AMERESCO
Green • Clean • Sustainable

Comprehensive Engineering Assessment

Prepared for

City of Hutchinson, MN

February 17, 2010

Integrity . Flexibility . Independence . Innovation

AMERESCO
Green • Clean • Sustainable

Anderson Lakes Center
9855 West 78th Street, Suite 310
Eden Prairie, MN 55344

P: 952 942 5142
F: 952 942 5421

ameresco.com

February 17, 2010

Mr. Gary Plotz
City Administrator
City of Hutchinson
111 Hassan Street SE
Hutchinson, MN 55350

Dear Mr. Plotz:

On behalf of Ameresco and our local office, we are pleased to submit this Comprehensive Engineering Assessment for the City of Hutchinson. Our team is excited to have the opportunity to work with you, your staff and your city.

This project provides an excellent opportunity for the City of Hutchinson to demonstrate its energy and environmental leadership, as well as address certain infrastructure needs. The project we have developed effectively utilizes utility, operational, and other budget savings to make improvements throughout the City, as well as help to offset the cost of needed capital improvements. In addition, we are exploring grants and rebates that will enable the City of Hutchinson to implement a solution that is as cost-effective as possible.

The combined resources of Ameresco bring together some of the best minds, experience, and capabilities in the energy services industry. We are a customer-driven company that delivers on our promises, treats customers with respect, and passionately strives to exceed the commitments we make to you.

We appreciate the opportunity to work with you to develop a long-term partnership focused on the City of Hutchinson's goals and community objectives.

Sincerely,

Michael R. Zukowski, CEM	Michael R. Piper, BEP, LEED AP	Robert S. Krukoski, PE, CEM
Account Executive	Account Executive	Sr. Project Development Engineer

Printed on recycled material

Comprehensive Engineering Assessment

Prepared for

City of Hutchinson, MN

February 17, 2010

Presented by
Ameresco, Inc.
Anderson Lakes Center
9855 West 78th Street, Suite 310
Eden Prairie, MN 55344

T: (952) 942-5142
F: (952) 942-5421

This Comprehensive Engineering Assessment contains data and information that has been submitted in confidence. The contents include proprietary information and trade secrets that belong to Ameresco, Inc., ("Confidential Information") and is disclosed to the recipient only for purposes of evaluation. In the event Ameresco is awarded a contract or purchase order as a result of or in connection with the submission of this assessment, Customer shall have a limited right as set forth in the governing contract or purchase order to disclose the data herein, but only to the extent expressly allowed. This restriction does not limit the Customer's right to use or disclose data obtained without restriction from any source, including the proposer.

Table of Contents

I. Executive Summary

II. Ameresco Overview

III. Project Development

IV. Facility Improvement Measures

V. Support Services

VI. Project Funding

VII. Financial Summary

VIII. Project Management Plan

I. Executive Summary

Subsequent to meeting with a number of energy services companies, the City of Hutchinson selected Ameresco in July, 2009 to explore and develop a guaranteed energy savings project approach to reducing city-wide utility and operating costs, and to address a number of deferred maintenance needs.

After a favorable preliminary assessment was completed in October, 2009, Ameresco and the City of Hutchinson entered into a Project Development Agreement to complete a detailed analysis of the project. This detailed analysis provides specific measures for the City to consider and evaluate. These measures reduce costs, improve operation, and assist with capital intensive deferred maintenance needs.

Several goals were identified by the City of Hutchinson as being of key importance to the outcome of this project and are listed below. Ameresco investigated and developed the cost-benefit analysis of many different Facility Improvement Measures (FIMs) throughout the City (see Section IV), enabling the City to weigh project options that will best meet these goals:

- Address the high energy cost, comfort issues and mechanical upgrade needs of the Police Department;
- Evaluate opportunity and measures to reduce energy and operating costs in all city-owned facilities and sites, and leverage these savings for other needs;
- Explore energy-related grants and rebates to improve cost-effectiveness of project;
- Work to incorporate deferred maintenance and capital improvement needs;
- Develop a long-term project financing approach that is self -funding from savings;
- Provide a savings guarantee; and
- Explore clean, renewable energy technology and systems, including wind energy.

Ameresco's comprehensive analysis includes several different components of savings and funding designed to assist in addressing the needs of the City of Hutchinson. The different areas of savings and funding for the project are explained in further detail below.

Energy Savings Performance Contracting

Over two decades ago, Minnesota enacted legislation that permits cities to create long-term partnerships with energy services companies to implement guaranteed energy savings contracts, often referred to as "Performance Contracts." A Performance Contract enables a city to upgrade facilities and sites through efficiency improvements, generating energy and operational savings that will be guaranteed to pay for the cost of the project.

Long Term Financing

Minnesota legislation allows cities to enter into guaranteed energy savings agreements of up to 20 years in length. The 20-year maximum length is intended to allow cities to complete longer return improvements and address critical deferred maintenance needs.

Ameresco's structured financing team can assist in arranging long-term financing, such as a Tax-Exempt Lease-Purchase or Bonding options. A tax-exempt lease purchase is a very common method for financing energy savings performance contracts, and has been used successfully for over three decades by thousands of local government entities.

We will work with your independent financial advisor to determine what type of long term financing is best for the City, at the lowest cost of funds and best possible terms. We can assist with the development of a financing RFP for national, regional or local lenders who are very familiar with the energy services business; this will help assure the best possible terms and rates. A lower cost of funds can allow a city to include more improvements in the project, thereby improving the overall impact.

Grants and Rebates

Working in partnership with Ameresco, the City of Hutchinson delivered a proposal on January 25, 2010 for a competitive grant to the Minnesota Department of Commerce, Office of Energy Security (OES). The energy efficiency and conservation proposal was for the maximum grant request allowed of $100,000. This grant opportunity was funded through the 2009 federal ARRA "stimulus" bill under the DOE's Energy Efficiency and Conservation Block Grant (EECBG) program. The next step in the selection and award process will be a "Short-List Notification to Responders" on March 12, 2010. We are hopeful that the Proposal submitted by the City will receive a high ranking and merit grant funding.

Ameresco will continue to work with the Hutchinson Utilities Commission and their Energy Conservation Administrator on potential energy conservation rebates. Once the scope of the recommended project is defined, Ameresco will meet with Hutchinson Utilities to firm up what rebate amount can be assigned to this comprehensive energy conservation project.

Based on this Comprehensive Engineering Assessment, here are a few of the key highlights of the potential project:

- City wide annual energy and operational savings of up to $286,000
- Many needed Capital Improvements at numerous facilities
- City Street Lighting Improvement Options
- Wind Energy System Options to provide part of the annual electricity needs of the Wastewater facility
- Rebate and Grant development to assist in the financing of the project

Conclusion

This Comprehensive Engineering Assessment is a result of the Project Development Agreement entered into by the City of Hutchinson and Ameresco on October 28, 2009. From the information contained in this report, we will continue our work with the City to select the ideal combination of facility improvement measures, and subsequently request your approval of the final proposal. Ameresco will then finalize all necessary contract documentation and begin the implementation process. That would include working with the City and their advisors on the underlying long term financing.

Ameresco believes that this project provides the City of Hutchinson the ability to implement many improvements to its facilities and sites in the most cost-effective manner possible. We ask you to move forward to establish a partnership with us that will address a number of the funding issues facing the City, dramatically reduce your energy consumption and improve the environment; all being done with a fiscally responsible approach.

II. Ameresco Overview

As the largest independent Energy Services Company (ESCO) in North America, Ameresco is focused on renewing our customer's facilities and infrastructure, saving money on your energy related costs, and ensuring that the solution provided will be the optimal approach both technically and financially. The value we bring is worth far more than just dollars and cents. Our customers find genuine value in the projects we perform as evidenced by a more pleasant working environment, greater flexibility in their budgets, and extended infrastructure life.

Ameresco always strives for complete customer satisfaction in every project we undertake. We go beyond your expectations to create as comprehensive a project as possible, differentiating ourselves through independence, experience, and local presence that will truly benefit your project.

Ameresco Attributes and Benefits	
Independent	Not owned by a product manufacturer, utility or contractor. Ameresco promotes a competitive and negotiated selection process, which typically results in the best value and our process allows for client's maximum participation.
Innovative	Bringing cutting edge technology through strategic partnerships.
Flexible	Realizing each customer has unique objectives and different ways of doing business. We excel at working with facility personnel and their schedules to minimize disruption.
Cost-effective	Delivering maximum project value per dollar; not burdened with the overhead of a large corporate structure.
Knowledgeable and Dedicated	Our project teams include working managers, with senior technical staff working directly on customer projects. All engineering and design work is performed or thoroughly reviewed by our internal Professional Engineers.
Customer-focused	With a commitment to 100% satisfaction, our in-house Project Managers take pride in completed projects that exceed customer expectations and in establishing long-term relationships.
Funding Development	We lead the effort to find funding and financing from multiple sources, including local utilities and third-party financing firms.

Ameresco-Eden Prairie, MN office

Ameresco Project Staff

Sales and Project Communications

Michael R. Zukowski CEM
Midwest Account Executive
Mike will be your primary project contact person. He will be responsible for coordinating all aspects of the project. Mike has over 20 years of energy project development and management experience including Honeywell and Trane. Mike is a Certified Energy Manager (CEM).

Michael R. Piper BEP, LEED AP
Midwest Account Executive
Mike will be teaming with Mike Zukowski in the full coordination of activities on the project. Mike has over 6 years of energy project development experience with Johnson Controls and Harris Companies. Mike is a certified Business Energy Professional (BEP) and LEED Accredited Professional.

Engineering and Project Specialties

Robert S. Krukoski PE, CEM
Senior Project Development Manager
Rob will be the Lead Engineer on this project. He and his team will be responsible for the development of energy savings measures and associated calculations for this project. Rob has 7 years of energy project development and management experience with Johnson Controls. Rob is a registered Professional Engineer (PE) and a Certified Energy Manager (CEM).

Brian Prall PE, CEM, GBE, CSDP
Senior Project Development Manager
Brian will team with Robert Krukoski on this project. He has over 30 years of HVAC design and energy experience, including Alliant Energy Integrated Services and Energy Services Group (ESG) – Honeywell International. Brian is a registered Professional Engineer (PE), Certified Energy Manager (CEM), Certified Green Building Engineer (GBE), and a Certified Sustainable Development Professional (CSDP).

Jayson R. Naughton PE, CEM
Lead Project Manager
Jayson will lead the project management team and has 13 years with Reliant Energy Services, Energy Masters International, Alliant Energy Integrated Services, and Energy Services Group. Jayson is a Professional Engineer (PE) and a Certified Energy Manager (CEM).

Michael W. Bartlett PMP, CEM, LEED AP
Project Management
Mike will be available to assist the project management team and has 14 years with Johnson Controls and Chevron Energy Solutions. Mike is an Industrial Engineer, Certified Energy Manager (CEM), Project Management Professional (PMP), and is a LEED Accredited Professional.

Peter Kurpiewski PE, LEED AP, CEM
Regional Manager, Engineering & Operations
Pete will oversee the project as the Regional Manager of Engineering such that all the needed resources and engineering talent are made available for this project. Pete has over 20 years of energy project development and management experience with Exelon Energy Solutions and Ameresco. Pete is a registered Professional Engineer (PE), Certified Energy Manager (CEM), and a LEED Accredited Professional.

Dean Robinson PE
Senior Project Management Engineer
Dean will provide his expertise to any renewable energy (e.g. solar or wind applications) aspect of this project. Dean is one of Ameresco's top engineers with over 15 years of experience in renewable energy projects with Xcel Energy, Sebesta Blomberg Engineering, and HDR Engineering. Dean is a registered Professional Engineer (PE).

Project Support and Overview Management

John J. Neville PE, CEM, GBE, CSDP
Regional Director
John will be overseeing all financial and timetable aspects of the project. John will assist the Account Executive team to deliver the highest quality project from all perspectives. John has over 15 years of Performance Contracting Management experience with Honeywell and Johnson Controls. John is a registered Professional Engineer (PE), Certified Energy Manager (CEM), a Certified Green Building Engineer (GBE), and a Certified Sustainability Design Professional (CSDP).

Louis Maltezos
Executive Vice President and General Manager, Ameresco Midwest Operations
Lou will be the ultimate overseer of the total project financials. Lou has over 20 years of senior executive experience in the Performance Contracting business with Exelon Energy Services and Ameresco.

Wendy Anderson
Midwest Proposal Coordinator / Office Manager
Wendy provides administrative support for proposal construction and publishing. Wendy has over 20 years of executive administrative support and office management experience.

III. Project Development

Background

Ameresco has been working with the City of Hutchinson to develop funding solutions and options to address the energy, operating and deferred maintenance needs of the City. Over the past few months Ameresco has been working in close partnership with the City's administrative and department personnel to develop a comprehensive project for the City that includes addressing the needs of the Police Department and other capital intensive projects.

The solution and options need to be fiscally sound and achievable. The goal is to integrate potential funding sources from energy and operating savings, grants, rebates and long term financing for a financially sound project structure. Achieving a self-funding project and solution at minimum cost, within current and long term budgets, has been the goal of the joint project development team.

A comprehensive facility renewal program must consider the long-term facility cost impact. Considering that operations and maintenance expenses consistently account for over 50 percent of the lifecycle cost of a building, improvements that reduce operations and maintenance expenses should be incorporated into the facility renewal and operation. Ameresco integrates life-cycle engineering, project financing, project management, commissioning, and savings guarantees into our comprehensive approach.

In October 2009, the City entered into an agreement that authorized Ameresco to proceed with a comprehensive analysis of all City facilities and sites. In summary, the co-authored agreement stated that Ameresco, with the City's assistance, would commit resources necessary to analyze existing city facilities and sites and potential capital improvement options in search of funding sources to minimize costs and improve operations. In return, the City committed in principal to moving forward with Ameresco's improvement recommendations as long as the plan could work within identified funding sources.

Project Development Timeline

The following series of activities are being used to develop and implement this project.

Milestone	Description	Status	Date
Concept Approval	Introduced guaranteed saving funding approach concept.	Completed	May, 2009
Preliminary Assessment and Report	Ameresco examined current operating costs and facility use. A preliminary report identified savings and funding feasibility for a comprehensive project.	Completed	September, 2009
Project Development Approval	Agreement to proceed with a comprehensive audit to identify and confirm all potential improvements measures and funding sources.	Completed	October, 2009
Comprehensive Analysis and Report	Ameresco to do a detailed study of all aspects of the project. The report to include detailed description of all improvement measures and recommended options.	Completed	February, 2010
Scope Selection and Project Approval	City selects a package of Facility Improvement Measures and approves Energy Services Agreement.	Future	March, 2010
Project Implementation	Implementation of the selected improvement measures and training of City personnel.	Future	May, 10 – October, 10
Savings Monitoring	Ameresco begins the multi-year process of ensuring and guaranteeing the results. This may include on-going training, education and guarantee management.	Future	Post Construction

Scope Selection & Project Approval

To proceed with the project, Ameresco requests your approval of the selected project scope. Your approval will authorize Ameresco to proceed as follows:

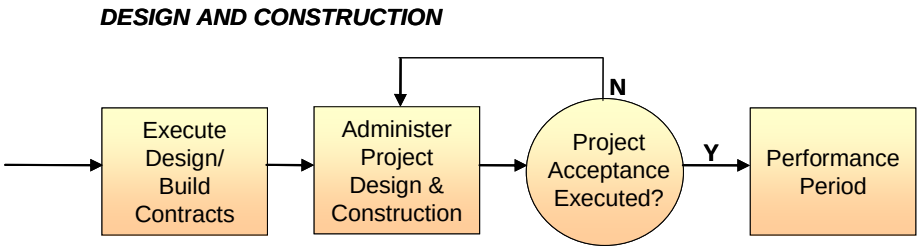
- Create finalized contract documents;
- Mobilize the project teams and finalize implementation schedules; and
- Arrange financing, including utility company rebates and third-party financing.

Ameresco is ready to move toward implementation. We understand your objectives, appreciate the challenges you face, and have built an excellent case for moving forward.

Project Implementation Phase

The project implementation phase will begin with the execution of a Letter of Intent for a Professional Services Agreement and an Energy Services Agreement (Performance Contract). Major activities in the implementation phase will include:

- Confirm final funding
- Execute Energy Services Agreement
- Execute Professional Services Agreement
- Construction period and project management
- Project closeout and commissioning
- Customer training
- Savings measurement and verification



IV. Facility Improvement Measures

STREET LIGHTING

City Wide

Description

The City of Hutchinson is in the process of standardizing street lighting, utilizing an acorn design. As a cobra head street light burns out, it is replaced with a new pole and new decorative acorn head. The lighting technology was standardized throughout the City using a High Pressure Sodium (HPS) fixture that produces yellow light. This technology is a relatively expensive light and used by most cities around the country.

Colors will not appear the same under HPS light as under a white light. For example, when a dark-colored car drives under a HPS fixture, most people can not determine if it is black, dark blue, dark green, or another dark color. It just appears as a dark-colored car. Under a white light, specific dark colors are visible and one's perception of brightness increases significantly. HPS light is commonly perceived by the human eye as appearing darker when compared to "White Light" even though the actual amount of light emitted is very similar.

Utility Baseline Analysis

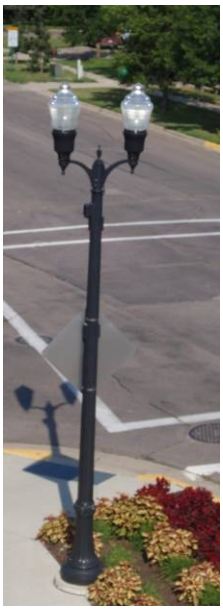
Street Lighting Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	1,417,315	N/A	$ 78,944	N/A	N/A	N/A	N/A	N/A	$ 78,944
2009	1,432,492	N/A	$ 82,941	N/A	N/A	N/A	N/A	N/A	$ 82,941
Average	1,424,904	N/A	$ 80,943	N/A	N/A	N/A	N/A	N/A	$ 80,943

Proposed FIMs

Currently, there are approximately 1750 decorative acorn heads throughout the City.

LIGHTING



Ameresco will provide solutions/options for converting the decorative acorn head HPS yellow light to a white light fixture, with an option of full cutoff fixture. Full cutoff provides the elimination of light pollution into the atmospheres.

FIM # CW-5a Street Lighting – Induction Street Lighting Retrofit Existing Fixtures

A white light provides several benefits including color recognition and the area appears to have more light. One of most energy efficient methods to produce this white light for street lighting is to use induction lighting. This lighting uses technology that is very close to the incandescent lighting system.

An induction lighting system will be retrofitted to the existing bases and utilize the existing globes. The new lighting will provide comparable light levels to the current HPS. This system will not be retrofitted with full cutoff globes.

FIM # CW-5b Street Lighting – Induction Street Lighting New Fixtures with Full Cutoff

In recent years there has been an effort to limit or eliminate much of this unwanted light pollution, most notably by the non-profit International Dark-Sky Association and the Illuminating Engineering Society of North America. By adding full cutoff to the induction technology, both energy efficiency and dark sky association will be achievable. A new base and globe will be required to achieve proper lighting, and elimination of light pollution.

FIM # CW-5c Street Lighting – LED Street Lighting New Fixtures with Full Cutoff

The latest technology in street lighting is Light Emitting Diodes (LED). This LED technology uses a large amount of LEDs to provide proper lighting with a white light. The full cutoff will provide the elimination of light pollution with the latest technology.

