



Gundersen Health System & La Crosse County, Wisconsin

Landfill Gas (LFG) Electricity Project with Waste Heat Recovery and Utilization





Project Organization



**LFG Conditioning,
Compression,
& Pipeline**

**General Contractor:
McHugh Excavating &
Plumbing, Inc.**

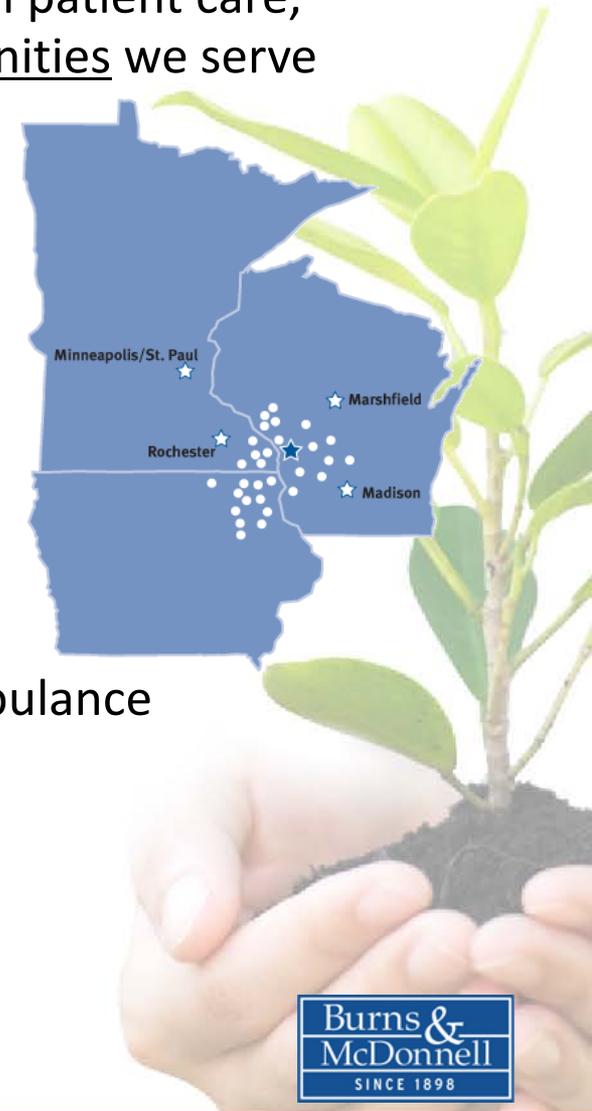
**LFG Electricity, Waste
Heat Recovery, and
Utilization**

