Observations on the Evaluation Process

Stakeholder Advisory Group Meeting
12/16/09

Sta

ComEd

Background

Energy savings are reported in a variety of ways by utilities, evaluators and policy analysts

Measure	Derivation	Methods
Gross	*Ex ante* kWh per measure * tracked number of measures	
Verified Gross	*Ex post* kWh per measure * verified installed units	Ex post kWh can be based on either metering or "new" data from secondary sources. Verified units based on surveys of a sample of projects or customers. Results from the sample are extrapolated to the entire program.
Verified Net	Verified Gross – savings attributable to free riders + savings attributable to spillover	Free riders and spillover determined through customer surveys that attempt to determine how much influence the program had in a decision to purchase/install a measure included in a program.

Sources of Uncertainty

- **Gross Savings**
  - The accuracy of the measure tracking system
  - The accuracy of the estimates of kWh per measure (there will be variation in the estimates because of the variation in methods used to measure savings)
- **Verified Gross**
  - The accuracy of methods used to estimate installation rates
    - Residential install rates often based on customer self-reports which are understood to be unreliable
  - The accuracy of methods used to measure unit energy savings
    - For programs with multiple or complex types of measures, care must be take to properly segment the samples or sample results cannot simply be extrapolated to the entire program

Sources of Uncertainty

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- **Net Savings**
  - Several methods for estimating free rider, spillover estimates and aggregate net-to-gross ratios that typically yield quite different results
    - ComEd and Ameren ran almost identical residential lighting programs but the respective evaluators used very different methods to estimate NTG ratios yielding substantially different NTG estimates
    - No consensus within the evaluation community with respect to the best method – depends on budget, perspective, type of program, data availability, etc.
  - Some methods relay on participant and non-participant self-reporting of the extent to which a program influenced a purchase decision
    - There are recognized issues with customer self-report data, especially in the residential sector and especially for upstream programs.
  - The results of survey-based methods are dependent on which questions are asked, how questions are worded, when the questions are asked and how the answers are weighted and scored
  - Despite the rigor of statistical method, survey- or model-based methods for estimating net savings are ex post methods to try to divine consumer motivation

The Context

	ComEd Plan	ComEd Reported Results *(Ex Ante)*			Summit Blue Result *(Ex Post)*		
	MWH Savings	MWH Savings	NTG Ratio	*Pct. Of Plan*	MWH Savings	NTG Ratio	*Pct. Of Plan*
Residential							
Residential lighting	75,809	95,321	0.80	*126%*	60,789	0.68	*80%*
Appliance recycling	8,159	8,528	0.40	*105%*	11,478	0.73	*141%*
Multi-family all-electric sweep	2,369	2,045	0.80	*86%*	1,852	0.80	*78%*
Total Residential	**86,337**	**105,894**	**0.74**	***123%***	**74,119**		***86%***
C&I							
C&I Prescriptive	43,255	79,614	0.80	*128%*	85,693	0.67	*138%*
C&I Custom	18,932		0.80			0.72	
C&I Retrocommissioning	1,090	1,207	0.80	*111%*	1,090	0.80	*100%*
Small C&I CFL Intro Kit	16,816	20,051	0.80	*119%*	2,815	0.56	*17%*
Total C&I	**80,093**	**100,872**	**0.80**	***126%***	**89,598**		***112%***
Total Portfolio	**166,430**	**206,766**	**0.77**	***124%***	**163,717**	**0.68**	***98%***
Statutory Goal	**148,842**	**206,766**		***139%***	**163,717**		***110%***

One Example – Residential Energy Star Lighting

- Negotiated upstream price mark-downs for spiral CFLs
  - Manufacturers get the rebate, they mark-down price to retailers which pass the mark-down along to the product as it hits the shelves
  - No way to track who purchases the bulbs
    - Several small retailers used coupons for the discount which enabled to track these customers
- Program planning assumptions
  - NTGR: 0.8 based on CA DEER Database circa 2007
  - Installation rate: 0.90
  - Planning net-to-gross adjustment: 0.72
  - Plan initially targeted 75,809 net MWh (105,290 gross MWh)
  - Plan target raised to 86,538 MWh (120,191 gross) as a hedge against risk that refrigerator program would under-perform – (2.8M units targeted)
  - 3,001,367 units sold
  - Estimated gross savings of 119,151 MWh
  - Estimated net savings of 95,321 MWh
  - Verified gross savings of 87,917 (Installation rate of 0.74)
  - Verified net savings of 60,789 (net-to-gross ratio of 0.68)
  - Verified net-to-gross adjustment of 0.50
  - Ratio of verified net to estimated net of 0.64
- Program received credit for 64% of the savings that it thought it achieved.
- Hitting its target based on the verified NTG ratio would have taken an additional 741,000 CFLs
- This would have cost an additional $733,590
- Contributed to a huge derating of the portfolio
  - Went from beating the statutory goal by almost 40% to beating it less than 10%

