

Big Savings Fast: The Industrial Revolution of Efficiency

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ABSTRACT

As energy efficiency programs spread throughout the country, more industrial energy efficiency projects are coming to fruition. Commonwealth Edison (ComEd) in Chicago launched their *Smart Ideas for your Business* Program in June 2008. The market was ripe for the program, and interest was phenomenal. In the first program year, this commercial/industrial prescriptive and custom rebate program delivered 90 million kWh of gross savings to participants. Four months into the program, first-year incentives had all been reserved by participants, and there was a growing waiting list. Efficiency goals double for the second year of the program which launched June 1, 2009 and will almost double again for the 2010 program. Over three program years, ComEd has or will help commercial and industrial customers save 486 million net kWh. This paper discusses how the program met consumer needs and how the ComEd team expedited program delivery to initiate significant energy efficiency savings projects.

ComEd's service territory serves a large industrial base. As the program evolved, the energy savings generated from proposed efficiency projects include over 50% savings from the industrial and warehouse sector. While lighting projects dominate the program, the industrial sector is realizing savings from a range of energy projects. This paper details program savings achievements by sector and efficiency measure. This paper also highlights the top energy saving and/or innovative industrial projects to showcase how facilities saved energy.

Program Background

ComEd's 2008-2010 Energy Efficiency and Demand Response Plan (EEDR) was filed with the Illinois Commerce Commission (ICC) in November 2007, as a response to Illinois legislation that mandated energy efficiency initiatives. The EEDR plan was approved by the ICC in February 2008, and included services for ComEd's entire customer portfolio. EEDR programs were designed to achieve 1,216 GWh of energy savings by May 31, 2011¹ across all customer segments. The *Smart Ideas for your Business* suite of programs focuses on the commercial and industrial (C&I) market sector, and has specific 3-year net GWh savings goals for prescriptive and custom incentives, as shown in Table 1.

The new suite of ComEd programs brings EE spending for a big portion of Illinois to nearly 2% of the utility's total kWh sales. On average states were spending 1.7% of revenues on EE for on average of 0.8% EE savings as a percent of total kWh sales (Kushler, York & Witte 2009). Therefore, reaching ComEd's goals was aggressive for a state that had near zero spending on EE prior to the program launch.

¹ More information on the ComEd's portfolio and filings may be found at http://www.exeloncorp.com/ComedCare_Main/ComedCare/learn/EfficiencyFiling/

Table 1: Program Goals

Commercial/Industrial Savings Goals (GWh)	2008	2009	2010	Total
Prescriptive Incentives	43	87	168	297
Custom Incentives	19	74	95	189
Total Net Savings	62	161	263	486
Incentive Budget (\$ mil)	7	14	28	49

Program Launch

With the approval of its EEDR Plan in February 2008, ComEd needed to launch its EEDR programs by June 2008 to meet regulatory requirements—less than four months. While ComEd launched several programs under the EEDR plan, this paper focuses on the methods and approaches used to successfully quick launch ComEd’s *Smart Ideas for your Business* energy efficiency program.

With an initial launch target for June 2008, ComEd had to transform the approved February filing into a live program in a condensed schedule. The program had to not only meet its early energy savings targets, but also had to provide a solid framework upon which to grow efficiency measures in ComEd’s service territory, meeting plans to double the program in its second year, and double second-year goals for its third year.

In early May, ComEd selected KEMA as the C&I incentive program implementation contractor and Frontier as the central data store development partner to manage all EEDR programs. With two months until program launch, KEMA and ComEd worked quickly to decide and implement critical program design steps.

Setting Priorities and Deciding on Trade Offs

The top priority for the ComEd-KEMA team was building a strong, knowledgeable team within ComEd and with consulting partners. The addition of an external team allowed ComEd to bring in specialized expertise and have that specialized team work quickly to kick off the program in a timely manner. Then, the team established a unified program look and feel by developing umbrella branding for C&I energy efficiency services, naming the program *Smart Ideas for your Business*. With the brand came all the marketing collateral.

Recognizing the need for a fast start up in a market ready for energy efficiency, the ComEd team needed to make trade-offs, postponing some well-liked program elements to ensure a timely launch. All team members worked diligently to keep implementation moving things forward, requiring all parties to make decisions quickly and confidently. The team decided that keeping program and implementation elements simple would make the launch easier.

