Minnesota
Energy Design Assistance (EDA) Program

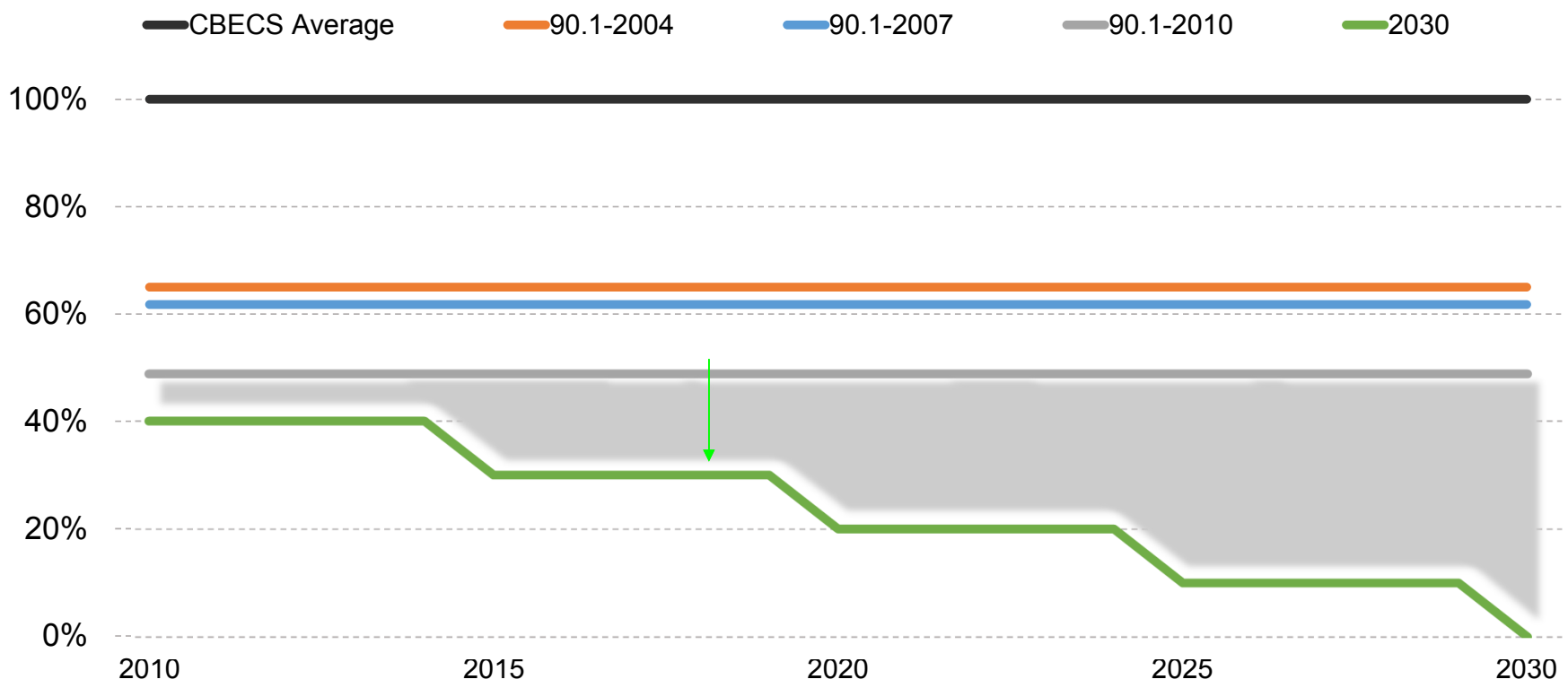
Brian Wass

THE WEIDT GROUP®

the energy practice of EYP Inc.

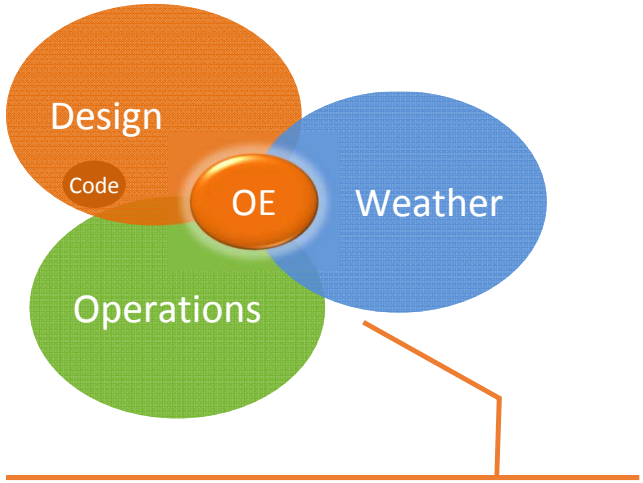
Context

Reduce Energy Use



Building Energy Use

- Energy consumption in buildings is the result of:
  - Efficiency of the physical assets – walls, windows, lighting, and HVAC system efficiencies
  - Level of service – hours of use, and activity type
  - Operation and maintenance – how well the controls are operated and how well the buildings physical assets have been maintained



