When an Energy Efficiency Program Grows by Leaps and Bounds

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ABSTRACT

ComEd is a transmission and distribution utility with 5,300 miles of overhead transmission lines and 36,000 miles of overhead distribution and 29,000 miles of underground lines. ComEd's service territory covers 11,411 square miles in Northern Illinois including the city of Chicago. ComEd serves about 70% of the population of Illinois, about 3.8 million customers. ComEd's peak system demand is just under 23,000 Megawatts.

Spurred on by Illinois' new energy efficiency legislation in 2008, ComEd's Smart Ideas for Your Business program doubled its goals between Year One and Year Two, and is slated for an additional 50% increase for Year 3. Over the course of the three program years, ComEd expects to help customers save 486 net GWh. With funding capped and performance penalties in place, the program raced through available Year One funding in four months, and Year Two's in less than six months. This paper will discuss how ComEd managed the challenges of high program growth in a previously untapped market, managed customer expectations, developed market channel partners and exceeded program goals while remaining under strict budget caps. ComEd also employed tactics throughout the program year to help manage customer interest and build a solid framework for a growing program. We will summarize two full years of program operations statistics, comparing Year Two experience to the initial start-up year ComEd recognized and addressed key trends and changes, including significant changes in the average size of projects submitted, most popular energy efficiency measures, trade ally performance, and the realities of program implementation vs. original program design. To meet increased goals for the 3rd program year, ComEd has increased its marketing through customer case studies, trade ally events, and increased Account Manager efforts.

Legislative Background

Enactment of Public Act 95-0481 created a new Section 12-103 of the Illinois Public Utilities Act, and, among other things, set forth new energy efficiency and demand response goals. Section 12-103's goals vaulted Illinois into the top-tier of states with respect to required investment in energy efficiency and, within four years, the levels of demand-side program investment and energy efficiency savings realized will place Illinois second to only California. By 2011, ComEd is projected to be investing more in customer energy management than every utility in the country except for Pacific Gas & Electric and Southern California Edison.[i]

The legislation provides for funding and programs to be provided in ComEd's service territory by ComEd and the Illinois Department of Commerce and Economic Opportunity (DCEO) on roughly a 75/25 split. The statutory program goals (across business and residential) are shown in the Table 1.[ii]

Statutory Portfolio Goals in First Three Program Years (Residential and Business)

Annual Goal	2008	2009	2010	Total
Spending Screen ($M)	$39.4	$81.6	$126.7	$247.7
Maximum increase in "per kWh" rate	0.5%	1.0%	1.5%	3.0%
Energy Efficiency Goal (MWh)	188,729	393,691	584,077	1,166,497
Incremental % of energy delivered	0.2%	0.4%	0.6%	1.2%
ComEd Goal (MWh)	148,842	312,339	458,919	920,100
DECO Goal (MWh)	39,887	81,352	125,158	246,397

Table 1-Goals and Budget: Source ComEd Energy Efficiency and Demand Response Plan

Implementation Challenges

There is no doubt that this legislation was good for energy efficiency in Illinois; however, the statute did include some elements that made implementing the programs challenging. Strict spending caps, limits on "banking" savings from one year to the next and measure-level cost-effectiveness requirements created challenges for the implementation team. In addition the legislation imposed significant penalties for underperformance (and no incentive if the utility was to exceed the goal).

Illinois is a deregulated market so there is no integrated resource or least-cost planning process. The generation mix is determined by the choices customers make when purchasing from various suppliers. Energy efficiency budgets and goals in Illinois are set through legislation. The maximum amount that can be collected under the law can result in a per kWh increase of 0.5% per kWh for customers each year for three years starting in 2008.[iii] This "not to exceed" budget limits for each year of the program; any spending beyond this is not recoverable.

In addition, the legislation limits the amount of savings that a utility can carry over from one year to the next or "bank" to maximum of 10% of the savings. If ComEd were to exceed the goal by 20% only half of those kWh could be applied to the next year's goal. In addition the company runs the risk that the cost incurred by going above 110% of the goal would not be considered recoverable even if it is below the spending screens. Limited yearly funding and the inability to carry projects over between years effectively meant that the program was to be implemented as three separate one-year programs instead of as a three-year program.

