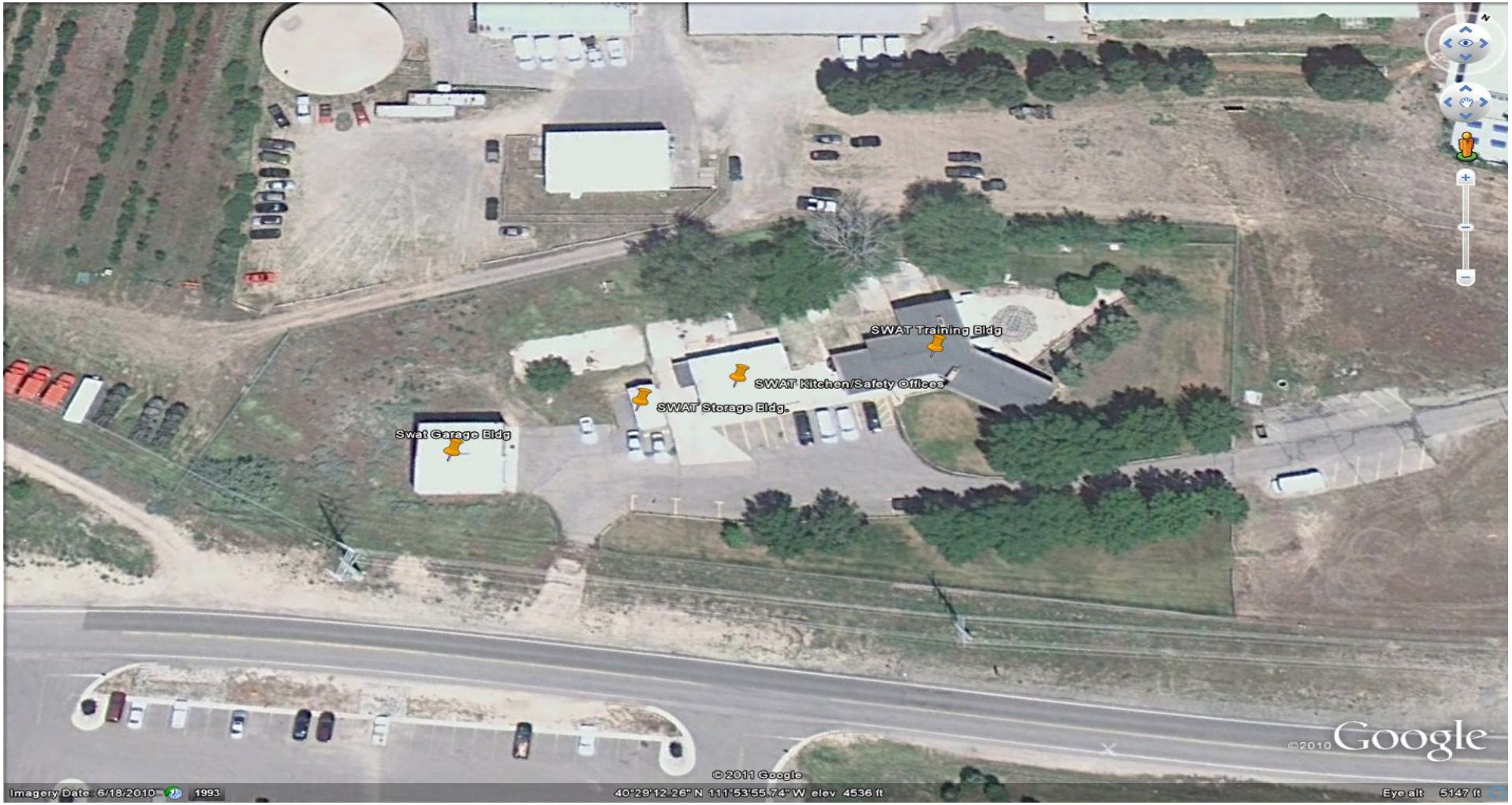
Milk Processing Etc.



North Point

Lone Peak/Promontory

Lone Peak/Promontory



UDC Administration/FHA

UDC Facility

State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

JOHN R. NJORD, P.E.
Executive Director

CARLOS M. BRACERAS, P.E.
Deputy Director

December 9, 2016

To: Bianca Shama
DFCM Energy Program Manager

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

Subject: UDOT Energy Projects Update

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.

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)

2016
- Salt Shed Solar Power (2 locations in Region IV)

2017 (In progress)
- Phase 1: 40Kw Solar Array at Rampton Motorpool Carports

Energy Efficiency Projects:

FY 2009

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

FY 2010

- Wanship Maintenance Lighting Upgrade
- 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
- Grantsville Maintenance Station Lighting Upgrade
- LED Rest Area Light Installs (Grassy Mountain (both sides), Salt Flats (both sides), Lunt Park (both sides).

FY 2015

- EV Charging Stations (Rampton Complex, Region I: Ogden, Region III: Orem)

FY 2016

- EV Charging Stations (Region II: Salt Lake City, Region IV: Richfield or St. George)

FY 2017

- Start 3 year program with Rocky Mountain Power's Small Business Direct Energy Efficiency program. This will be to provide energy audits and install energy efficiency measures at most of UDOT's small facilities (maintenance stations, rest areas, ports of entry, etc.) There is a 75% cost rebate from Rocky Mountain Power.

Energy Initiatives in the Planning Phase

- Facility Inventory System (with DFCM)
- Energy Efficiency Grants when available
- Expand EV Charging Stations

December 19, 2016

USDB Facility, State of Utah Energy Report

Designated staff member for coordinating reports: Gabe Areano
Back up staff for coordinating reports: Jenn Rust
Staff whom will oversee efforts: Letty Debenham

Energy and consumption monthly use cost per facility for the Ogden, Salt Lake and Orem Campuses.

Gas use per building: DTH = 1 million BTU's
Ogden Campus - 742 Harrison Blvd, Ogden UT 84404.
Main facility - 425 DTH @ $2.650.60
Cottages (4 each) - 7.0 DTH @ $40.15
STEP Center - 2.5 DTH @ $30.00
Learning skills shop - 2.0 DTH @ $ 28.00

Salt Lake Campus - 1655 East 3300 South, SLC UT 84106. BLDG #1 & #2
USDB JMS Campus - 42.8 DTH @ $395.00 Bldg. #1
USDB OEC Center - TBA FY 2018. Bldg. #2 We just occupied this facility as of September 9, 2016.
Millcreek Elementary - 3761 South 1100 East, SLC UT 84106
Classroom modular unit - 7.0 DTH @ $31.00
USDB Administration Office (former) - 3098 Highland Drive, SLC UT 84106
Leased office space - 24 DTH @ $178.00 Moved out in September to new facility Bldg. #2 on 3300 South.

Orem Campuses – modular classroom units
Scera Park Elementary - 450 South 400 East, Orem UT 84057
7.0 DTH @ $35.00
Westmore Elementary - 1150 South Main St, Orem UT 84057
7.0 DTH @ $35.00
Orem Elementary - 450 South 400 West, Orem UT 84057
7.0 DTH @ $35.00

Electric use per building: Kwh
Ogden Campus – 742 Harrison Blvd, Ogden UT 84404
Main facility – 114,000 kwh @ $ 10,132.00
Cottages (4 each) – 1,000 kwh @ $124.56
STEP Center – 1,350 kwh @ $ 134.67
Living Skills shop – 800 kwh@ $71.00

Salt Lake Campus – 1655 East 3300 South, SLC UT 84106
Bldg. #1 – 24,700 kwh @ $2,237.00
Bldg. #2 – TBA FY 2018, We moved in September 2016 from the Highland location.
Millcreek Elementary – 3761 South 1100 East, SLC UT 84106
Classroom modular unit – 1,200 kwh @ $ 149.00
USDB Administration Office (former) - 3098 Highland Drive, SLC UT 84106
Leased space – 11,200 kwh @ $1,200.00

Orem Campuses – modular classroom units
Scera Park Elementary - 450 South 400 East, Orem UT 84057
1,200 kwh @ $ 153.00
Westmore Elementary - 1150 South Main St, Orem UT 84057
1,200 kwh@ $153.00
Orem Elementary - 450 South 400 West, Orem UT 84057
1,200 kwh @ $153.00

Water use per building:
Ogden Campus – 742 Harrison Blvd, Ogden UT 84404
Main facility – 70,000 gal @ $812.00
Cottages (4 each) – 17,000 gal @ $65.00
STEP Center – 11,300 gal @ $ 53.00
Living Skills shop –2,000 @ $15.00

Salt Lake Campus – 1655 East 3300 South, SLC UT 84106
Bldg. #1 – 40,000 gal @ $430.00
Bldg. #2 – TBA FY 2018, We moved in September 2016 from the Highland location.
Millcreek Elementary – 3761 South 1100 East, SLC UT 84106
Classroom modular unit – 10,000 gal @ $47.00
USDB Administration Office (former) - 3098 Highland Drive, SLC UT 84106
Leased space – 20,000 gal @ $230.00

Orem Campuses – modular classroom units
Scera Park Elementary - 450 South 400 East, Orem UT 84057
8,000 gal @ $38.00
Westmore Elementary - 1150 South Main St, Orem UT 84057
10,000 gal @ $45.00
Orem Elementary - 450 South 400 West, Orem UT 84057
10,000 gal @ $45.00

Salt Lake Community College

Annual Energy Report 2015-2016

Prepared by: Facilities Services
Ezra Nielsen, Energy Manager

For Additional Information Contact:

Kathy Shipley
Access & Resource Manager
801-957-4939
kathy.shipley@slcc.edu

Robert Askerlund
Assistant Vice President of Facilities Services
801-957-4101
bob.askerlund@slcc.edu

Overview:

Salt Lake Community College (SLCC) continues to push the boundaries of what can be done to optimize and operate buildings and campuses efficiently. Great strides have been made this year, but we feel as if we are just touching the tip of the ice burg. We have tools and insights that have really never before been possible and the opportunities to leverage this data are proving limitless. That being said, our success has been largely due to vetting and scrutinizing the cost/benefit of various potential projects and solutions. We pride ourselves on having a comprehensive vision and understanding the "why" of our mission before we define "what" will get us there.

FY15-16

Energy Conservation Efforts

This year we were able to solve some complex issues that were affected by a lot of different factors. The solutions weren't low hanging fruit solved by a simple retrofit. We integrated energy and operations data into comprehensive analysis of the current operating status of our buildings and campuses.

Commissioning

We wrapped up the commissioning project at our Jordan Campus late this summer. A summary of the cost, savings, and incentive received is in the table below.

Total Cost	Incentive Received	Annual Savings	Annual kWh savings
43,564	$19,883	$60,059	999,150

The savings are expected to persist for at least 3 years. We also realized additional financially unquantified benefits of performing this project in terms of our maintenance program and HVAC operators understanding of the systems. Of three separate capital-upgrade measures that were proposed we will be pursuing two of them including; steam sterilization unit replacement and installing split systems for air conditioning IT rooms in winter (enables us to shut off chiller plant). See the details in the table below.

Total Cost	Incentive Received	Annual Savings	Annual kWh savings
$25,866	$8,935	$11,119	59,570

Mechanical

A number of upgrades occurred this year, mostly concerning VFD's, controls upgrades, etc. See the details in the table below. We are integrating energy data into our operations more and more with things like demand limiting. We are also able to do things like calculate chiller/boiler plant efficiencies which helps guide our billing rates and energy usage tracking of buildings.

Project	Cost	Incentive	Annual Savings	Annual kWh savings
SCC AHU VFD's	$9,350	$3,250	NA	54,100
East Chiller Plant upgrade	$267,960	$44,291	$19,726	295,277
Library Chiller upgrade	$34,055	$5,007	NA	NA
CT VFD upgrades	$10,950	$3,900	NA	64,920

Controls

Phasing out pneumatic controls takes time, but this year we bit off a big chunk by upgrading the CT building at our Redwood Campus as well as all of the AHU's at our South City Campus. This gives us the opportunity to achieve energy savings through enhanced controllability, as well as increases the comfort and satisfaction of the buildings occupants. Our goal obviously is to continue to retrofit/upgrade our automation systems.

Lighting

We completed a few small lighting projects, but mostly our maintenance electricians have just been replacing lights that go out with LED's. The most substantial project was a LED walkway lighting retrofit that was done at Meadowbrook campus and is detailed in the table below.

Cost	Incentive	Annual Savings	Annual kWh savings
$9,580	$2,233	$578	14,892

On Site Generation

We requested $519,000 from the DFCM revolving energy loan to design and construct a combined heating and power unit. We are about 50% through with the design currently. The project will generate 200kW of electricity while recycling approximately 1.0 MBTU of heat into the campus hot water loop. We anticipate this system to save us $75,000 in the first year and have a 10 year cumulative cost savings of $300,000. The life expectancy of the system is 15 years. We also hope to demonstrate this system and use it as a teaching tool and example of a different type of on site generation other than solar p.v.

Power Quality

We addressed power quality issues out at our Miller campus by installing a centralized cap bank and harmonic filter unit at the building MDP. We eliminated rather large power factor penalties from the utility bill on (3) of the buildings. We expect the project to pay for itself within 5 years. Project information can be found in the table below.

Project Cost	Project Annual Cost Savings
$34,259	$6,648

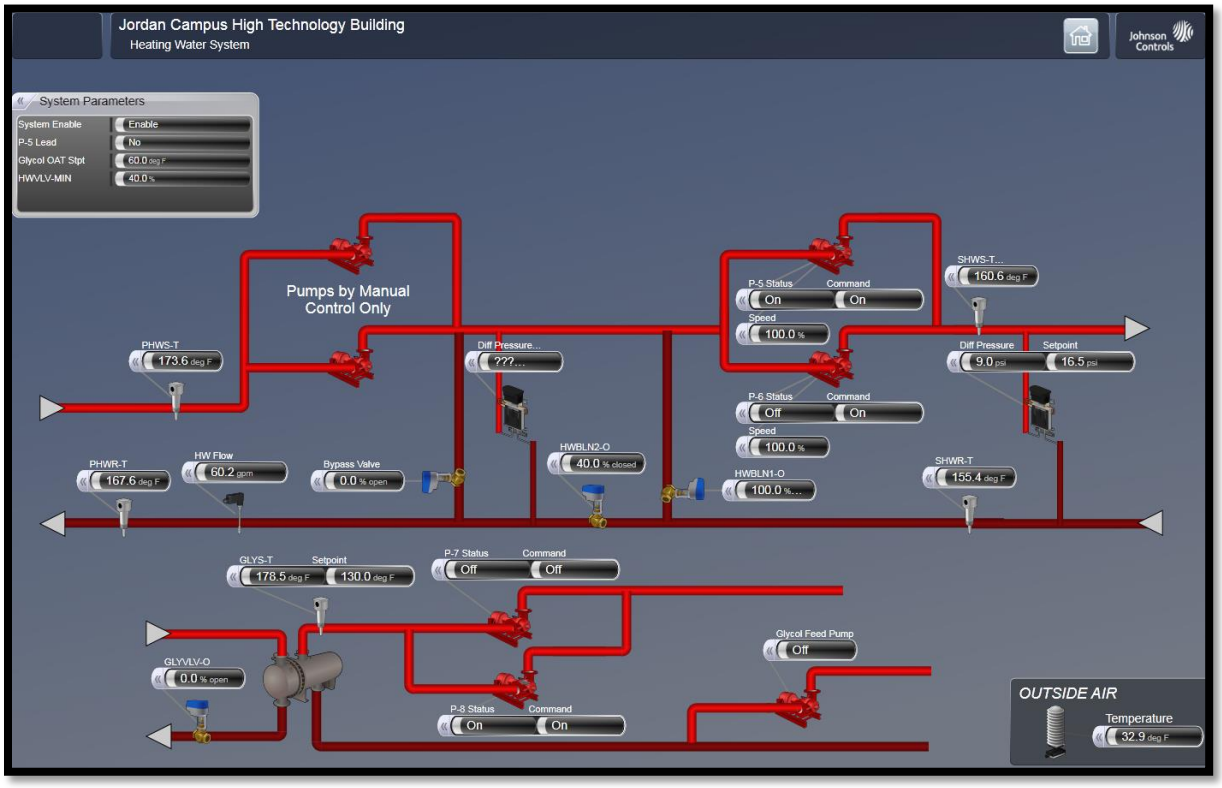
Energy Information System

Although we have spent close around 1 million dollar to implement, and the efforts are not directly tied to a payback of a specific project, our EIS system in my opinion makes it all possible. With the metering, analytics, and trending we can monitor completely the control system for a building/campus. This incentivizes our internal efforts to constantly commission and optimize our systems because progress can be tracked and attributed to specific efforts therefore creating more accountability. Understanding and taking ownership of the buildings that we operate as well as occupy is aided by data driven decision making. As the buildings themselves have continued to grow increasingly complex so must our approach by taking advantage of innovative tools and methods to keep up with constantly changing conditions. Our EIS system is comprised of these 3 parts:

Vitality – energy metering server, hosts database, and various dashboards.