While implementation and marketing teams usually discuss overall marketing strategy prior to finalizing a marketing plan, ComEd developed program marketing launch plans prior to hiring the implementation providers, and thereby ensuring an on-time program launch. While this advance planning helped with the launch, it required reworking the plan once the full implementation team was on board. ComEd decided to keep the initial marketing message and look simple since this was for a program launch rather than for a comprehensive, established program, which typically includes numerous types and levels of marketing materials. They relied on best practices from other successful programs and focused efforts on the critical introductory materials. The number of marketing materials and collateral in the initial program

design were limited and included only key materials, such as the trade ally application, prescriptive and custom program applications, and some basic program flyers, all of which streamlined program set-up. For other KEMA programs, a full set of marketing materials are usually developed for program onset. In this particular case, waiting to develop targeted marketing materials has been beneficial, so the ComEd team could understand market interest and needs. The launch concept also included conducting two types of initial outreach events at the outset with one targeted to customers and the other to trade allies². These events were large forums in multiple geographic locations within the service territory intended to provide program information to a wide audience and an opportunity for questions and discussions.

The initial mass-market launch design enabled the team to get information out quickly to many program players. The team acknowledged that this approach would provide trade allies and customers less individual attention at the program's outset, but would spread the word faster and more widely, which was necessary to accomplish the first year's savings goals. As applications arrived, there was more administrative clean-up and follow-up than expected to ensure applications were complete before an incentive could be processed. These problems may have been mitigated if the team had more time at the program's beginning for one-on-one education and application tutorials (or lag between trade ally submittals, hence improvement over time) to ensure proper, complete application submittal. In hindsight, the massive launch may have moved too quickly, but was a necessity because the target market demand was unclear.

ComEd held off launching several program components that would encompass a full-spectrum *Smart Ideas for your Business* Program understanding that program development would require additional design time and delay program launch. Thus, ComEd decided not to launch a new construction or large scale retro-commissioning program. Additionally, lead time on new construction projects is great enough that implementation approach would need to be different from the mass outreach process used in this first launch phase. The ComEd team also postponed efforts for targeting certain end-users or industries, as well as, promoting the custom portion of the program.

The team understood that the program design had to be simplified, and that the prescriptive program measure mix needed to be straightforward. The team did not spend time developing detailed forms or specifications for measures that were unlikely to account for a large percentage of the program's first year. The prescriptive program included measures that covered a range of technologies that KEMA established in other markets and could expect proven results. The team postponed inclusion of some complex, newer technologies until there was time to determine existing program success or fit within the prescriptive program. For example, simple lighting measures, such 2-foot, 3-foot, and U-tubes, were left out of the initial launch in order to fast track the program to market. However, the program still allowed flexibility, so customers could submit custom applications for any energy savings measures not on the prescriptive form.

Historically, lighting projects account for the bulk of many large commercial and industrial programs, while other measures are slower to develop in the market (but also yield significant savings). The *Smart Ideas for your Business* Program encouraged solid "quick" savings in markets, like lighting, and set incentive levels to stimulate consumer interest in the program to kick-start it. Time considerations and the need to see results quickly limited the measure mix; thus, had conditions allowed for more time educating the market on non-lighting measures, larger, more complicated projects may have participated more in the program.

² See "ComEd Seeks the True Meaning of Trade Ally" AESP 2009 conference for more details.

The initial large-scale launch engaged numerous trade allies and customers, some of whom were not currently ready to participate in the program, but were still considered potential participants in time. The ComEd team maintains records of all customer and trade ally contact information for future marketing and outreach activities. Therefore, while the program's first-year incentives were reserved quickly, achieving future years' growth targets has and will require ongoing outreach and marketing.

Record Pace Program Design and Planning

Early identification of particularly challenging decisions or those dependent on the execution of other, later decisions helped the team move quickly through the design process. Quick decision making was critical to meet the aggressive timeline. All program rules and guidelines, establishing incentive design methodologies, determining incentive levels, and establishing as simple a program design as possible were decided early and facilitated the quick launch. While quick decision-making was important, the team allowed for changes and adapted the design process as the program developed. Maintaining this flexibility was critical to the success of quick program launch.