Also, the statute requires that every measure incentivized through the programs pass the total resource cost (TRC) test. As a result, the utility cannot bundle less cost-effective measures with those that are more cost-effective. This limited the company's ability to offer incentives on emerging technologies or deeper, whole building offerings.

Finally, the Illinois legislation sets fourth penalties should the utilities not make the goal and does not include any incentives for exceeding the goal. The penalty for missing the goal in the second year would be a $665,000 contribution to the Low-Income Home Energy Assistance Program (LIHEAP). The penalty for missing the goal the third year (any every subsequent three-year period thereafter) is again a $665,000 contribution to LIHEAP and the transfer of the program to the Illinois Power Agency.

Given these constraints, the program needed to be able to hit the annual goals within the budget but not exceed them or face a steep penalty. The final program design needed consider several issues including:

- Annual spending caps and limited available funding in early years of program
- Unknown pent-up demand
- Significant ramp-up (goals that escalate every year)
- Measure level TRC
- Penalties for underperformance

Program Plan and Design

ComEd developed a portfolio of energy efficiency and demand response programs to achieve the ambitions goals. The programs spanned all customer classes and covered a diverse set of energy efficiency and demand response technologies and measures. The business sector energy efficiency programs, *ComEd Smart Ideas for Your Business,* offer prescriptive, custom, new construction, and retro-commissioning incentives. Prescriptive and custom incentives were launched in Year One with new construction and retro-commissioning phased in later. This paper will focus on the prescriptive and custom elements of the program because they account for up to 90% of the program activity. The three-year budgets and goals are shown in the following tables:[iv]

Prescriptive/Custom Program Budget

Program Element	2008	2009	2010	Total
C&I Prescriptive Incentives	$6,970K	$13.9M	$27M	$47.9M
Custom Incentives	$2,520K	$10.5M	$13.4M	$26.4M
Totals	$9.5M	$24.3M	$40.4M	$74.3M

Table 2- Prescriptive and custom budget. Source: ComEd Energy Efficiency and Demand Response Plan

Prescriptive/Custom Program Savings Goals

Program Element	MWh			
	2008	2009	2010	Total
C&I Prescriptive Incentives	43,255	86,510	167,613	297,378
Custom Incentives	18,932	74,475	95,244	188,651
Totals	62,187	160,985	262,857	486029

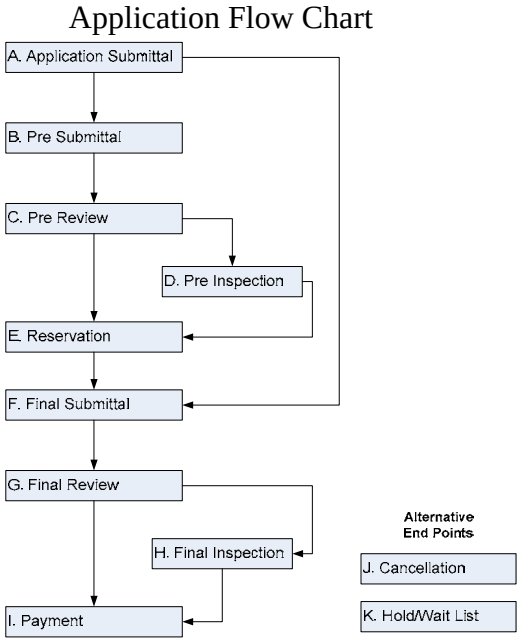
Table 3- Savings Goals Source: ComEd Energy Efficiency and Demand Response Plan

Prior to the launch of these programs, there were no programs in the ComEd service territory. The staff expected a massive market response due to significant pent-up demand, but there was no guarantee that this would be the case. If there was inadequate demand the team would need to market the programs heavily or if the demand was overwhelming the budget would be exhausted. During the program design process the team integrated several controls intended to either ramp up or dial back the program depending on the market response. Even with these controls in place the program rapidly oversubscribed in the first year and the team needed to rapidly develop and implement a wait list process. In general, projects followed the process flow outlined in Figure 1.