Scope Synopsis	Street Lighting

CW-5a Street Lighting – Induction Street Lighting Retrofit Existing Fixtures

- Retrofit existing bases and globes to induction technology. Total fixture quantity: 1750

CW-5b Street Lighting – Induction Street Lighting New Fixtures with Full Cutoff

- Replace existing bases with induction technology and new full cutoff globes. Total fixture quantity: 1750

CW-5c Street Lighting – LED Street Lighting New Fixtures with Full Cutoff

- Replace existing bases with LED technology and new full cutoff globes. Total fixture quantity: 1750

BALL FIELD

1300 Adams Street SE

Building Description

Roberts Park has four baseball fields that are equipped with lighting for night games. The 96 1000-Watt metal halides are on wooden poles and are currently shorter than the new sport lighting standards, and the poles are starting to lean. The lighting system is controlled in a central location and needs to be updated.

Utility Baseline Analysis

Ball Field Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	33,400	N/A	$ 10,532	N/A	N/A	N/A	N/A	N/A	$ 10,532
2009	36,430	N/A	$ 10,896	N/A	N/A	N/A	N/A	N/A	$ 10,896
Average	34,915	N/A	$ 10,714	N/A	N/A	N/A	N/A	N/A	$ 10,714

Proposed FIMs

Replace the existing lighting fixtures with new 1500-Watt fixtures.

LIGHTING

FIM # CW-6a Roberts Park – Lighting Retrofit

When replacing the lighting system, the existing poles could be reused. New wiring will be pulled and controls will be installed with the 1500 Watt fixtures. The existing pole locations would provide adequate layout and provide better lighting levels than currently installed.

FIM # CW-6b Roberts Park – Lighting Replacement

When considering the current condition of the poles, Ameresco recommends replacement of the poles with taller metal poles. This will provide a better lighting design, and with taller poles, this will reduce the amount of time the baseball can be "lost" in the lights. With the new poles, the lighting design can be constructed with the minimum amount of fixtures required.

FIM # CW-7 Roberts Park – Parking Lot Lighting Addition

The current parking lot and boat landing does not have any light besides the main entrance off of the street. When the ball field lights turn off, there is no lighting in the area. By adding parking lot lights, there will be some additional lights for security purposes and general illumination.

Scope Synopsis — Ball Field Lighting

CW-6a Roberts Park – Lighting Retrofit

- Replace 96 1000 Watt fixtures with 96 1500 Watt metal halide fixtures
- Reuse existing Poles
- New Wiring and controls
- Replace 4 Security Lights

CW-6b Roberts Park – Lighting Replacement

- Replace 1000 Watt fixtures with 1500 Watt metal halide fixtures
- Replace Poles with 24 New 60 ft steel poles
- New Wiring and controls
- Replace 4 Security Lights

CW-7 Roberts Park – Parking Lot Lighting Addition

- Install four New 35 ft steel poles for lighting the adjacent parking lot
- Acorn heads to match existing street lighting style

AIRPORT

1700 Butler Field Drive SW

Building Description

The airport was built in 1997, and is in good condition. The building has well water, propane gas, and electrical power. The main building is cooled and heated with residential furnaces and has T8 lighting. The hangar has metal halide lighting with an infrared (IR) heat system.

The runway lighting system has incandescent lighting with multiple light levels when the pilots signal on approach. During the investigation, LED lighting was analyzed. LED runway lighting works well in southern states because they typically do not have to cope with snow. Considering the large amount of snowfall at the airport during the winter, a heater would need to be installed to ensure the snow melts on and around the fixture. Additionally, with the existing bi-light leveling, new wiring would need to be installed to provide the same level of control. In sum, this option was not evaluated because the cost would not be economical.

Utility Baseline Analysis

Airport Utility Information

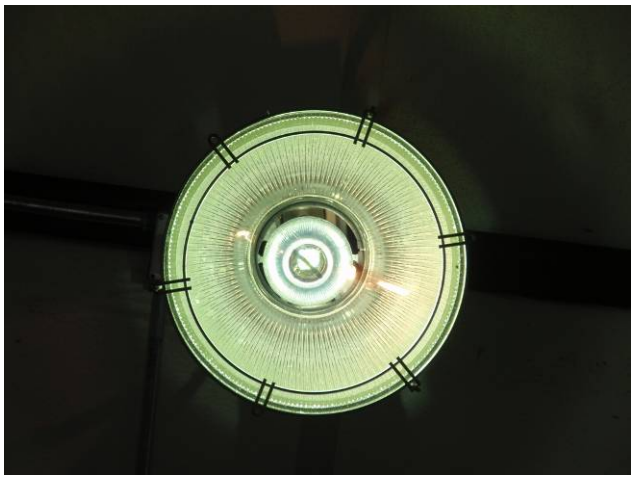
	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	180,470	N/A	$ 16,434	N/A	N/A	N/A	N/A	N/A	$ 16,434
2009	158,270	419	$ 11,770	$ 2,513	N/A	N/A	N/A	N/A	$ 14,283
Average	169,370	419	$ 14,102	$ 2,513	N/A	N/A	N/A	N/A	$ 15,359

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps. The hangar has existing high bay metal halide lighting.

FIM # CW-1 Interior Lighting Improvements



Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors are proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Airport Lighting

CW-1 Interior Lighting Improvements

- Replace four 175W MH fixtures with 4' T8 lamps
- Clean and Relamp existing 4' and 8' 2-lamp wall bracket fixtures to 28w T8 lamps. Total of 12 Lamps
- Install ceiling mounted Occupancy Sensor in Flight Planning room
- Install wall switch Occupancy Sensors in 3 bathrooms
- Replace existing 400w MH Hi Bay fixtures with new 2x4 – 6 lamp Fluorescent Hi-Bay fixtures. 16 units total

BUILDING ENVELOPE

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # AP-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.

Scope Synopsis	Airport Building Envelope

AP-1 Building Envelope

- Weather Striping and door sweeps on 3 doors

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

Scope Synopsis	Airport Electrical Load

CW-3 Vending and Plug Load Control

- One Pop Machine Controller

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems for large and small facilities. Ameresco does not represent any one manufacturer or product line of control systems, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

Scope Synopsis	Airport HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- Two AHU controllers
- City Wide BAS Controller

CITY CENTER

111 Hassan Street SE

Building Description

The City Center was converted from a grocery store in 1993. This conversion removed all of the grocery store mechanical systems and other architectural design. A new mechanical VAV system with both traditional and fan powered VAV box was installed. The lighting system was traditional 4' 32W T8 lamps, and there are several U bend 2' 32W T8 lamps. These bulbs are expensive and difficult to maintain.

Utility Baseline Analysis

City Center Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	kGal	$ Water	$ Total
2008	267,710	N/A	$ 25,451	N/A	9,577	$ 9,074	179	$ 1,822	$ 36,347
2009	212,030	755	$ 15,743	$ 4,529	6,813	$ 6,564	N/A	N/A	$ 20,272
Average	239,870	755	$ 20,597	$ 4,529	8,195	$ 7,819	179	$ 1,822	$ 28,310

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	City Center Lighting

CW-1 Interior Lighting Improvements

- Replace 142 existing 2x2 – 3 lamp parabolic with new 2x2 – 3 lamp F17/white parabolic fixture in existing locations.
- Clean and Relamp 99 existing 4' – 2 lamp strip / cove lighting fixtures. 128 lamps total.
- Relamp 20 existing incandescent downlights with 20w Par 30 CFL lamps.
- Replace 30 existing MH recessed cans downlight fixtures with 2 – 32 watt CFL recessed cans.
- Install ceiling mounted Occupancy Sensors in Office and Conference Rooms. Total of 19 sensors.
- Replace 12 existing Exit signs with new LED Exit sign fixtures.
- Relamp 46 existing incandescent recessed cans with 23 watt CFL Par 38 lamps.
- Clean and Relamp 19 existing 4' – 1 lamp strip / cove lighting fixtures.
- Relamp 2 existing 4' – 2 lamp Industrial fixtures with 28w ES T8 lamps.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

In addition to vending machine control, new power strips have been introduced into the marketplace that will eliminate the phantom power from radios, monitors, cell phone chargers, and other surging systems.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

By installing new surge protectors, the unit senses the monitor going into sleep mode and turns selective outlets off. With the monitor going to sleep, this notes that the occupant is gone and does not need to task lighting on or other power draining source. There are selective power outlets that will always remain on for the main CPU or clock.

Scope Synopsis	City Center Electrical Load
CW-3 Vending and Plug Load Control ♦ One Pop Machine Controller ♦ Twenty Power Strip Controller	

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	City Center Water Conservation

CW-2 Domestic Water Conservation

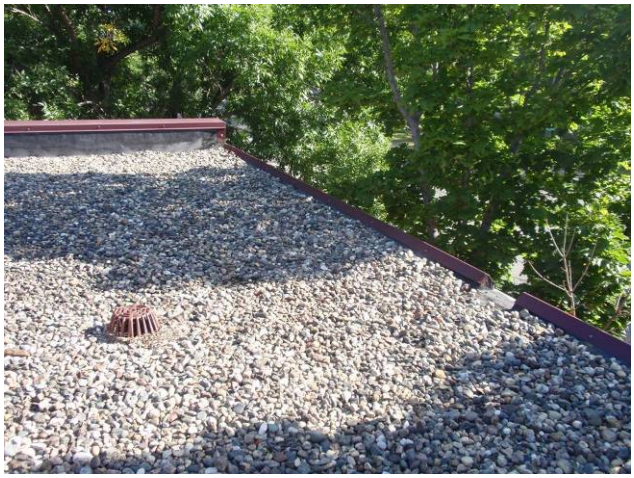
- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 2
- Spud Replacement: 1
- Flushtube Replacement: 0
- Retrofit Upgrade: 6
- Angle Stop Adder Valve: 1
- Vandal Resistant Flow Control: 5
- Gravity Toilet Re-commission: 6

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

FIM # CC-3 Roof Repairs

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.



Scope Synopsis	City Center Building Envelope

CC-3 Roof Repairs

- Repair membrane at perimeters, and projections.

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # CC-1 Boiler Replacement

The boiler system has reached the end of its useful life. The boiler is a modular boiler with four atmospheric burners. The system is designed with boiler pumps and building pumps. Ameresco recommends replacing the boilers with high efficiency condensing boilers. The boilers will be installed with new boiler pumps, exhaust piping, and outdoor air intake. The boilers will be sealed combustion which will eliminate the need for outdoor air to come into the boiler room.

FIM # CC-4 VAV Box Replacement

The initial design of the building called for four Variable Air Volume (VAV) boxes to be fan powered boxes. This type of VAV box has a second fan in the unit to allow better air flow and better temperature control. Over time, all four of the boxes have broken, or the fan has failed. All of these units have been modified to eliminate the fan power, but this does not ensure they act the same as a traditional box.

Ameresco proposes to replace three of the fan powered boxes with traditional boxes, and replace the Council Chamber box with another fan powered box. These changes will allow better control and airflow to these zones.

FIM # CC-5 Hot Gas Bypass

When working with a VAV-style system, hot gas bypass on the cooling unit is critical. The current condenser has two stages of cooling. One stage has hot gas bypass, but the second does not. By adding hot gas bypass allows proper cooling at lower air flow, and lower tonnage. This improvement will help the temperature control and provide better occupant comfort.

Scope Synopsis — City Center HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- Boiler Controller
- AHU Control
- 22 VAV Controllers
- City Wide BAS Controller

CC-1 Boiler Replacement

- Replace existing boiler with two new High Efficiency condensing boiler

CC-4 VAV Box Replacement

- Convert 3 VAV Boxes from fan power boxes to traditional VAV boxes
- Replace Council Chamber fan powered VAV with new fan powered VAV

CC-5 Hot Gas Bypass

- Install hot gas bypass on second compressor

OTHER OPPORTUNITIES

The existing fire alarm system in the City Hall is an older zoned system. Currently, parts are not available for replacement, and do not comply with the Americans with Disabilities Act, NFPA 72, UL® Revision 9 Standards or Life Safety Code 101. While none of these codes require the city to upgrade, it is highly recommended to do so.

FIM # CC-2 Fire Alarm Replacement

The replacement systems would be fully addressable with new control panels, annunciator panels, sensing devices and notification devices installed. Under the new codes, the pull stations next to the entry and exit doors will be removed. These areas are prone to false alarms in buildings.

Scope Synopsis	City Center Other Opportunities

CC-2 Fire Alarm Replacement

- Replace existing fire alarm system with new addressable system
- Bring system up to current code

CREEKSIDE COMPOST

1500 Adams Street SE

Building Description

The Creekside Compost facility is a for-profit facility which the City operates. The buildings were built in 1999 and use a pre-engineered steel style design for most of the facilities. The buildings are heated with IR heat besides the main office space. The offices are heated and cooled with a gas fired furnace in the ceiling. The building connected to the office is the Separation building where smells migrate from there into the offices.

The packaging facility is another steel building and has only IR heat. The only ventilation in the facility is exhaust fans with direct OA intake.

Utility Baseline Analysis

Creekside Compost Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	119,570	N/A	$ 15,624	N/A	29,969	$ 27,589	N/A	N/A	$ 43,213
2009	133,810	1,045	$ 9,909	$ 6,270	27,580	$ 25,420	N/A	N/A	$ 41,599
Average	126,690	1,045	$ 12,767	$ 6,270	28,775	$ 26,505	N/A	N/A	$ 42,406

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps in the office space. The warehouse spaces have high bay metal halides. These lights are in both heated and outdoor areas.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In the Separation buildings, existing metal halides will be replaced with high bay T8 lamps. This will provide better lighting and reduce energy cost. In the Packaging building, only the heated spaces will have new lighting. The other areas that are not heated will retain the existing lights. These are better equipped for the outdoor temperature, and have minimal run hours as well.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis — Compost Lighting

CW-1 Interior Lighting Improvements

Main Building - Office Area Lighting

- Replace 10 existing 2x4 – 4 lamp prismatic troffer fixtures with new 2x4 – 3 lamp T8 prismatic troffer units
- Replace existing 4' – 2 lamp Industrial fixtures in Janitor / Mech. Room with new 4' – 2 lamp strip fixture in existing location. Install wall switch Occupancy Sensor
- Install ceiling mounted Occupancy Sensors in Office and Open Office. Total of 2 sensors and power packs

Garbage / Sort Bay

- Replace existing 400w MH Hi Bay fixtures with new 2x4 – 6 lamp Fluorescent Hi Bay fixtures in existing locations. 30 units total

Bagging Building - Office Area Lighting

- Clean and Relamp 7 existing 4' - 2 lamp Prismatic Wrap fixtures with 28w ES T8 lamps
- Clean and Relamp 4 existing 4' - 4 lamp Prismatic Wrap fixtures in Office with 28w ES T8 lamps Install wall switch Occupancy Sensor
- Install wall switch Occupancy Sensor in Restroom
- Relamp existing Restroom 3 lamp Vanity fixture with 20w CFL vanity lamps

Bagging Bay

- Replace existing 400w MH Hi Bay fixtures with new 2x4 – 6 lamp Fluorescent Hi Bay fixtures in existing locations.
- Existing Cold Storage and Exterior 400w MH Hi bays to remain with no work.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

In addition to vending machine control, new power strips have been introduced into the marketplace that will eliminate the phantom power from radios, monitors, cell phone chargers, and other surging systems.

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities require that the power factor remain above 0.94 to avoid being penalized.

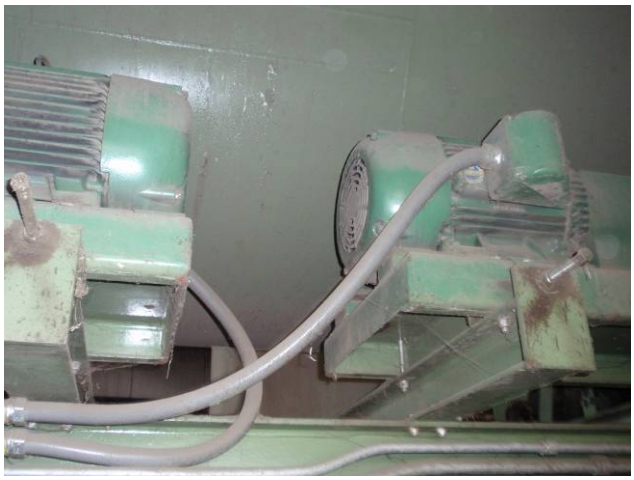
FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

By installing new surge protectors, the strip senses the monitor going into sleep mode and turns selective outlets off. With the monitor going to sleep, this notes that the occupant is gone and does not need task lighting on or other power draining source. There are selective power outlets that will always remain on for the main CPU or clock.

FIM # CS-3 Power Factor Correction

Both buildings were determined to have poor power factor. This could be a result of the motors on the pumps. Ameresco recommends that the Separation building have power factor correction on individual motors, but recommends that the Packaging building have a smart modulating capacitor installed to eliminate the power factor penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.



Scope Synopsis — Compost Electrical Load

CW-3 Vending and Plug Load Control

- One Pop Machine Controller
- Two Power Strip Controller

CS-3 Power Factor Correction

- New Smart Modulation Power Factor Correction on the packaging building
- Two Power Conditioning Units
- Separation Building
  - 50 HP Dual PFC Unit
  - 100 HP Single PFC Unit
  - (2) 25 HP Single PFC Unit

BUILDING ENVELOPE

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # CS-1 Building Envelope – Office Space – Separation Building

The compost facility has good separation from the outside to the inside of the building. Ameresco noted that where the Separation building attaches to the office space, fumes channel into the office area. By sealing this wall between the spaces will help eliminate many of these odors.

Scope Synopsis Compost Building Envelope

CS-1 Building Envelope – Office Space – Separation Building

- Replace door weather stripping and sweep
- Remove metal wall panels on shop side of separation wall to office
- Foam insulation fill entire separation wall cavity from office to shop
- Place 6 mil vapor barrier over foam insulated wall and rep lace wall panels

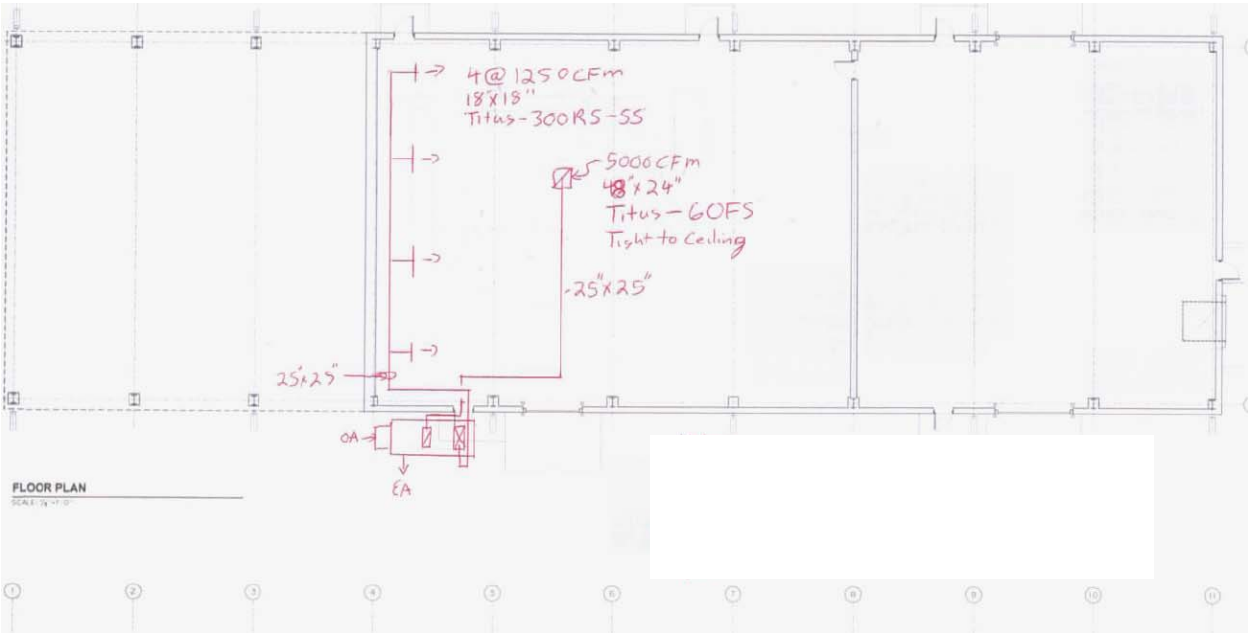
HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CS-2 New Makeup air unit for Bagging Area

With no traditional mechanical ventilation for the Packaging facility this space can become very dusty. In the summer months, the large garage doors are open to allow proper ventilation. During the fall and winter months, these doors are closed and dust builds up in the air.