Models for ratings isolate these factors to find strategies to improve a building and compare to others in fair and credible ways

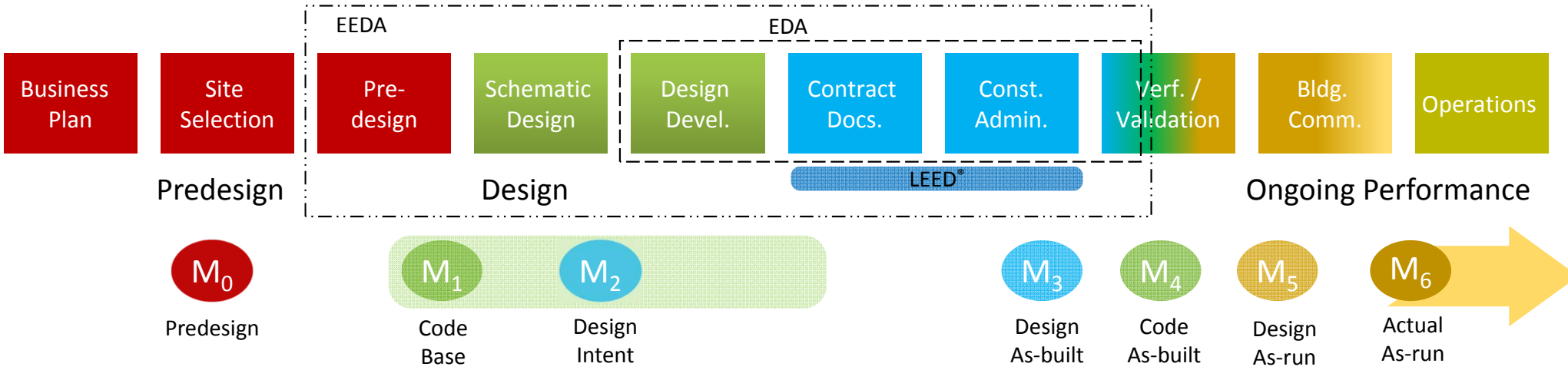
Energy Efficient Buildings

How do we get there?

Building design fixes the load	Efficient systems meet the load	Energy sources to fuel systems	People run the systems
Building shape	Envelope	Wood	Schedules
Building volume	Daylighting	Sun-active heat	Controls
Glass location	Lighting	Sun-photovoltaics	Maintenance
Glass area & type	HVAC	Wind generation	Setpoints
Insulation values	Controls	Solar electricity	Windows
Thermal mass	District heating	Gas co-gen	Equipment
Lighting concept	Domestic hot water	Micro turbines	Education
Mechanical concept		Fuel cells	Ongoing M&V
Minimize load as a first priority	Use simple, cost-effective systems	Use appropriate sources of energy	Operate the building well
M_0	M_1 - M_2		M_5

