



Optimal Design & Delivery of Industrial Conservation Programs

By

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Outline

- Energy Consultants
- General Program Priorities
- Comparison of Regional Programs
- Customer Priorities
- Summary

What are Energy Consultants?

- Identify energy efficiency measures
- Assess and cost measures
- Assist in design & implementation
- Plan and perform commissioning
- Perform final inspection
- Provide corporate energy management

- We are some of the “front-line troops” for industrial energy efficiency.

Cascade Energy Engineering

- Started in 1993
- 17 engineers
- 3 offices – WA, OR, & UT
- Largest industrial-specific energy efficiency consulting firm in North America...?

Our Focus

- Only industrial (little or no commercial)
- Mostly electricity-saving projects
- All industrial technologies
 - Industrial refrigeration, compressed air, pumps, fans, lighting, etc.
- All industrial sectors
 - Food processing, petrochemical, high-tech, wood products, pulp & paper, primary metals, etc.

What We Do

- Energy-Focused Capital Project Studies
 - New Construction
 - Retrofits
- Design Assistance
- Commissioning (Kaizen Blitz)
- Measurement & Verification (M&V)
- Corporate Energy Management
 - Program Design
 - Program Implementation
 - Software & Services
- Speaking, Training & Seminars
 - IIAR, RETA, ASHRAE
 - Corporate Retreats (SYSCO, US Cold Storage, Henningsen, Frick)
 - Industrial Refrigeration Best Practices Training

Achievements

- Delivered 170,000,000+ kWh/yr of projects within PacifiCorp FinAnswer program during 2001-2007.
- 1 of 3 ETO Program Delivery Contractors (PDC's)
- We are the corporate energy management firm for SYSCO Food Services (\$35 billion/yr in sales).
 - 105 distribution centers
 - 600 man-days onsite performing commissioning
 - Tracking 450+ utility bills and 170 pulse meters
 - Energy intensity (kWh/day/ft³) reduced by 22% over 18 months
- Recently awarded the ETO Small Industrial Initiative contract.

Sample Clients – Food Processing & Cold Storage

- SYSCO
- Kroger
- Nestle
- Henningsen Cold Storage
- Simplot
- ConAgra

The “Facts of Life” for Industrial Customers

- Customers have limited capital
- Customers are often focused on increasing revenue
- Energy is often considered a fixed cost
- Customer staff are stretched thin
- Corporate or site-specific attention to energy is often limited
- There is often a disconnect between corporate mandates and resources at the plant level
- The bigger the company, the more difficult to make inroads without a high-level advocate
- Most companies require payback of 1 to 3 years
 - There are limited efficiency opportunities within this range⁹

The “Facts of Life” for Efficiency Projects

- Project must be economically viable.
- Energy projects compete with production, safety, expansion, etc. for finite capital.
- Efficiency is at best “3rd place”
 - #1 Safety
 - #2 Production
 - #3 Efficiency / Sustainability

In General, What Works?

- Focus on building long-term customer relationships
 - You want the customer to think of you or what you offer when an opportunity arises
- Programs & other regional efforts must be:
 - Consistent
 - Simple
 - Clear
 - Responsive & Accommodating
 - Apolitical

In General, What Hurts?

- Wild swings in programs
 - Design & Funding
 - Industrial efficiency is slow to develop. Sensitive infrastructure is severely damaged by on/off mentality.
- Secretive programs
 - Incentives are negotiated, custom, or hidden from public
 - Customer doesn't know what they are getting into
- Too many players
 - Confuses customer
- Obsession with "free riders"
 - Very small, budget for it
- Not focusing on building relationships
- Making customers, vendors, contractors, or consultants shoulder unreasonable burden or risk.

Risk

- Customer Risk
 - Unfamiliar with program
 - Unfamiliar with energy consultant
 - Unfamiliar with recommended technology
 - Sharing process information with outside parties
 - Possible delay of new construction
- Vendor/Contractor Risk
 - Possible delay of new construction
 - Delay allows competitors to swoop in
- Energy Consultant Risk
 - Time up front pursuing or responding to leads
 - Vouching for program with vendors/contractors
 - Often asked for numbers (accountability) with insufficient information.
- Utility / BPA Risk
 - Unproductive studies
 - Free Riders (would have implemented without incentives)
- Everyone
 - Underperforming projects

Through the Customer's Eyes....