The quick start launch appears to be a new trend—rather than a planned strategy—resulting from public utility commission decisions and the need for utilities to reach savings goals within a short period of time. For example, past KEMA implementation projects have had longer design and marketing plan/collateral development lead times stretching out over periods of six months to one year rather than the latest trend of launches in a few months. Additionally, few states have gone from minimal EE spending to a full program portfolio in less than a year.

It is interesting to note from an ACEEE paper that many of the common traits of leading programs were incorporated in this program despite the quick launch (Kushler and York 2008). These include: **(1) using proven approaches**, **(2) building a comprehensive program portfolio**, **(3) comprehensive program designs** (offering a full menu of services including incentives, marketing, technical assistance, training, and education for a full menu of customer end-use applications, and offering a single program contact to access a full range of program services), **(4) new start-up programs** (benefiting from transferring lessons and experiences from other programs, thereby enabling them to more quickly achieve full-scale implementation) and **(5) establishing collaboration** (with a broad spectrum of stakeholders and market participants).

Getting the Word Out Quickly

There was a strong feeling that the market was ready to adopt energy efficiency in earnest; therefore, ComEd used the large forum launch events to spread program information to trade allies and customers. In addition, the team worked closely with key utility parties, such as call center staff and account managers, to train them about the program and application submittal enabling these critical internal teams to successfully support customers. The ComEd team developed detailed lists of possible event attendees and gathered input from various utility parties, such as the community development group, to create a comprehensive list of possible participants to ensure wide coverage at both the trade ally and customer events.

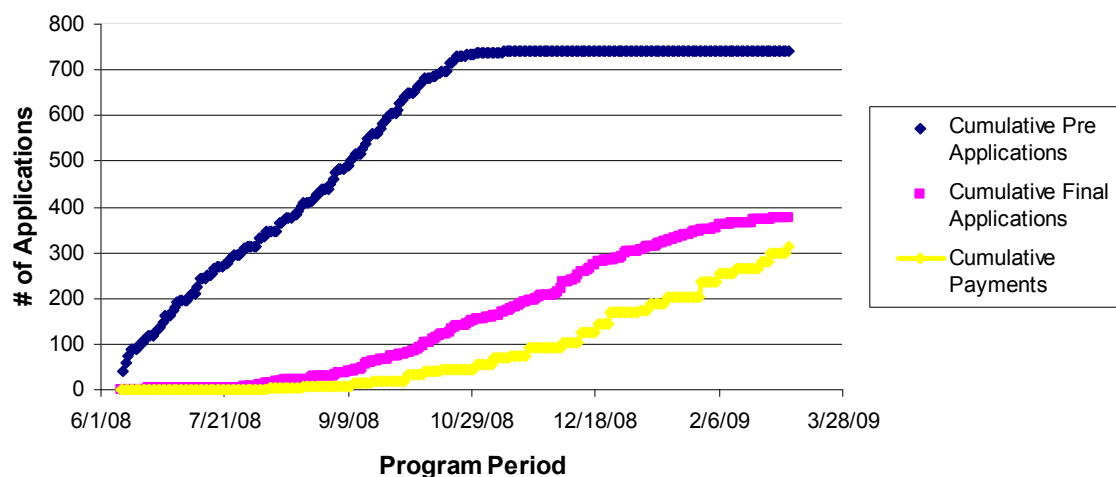
Both meetings provided well-attended forums to present the program guidelines, answer questions, and provide detailed break-out sessions on specific technologies. All sessions drew

large crowds, and the team collected participants' contact information to use for outreach in the event initial application intake was slow. Because program demand was so strong, these contact lists instead have been used to convey information about early closure of first-year program funds and the waitlist process. They are also being used to establish ongoing trade ally outreach communications and enable future outreach efforts.

Receiving a “Mountain” of Applications

As expected, customer interest was high from the outset due to a lack of similar incentive program offerings in the service territory. This program has allowed contractors to expand their marketing abilities and client base. Additionally, the program has allowed other contractors to expand their list of services and include energy efficiency amongst their existing skills. In Figure 1, pre- and final application and payment activity are illustrated. The initial ramp up for application receipt was immediate. KEMA quickly compiled a waitlist for all projects received after September 9; the program stopped accepting applications on November 1, 2008. The figure shows the lag time between receipt of pre and final applications, as well as project payment approval³. The option of submitting a pre-approval application prompted many applicants to apply for projects at the “pre” stage and provided a strong metric of the interest in the program. The “final” application line in Figure 1 below illustrates the lag time between the initial project submittal and the final application submittal and payment.

