Engaging Large Industrial Customers

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ABSTRACT

The manufacturing sector comprises sophisticated plants with a reduced workforce, compared to the previous decades (Bureau of Labor Statistics 2015). Energy conservation in industrial facilities is commonly the most cost effective resource in a multi-sector utility program. However, keeping large industrials regularly engaged and preventing staff turnover from affecting a steady flow of conservation projects is an ongoing challenge. So, how do we open doors and build a foundation for sustained energy efficiency engagement? We will share our collection of experience and real examples with successful large industrial engagements. This paper will explore the following:

- Using gateway projects to open doors. What are good gateway projects?
- Leveraging motivations to explore and implement energy conservation measures. Beyond the energy economics. What gets plants to commit?
- Tools to deploy while on your first site visit in a plant that is overwhelming.
- How to develop rapport with an industrial. What not to do.
- Using Retro-Commissioning approaches to earn trust with data driven presentations and results.

Key takeaways for the reader will be to:

- Build meaningful relationships for sustained energy efficiency contributions to a utility program, beyond the low hanging fruit.
- Have a better understanding of how to approach a difficult to engage market.
- Learn more about what non energy benefits to focus on, how to "leverage" an efficiency project.
- Provide examples where traditional "non-participants" were re-engaged and became regular participants in an Industrial conservation program.

Introduction

Nationally there are a multitude of approaches to Industrial energy efficiency program delivery. Most programs are successful and accomplish goals while keeping costs in check. This is largely due to experience in the industry and a wealth of knowledge in the demand side management (DSM) delivery field. However, not all programs innovate and respond to the needs of industrial customers. Adapting to the needs of industrials is critical to retain engagement. Having the right program offerings makes energy efficiency an easier sell. While we will not focus on how to be innovative with a DSM program within this paper, we will share some effective program offerings and why they work. We demonstrate approaching industrial engagements with agility; providing knowledge and value to unlock potential. Based on experience and research we offer examples of breaking the ice with large energy users, garnering trust and delivering results back to the utility.

Our experience is mostly focused within the Pacific Northwest (PNW) region. Annually we deliver (outreach, analyze, incentivize, commission and verify) over 80 industrial energy conservation projects. We also provide energy engineering services only for over 150 additional commercial and industrial projects. We are responsible for managing relationships and continuous engagement with dozens of large industrial energy users. A few commitments beyond the region have opened our eyes to the variety of energy program approaches to industrials on an international level. The core of our methods rest upon strong technical expertise, mindful contact and excellent listening skills. First, I would like to explain a little about our perspective in the PNW. A quick background on the Industrial EE market Energy 350 primarily works in:

1. Most industrials are paying in the range of 5-7 cents per kWh and 4-8 dollars per peak kW/mo.
2. In Oregon large energy users can decide to opt-out of conservation Public Purpose Charge (PPC) fees through a self-direction pathway. However, each year fewer are opting out due to the success of the CRM funded program (Chittum 2011)
3. Most large industrials do not purchase gas from the local utilities and therefore cannot participate in natural gas efficiency programs.
4. Conservation CRM fee is around 1.7% of total electric bill. (ODOE 2015)
5. Investor owned utilities are both deregulated and decoupled meaning that efficiency doesn't compete directly with utility revenue.

For the purposes of this discussion we define large industrials as a site that consumes more than 20,000,000 kWh/yr or 600,000 therms/yr. More distinctive large industrials have the opportunity to conserve a significant amount of energy and sustain energy management.

Breaking Down Engagement

Establishing a Relationship

Before any engagement happens an introduction must take place. A meeting between you/your staff and a target customer to build a relationship. First impressions matter, in fact they matter a lot. Many large industrials are thin on staff, highly focused and very results oriented. It is critical to prepare for an introduction. However, in order to avoid sinking into a black hole of preparation and consuming far too much time on a project that may not come to fruition, we advocate for a balance between preparation and time with a few ideas below:

1. Know who your customer is. What does the plant produce? Lightly research (10-15 minutes) on the company's website reviewing the Products or Markets webpage. Try to understand their business interest at a basic level (i.e. cold storage facilities are focused on maintaining product freshness).
2. Review a satellite image. Spend 3-4 minutes reviewing the plant site from the air. A seasoned eye will spot support systems, processes and critical equipment to be well prepared for conversations that may arise.
3. In addition to reviewing any documentation on file regarding your potential site, look for an environmental statement on the company's website. Often a company will highlight energy conservation projects they have implemented in the past.