Skyspark – trending server, hosts database, and runs analytics software.

Metasys – building automation server, controls all equipment and systems.



Current & Future (FY16-17)

Energy Conservation Efforts

This year will be our 3rd time participating in the Energy Manager Co-funding program from Rocky Mountain Power. The extra incentives from that program have really helped fortify our institutional revolving energy budget that we have begun to fund projects out of. DFCM's revolving 0% interest energy loan has also been the funding source for many projects over the years and we are very grateful. We have a lot of really exciting stuff we're working on this year and we owe it all to the progress we've made in the years past that we are building on.

Onsite Generation

Our CHP project will be designed and built in this fiscal year. So we will have some cost/savings figures for the next report. Our new Westpointe building will also be the recipient of a large 500 kW solar array, nearly doubling our current capacity of onsite generation.

Persistent Commissioning

Redwood Road campus is currently being scoped for savings potential right now. We will then request some money's to complete the project, but we hope to keep costs minimal and in house for the most part. Capital measures that are identified will have to be funded separately.

Lighting Controls

We are currently in the process of enhancing our exterior lighting control by bringing it all under one graphic in Johnson Controls. Each zone will have a status and a corresponding point of control and for the fixtures that are controlled off photocell we plan to upgrade to a centralized averaging of (4) campus photocells. We are also investigating the option of networking the walkway poles and implementing dimming and occupancy based control of those poles to get energy savings.

EIS

With the glut of data streams that we have set up recently we are always in the market to leverage it by dash boarding and other technologies. FinnStack is a compelling add on that we have purchased and are going to test out this year. We also aim to communicate information to students, faculty, and administrators about energy consumption, air quality, weather, etc.

Controls

We are continuing the controls upgrade of our South City Campus by retrofitting VAV boxes to DDC controls from pneumatic. This is a big project and will probably take a couple years. In the HP on Redwood Road campus we plan on retrofitting to DDC completely as well.

Past Energy Conservation Efforts
FY14-15

A lot of progress was made this past fiscal year. One of our biggest accomplishments was one that didn't have any energy savings associated with it. Our own revolving fund is now set up that will let us borrow money from an account funded through realized energy savings and received incentives. This ensures that we reap the residual cost benefits of our project and utilize the funds for the development and implementation of more projects.
The most notable project that was done this year in terms of energy and cost savings is defined in the below table.

Project name	Project cost	Incentives	Annual kWh Savings	Annual $ savings
Aggregate Lighting Project	$ 714,000	$ 242,662	1,207,108	$58,709

Lighting
All major Salt Lake Community College campuses had their exterior lights (parking lots, walkways, and wall packs) retrofit to new LED fixtures. We standardized on as many things as possible including color temperature, fixture type, and driver type. The project was made possible by revolving loan monies from DFCM. It has provided us with many benefits other than the outlined financial ones above, namely decreased maintenance and enhanced aesthetics.

Mechanical
VFD's were installed on multiple motors of major HVAC equipment including cooling towers, pumps, chillers, and fans. The benefits we have seen are two fold, energy savings and enhanced controllability. We upgraded to a high efficiency Muirra boiler and have seen superior performance by it. We also upgraded one of our smaller chillers to a high efficiency mag bearing screw machine that is the most efficient one we have.

Metering
Continuing on with our building level utility sub metering effort we were able to bring all of Jordan Campus online, All of South City Campus online, and 4 buildings of redwood online. We have spent a lot of time this year defining how we are going to use this new energy information system and how we want the data formatted and displayed. This year we will be completely sub metered on all our district energy campuses and equipped with a sophisticated dashboard that displays energy usage information from a central server where all our data is stored and backed up. This will single handedly be the most powerful tool we have for tracking energy use in our building operations and prioritizing them, as well as quantifying the savings achieved from energy upgrades and efficiency projects.

Controls
One of our biggest buildings, our Technology building was converted from pneumatic HVAC controls to a state of the art DDC VAV reheat system. This upgrade was mostly for increased occupant comfort and enhanced functionality, but it will also decrease the buildings demand for energy. Various other

buildings across all our major campuses have seen the slow but steady phase out of pneumatic control valves and actuators as they are replaced with DDC ones when they fail.
Deciding on an analytical platform was no easy choice but we settled on the SkySpark software. We have slowly been building a data base consisting of all HVAC equipment and points for all our major campuses. We don't currently have the full functionality of the software which includes automatic diagnostics determined on predefined rules, but sometime this year we will.

Onsite Generation
This year was our biggest for renewable generation. We entered into a PPA with solar city and allowed them to install a 300kW system on the roof of our LAC building. The rate schedule that we are locked in with has proved to be favorable this year. Additionally we purchased and installed a 25kW system on our facilities shops buildings. This brings our total onsite renewable energy generation to 422kW.

Sustainability
SLCC's sustainability committee is working on developing a comprehensive sustainability plan that defines how we assess different projects and initiatives in relation to energy and sustainability. The plan will outline investment and M&V criteria for projects, as well as the overall direction we are headed to help us achieve our stated goals. The committee is comprised of faculty and staff from all different disciplines across the institution and is a collaborative effort by all those involved.

Water & Waste Reduction Efforts

Water
There wasn't any major water conservation efforts this year due to our heavy focus on energy, but we will continue to identify and target any water conservation opportunities. Once we have all of our buildings metered for water and have some history to assess the usage profile we can begin to identify water reduction measures.

Waste
Our target goals in waste reduction include recycling of all green waste, all metals and diverting 80% or more of all solid waste. This year we made big progress towards that goal by buying a garbage truck and collecting all of our own waste. What this does is enable us to track exactly how much waste we are producing. We will use that data we can track our progress towards achieving our stated goals of waste reduction and recycling efforts. SLCC has been awarded for its comprehensive recycling program and we continue to build on our success in that area.

SUU SOUTHERN UTAH UNIVERSITY

Annual Energy Report FY 2016

Prepared by: Southern Utah University
Facilities Management
October 2016

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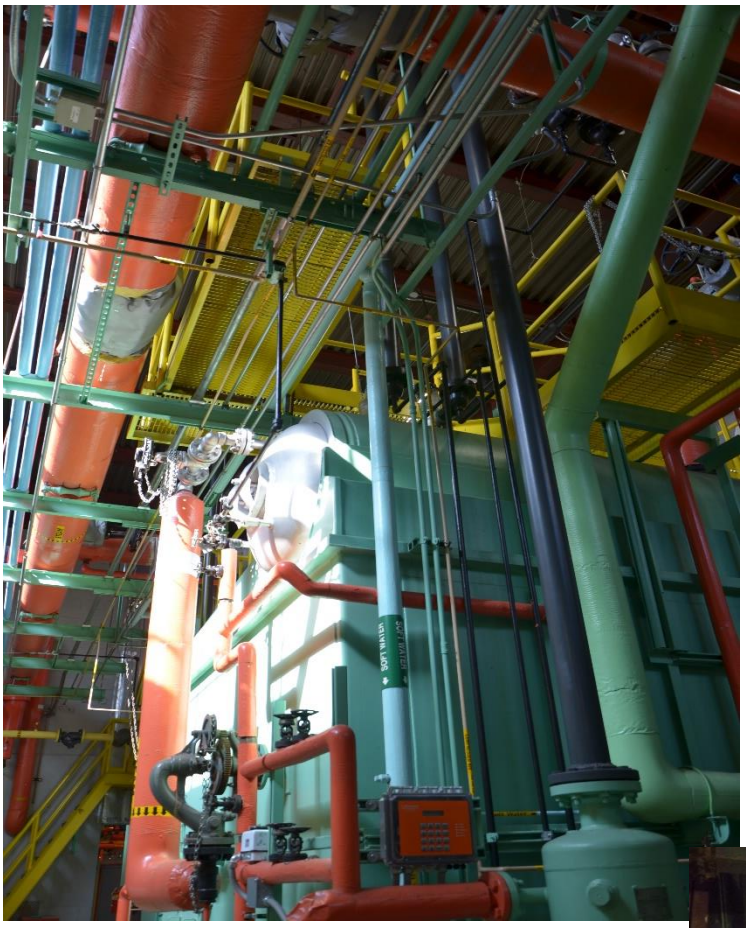
Overview

Southern Utah University utilizes natural gas and electrical trend data to track energy usage for the campus. During FY16, natural gas and electricity usage data were entered into trend charts each month from campus utility bills. Usage numbers for campus for the last four years, along with baseline data from FY07 have been included in these charts in order to illustrate a history of energy usage for the campus.

To create consistent reporting data, kBtu for power and natural gas were calculated. Power usage was converted to kBtu by multiplying kWh by a factor of 3412.14. Natural gas usage was converted to kBtu by multiplying MBtu by 1,000. The results of these independent calculations are in the following sections.

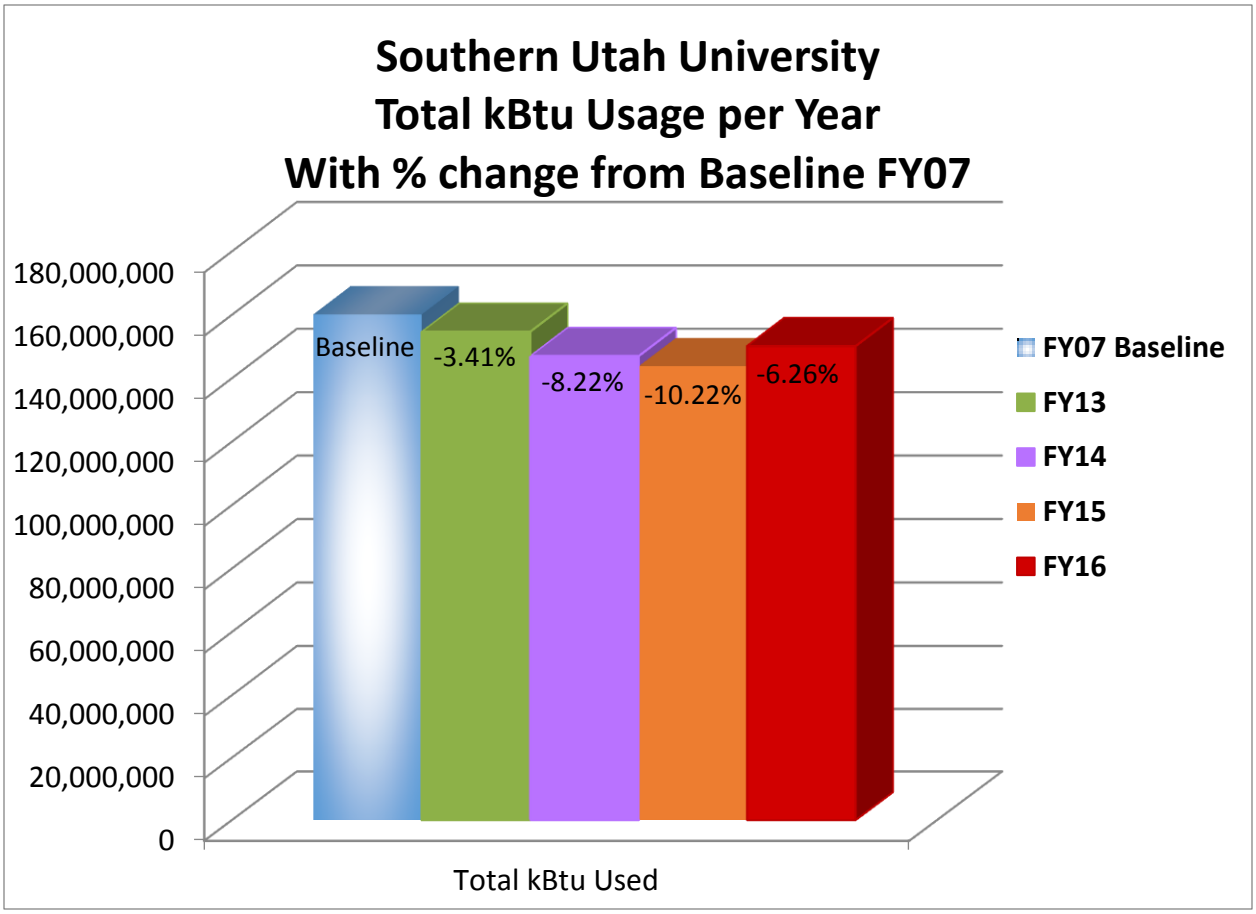


Heat Plant Boiler

Old Main Mechanical Room

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.