Figure 1: Application Received and Paid to Date



³ The program provides the applicants the option to submit a pre-application for reserving funds. Some measure types require pre-approval (for example, custom).

Many early applications were from a few aggressive trade allies who solicited customers for projects and immediately submitted their applications. In many cases, customers decided not to do their projects, but by having reservation confirmations contractors sell the economics of the project more easily. While some initial applicant responses were from a few trade allies, the overall program has reached a wide group of trade allies and customers with no one trade ally dominating the program. Fifty percent of the active projects have a trade ally involved with the purchase and/or installation of the measures. Almost 70% of these projects are unique trade allies. The program outreached a wide distribution of participants, an unusual occurrence in a new program in a developing energy efficiency market. This provides encouragement that a wide distribution of customers (and trade allies) will participant in coming years.

While market interest was high, much of the program interest was found in ComEd's managed account network. Account managers are invited to participate in site inspections, and are kept informed about the status of their customers' applications. Providing active inclusion in the process is and has been critical for maintaining strong customer relations with service territory managed accounts, especially for possible program participation over multiple years. Key account projects made up approximately 70% of the first year program savings.

Adapting to Huge Interest

The total number of incentives requested equaled \$15 million five months into the program. With a first-year incentive target of \$7 million, the team instituted an "adaptive management" approach, whereby they updated and refined application processing steps as the early program evolved to accommodate the rush. This required an active hands-on team approach with solid lines of communication, both internally and externally.

The adaptations included adding customer and trade ally outreach channels, such as additional letters throughout the process and phone call follow-ups at different points. We also adjusted inspection protocols and streamlined the inspection process to facilitate the large number of applications coming in for one specific measure—high-bay lighting makes up about half of all proposed energy savings, as shown in Figure 3. This adjustment allowed the team to accommodate the large number of required inspections that this measure triggered⁴. We focused on keeping energy saving and incentive payout goals in sight and made certain that customers were aware of their overall program and application status.

Initially, the team had to closely monitor projects and perform due diligence tests to make sure that projects met program requirements. This required performing more inspections in the early stages to understand marketplace events and working closely with contractors to help them navigate the application process and submit required information. With over 475 projects paid out in the first year, the team is already seeing the advantages of a comprehensive review on early projects. Trade allies with more than one application have improved the quality of information they provide to the team, and inspectors are keeping a close eye on what is happening in the market.

⁴ The program required pre-approval applications for some measures. For most of these applications, a pre-inspection was conducted.

Shutting Down the Program

From some vantage points, having to close the program is a good problem to have; it exceeded its first-year goals. However, it creates mixed messages in the marketplace. It can be frustrating to applicants who prepared to implement energy efficiency measures and are now left with no option for immediate incentives.

The team watched closely the proposed projects that came in to identify the potential realized savings from the pool of applicants. Using historical experience from other markets, we estimated the rate by which projects would fall out of the program, and oversubscribed the program to make up for those losses. Projects that fall out in the early phases of a program include those started prior to program launch and are not eligible, and others who were not ComEd customers, which together accounted for five percent of the cancellations in the early stage. In addition, common cancellation issues—such as not meeting measure specifications or program requirements, contractors selling a job but the customer deciding not to move forward, or otherwise not getting financial approval to proceed—move some projects out of the active queue. The *Smart Ideas for your Business* Program has had relatively fewer cancellations than KEMA's experience in other utility territories. The program initially had less than 20 percent cancellations, which is a confirmation that the market was ready for this type program, and it acted quickly with projects that trade allies could complete immediately.