4. Draw upon knowledge and case studies from similar manufacturing market segments to help connect with the site and apply available program incentives to their processes.

Introductions happen spontaneously as well. For instance you may cross paths with a target customer at a trade show or conference. Obviously preparation isn't in the cycle for these instances. Take it in stride, exchange contact information and agree to follow up and set yourself a reminder.

Now that there is an introduction meeting scheduled and preparation done, focus on effective approach, delivery and your goals. Here are a few basic rules to abide by when entering the first meeting:

1. Be yourself and be punctual
2. Listen and ask questions rather than talk
3. Offer compliments. For example, "I'm impressed with the cleanliness of your plant" or "Your new light fixtures present your plant very well".
4. Discover the sites priorities, interests or concerns.
5. Approach energy efficiency as a collaborative partnership rather than a sale of service. Often program delivery engineers can be positioned as valuable resources to assist in capital and strategy planning.

When constructing an agenda don't always share it with the site contact. Agendas are a great tool for operating a meeting in an established relationship. They demonstrate organization, thoughtfulness and professionalism but they also can close the door before it ever opens. As an example of this point, we were once hired to conduct a technical study in a large facility. It was a big deal for our firm and we wanted to hit a homerun. So, we constructed an agenda for the first meeting to communicate thoroughness, organization and time management. The chief engineer took one look at the agenda and canceled the meeting. We were left in awe to reflect on failure. We learned from this experience. What had happened was the engineer became uncomfortable with engaging. We were fortunate to de-brief and learned that the agenda, while trying to be comprehensive, touched in some sensitive areas of the process. More specifically, they knew they had issues with the chilled water plant running efficiently but they did not want to explore those opportunities at this time. The primary interest was on other systems. Just by mentioning "Review Chillers" on the agenda we lost the opportunity for a meeting. Make an agenda for yourself and write it on your notepad but save the formal agenda for later or keep it high level when first going in.

First Win/Win Project

Our goal is to influence completion of energy efficiency projects and deliver incentive payments or services whenever possible. When confronted with breaking the ice at a new site, the first energy efficiency project can often range from being very easy to extremely hard. Sometimes we find the plant's concept of an energy project is not always aligned with the utility program definition of an energy project. This is where agility and masking the challenges of the internal program hurdles from the participant are critical. For example a site may present converting their propane fork trucks to electric fork trucks as an efficiency measure. While this may offer an energy efficiency improvement to the site, most programs must abide by fuel switching policies (i.e. improving efficiency by switching fuel sources) and these policies can be

difficult for industrials to understand. It is up to the delivery staff to navigate the project and policies effectively. Redirecting attention to a high potential energy conservation project is a skill that is necessary and takes practice. Expanding on the last example, if a site is going to convert to electric fork trucks, inquire on the status of that decision. Ask questions like "Have you considered the infrastructure required for battery charging?" Will any new HVAC equipment be required to support the systems? Do you have options regarding the energy efficiency of the new equipment? Often discovery of a potential project can lead to a design review and hopefully influence a more energy efficient system along with an eligible energy project.

A rudimentary approach to assessing opportunities at a new site is to ask about planned capital projects. Where are they planning to spend future money? Consider support systems, options, design reviews and discuss when and where energy conservation incentives can be applied to leverage projects under consideration. It is much more difficult to influence the consideration of an additional project at a new site versus influencing the design on an existing. Collaboration, good engineering consultation and the lure of incentives are the tools to get a seat at project update meetings where efficiency decisions can be monitored and enhanced upon.

Even sites that are willing to have you engage in these meetings take time to build relationships and trust. It often makes sense to introduce gateway projects which can be used to establish these relationships. Gateway projects are those that are low or no risk for performance, minimal time requirements of staff and typically have a high rate of return. Table 1 provides a few ideas to consider.