Funds Reservation

There were two types of applications (pre-approval or final). Customers could submit a pre-approval application to reserve funds before the project was initiated or submit a final application after the project was completed. There were only a few measures that required pre-approval, however ComEd encouraged all customers to receive reservations before initiating projects to ensure that funds would be available.

Fig. 1 – Funds Reservation Process



Most applications can enter at either point A or Point . in the above figure. Point A represents projects that received a reservation prior to initiating a project and point F represented projects that did not. Only a few measures required a reservation but ComEd encouraged all customers to obtain a reservation before moving forward with their projects. This was to ensure customers would not complete a project without first securing funding.

Reservation Expiration Deadlines

Upon receiving a reservation customers were given 90 days to complete their projects. This rather short timeline was to ensure that projects were moving forward. If the project was not moving forward (as documented by purchase orders and signed contracts) then the funding was released and made available to the next customer. A 90 day reservation window is very short, but the ComEd staff felt this was necessary because of the heavy demand and to ensure the very limited funding was not tied up in projects that weren't moving forward. The funds reservation process and tight expiration deadlines proved very useful tools in the ramp up/dial back scenario. At the same time this mechanism was more favorable to projects with shorter lead times and shut out projects that require longer planning and implementation timelines.

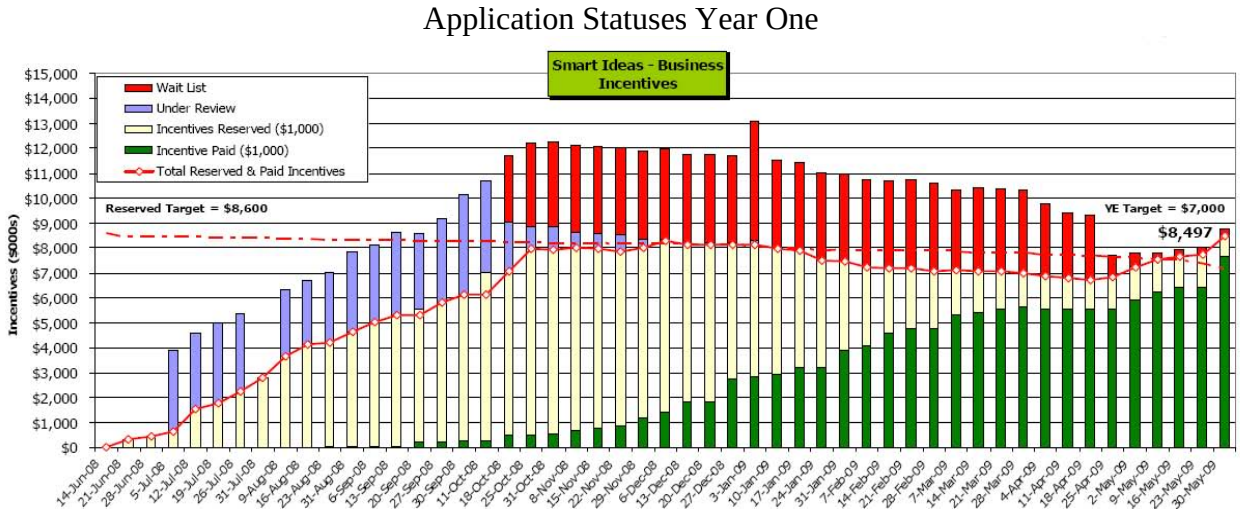
Prescriptive/Custom Split

The original plan filed with the commission called for separate budgets and goals for prescriptive and custom incentives however, in the final program design the team decided to combine the budgets. The team decided that custom and prescriptive were really simply two different ways to access the same funding and were not separate programs. In addition the team felt that ramping-up and/or dialing-back two separate programs would be too difficult to manage in the first few years.