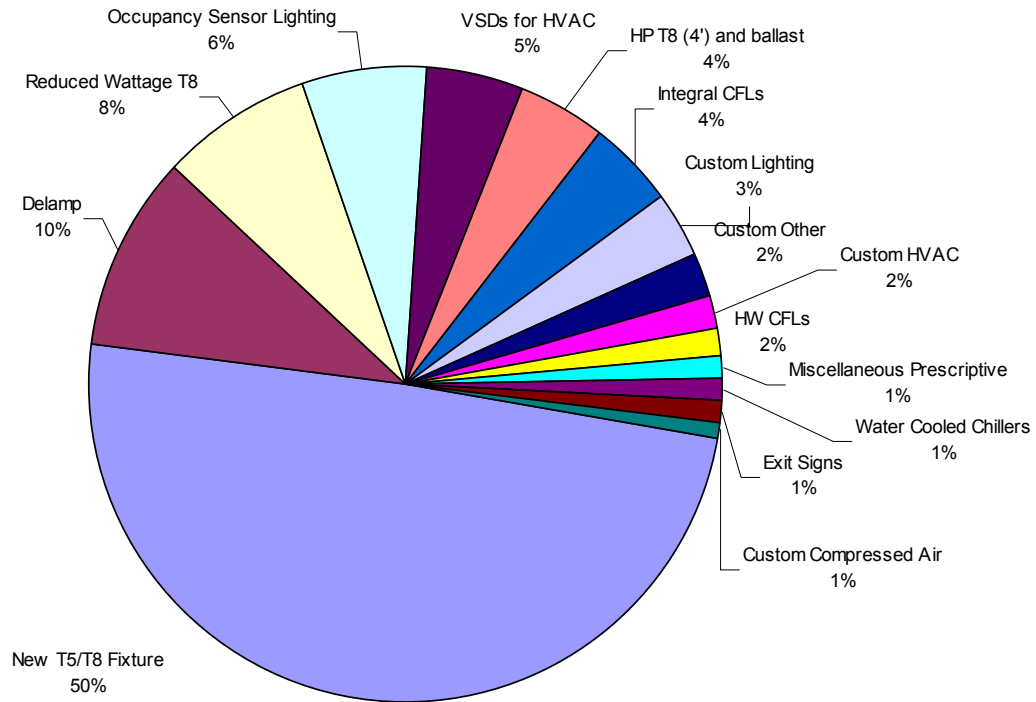
In early September, we had to establish a waitlist, and moved projects that would exceed available funds to the waitlist. In late October 2008, the team recognized that a \$5 million waitlist of projects was too large, that it was unlikely that many waitlist projects would be considered under the first year program. On November 1, 2008 the team decided to stop accepting new applications.

With the rush to complete projects, the implementation team managed the risks associated with not meeting the energy savings goal. At the end of the first program year, the team was able to exceed the savings goal with the allocated incentive budget, bring in some of the waitlist projects, and shift some projects to the second year for those customers who had to put their project on hold due to the downturn in the economy.

Savings and Project Demographics

The first year savings came, as expected, predominantly from the lighting sector. Early in 2009, eighty eight (88) percent of savings were from lighting, 7.6 percent from HVAC, and 4.4 percent from other measures. Figure 2 shows the savings percentage breakdown by measure—with 50 percent from high bay (new T5/T8 fixture), 10 percent delamping, and 8 percent from reduced wattage T8 lamps and ballast.

Figure 2: Percentage of Savings (Annual kWh) by Measure



These results are from early 2009, where over 750 applications have been received. As of May which is the last month in the first program year, the total number of projects that were paid was over 450 with another 130 that had to be cancelled. The following table (Table 2) shows the distribution of savings, incentives, and application quantity by market sector. The industrial and warehouse sector have the biggest shares in savings and incentive dollars in the ComEd program.

Table 2: Distribution of Savings, Incentives, and Quantity by Business Type

Business Type	kWh Percent	Dollars Percent	Applications
Light Industry	20%	21%	24%
Warehouse	20%	20%	14%
Heavy Industry	19%	17%	10%
Office	10%	16%	19%
Retail/Service	9%	10%	12%
Medical	9%	5%	4%
Miscellaneous	6%	6%	8%
Hotel/Motel	3%	1%	3%
Grocery	2%	2%	4%
College/University	1%	1%	1%
Restaurant	1%	0%	1%
School (K-12)	0%	0%	1%