**Engineer-Procure-Construct
Contractor:**



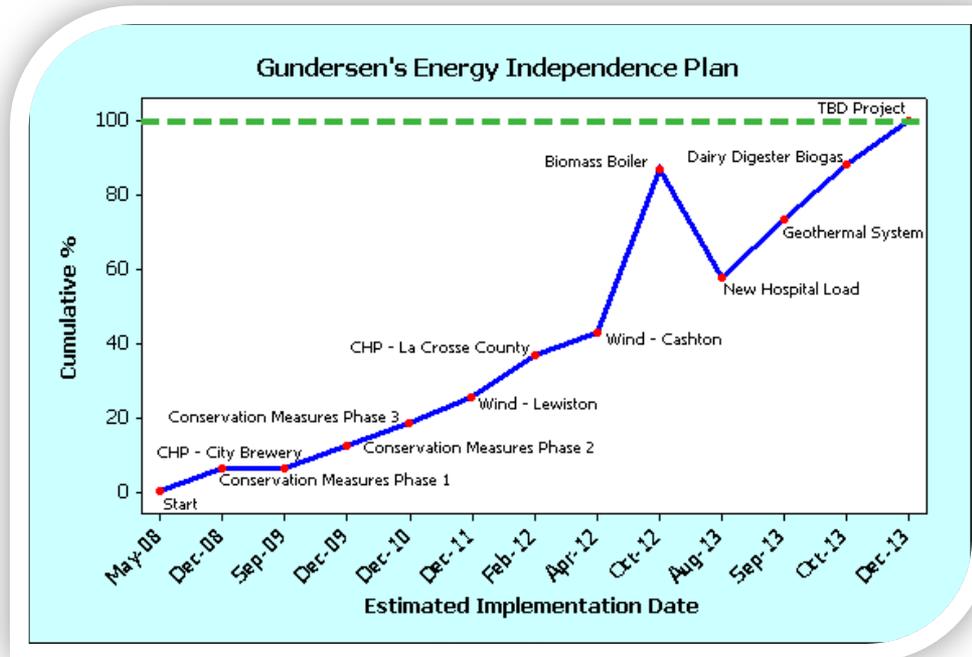
Gundersen Health System

- Mission: We distinguish ourselves through excellence in patient care, education, research, and improved health in the communities we serve
- GL Health System
 - Currently have 41 clinic facilities
 - 325 bed tertiary care hospital
 - Physician-led Integrated delivery system
 - ~700 providers and ~6,500 employees
 - Residency and medical education programs
 - Multiple Top 100 Hospital & Service Line recognition
 - Health Plan
 - A variety of affiliate organizations including EMS ambulance service, rural hospitals, nursing homes, hospice, etc.



Primary Objective

- **Energy Independence by 2014 - Produce more power than Gundersen consumes from fossil fuel sources**
 - Makes our healthcare delivery more affordable to patients
 - Benefits human health
 - Strengthens our regional economy
 - Improves our environment



Why Health Care Providers Should Care

- Pollutants from the burning of fossil fuels cause:
 - Cancer, liver disease, kidney disease, reproductive issues
 - Cardiovascular deaths and stroke¹
- According to the Department of Energy, hospitals are 2.5 times more energy intensive than other commercial buildings²
 - This is inconsistent with our mission... we are responsible for contributing to disease through our wasteful consumption.
- Energy costs continue to escalate, making it more difficult to provide affordable care
- Reducing waste results in an improved bottom line