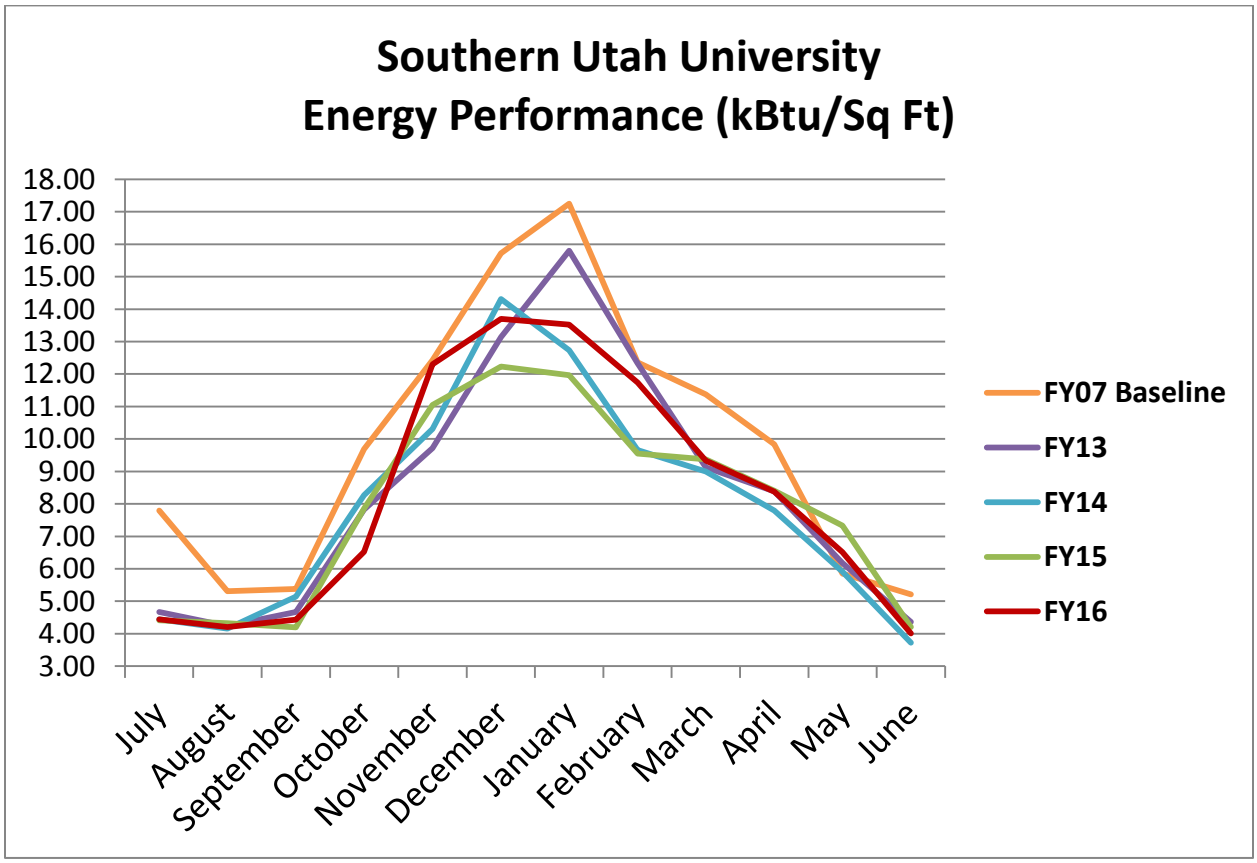
	Total kBtu Used	% Change from Baseline Year
FY07 Baseline	160,110,792	
FY13	154,647,673	-3.41%
FY14	146,956,811	-8.22%
FY15	143,751,464	-10.22%
FY16	150,087,937	-6.26%

P.E. Building Lighting

Energy

Performance

KBtu usage per month divided by the campus square footage results in an Energy Use Intensity (EUI) factor as defined by the EPA tracking tool, Portfolio Manager. EUI was computed for each month in the analysis period, shown on the table below. The average temperature during the winter of 2015 was lower than the previous year, requiring higher energy usage on campus which resulted in decreased energy performance during the winter months of FY2016.

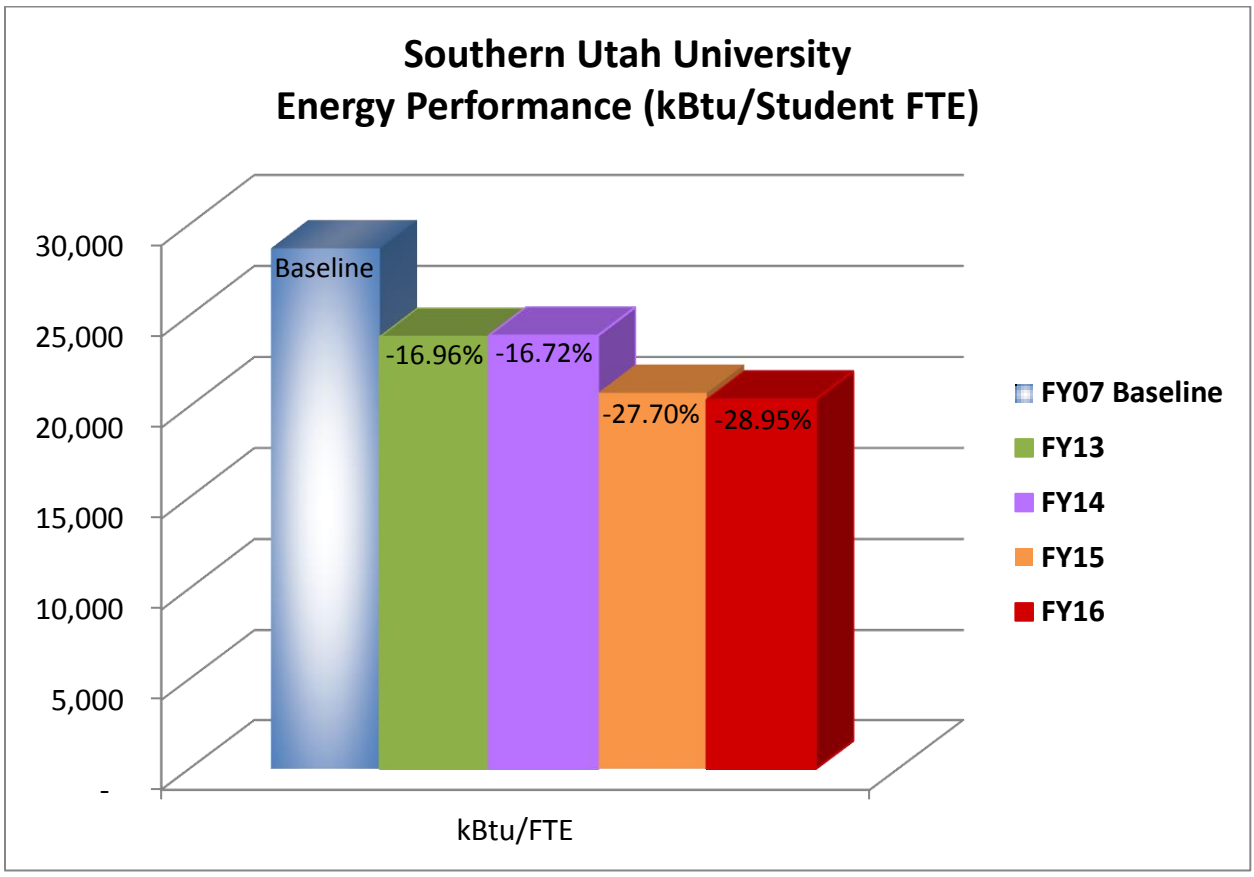


	FY07 Baseline	FY13	FY14	FY15	FY16
Prevalent Sq. Ft.	1,354,675	1,539,759	1,539,759	1,514,653	1,514,653
July	7.80	4.66	4.44	4.41	4.45
August	5.31	4.23	4.16	4.33	4.21
September	5.37	4.67	5.14	4.20	4.43
October	9.68	7.83	8.26	7.85	6.52
November	12.43	9.72	10.31	11.04	12.30
December	15.72	13.14	14.31	12.23	13.70
January	17.25	15.80	12.74	11.97	13.52
February	12.36	12.33	9.66	9.55	11.74
March	11.37	9.12	9.00	9.37	9.33
April	9.84	8.39	7.79	8.41	8.38
May	5.85	6.18	5.91	7.34	6.51
June	5.21	4.36	3.72	4.21	4.01

Energy Performance (Continued)

Southern Utah University's energy usage is influenced by more than just changes in overall campus square footage or outdoor temperature. For example, by using student FTE data from the Fall semester of each year, kBtus per student FTE were computed and show the relationship between campus energy consumption and the increased number of people on campus. As the student population increases, the faculty and staff count also increases, adding to the factors which increase energy usage.

Sharwan Smith Student Center Rotunda



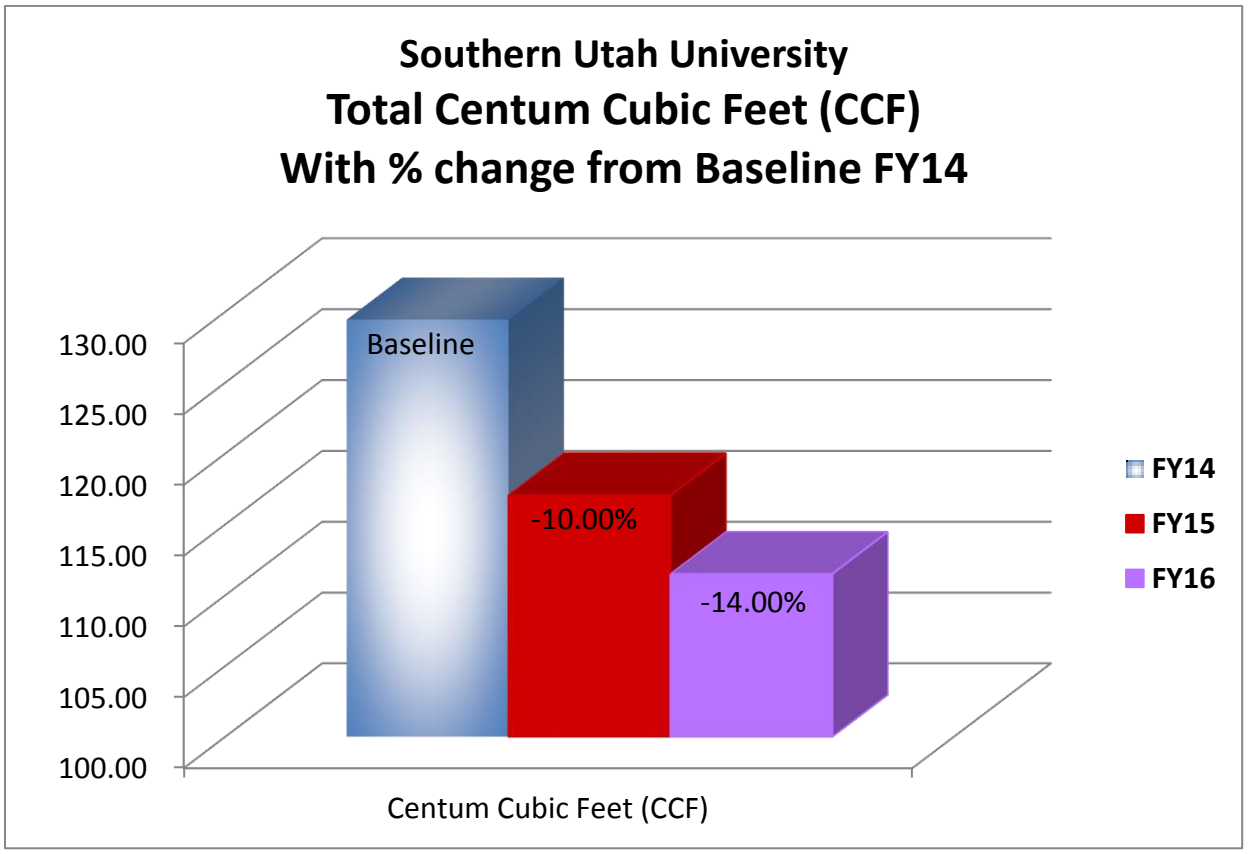
	Total kBtu Used	Student FTE	kBtu/FTE	% Change from Baseline Year
FY07 Baseline	160,110,792	5,580	28,694	
FY13	154,647,673	6,490	23,829	-16.96%
FY14	146,956,811	6,150	23,895.42	-16.72%
FY15	143,751,464	6,929	20,746.35	-27.70%
FY16	150,087,937	7,363	20,385.46	-28.95%

Water Consumption

Facilities Management at Southern Utah University regularly researches water conservation measures. Besides irrigating 50% of campus with non-potable city water, the Grounds and Gardens division has made consistent progress in the reduction of natural turf areas and the addition of xeriscape zones across campus. Continued use of the Maxicom irrigation management system for the precise control of irrigation based on a complex algorithm of data input and analysis assists with conserving water on campus. Within the buildings, the Utility Services division installs waterless and low-flow appliances in restrooms, which continue to be a standard in campus building designs. The implementation of new water saving technology in restrooms, locker rooms, and food preparation areas is an ongoing priority.

A significant amount of natural turf was removed for the Center for the Arts project which was completed in April 2016. The majority of the landscaping installed for that project consists of drought tolerant trees and plant material.

Both culinary and irrigation water are delivered from a municipal source at several metering points across campus. Data for gallons consumed (measured as centum cubic feet) is taken from the municipal bill, which has been verified for accuracy by a third party consultant.



Water Consumption (continued)

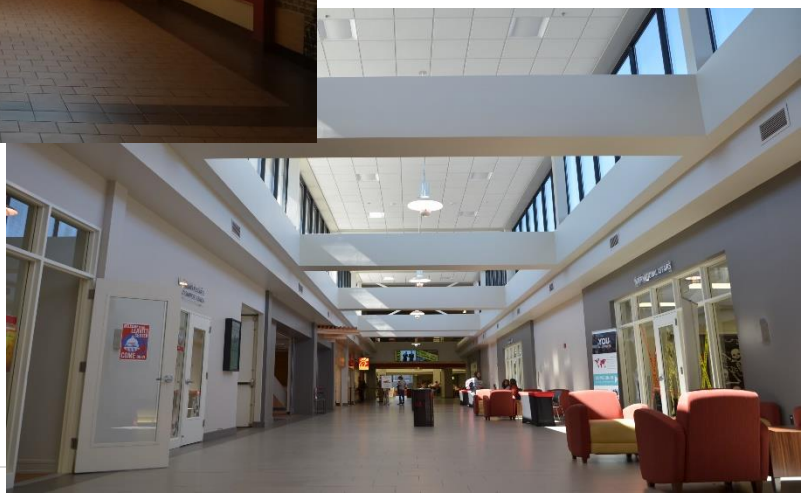
	Total Consumption (Gallons)	Centum Cubic Feet (CCF)	% Change from Baseline Year
FY14	96,822	129.44	
FY15	87,551	117.05	-10%
FY16	83,404	111.50	-14%

Energy Conservation Efforts

Southern Utah University actively works to reduce campus energy and water consumption with ongoing projects. Some of those efforts include:

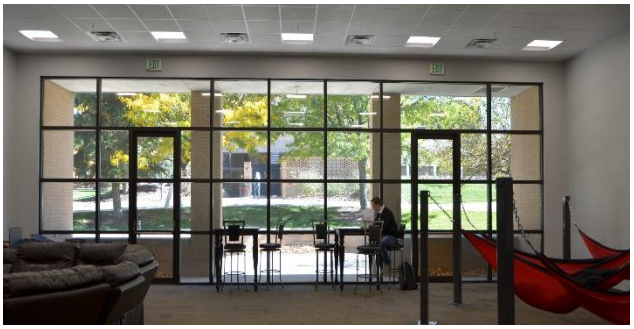
- *Renewable energy production:* Over 94 kilowatts of photovoltaic solar arrays installed on campus produce 252,880 kilowatt-hours per year – enough to run 72 average homes and offset the production of over 346,418 pounds of CO_2 per year.
- *Rocky Mountain Power Incentive:* Participated in the *wattsmart* Business Incentive Program to improve the energy efficiency of a number of areas on campus.
- *Sherratt Library Building Automation System:* Replaced the pneumatic building automation system components with modern digital controls for energy efficiency.
- *Utility Metering Project:* Electric, gas, and water meters are being installed for individual building sub-metering. This will assist with tracking usage points for making buildings more energy efficient and for identifying water waste.
- *Campus Exterior Lighting Improvements:* Replaced and improved lighting in parking lots across campus to improve energy efficiency and safety.
- *Braithwaite Window/Frame Upgrades:* Replaced and re-sealed windows for improved building energy efficiency.
- *Student Center Clerestory Project:* Raised the ceiling for construction of fenestrated walls to admit natural light for increased daylighting.