By adding a new make-up air unit, this 100% outdoor air unit will provide adequate ventilation to the building. By adding an energy recovery wheel, the energy cost will be greatly reduced to the gas fired unit. The unit will be installed approximately 6' in the air on the south side of the building. New ductwork will be installed in the space to ensure proper distribution. The energy wheel is removable for proper cleaning and to ensure energy transfer.



FIM # CS-4 Bio-Mass Boiler

A Bio-mass boiler will be installed to provide heat to the buildings. The existing byproducts of the compost site will be pelletized to burn in a hot water boiler and then pumped into the boiler.

This opportunity and scope is being evaluated.

Scope Synopsis	Compost HVAC Controls

CS-2 New Makeup air unit for Bagging Area

- New package RTU – 5000 CFM
- Energy Recovery units
- All associated piping and ductwork as required

CS-4 Bio-Mass Boiler

- Scope to eliminate gas heaters in the separation building.
- Final Scope to be determined

EVENT CENTER

1005 Highway 15 South

Building Description

The events center is a converted grocery store in a strip mall. The building was converted in 2001, and is rented out for weddings and other social events. Additionally, part of the building is used for senior events on a daily basis.

Utility Baseline Analysis

Event Center Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	136,310	N/A	$ 13,341	N/A	14,635	$ 13,667	N/A	N/A	$ 27,008
2009	133,140	600	$ 9,892	$ 3,600	11,946	$ 11,225	N/A	N/A	$ 24,717
Average	134,725	600	$ 11,617	$ 3,600	13,291	$ 12,446	N/A	N/A	$ 25,863

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Event Center Lighting

CW-1 Interior Lighting Improvements

- Clean and Relamp 123 existing 2x4 – 3 lamp Parabolic troffers.
- Clean and Relamp 38 existing 2x4 – 3 lamp Prismatic Lens troffers.
- Relamp 20 existing 4' – 2 lamp strips and Industrial fixtures.
- Relamp 2 existing 8' – 4 lamp Industrial fixtures.
- Install wall switch Occupancy Sensors in Unisex Restroom and 2 dressing rooms.
- Install ceiling mounted Occupancy Sensors in 2 Offices.
- Install 2 ceiling mounted Occupancy Sensors and one power pack to control lighting in Men's and Women's Restrooms.
- All CFL downlights and Decorative Bowl fixtures to remain with no work

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities require that the power factor remain above 0.94 to avoid being penalized.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

FIM # EC-2 Power Factor Correction

The air handlers were determined to have poor power factor. This could be a result of the motors on the pumps. A smart modulating capacitor will be installed to eliminate the penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.

Scope Synopsis	Event Center Electrical Load

CW-3 Vending and Plug Load Control

- Two Pop Machine Controller

EC-2 Power Factor Correction

- (2) Configuration C Load Century – PFC Unit
- (3) 0-30 HP Single PFC Unit

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Event Center Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 16
- Spud Replacement: 4
- Flushtube Replacement: 2
- Retrofit Upgrade: 0
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 14
- Gravity Toilet Re-commission: 0

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # EC-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.

FIM # EC-3 Roof Replacement

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

Scope Synopsis — Event Center Building Envelope

EC-1 Building Envelope

- Building foam insulation at bar joist bearing locations 420 LF
- Foam fill hollow metal frames 6 EA.
- Replace door weather stripping and sweep at 10 exterior doors

EC-3 Roof Replacement

- Replace existing roof with modified built up roof
- Approximately 24,687 square feet
- 30 year warranty

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # EC-4 Re-commission Existing Rooftop Units

The air handlers that serve the senior area have temperature control issues. These units are a pressure dependent variable air volume system. This system style is typical of smaller systems and is known to get out of balance over time.

By re-commissioning the existing system, there will be better temperature control with less over and under cooling spaces. Due to large fluctuations of occupancy levels in these rooms, having proper air into the room is critical.

Scope Synopsis — Event Center HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- 7 RTU Control
- 2 Exhaust Fan Controllers
- 3 Unit Heater Controllers
- City Wide BAS Controller

EC-4 Re-commission Existing Rooftop Units

- Rebalancing and re-commissioning of the 7 existing RTU and VAV devices

EVERGREEN / SENIOR DINING

115 Jefferson Street SE

Building Description

Evergreen Senior Dining in the ground level of a seven story senior building. There is a full kitchen, cafeteria style area, and a few breakout areas. This space is used daily.

Utility Baseline Analysis

Evergreen Senior Dining Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	58,700	N/A	$ 5,453	N/A	3,077	$ 3,172	91	$ 1,004	$ 9,629
2009	55,890	N/A	$ 5,077	N/A	2,810	$ 2,929	N/A	N/A	$ 8,006
Average	57,295	N/A	$ 5,265	N/A	2,944	$ 3,051	91	$ 1,004	$ 8,818

Proposed FIMs

LIGHTING

The existing lighting consists of both 40W T12 and 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 40W T12 and 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis — Evergreen Sr Dining Lighting

CW-1 Interior Lighting Improvements

- All 4' – 2 lamp surface mount cloud wrap fixtures to be cleaned and re-lamped to 28w Energy Saving T8 lamps. 39 unit's total.
- Replace existing 4' – 2 lamp T12 continuous Prismatic Wrap fixtures with new 4' -2 lamp T8 Prismatic Wrap units in Kitchen Area. 16 units total. Install in same locations.
- Replace existing 4' – 2 lamp T12 prismatic wrap fixtures with new 4' - 2 lamp T8 units in Panty Area. 2 units total. Install in same locations.
- Clean and Re□ lamp existing 8 lamp Vanity fixtures in Restrooms to med-base CFL Vanity lamps. 2 fixtures total.
- Relamp existing med base socket in Janitors Closet with 25w CFL lamp.
- Install wall switch Occupancy Sensors in 2 bathrooms.
- Install wall switch Occupancy Sensors in 3 offices.

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems for large and small facilities. Ameresco does not represent any one manufacturer or product line of control systems, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4b City Wide Building Automation Control System – Secondary Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

Scope Synopsis	Evergreen Sr Dining HVAC Controls

CW-4b City Wide Building Automation Control System – Secondary Buildings

- Boiler Controller
- 2 FCU Control
- City Wide BAS Controller

FIRE DEPARTMENT

205 3rd Avenue SE

Building Description

The fire department has a seven-bay facility that was built in 1981. The office space is heated and cooled with gas fired residential units. These units are still in good condition and do not need to be replaced. The bays have IR heat and a general exhaust system for when the trucks run in and out.

Utility Baseline Analysis

Fire Department Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	41,080	N/A	$ 3,912	N/A	3,303	$ 3,377	N/A	N/A	$ 7,289
2009	38,130	N/A	$ 3,534	N/A	2,858	$ 2,973	N/A	N/A	$ 6,507
Average	39,605	N/A	$ 3,723	N/A	3,081	$ 3,175	N/A	N/A	$ 6,898

Proposed FIMs

LIGHTING

The existing lighting consists of 40W T12 lamps. The bays have new metal halides. These lights are on for a very short amount of time each day. Considering the new fixtures and a short amount of operating time it was determined that to replace the fixtures was not feasible.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 40W T12 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis — Fire Dept Lighting

CW-1 Interior Lighting Improvements

- Relamp existing incandescent vanity fixtures in restrooms with 9w CFL lamp. 4 total.
- Replace existing 4' – 2 lamp T12 surface Prismatic Wrap fixtures with new 4' -2 lamp T8 Surface Prismatic Troffer. 19 units total. Install in same locations.
- Replace existing 4' – 4 lamp T12 surface Prismatic Wrap fixtures with new 4' -3 lamp T8 Surface Prismatic Troffer. 1 units total. Install in same locations.
- Replace existing 4' – 1 lamp T12 surface Prismatic Wrap fixtures with new 4' -2 lamp T8 Surface Prismatic Troffer. 2 units total. Install in same locations.
- Replace existing emergency lighting with 2 head halogen emergency packs. 2 total.
- Clean and Re-lamp existing fixtures in Mechanical/Chemical/Air Rooms. 5 fixtures total.

Excluded Lighting Improvements

- Replace existing 320w MH HiBay fixtures with new 21 new 4' - 6 lamp Florescent Hibay T8. Install in same locations.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

Scope Synopsis	Fire Dept Electrical Load
CW-3 Vending and Plug Load Control ♦ Two Pop Machine Controller	

BUILDING ENVELOPE

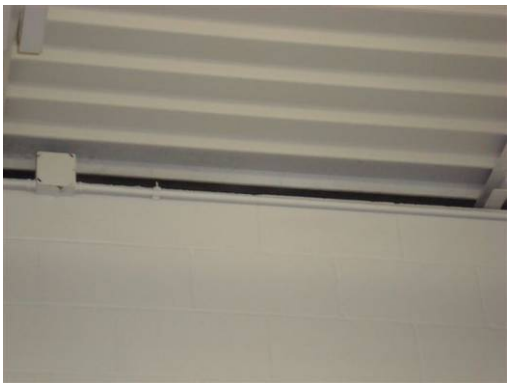
Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # FD-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.



FIM # FD-3 Roof Repairs

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

Scope Synopsis — Fire Dept Building Envelope

FD-1 Building Envelope

- Building foam insulation at bar joist bearing 240 LF
- Foam fill hollow metal frames 6 EA.
- Replace door weather stripping and sweep at 4 exterior

FD-3 Roof Repairs

- Repair minor shrinkage at perimeters
- doors

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4b City Wide Building Automation Control System – Secondary Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # FD-2 Truck Bay Exhaust System

The building has six truck bays, of which seven trucks are stored; a general exhaust system is started when the trucks are running in the bay. When a fire call comes in, fire fighters are running to the fire department, starting the trucks and leaving within minutes. Periodically, the trucks will run while in the bay (for maintenance).

With a general exhaust, the total air volume of the bays is exchanged several times an hour. This is very costly and uses a lot of energy. With a new truck exhaust system, a tube will be connected to the truck exhaust system and will eliminate the need for the general exhaust. The tube exhaust system will be mounted on rails, and will be connected to the tail pipe with a magnetic connection. The tube will disconnect from the exhaust when the truck leaves, and will need to be reconnected when the truck returns.

This system will allow the trucks to run in the bays without the need of the central exhaust system.

Scope Synopsis	Fire Dept HVAC Controls

CW-4b City Wide Building Automation Control System – Secondary Buildings

- 2 Furnace Controllers
- City Wide BAS Controller

FD-2 Truck Bay Exhaust System

- 7 Rail systems to be installed in 6 truck bays

HATS (Hutchinson Area Transportation Services)

1400 Adams Street SE

Building Description

The HATS facility is owned and operated by the City, but is also used by the county, state, and city for storage of their large earth movers and snow plows. This facility has a building automation system that was installed and maintained by MnDot.

This facility was originally built in 1995, and the office space has seen two additions in 1999, and 2002. The facility has a truck wash bay that uses a large amount of water.

Utility Baseline Analysis

HATS Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	455,980	N/A	$ 44,783	N/A	27,259	$ 25,129	N/A	N/A	$ 69,912
2009	395,010	1,362	$ 30,471	$ 8,171	25,473	$ 23,475	N/A	N/A	$ 53,946
Average	425,495	1,362	$ 37,627	$ 8,171	26,366	$ 24,302	N/A	N/A	$ 61,929

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps. The truck bay has metal halides lighting.

FIM # CW- Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In the truck bays, existing metal halides will be replaced with high bay T8 lamps. This will provide better lighting and reduce energy cost. Additionally, these new lights will have an instant on/off capability that the existing lights currently do not.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	HATS Lighting

CW-1 Interior Lighting Improvements

City of Hutchinson Office Area Lighting

- Clean and Relamp 8 existing 2x4 – 2 lamp Prismatic lens troffers.
- Clean and Relamp 30 existing 2x4 – 3 lamp Prismatic lens troffers.
- Clean and Relamp 14 existing 2x4 – 3 lamp Parabolic troffers.
- Install ceiling mounted Occupancy Sensors in State Patrol Office and Maintenance Office. Total of 4 sensors and power packs.

McCloud County Office Area Lighting

- Clean and Relamp 42 existing 2x4 – 3 lamp Parabolic troffers. 126 lamps total. Typical of all offices and open office areas.
- Clean and Relamp 4 existing 4' – 2 lamp Industrial fixture in HUB room.
- Clean and Relamp 1 existing 4' 4 lamp Prismatic Wrap fixture in Storage room.
- Install ceiling mounted Occupancy Sensors in 6 offices. Total of 6 sensors and power packs.

Scope Synopsis Continued

HATS Lighting

CW-1 Interior Lighting Improvements

MnDot Office Area Lighting

- Clean and Relamp 55 existing 2x4 – 3 lamp Parabolic troffers.
- Clean and Relamp 11 existing 2x4 – 3 lamp Prismatic lens troffers.
- Clean and Relamp 1 existing 8' – 4 lamp Industrial fixture in Electrical room.
- Install ceiling mounted Occupancy Sensors in 7 offices and conference rooms. Total of 7 sensors and power packs.

Truck / Maintenance Bay

- Replace existing 400w MH Hi Bay fixtures with new 2x4 – 6 lamp Fluorescent Hi Bay fixtures in existing locations. 46 units total.
- Demo existing 8' – 4 lamp Industrial fixtures in center run of two truck bays. Total of 10 fixtures.
- Replace existing 8' – 2 lamp and 4 lamp T12 Industrial shop fixtures with new 8' – 4 lamp T8 Industrial Shop fixtures. Typical of 12 various locations in Garage.
- Replace existing 4' – 2 lamp T12 Industrial shop fixtures with new 4' – 2 lamp T8 Industrial Shop fixtures. Typical of 6 various locations in Garage.
- Replace existing Exit lighting and Emergency lighting wall pack with new LED Exit and Emergency lighting combo unit. Typical of five locations.
- Demo existing HID wall pack with photo cell at Exit doors. Typical of 4 locations.
- Retrofit 19 existing 4' – 2 lamp T12 Industrial fixtures in Parts Dept. (both levels) with 28w T8 lamp and .88bf ballast.
- Retrofit 8 existing 4' – 2 lamp T12 Industrial fixtures with 28w T8 lamp and .88bf ballast. Total of 16 lamps and 8 ballasts.
- Relamp 2 existing 8' – 4 lamp Industrials in Generator Room with 28w ES T8 lamps. Total of 8 lamps.
- Replace existing 4' – 2 lamp Vapor Tight in Wash area with new 4' – 2 lamp Vapor Tight fixture.
- Replace 4 – 300w Halogen Flood lights in Truck Wash Area with 150w Induction Wall Packs.

Scope Synopsis Continued

HATS Lighting

CW-1 Interior Lighting Improvements

McCloud County Transit Services Office

- Clean and Retrofit 7 existing 4' - 4 lamp Prismatic Wrap fixtures in open office and supervisor office with T8 28w ES lamps and .88bf ballast.
- Clean and Retrofit 2 existing 4' - 2 lamp Prismatic Wrap fixtures in Office Entry and Entry Vestibule with T8 28w ES lamps and .88bf ballast.
- Replace suspended 2x4 fixture in small office with 4' - 4 lamp suspended prismatic wrap fixture.
- Replace 2 existing Exit signs with new LED Exit signs in existing locations.

City of Hutchinson Cold Storage Garage

- Relamp 32 existing continuous 8' – 4 lamp T8 surface mounted strips with 28w ES T8 lamps.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities requires that the power factor remain above 0.94 to avoid being penalized.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

FIM # HATS-3 Power Factor Correction

The lift station was determined to have poor power factor. This could be a result of the motors on the pumps. A smart modulating capacitor will be installed to eliminate the penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.

Scope Synopsis	HATS Electrical Load

CW-3 Vending and Plug Load Control

- One Pop Machine Controller

HATS-3 Power Factor Correction

- (1) 75 HP Single PFC Unit
- Two Power Conditioning Units

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	HATS Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 7
- Spud Replacement: 2
- Flushtube Replacement: 1
- Retrofit Upgrade: 0
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 5
- Gravity Toilet Re-commission: 0

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # HATS-2 Destratification Fans

Within an enclosed building space, minimal air movement may cause temperature fluctuations. Warm air generated from the building's heating system rises to the ceiling, and, conversely, cold air lingers near the floor. This net effect is stratification – air temperatures at ceiling level are substantially higher than air temperatures at floor level. De-stratification fans reduce energy usage by eliminating air stratification.

De-stratification fans will be installed in high ceiling areas of the garage. These units will replace the existing ceiling fans. This new version is more efficient and cirulates the air better than the existing fans. The units will remain on a switch in the space.

FIM # HATS-4 VFD on Main MAU Ventilation Units

Trucks drive in and out of the facility throughout the day. Maintenance mechanics will run the trucks while doing repairs. Sensors in the facility will monitor the air and turn on exhaust fans and large make-up air units. When these units turn on, the space becomes a positive pressure, and the units ramp up very quickly.

By adding VFD to the units, the building can have a negative pressure to the outside and not allow fumes to come into the office space. Additionally the VFD will allow a soft start to the large air handlers and help extend the life of the equipment.

FIM # HATS-6 Office Space Air Balancing

With the multiple additions to the office space, re-balancing the units will ensure proper ventilation for the staff. If the units are not balanced properly, part of the pressure concerns with the garage space can be reduced. Also, by rebalancing the facility, comfort issues can be eliminated.

Scope Synopsis — HATS HVAC Controls

HATS-2 Destratification Fans

- Replace existing ceiling fans with 9 new Destratification fans.
- Local control to remain

HATS-4 VFD on Main MAU Ventilation Units

- Install new 25 HP on two Makeup air units
- Soft start and speed control

HATS-6 Office Space Air Balancing

- 1 RTU
- 2 FCU
- 2 Residential Units

BUILDING ENVELOPE

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # HATS-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.