- I'm unfamiliar with this program.
 - "I have to trust the incentives will really be delivered"
- I'm unfamiliar with this energy consultant.
 - "Do they know what they are doing"
- I'm unfamiliar with the technology
 - "Am I a guinea pig?"
- You (the utility) need kWh to meet your goal.
 - "Who is this really about?"
- You want ME to co- or fully-fund a study under these conditions?
 - "Why would I want to do that?"

Regional Program Comparisons

ACTIVITY	PacifiCorp	Energy Trust	Idaho Power	BPA
Incentives	12¢ / 50%	15¢ / 50%	12¢ / 70%	?
Scoping Study	100% Funding	100%, 24 hr.	100%, \$3000	?
Detailed Study				
Funding	100% Funding	100% Funding	50%, \$10k Max.	?
If No Implementation	Reduced Effort	80% Funding	?	?
Commissioning				
Required	For Full Incent.	No	No	No
Payee	Customer	-NA-	-NA-	-NA-
Final Inspection/M&V				
Documentation of Costs	Standard	Standard	Standard	Standard
Revised Savings:	Standard	Limited	Limited	Standard

Note: Most projects cap on percent of project cost

What is Scoping?

- Short site visit, analysis, & report to:
 - Meet with customer, vendor, contractor, utility, etc.
 - Note majority of promising measures
 - Review customer payback criteria, availability of capital, etc.
 - Present very rough economics & brief report
 - Gauge customer interest & commitment
- Typically 16-24 hours of engineering
- Similar to a low-risk “first date”

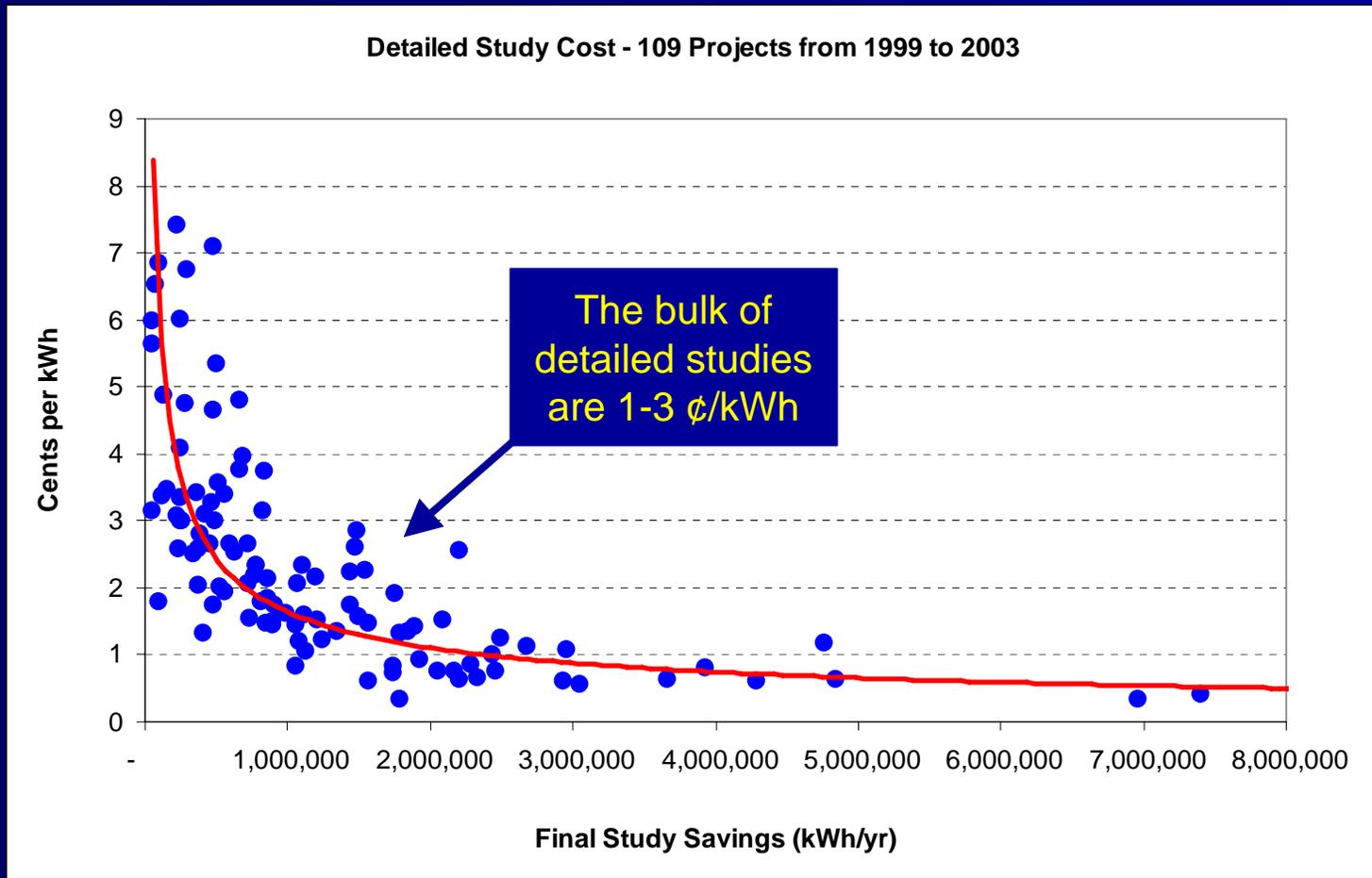
Why is Scoping Critical?