Results from Year One

In the first year of the program the response was dramatic. Figure 2 shows the week-by-week status of applications in the program and illustrates how quickly the prescriptive and custom incentives became fully subscribed. The various colors of the bars indicate the different statuses (under review, reserved, paid or wait listed) of the applications throughout the year.

Figure 2-Year One Reservations Paid and Reserved



Oversubscription and Wait List

The overwhelming response brought about many challenges including; How do you wind down a program once its out in the market? In order to mitigate the attrition risk, the team decided to over-reserve the incentive funds by 20%. When the program reached 120% of goal in paid and reserved projects the team instituted a wait list policy. This allowed customers to queue up projects to receive incentive funding that would be made available if another project dropped out. Even after instituting a wait list the flow of applications remained high and in November the program stopped accepting applications altogether.

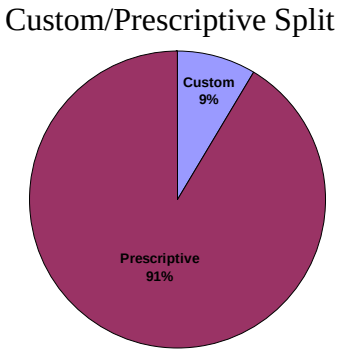
It's important to note that the payments significantly lagged behind reservations, even given the 90 day reservation deadline. The green portions of the bar in Figure 1 (which represent "paid" projects) show a slow and steady incline through the year. The yellow and blue portions of the bar (which represent projects that are "reserved" and "under review") show a much steeper increase from the beginning of the program year and then a gradual leveling off as the projects moved from "reserved" to "paid". One reason that the payments lagged behind the reservations

was that many customers requested and received extensions. Extensions were only granted when a customer could produce documentation proving that the project was moving forward (for example purchase orders). The table also reflects the natural attrition rates of projects that are cancelled throughout the program year.

Prevalence of Prescriptive Lighting Projects

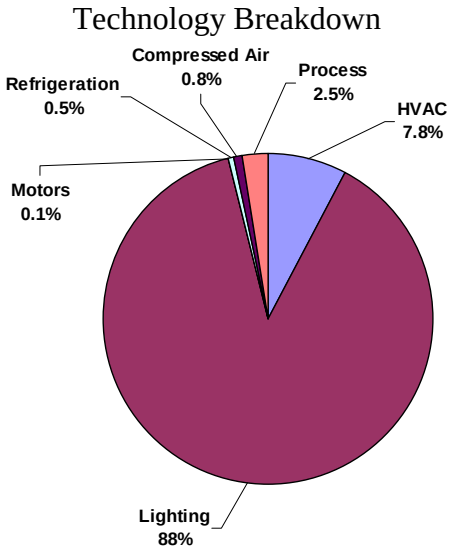
In the original plan filed with the Commission ComEd estimated that about a quarter of the incentive budget would go to custom projects. Prescriptive projects tend to be smaller and less complicated than custom projects and they also typically require shorter lead times. Because the team combined the budgets for prescriptive and custom incentives and instituted a 90 day reservation expiration deadline, more than 90% of the funding went to prescriptive projects.

Fig. 3 – Custom/Prescriptive Incentive Split Year One



Within prescriptive, the vast majority (88%) of the projects completed were lighting related. Figure 4 shows the breakdown in savings that came from the different technology categories in custom and prescriptive. Although a more balanced portfolio would have been preferred, a potential study that was completed following the launch of Year One aligned almost exactly with the results that ComEd achieved.[v]

Fig. 4- Technology breakdown



Communication Challenges

Before the programs launched ComEd held a number of workshops to explain how the programs would work but there was still a lot of confusion in the market. Some trade allies and customers were skeptical and didn't understand why a utility would pay customers to use less of the product they sell. They were also confused about how incentive programs work; many customers thought the incentives were tax credits from the federal government or bill credits. Unfortunately just as many trade allies were getting up to speed on how to use the program, the funding started to dry up and ComEd had to scramble to come up with a plan to handle the incoming applications and to communicate the funding levels.