Another Example: Small Business CFL Intro Kit Program

- The Small Business CFL Intro Kit program was designed to reach small business customers that are often underserved by efficiency programs
- Program intended to be our risk hedge against other programs falling short
- Program used a direct mail approach:
  - Customers were required to choose the best CFL for their business from several options (this meant they had to actually think about it) and mail back their request.
  - Response rate for a typical direct mail campaign is about 2% -ComEd achieved a 25% response rate
  - Program was under-budget by almost 25%
- Ex-ante results
  - **More than 35,000 small business customers participated**
  - More than 105,000 CFLs were distributed
  - Assumed NTGR ratio of 0.8 and installation rate of 0.95
  - Achieved 119% of savings target in the plan
- Ex-post results
  - High free-ridership - received a NTG of 56%
  - Low installation rate- only 37% of customers said they installed the CFLs within one month of receiving them. These customers will likely install the CFLs at some point- however the program did not receive credit
  - ComEd received credit for 13% of the savings reported at the end of the year

Something Else to Consider

- Both ComEd and Ameren ran similar residential CFL Lighting Programs –
  - Midstream delivery approach
  - Price buy down in stores
  - First year of EE programs in territory
  - Same implementation contractor
- Results varied dramatically due to the NTG ratios
  - Ameren NTG - 1.03
  - ComEd NTG - 0.68
  - How to explain the difference?

Other CFL NTG ratios –
Massachusetts program (2007) = 1.97
(source: Nexus Market Research)
Wisconsin program (2007) = 0.81
(source: Nexus Market Research)
California (2004-05) = 0.59
(source: ITRON)

So What's the Point?

- Believing that we had exceeded our planning target by 24% and the statutory goal by almost 40%, we stopped spending and returned $3.8M to customers.
  - 30% of residential lighting budget unspent
- In fact, even our "over-shoot" strategy was barely effective.
  - Essentially, we were derated by 20%
- Huge evaluation risk
  - Part 1: The "verified" values for key numbers like NTG ratio are unpredictable
    - No reason to think uncertainty will diminish in year 2 (different evaluation methods, different data sets, etc)
    - We don't know what the expected values are for things like NTG, but we suspect risk is asymmetrical (greater risk that we are over-estimating than under-estimating NTG)
  - Part 2: Verified values are not available until well after the program year is over
    - No way to recover if NTG ratio falls significantly lower than expected
    - If NTG ratio is higher than expected, we will have spent more than necessary to hit goals
    - No process for settling on the "final" values or arbitrating disputes over EM&V results – could be a year or more before we actually settle on what happened.

Implications and Options

- **This uncertainty and risk creates a significant portfolio management problem**
  - Significant penalties for missing the goal from here on out
  - As goals increase, programs have to become more efficient ($/MWh has to go down) BUT
  - The lower the realization rate or the NTG ratio, the more expensive the program per MWh for any given target
- **Options**
  - Portfolio/program management
    - Reallocate portfolio based on risk profile
      - Assume the worst in terms of evaluation
    - Change program implementation to improve NTG and installation rates
      - Increase CFL volume to account for lower NTG and installation rates
      - Increase marketing to boost customer awareness/program influence
    - Change program design to improve NTG and installation rates
      - Move incentives downstream
  - Policy options
    - Move toward gross savings target
      - NTG still estimated but used to improve program design
      - Put program protections in-place to prevent “drive-by” programs
    - Apply NTG prospectively
      - Provides planning/management certainty which will lower costs

The Short-Term Adjustment

- Due to the PY1 evaluation results, we've made some modifications to its PY2 program target to minimize the risk of missing the statutory goal
- **ENERGY STAR Lighting Program**
  - Original Plan: 4.3M CFLs *(Realization rate = 0.9, NTG Ratio = 0.8)*
  - New Plan: 8.3M CFLs *(Realization rate = 0.65, NTG Ratio = 0.65)*
  - Additional Program Cost: $1.7M *(Additional cost of $1.37 / net MWh)*
  - Additional spending on marketing or major change in program design not feasible in mid-year.
- **Prescriptive / Custom Program**
  - Original Gross MWH target: 207 GWh *(Realization rate = 0.9, NTG Ratio = 0.8)*
  - New Gross MWh target: 265 GWh (*Realization rate = 0.9, NTG Ratio = 0.65)*
  - Additional Program Cost: $1.4M *(Additional cost of $0.90 / net MWh)*
- **TOTAL NEW COST - $3.1M**
  - This budget is still within the PY2 overall budget of $79M
  - However, this was money that ComEd did not plan to spend to achieve its statutory goal and would have been returned to the ratepayer as part of the Rider EDA reconciliation filing
- **PY3**
  - Evaluating our options

What Needs to Happen

- Resolve net v. gross
- If net, resolve retroactive v. prospective
- If retroactive, resolve the timing issue
- Establish process for review of EM&V results and determination of final numbers

Understand that there are implications for portfolio planning/management for each of these.