Scope Synopsis	HATS Building Envelope

HATS-1 Building Envelope

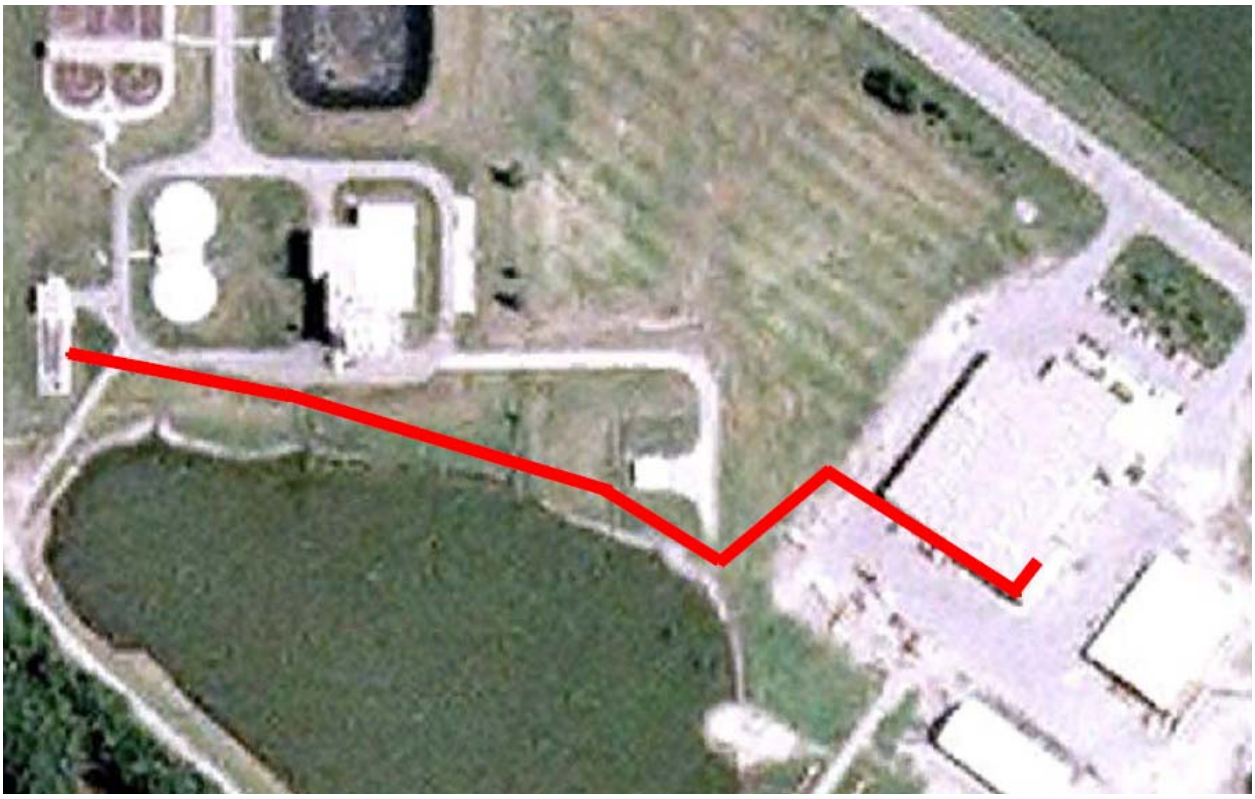
- Foam fill hollow metal frames 12 EA
- HVAC ductwork insulation repair as required at MAU
- Replace door weather stripping and sweep at 12 exterior doors.
- Replace 24 ' overhead door bottom edge seal

OTHER OPPORTUNITIES

FIM # HATS-5 Non-Potable Water line from WWTP

The HATS facility uses a lot of water for washing trucks and other equipment. The truck bay washer and hoses around the facility are in constant use. The Waster Water Treatment Plant is located next to the HATS facility, and has non-potable water that is currently not being used to the fullest extent.

By adding a new 3" water line, the HATS facility will no longer need to use potable water for non-potable use.



Scope Synopsis	HATS Other Opportunities

HATS-5 Non-Potable Water line from WWTP

- New 3" water line buried below ground from the WWTP to the HATS wash bay

CIVIC ARENA

900 Harrington Street SW

Building Description

The existing ice arenas have two sheets of ice, and are used mainly in the winter months. The West rink does have ice on it for about 2 months in the summer for camps. The West rink is a sand rink and is used more for practice. There is limited seating, and is a smaller building. The East rink has a larger spectator area, and is used for larger events. This East rink has a cement floor.

The existing ice arena chiller equipment, dehumidification equipment, and low-e ceiling were used equipment when the City of Hutchinson purchased them. They have served the facility's needs, but they have reached the end of their useful life.

The lighting system over the ice has been retrofitted to high bay T5 lighting. This is the most efficient system for the rink with bi-level lighting.

Utility Baseline Analysis

Civic Arena Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	855,600	N/A	$ 83,052	N/A	35,286	$ 32,418	2,548	$ 8,541	$124,011
2009	812,000	3,140	$ 60,293	$ 18,840	32,377	$ 29,776	N/A	N/A	$108,909
Average	833,800	3,140	$ 71,673	$ 18,840	33,832	$ 31,097	2,548	$ 8,541	$116,460

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps. The ice arena has high bay T5 lights, and there is no need for replacement of this system.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis — Civic Arena Lighting

CW-1 Interior Lighting Improvements

Main Ice Arena - Interior Building Lighting

- Main Arena Entry – Replace 2 existing 4' -2 lamp T12 Vapor Tight fixtures with new 4' -2 lamp T8 Vapor Tights in existing location
- Replace existing exit sign with new LED surface mount unit
- Hockey Lodge – Clean and Retrofit 6 existing 4' – 4 lamp T12 wraps to 28w ES T8 lamps and Electronic Ballast. Install wall switch Occupancy Sensor.
- 2nd level Seating Area – Replace 2 existing 8' – 2 lamp T12 strips with new 8' – 4 lamp T8 units in existing location. Relamp 16 existing 8' -4 lamp T8 retrofitted strips fixtures on structure beams to 28w ES T8 lamps.

Scope Synopsis Continued

Civic Arena Lighting

CW-1 Interior Lighting Improvements

Main Ice Arena - Interior Building Lighting

- Replace 26 existing 8' – 2 lamp T12 strips with new 8' – 4 lamp Vapor Tight fixtures in existing locations. Typical of Arena Office, Concessions, Men's & Women's Restrooms, 6 Locker Rooms, Workshop/Electrical Room and Weight Room.
- Replace 2 existing 4' – 2 lamp T12 strips with new 4' – 2 lamp Vapor Tight fixtures in existing locations. Typical of Arena Office entry and Locker Room #3.
- Relamp 4 existing med base Jelly Jar fixtures with 25w CFL lamps. Typical of Men's & Women's Restrooms and Locker Rooms #3 & #4.
- Clean and Relamp 17 existing 1x4 2 lamp recessed prismatic troffers in Locker Room Corridor to 28w ES T8 lamps. 34 total lamps.
- Install new 8' – 4 lamp T8 Vapor Tight fixtures in Mechanical / Storage room next to Electrical room. Demo existing lighting.
- Install 10 (1 each location) wall switch Occupancy Sensors. Typical of Arena Office, Concessions, Men's & Women's Restrooms and 6 Locker Rooms.
- Zamboni Ice Equipment Room – Replace 4 existing 250w MH Low Bays fixtures with 4 – 4' – 6 lamp T8 Vapor Tight fixtures in existing locations
- Compressor Room – Replace 5 existing 4' – 2 lamp T12 Industrial fixtures with new 4' – 2 lamp T8 units in existing locations. Relamp 2 remaining 4' -2 lamp fixtures with 28w ES T8 lamps.

West Ice Arena - Interior Building Lighting

- Replace 7 existing 8' – 2 lamp T12 / T8 strips with new 8' – 4 lamp Vapor Tight fixtures in existing locations. Replace existing exterior 8' – 2 lamp T12 Vapor Tight with new 8' – 4 lamp T8 Vapor Tight in existing location.
- Replace 3 existing Exit / Emergency Lighting Wall Packs with new LED Exit/Emergency Lighting units in existing locations.
- Restrooms - Replace 4 existing 8' – 2 lamp T12 / T8 strips with new 8' – 4 lamp Vapor Tight fixtures in existing locations. Install wall switch Occupancy Sensor.
- Replace existing 4' – 2 lamp T12 strip at restroom entry with new 4' – 2 lamp Vapor Tight fixture.
- Replace existing 4' – 2 lamp T12 strip at restroom entry with new 4' – 2 lamp Vapor Tight fixture.
- Replace existing 8' – 2 lamp T12 strips with new 8' – 4 lamp Vapor Tight fixtures in existing locations. Install Wall Switch Occupancy Sensor. Typical of four Locker Rooms.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities requires that the power factor remain above 0.94 to avoid being penalized.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

FIM # ICE-8 Power Factor Correction

The lift station was determined to have poor power factor. This could be a result of the motors on the pumps. Ameresco recommends that a smart modulating capacitor be installed to eliminate the penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.

Scope Synopsis	Civic Arena Electrical Load

CW-3 Vending and Plug Load Control

- Five Pop Machine Controller

ICE-8 Power Factor Correction

- Scope to eliminate penalties, scope to change based on equipment selection.

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Civic Arena Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 5
- Spud Replacement: 1
- Flushtube Replacement: 1
- Retrofit Upgrade: 9
- Angle Stop Adder Valve: 1
- Vandal Resistant Flow Control: 12
- Gravity Toilet Re-commission: 9

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # ICE-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.

FIM # ICE-4 Roof Replacement

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

FIM # ICE-5 Exterior Wall Insulation Addition

The walls for the ice arena are made of two different materials. The bottom eight feet are made of block material, and the upper level is made of steel, insulation and a steel exterior. Both of these wall sections are starting to deteriorate. Also, both rinks are showing signs of moisture damage with the vapor point of the wall moving throughout the season.

It is recommended to add more insulation to both sections of the building. This will help when the building is heated in the winter, but will also help to maintain the envelope integrity. The lower block section would get 2 ½" of hard foam and get EFIS exterior. The upper level would get 3" of hard foam and new sheet metal on the interior or exterior of the building.

FIM # ICE-6 New Low-e Ceiling

The existing low-e ceiling in the East arena was used when it was installed 10+ years ago. The ceiling is reaching the end of its useful life. The low-e ceiling helps prevent heat from building up at the ceiling level. The West rink currently does not have a low-e ceiling.

The new ceiling would be installed in both arenas and would have a lifetime warranty against puck damage. The new ceiling would be physically fastened to the ceiling and provide a tight appearance to the building.

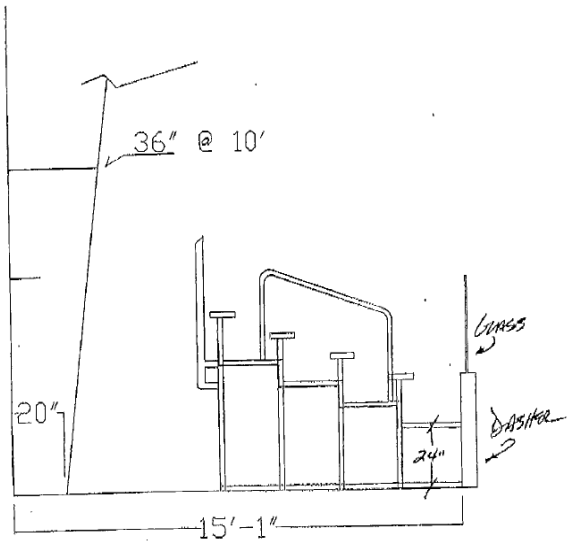
FIM # ICE-7 New Low-e Material on Walls

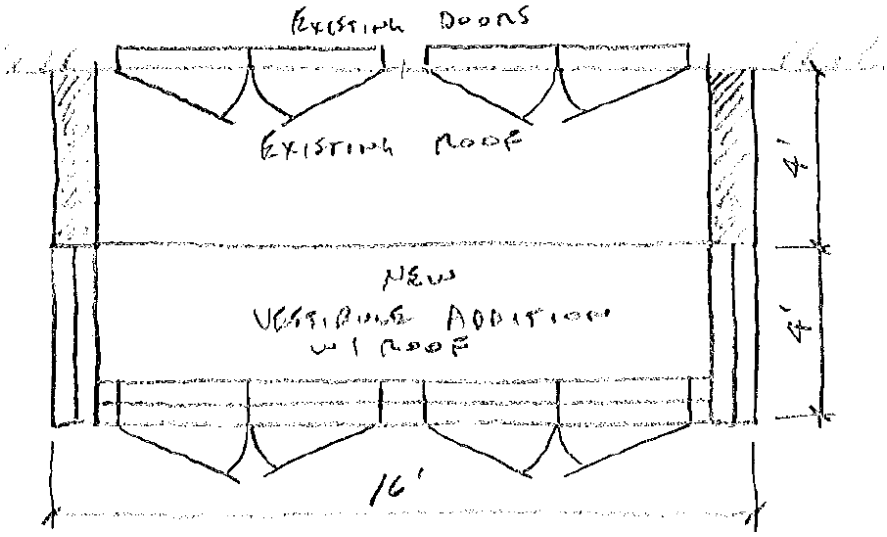
With the current condition of the walls, installing the same low-e ceiling on the walls would provide a clean updated look to the building.

FIM # ICE-9 General Construction – New Locker Room Floor; Vestibule; and Bleachers (West Rink)

As part of the building improvements, three upgrades or replacements were priced. The locker room floors in the East arena needed to be replaced. The main entry for the West Arena on the North side allows drafts to come into the building. Additionally when the ice arena is used in the summer months, hot air enters into the building.

Finally, the bleachers in the West Arena are currently movable, and not functional. By installing new bleachers a better viewing area of the rink will be provided.





Scope Synopsis — Civic Arena Building Envelope

ICE-1 Building Envelope

- Foam fill hollow metal frames 12 EA.
- Replace door weather stripping and sweep at 12 exterior doors

ICE-4 Roof Replacement

- Replacement with new metal roof on East Rink Only
- New Vapor barrier and additional R25 insulation
- Replacement of roof will be installed on top of existing roof

ICE-5 Exterior Wall Insulation Addition

- Add 3" rigid insulation and install new metal wall panel system and vapor barriers on upper level
- Add 2 ½" rigid insulation on block sections with new exterior finish

ICE-6 New Low-e Ceiling

- Replace existing low-e ceiling in the East Arena
- Install new low-e ceiling in the West Arena

ICE-7 New Low-e Material on Walls

- Install new wall coverings above the block in the interior of the building

ICE-9 General Construction – New Locker Room Floor; Vestibule; and Bleachers (West Rink)

- Replace East locker room rubber flooring room 1-5
- Add vestibule to West Rink Main entrance including foundation extension and 4 doors
- Roof Sheathing - Flat Roof at vestibule extension
- Replace bleachers in rink 2. 4 - row system with ADA access, remove existing

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # ICE-2a&b Chiller Plant Replacement Option A & B

The existing chiller system is past its useful life and needs to be replaced. The equipment was original used when installed. The new system is a chiller heat pump system that would produce chilled water and hot water for the building use, or send out to a well field for later use. The system would also have a fluid cooler for elimination of heat from the system. A heat pump system provides for energy efficiency and operational cost savings over other traditional systems.

FIM # ICE-3a&b Ventilation Replacement Option A & B

The existing air handlers are a gas fired desiccant system that provides outdoor air for the ventilation of the ice rink. The three units were used when installed over 10 years ago. These system use gas to regenerate the heat wheels, and gas to heat the ventilation air.

The new units would allow hot water and chilled water from the ice rink chiller system to both dehumidify the air, and heat the air to the desired temp. The first option would be just a ventilation system that would provide adequate ventilation, but would not be able to temper the air to 50 deg F.

The second option would install a second heat pump to distribute 115 deg F water to properly heat the space. This would allow the elimination of the gas fired heaters and reduction of the IR heaters usage.

Scope Synopsis — Civic Arena HVAC Controls

ICE-2a Chiller Plant Replacement Option A

- New heat pump chiller system, removal of the existing chillers
- New well field between the ice rink and the recreation center
- New fluid cooler sized to handle the waste heat not used
- Convert sand floor center header trench to 4 pass

ICE-2b Chiller Plant Replacement Option B

- New heat pump chiller system, removal of the existing chillers
- No well field
- New fluid cooler sized to handle all waste heat not used
- Convert sand floor center header trench to 4 pass

ICE-3a Ventilation Replacement Option A

- New dehumidification unit that will bring in outside air through and enthalpy wheel
- One unit per rink
- New ductsock air distribution

ICE-3b Ventilation Replacement Option B

- New dehumidification unit that will bring in outside air through and enthalpy wheel
- One unit per rink
- New heat pump for 115F water temp
- New ductsock air distribution

LIBRARY

50 Hassan Street SE

Building Description

The library is a corner stone of downtown Hutchinson. Part of the building is a historical building with modern addition was built in 1984. The mechanical system has been replaced with a residential-style system.

Utility Baseline Analysis

Library Utility Information

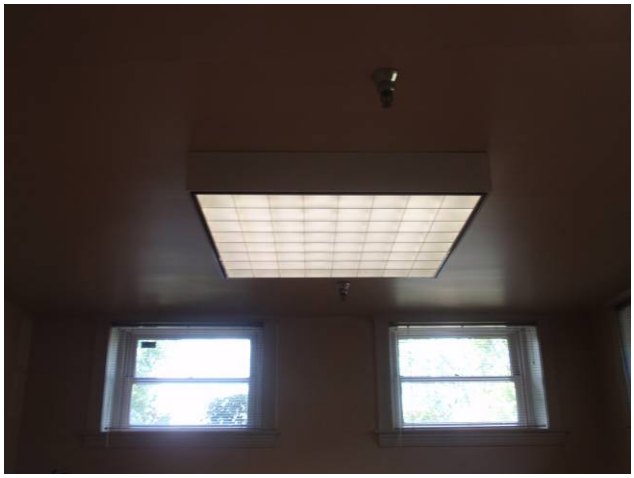
	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	112,900	N/A	$ 11,386	N/A	5,380	$ 5,535	1,464	$ 13,772	$ 30,693
2009	104,500	455	$ 7,753	$ 2,729	4,879	$ 4,808	N/A	N/A	$ 15,290
Average	108,700	455	$ 9,570	$ 2,729	5,130	$ 5,172	1,464	$ 13,772	$ 22,992

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements



Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Library Lighting

CW-1 Interior Lighting Improvements

- Relamp existing 4' – 2 lamp fixtures with new 4' lamps. 159 units total.
- Relamp and reballast existing 4' – 2 lamp fixtures with new 4' lamps and ballast. 3 units total.
- Relamp and reballast existing 4' – 3 lamp fixtures with new 4' lamps and ballast. 9 units total.
- Relamp existing 100watt medium base A-lamp fixtures with 20w CFL dimmable. 1 unit total.
- Relamp existing 100watt medium base A-lamp fixtures with 25w CFL. 7 units total.

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Library Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 5
- Spud Replacement: 1
- Flushtube Replacement: 1
- Retrofit Upgrade: 0
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 4
- Gravity Toilet Re-commission: 0

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems for large and small facilities. Ameresco does not represent any one manufacturer or product line of control systems, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

Scope Synopsis	Library HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- 8 FCU Controllers
- City Wide BAS Controller

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

FIM # LB-1 Roof Replacement

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

Scope Synopsis	Library Building Envelope

LB-1 Roof Replacement

- Replace existing rubber ballast roof with new modified built up roofing system
- Approximately 11, 357 square feet
- Warranty 30 years

LIQUOR HUTCH

245 Washington Avenue East

Building Description

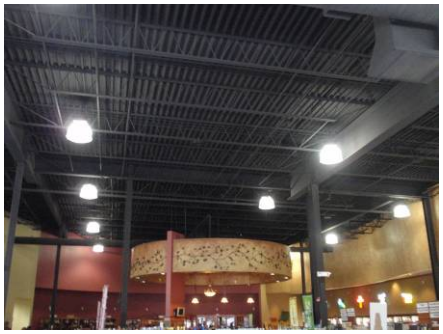
The liquor store has been re-located and modified several times over the years. The latest remodel was in 2005, and re-used several of the existing pieces of equipment.