¹Source: American Heart Association Scientific Statement: DALLAS, May 10, 2010

²Source: <http://www.energy.gov/news2009/7363.htm>

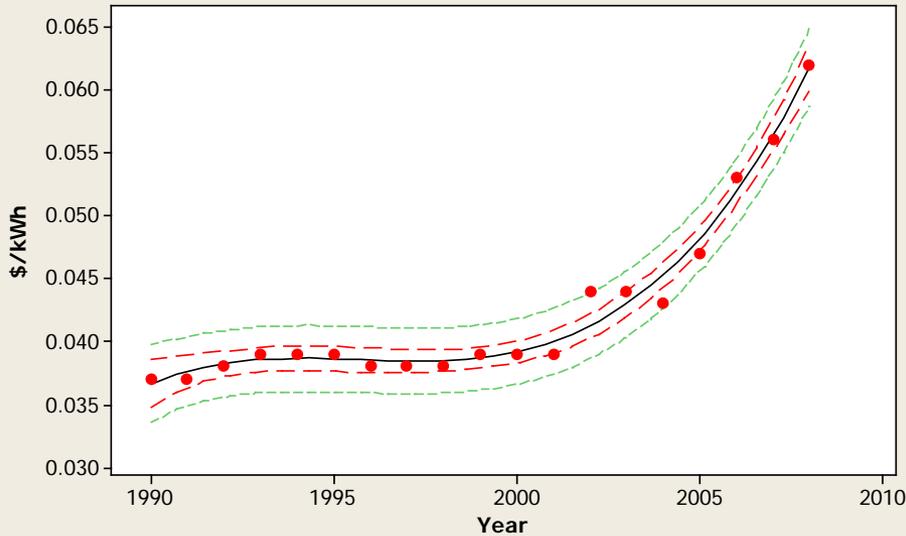
The Cost of Energy

\$5,000,000+ Energy Bill in 2007

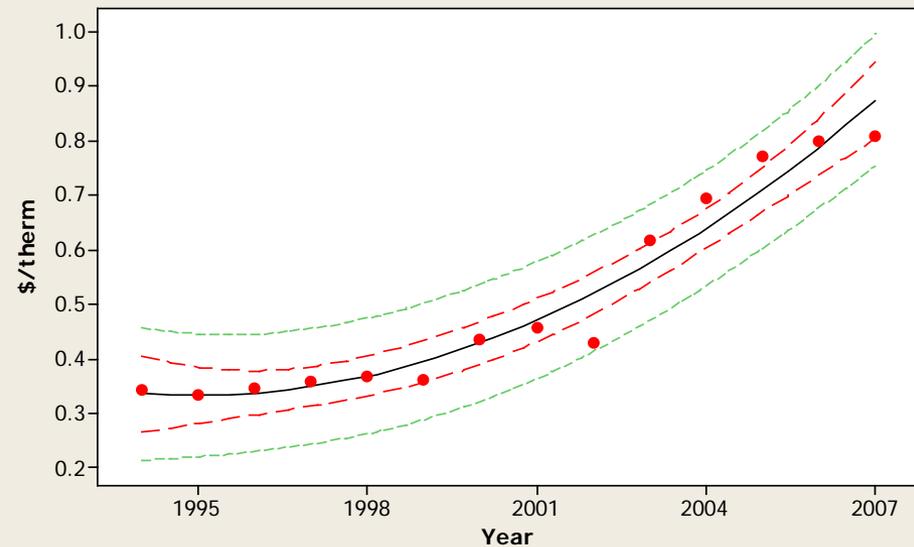
>\$350,000 Increase Annually for Gundersen Lutheran



Electricity Cost Trend



Gas Cost Trend



The need for affordable healthcare compels us to address this trend

Our Envision® Program



- **Energy Management**
 - Energy Efficiency
 - Renewable Energy
- **Waste Management and Control**
- **Recycling**
- **Sustainable Design of New Facilities**



La Crosse County Solid Waste Department



**The Responsible
Resource**



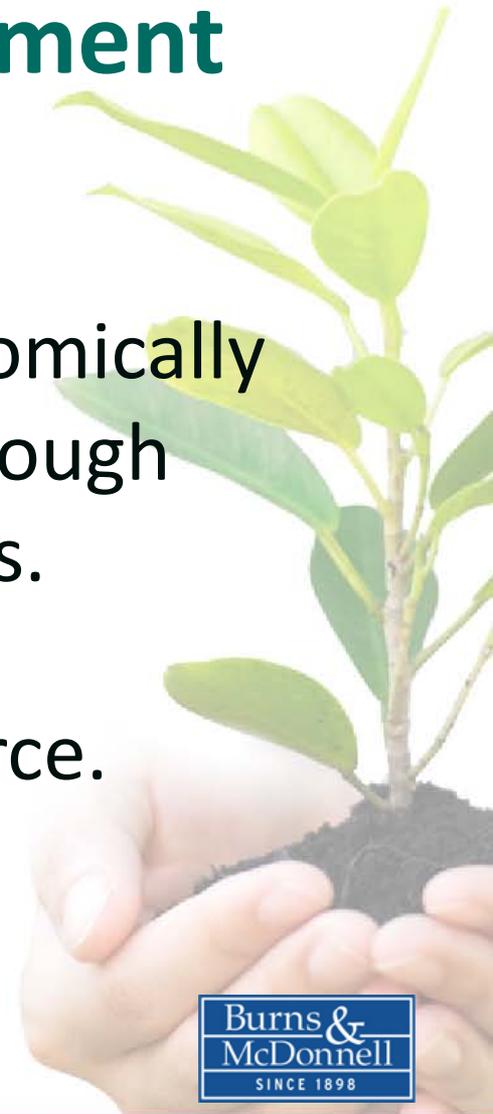


Mission Statement

La Crosse Disposal System

Provide environmentally and economically sound solid waste services through public/private partnerships.

To be your Responsible Resource.