Table 1. Gateway projects for large industrials

Project	Why it works	Potential risks	How to avoid risk
Custom O&M	O&M is typically lower cost and an easier sell than traditional capital projects. Custom O&M can fit any manufacturing process and helps systems operate better.	The persistence of O&M projects is difficult. Delivery staff must be closely engaged with the site to identify and recommend persistence strategies that will be effective.	Demonstrate the value of energy efficiency. Communicate in terms and units that connect with plant staff. Not everyone knows order of magnitude of a kWh or Therm.
Lighting	It's visual. Lighting can be observed by all employees. Energy savings are very straight forward to quantify and demonstrate and typically pay back in a short timeframe.	Under performing systems must be avoided. An experienced lighting vendor will ensure proper equipment selection to meet or exceed performance of the existing system.	Start small. Do a demonstration project to prove the concept and get a quick win.
VFD retrofits	VFDs offer a new capability to controls. The ability to change the	In some cases VFDs do not conserve energy.	Proper energy engineering and due diligence is

	speed of a motor driven load offers increased flexibility for the plant staff.	Understanding plant processes is critical to selecting the correct applications for a VFD.	required to ensure the appropriate control strategies are implemented. Review the implementation of every project.
Compressed Air Demand Reductions	Compressed air is a costly resource. Demand reductions are often low cost. Consider leak repairs, solenoid valves and operational practices to limit the use.	Often a cultural resistance to taking compressed air demands seriously.	Communicate the cost of a compressed air leak. Share case studies. Fixing leaks never has a negative impact on production.

Once a project is mutually agreed upon by both the site and utility program, provide white-glove service. Make sure the application process is smooth. Listen to the site. Take cues from your point of contact and communicate with their preferred method. Meet in person to discuss program forms whenever possible. Respond in a timely fashion and be professional.

A potential pitfall to building a relationship with a customer are the hoops that they may need to jump through in order to comply with utility program requirements. Utility incentive programs can be an extra step to take prior to purchasing equipment. Some programs are able to process applications with minimal to no delays, while others have a longer process. When the construction schedule is delayed for an incentive application regular communication is important. Perhaps more important however, is establishing application timeline expectations up front with the site. Careful attention to masking the internal program hurdles and providing excellent customer service are critical on a first project. Incentives estimates should be conservative, set realistic timelines and manage the project effectively through the process to ensure the site not only complies with the program requirements, but that it meets their objectives for equipment purchase and installation schedule.

Sustaining Engagement

Building a long term relationship takes commitment, knowledge and the ability to continually provide value. Long term value refers to being time efficient, beneficial to the plant, providing useful resources and support that fills a need. It takes a team of individuals to support any energy efficiency engagements and all must be committed to a sustained engagement to be successful.

Repeating successes with a site is extremely valuable to energy conservation programs and they are equally valuable to any large industrial. A great example of a repeated success is rolling out multi-phase implementations to break a large project into manageable sizes that fit with the plant's budget over several years. Most large industrial sites have the size and complexity to allow for duplication of similar projects. And, since both the program and site are familiar with the project, these projects tend to flow very smoothly through the incentive funding process.

Managing an engagement with a large industrial customer is much like managing a retirement investment account; a portfolio of both projects and relationships is key to sustaining success. At any time a project or relationship can fold and therefore having reserves ensures long term site commitment to energy management. Energy conservation should never be dependent on a single individual at an industrial site for consistent results and sustained engagement.

Managing the Dreaded Failure

Equally important to repeat success is learning from failures. A great quote from former UCLA basketball coach John Wooden is "Failure isn't fatal, but failure to change might be". It is crucial that any failures are outweighed by subsequent reflection and forward progress on the next project. Recovering from a failure is not easy. Learning from experience, several PNW industrial sites implemented lighting projects as early adopters of a new technology over 10 years ago and still feel a little hesitant towards energy efficiency programs due to inferior product quality at that time. It is not easy to turn the relationship around but very possible with the right approach. Some tips to consider when faced with the reality of a failed energy project:

- Advocate for a constructive meeting between utility, site and vendor to discuss issues.
- If at all possible review implementation and rule out a strategy that would correct the situation.
- Identify why the failure occurred. Utilize root cause analysis techniques or a 5-why's approach (iSixSigma 2015).
- Mutually agree to recover with a successful project.

While not all energy projects can be salvaged due to a variety of reasons, it is often the case that relationships can. Fostering a trusting relationship with an industrial by demonstrating willingness to explore additional strategies and discussing why a project ultimately failed will often leave the door open to future engagements.