Utility Baseline Analysis

Liquor Hutch Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	295,282	N/A	$ 27,533	N/A	7,878	$ 7,531	N/A	N/A	$ 35,064
2009	266,299	468	$ 21,679	$ 2,146	7,144	$ 6,865	N/A	N/A	$ 30,690
Average	280,791	468	$ 24,606	$ 2,146	7,511	$ 7,198	N/A	N/A	$ 32,877

Proposed FIMs



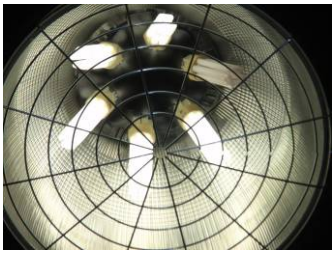
LIGHTING

The existing lighting consists of 32W T8 lamps. The main shopping area has high bay compact florescent lighting that does provide energy savings over traditional metal halides, but does not evenly distribute the lighting in the store.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

The store lighting will be replaced with new high bay T8 lighting. This improvement will provide better lighting of the products and have a longer life over the compact florescent light.



In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Liquor Hutch Lighting

CW-1 Interior Lighting Improvements

- Clean and Relamp 28 existing 4' – 2 lamp suspended strip fixtures.
- Clean and Relamp 13 existing 4' – 2 lamp T8 Vapor tight cooler fixtures.
- Replace 5 existing 8' – 2 lamp F96T12 fixtures in rear stock area with 8' – 4 lamp T8 Industrial Strip fixtures. Install at existing location and mounting height.
- Existing 2x2 parabolic fixtures to remain with no work.
- Replace 20 existing 6 lamp CFL HiBay fixtures with new 4' – 4 lamp T8HO fluorescent HiBay fixtures.
- Clean and Relamp 9 existing 2x4 – 3 lamp Parabolic troffers.

ELECTRICAL LOAD CONTROL

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities requires that the power factor remains above 0.94 to avoid being penalized.

FIM # LH-2 Power Factor Correction

The cooler condensers were determined to have poor power factor. This could be a result of the motors. Capacitors will be installed to eliminate the penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.

Scope Synopsis	Liquor Hutch Electrical Load

LH-2 Power Factor Correction

- (2) 0-30 HP Dual PFC Unit
- (1) 0-30 HP Single PFC Unit

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Liquor Hutch Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 1
- Spud Replacement: 0
- Flushtube Replacement: 0
- Retrofit Upgrade: 2
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 5
- Gravity Toilet Re-commission: 2

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

FIM # LH-3 Roof Replacement

Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

Scope Synopsis	Liquor Hutch Building Envelope

LH-3 Roof Replacement

- Replace existing rubber ballast roof with new modified built up roofing system
- Approximately 14,679 square feet
- New roof separation divider between the Liquor Hutch and the Grocery Store
- Warranty 30 years

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # LH-1a&b North Cooler Condenser Replacement Option A & B

The North cooler condenser was used from the old store. This unit is approaching the end of its useful life, and needs to be replaced. When replacing the system, there are two options to consider. The first option is replacement of the condenser.

The second option is a total replacement of the condenser and evaporators in the cooler. The current system uses R-22; a refrigerant that is currently being phased out of production. The new system would utilize an ecological friendly refrigerant and have two condensers on the roof to provide redundancy as cited on the South cooler.

FIM # LH-4 Rooftop Unit Replacement (RTU-1 & 2)

The East (RTU-1) and West (RTU-2) air handlers were used from the old store. This unit is approaching the end of its useful life, and needs to be replaced. When replacing the system, the most economical option is to replace them one by one.

Scope Synopsis Liquor Hutch HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- 3 RTU Controllers
- 2 Cooler Temp Alarms
- Domestic Hot water pump control
- City Wide BAS Controller

LH-1a North Cooler Condenser Replacement Option A

- Replace one for one – Roof top condenser

LH-1b North Cooler Condenser Replacement Option B

- Replace both condenser and evaporators
- Install two new condensers and four new evaporators

LH-4 Rooftop Unit Replacement (RTU-1 & 2)

- Replace existing rooftop units
- Replace in same location as existing

OAKLAND CEMETERY

805 Highway 15 South

Building Description

The cemetery building was constructed in the early 1980's. The building has a garage space for service equipment and a small office space with a chapel. The building is not used much in the winter months, but is heated and cooled with two residential units.

Utility Baseline Analysis

Oakland Cemetery Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	19,320	N/A	$ 1,935	N/A	2,397	$ 2,254	52	$ 641	$ 4,830
2009	15,800	N/A	$ 1,569	N/A	2,160	$ 2,039	N/A	N/A	$ 3,608
Average	17,560	N/A	$ 1,752	N/A	2,279	$ 2,147	52	$ 641	$ 4,219

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Oakland Cemetery Lighting

CW-1 Interior Lighting Improvements

Interior Office Area Lighting

- All 2x4 -4 lamp and 2x4 -3 lamp recessed prismatic troffers are to be cleaned and re-lamped to 28w Energy Saving T8 lamps.
- Relamp existing 4' -2 lamp strip fixture in Mech. Room to 28w Energy Saving T8 lamps.
- Install wall switch Occupancy Sensors in bathroom.
- Install 2 ceiling mounted Occupancy Sensor in offices

Garage Area Lighting

- All 8' -4 lamp T8 surface mounted strip fixtures are to be re-lamped to 28w Energy Saving T8 lamps. 12 – 8' -4L fixtures.

Scope Synopsis Continued — Oakland Cemetery Lighting

CW-1 Interior Lighting Improvements

Chapel Area Lighting

- Relamp 5 existing med base incandescent fixtures in basement area to 25w CFL lamps.
- Retrofit 8 existing 4' – 2lamp T12 strips to 28w ES - T8 lamps and .88bf ballast.
- Clean and Relamp 4 decorative pendants in Chapel to 25w CFL lamps.
- Clean and Relamp 8 decorative wall sconces in Chapel to 13w CFL lamps.
- Clean and Relamp 5 existing 4' -2 lamp prismatic wrap fixtures in Chapel Foyer area to 28w Energy Saving T8 lamps.

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Oakland Cemetery Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 1
- Spud Replacement: 0
- Flushtube Replacement: 0
- Retrofit Upgrade: 2
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 2
- Gravity Toilet Re-commission: 2

PARK OFFICES & SHOP

1100 Adams Street SE

Building Description

The park offices and maintenance shop is in a steel structure and is in disrepair. The roof and walls are starting to rust and have a limited amount of insulation. The maintenance bays are heated with IR heaters, while the office space is heated and cooled with a residential furnace. This unit is newer and does not need replacement.

Utility Baseline Analysis

Park Offices Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	32,550	N/A	$ 3,091	N/A	5,032	$ 4,947	46	$ 585	$ 8,623
2009	26,920	N/A	$ 2,554	N/A	3,844	$ 3,868	N/A	N/A	$ 6,422
Average	29,735	N/A	$ 2,823	N/A	4,438	$ 4,408	N/A	N/A	$ 7,523

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Park Office Lighting

CW-1 Interior Lighting Improvements

Interior Office Area Lighting

- • Relamp 6 existing 4' -2 lamp T8 Prismatic Wrap fixtures to 28w Energy Saving T8 lamps.
- • Install wall switch Occupancy Sensors in Restroom.
- • Replace 5 existing 4' – 2 lamp T12 Prismatic wrap fixtures with new 4' – 2 lamp T8 Prismatic Wrap fixtures in front two Office areas.
- • Relamp existing 8' - 2 lamp surface incandescent fixture in Furnace Room to 13w CFL lamps.

Garage Area Lighting

- • All 8' -4 lamp T8 surface / suspended mounted strip fixtures are to be re-lamped to 28w Energy Saving T8 lamps.

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Park Office Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 0
- Spud Replacement: 0
- Flushtube Replacement: 0
- Retrofit Upgrade: 1
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 1
- Gravity Toilet Re-commission: 1

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # PK-1a Building Sealer

The roof system is starting to rust away. The sealer would slow the amount of rusting on the roof. This solution will help to extend the life of the building, but will not reverse the damage and rust that has already obtained.

FIM # PK-1b New roof and additional wall insulation

The roof and walls need to be replaced and added more insulation. The roof would get an additional 3" of hard insulation, and the walls would get 2 ½" of additional insulation. The system would have EFIS in the exterior of the walls, and new metal roof installed. This would allow the building to stand for another 30 years.

Scope Synopsis — Park Offices Building Envelope

PK-1a Building Sealer

- Restore with new rust inhibiting coating system
- Help to extend life

PK-1b New roof and additional wall insulation

- Replace roof and add 3" rigid insulation and install new metal wall panel system and vapor barriers
- Add 2 ½" of rigid insulation and install new exterior finish material

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems for large and small facilities. Ameresco does not represent any one manufacturer or product line of control systems, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4b City Wide Building Automation Control System – Secondary Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

Scope Synopsis	Park Offices HVAC Controls

CW-4b City Wide Building Automation Control System – Secondary Buildings

- 1 Furnace Controller
- City Wide BAS Controller

POLICE DEPARTMENT

10 Franklin Street NW

Building Description

The police department was built in 1987 and when originally designed, the roof was lowered to save on cost. The roof structure was constructed with wood, the same as residential construction practices. The ductwork and heat piping were installed in this un-heated and un-cooled space. This has caused issues in breaking piping and coils along with sweating of the ductwork.

Utility Baseline Analysis

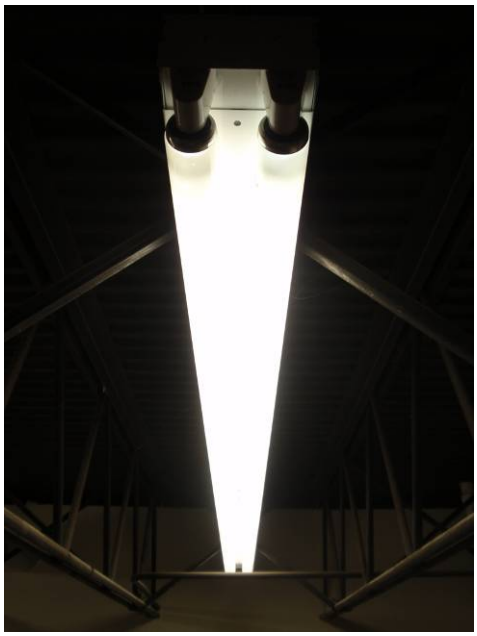
Police Department Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	252,600	N/A	$ 22,931	N/A	15,582	$ 14,905	121	$ 1,597	$ 39,433
2009	259,300	N/A	$ 20,689	N/A	15,473	$ 14,805	N/A	N/A	$ 35,494
Average	255,950	N/A	$ 21,810	N/A	15,528	$ 14,855	121	$ 1,597	$ 37,464

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.



FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	Police Dept Lighting

CW-1 Interior Lighting Improvements

Interior Office Area Lighting – Main Level

- Replace existing T12 tube indirect fixture in entry with new 12' – 3 lamp T8 direct / indirect fixture. Suspend at existing height.
- Replace 20 existing 2x4 – 4 lamp surface honeycomb troffer fixtures with new surface mount 2x4 – 3 lamp T8 Prismatic Lens fixtures in existing locations. Typical of 1 Open Office and 4 Private Office areas.
- Relamp 4 – recessed 4 lamp fixtures in Dispatch Office to 28w ES T8 lamps.
- Clean and Relamp 48 existing 4' – 2 lamp recessed or surface mount prismatic troffer fixtures.
- Clean and Relamp 4 existing 4' – 2 lamp Restroom Vanity fixtures. Typical of 3 restrooms. Install wall switch Occupancy Sensor. Typical of 3 locations.
- Clean and Relamp 6 existing 4' – 2 lamp Security fixtures. Typical of 3 Holding Cells.
- Relamp 6 – 4' – 2 lamp surface mounted strips in garage area with 28w ES T8 lamps.

Scope Synopsis Continued — Police Dept Lighting

CW-1 Interior Lighting Improvements

Interior Office Area Lighting – Lower Level

- Clean and Retrofit 15 existing 2x4 -4 lamp recessed prismatic troffers to 3 lamps fixtures using delamping -retrofit kits.
- Clean and Relamp 21 existing 4' – 2 lamp recessed or surface mount prismatic troffer fixtures.
- Relamp 13 existing 4' – 2 lamp strips fixtures to 28w ES T8 lamps. Typical of Mech and Storage areas.
- Clean and Relamp 4 existing 4' – 2 lamp Restroom / Locker room Vanity fixtures.

Squad Car Garage Area Lighting

- All 8' -4 lamp T8 surface / suspended mounted strip fixtures are to be re – lamped to 28w Energy Saving T8 lamps. 19 – 8' -4L fixtures.
- Clean and Relamp existing 4' – 2 lamp Prismatic Wrap fixture in Restroom with 28w ES T8 lamps.

EOC / Training Area Lighting

- Replace 15 existing 8' – 2 lamp T12 strip / Industrial fixtures with new 8' – 4 lamp T8 fixtures in existing locations.
- Clean and Relamp existing 4' - 2 lamp and 4 lamp Prismatic Wrap fixtures to 28w ES T8 lamps. Typical of 40 locations.
- Clean and Relamp 4 existing 4 lamp prismatic troffer fixtures in Training Room to 28w ES T8 lamps.
- Relamp 23 existing 75w Incandescent recessed cans fixtures to 23w Dimmable CFL lamps.
- Relamp 4 existing 75w Track head fixtures to 23w Dimmable CFL lamps.
- Relamp 2 existing 8' – 2 lamp strip fixtures to 28w ES T8 lamps in Armory room.
- Relamp 2 existing 8' – 4 lamp strip fixtures in Training breakroom to 28w ES T8 lamps.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

In addition to vending machine control, new power strips have been introduced into the marketplace that will eliminate the phantom power from radios, monitors, cell phone chargers, and other surging systems.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

By installing new surge protectors, the unit senses the monitor going into sleep mode and turns selective outlets off. With the monitor going to sleep, this notes that the occupant is gone and does not need to task lighting on or other power draining source. There are selective power outlets that will always remain on for the main CPU or clock.

Scope Synopsis	Police Dept Electrical Load
CW-3 Vending and Plug Load Control ♦ Two Pop Machine Controller ♦ 15 Power Strip Controller	

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Police Dept Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 1
- Diaphragm X-Body Replacement: 8
- Spud Replacement: 2
- Flushtube Replacement: 1
- Retrofit Upgrade: 4
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 16
- Gravity Toilet Re-commission: 4

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # PD-1a HVAC Renovation with existing Air Handling Unit

The main mechanical room equipment is past its useful life and needs to be replaced. The main air handler is still in working order, but the boiler and condenser need to be replaced. The ventilation rate of the air handler needs to be modified to meet the current needs of the building.

Ameresco recommends the replacement of the boiler with a fully-condensing high efficiency boiler plant. The condenser needs to be replaced with a refrigerant that uses an economically friendly refrigerant. The main air handler will receive a new hot water coil and DX coil. This is because the new air flow needs to match up with the new condenser outside. A new motor will be installed in the main air handling unit and VFD to ensure proper air flow into the building

FIM # PD-1b HVAC Renovation with New Air Handling Unit

Under this option, the main air handler will be replaced instead of replacing coils in the existing air handler. Due to the amount of recommended modifications to the existing air handling units, a new unit will be more economical. The new unit will be designed for the proper air flow and will match up with the new condenser outside. The main air handling unit will also get a new VFD to ensure proper air flow into the building.

FIM # PD-2 New VAV System and Roof Modifications

The ductwork distribution system is a volume damping zone control with zone reheats. This system will allow independent zone control, but with pneumatic controls it will not always be the most

sensitive control. The insulation in the un-conditioned attic space has been added to over the years to help eliminate condensation, but still proves an issue.

Ameresco recommends several improvements to help solve the problem. The first is to provide a "hot roof" which would insulate the back side of the single roof and block the outside air from seeping into the attic space. Removal of the batting insulation around the ductwork and installation of heat tape on the ductwork will ensure proper heating. The ductwork would then be reinsulated with hard board insulation and wrap to ensure proper thermal break. A new Variable Air Volume (VAV) system with digital controls would be installed. This system would allow better control for the total system, and help to eliminate many of the issues the building is currently experiencing.

Scope Synopsis — Police Dept. HVAC Controls

PD-1a HVAC Renovation with existing Air Handling Unit

- Replace existing boiler with two high efficiency condensing boilers
- Replace existing condenser with new 20 Ton unit
- Replace hot water and DX coil in existing AHU
- Install new 7.5 HP motor and VFD
- New digital controls

PD-1b HVAC Renovation with New Air Handling Unit

- Replace existing boiler with two high efficiency condensing boilers
- Replace existing condenser with new 20 Ton unit
- Replace Existing air handling unit with new double walled vertical unit
- Provide new VFD for new unit
- New digital controls

PD-2 New VAV System and Roof Modifications

- Add 4" foam on the bottom side of the roof deck
- Add VAV boxes to the existing reheat system
- Replace all ductwork insulation with heat tape and new insulation
- New Digital controls for the VAV system

RECREATION CENTER

900 Harrington Street SW

Building Description

The building is a multi-purpose facility with a large gym and outdoor pool. The facility was built in 1985, and some equipment is original to the building. The pool is used only in the summer time, but the gymnasium is used year-round.

Utility Baseline Analysis

Recreation Center Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	184,610	N/A	$ 17,883	N/A	17,011	$ 15,824	647	$ 6,174	$ 39,881
2009	140,850	462	$ 10,457	$ 2,746	20,164	$ 18,687	N/A	N/A	$ 31,890
Average	162,730	462	$ 14,170	$ 2,746	18,588	$ 17,256	647	$ 6,174	$ 35,886

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps. The gymnasium lighting has been replaced with high bay T5 lights and do not need to be replaced.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis — Rec Center Lighting

CW-1 Interior Lighting Improvements

Recreation Center - Interior Building Lighting

- Open Lobby and Entry areas – Replace existing open RLM fixtures with new 12' 3 lamp T8 direct / indirect suspended fixtures. Typical of 11 fixture locations.

Recreation Center Offices

- Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 parabolic troffer unit in existing location. Typical of 30 fixtures.
- Install 2 new ceiling mounted Occupancy Sensors control Open Office lighting.
- Install new wall switch Occupancy Sensor in each office. Typical of 5 offices.
- Gym Area corridor – Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 parabolic troffer unit in existing location.