Disposal System Partner

Waste to Energy (WTE)

- Xcel tonnage exceeded 73,000 tons (74,578)





09/09/2011





Feasibility Study

- Approval Summer 2009
- Finished Nov 2009
- Alternatives Explored
 - Micro turbines
 - Pipeline Gas
 - Compressed Natural Gas (CNG)
 - Boiler Gas (Direct Use)
 - Combined Heat and Power (CHP)



Feasibility Study Cont'd

- Recommendations
 - CHP with a partner offsite
 - Go it alone but without heat recovery distant 2nd choice



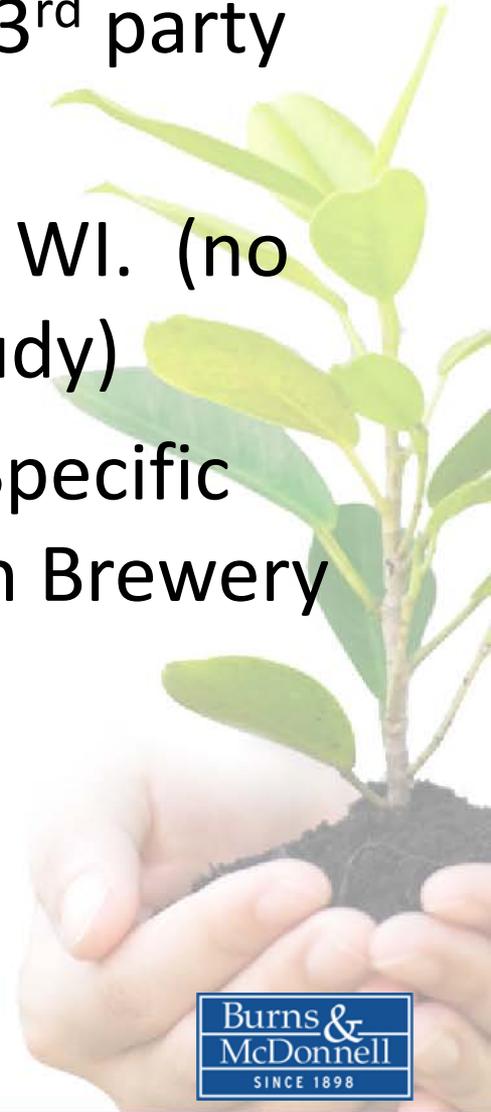
Request For Information(RFI)

- Local and Statewide Media contacts
- Local and Statewide Organizations
- Website access to RFI
- L.M.O.P. Landfill Methane Outreach Program
(National Exposure)



Three Local Responses

- Solution Dynamics La Crescent Mn. (3rd party approach)
- River States Truck & Trailer La Crosse WI. (no specific project and needed more study)
- Gundersen Lutheran La Crosse WI. (Specific and detailed project, experience with Brewery project)



County Requirements

- Risk adverse
- Guaranteed income
- Solid Waste Department controls the gas
- Collaborative





08/19/2011 09:41



450°

USCOPLEX™ 6400 GAS GATHERING PE 3408 14710 CEE ASTM D2513 API-15LE

412



07/05/2011 13:23

The guys who keep it running >99% in Dec.



Lesson's learned

- Don't delegate your responsibility
- Make the regulators your allies



Elements of the Project:



LFG Conditioning Skid & Pipeline Specs

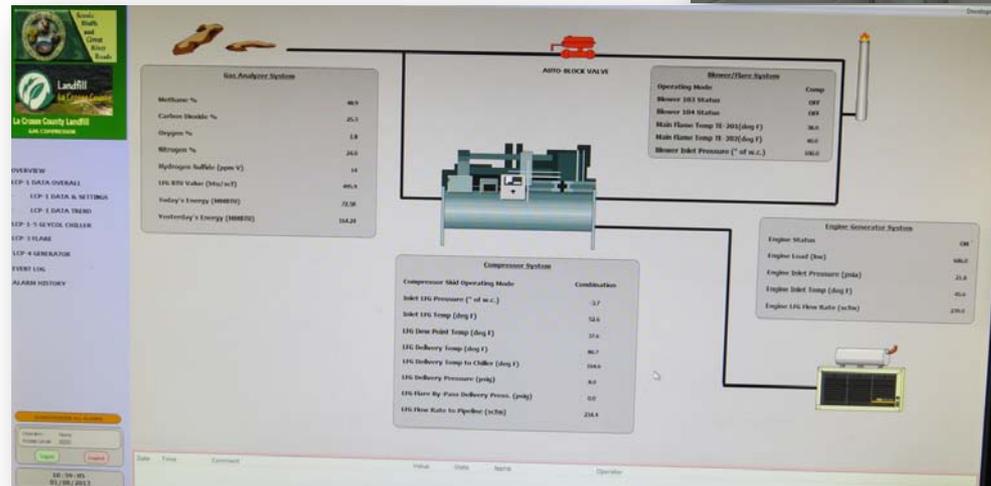
Unison Solutions, Inc. LFG Conditioning Skid