Before



After

Energy Conservation Efforts (Continued)



- *Birdhouse Living Room Project*: Opened the living room walls to allow natural light into the east section of the Student Center for energy savings.

Energy Efficiency and Reduction Projects

Tiger Funk serves as SUU's designated administrator of energy efficiency projects, responsible for overseeing and implementing reduction strategies. Energy and water conservation projects are being researched and completed on the SUU campus. Conservation efforts which typically yield the highest rate of return, such as lighting, electrical motor retrofits, building automation modifications, renewable energy projects, and water saving projects, are priorities. Additionally, efforts to help with occupant behavior modification are paramount - encouraging the campus community to be conscious of energy saving steps such as shutting down computers at night, along with heaters and other equipment when not in use.

Future Projects:

- *President's Residence HVAC Unit Replacement:* Replace the 18-year old temperature control system with state of the art energy efficient equipment. Additionally, replace perimeter caulking around doors and windows for energy savings.
- *Water Conservation:* Connect additional areas of the campus irrigation system to Cedar City's non-potable irrigation source.
- *Building Automation Projects:* Replace pneumatic building automation system components in various buildings on campus to solve problematic issues and to conserve energy.
- *Building Recommissioning Projects:* Review building mechanical system operation point by point and tune the performance of these systems for energy savings.
- *Campus-wide submetering enhancements:* Install additional metering stations for increased data collection and real-time meter reading capabilities.

ENERGY MANAGEMENT
ANNUAL REPORT
FISCAL YEAR 2016

August 30, 2016

August 30, 2016

The purpose of this annual report is to provide an update on the activities and performance of Energy Management's energy and utility-cost savings program through the end of fiscal year 2016. It provides an overview of energy consumption and utility cost over the six-year period of July 2010 through June 2016, a summary of FY16 financial and project information, and an estimated program budget for fiscal year 2017. In addition to financial and project information, this report provides a summary of other activities Energy Management is engaged in.

The contents of this report include:

1. Energy trends
2. Energy Management Financial and Project Summary
3. Other Energy Management Activities

1. Energy Trends

Following are a variety of charts that illustrate trends in our power and fuel consumption between July 2010 and June 2016. The basis of these charts is the group of utility-fed fuel and power accounts that serve main campus, health sciences, Fort Douglas and surrounding buildings including the Natural History Museum, the Dumke Health Professions Education Building, University Villages and the Guardsman Way sports complex.

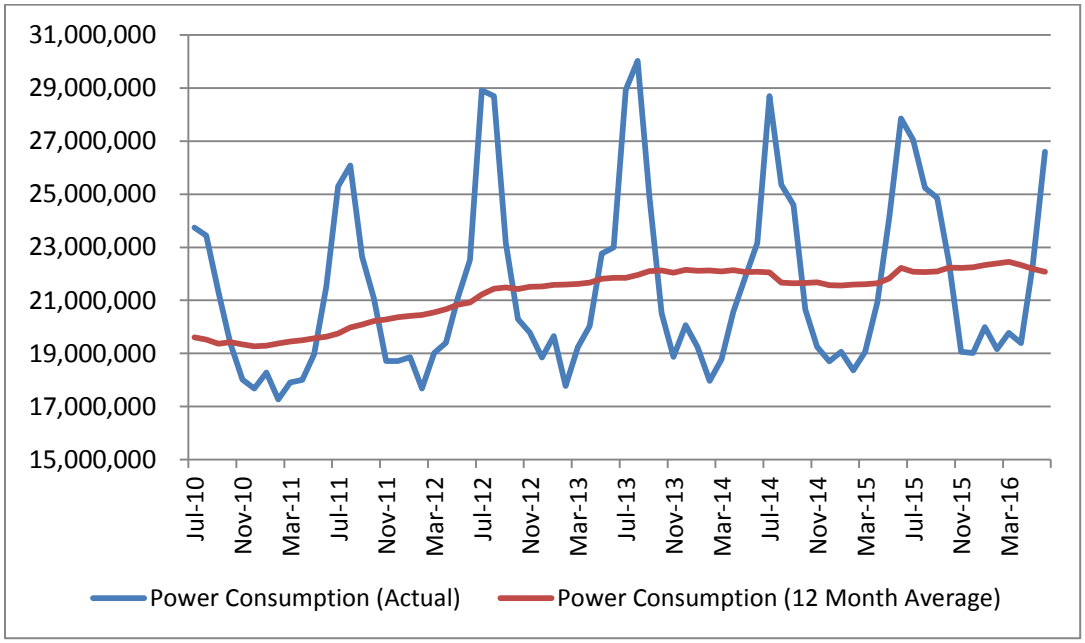
1.1. Power

Chart 1 provides an overview of Power consumption from fiscal year 2011 through 2016. This six-year period saw an increase in the University's purchase of power, moving from a total consumption of 235,515,000 kilowatt hours to 264,923,000, a growth of 12.5%. The good news is growth in power consumption has frozen over the last three years. Remarkably, total energy usage was less in FY16 than in FY15, having gone down by 0.4%. Over the span of FY14 to FY16 consumption was flat at 264.9 gigawatt hours for both years which is especially noteworthy considering that campus growth totaled nearly 8.6%

Chart 2 shows a six-year trend of rising power costs. Costs continue to rise through rate increases and are only slightly moderated by the slowing of the growth in electrical energy consumption. Power costs have climbed from $13.1 million in FY11 to $18.4 million in FY16, a growth of 41%. To further compare cost to consumption, the total cost of electricity over FY16

was 2.8% higher than the preceding year, the same period of time that saw the 0.4% decrease mentioned above.

Chart 1: Power Consumption (FY10-FY16)



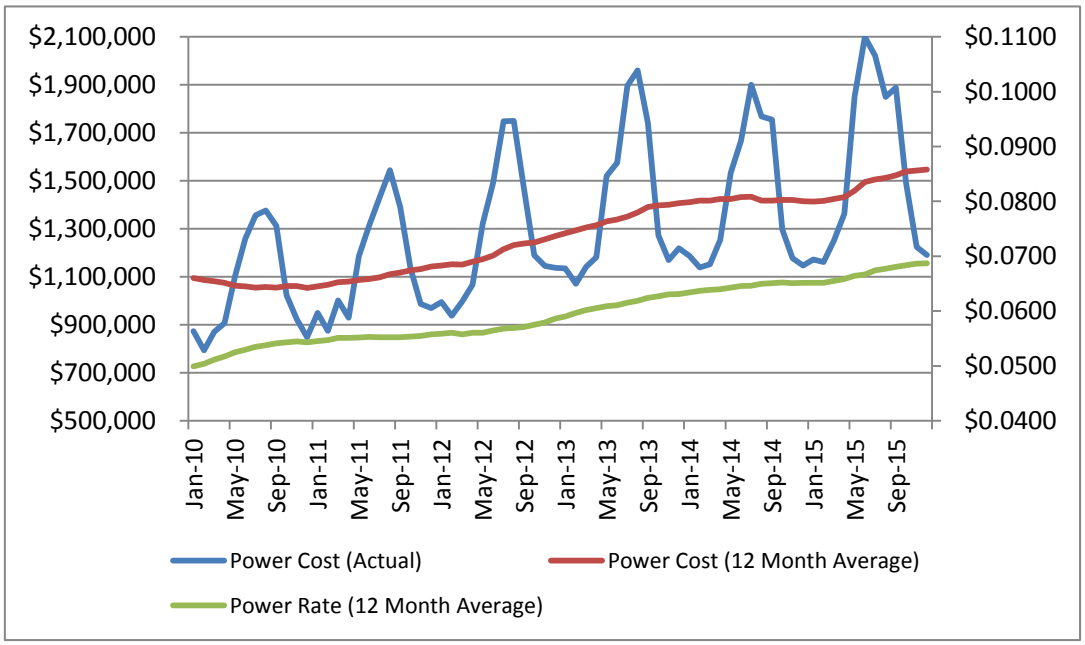


Chart 2: Power Cost (FY10-FY16)

1.2. Gas

Chart 3 illustrates the pattern of the University's natural gas consumption from FY11 through FY16. Gas consumption has remained relatively flat over this period with a slight rise from 2010 through 2012 that coincides with the introduction of the cogeneration unit in the main heating plant. Consumption in 2015 was down compared to 2010 with a total gas purchase of 1,415,318 Dekatherms compared to 1,425,896 Dekatherms, a reduction of 0.7%. The peaks in the consumption graph below strongly correlate with temperature data with the peak monthly usage occurring during the coldest of the last six years (2013). In spite of temperature, gas consumption has remained flat notwithstanding campus growth which has increased 19.7%, in terms of gross square footage, from 2010 to 2015.

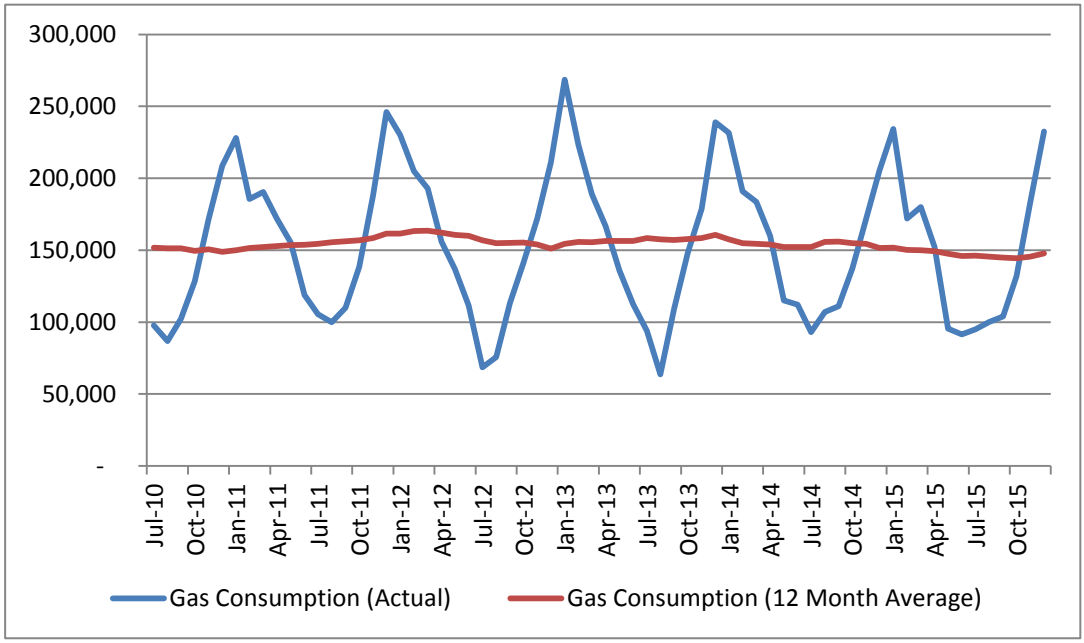
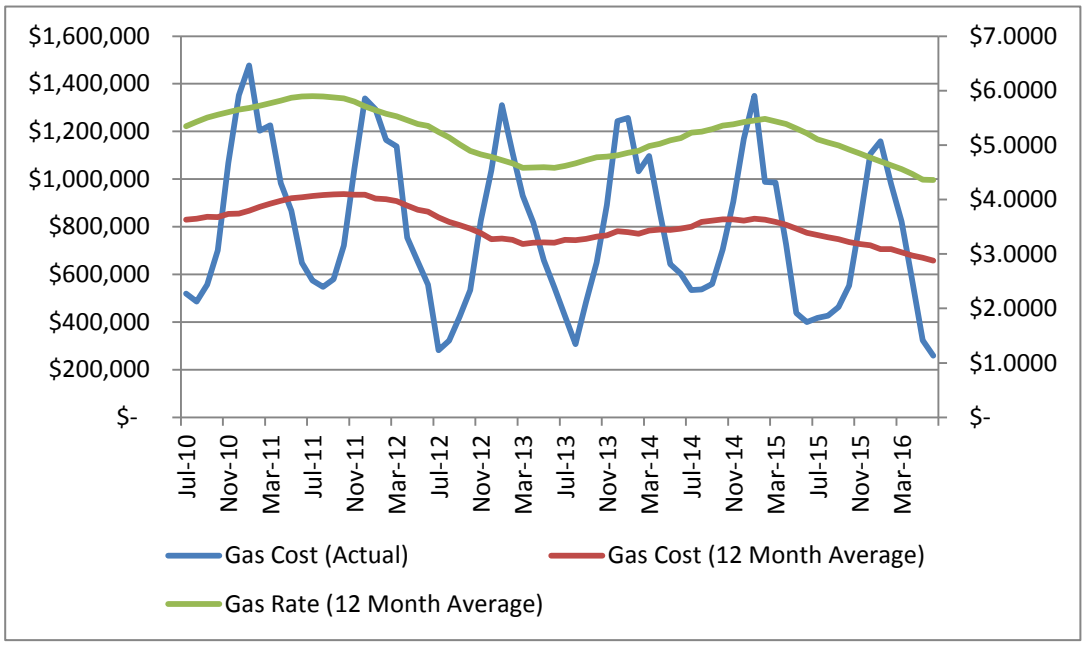


Chart 3: **Gas Consumption (FY10-FY16)**

Chart 4 provides an overview of the cost of natural gas from 2010 through 2015. Due to nation-wide fluctuations in gas pricing, the University's gas costs have varied widely over this period.

Rates reached a low point of $2.00 per dekatherm (wholesale rate) in summer 2012, down from a peak of over $9.00 per dekatherm in summer 2008. After a small rise in rates from mid-2013 through 2014 prices have gone down again and are now back in the $2.00 per dekatherm range with no upward pressure (at this time).

Chart 4: Gas Cost (FY10-FY16)



1.3. Power and Gas Combined

Chart 5 is a snapshot of the University's total energy consumption (natural gas and electricity) between FY11 and FY16. It reinforces the leveling trend seen in power and gas. In terms of total consumption, we appear to have reached a peak in FY12 of 2.76 trillion Btus and have since been trending downward. During FY16 the University consumed 2.68 trillion Btus, 3% less than the peak of FY12. Again, this trend is happening during a time of growth on campus, but it also during a time of milder weather, especially in winter. Improvements in the management of our central plants and in energy efficiency across campus have also played a role.

Chart 6 illustrates the trend in overall energy cost, which also recently has gone down with the leveling of power costs and rock bottom natural gas prices.