Energy Models

From Design through Operations



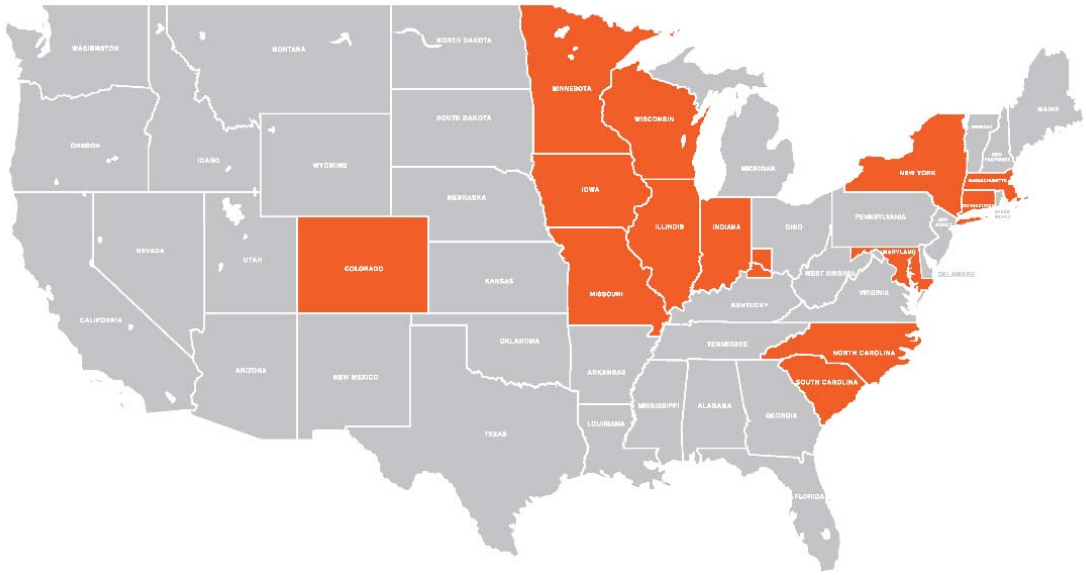
Design models create opportunity to minimize energy consumption in the proposed design

Operational models, together with regularly updated real information, including metered data, create the best opportunity for continuous reductions in energy consumption

Energy Design Assistance

The Weidt Group

- 35+ years experience
- Commercial new construction consulting for utility programs in 13 states
- 2,000+ commercial energy modeling consultations each year
- 12,000+ B3 benchmarked buildings
- 2% nationwide new construction in an average year*
- 800 new construction or renovation project engagements annually