- Conditions up to 450 scfm LFG (Roots Blower)
- Conservative Discharge Pressure (8 psi)
- Chill to 40°F --> Re-heat to 80°F
- Auto Flare Startup

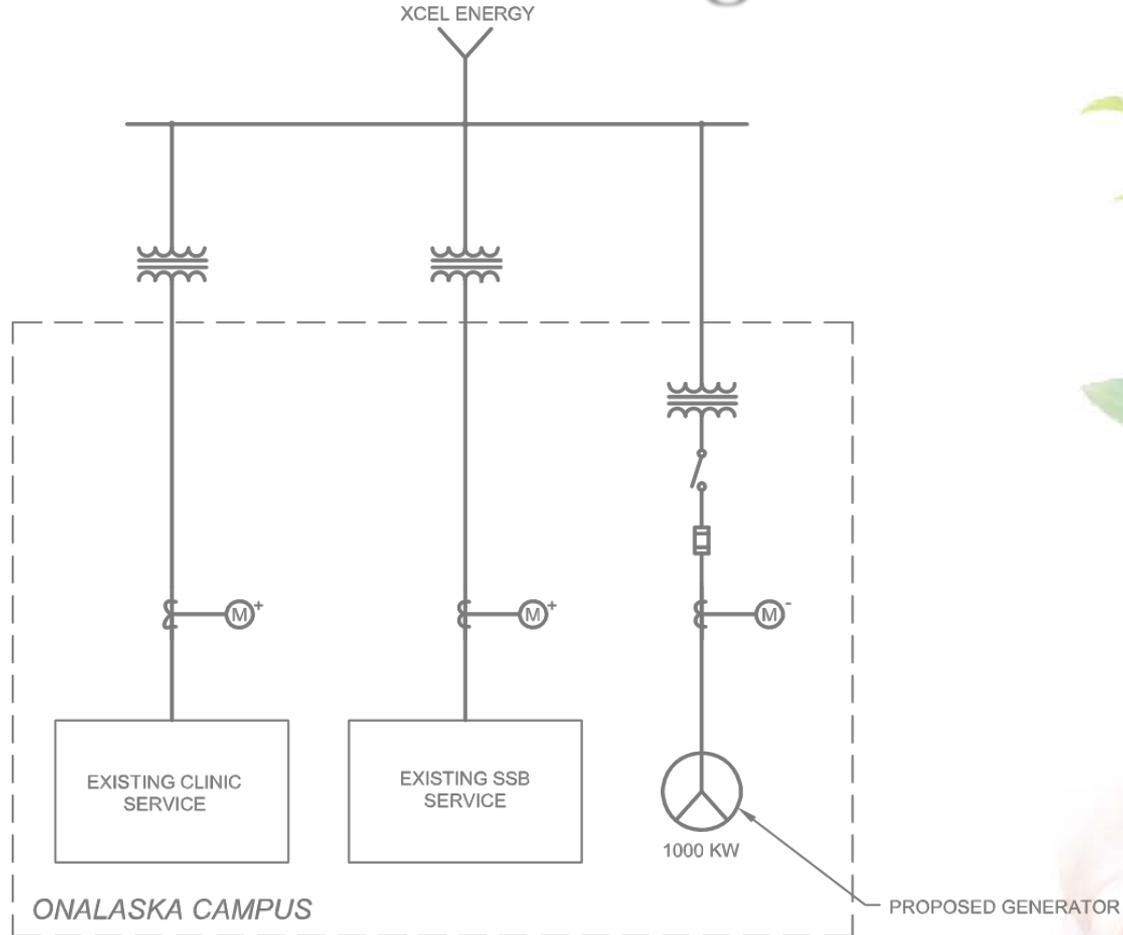


6" Pipeline

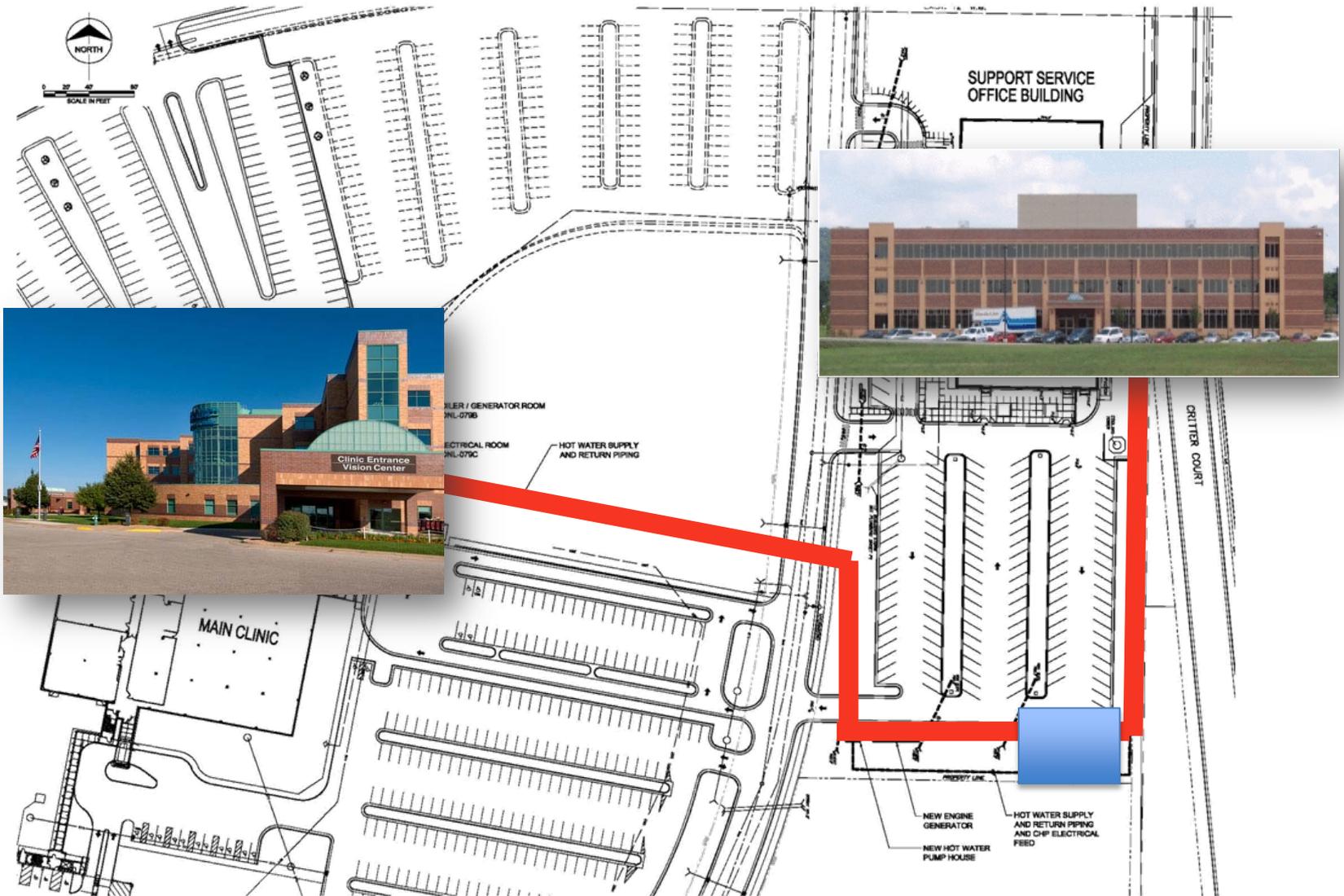
- 2 Miles
- Crossed I-90