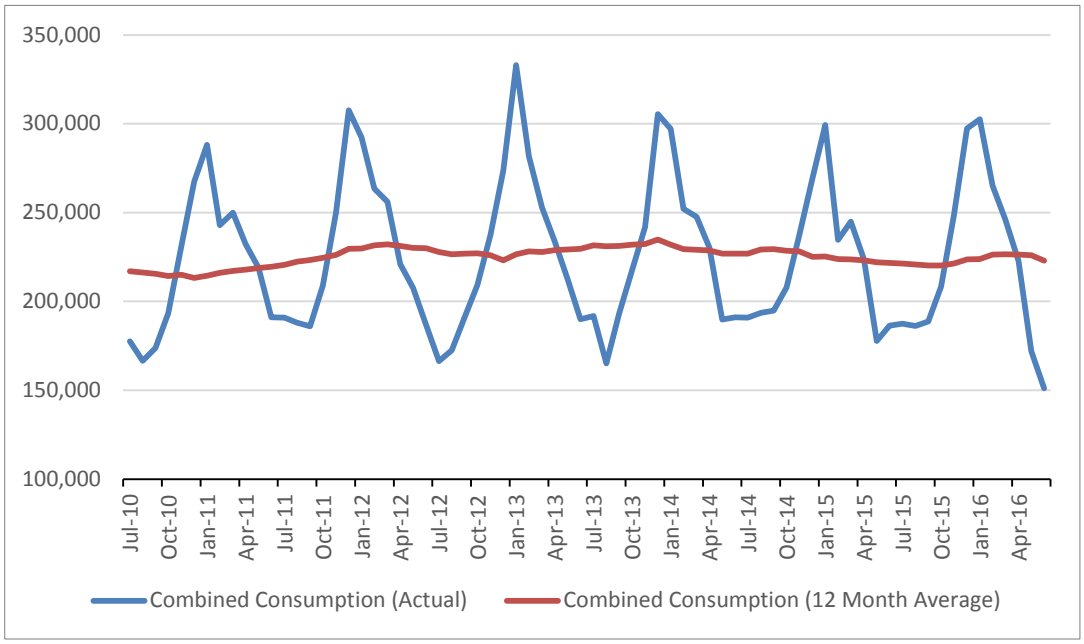


Chart 5: **Total Energy Consumption (2010-2015)**

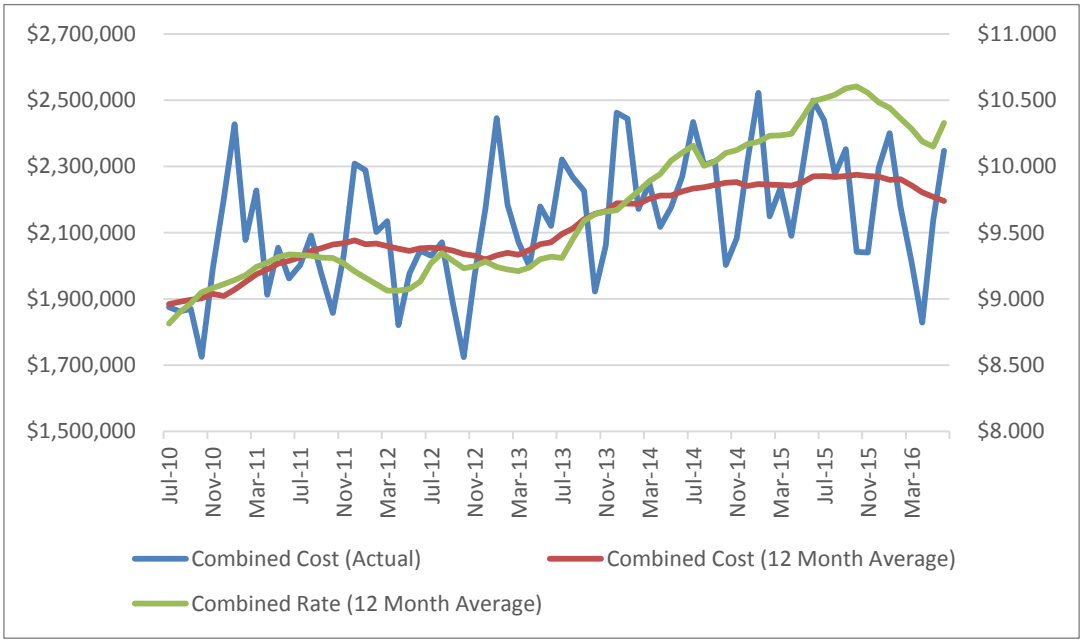
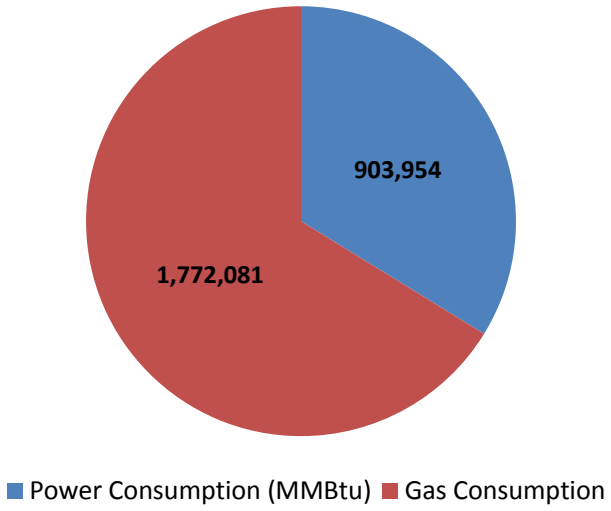


Chart 6: Total Energy Cost (2010-2015)

Chart 7



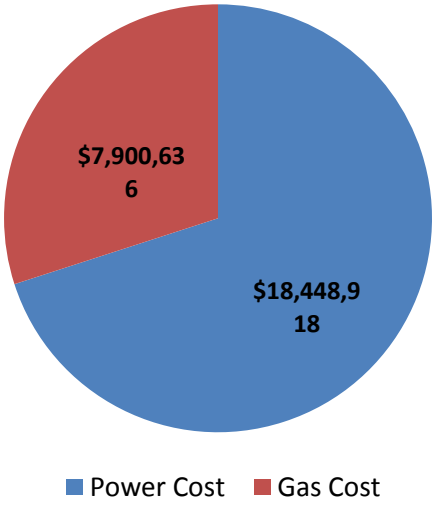
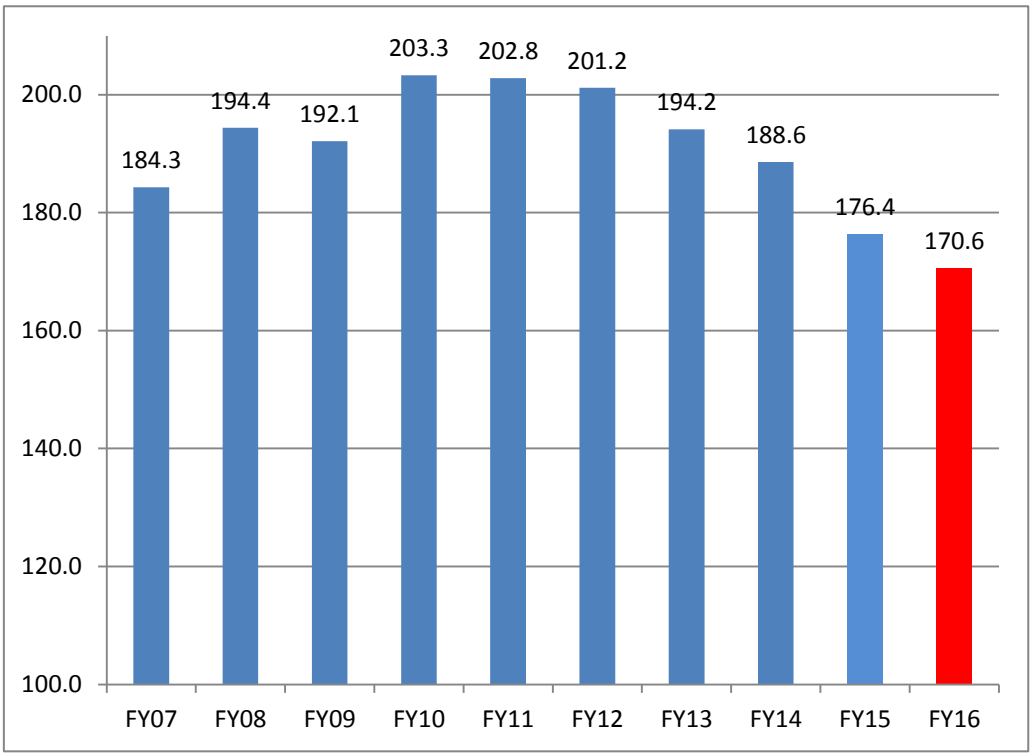


Chart 7 shows a comparison between energy consumption and cost. FY16 power costs accounted for 70% of the University's total energy expense, while accounting for only 34% of energy consumption. This difference between share of consumption vs share of cost has been increasing as power rates grow faster than gas rates. Just 6 months ago power costs accounted for 68% of the total energy expense and in 2014 power costs accounted for 67% of total energy cost while making up 36% of energy consumption.

A more fitting and informative method of comparing year over year energy consumption is Energy Utilization Index (EUI). EUI is defined as energy per square foot per year and provides an informative comparison over time by taking building size out of the equation. Chart 8 shows overall campus EUI from FY07 through FY16. The pattern is similar to that of overall consumption, rising sharply after 2007 but 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 10% lower than our 2008 baseline year and 16% lower than the fiscal year 2010 peak. Campus growth, increased efficiency in new buildings, and improved efficiency in existing buildings all factor into the downward trend.

Chart 8: Energy Utilization Index, FY07 through FY16



2. Energy Management Financial and Project Summary

This section of the report covers Energy Management projects and financial activity over fiscal year 2016. Projects and budgets summarized in this section are managed by Energy Management with the purpose of continually finding energy savings projects without the need to obtain individual project approval. The Energy Management Fund is supported by an annual appropriation from the University (also known as "Measurement and Verification" funding), and retained energy savings and utility incentives that are the result of previous projects.

Table 2.1 summarizes funding going into and out of the Energy Management Fund. Incoming funds include the annual "measurement and verification" (M&V) transfer from the administration, energy savings and utility incentives from the fuel and power accounts, and miscellaneous other inflows. The total also includes carryover from the prior year. M&V funding is transferred to the Energy Management Fund once at the beginning of the fiscal year and energy savings/utility incentives are transferred twice per year. The $1.28 million total shown in Table 2.1 includes all transfers for FY16.

Total Energy Management project expenses for FY16 were $888,410. A breakdown by project type is provided in Table 2.1. Energy efficiency projects, defined as projects designed to be paid

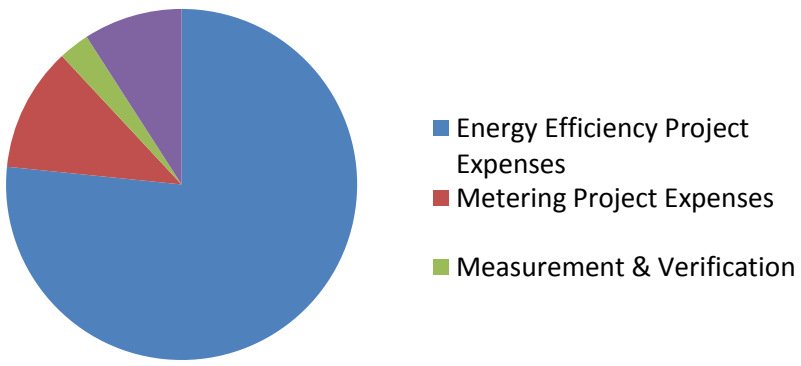
from energy savings, account for the bulk of spending and total $680,600. In addition to projects paid by savings, Energy Management has been carrying out meter and data gathering projects and also pays for an annual measurement and verification contract performed by a third party in support of the 2001 Energy Savings Performance Contract project.

Table 2.1 Energy Management Fund Financial Activity (FY16)

Inflows		
Measurement &Verification	$	238,228
Energy Savings	$	185,824
Utility Incentives	$	365,858
Other	$	18,720
Carryover From Previous Year	$	472,361
Available FY16 Funds	$	1,280,991
Outflows		
Energy Efficiency Project Expenses	$	680,600
Metering Project Expenses	$	101,757
Measurement & Verification	$	25,200
Other	$	80,853
Total Outflows, Projects	$	888,410
Balance (July 2016)	$	392,581

A proportional breakdown of funding going into each category is illustrated in Chart 2.1. This illustrates the amount of the Energy Management Fund being used for energy savings projects as compared to all other uses.

Chart 2.1: Distribution of Energy Management Fund Out



flows

Table 2.2 summarizes energy management projects that were active during fiscal year 2016. Energy Management's total contribution to these projects was $882,132. Energy Management is constantly working with shops, construction project managers and campus departments to develop new projects to use this funding.

Table 2.2 FY16 Energy Management Projects

FY16 Energy Management Projects		
Project Name	Estimated Cost	FY16 Cost to Date
Projects With Direct Energy Savings		
Natural History Museum Recommissi	$ 60,000	$ 59,099
Dentistry Enhanced Commissioning	$ 23,500	$ 20,363
Exterior Walkway LED Lighting (Contr	$ 100,000	$ 100,000
Tennis Center LED Lighting	$ 146,916	$ 184,325
Miscellaneous Lighting Projects	$ 40,000	$ 15,512
Refrigerator Replacement Program	$ 15,000	$ 11,164
Retrocommissioning Projects	$ 65,000	$ 9,816
Steam Traps	$ 25,000	$ 9,466
Shut the Hood Behavioral Program	$ 70,000	$ 33,938
Merrill Engineering Libert Units	$ 114,445	$ 114,445
Merrill Engineering HVAC Upgrades	$ 160,000	$ 160,000
Chiller Recommissioning (Mlib)	$ 13,050	$ 13,050
Subtotal	$ 832,911	$ 731,178
Projects Without Direct Energy Savings		
AiMstack Integration	$ 120,000	$ 73,951
General Metering	$ 10,000	$ 51,803
Measurement & Verification	$ 25,200	$ 25,200
Subtotal	$ 155,200	$ 150,954
TOTALS	**$ 988,111**	**$ 882,132**

3. Other Energy Management Activities

This section provides a general overview of other activities Energy Management is involved in. Energy Management was created with the purpose of reducing the University's energy consumption and corresponding utility cost. Projects undertaken by the Energy Management Fund are helpful in making progress toward this purpose, but are just a drop in the bucket compared to opportunities that lie outside of the group. For this reason, Energy Management takes on a supporting role in several important areas.

Following is a summary of two of those areas:

1. Construction Projects

Energy Management has an energy manager specifically assigned to help with all projects carried out by Facilities Management, particularly with Planning and Construction Project Delivery. Table 3.1 provides a list of projects that closed out in FY16 (in terms of utility incentives) and shows the energy savings and incentives associated with each.