- Helps avoid unproductive detailed studies
- All scoping work has value toward a detailed study
 - Without scoping, must budget for unknowns in detailed study
- Provides ALL customers with service
 - Even if no cost-effective measures are identified
- The result is always beneficial

Detailed Studies

- Used by customer for in-house justification
- Defensible documentation of baseline
- Rigorous analysis for savings
- Detailed cost estimates or actual bids
- Opportunity to align customer, vendor, contractor, utility, and consultant
 - Specify hardware & upgrades
 - Outline control algorithms and set points
 - Clarify intent & goal of upgrades
 - Improves project performance
- Commissioning and/or M&V plan
- Documentation for later realization rate & persistence assessment

Typical Detailed Study Cost



Perceived Value of Co-Funding Detailed Studies

- “Customer needs skin in the game”
 - Customer’s time is “skin in the game”
- Actual impact of co-funding is to:
 - Drive away legitimate participants
 - Fail to deter free rider participants
 - “Sure, I’ll co-fund a \$10,000 study to get a \$50,000 incentive”
 - Ensure a higher ratio of free riders to legitimate projects

What is Risk of Co-Funding or No Funding?

- Drives away good customers or projects due to risk and/or complexity
- There is a real admin cost associated with complexity
- Forces energy consultant to contract with both customer and utility
- Adds critical delays to time-sensitive projects (e.g., new construction)
- Risks falling short of conservation goals (I-937....)
- "Stepping over dollars to pick up pennies"
 - Scoping\$ + Study\$ + Incentive\$ + M&V\$ + Admin\$ = Total\$
 - 1¢ 1-3¢ 5-15¢ 1¢ 3¢ = 11-23¢

Are these risks worth eliminating half of this?