The Industrial and Warehouse Sector Participation

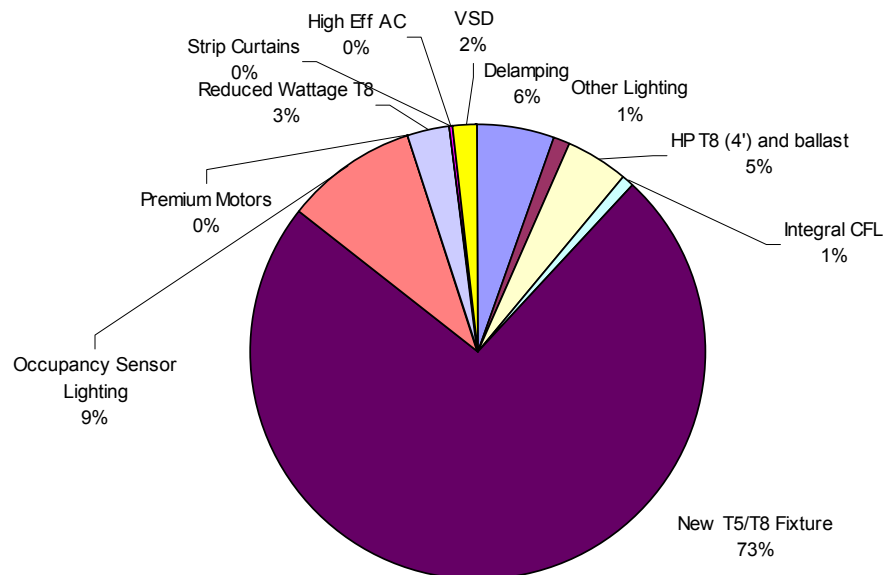
The ComEd service territory is rich with industry. The industry types served under this sector are summarized in the following table.

Table 3: Chicago Area Industries

2 Digit SIC	Description	Percent of Total Industrial Usage
34	Fabricated Metal Products Mfrs	14%
20	Food & Kindred Products Mfrs	11%
30	Rubber & Miscellaneous Plastics Mfrs	8%
33	Primary Metal Industries Mfrs	8%
29	Petroleum Refining & Related Inds Mfrs	8%
35	Industrial & Commercial Machinery Mfrs	7%
36	Electronic & Other Electrical Equip Mfrs	6%
28	Chemicals & Allied Prods Mfrs	6%
27	Printing Publishing & Allied Industries	6%
16	Heavy Construction Except Building	4%
26	Paper & Allied Products Mfrs	4%
38	Measuring & Analyzing Instruments Mfrs	4%
32	Stone Clay Glass & Concrete Prods Mfrs	3%
17	Construction-Special Trade Contractors	3%
	All Others	10%

Most of the projects submitted by the industrial and warehouse market sectors were lighting. Figure 3 illustrates the distribution of prescriptive measures in this sector. Fewer than 2 percent of the savings were coming from non-lighting measures.

Figure 3: Distribution of Prescriptive Energy Savings in the Industrial Sector



There were 18 custom projects in the industrial and warehouse sectors; six were for non-lighting measures. These six custom, non-lighting projects were:

- Motor greater than 200 hp (the cut off for the prescriptive program)
- Variable speed drives on pumps and fans for a chiller plant serving non-cooling loads
- Thermostat controls on their HVAC system
- Two air compressor plant upgrades
- Chiller replacement for non-HVAC loads

The number of projects with non-lighting custom measures in the industrial sector was smaller than expected due to the overwhelming program response early on. This occurrence aligns with the need for longer lead times for custom projects, including the time needed to:

- Gather information for determining feasibility
- Assemble a complete project application
- Work with potential contractors to assess the work/submit proposals

More complex custom- and industrial-focused projects require significant time to put together, resulting in potential applicants being unable to submit applications in a timely manner before the program closed to new applications. Moreover, many industrial custom projects have long lead times for installation (including designing the solution, ordering customized equipment, etc.) even if the decision to apply for an incentive occurred in a timely manner. In future years, the program team expects to receive more custom project applications, since trade allies and ComEd customers will have the time to think through and prepare potential projects. In addition, some of the early projects are still in the queue with plans to start and complete the work in the second program year. Since industrial customers account for a huge percentage of the load in the ComEd marketplace, this shift will continue as the program grows.

Many process improvements in industrial facilities are designed for reasons other than energy efficiency, so efficiency considerations are often not planned into the process, a major hurdle that needs to be overcome in the industrial market. These large capital projects offer improvements with numerous non-energy benefits that drive their design. One of the key objectives of the *Smart Ideas for your Business* Program is to educate industrial customers that their proposed improvements may realize energy savings and incentives from the local utility. This knowledge— that realizing energy, labor, or other production savings—may justify improvement expenses, improve project economics, and allow for more efficient projects.