Table 3.1: Construction Projects with Energy Management

FY16 CONSTRUCTION PROJECTS WITH ENERGY MANAGEMENT ASSISTANCE				
Active Projects	U Project Manager	kWh	Incentive	
Kennecott South Wing	Liz Blackner	244,800	$	30,581
Student Life Center	Michael Beck	844,451	$	95,115
Dumke lighting upgrade	Liz Blackner	10,597	$	1,606
School of Dentistry	Curtis Leetham/Joe Harman	507,405	$	45,485
Kennecott PH 2	Liz Blackner	125,206	$	13,353
Quinney Law	Jennifer Still/Rich Johansen	811,252	$	120,000
HYPER chiller upgrade	Steve Laraway	342,166	$	51,324
AA&S Lighting	Christin Robbins	93,183	$	7,525
Union roof replacement	Desslie Anderson	25,436	$	7,800
Business Parking Structure	Rick Johansen	808,994	$	43,651
TOTALS		3,813,490	$	416,438

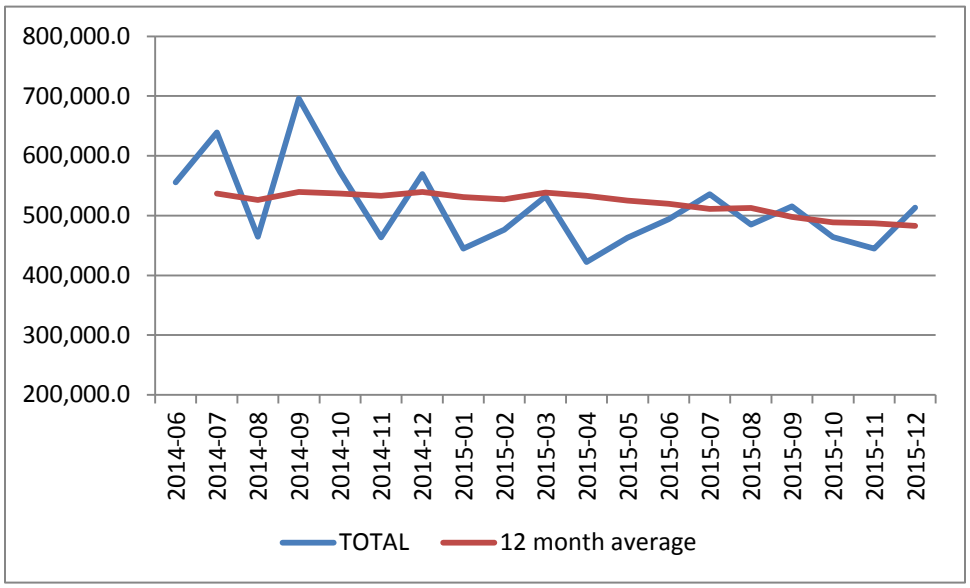
2. Large Scale Building Retrofits

With the adoption of the Better Buildings Challenge in 2011, Energy Management took on a primary in developing a strategy that will help the University achieve 20% energy savings. The most important part of that strategy is undertaking large scale, capital projects at the "whole building" level.

The first project includes 3 buildings on lower campus, the Eyring Chemistry Building, Skaggs Biology Building and the Biology Building. It is an $8 million project with the first and largest phase in Chemistry which is nearing completion. This project includes HVAC upgrades and improvements that support a separate ongoing project to replace the building's fume hoods. The project is expected to result in at least 20% energy savings.

Preliminary results are encouraging. Chart 3.1 shows an 18 month overview of power consumption in Chemistry that shows a 10% decrease in energy consumption between 2014 and 2015, in terms of a sliding 12 month average. Commissioning and official measurement and verification still need to be completed, but the initial signs are in the right direction.

Chart 3.1: Energy Trend in the Eyring Chemistry Building



The second area most likely to be impacted by large scale renovation is the health sciences campus and, specifically, the University Hospital. As part of their Transformation Project, Facilities is examining energy consumption over the entire campus and has recognized that energy reductions are an integral part of meeting building energy needs over the next several years. Along with the design of new buildings, energy conservation measures are being developed and recommended that, if undertaken, will reduce demand on the East high-temp and chilled water plant and enable it to better serve health sciences.

The third area is lower campus in general. Facilities Management is currently looking at high priority buildings in terms of energy consumption, facility condition and institutional importance to develop a short-list of buildings of buildings that are most in need of improvements that will result in significant energy savings.

Annual Energy Report

Fiscal Year 2016

WEBER STATE UNIVERSITY
Facilities Management

ENERGY &
SUSTAINABILITY
—OFFICE—

TABLE OF CONTENTS

Table of Contents

ENERGY EFFICIENCY COORDINATION

Energy Efficiency Coordination

The Energy & Sustainability Office, located within the Facilities Management Department, is responsible for managing WSU's energy efficiency and renewable energy projects. Justin Owen is WSU's Energy Manager. The Energy & Sustainability Office is housed under Operations which is overseen by Jacob Cain.

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ENERGY/WATER CONSUMPTION & CONSERVATION

Energy/Water Consumption & Conservation

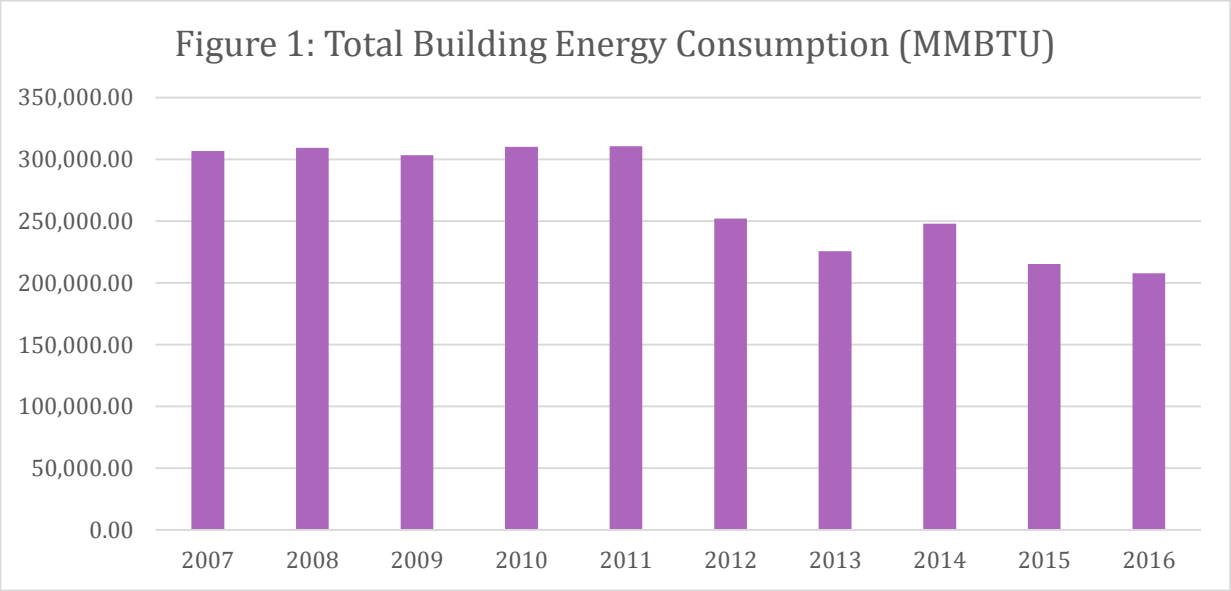
UNIVERSITY BUILDING ENERGY CONSUMPTION

Table 1 depicts WSU's electricity and natural gas consumption figures. From the baseline year of 2007, WSU has reduced its electricity consumption by 31.6% and its natural gas consumption by 32.7% thanks to the combined efforts of WSU's facilities team.

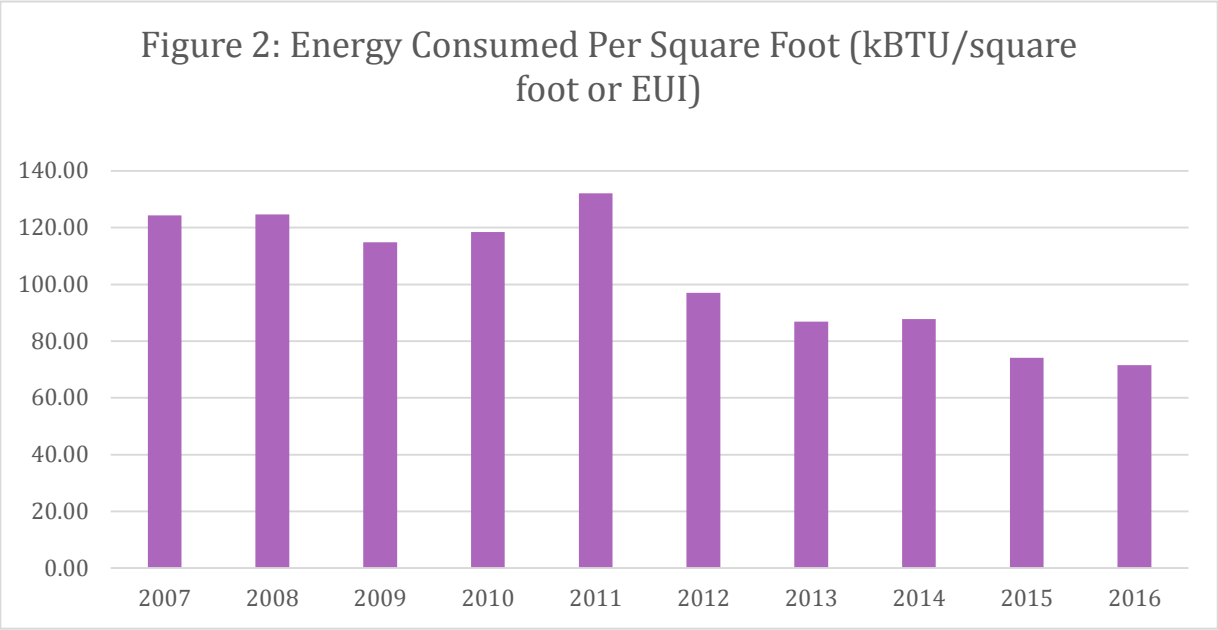
Table 1: WSU Building Energy Consumption

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
2015	28,044,123	119,720
2016	26,453,387	117,534

Since fiscal year 2007 WSU has reduced its total building energy consumption by 30% (see Figure 1) and WSU's energy consumption per square foot dropped by 40% (see Figure 2).



ENERGY/WATER CONSUMPTION & CONSERVATION



ESTIMATED ANNUAL COST FOR UTILITIES

WSU's current utility costs (including water) are approximately $5 million. This number includes utilities associated with campus housing.

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 2 below provides a list of the projects and their current status, as well as a listing of other projects WSU has pursued.

Table 2: Energy Conservation/Efficiency Project Status (12/18/2016)

Interior Lighting Upgrade - Campus Wide	Construction - 65% 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
Boiler 2 Economizer	Complete
VFDs for Central Plant Cooling Towers	Complete
Davis 2 VAV Upgrade and IDEC	Complete

Recomission Sky Suites, ED, SS	Complete
Water conservation	New position created
Solar Water Heating – GYM	Complete
Solar PV Davis – Phase I	Complete
Solar PV Davis – Phase II	Complete
Solar PV Union	Complete
1.8 MW Solar Davis	Complete
FM Solar	Complete
Weatherproofing - SS, LI, SL	Complete
Swimming Pool Cover	Complete
Electric Meters	Complete
Steam Meters	Complete
Chilled Water Meters	Complete
Irrigation Water Meters	Complete
Exterior Lighting	Complete
DEC Power Factor Correction	Complete
Building scheduling and commissioning	Ongoing
Steam system improvements	Ongoing
Public Safety Solar	Complete
FM VRF	Phase 1 Complete
Wattis VRF and renovation	Complete
Miller Admin VRF and renovation	Complete
W4 Groundsource	Complete
Social Science Groundsource	Design
Building scheduling	Ongoing
Building mechanical and control upgrades	Ongoing – 30%
Campus Services VRF	Complete
Wildcat Center RCx	Complete

RENEWABLE ENERGY

WSU has completed a number of renewable energy projects. (see Table 2 above). WSU completed two major solar projects during 2016. A 1.8 MW array at the Davis Campus now offsets that campus's electrical needs. A 78 kW system on the facilities management building provides for that building's needs. WSU is beginning a solar plan for the Ogden campus, to include rooftop, ground mount, and solar covered parking.

In conjunction with WSU's new Tracy Hall Science center, WSU installed its first groundsource system. 200 wells near the stadium provide 400 tons of heating and cooling capacity for the campus loop. WSU's next groundsource field will be completed with the renovation of the Social Science building. Test wells have already been drilled and indicate excellent thermal performance.

ENERGY/WATER CONSUMPTION & CONSERVATION

In addition to on-campus production 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.

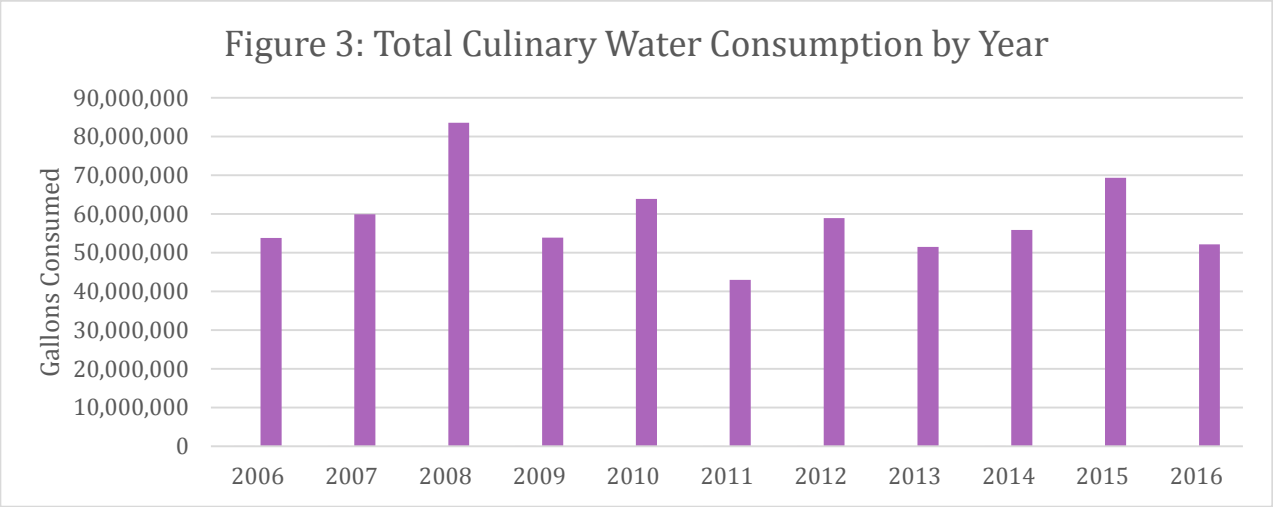
WSU is also a VIP Subscriber Solar Customer. Starting Jan 1 2017, approximately half of the Dee Events Center's annual kilowatt hours will come from this program, saving the university money and reducing its environmental impact.

WATER CONSUMPTION AND CONSERVATION EFFORTS

Figure 3 depicts Weber State University's culinary water consumption over the past 10 years. In FY 2016, WSU consumed 52,122,751 gallons of culinary water, primarily for indoor water use.

The spike in water consumption in 2008 is due to a water main break. In fiscal year 2010 WSU had a few smaller water main breaks that increased the University's water consumption above what would have been typical consumption. With the new water meters and Lucid Dashboard in place it is expected that water main breaks will be identified and resolved faster.

WSU has hired a full time Water Conservation and Sustainability Specialist who will focus on maximizing culinary and secondary water efficiency and conservation. Among other projects, this specialist will work with landscapers, plumbers, and other facilities staff to ensure that WSU's water conservation program is as successful as its energy program.



FY 2016 Annual Energy Report

USU Facilities

December 10th, 2016

Overview

Utah State University Logan Campus has nearly 5 million square feet of usable space that is maintained and operated by state O&M funding. All utilities (electrical, steam, chilled water, and culinary water) for buildings on campus over 3,000 square feet are metered individually. Nearly all meters on campus with exception of the culinary water meters can be viewed and monitored remotely. Monthly reads are automatically read for billing purposes from smart meters and those without smart capabilities are read manually on the same period.