** Compared to SF per year of new construction from CBECs*

Participating Minnesota Utilities

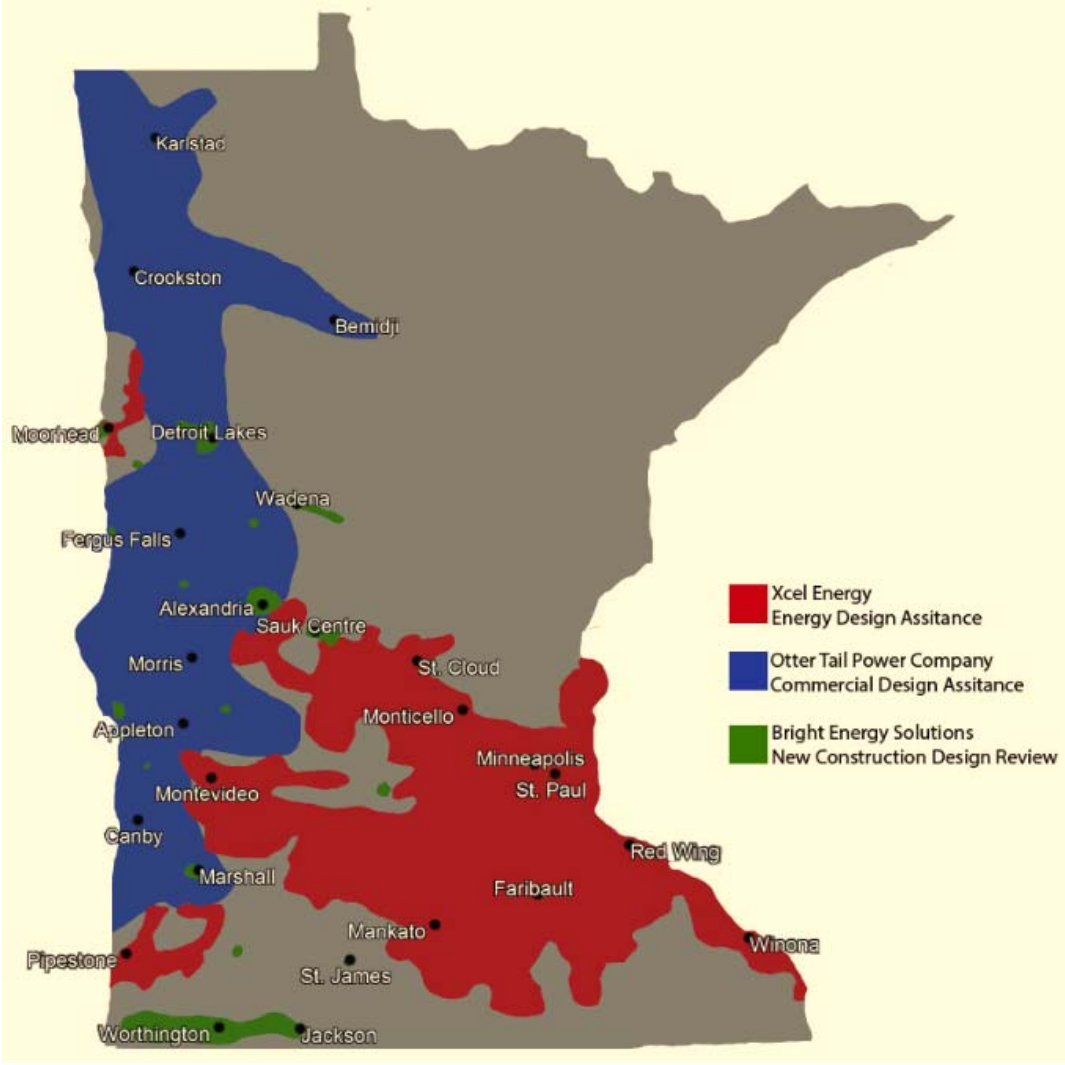
Energy Design Assistance

Xcel Energy®

CenterPoint Energy®

Otter Tail Power Company

Bright Energy Solutions
Saving energy. Saving money.



What is Energy Design Assistance?

- A comprehensive approach to energy and cost savings for business new construction or major renovation projects
- No charge - free service provided by utilities' conservation improvement programs
- To qualify:
  - A business electricity or natural gas customer of participating utility in Minnesota
    - Note: customers who only have gas service qualify for other programs
  - Constructing a new building, adding to an existing building, or renovating an existing space including HVAC and lighting upgrades
  - Project size – generally greater than 20,000 sq. feet
    - 5,000 sf Otter Tail Power and Bright Energy Solutions

Incentive Program Overview

EDA Standard

- Construction projects with stated energy savings goals in mind
- 5,000 to 20,000 sf and larger
- Schematic design or early design development
- Minimum of 5% electric demand savings, 5% electric consumption savings, and 5% natural gas savings
- Basic services:
  - Energy modeling results for efficiency strategies
  - Site verification of installed strategies

Incentive Program Overview

Enhanced EDA *

- Ideal for owners and design teams interested in early goal setting and evaluation of energy efficiency options
- 50,000 sf and larger
- Pre-design or early schematic design
- Minimum of 30% electric demand savings, 5% electric consumption savings, and 5% natural gas savings
- Registered for verified green building certification
  - Such as LEED or Minnesota B3/SB 2030
  - Additional energy modeling provided if demand savings minimum is met
- Participate in at least two additional modeling reviews
  - Massing, daylighting, or early HVAC analysis

* Bright Energy Solutions does not provide EEDA

Incentives

Depends on the amount of Energy Saved

Building Owner Incentive

- $400 per peak kW, $270 Bright Energy Solutions
- $0.04 per kWh, none Bright Energy Solutions
- $5.00 per Dth for Xcel Energy gas customers
- $3.50 per Dth for CenterPoint Energy gas customers

Design Team Reimbursement

- Xcel/CenterPoint: $4,000 to $12,000, varies by size
- Ottertail Power: Project by project
- Bright Energy Solutions: None

EDA Program Process

EDA Standard – Three steps

EDA Program Process

Step one

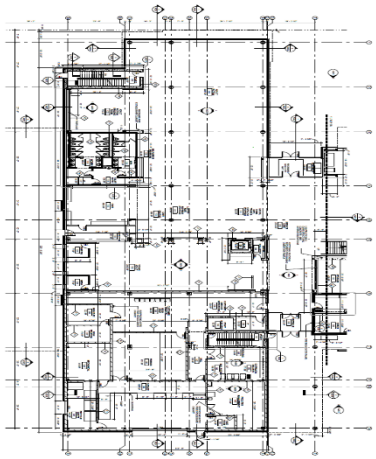
1 Introductory Meeting

- Conference call/web meeting
- Program overview
- Review project scope
- Discuss goals and efficiency strategies