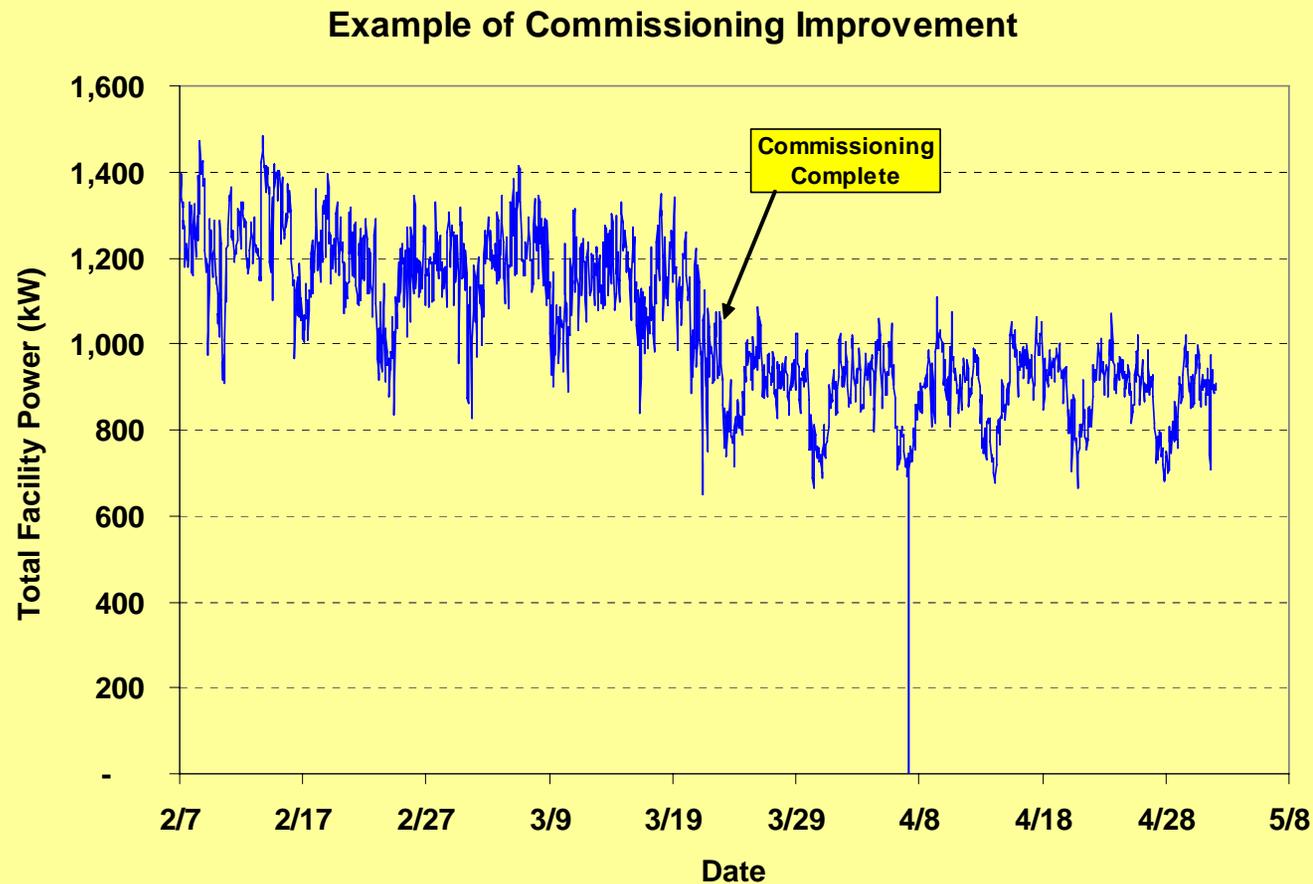
Commissioning

- Fine-tuning of:
 - Control set points
 - Control algorithms
 - Operating practices
- Training opportunity
- Maximizes savings
- Productive toward final inspection or M&V

Commissioning is an Intensive Relationship Builder



Example: Impact of Commissioning



Final Inspection / M&V

- Documentation of As-Built Savings
 - May require remodeling
- Documentation of As-Built Costs
 - Presentation of actual invoices
 - Challenging on new construction due to incremental costs & defined baseline

How to Inspire the Customer

- Competence
 - Savvy in technology and industrial processes
 - Have to be able to “talk the language”
- Experience
 - Promotion of products and technologies that are proven, minimally intrusive, and add limited burden to staff.
 - Be able to point to successes at peer facilities
- Understanding & Listening
 - Understanding the processes, people, equipment, politics, and other realities the customer deals with
 - Meet the customer where they are – listen, don’t tell
- **If these are done properly, you will inspire the customer to implement**

Summary

- RELATIONSHIPS, RELATIONSHIPS, RELATIONSHIPS!!!!!!
 - These take years, perhaps decade+
 - You must EARN the right to offer advice and intrude in management and process decisions
 - Inspiration and permission are the magic combination
 - They allow you to be at the right place at the right time