The energy management program consists eighteen HVAC technicians who report to the HVAC shop foreman, several interns, two HVAC re-commissioning technicians, who report to the university's energy engineer and an electrical engineering technician. All these positions report to and work under the direction of the energy manager position. 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.

Mechanical and controls upgrades of the Fine Arts Center, Engineering Lab, and BNR buildings have improved comfort, controllability, and energy efficiency of the mechanical systems. Over the next year there are plans to upgrade the laboratory ventilation system in the Biotech Building and continue upgrading HVAC controls in the BNR, Engineering Lab, and Vet Science Buildings.

Analytics and Utility Data Tracking will allow for better use of the data that the building automation systems gather to monitor building operation and performance. USU currently has most of the meters communicating over data line to provide access to live meter data. Dashboards are being developed to allow building occupants to view this data live and visualizations are being put together to provide easy to view performance for the energy management team.

Lighting upgrade projects over the last year have included several LED lighting upgrades across campus. Over the past year $415,000 dollars have been invested in various lighting projects across USU campus. $65,000 of annual energy savings are anticipated along with unaccounted maintenance savings.

Student, Faculty, and Staff involvement has been the focus of efforts of the energy and sustainability team. An app "USU Campus Reporter" has been developed, with the help of computer science students on campus, to encourage and make it easier to report wasted energy and water on campus to Facilities. The first energy wars competition has been completed. Six buildings competed to reduce their electrical usage the largest percent compared to their previous years' usage.

USU Photovoltaic Project

USU has been working toward the American College & University Presidents Climate Commitment (ACUPCC) of becoming carbon neutral by 2050. In an effort to do so, renewable energy sources are being sought after. USU is currently negotiating the terms of a large scale solar power PPA.

Energy Usage

Utility data has been gathered from the USU Logan campus, Uintah Basin, and Moab Campuses. This information represents the significant portion of USU's energy usage, but is not comprehensive. Due to the wide range of USU organizations across the state receiving utility bills we have not been able to capture the usage in its entirety. However, with the development of the energy management group, the goal has been set to be more involved with tracking usage and energy reduction for all regional facilities.

USU L*ogan Campus*

Electric (kWh)	30,943,751	$2,011,341
Gas (Decatherms)	719,629	$3,238,331
Water (kgal)	163,263	$26,721

USU Eastern

Electric (kWh)	Not Available	Not Available
Gas (Decatherms)	Not Available	Not Available
Water (kgal)	Not Available	Not Available

USU Regional Campuses

Electric (kWh)	1,960,499	$187,762
Gas (Decatherms)	10,648	$76,933
Water (kgal)	16,844	$8,423

USU Total

Electric (kWh)	32,904,250	$2,199,103
Gas (Decatherms)	730,277	$3,315,264
Water (kgal)	180,107	$35,144

DIXIE STATE UNIVERSITY
ST. GEORGE, UTAH

Annual Energy Report FY 2016

Prepared by: Bart Peacock
DSU Energy Controls Manager
December 14, 2016

For Additional Information Contact:

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Overview

During fiscal year 2016, DSU has continued its efforts in efficiency and conservation of resources. We continue to use funds provided to employ technologies and methods that are aiding in our resource management endeavors.

FY16 Points of Emphasis

- Continued use of and maintenance of improvements made in the conservation measures implemented in the ESCO project completed in FY2013
- An even higher emphasis on building HVAC scheduling to limit the run-times of equipment outside of normal operating hours
- Continued retrofit or replacement of outside building lights and wallpacks to LED or compact fluorescent
- The start of the installation of smart meters for power, water and natural gas so that utility usage data can be analyzed and trended in real time

FY16 Water and Sewer Including Irrigation

- **Volume: 132,183 CCF or 98,879,522 Gallons**
- **Cost: $173,531.92**

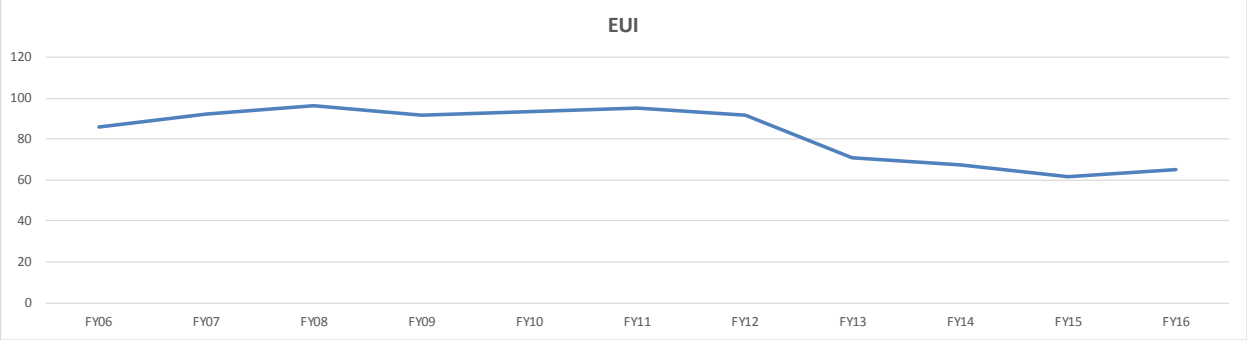
FY06-FY16 Energy Usage Data

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
FY15	$1,221,998	14,765,506	50,379,906	$183,281	21,443	21,443,000	1,168,649	$0.08	12.63	$8.55	0.0183	61.46	71,822,906
FY16	$1,309,754	16,272,368	55,521,320	$183,417	21,452	21,452,281	1,186,715	$0.08	13.71	$8.55	0.01807	64.86	76,973,601

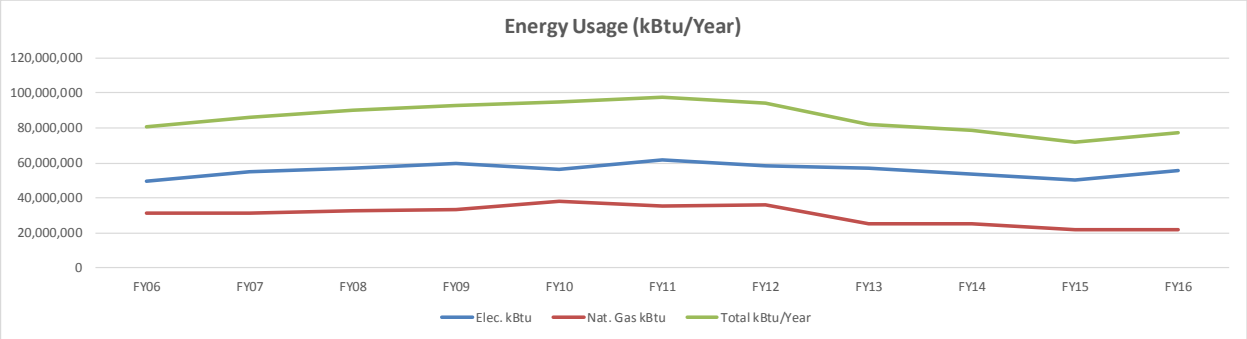
Estimated Annual Cost for Utilities: $1,666,703

Tables

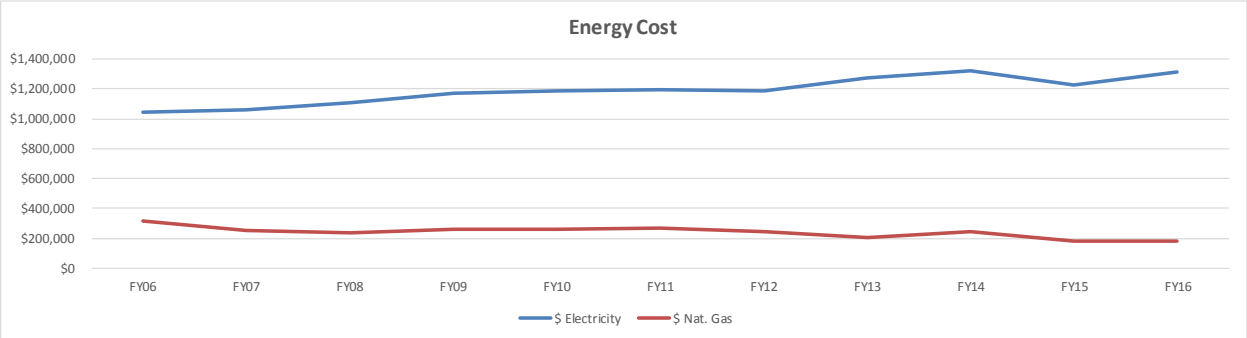
EUI (kBtu/Sq.ft.)



Energy Usage (kBtu/Year)



Energy Cost



Conclusion

As one can see from the tables and the data shown, DSU has used slightly more energy during FY16 than in FY15. We continue in our efforts to operate in a highly efficient manner. However, as our campus population continues to grow, our buildings are being utilized to a greater extent. Increased occupancy and use require a greater amount of energy resources in order to heat and cool rooms and spaces and to provide the power needed for the increased use of lighting and power circuits, for example. Even with expanded growth and utilization of our facilities, we plan to further implement strategies and technologies through design, commissioning, improvements and upgrades to become more sustainable, energy efficient and better stewards of energy resources.

Energy Report Summary 2015-2016 Richfield Campus.

- **Commissioned the Administration Building**
- **Added new Chiller to Administration Building**
- **Added three Evaporated coolers on each air intake for Admin Building**
- **Increase LED lighting to Washburn Halls, Admin Halls for all emergency lighting**
- **Replaced all exterior windows for Washburn Building**
- **Added VFD equipment to Washburn Building**

Projects for 2016-2017

- **Install Evaporative coolers for Sevier Valley Center**
- **Install metering for both campus's**
- **Continue to add in house LED lighting**
- **Requested CI funds for Johnson Control upgrades**
- **Requested funds for LED arena lighting for Sevier Valley Center**

Attachments photos for projects:

Washburn Windows

Washburn Windows

New Chiller for Administration Building

Three new Evaporative coolers for Administration Building

- **VFD upgrade for Washburn pumps**

Energy Report Summary 2015-2016 Snow College Ephraim Campus

- Installed LED in Social Science display cases. $631.42
- Installed LED in Greenwood Student Center display cases $574.14
- LED light pole High Tech $293.50
- Installed LED lights High Tech electrical room $280.00
- LP8 Panel High Tech $948.00
- Installed LED wall packs Business Building $3469.12
- Installed LED lighting in Business Building shed $809.50
- Installed LED lighting on housing units $479.58
- Installed LED lighting Performing Arts Theater $500.00
- Installed LED lighting Humanities Art Gallery $3359.31
- Installed LED lighting Humanities Photo Gallery $866.32
- Installed LED lighting Stadium Restroom $506.92
- Installed LED lighting Activity Center Front Entrance $991.95
- Surge Protection High Tech, Library and Activity Center $3,700
- Installed new VFDs, made upgrades to air handler, replaced all VFDs and automated controls Greenwood Student Center.

UCAT CAMPUS

RETHINK EDUCATION

FY 2016 Annual Energy Report

Mountainland Applied Technology College

MOUNTAINLAND
APPLIED TECHNOLOGY COLLEGE
A Utah College of Applied Technology Campus

MLATC.edu

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MATC Energy Report 2016

Overview:

The goal of Mountainland ATC Facilities is to increase energy efficiency and reduce energy costs while maintaining comfortable environment for instruction and learning. MATC Facilities conserve energy and resources by tracking costs of consumption of energy using Portfolio Manager and ensuring maximum operating efficiency of energy-consuming equipment and systems. The College's expectation is that the campuses will operate and develop strategies for its Facilities in the most efficient manner to provide timely, effective, and economical plant operation in support of the College's Mission.
This energy report is provided annually to comply with the State statute 63A-5-701.

Consumption & Costs FY2016:

Meter: Potable: Mixed Indoor/Outdoor Meter

Property: Mountainland Applied Technology College
10/05/2015 05:42 PM EST

Start Date	End Date	Usage KGal (thousand gallons) (US)	Cost	Location
6/15/2015	6/15/2016	1188	$790.48	Orem Campus
6/17/2015	6/26/2016	2999	$3415.91	Lehi Campus

Meter: Electric Grid Meter

Property: Mountainland Applied Technology College
10/05/2015 05:43 PM EST

Start Date	End Date	Usage kWh (thousand Watt-hours)	Cost	Location
6/17/2015	6/28/2016	278960	$34752.59	Orem Campus
6/29/2015	6/26/2016	1566880	$133778.16	Lehi Campus

Meter: Natural Gas
Property: Mountainland Applied Technology College
10/05/2015 05:47 PM EST

Start Date	End Date	Usage MCF (million cubic feet)	Cost	Location
7/1/2014	7/1/2015	1285	$3731.41	Orem Campus

Start Date	End Date	Usage CCF (hundred cubic feet)	Cost	Location
6/18/2014	7/17/2015	32964	$ 25492.7	Lehi Campus

Estimated Annual Cost for Utilities= $215,766.90

Strategies for improving energy efficiency:

Capital improvement projects for FY16 included:

1. Exterior LED lighting upgrades on the buildings as well as the new parking lot at the Orem Campus.
2. A welding filtration system implementation started in June of 2016 the MATC Orem Campus completing the fourth phase of its renovation. The Overall project removed an exhaust system, replaced a 1.5 million BTU make up air unit and upgraded to a filtration system. This system was designed to prevent heat loss in the Welding lab area by filtering welding exhaust reducing need for heated/cooled make up air.
3. Building controls were also added to existing equipment to help monitor their performance.

In September 2013 a solar array system was added to the rooftop of this facility. Rocky Mountain Power with the net metering program has bought back energy equivalent to 4240 KWH this past year.

Future Capital Improvements projects & O&M funded projects for the College are centered on conserving energy and resources by ensuring maximum operating efficiency of energy-consuming equipment and systems. This includes mechanical upgrade systems replacement for inefficient mechanical systems in office spaces at the Orem Campus.

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ENERGYREPORT FY-17

"ENERGY"

" The work that a physical system is capable of doing in changing from its actual state to a specified reference state, the total including, in general, contributions of potential energy, kinetic energy, and rest energy." The American Heritage Dictionary

To Our Stakeholders

STRATEGIC HIGHLIGHTS

Ogden-Weber Tech with and through the assistance of the DFCM Energy Team of John Harrington and Bianca Shama, have solicited and been awarded the largest incentive grant project that Rocky Mountain Power has ever awarded. Totaling $ 700,000, the grant will go toward the installation of a 1.2 Mega-Watt ground mount PV (Photo-Voltaic) array. This new is slated to be complete by the summer of 2016.

This system will comprise 3,878 solar PV modules mounted, two high in 'portrait mode' and at 25 degree tilt angle on a racking system, which is secured in the ground. The modules will be south facing, with the front (leading edge) of the module 'tables' elevated about 3 feet above ground and the back being elevated about 6 feet above ground (furthest from south side.) The solar array will be entirely enclosed by chain link fencing. The visual impact to residents directly on the south side of the array is minimal.