Scope Synopsis Continued — Rec Center Lighting

CW-1 Interior Lighting Improvements

Recreation Center - Interior Building Lighting

- Restroom – Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 prismatic troffer unit in existing flanged location. Install wall switch Occupancy Sensor.
- Mech. / Storage Room – Retrofit existing 4' – 2 lamp strips to T8 lamps and .88bf ballast. 16 lamps / 8 ballast total. Maintain existing controls.
- Concessions Room - Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 prismatic troffer unit in existing location. Typical of 8 fixtures. Install wall switch Occupancy Sensor.
- Towel room - Retrofit existing 4' – 2 lamp strips to T8 lamps and .88bf ballast. 8 lamps / 4 ballast total. Install wall switch Occupancy Sensor.
- Locker Room – Clean and Retrofit existing 1x4 – 2 lamp recessed flanged troffer to T8 lamps and .88bf ballast. Replaced existing surface med base circular fixture with new surface CFL ceiling circular fixture. Replace existing 4' – 2 lamp Vapor Tight fixtures with new 4' – 2 lamp T8 Vapor Tight fixtures. Relamp recessed shower light fixtures to 20w CFL med base lamp. Replace existing Exit signs with new LED Exit light fixtures. Relamp Locker Room janitor closet to 25w CFL med base lamp.
- Locker Room Entry - Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 parabolic troffer unit in existing location. Typical of 2 fixtures.
- Locker / Concessions Room - Replace existing 2x2 prismatic troffer fixtures with new 2x2 – 3 lamp T8 prismatic troffer unit in existing location. Install wall switch Occupancy Sensor.
- Pool Concessions – Replace existing 4' – 2 lamp Vapor Tight fixtures with new 4' – 2 lamp T8 Vapor Tight fixtures. Install wall switch Occupancy Sensor.
- Elec. / Storage Room – Retrofit existing 4' – 2 lamp strips to T8 lamps and .88bf ballast.

Exterior Parking Lot lighting

- Replace 6 existing 12' decorative poles and fixture heads with new 18' – single 250w MH fixture assembly. Reuse existing base and wiring. Maintain existing controls.
- Replace existing 12" square 150w MH surface fixture at 2 entries with new surface mount 70w PSMH fixture.

ELECTRICAL LOAD CONTROL

Existing vending machines and plug load control draw power 24/7/365, regardless of occupancy levels.

In addition to vending machine control, new power strips have been introduced into the marketplace that will eliminate the phantom power from radios, monitors, cell phone chargers, and other surging systems.

FIM # CW-3 Vending and Plug Load Control

Ameresco proposes to install VendingMiser™ controllers on each vending machine to conserve energy. The VendingMiser™ device controls the vending machine operation without compromising its product quality. The controller is external to the vending machine and does not require vendor maintenance, and is approved for use by major soft drink manufacturers.

By installing new surge protectors, the unit senses the monitor going into sleep mode and turns selective outlets off. With the monitor going to sleep, this notes that the occupant is gone and does not need to task lighting on or other power draining source. There are selective power outlets that will always remain on for the main CPU or clock.

Scope Synopsis	Rec Center Electrical Load

CW-3 Vending and Plug Load Control

- Two Pop Machine Controller
- Four Power Strip Controller

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	Rec Center Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 14
- Spud Replacement: 4
- Flushtube Replacement: 1
- Retrofit Upgrade: 0
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 9
- Gravity Toilet Re-commission: 0

BUILDING ENVELOPE

Despite the best efforts of city maintenance staff, deferred maintenance projects accumulate. The City of Hutchinson has been replacing roofing segments over the last several years, but more segments need attention. A complete roof report was developed to determine the remaining life of the roofs, and when repairs or replacement needs to happen.

Uncontrolled movement of conditioned air through the building envelope is called air leakage.

Pressure differences due to mechanical systems, wind, or chimney (or stack) effect have been shown to correspond to a substantial source of heat loss or gain through the building envelope. One study by the National Research Council of Canada attributed 30-50% heat loss to air leakage in schools, commercial and residential high-rise buildings, supermarkets, and houses.

FIM # RC-1 Building Envelope

In addition to potential energy savings, uncontrolled air leakage could affect the thermal comfort of occupants and air quality through the imbalance of mechanical systems and the structural integrity of the building envelope with moisture migration. Measures to control air leakage involves sealing gaps, cracks and holes using appropriate materials and systems to potentially create an "air-tight" building envelope.

FIM # RC-9 Roof Replacement

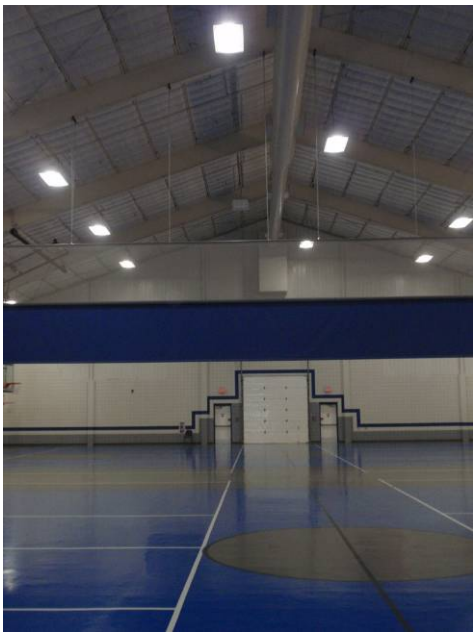
Ameresco produced this report to determine the status of each roof, and to determine the remaining life efficiency of each roof. Many of these roof membranes are deteriorating and approaching the end of their useful life. Once this happens, the roof starts to pull away from its flashing, allowing moisture to accumulate along the roof seam, causing corrosion and increasing the potential of water leaking into the building.

FIM # RC-10 Exterior Wall Insulation Addition

The walls for the recreation center are made of two different materials. The bottom eight feet are made of block material, and the upper level is made of steel, insulation and a steel exterior. Over the last couple of years, the interior of the building was lined with sheet metal. Both of these wall sections are starting to deteriorate. Also, the building has moisture damage with the vapor point of the wall moving throughout the season.

Ameresco recommends adding more insulation to both sections of the building. This will help when the building is heated in the winter, but will also help to maintain the envelope integrity. The lower block section would get 2 ½" of hard foam and install EFIS on exterior. The upper level would get 3" of hard foam and new sheet metal on the interior or exterior of the building.

FIM # RC-11 New Ceiling



The Recreation Center ceiling has batting insulation that is exposed. The new ceiling would be fastened to the ceiling and provide a clean ceiling. The material would be the same as in the ice arena.

Scope Synopsis — Rec Center Building Envelope

RC-1 Building Envelope

- Foam fill hollow metal frames 16 EA.
- Replace door weather stripping and sweep at 16 exterior doors

RC-9 Roof Replacement

- Replacement with new metal roof
- New Vapor barrier and additional R25 insulation
- Roof to be installed on top of existing roof
- Approximately 25,254 Sqft

RC-10 Exterior Wall Insulation Addition

- Add 3" rigid insulation and install new metal wall panel system and vapor barriers on upper level
- Add 2 ½" rigid insulation on block sections with new exterior finish

RC-11 New Ceiling

- Install new ceiling system as in the ice arena to brighten and clean up the ceiling

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

The existing fire alarm system in the Recreation Center is an older zoned type, currently parts are not available for replacement, and do not comply with the Americans with Disabilities Act, NFPA 72, UL® Revision 9 Standards or Life Safety Code 101. While none of these codes require the City to upgrade, Ameresco highly recommends this upgrade.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # RC-2 Pool Boiler Replacement and Chemical Feed System

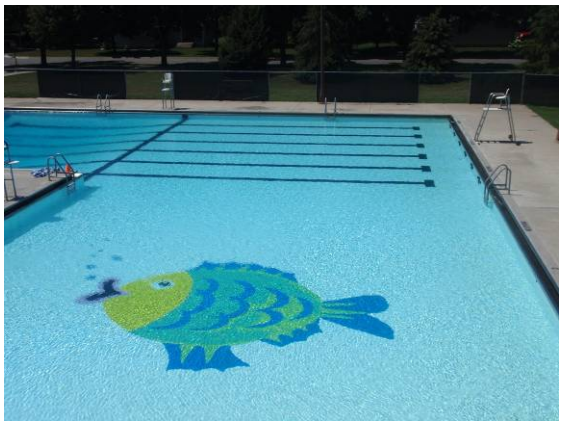
The boiler system has reached the end of its useful life. The boiler has an atmospheric burner. The system is designed with boiler pumps and building pumps. Ameresco recommends replacing the boiler with a high efficiency condensing boiler. The boiler will be installed with new boiler pumps, exhaust piping, and outdoor air intake. The boiler will be a sealed combustion type, eliminating the need for combustion air to come into the boiler room.

The existing chemical feeder for the outdoor pool is past its useful life and should be replaced. The current strainer for the pool should be replaced with a model that has a clear top to ensure there are no obstructions.

FIM # RC-3a&b Pool Sand Filter or Pool Regenerative Filter

The current pool filters are starting to leak and should be replaced. Replacing the current system with a sand filter would provide adequate system for the pool to function.

The second option would be a regenerative system that would provide a different filtration, but still be adequate for the facility. The benefit of the regenerative system would be the need to only flush the system once a month or once every two months



FIM # RC-4 Pool Blanket

A "semi-automatic" pool cover would be installed to cover the pool when it is not in use. Pool covers greatly reduce evaporation, and trap the heat of the water so it is not transferred to the air. Pool covers reduce evaporation which saves water and chemicals. The pool cover installation would be scheduled to coincide with a period of reduced activity.

FIM # RC-6 Fire Alarm Replacement

The replacement systems would be fully addressable with new control panels, annunciator panels, sensing devices and notification devices installed. Under the new codes, the pull stations next to the entry and exit doors will be removed. These areas are prone to false alarms in buildings.

FIM # RC-7a Gym Ventilation Unit Replacement

The gym air handling unit is past its useful life and needs to be replaced. The ductwork is rusting away and the insulation is falling apart. Replacing the unit with a new gas fired rooftop unit would be the best option for the building.

FIM # RC-7b Gym Ventilation Unit Replacement – Heat Pumps

If a heat pump well field was installed, the option of installing a heat pump for the building would be feasible. The heat pump would be used for heating purposes only: heating the pool in the summer months; heating the new gym unit during the winter months. The new air handling unit would have a hot water coil, and new piping would be installed in the building.

FIM # RC-8 Destratification Fans

Within an enclosed building space, minimal air movement may cause temperature fluctuations. Warm air generated from the building's heating system rises to the ceiling, and, conversely, cold air lingers near the floor. This net effect is stratification – air temperatures at ceiling level are substantially higher than air temperatures at floor level. De-stratification fans reduce energy usage by eliminating air stratification.

De-stratification fans will be installed in high ceiling areas of the gymnasium. Units will be equally spaced throughout the rooms per manufacturer's recommendations. Outdoor air temperatures determine when the units operate. De-stratification fans operate continuously as long as the outdoor air temperature stays below 50°F.

Scope Synopsis	Rec Center HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- 3 RTU Controller
- Generator Monitor
- City Wide BAS Controller

RC-2 Pool Boiler Replacement and Chemical Feed System

- Replace existing 1.8 MMBTU with one new high efficiency condensing boiler
- New chemical feed system for the pool
- Install new strainer for the main pool

RC-3a Pool Sand Filter

- Replace existing Pool filters with two high rate sand filters

RC-3b Pool Regenerative Filter

- Replace existing Pool filters with one regenerative media filters

Scope Synopsis Continued — Rec Center HVAC Controls

RC-4 Pool Blanket

- Provide two motorized movable pool blankets

RC-6 Fire Alarm Replacement

- Replace system with a fully addressable system
- Provide new sensors to bring up to code

RC-7a Gym Ventilation Unit Replacement

- Replace existing gym gas fired unit with a new gas fired unit
- Replace all ductwork on the roof, and re-insulate

RC-7b Gym Ventilation Unit Replacement – Heat Pumps

- Replace existing gym gas fired unit with a new hot water unit
- Replace all ductwork on the roof, and re-insulate
- Install new heat pump based off the well field from the Civic Arena (hot water only)

RC-8 Destratification Fans

- Install 8 new destratification fans in the gym
- Control will be connected to the building automation system

RENEWABLE OPPORTUNITIES

FIM # RC-5 Solar Pool Application

Solar pool heat is designed to heat the pool by energy from the sun. This system will pump pool water to the roof using black solar panels to heat the water. An automatic drain system will prevent the system from freezing in Minnesota winters.

Scope Synopsis	Rec Center Renewable Opportunities

RC-5 Solar Pool Application

- Install 120 50 sqft panels
- Panels will be located on the ground

WATER TREATMENT PLANT

439 Prospect Street NE

Building Description

The water treatment facility was built in 2006. The building has all of the water wells and filtration on the property.

Utility Baseline Analysis

Water Treatment Plant Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	2,554,900	N/A	$235,712	N/A	22,019	$ 20,371	485	$ 4,982	$261,065
2009	2,371,800	5,923	$175,830	$ 35,568	22,285	$ 20,613	N/A	N/A	$232,011
Average	2,463,350	5,923	$205,771	$ 35,568	22,152	$ 20,492	485	$ 4,982	$246,538

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	WTP Lighting

CW-1 Interior Lighting Improvements

Water Treatment Offices Lighting

- Clean and Relamp existing fixtures in the office are to 28W T8
- Install wall switch Occupancy Sensors in Plan room, Storage Room and Men's and Women's Restrooms. 4 total units.
- Install ceiling mounted Occupancy Sensors in Supervisors Office and Lunch Room.

Water Treatment Storage Garage

- Relamp 8 med base sockets fixture with 25w CFL lamps.

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	WTP Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 1
- Spud Replacement: 0
- Flushtube Replacement: 0
- Retrofit Upgrade: 2
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 5
- Gravity Toilet Re-commission: 2

WASTE WATER TREATMENT PLANT

1300 Adams Street SE

Building Description

The Wastewater Treatment Facility consists of 1 main office building and 8 treatment buildings. The office building was remodeled in 2006. The plant processes all of the waste water in the city, and facility has had several building additions and improvements over the years.

Utility Baseline Analysis

Waste Water Treatment Plant Utility Information

	Electricity				Natural Gas		Water		
	kWh	kW	$ kWh	$ kW	Therms	$ Therms	Water kGal	$ Water	$ Total
2008	4,373,600	N/A	$386,783	N/A	49,496	$ 45,698	5,870	$ 50,722	$483,203
2009	3,864,000	7,465	$286,929	$ 44,790	48,731	$ 45,004	N/A	N/A	$376,723
Average	4,118,800	7,465	$336,856	$ 44,790	49,114	$ 45,351	5,870	$ 50,722	$429,963

Proposed FIMs

LIGHTING

The existing lighting consists of 32W T8 lamps.

FIM # CW-1 Interior Lighting Improvements

Ameresco recommends replacement of 32W T8 lamps with more efficient 28W T8 lamps. In addition, Ameresco would de-lamp fixtures (i.e. reduce number of bulbs within a fixture) in areas of the building. The lower wattage bulbs produce equivalent quality light with lamps that last longer and maintain better illumination levels. The 28W T8 lamps would use the existing instant start ballast.

In addition to the re-lamping of the building, occupancy sensors have been proposed for selective areas. These occupancy sensors will provide automatic control of the lighting system that may be turned on and off automatically.

Scope Synopsis	WWTP Lighting

CW-1 Interior Lighting Improvements

Wastewater Treatment Office Lighting

- Clean and Relamp 73 existing fixtures to 28W T8
- Install wall switch Occupancy Sensors in 3 Restrooms, 2 Locker Rooms, Office Storage room and Shop Storage Room.
- Install ceiling mounted Occupancy Sensors in 2 - Front Offices, 2 - Training/Break rooms and 2 - Maintenance Offices.
- Install 2 ceiling mounted Occupancy Sensors and 1 power pack to control existing lighting in open office area.
- Install 2 - cold temp rated wall mount Occupancy Sensors in each Vehicle Garage Area.

Treatment Building 30

- Clean and Relamp 4 existing 4' - 2 lamp T8 Industrial fixtures in Electrical Room. 8 lamps total. Maintain existing controls.
- Replace existing wall pack over double doors. Install new 70w HPS full cut-off wall pack with photo sensor in existing location.
- Replace 3 - 150w MH Low Bay with 4' – 2 lamp T8 Fluorescent VT fixtures

Scope Synopsis Continued

WWTP Lighting

CW-1 Interior Lighting Improvements

Treatment Building 50 – 100 / 200 / 300

- Replace existing wall packs over double doors at each end of building. Install new 70w HPS full cut-off wall pack with photo sensor in existing location. Typical of 3 buildings, 6 total fixtures.

Treatment Building 60

- Replace 4 existing 4'- 2 lamp T12 Industrial fixtures on Upper Level with new 4' – 2 lamp T8 Industrial fixtures in existing locations.
- Replace existing 4' -2 lamp T12 wall bracket fixtures at stair landing with new 4' – 2 lamp T8 Vapor Tight fixture in existing location.
- Replace 7 150w HPS Low Bay fixtures in Lower Level with 4' – 4 lamp T8 HO Fluorescent Vapor Tight fixtures. Install at same height and location.
- Replace existing wall packs around exterior of building. Install new 70w HPS full cut-off wall pack with photo sensor in existing locations. Total of 4.

Treatment Building 80

- Replace 15 existing 4' – 2 lamp T12 wall bracket and vapor tight fixtures with new 4' – 2 lamp T8 Vapor Tight fixtures in existing locations.

Treatment Building MBR

- Replace 4 - 150w MH Low Bay fixtures in Lower Level with 4' – 4 lamp T8 HO Fluorescent Vapor Tight fixtures – Fixture on 24/7
- Clean and Relamp 6 existing 4' – 2 lamp T8 Vapor Tight fixtures
- Replace 1 - 150w MH Low Bay fixtures in Compressor Room with 4' – 4 lamp T8 HO Fluorescent Vapor Tight fixtures – Fixture on 24/7
- Replace 3 2' T8 fixtures with 4' – 2 lamp T8 Fluorescent fixtures. Install at same height and location

Treatment Building 100

- Clean and Relamp 4 existing 4' - 2 lamp T8 Industrial fixtures.

Treatment Building 90

- Replace existing 250w HPS Low Bay fixtures with 4' – 4 lamp T8 HO Fluorescent Vapor Tight fixtures. Total of 39 units/locations.
- Replace existing 4' - 2 lamp T12 wall bracket and Industrial fixtures with new 4' – 2 lamp T8 Vapor Tight fixtures in existing locations. Total of 8 units/locations.
- Replace existing Exit Signs with new LED Exit signs. Total of 3 units/locations.

ELECTRICAL LOAD CONTROL

New power strips have been introduced into the marketplace that will eliminate the phantom power from radios, monitors, cell phone chargers, and other surging systems.

Power Factor is the percentage of electrical power used by the building versus the amount of energy that is sent to the building by the utility company. This percentage fluctuates because the equipment utilizing electricity varies throughout the day in buildings. Motors, lighting, computers, and chillers are examples of equipment that can cause lower power factors for the building. Hutchinson Utilities requires that the power factor remain above 0.94 to avoid being penalized.

FIM # CW-3 Vending and Plug Load Control

By installing new surge protectors, the unit senses the monitor going into sleep mode and turns selective outlets off. With the monitor going to sleep, this notes that the occupant is gone and does not need to task lighting on or other power draining source. There are selective power outlets that will always remain on for the main CPU or clock.

FIM # WWTP-2 Power Factor Correction

The lift station was determined to have poor power factor. This could be a result of the motors on the pumps. Ameresco recommends that a smart modulating capacitor be installed to eliminate the penalties. When correcting power factor, conservation of energy does not occur, but is a cost reduction measure with the utility company.

Scope Synopsis	WWTP Electrical Load

CW-3 Vending and Plug Load Control

- Four Power Strip Controller

WWTP-2 Power Factor Correction

- New Smart Modulation Power Factor Correction on the lift station

WATER CONSERVATION

Ameresco engineers have developed a number of plumbing retrofit projects that replace plumbing fixtures and flush valves with new lower flow units; install low flow aerators on faucets; and in some cases, install automatic controls on the fixtures.