ComEd communicated the wait list process by posting a message on the ComEd website, sending customers and trade allies letters and hosting a webinar to explain how the wait list process would work. Even with these communications, customers and trade allies called to continually check the status of their wait listed applications and ask various questions about the wait list process.

Changes Made for Year Two

For Program Year Two of Smart Ideas for Your Business, the budget and goals almost doubled: The goal was 161 net GWh and the incentive budget was $17 million. The team assumed that a wait list would again be necessary, and, based on the lessons learned in Year One, made a number of changes in order to diversify the portfolio, improve communication, manage risk and control the wait list process.

Diversify the Portfolio

The first change was to reduce the incentive on the program's most popular project: upgrading high intensity discharge (HID) fixtures to T8 or T5 fluorescent fixtures with electronic ballasts, generally in highbay applications. The incentive went from $0.40 to $0.30 per kWh reduced. In addition, the incentive was capped at $100 per fixture. This had little effect on the number of highbay projects, and made more funds available for other projects.

The second change was to target high-value non-lighting projects with deliberate outreach efforts. An outreach manager was added to the team, and marketing efforts focused on supporting non-lighting trade allies. Outreach efforts targeted compressed air projects and HVAC VSD projects in particular.

Finally, when the wait list was implemented in December of Program Year Two, it applied only to lighting projects. This allowed non-lighting projects access to the funding that had been reserved too quickly in the first year of the program.

Improve Communication

To reduce the number of questions and complaints in Year Two, a communications plan was developed in advance and put in place in anticipation of the program starting a wait list. Trade allies were able to track the available of funds on the ComEd web site by checking the "Fund-o-Meter" – a thermometer-style graphic that was updated weekly. The trade ally e-

newsletter also provided updates. Finally, a set of "talking points" with the wait list "rules," explanations and answers to potential questions was prepared in advance.

When the wait list was called on December 2, the communications plan was implemented:

- All contractors with projects in the program in Program Year Two received an e-mail letter from the vice president of Marketing and Environmental Programs (Val Jensen).
- The e-mail was followed by an issue of the trade ally newsletter with more detail and FAQs (Frequently Asked Questions).
- The "rules" and FAQs were posted on the ComEd web site.
- Two webinars presented the "rules" and covered questions.
- A message was placed under the "Fund-o-Meter" on the ComEd website explaining the status of funds.

Attendance at the two webinars was low compared with attendance at other webinars (less than 100 total), which indicated that the wait list information that had been sent was clear. Subsequently there were questions about whether non-lighting projects were on the wait list, showing that some trade allies assumed that the Year Two wait list process was identical to the Year One process.

Improved Risk Management

One of the challenges in Year One was deciding when to begin putting projects on a wait list. There is always some attrition due to projects being cancelled or delayed. ComEd knew that it would be necessary to accept more reservations than the final budget could allow but it was difficult to know exactly how far over the goal and budget ComEd could target. Any spending above the legislatively mandated budget and goal could be considered imprudent and the company faced a penalty if it fell short of the goal. Based on the experience in Year One ComEd know that pre-approval applications provided a good "leading indicator" of completed projects. A review of cancelled projects, including the project size and when in the process the project was cancelled, enabled the team to assign a probability of completion to the projects in the pre-approval stage. In addition to the probability of cancellation, the evaluation results from the first year were integrated into the probability number when they became available.

Applying the probability to projects in each application status gave a more accurate reading of where the program was in terms of budget and kWh savings. Arriving at the probability number was part data analysis and part experience, and the results were used to determine timing of the wait list. Figure 5 shows the probability chart that ComEd used to get a more accurate prediction of the final paid projects and savings achieved.