- HDPE



Electrical Interconnection One-Line Diagram

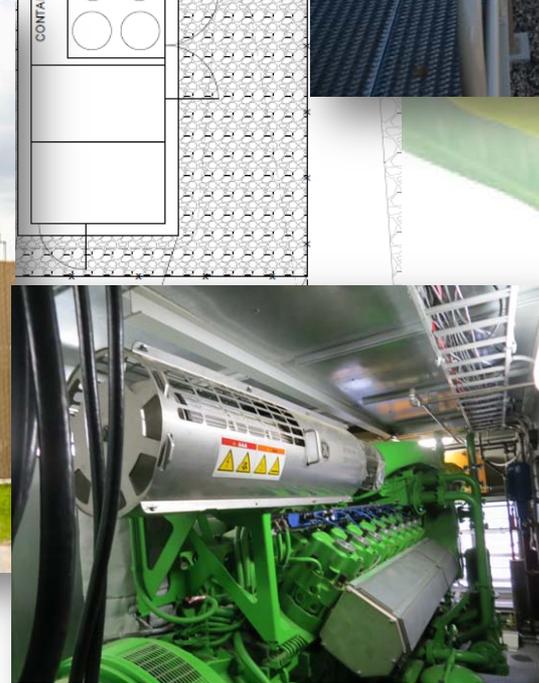
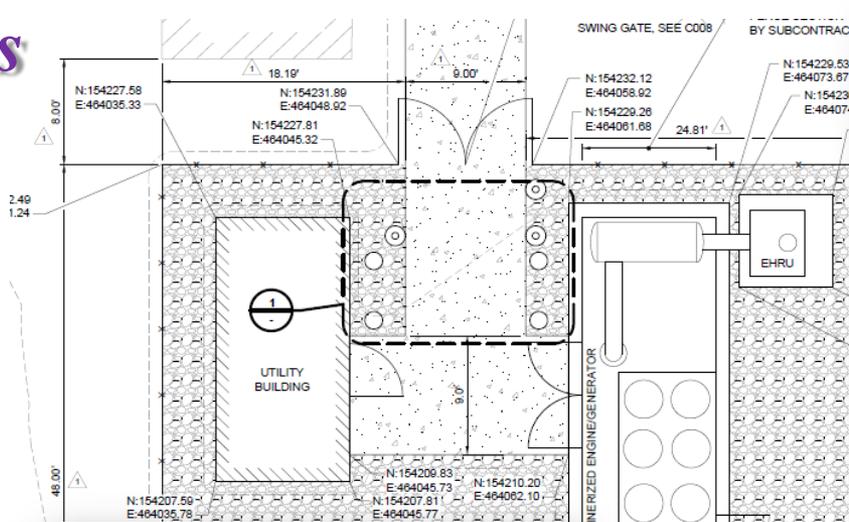