When new fixtures are installed, most have water-conserving flush valves. However, many of these are not properly tuned to the fixtures, and older fixtures typically do not have low flow valves. By updating the valve-wear components (urinals, water closets and tank toilets) and calibrating the new flushometers, a substantial amount of water can be saved. Components are designed and tested to resist the rigors of substantial use as well as the effects of chloramines and sediments in water. This will reduce water consumption, extend equipment life and significantly reduce maintenance.

FIM # CW-2 Domestic Water Conservation

This retrofit will also produce energy savings associated with the pumping and heating of water. All fixtures were evaluated to ensure that proper flushing and flow characteristics are maintained.

Scope Synopsis	WWTP Water Conservation

CW-2 Domestic Water Conservation

- Diaphragm Calibration: 0
- Diaphragm X-Body Replacement: 2
- Spud Replacement: 1
- Flushtube Replacement: 0
- Retrofit Upgrade: 3
- Angle Stop Adder Valve: 0
- Vandal Resistant Flow Control: 7
- Gravity Toilet Re-commission: 3

HVAC CONTROLS / ADDITIONS / MODIFICATIONS

Ameresco's engineers have a wealth of experience in the application of energy management control systems and HVAC equipment energy evaluation for large and small facilities. Ameresco does not represent any one manufacturer or product line, and can work with our customers to tailor their needs to the available systems in the market.

FIM # CW-4a City Wide Building Automation Control System – Main Buildings

By installing a new city wide web-based digital control system, several benefits can be seen. With a single system, one person could log in and see all of the buildings on the network. This system would allow units to be turned on and off, regulate night setbacks, and generate critical alarms to ensure buildings do not freeze. This web-based system would be expandable to incorporate more buildings or points of monitoring as the City's needs change.

FIM # WWTP-1 Boiler Plant Replacement (Building 90)

The boiler system in the 90 building has reached the end of its useful life. The boiler is a modular boiler with one atmospheric burner. The system is designed with boiler pumps and building pumps. Ameresco recommends replacing the boilers with a high efficiency condensing boiler. The boilers will be installed with new boiler pumps, exhaust piping, and outdoor air intake. The boilers will be sealed combustion which will eliminate the need for outdoor air to come into the boiler room.

FIM # WWTP-3 VFD on the Rotors

The existing rotors for the aeration process do not have VFDs on them. The system is turned on and off based on the amount of flow into the plant. There are currently several motors and rotors, but most of the time only two are running at one time, and they turn on and off during the day.

FIM # WWTP-4 Re-commission Existing AHU

Several of the buildings have large air handing units that serve this process. By ensuring the buildings are balanced with the exhaust and outdoor air on the energy recovery units, energy savings can be achieved.

Scope Synopsis	WWTP HVAC Controls

CW-4a City Wide Building Automation Control System – Main Buildings

- Administration Building
  - Interface to existing Tridium BAS
- Preliminary Treatment (Bldg 30)
  - Innovent MAUs (2)
- Solids Handling (Bldg 90)
  - AHU (3)
  - Boiler (1) & pumps (2)
- MBR (Bldg 55)
  - AHU/RTU (4)
  - Boiler (1) & pumps (2)
- Wide BAS Controller

WWTP-1 Boiler Plant Replacement (Building 90)

- Replace existing boiler with two new high efficiency condensing boilers
- Install new system boiler and system pumps

WWTP-3 VFD on the Rotors

- Install two 60 HP VFD
- Connect to the existing Process Control System

WWTP-4 Re-commission Existing AHU

- Re-commission and air balancing existing air handling units

RENEWABLE OPPORTUNITIES

FIM # WWTP-5a, b & c Wind Energy

When assessing the feasibility of wind energy, the only facility that would utilize the full benefit of the wind turbine would be the WWTP. This facility is a 24/7 facility and uses a large amount of energy.

There are two locations that are under consideration for the turbines. The first is the location between the WWTP and the HATS facility. This large field would be adequate for the smaller turbine, and would allow connectivity to the facility. The second location is across the road where the City had purchased property for an industrial park. This location is further away from the airport, and is at a higher elevation for better wind conditions.

The two turbines that are being considered would be to install a 600 kW turbine next to the WWTP. All of the energy would be consumed by the facility, and would be placed on a 50 Meter or 65 Meter shaft. The second location could handle the 600 kW unit, but a 1500 kW unit would be better for this site. The turbine would be installed on a 80 Meter shaft, and would produce just about all of the energy the facility uses.

Photo courtesy of Spirit Lake Community Schools

Scope Synopsis — WWTP Other Opportunities

WWTP-5a Wind – 600kW – 50 Meter

- Install new 600kW Wind Turbine between the WWTP and HATS facilities
- Tower to be 50 Meters Tall

WWTP-5b Wind – 600kW – 65 Meter

- Install new 600kW Wind Turbine between the WWTP and HATS facilities
- Tower to be 65 Meters Tall

WWTP-5c Wind – 1500kW – 80 Meter

- Install new 15000kW Wind Turbine location to be across the street on city owned property
- Tower to be 80 Meters Tall

V. Support Services

Training

One of the most important, initial steps in the process is proper training. Ameresco realizes that all installed equipment must be reliable, durable and properly maintained. Even the most efficient systems will not perform unless properly integrated with existing infrastructure, and the best installations can cause problems if not carefully coordinated with on-going maintenance practices.

Facilities personnel must be motivated to integrate energy-efficient performance into their daily routine. They must be trained to understand that their efforts keep the equipment performing efficiently and effectively; and their observations can be important indicators of where and when waste is occurring. To this end, Ameresco will properly and thoroughly train designated City personnel on all installed measures. Successful training will ensure the persistence of energy savings, as well as help to maintain the comfort and aesthetics of the facilities.

The training program for facilities and maintenance personnel will focus on the necessary operations and service requirements after the contract is closed out. Training will be conducted at the site of the implementation, and will feature a hands-on approach to ensure adequate understanding of all materials presented. Training sessions will include a review of the overall installation and performance history so that everyone understands the benefits of the program. Documentation will include review of Operation and Maintenance (O&M) manuals, drawings, and equipment specification literature.

Technical Training

Technical training is for City personnel with direct responsibility for the management, oversight, operation, and maintenance of all energy systems and equipment within your facilities. An outline of the technical training curriculum follows:

1. Explanation of the Design Concept
    - Design intent
    - Seasonal modes of operation
    - Emergency conditions and operation
    - Comfort conditions / Indoor air quality
    - Energy efficiency considerations
2. Systems operation
    - Operation of individual components, if required; instruction provided by authorized factory technicians
    - Physical location of critical shut-off valves, fire, smoke, and balancing dampers relief valves, safeties, control panels, etc.
    - System operational procedures for all modes in manual and automatic modes

3. Operation of the control systems
    - Sequences of operations
    - Use of graphical user interfaces
    - Alarms and problem indicators
    - Diagnostics and corrective actions
4. Service and Maintenance
    - Use of the Operation and Maintenance Manuals
    - Instruction and logging procedures for lubrication
    - Instruction from authorized factory technicians
    - Troubleshooting and investigation of malfunctions
5. Recommended procedures for collecting interpreting, and storing specific performance data

Ameresco's Project Manager will be responsible for coordinating the delivery of our training program to the City of Hutchinson. The training curriculum will be specifically structured for facilities and maintenance personnel, and over time and through hands-on experience, City personnel will gain intimate knowledge of necessary procedures to ensure optimal reliability and efficiency.

Non-Technical Training

Ameresco believes strongly that everyone who works for or within a facility can have an impact on the level of success of any energy conservation program. Therefore, to the fullest extent possible, training should be offered to the broadest possible range of facility groups. Non-technical training will include curriculum that discuss energy policy development and behavioral energy awareness for the City of Hutchinson staff and service providers.

At the request of the City of Hutchinson, Ameresco will assist in developing a City-wide Energy Policy. A well-defined and effective Energy Policy is the basis upon which a solid training program can be built as it provides goals, objectives, and management direction and leadership for all energy-related activities.

Service

Typically, the equipment and systems Ameresco proposes can generally be maintained and serviced by a variety of local service entities, including maintenance personnel currently employed by the City of Hutchinson. For this reason training is an important component of all Ameresco projects after the implementation stage, as well as assisting you in determining how to most efficiently and effectively implement an ongoing maintenance plan.

Measurement & Verification

Ameresco will coordinate a detailed and comprehensive Measurement and Verification plan, which includes on-going monitoring, to ensure actual on-going savings are attained. This is a critical element of the performance contract because it provides the basis for the energy savings guarantee and debt-service payment. The specific Measurement and Verification plan for this project will be agreed upon between the City of Hutchinson and Ameresco once the final scope of work has been determined.

Measurement and Verification (M&V) involves two essential components: (1) verifying the ability of the project to generate all the projected and/or guaranteed savings; and (2) measuring actual, periodic performance of the project against the established baseline(s). The baseline is developed from a rigorously derived end-use analysis, on-site measurements, and historical energy consumption data.

There are a variety of ways to accomplish the two primary M&V tasks, but a critical prerequisite is to establish the aforementioned baseline. Techniques range from stipulating all factors affecting Facility Improvement Measure performance to installing extensive, highly accurate metering systems. When deciding the appropriate level of sophistication for a particular plan, factors such as complexity of the measure, expected magnitude of savings from the measure, and the customer's aversion to risk all weigh upon the decision. In an effort to aid agencies in gaining an understanding of measurement and verification, an international guideline was established called the International Performance Measurement and Verification Protocol (IPMVP).

Ameresco bases all of its site-specific measurement and verification plans on the IPMVP. The general approach to determining energy savings in these plans involves comparing the energy use associated with a facility, or certain energy consuming systems within a facility, before installation of the measure and after installation of the measure.

In general: *Energy Savings = (Baseline Energy Use) – (Post Installation Energy Use) +/- Adjustments*

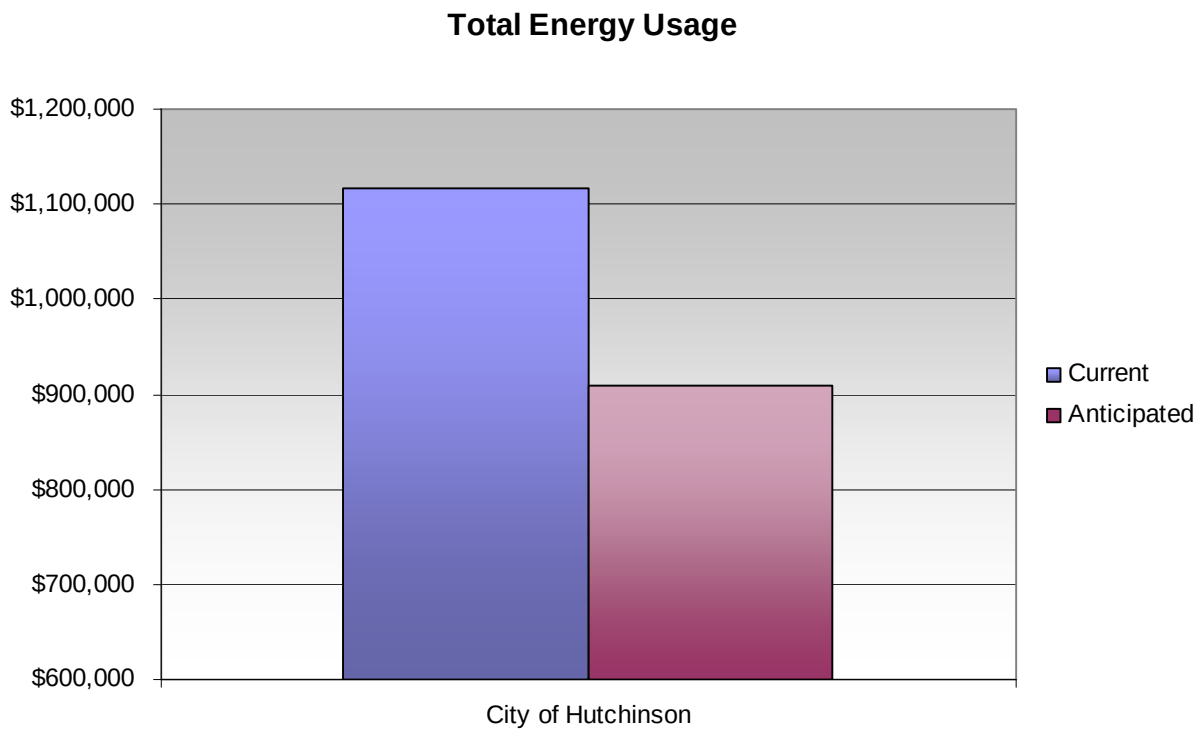
The specific algorithms vary from measure to measure but they can all be broken down into usage before and after installation of the facility improvement measure. Sometimes the baseline usage is fixed, while in other cases the baseline is calculated based on the post-installation usage; it depends on the specific plan used to verify the performance of the measure. All specific protocols will be explained to the City of Hutchinson before project construction begins.

VI. Project Funding

The following information provides a summary of the expected funding sources needed to implement this project. This project relies on the ability of the measures implemented to generate utility, operations and maintenance savings as well as other revenue sources that are described in further detail below.

Energy/Utilities Cost Reduction

Ameresco has evaluated the City of Hutchinson's current utility spending, including electricity, natural gas and water/sewer. The chart below shows the greatest potential utility savings from the measures identified in the detailed assessment that could be guaranteed by Ameresco.



Total Potential Guaranteed Annual Utility Savings = $208,445

Utility Rebates

Ameresco anticipates rebates from your local utility provider, which will help to lower the up-front cost of improvement measures. Ameresco will continue to work with the Hutchinson Utilities Commission and their Energy Conservation Administrator on potential energy conservation rebates. Once the scope of the recommended project is finalized, Ameresco will meet with Hutchinson Utilities to confirm what rebate amount can be assigned to this comprehensive energy conservation project.

Grant Opportunities

Working in partnership with Ameresco, the City of Hutchinson delivered a proposal on January 25, 2010 for a competitive grant to the Minnesota Department of Commerce, Office of Energy Security (OES). The energy efficiency and conservation proposal was for the maximum grant request allowed of $100,000. This grant opportunity was funded through the 2009 federal ARRA "stimulus" bill under the United States Department of Energy (DOE) Energy Efficiency and Conservation Block Grant (EECBG) program. The next step in the selection and award process will be a "Short-List Notification to Responders" on March 12, 2010. We are hopeful that the Proposal submitted by the City will receive a high ranking and merit grant funding.

Operational Cost Reduction

Ameresco assembled an existing profile for operations and maintenance costs relating to City facilities and infrastructure. City administration provided three years of expense data for Ameresco to analyze and compile a three-year average cost profile. This data was then used to project an annual savings based upon which operational costs could be reduced or eliminated as a result of the measures that were identified in the Detailed Engineering Assessment.

Ameresco will continue to work with the City to determine additional amounts of operational, maintenance, and capital savings that exist from the finalized scope of work for this project. Please refer to section seven of this report (Financial Summary) for the current amount of identified savings by measure.

Approach to Project Financing

Ameresco's approach to the financing of energy-efficiency and related construction projects is unbiased, thus we align our goals with our client's goals. Of course, we think that it makes sense to use the most economical type of financing for an efficiency and facility renewal project. The most attractive financing terms for the City of Hutchinson, usually defined as the lowest cost of funds,

will yield the greatest net benefit from the project for the City. Ameresco has no fee charges from whatever financing approach and term is ultimately used.

Ameresco will work with the City's financial advisor, Ehlers & Associates. Working together, we will develop projections and options for funding this project. Options typically include a Tax-Exempt Lease Purchase structure or bonding scenarios. Since both Ehlers & Associates and Ameresco are independent, together we can align our efforts around making sure we obtain the best possible funding solutions and the lowest cost of funds.

Minnesota legislation allows cities to enter into guaranteed energy savings agreements of up to 20 years in length. The 20 year maximum length is intended to allow cities to complete longer return improvements and address critical deferred maintenance needs.

In consideration of our customer's needs and requirements, Ameresco can provide support and coordination in the financial structuring and sourcing of capital for energy projects. Ameresco has all the requisite experience and capabilities in-house, including dedicated project finance professionals experienced with transactions of various types. Ameresco has arranged highly structured financings, equity-funded, guaranteed and even acted as the lessor for benefit of our commercial and institutional customers. Our expertise, financial strength, and demonstrated track record of performance combine to attract competitive financiers to these projects and ensure that the appropriate capital structure is in place. Ameresco is willing to customize a co-authored financial solution with the City for the project.

The first step in determining the financing structure is to identify and evaluate the City's financial objectives. The terms of a financing contract are highly dependent upon a number of factors including: financing structure, length of contract, capital market conditions, customer's financial position, equipment type, agreement terms and conditions, Ameresco obligations, and various other factors. All of these factors would be considered in order to achieve the desired objectives for the City.

We will then assist with the development of a financing RFP for national, regional or local lenders who are very familiar with the energy services business; this will help assure the best possible terms and rates. A lower cost of funds can allow a city to include more improvements in the project, thereby improving the overall impact.

VII. Financial Summary

Ameresco has developed many facility improvement measures based on our understanding of your challenges and objectives. The following pages include a summary of those measures, their costs and associated savings.

Additional capital improvement items were identified by City Staff and Ameresco. These capital improvement items are at or beyond their expected useful life and their replacement can result in both energy and operational savings; therefore should be considered as a part of this comprehensive program.

All of the measures that were identified and evaluated merit consideration by the City of Hutchinson for implementation for various reasons. Ameresco has worked with City Staff to prioritize items into different options:

- Option 1 includes Cost Reduction measures and minimal Capital Improvement items
- Option 2 includes Cost Reduction measures and moderate Capital Improvement items
- Option 3 includes Cost Reduction measures and extensive Capital Improvement items

Several measures were not included in any of the above options. Ameresco is currently working with City Staff to further evaluate the following items for inclusion in future phases:

- City Street Lighting improvements
- Wind Energy System
- Bio-mass Heating System
- Non-potable Water Line from Wastewater Treatment Plant to HATS

We look forward to working with the City to determine a final scope of work.