Fig. 5- Probability Table

Active by Status

Status	Project count	kW	kWh	Uncapped Incentive	Capped Incentive	Projected Incentive	$/kWh	Probability	kWh	Incentive
Pre-App - Reviewing	117	3,135	24,730,910	$1,818,544	$1,679,602	$1,679,602	$0.068	70.%	17,311,637	$1,175,721
Pre-App - Approved	905	27,700	156,012,917	$10,741,482	$9,962,859	$9,962,859	$0.064	80.%	124,810,333	$7,970,287
Pre-App - Pending ComEd Approval	1	432	1,832,964	$99,947	$99,947	$99,947	$0.055	75.%	1,374,723	$74,960
Final -	136	5,102	25,649,673	$1,649,430	$1,472,449	$1,462,268	$0.057	90.%	23,084,706	$1,316,041

This is a snapshot of the actual report that ComEd used to project progress to goal. the column on the left shows the status of the applications. The column titled "Projected Incentive" shows the incentives that would be paid after all applicable caps were applied. The "Probability" column shows the probabilities that were applied to the various statuses and the far right columns titled "kWh" and "Incentive" show the final savings and incentive that could be expected from projects in each of the statuses. The probabilities were continually updated as new information became available.

Year Two Results

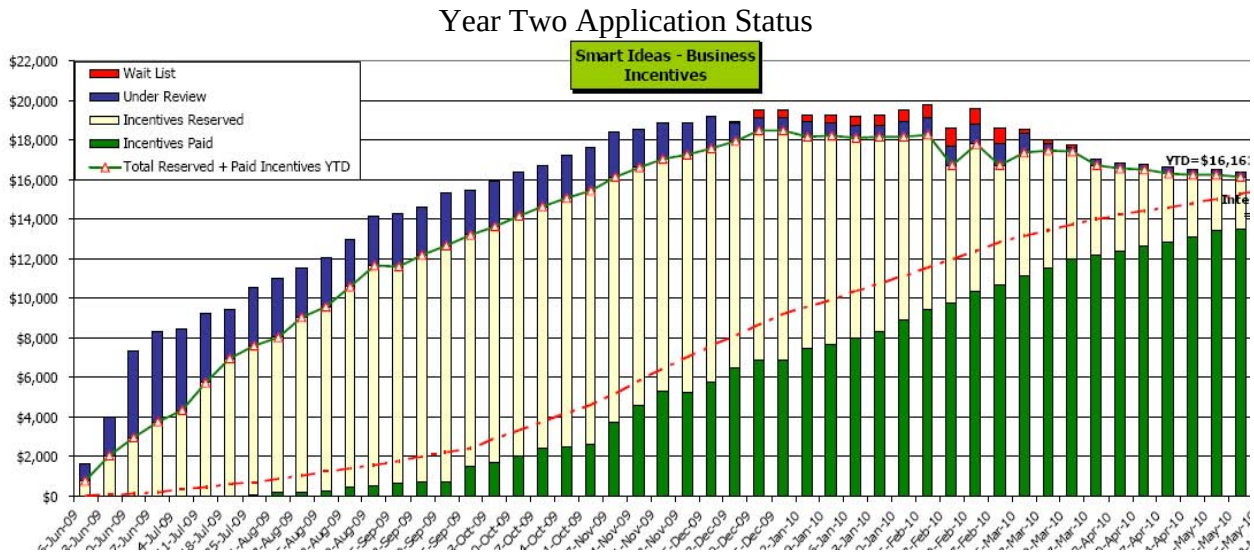
As expected, the program was also oversubscribed in Year Two. With about double the budget in incentives the program was able to last an additional three months. Just as the Smart Idea team started the year with lessons learned, the trade allies had learned from the tumultuous first year. Unfortunately, the lesson many trade allies had learned was: Get applications in as soon as possible, whether the project is fully defined or not. This eagerness to get funds reserved lead to a larger volume of incomplete or incorrect applications which slowed the process to some extent.

Other patterns seen in Program Year Two:

- More projects, smaller projects
- Fewer projects from program trade allies, more projects from unaffiliated contractors and in-house staff
- Portfolio was still lighting heavy despite direct outreach to customers and non-lighting trade allies and wait listing lighting projects.

Also as you can see in Figure 6, far fewer projects were placed on the wait list in Year Two (as indicted by the red portion of the bars). As in Year One the amount of projects reserved or under-review (yellow and blue portions of the bar) increased steeply at the beginning of the year while payments (indicated by the green bar) lagged behind.