EDA Program Process

Step two

2 Energy Analysis/ Results Meeting

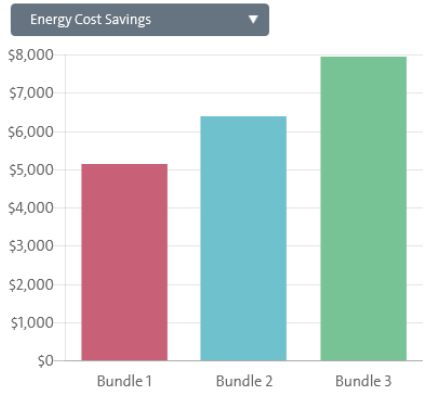


- In-person or conference call/web meeting
- In a team exercise, create “bundles” of strategies or virtual buildings to see how selected options perform together
- Review energy modeling results and estimated utility incentive
- Select a bundle of energy performance strategies anticipated for inclusion in the final design

EDA Program Process

Net Energy Optimization

Savings vs Baseline	1 Bundle 1	2 Bundle 2	3 Bundle 3
Energy Cost Savings	$5,138 11 %	$6,381 14 %	$7,935 19 %
Peak Electric Savings (kW)	7.5 7 %	11.4 10 %	16.9 15 %
Electric Savings (kWh)	25,112 9 %	35,344 12 %	40,830 15 %
Gas Savings (Therm)	2,516 26 %	2,474 26 %	3,501 33 %
Incremental First Cost	$68,993	$71,825	$127,001
Projected Incentive	$4,217	$4,785	$7,281
Net Incremental First Cost	$64,776	$67,040	$119,720
Payback with Incentive (yr)	12.6	10.5	15.1
Energy Use Intensity (kBtu/ft²/yr)	51.0	50.0	46.6



Summary Results

Strategy Options

Strategy Selection

Tab by Area | Tab by Category | No Tabs | Filter

Mechanical | Architectural | Lighting | Plug Loads

Strategy / Facility	Savings vs Proposed: Electric Peak kW	Electric kWh	Gas Therm	Energy Cost	Inc. Cost	Payback yrs	Bundles
Beyond premium efficiency pump motor	0	19	0	$2	$3,835	100+	1 2 3
Heating water system pump head at 62.82 ft	0	167	-3	$17	$5,433	100+	1 2 3
VFD on building heating water pump	0	623	-13	$63	$383	6.1	1 2 3

Bundled Options

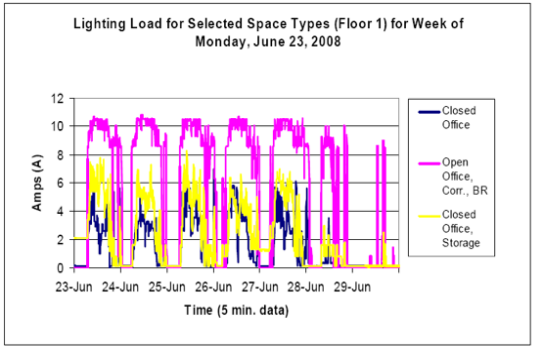
EDA Program Process

Step three

3

Verification

- **Site Verification**: Post-construction, The Weidt Group visits the project location and confirms implemented strategies
- Weidt prepares a final report for Utility
- Utility sends incentive check to the Owner