Onalaska Campus Facility Layout

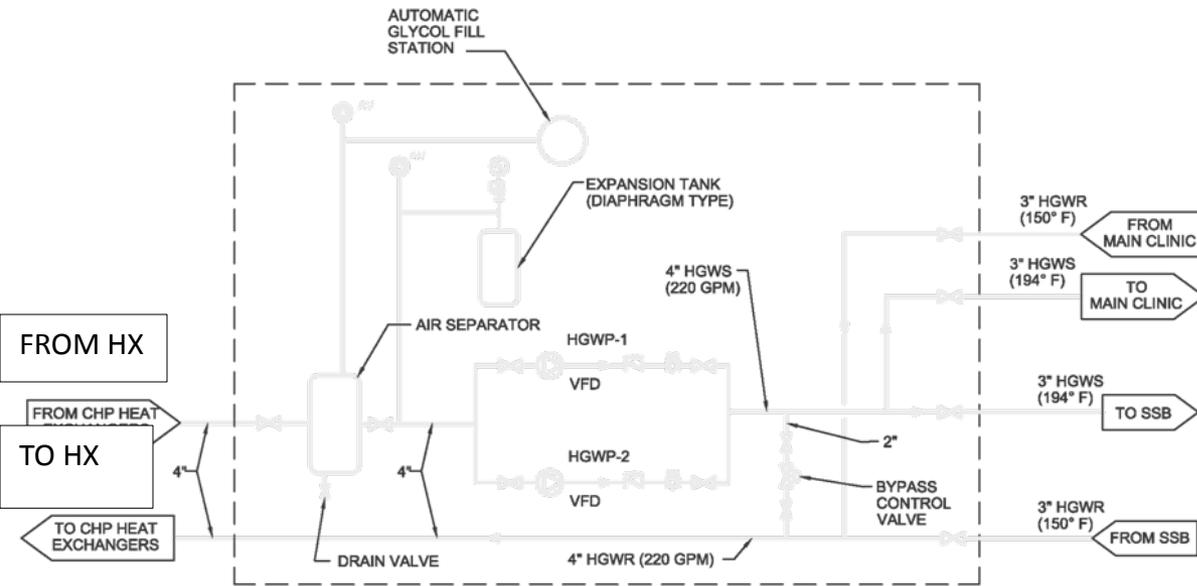


Power Plant Specs

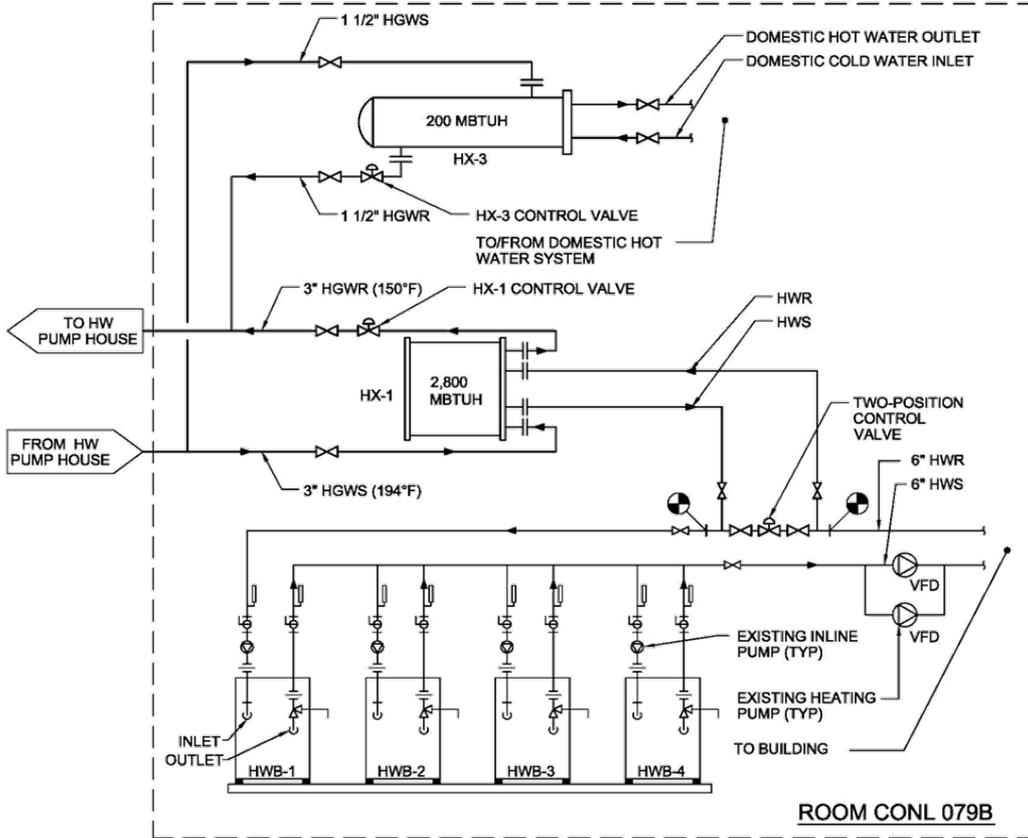
- JGC416
- 56% Efficiency
- Offsets 100% of Facility Energy Needs (~12,000 MMBtu/Yr) (350,000 SF)
- Section 1603



Pump House / Utility Building



Typ. Building Flow Diagram & HX's



Lonely Equipment



Balancing Multiple Objectives

“Two-Sided Green”

- Reduce the Cost of Healthcare
- Achieve Energy Independence
- Decrease Emissions Harmful to Health
- Decrease Emissions Harmful to Environment
- Use Renewable Resources
- Reduce our Dependence on Fossil Fuel
- Provide Benefit to Regional Economy
- Local Jobs
- Improve Patient Experience & Cost
- Partner with Public and Private Organizations
- Make Cost Effective and Sound Investments
- Hedge against inflation
- Power Security/Reliability
- Wisconsin imports nearly \$20B in fossil fuels each year...every bit of local production keeps dollars in our region



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