Included in the project will be Batteries, Yes, batteries will be a component of this new Hybrid System, The Tesla batteries will be used in combination with the solar array to help reduce the demand side cost associated with an Electrical service the size of the existing service at the college.

The solar system will provide a valuable renewable energy source for the campus and will offset more than 30% of campus electricity consumption. The system is expected to generate over 37 million kWh of energy over its lifetime, offsetting more than 50 million lbs. of carbon emissions. This is the equivalent to removing 4,848 cars from the road, or powering 162 homes yearly. The solar arrays will also provide the campus with a secure, predictable and lower, stable utility rate for the next 20 year

FINANCIAL HIGHLIGHTS

Our highlight here at the Ogden-Weber Tech College come in the way of reductions. While we have had two significant projects that can be attributed to cost savings, one being the upgrade and replacement of all exterior lighting on campus from High-Pressure Sodium and incandescent lighting to all LED lighting. Second would be the upgrade of our existing motors, pumps boiler controls in our Heat Plant, to new Lower voltage and higher efficient pumps, motor and motor starters.

The two projects mentioned above have brought to the college some Financial and Energy savings in both the Electrical and Natural Gas utilities. To recognize these savings we have taken data directly from our Utility providers and have compared 2015 calendar year with 2016 calendar year, saving

FINANCIAL HIGHLIGHTS (CONT.)

ELECTRICAL Stats:

Total Kilowatt Hours:	2015 ……	3,594,900 Kwh
	2016 ……	3,498,000Kwh
Total Kwh's per day	2015 ……	118,006
	2016 ……	114,839
Total Cost Per Year	2015 ……	345,285
	2016 ……	322,668

NATURAL GAS Stats: (3 separate accounts)			**Cost Comparison**
Health Tech Bldg. *	2015 ……..	2,266 Total DTH	16,683.48
	2016 ……...	2,216 Total DTH	14,115.92
Main Campus	2015 …….	22,166 Total DTH	131,498,52
	2016 ……	21,182 Total DTH	121,584.68
BDO Campus	2015 …….	2,242 Total DTH	18,581.23
	2016 …….	2,145 Total DTH	17,782.05

*Denotes our only High Performance Building

While the college has done its best with the resources available it is easy to see that while reduction is the posture we take, reductions don't necessarily result in a cost saving, we have tried and for the most part we have and will continue to push for reduction. There are several facture that will always play a part in these equations. One, being the weather and two, being the cost of product bought. We will always strive to have reduction and we hope savings will follow.

OPERATING HIGHLIGHTS

We continue to move forward with the placement of metering devices on all new equipment and incorporate measuring devices in all the Capital improvement projects. We could still use some help on placement and monitoring these devices. This information will continue to help guide our Energy saving efforts.

Our College fits into a niche between medium and small campus's in size and funding. We currently have 17 buildings with a gross of 446,000 Sq. Ft., and a Maintenance staff of 4 FTE's and 2 Part-time employees, (30 Hr. per week.) We continue to show progress on keeping our Campus's the best in UCAT. But as you might guess all employees are required wear many hats and shoulder extra responsibility.

While working together as a team we have been able to just keep up with the demands and mandates. Our team continues to improve and operate a very progressive outlook and attitude.

LOOKING AHEAD

The future of our campus and the College as a whole is very bright, with the new Solar P.V. system being implemented and the better controls on our operational programs, we will continue to look into the future. We will continue to try to implement new and progressive technologies that will help us to be better stewards of the Tax Payers dollars. Whether it be in the Natural Gas, Electric, or Hydronic arena's we will continue to do the best we can to get the biggest bang for the Tax Payers buck that we are able too.

Our future is bright and our aim is true. We continue to pursue to stay on the top of the proverbial heap, and with your help and guidance we will achieve great things.

December 19, 2016

FY 2016 – Southwest Applied Technology College Annual Energy Report

Prepared by:

Southwest Applied Technology College
Facilities Management
December 2016

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Overview

The Southwest Applied Technology College (SWATC), based in Cedar City, Utah, currently owns two buildings with a combined square footage of 117,489. In July 2015, the college procured ownership of the existing Business & Technology Building (510 W. 800 S.) from the Iron County School District, and in January 2016, the college moved into the newly constructed Health Professions & Trades Building (757 W. 800 S.). The following information provides details about the energy & water usage, waste disposal, costs, and reduction strategies at both locations. To help compile and analyze the data, the college utilizes the Energy Star Portfolio Manager.

FY 2016: SWATC – Energy Management Plans & Strategies

HVAC Units: All of the Business & Technology Building rooftop HVAC units are over 15 years old and have reached the end of their useful life. In FY 2016, Capital Improvement funding was requested and approved to replace the units, which would allow more efficient units to be installed. The work will begin in FY 2017.

Roofing: The Business & Technology Building metal roofing has reached the end of its useful life; part of the roof is over 15 years old (on the addition) and the remainder is over 31 years old (on the original building). In FY 2016, Capital Improvement funding was requested and approved to install increased insulation over the metal and install a new membrane roofing, which would increase the insulation levels of the building. The work will begin in FY 2017.

Thermostats: After taking ownership of the Business & Technology Building in July 2015, it was observed that the 20 HVAC units were not programmed according to area usage; some were operating at occupied temperatures during the night, weekends, and holidays. To correct this problem, the 20 thermostats were programmed according to area usage and occupant requested temperatures. The thermostats were then programmed so only members of the Facilities Department could make adjustments.

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FY 2017: SWATC – Energy Management Plans & Strategies

Behavior Changes: Beginning in January 2017, the Facilities & IT Department will begin a coordinated effort to educate college staff about energy use and how to effectively reduce consumption. Outreach to the local utilities (Rocky Mountain Power and Questar Gas) and Utah's State Building Energy Efficiency Staff will be made to help meet the intent of the State Employee Behavior Partnership for Energy Efficiency.

Building System Commissioning: During FY 2017, careful analysis of the building's occupancy and operation will be used to complete the building system commissioning at the Health Professions & Trades Building.

Demand & Facilities Charges: During FY 2017, the building automation system at the Health Professions & Trades Building will be evaluated to determine whether additional programming will help reduce the electrical demand & facilities charges. During the summer months, the demand & facilities charges can be more than 2.5 times higher than the energy costs at the building; the charges are related to one or two large spikes each month.

Electrical Upgrades: During FY 2017, Capital Improvement Funding will be requested to upgrade the electrical systems at the Business & Technology Building. Some of the upgrades include the installation of a building automation system for the HVAC units (including occupancy sensors), installation of new metering for the electrical, gas, and water systems, and upgrading any inefficient electrical equipment.

Energy Audit: During FY 2018, a building-wide energy audit will be conducted at the Business & Technology Building to identify inefficiencies and provide recommended improvements.

Landscape Irrigation: Beginning in the spring of 2017, the Facilities & IT Department will begin evaluating the water usage for landscape irrigation at both the Business & Technology Building and the Health Professions & Trades Building. Plans will be developed and implemented according to the findings.

Lighting Upgrades: During FY 2017, Capital Improvement Funding will be requested to upgrade the lighting systems at the Business & Technology Building. Some of the upgrades include the installation of a building automation system for lighting (including occupancy and daylight sensors) and upgrading to more energy efficient lighting fixtures.

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SWATC – Business & Technology Building

The Business & Technology Building has a total square footage of 37,147. The one-story building was constructed in 1984, and a remodel/addition was completed in 2000. In 2013 a 32.1 kW solar photovoltaic (PV) system was added to the building with funding provided by the Rocky Mountain Power Blue Sky Program.

The energy usage patterns at this building have changed since the college accepted ownership of the building in July 2015. Beginning in January 2016, a significant portion of SWATC programs, staff, and students moved to the Health Professions & Trades Building, thereby reducing the energy consumption at the building.

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SWATC – Business & Technology Building

Electricity: Other than general lighting and outlet usage, the largest consumption of electricity occurs through the 20 rooftop HVAC units (heating and cooling).

Solar PV System: During the reporting period, the solar PV system generated 60,900 kWh of electricity. This is a reduction of 26.2% of the total electricity usage at the building.

Natural Gas: Other than minor water heating usage, the largest consumption of natural gas occurs through the 20 rooftop HVAC units (heating).

Water: Other than general drinking fountain and restroom usage, the largest consumption of water occurs through landscape irrigation.

Waste Disposal: Other than general office and classroom waste, the largest contribution of waste occurs from the construction labs.

FY 2016: SWATC – Business & Technology Building

	Electricity			Natural Gas		Water		Waste Disposal	
	kWh	kW	Costs	MBtu	Costs	Gallons	Costs	Cubic Yards	Costs
July	10,560	78	$ 1,362.07	0.5	$ 44.51	-	$ 39.03	-	$ -
August	18,240	89	$ 2,703.15	1.9	$ 37.81	120,000	$ 230.01	30	$ 207.06
September	23,760	103	$ 3,249.22	3.6	$ 53.66	98,000	$ 208.01	30	$ 142.16
October	17,760	87	$ 2,361.36	53.0	$ 450.12	106,000	$ 218.01	30	$ 149.98
November	15,840	69	$ 1,852.00	180.3	$1,491.47	32,000	$ 152.81	30	$ 149.64
December	19,440	67	$ 1,975.66	196.0	$1,580.82	14,000	$ 124.55	30	$ 142.82
January	13,200	44	$ 1,347.91	302.8	$2,447.59	12,000	$ 122.01	60	$ 352.74
February	12,480	45	$ 1,317.53	132.7	$1,182.31	7,000	$ 117.01	30	$ 177.82
March	10,080	44	$ 1,204.90	101.5	$ 799.31	5,000	$ 115.01	30	$ 140.84
April	9,120	53	$ 1,317.40	44.2	$ 353.81	12,000	$ 113.01	30	$ 145.68
May	9,840	45	$ 1,357.13	8.8	$ 86.39	119,000	$ 220.01	-	$ -
June	11,040	56	$ 1,715.30	1.5	$ 34.00	133,000	$ 234.01	30	$ 157.12
Total	171,360	780	$21,763.63	1,026.8	$8,561.80	658,000	$1,893.48	330	$1,765.86

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SWATC – Health Professions & Trades Building

The Health Professions & Trades Building has a total square footage of 80,342. Occupancy of the two-story building began in January 2016 and construction was completed in March 2016. The building was designed and constructed according to the state's High Performance Building Standards.

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SWATC – Health Professions & Trades Building

Electricity: The distribution of electricity is diversified throughout the building, with some of the largest consumption occurring from the welding labs, culinary labs, two air handling units (heating and cooling), and chiller (cooling).

Natural Gas: The distribution of natural gas is diversified throughout the building, with some of the largest consumption occurring from the culinary labs and two boilers (heating).

Water: The distribution of water is diversified throughout the building, with some of the largest consumption occurring from the culinary labs and landscape irrigation.

Waste Disposal: Other than general office and classroom waste, the largest contribution of waste occurs from the welding labs, culinary labs, and industrial maintenance labs.

FY 2016: SWATC – Health Professions & Trades Building

	Electricity			Natural Gas		Water		Waste Disposal	
	kWh	kW	Costs	MBtu	Costs	Gallons	Costs	Cubic Yards	Costs
July	-	-	$ -	-	$ -	-	$ -	-	$ -
August	-	-	$ -	-	$ -	-	$ -	-	$ -
September	-	-	$ -	-	$ -	-	$ -	-	$ -
October	-	-	$ -	-	$ -	-	$ -	-	$ -
November	-	-	$ -	-	$ -	-	$ -	-	$ -
December	-	-	$ -	-	$ -	-	$ -	-	$ -
January	43,600	147	$ 4,265.60	407.5	$ 3,333.23	14,000	$ 34.50	60	$ 210.00
February	38,160	132	$ 3,801.46	824.4	$ 6,660.52	14,000	$165.25	54	$ 190.00
March	34,160	273	$ 6,004.90	556.6	$ 4,760.60	78,000	$229.25	60	$ 160.00
April	36,480	220	$ 5,209.27	474.0	$ 3,609.16	12,000	$163.25	48	$ 160.00
May	38,320	245	$ 6,457.85	170.1	$ 1,200.76	38,000	$189.25	54	$ 190.00
June	45,600	248	$ 7,231.69	38.4	$ 429.34	57,000	$208.25	60	$ 160.00
Total	236,320	1,265	$32,970.77	2,471.0	$19,993.61	213,000	$989.75	336	$1,070.00

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		UBATC-R	CDL-R	Bldg Tr-R	Storage-R	UBATC-V	CDL-V	
		3933	8591	9795	8333	15056	10814	
		88000	4290	3500	11520	87736	4250	199296
Questar-Gas		Sq Ft	Sq Ft	Sq Ft	Sq Ft	Sq Ft	Sq Ft	Total
1919 W 500 N Vernal-GS	Vernal Campus					1,887.44	91.43	1,978.87
1919 W 500 N Vernal-TS	Vernal Campus					9,301.47	450.57	9,752.04
450 N 2000 W Vernal	Oil Field Simulator					726.79	35.21	762.00
901 E Lagoon St Roosevelt	Roosevelt CDL		3,713.75					3,713.75
950 E Lagoon St Ballard	Roosevelt Campus	63,895.20						63,895.20
1100 E Lagoon St Roosevelt	Roosevelt Storage Bldg				2,134.91			2,134.91
BP-Gas								
Vernal Campus	Vernal Campus					15,405.67	746.26	16,151.93
TOTAL GAS		63,895.20	3,713.75		2,134.91	27,321.37	1,323.47	98,388.70
Moon Lake Electric-Electric								
Dina Enterprises	Roosevelt CDL		1,145.16		3,075.12			4,220.28
UBATC	Roosevelt Campus	83,785.08		3,332.36				87,117.44
Driving Range		363.37						363.37
Rocky Mountain Power -Electric								
1919 W 500 N Vernal	Vernal Campus					106,310.56	5,149.77	111,460.33
450 N 2000 W Vernal	Oil Field Simulator					962.49	46.62	1,009.11
TOTAL ELECTRICITY		84,148.45	1,145.16	3,332.36	3,075.12	107,273.05	5,196.39	204,170.53
Ashley Valley-Water								
450 N 2000 W Vernal						5,520.00		5,520.00
450 N 2000 W Vernal-Landscaping						7,877.15		7,877.15

450 N 2000 W Vernal-Storage							279.90	279.90
Ashley Valley-Sewer								
450 N 2000 W Vernal						7,554.07	365.93	7,920.00
Roosevelt City-Water								
Summer #1		1,800.00						1,800.00
CDL	Roosevelt CDL		692.25					692.25
UBATC	Roosevelt Campus	2,948.00						2,948.00
UBATC/2	Roosevelt Campus	1,925.00						1,925.00
UBATC-Secondary Water	Roosevelt Campus	3,222.25						3,222.25
Roosevelt City-Sewer								
CDL	Roosevelt CDL		900.00					900.00
UBATC	Roosevelt Campus	900.00						900.00
TOTAL WATER & SEWER		10,795.25	1,592.25			20,951.22	645.83	33,984.55
Allocation of Utilities		104.86	5.11	4.17	13.73	104.54	5.06	237.47
		158,943.75	6,456.27	3,336.53	5,223.76	155,650.19	7,170.75	336,781.25
	GL GAS	105007.78						
	GL Elec	189043.78						
	GL Water/Sewer	42729.69						
		336781.25						
	Less Identified above	(336,781.25)						
	Remainder to allocate	0						