Project Selection Worksheet

City of Hutchinson - Facility Improvement Measures

Cost reduction measures + minimal Capital Improvements	Cost reduction measures + moderate Capital Improvements	Cost reduction measures + extensive Capital Improvements												
Option 1	**Option 2**	**Option 3**	FIM Reference #	Project Report Page #	FIM Description	Purpose		Project Costs	Annual Savings			One-Time Savings		**Net Project Cost**
						Cost Reductions	Capital Improvements		Utility Savings	O&M Savings	Total Savings	Needed Capital Expenditure	Est. Utility Rebate / Incentive	
City Wide Improvements														
X	X	X	CW-1	See all Buildings	Interior Lighting Improvements	X		$ 262,334	$ 23,179	$ 2,700	$ 25,879	$ -	$ 24,000	$ 238,334
X	X	X	CW-2	15,32,52,61,70,76,83, 86,94,102,113,118	Domestic Water Conservation	X		$ 31,429	$ 3,614	$ 155	$ 3,769	$ -	$ -	$ 31,429
X	X	X	CW-3	10, 14, 24, 31, 42, 51, 60, 93, 101, 117	Vending and Plug Load Control	X		$ 18,257	$ 1,624	$ -	$ 1,624	$ -	$ -	$ 18,257
X	X	X	CW-4a	11, 17, 35, 71, 78, 106, 119	City Wide Building Automation Control System - Main Buildings	X		$ 305,663	$ 12,907	$ 5,000	$ 17,907	$ -	$ -	$ 305,663
X	X	X	CW-4b	39, 45, 89	City Wide Building Automation Control System - Secondary Buildings	X		$ 28,911	$ 469	$ 500	$ 969	$ -	$ -	$ 28,911
			CW-5a	2	Induction Street Lighting Retrofit Existing Fitures	X		$ 1,143,591	$ 37,545	$ 42,394	$ 79,939	$ -	$ -	$ 1,143,591
			CW-5b	2	Induction Street Lighting New Fixtures with Full Cutoff		X	$ 2,414,523	$ 37,545	$ 42,394	$ 79,939	$ -	$ -	$ 2,414,523
			CW-5c	3	LED Street Lighting New Fixtures with Full Cutoff		X	$ 3,581,447	$ 31,554	$ 36,741	$ 68,295	$ -	$ -	$ 3,581,447
			CW-6a	5	Roberts Park - Lighting Retrofit		X	$ 154,382	$ -	$ -	$ -	$ -	$ -	$ 154,382
		X	CW-6b	5	Roberts Park - Lighting Replacement		X	$ 525,645	$ -	$ -	$ -	$ -	$ -	$ 525,645
		X	CW-7	5	Roberts Park - Parking Lot Lighting Addition		X	$ 27,090	$ -	$ -	$ -	$ -	$ -	$ 27,090
Airport														
X	X	X	AP-1	9	Building Envelope	X		$ 488	$ 50	$ -	$ 50	$ -	$ -	$ 488
City Center														
			CC-1	17	Boiler Plant Replacement	X		$ 120,422	$ 1,977	$ 2,500	$ 4,477	$ -	$ -	$ 120,422
		X	CC-2	20	Fire Alarm Replacement		X	$ 15,220	$ -	$ 500	$ 500	$ -	$ -	$ 15,220
X	X	X	CC-3	16	Roof Repairs		X	$ 13,670	$ -	$ 2,000	$ 2,000	$ -	$ -	$ 13,670
			CC-4	18	VAV Box Replacement		X	$ 23,012	$ 844	$ 200	$ 1,044	$ -	$ -	$ 23,012
	X	X	CC-5	18	Hot-Gas Bypass		X	$ 6,342	$ -	$ -	$ -	$ -	$ -	$ 6,342
Creekside - Compost Facility														
		X	CS-1	26	Building Envelope - Office Space - Separation Building		X	$ 19,287	$ -	$ -	$ -	$ -	$ -	$ 19,287
		X	CS-2	27	New make-up-air unit for Bagging Area		X	$ 132,198	$ (1,632)	$ -	$ (1,632)	$ -	$ -	$ 132,198
	X	X	CS-3	24	Power Factor Correction	X		$ 59,071	$ 2,922	$ -	$ 2,922	$ -	$ -	$ 59,071
			CS-4	28	Bio Mass Boiler	X		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Events Center														
	X	X	EC-1	33	Building Envelope	X		$ 11,981	$ 782	$ -	$ 782	$ -	$ -	$ 11,981
			EC-2	31	Power Factor Correction	X		$ 23,260	$ 132	$ -	$ 132	$ -	$ -	$ 23,260
			EC-3	33	Roof Replacement		X	$ 390,437	$ 4,750	$ -	$ 4,750	$ -	$ -	$ 390,437
		X	EC-4	35	Re-commission Existing Rooftop Units	X		$ 15,220	$ 479	$ -	$ 479	$ -	$ -	$ 15,220

Cost reduction measures + minimal Capital Improvements

Cost reduction measures + moderate Capital Imrprovements

Cost reduction measures + extensive Capital Improvements

AMERESCO

Project Selection Worksheet

City of Hutchinson - Facility Improvement Measures

Option 1	Option 2	Option 3	FIM Reference #	Project Report Page #	FIM Description	Purpose		Project Costs	Annual Savings			One-Time Savings		Net Project Cost
						Cost Reductions	Capital Improvements		Utility Savings	O&M Savings	Total Savings	Needed Capital Expenditure	Est. Utility Rebate / Incentive	
Fire Department														
X	X	X	FD-1	43	Building Envelope	X		$ 8,007	$ 552	$ -	$ 552	$ -	$ -	$ 8,007
		X	FD-2	45	Truck Bay Exhaust System		X	$ 163,025	$ 449	$ -	$ 449	$ -	$ -	$ 163,025
		X	FD-3	43	Roof Repairs	X		$ 7,595	$ -	$ 500	$ 500	$ -	$ -	$ 7,595
HATS														
X	X	X	HATS-1	55	Building Envelope	X		$ 8,646	$ 894	$ -	$ 894	$ -	$ -	$ 8,646
X	X	X	HATS-2	53	Destratification Fans	X		$ 7,269	$ 2,406	$ -	$ 2,406	$ -	$ -	$ 7,269
X	X	X	HATS-3	51	Power Factor Correction	X		$ 4,957	$ 1,015	$ -	$ 1,015	$ -	$ -	$ 4,957
		X	HATS-4	53	VFD on Main MAU Ventilation Units	X		$ 17,222	$ 742	$ -	$ 742	$ -	$ 1,500	$ 15,722
			HATS-5	56	Non-Potable Water line from WWTP	X		$ 64,206	$ 4,411	$ -	$ 4,411	$ -	$ -	$ 64,206
		X	HATS-6	53	Office Space Air Balancing	X		$ 6,057	$ 101	$ -	$ 101	$ -	$ -	$ 6,057
Burich Ice Arena														
X	X	X	ICE-1	62	Building Envelope	X		$ 6,295	$ 571	$ -	$ 571	$ -	$ -	$ 6,295
	X	X	ICE-2a	66	Chiller Plant Replacement Option A		X	$ 1,672,286	$ 23,366	$ 7,555	$ 30,921	$ 1,300,000	$ 22,500	$ 349,786
			ICE-2b	66	Chiller Plant Replacement Option B		X	$ 1,613,917	$ 22,665	$ 7,555	$ 30,220	$ 1,300,000	$ 22,500	$ 291,417
			ICE-3a	66	Ventilation Replacement Option A		X	$ 366,269	$ 6,982	$ 1,592	$ 8,574	$ 300,000	$ -	$ 66,269
	X	X	ICE-3b	66	Ventilation Replacement Option B		X	$ 560,056	$ 9,775	$ 1,592	$ 11,367	$ 300,000	$ -	$ 260,056
			ICE-4	62	Roof Replacement		X	$ 555,794	$ 2,698	$ 1,000	$ 3,698	$ -	$ -	$ 555,794
			ICE-5	62	Exterior Wall Insulation Addition		X	$ 695,430	$ 5,949	$ -	$ 5,949	$ -	$ -	$ 695,430
		X	ICE-6	63	New Low-e Ceiling	X		$ 172,719	$ 8,354	$ -	$ 8,354	$ -	$ -	$ 172,719
		X	ICE-7	63	New Low-e Material on Walls		X	$ 15,206	$ -	$ -	$ -	$ -	$ -	$ 15,206
	X	X	ICE-8	60	Power Factor Correction	X		$ 35,321	$ 2,414	$ -	$ 2,414	$ -	$ -	$ 35,321
			ICE-9	64	General Construction - New Locker Room Floor, Vestibule, Bleachers		X	$ 188,337	$ -	$ -	$ -	$ -	$ -	$ 188,337
Library														
			LB-1	72	Roof Replacement		X	$ 171,640	$ 1,760	$ 1,526	$ 3,286	$ -	$ -	$ 171,640
Liquor Hutch														
			LH-1a	78	North Cooler Condenser Replacement Option A		X	$ 20,788	$ -	$ 200	$ 200	$ -	$ -	$ 20,788
		X	LH-1b	78	North Cooler Condenser Replacement Option B		X	$ 32,908	$ 220	$ 200	$ 420	$ -	$ -	$ 32,908
	X	X	LH-2	75	Power Factor Correction	X		$ 9,451	$ 594	$ -	$ 594	$ -	$ -	$ 9,451
			LH-3	77	Roof Replacement		X	$ 231,984	$ 2,831	$ 500	$ 3,331	$ -	$ -	$ 231,984
			LH-4	79	Roof Top Unit Replacement (RTU-1 & 2)		X	$ 82,783	$ 68	$ 55	$ 123	$ -	$ -	$ 82,783

Project Selection Worksheet

City of Hutchinson - Facility Improvement Measures

Option 1 (Cost reduction measures + minimal Capital Improvements)	Option 2 (Cost reduction measures + moderate Capital Improvements)	Option 3 (Cost reduction measures + extensive Capital Improvements)	FIM Reference #	Project Report Page #	FIM Description	Purpose: Cost Reductions	Purpose: Capital Improvements	Project Costs	Annual Savings: Utility Savings	Annual Savings: O&M Savings	Annual Savings: Total Savings	One-Time Savings: Needed Capital Expenditure	One-Time Savings: Est. Utility Rebate / Incentive	Net Project Cost
Police Department														
			PD-1a	95	HVAC Renovation with Existing Air Handling Unit		X	$ 265,286	$ 2,139	$ 5,605	$ 7,744	$ 200,000	$ 825	$ 64,461
X	X	X	PD-1b	95	HVAC Renovation with New Air Handling Unit		X	$ 289,452	$ 2,139	$ 5,605	$ 7,744	$ 200,000	$ 825	$ 88,627
X	X	X	PD-2	95	NEW VAV System & Roof Modifications		X	$ 157,557	$ 4,147	$ 500	$ 4,647	$ 110,000	$ -	$ 47,557
Park Offices														
			PK-1a	87	Building Sealer		X	$ 60,772	$ -	$ -	$ -	$ -	$ -	$ 60,772
			PK-1b	87	New Roof and additional wall insulation		X	$ 273,694	$ 1,652	$ -	$ 1,652	$ -	$ -	$ 273,694
Recreation Center														
X	X	X	RC-1	103	Building Envelope	X		$ 3,714	$ 779	$ -	$ 779	$ -	$ -	$ 3,714
	X	X	RC-2	106	Pool Boiler Replacement and Chemical Feed System	X		$ 96,074	$ 3,794	$ 500	$ 4,294	$ 60,000	$ -	$ 36,074
			RC-3a	106	Pool Sand Filter		X	$ 75,111	$ -	$ -	$ -	$ -	$ -	$ 75,111
			RC-3b	106	Pool Regenerative System		X	$ 139,181	$ 33	$ -	$ 33	$ -	$ -	$ 139,181
			RC-4	107	Pool Blanket	X		$ 35,569	$ 4,141	$ (2,000)	$ 2,141	$ -	$ -	$ 35,569
			RC-5	110	Solar Pool Application	X		$ 212,652	$ 3,984	$ -	$ 3,984	$ -	$ -	$ 212,652
		X	RC-6	107	Fire Alarm Replacement		X	$ 10,792	$ -	$ -	$ -	$ -	$ -	$ 10,792
	X		RC-7a	107	Gym Ventilation Unit Replacement		X	$ 119,055	$ -	$ 200	$ 200	$ 100,000	$ -	$ 19,055
		X	RC-7b	108	Gym Ventilation Unit Replacement - Heat Pumps		X	$ 143,880	$ 663	$ 200	$ 863	$ 100,000	$ -	$ 43,880
X	X	X	RC-8	108	Destratification fans	X		$ 17,263	$ 1,800	$ -	$ 1,800	$ -	$ -	$ 17,263
			RC-9	103	Roof Replacement		X	$ 468,456	$ 3,662	$ 1,000	$ 4,662	$ -	$ -	$ 468,456
			RC-10	104	Exterior Wall Insulation Addition		X	$ 396,077	$ 6,179	$ -	$ 6,179	$ -	$ -	$ 396,077
			RC-11	104	New Ceiling		X	$ 57,228	$ -	$ -	$ -	$ -	$ -	$ 57,228
Wastewater Treatment Plant (WWTP)														
	X	X	WWTP-1	119	Boiler Plant Replacement		X	$ 136,130	$ 3,807	$ 930	$ 4,737	$ 95,000	$ -	$ 41,130
		X	WWTP-2	117	Power Factor Correction	X		$ 38,794	$ 408	$ -	$ 408	$ -	$ -	$ 38,794
X	X	X	WWTP-3	119	VFD on the Rotors	X		$ 56,630	$ 6,692	$ -	$ 6,692	$ -	$ 3,600	$ 53,030
			WWTP-4	120	Re-commission Existing AHU		X	$ 6,987	$ -	$ -	$ -	$ -	$ -	$ 6,987
			WWTP-5a	121	Wind - 600kW - 50 Meter	X		$ 2,850,108	$ 83,451	$ (22,640)	$ 60,811	$ -	$ -	$ 2,850,108
			WWTP-5b	121	Wind - 600kW - 65 Meter	X		$ 2,926,888	$ 89,874	$ (22,640)	$ 67,234	$ -	$ -	$ 2,926,888
			WWTP-5c	121	Wing - 1500kW - 80 Meter	X		$ 5,247,156	$ 258,236	$ (30,000)	$ 228,236	$ -	$ -	$ 5,247,156
			WWTP-5d	121	Wind Study - 1 Year Met Tower (Not-to-Exceed)	X		$ 40,000	$ -	$ -	$ -	$ -	$ -	$ 40,000

Notes:

** Needed Capital Expenditure reflects expected cost to replace equipment with same type / efficiency. Shown for Option 2 Measures only.*

VIII. Project Management Plan

Ameresco has extensive experience in managing project implementation in occupied facilities, including many successful projects in cities. Ameresco has assembled a project management group that includes construction and project managers, project engineers, superintendents, estimators, and schedulers. For the City of Hutchinson, the benefits of the Ameresco team's capabilities are simple: a single point of contact and continuity from pre-design through construction and commissioning. This enhanced continuity ultimately helps keep the project on schedule and ensures minimal impact on the service mission of the City.

Ameresco's pre-construction services include scheduling, constructability reviews, risk reviews, cost estimating, value engineering, life cycle cost evaluations, subcontractor pre-qualification, instructions to sub-contractors, long lead procurement, pre-bid meetings, etc.

During the construction phase Ameresco's tasks and activities will include contract administration, scheduling, procurement & expediting, construction kick-off meetings, project administration, cost control, quality assurance, project reporting, on-site management, site safety reviews, commissioning & startup, punch lists, product and equipment training, project close-out and issuance of O&M manuals, and as-built drawings.

Availability

The project manager will stay with the project from design through construction to ensure continuity and successful construction of a project. Ameresco will have a dedicated project manager to oversee all project activity as well as on-site construction managers, as needed, to oversee specific activities.

Qualifications

Ameresco project and construction managers are seasoned veterans in the industry, each averaging between twelve to fifteen years of experience. Most are degreed engineers that hold contractor licenses, Certified Energy Manager certifications, and Professional Engineering registrations.

Construction Management

The onsite day-to-day construction management of this project during the construction phase is a critical task that Ameresco takes very seriously. Ameresco's comprehensive approach to managing a comprehensive project is designed to ensure that we deliver to the City of Hutchinson the maximum value for the lowest possible cost. Ameresco is committed to implement a high quality and successful project that will meet the City's expectations through its construction management approach described below.

1. Project Cost – Development and Control

Ameresco tracks subcontractor expenditure on a sub-project and task basis using a phase work breakdown structure. These sub-projects and tasks are continually updated as the project moves through its life cycle and as new sub-projects and task orders are developed. Cost accounts are established to collect and segregate expenditures and accruals according to project and project phase (i.e., site survey, work plan development, design, procurement, construction, testing, commissioning and turnover).

2. Project Timeline – Development and Control

All the tasks for the development and implementation phases will be developed thoroughly by the project team in close coordination with the City staff. These tasks will then be inputted into the state-of-the-art project management software for projecting the total project timeline, estimating manpower loading, and ensuring that there is no overlapping of critical activities that will affect the project implementation schedule. The timeline is finally approved internally by Ameresco management staff and then used diligently by the field staff to track the development of the project. The project schedule is a living document and is constantly updated during the project life by the Project Manager. Any changes to the project schedule are communicated immediately to City staff.

3. Communication

Proper reporting procedures ensure timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information. It provides the critical link among people, ideas, and information that is necessary for success, and all involved must be prepared to effectively deal with and understand these communications. Ameresco will request that a member of the City of Hutchinson administration is available at all times throughout the course of this project.

The primary components are:

Communications Planning – defining information and communications needs: who needs what, when they need it, and how they should receive it.

Information Distribution – supplying needed information to project stakeholders in a timely fashion.

Performance Reporting – collecting and disseminating performance information (status reporting, progress measurement, forecasting).

Administrative Closure – generating, gathering, and disseminating information to formalize phase or project completion.

Specific reporting procedures typically include but are not limited to weekly or bi-weekly project construction meetings. As part of these meetings, there will be a review of actual versus anticipated project schedules, milestone achievements, site-specific issues and resolutions, critical path analysis,

and most importantly customer input. Ameresco intends to use its standard project management process subject to the City's approval.

4. Quality Control

Our Quality Assurance Plan (QAP) represents Ameresco's philosophy of doing business. Ameresco's quality policy states that: "We will attain 100% customer satisfaction by providing our customers with value-added innovative solutions which perform to the customer's requirements every time." The core components of QAP at Ameresco include customer satisfaction teams, quality awareness and communication, requirements, measurement, corrective action, and recognition.

Customers who select Ameresco can be confident they are dealing with a company that recognizes the importance of delivering high-quality products, systems, and services. All Ameresco projects receive the same level of commitment to quality and dedication to delivering a solution that results in 100% customer satisfaction.

Schedule Approach

Sequencing operations are based to minimize potential environmental issues. System commissioning, start-up, testing, and scope review will take place during every facet of construction as new systems come on-line or as work scope items are completed. System training and turnover will occur at mutually agreeable times with the City's maintenance staff. At the conclusion of construction, closeout documents will be assembled and transmitted to the Owner.

Once the final proposal is approved, Ameresco will develop, in partnership with the City, a detailed construction schedule based on the final scope of work approved for inclusion in the project.

Customer Satisfaction

At Ameresco, 100% customer satisfaction is our goal. In order to ensure this, Ameresco follows a rigorous delivery and acceptance process that includes the following:

1. Manufacturer authorized equipment start up, followed by review of start up documentation by Ameresco Project Manager.

2. Review of all completed items, followed by issuance of punch list items to subcontractors by Ameresco Project Manager.

3. On-site training of designated City personnel.

4. Subcontractor(s) punch list closeout and acceptance by Ameresco Project Manager.

5. Delivery of owner's operating and maintenance manuals and review of all warranty documents with the customer.

6. Reconciliation of customer's punch list.

7. Review of savings, and customer sign off on Certificate of Completion.

These activities are documented in a Delivery and Acceptance Certificate that is signed by Ameresco and the City at the end of the project, ensuring that the City of Hutchinson is 100% satisfied.

Corporate Headquarters
Ameresco, Inc.
111 Speen Street, Suite 410
Framingham, MA 01701

T: (508) 661.2200
F: (508) 661.2201

Name of contact person in the firm:
Michael Zukowski, Account Executive
Phone (952) 942-5142 x4689

www.ameresco.com

DA-3405-00-0/10-02-00.23
Copyright ©2010 by Ameresco, Inc.
All rights reserved. Printed in the USA.

AMERESCO
Green • Clean • Sustainable

Integrity . Flexibility . Independence . Innovation