EEDA Program Process

Two plus steps, then EDA Standard of Three steps

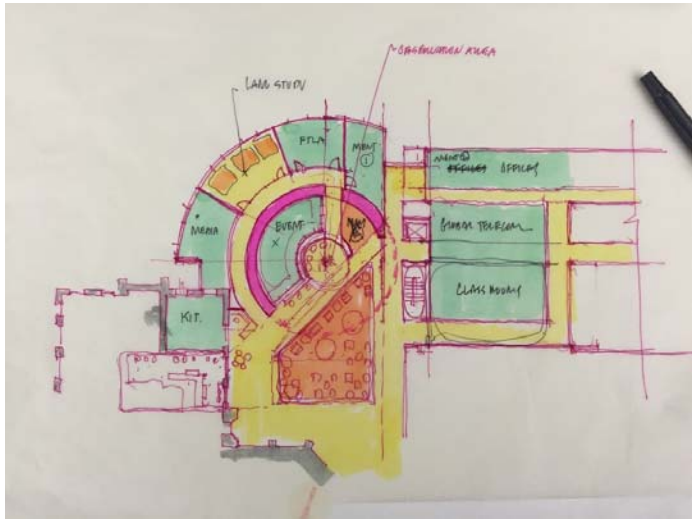
Goal Setting Meeting

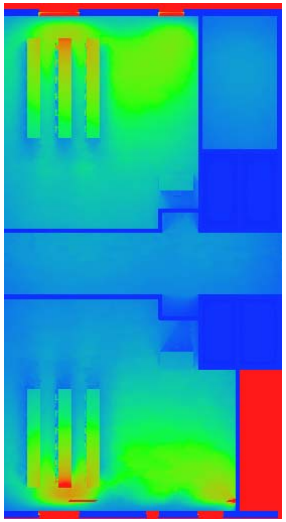
Massing, Daylight , or HVAC Analysis

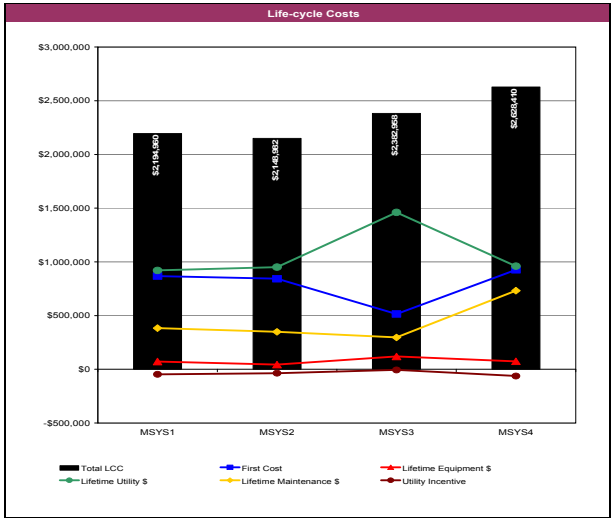
1 Introductory Meeting

2 Energy Analysis

3 Verification



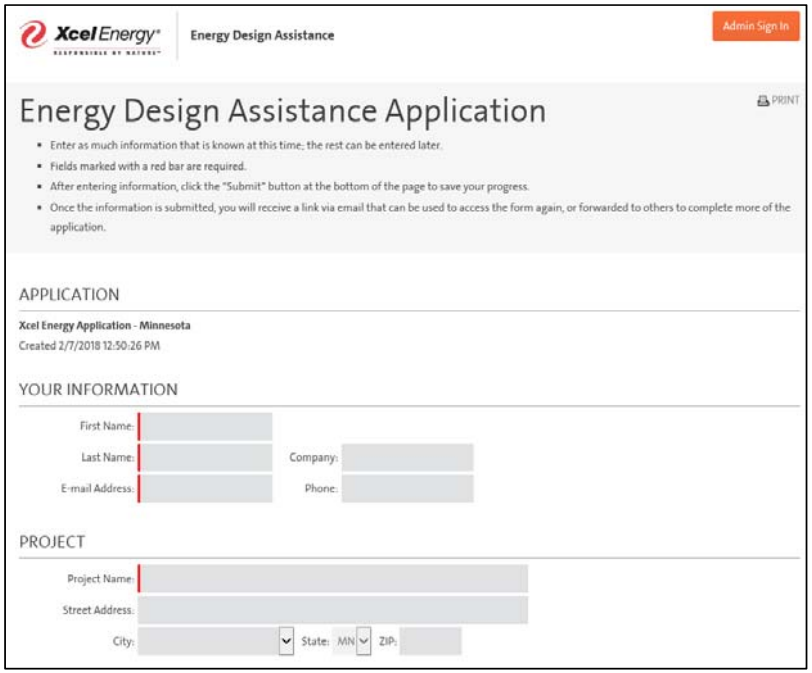




Next Steps

How to enroll

- Determine if project qualifies
  - Contact Alex Fritz
- Complete Utilities' application form
- Sign application program terms & conditions
- Note: there are no contracts or agreements with The Weidt Group
  - Free service provided by utilities' efficiency programs
- Utility approves application
- Weidt schedules introductory meeting



Thank you

Questions?

Brian Wass

AIA, CSI, LEED AP BD+C

brianw@twig.com

952 938 1588

Alex Fritz

Program Outreach Coordinator

alexf@twgi.com

952 939 1852

Thank You

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Brian Wass, AIA, LEED AP BD+C

brianw@twgi.com

A Coordinated Process

Verification
Update for implemented energy conservation measures to ensure valid model for diagnostic work

Ongoing Performance
Evaluate operation of building based on actual conditions to determine additional savings potential

Goal Setting
Evaluate viability of energy efficiency goals and inform major design decisions

Detailed Analysis
Tune interactions between building systems in conjunction with building system performance modeling