Figure 6- Application Statuses in Year Two



Source: ComEd tracking scorecard

Conclusions

Utilities launching programs into new markets face unique challenges. In ComEd's case this was exacerbated by funding limits and unknown pent-up demand. In the first two years of implementation the programs became quickly oversubscribed leaving ComEd to shut the programs down. One key lesson that ComEd learned was how to manage massive demand, oversubscription and risk.

- **Dealing with legislative and regulatory constraints.** All programs are subject to various constraints set forth in the laws and policies governing them. In the case of ComEd the mechanism created to limit the energy efficiency spend could not fund the programs adequately to keep pace with the demand. This was exacerbated by the fact that the program was established as three separate one-year programs with distinct annual goals and budgets with limited carryover between years; more flexibility would have allowed the program to better respond to the market.
- **Managing risk.** The Illinois law that governs the utility-run energy efficiency programs contains significant penalties for under performance and no incentives for overachievement. In fact, if the programs were too successful and overshot the goal by more than 10% ComEd could have feasibly run the risk of being unable to recover costs associated with over achievement; leaving little room for error. Therefore it was in ComEd's best interest to come out of the gates strong and fast and then shut the program off when the goal was in reach. It also motivated ComEd to implement a very short (90 day) reservation limit. This lead to confusion in the market and some (albeit luckily minor) customer dissatisfaction. Additionally because of uncertainty of the market, it was difficult to know exactly when to shut the programs down. To manage this ComEd created a probability factor to model the progress toward the goals. This model was

continually updated as new information and data became available. Data from previous years of experience is a very valuable tool for forecasting what will happen in the future.

- **Managing oversubscription.** Although ComEd views this as becoming less of a problem when the budgets start to keep pace with demand, oversubscription was a serious issue in the first two years of program implantation. ComEd encouraged all customers to reserve funding before starting the project in order to lock up funding. With the reserved projects approaching the budget limit and an unknown attrition rate ComEd instituted a wait list. Projects off the wait list would be accepted if other projects with reservations dropped out. The wait list was instituted after ComEd reached 120% in reserved, paid and under-review projects.
- **Communicating with customers and trade allies.** Communication is critical. For ComEd, customers and trade allies were totally unfamiliar with how utility incentive programs work and were also a little skeptical. In the first year ComEd made an effort very early on to educate customers and trade allies about how the programs work only to have to re-educate them a few months later when the funding began to dry up and the program was reaching its goal. ComEd used this learning and improved its communication plan for the second year. ComEd used web, email, mail and webinars to communicate program updates and changes.
- **Diversifying the portfolio.** Program administrators in new markets can expect to see a large portion of their savings to come from lighting projects. Lighting projects generally have shorter planning periods and very quick simple paybacks. ComEd expected this as well. In the first year the Smart Ideas team wasn't sure how the market would respond and rules were put in place that favored projects that could be planned and implemented quickly. To diversify the portfolio for the second year ComEd adjusted incentives and wait listed only lighting projects.

With many new utilities joining the energy efficiency market and existing programs seeing increased budgets and goals, it is an exciting time to be in the energy efficiency industry. However, these rapidly increasing goals and budgets bring about a whole host of new challenges for program implementers. Illinois has taken a big step forward in energy efficiency and as funding increases and stakeholders see the positive impacts of these programs hopefully we can keep moving forward.

References

[i] Commonwealth Edison Company's 2008 – 2010 Energy Efficiency and Demand Response Plan, Docket No. 07—540, ComEd Ex. 1.0, November 15, 2007, page 1.

[ii] Ibid, page 2.

[iii] State of Illinois, Illinois Commerce Commission

[iv] ComEd Commercial and Industrial Energy Efficiency Incentive Program Implementation Request for Proposals, page 16

[v] Dimetrosky, Scott. Et al.. (2009). *Assessment of Energy Efficiency and Load Management Potential (2011-2016)* Prepared for Commonwealth Edison by The Cadmus Group, Inc.