Diversifying Industrial Energy Efficiency

Offering O&M and RCx Programs Leads to Engagement

Going beyond gateway projects such as lighting and compressed air is critical to meet the needs of industrials and build a trusting relationship with the utility program operator. In our experience, momentum with industrials begins to fizzle over time if a variety of projects – both new and old – are not continually considered. Often capital is difficult to secure for most projects, especially those that don't directly contribute to sales of additional product, as is often the case for an industrial in the manufacturing sector. For this reason we favor building a portfolio complete with O&M or Retro-Commissioning (RCx) projects to keep industrials continually involved. O&M projects tend to be very low cost, have short paybacks and compliment safety and quality programs at sites thereby leveraging other aspects of plant operation. Although utility programs often struggle with measure life and persistence rates of O&M or RCx measures, these strategies commonly yield highly cost effective savings at low lifetime levelized cost, even with conservative measure lives (Energy Trust of Oregon 2013). Some examples of successful applications of O&M or RCx projects to look for at a site include:

- Tune automation systems to be demand based.
- Actively utilize all existing VFDs with control variables vs fixed speed.
- Adjust or implement reset algorithms for supply air temperature and static pressure control loops in VAV systems.
- Verify or implement daily and seasonal equipment shutdown procedures.
- Adjust or implement minimum speed setpoints on pumping.
- Repair compressed air, process gas and steam leaks.
- Eliminate operation of any back-up systems that should not be running.
- Maintain steam traps on a regular interval.
- Clean cooling towers and verify chemical treatment service and blowdown schedule.
- Sequence equipment to be most efficient.

A good RCx program can help build a strong relationship with sites due to the in-depth analysis and knowledge gained about plant system operations. Deploying highly skilled RCx engineers with a diverse background in multiple mechanical systems is key to the success of delivering cost effective RCx. One example of having a highly skilled team delivering results occurred at a chilled water plant that led to the plant operators calling upon the RCx team again at a later date. The site had been suffering from a chronic reverse flow condition and they were losing control of their system. While our RCx engineering team was never involved with any maintenance or operation of the system, they earned trust during the RCx engagement which led to a relationship that sustained. The plant operator responded by "turning over the keys" to the RCx engineer as a result of the past trust and success that was earned. A phone call such as that validates the value of a utility sponsored RCx program and why relationships can be strengthened and future efficiency projects realized when highly skilled individuals are used to deliver results.

To further illustrate this point we once had a site with a very large laboratory building that was commissioned and turned over 12 months prior to our visit. Even though the building was a LEED Gold project with complex highly efficient mechanical systems, the complexity of the systems led to potential for inefficient control. The site did not consider the building to be operating inefficiently but was open to allowing a review of the Building Management System (BMS) graphics. Upon review we discovered many conditions to be locked in manual mode rather than automated. We found that the systems were so complex no one individual understood how the system should be operating. By working with a BMS programmer we were able to unlock multiple control loops which then lead to shutting off approximately 250 kW of unnecessary load. At a follow up visit, six months later, the building was operating to the satisfaction of the owner and the changes had persisted. The lesson to be learned is energy efficiency engineers may find large opportunities in what are thought to be highly efficient systems.

O&M initiatives are an excellent gateway project at a new (to the program) site. If a program delivery representative can offer a no cost/low cost solution that will improve operations, make the systems more reliable and conserve energy, doors open. Once that happens, more projects and relationships are likely to be discovered and a deeper level of savings can be attained. Almost all O&M and RCx engagements identify additional capital projects to consider down the road, and can provide the site with a list of future projects and estimated budgets to work towards implementing.

Finding and Using Leverage

In the context of mechanical systems a lever arm provides a force multiplier and allows actions that otherwise would not be possible. Much like breaking a bolt loose with a wrench, efficiency programs seek to move energy conservation projects from concept to reality. Every industrial plant has potential to be leveraged into doing energy projects and in some cases incentives help tip the economics to be favorable to the site. But often incentives alone are not enough. In some cases the energy savings of the project are not the primary driver and we must identify and leverage the real driver. These projects tend to have a longer simple payback when considering energy savings alone.

Listen to Discover

Listening leads to discovering which enables successful strategies. Listening can make the difference between delivering results and a lot of wasted time. Energy conservation delivery professionals should excel at presenting the economics of a project to a site and know the ins and outs of utility energy incentives. They must also be exceptional listeners. The subtle statements in a project conversation can be the most impactful. Try to have the project contacts open up and share the internal conversations that are happening behind the scenes. To reiterate a key tip for engagement: ask questions rather than present potential solutions.