There are several strategies to adapt incentives to address various market barriers for this market. These strategies include increasing participation rates by educating customers about the economic benefits realized by incorporating energy improvements with process improvements and adopting larger caps to avoid constraining incentives for large comprehensive projects with substantial energy savings potential.

For the ComEd *Smart Ideas* Program, custom measures must meet certain payback period requirements based on measure life to qualify for an incentive. Additionally, measures must have a 1.0 or greater Total Resource Cost, which is an economic test used by utilities to evaluate overall program cost effectiveness. In the *Smart Ideas* first year, there were some custom projects that did not pass the economic screening test, such as light tubes and cool roofs. This may become a bigger challenge in subsequent years.

For the 2008-09 program year, one of the measure that dominated the industrial and warehouse sector were the new T5/T8 fixture. This efficiency measure provided the retrofit of high-bay metal halides with either 10, 8, 6 or 4-lamp T5 high output or T8 fixtures; many of these fixtures were also fitted with occupancy sensors.

The custom project with the highest savings that was incentivized during the initial phase of the program combined two chillers to one system and installed a plate and frame heat exchange for free cooling at a foam manufacturing facility. Air compressors account for the second largest type of custom project, which are very unique to each facility. The demand for air varies depending on its use and many other factors. Another custom project was a consumer packaging company that installed variable speed drives on the chilled water plant motors.

Looking Forward

The rush to launch the program was good, providing overall assurances that there were energy projects in the pipeline. However, the necessity to shut down the program created mixed market messages, which is an unfortunate impact at a time when the program needs momentum, since the market is new to energy efficiency programs and will need to expand in future years. A slower launch may have worked more effectively and enabled a steadier program over the first year. The ComEd team will review the outreach efforts to date and leverage the contacts made in this first year to deliver the messages more effectively about programs in the future. With growing goals as well as a very interested market, the prognosis is strong that subsequent year activity will also be high.

Based on the level of interest in the program, ComEd's team has assessed measures where the program can adjust incentive levels. These adjustments should help stretch the incentives to more customers and even achieve program goals more cost effectively. The team did not cut incentives as much as they might have initially knowing that making changes in subsequent years would be relatively easy. By using market information, next year's program will incorporate past findings. The two significant changes that were made include: Reducing incentives on the most popular measures (New T5/T8 fixtures (high bay), occupancy sensors (mostly installed on the new fixtures), and high performance and reduced wattage T8s. The team also raised caps for larger custom projects, up to \$200K, to help increase participation among larger industrial facilities

Reducing incentive levels for the most common measures was necessary, since these measures have a higher per first-year kWh-saved cost. Program goals need to be met by a designated pool of incentive money; to reach those goals, the cost per kWh saved needed to be reduced based on the actual measure mix seen in the first year. The ComEd team also plans to create additional, focused marketing collateral that will encourage participation of custom measures. The team will target end uses, such as air compressors in the coming years, which should encourage participation of the industrial sector.

It is also important to recognize the need for evolution and change. As an example, the San Diego Gas & Electric's Energy Savings Bid Program was cumbersome at first. After making changes, the program four years out is very successful (Webber 2008). The *Smart Ideas for your Business* Program team plans on taking the lead from programs like SDG&E's to evolve to ensure broad participation while meeting goals cost-effectively.

Conclusions

Despite a busy first several months, the *Smart Ideas for your Business* Program has proven to be a huge success. Customers and trade allies are interested in energy efficiency. The market is strong, and ComEd will be able to meet the energy savings goals set for this program. The program was a big undertaking, and over the course of the next two years will double in size and then double again. With high expectations for energy efficiency, it is refreshing that there is unmet demand. From the beginning, there was very limited ramp-up needed to bring the program to full-scale deployment, in part by getting relevant information to lots of people. With such a solid trade ally and customer base, the market is well-primed for coming growth. The need to balance over-subscription was a frustration in the first year, but bodes well for the continued growth of this program.

As in any large project, teamwork was critical. In addition to working well together, the team has kept a positive attitude and focus on the long-term energy savings goals through the process. Collaboratively, ComEd and the outside team members have used “adaptive management” to refine the program design and delivery processes throughout, which have been critical to the success of the project. It was a fast process, but the team was enthusiastic about meeting goals and building a revived urgency for energy efficiency in the Chicago marketplace. The team will continue to work with the market in expanding its focus to non-lighting measures and increasing the customer base.

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