There are often many sources of leverage within an industrial plant. For purposes of this discussion, we categorize leverage in two buckets; Relational Leverage and Technical Leverage.

Relational Leverage

We consider relational leverage to be a utilization of relational capital. In other words calling upon the established relationships with customers, vendors and other important constituents. Some examples of where and how to leverage relationships are as follows:

- Build relationships with contractors, vendors, equipment manufacturers and trades organizations.
- Regularly invest time and resources to industry groups. Have a presence.
- Share case studies and regularly work to develop new case studies to keep the library fresh and applicable.
- Share ideas and contribute when applicable.

We recently identified a few industrial sites that were not interested in participating in conservation programs. They were traditional “non-participants”. A number of companies had large facilities in the region and due to a single failed lighting project at one of the plants over ten years ago, word spread that the utility program was low quality. Even though multiple competing companies occupied the region they all talk to each other. It was truly a challenge to break the ice and earn enough respect to even get a meeting. The solution was not apparent at the time but upon reflection it is very clear.

While being involved in an unrelated project a vendor invited our program to present at an upcoming trade association meeting. The request was to attend the meeting and present general energy efficiency opportunities and incentives available to their industry segment. Our staff attending was well prepared with a robust presentation by an engineer with experience on

the subject and materials that were tailored specifically to the industry. Included were case studies and energy savings guides published by the applicable utility programs. Within the audience was one of the three target "non-participant" companies mentioned above. The attendee was impressed by how well the utility program understood the needs of their process and the strength of the incentives available. That presentation lead to a walkthrough at the site and as a result of the walkthrough, three energy conservation projects were identified and implemented within six months for a cumulative savings of over 1,200 MWh/yr. Upon completion of the first project we were contacted with invitations at two adjacent industrials. Currently there are projects under consideration in all of the sites and the leverage needed was simply attendance at the trade association meeting and a well prepared presentation.

Technical Leverage

Technical leverage is the diverse array of project leverage that can include:

- Traditional non-energy benefits
- Equipment lifecycle
- Process throughput improvements
- Deferred maintenance
- Addition of a new capability
- Compliance
- Availability of data
- Increased Safety

Industrials are commonly focused on shipping orders on time, safely, within product specification and profitably. In this sense energy projects can offer much more to an industrial site than solely contribution to profit. While cost savings is a primary sales point on all energy projects, other technical levers can be more effective at realizing projects. Whenever feasible the presence of other benefits and motivators must be recognized, studied, and communicated to the customer. Although quantifying these technical leverage points through traditional utility program channels may be difficult, alerting the site to their existence and potential benefit is likely to increase the chance that a project will move forward based on more than energy savings alone.

Conclusion

Large industrials are a key player in the national economy and a steady resource for energy conservation. Mindful and practical approaches such as those discussed in this paper can lead to impactful, sustained energy conservation engagements. Equally important is a conservation program that is tailored for the needs of industrial sites and a diverse portfolio of program offerings improves the odds to meet the needs across a broad array of industrials. With practice and a crafted approach the ice can be broken and a conversation regarding energy conservation projects can occur.

References

Chittum A. 2011. *Follow the Leaders: Improving Large Customer Self-Direct Programs*. Washington, D.C.: American Council for an Energy-Efficient Economy. http://aceee.org/research-report/ie112

Energy Trust of Oregon. December 2013. *Impact Evaluation of Energy Trust of Oregon's 2009-2011 Production Efficiency Program*. Portland, OR: Energy Trust of Oregon. http://assets.energytrust.org/api/assets/reports/PE_Impact_Eval_2009-11.pdf

iSixSigma. March 2015 *Determine the Root Cause: 5 Whys.* http://www.isixsigma.com/tools-templates/cause-effect/determine-root-cause-5-whys/

ODOE (Oregon Department of Energy). 2015 *Public Purposes for Investor-Owned Utilities.* http://www.oregon.gov/energy/cons/pages/sb1149/business/ppcinvest.aspx

US Bureau of Labor Statistics. Accessed March 2015 *Employment, Hours, and Earnings from the Current Employment Statistics Survey (National).* Database Query for Manufacturing Sector 1985-present . http://www.bls.gov/data/#employment