

DEMAND ANALYSIS WORKING GROUP (DAWG) Energy Savings Pup

Notes

CPUC Energy Efficiency Potential Study -- CPUC 2018 & Beyond EE Potential & Goals Study – Model Calibration and Forecasting Scenarios

December 12, 2016 @ 2:30 pm – 4:30 pm

Webinar only

Meeting Link:

http://demandanalysisworkinggroup.org/?post_type=ai1ec_event&p=2695&preview=true

Agenda

Commission staff and Navigant will present on two key methodological topics that impact the forecast of market potential: Calibration and Scenarios. Calibration focuses primarily on IOU rebate programs. This webinar will cover the following topics:

- Calibration
 - Basics of adoption forecasting and key variables
 - What is calibration and why is the forecast calibrated?
 - Calibration methodology
- Scenarios
 - Key variables that can be considered in scenario analysis
 - Developing scenario pathways
 - Collectively brainstorm with stakeholder the opportunities and barriers to incorporating the SB350 mandate into scenarios.

Stakeholders will have the opportunity to provide informal comments before, during, and after the webinar. Slides will be posted in advance of the webinar in this website and we encourage stakeholder to review ahead of time. Given the fast approaching holidays, the time period of commenting after the workshop will be limited.

Notes

Introductions

- Calibration
 - Basics of adoption forecasting and key variables
 - What is calibration and why is the forecast calibrated?
 - Calibration methodology

Simulation Period

- Calibration: 2013 -2015
- Forecast: 2018 -2030

Dimensionality

- Forecasts potential by utility, sector, building type, impact type, replacement type, end use and measure

Methodological Updates

- Cost-effectiveness calculations and stock turnover algorithms accommodate existing baseline conditions
- Accommodates rebates in the form of \$/kWh and \$/therm
- Calculates annual economic potential (accounts for stock turnover) in addition to instantaneous economic potential.
- Uses bass diffusion approach to forecast market potential for Industrial/Ag technologies

Calibration is a standard process of adjusting model parameters such that model results align with observed data. The ability of a forecast to reasonably simulate observed data affords credibility and confidence.

Question

Is the cost of multiple installations calculated? E.g., if an LED is used in order to replace incandescent, the cost of labor saved from having to replace the CFL over a 10 year forecast horizon tends to dominate the cost-effectiveness.

Yes, the model captures labor cost of doing multiple replacements of an incandescent light that are foregone due to replacement with an LED.

Navigant is planning to use a high discount rate in the modeling – the implicit discount rate or “IDR.” The IDR is as high as 50% or 60%. They do this based on customer IDR – understanding that customers may not behave the way a “rational economic” equation would predict and undertake all cost-effective actions. Of course there are non-financial aspects of adoption that aren’t reflected in straight “rational economic” tests. The 2015 CPUC Energy Efficiency Potential study has additional information and cites some research.

Question

Is there consistency between this portion of the analysis and the work that Cadmus has done in codes & standards (C&S) looking at naturally occurring adoption in effect Cadmus is looking at diffusion of lighting adoptions.

It's not necessarily the same issue – it's not necessarily the case that the numbers would be the same. However, Paula will check in with the research to see whether coordination would be fruitful.

See page 12-13. The purpose of calibration is to ground model in reality so that results align with observed data.

The model is anchored to historic observations. Those could be either higher or lower than the model without calibration.

p. 13 – they are calibrating to the trend to smooth out “bumps” in observed data.

In the previous study the model was only calibrated to *above code* growth in program savings. Now there are new avoided costs – the values have generally decreased; now the goals are expressed as net (rather than gross), AB 802 has passed and now the programs can address below code savings, etc.

The combined effect(s) of these changes in the programs and regulatory system is significant and indeed represents an entirely new future. While it is still necessary to calibrate, the calibration is more difficult since the program historic accomplishments won't really correlate to future accomplishments under the new system. Since the past is less predictive of the future than it was in prior energy efficiency potential studies, Navigant is going to calibrate the model to program budgets rather than prior accomplishments. This is completely different approach than before. “Budgets” in this framework will include both incentives and administrative expenditures.

The model will be calibrated to budgets but as Paula and the team work to design this approach, they will also be looking at savings. Since there is no history of savings under this framework,

Comment

Budgets at some of the utilities are being reduced – admin costs, etc. are being reduced people. If admin costs are *decreasing*, will past budgets/accomplishments correlate very well with future budgets/savings? Are budgets really a good proxy to use for forecasting savings?

This is what this meeting is about, and the team is seeking input from DAWG members.

Comment

With avoided cost going down, how is this going to affect cost-effectiveness for the future? The model only assigns incentives to measures that pass an initial screen through the cost-effectiveness models.

Levelized measure costs are included slide 15. Also, the savings from C&S have been netted out.

Slide 17 – the model will allow budgets to grow over time.

Question

How are we calibrating via budget vs. calibrating by category for diffusion models adjusted on slide 18. Are the adjustments are at a measure level?

If you have a code change at a federal or state level that is affecting an end use, how will that work? The adjustments are done at the measure level.

The calibration is not based on budgets/savings for each individual year, so its total spending/savings in a three year span.

Slide 18

Category	Lever	Impact on Model results
Awareness	Initial Awareness	Increasing initial awareness shortens the time required for a measure to reach 100% consumer awareness. Also sets upper bound on adoption in the first year.
	Marketing Strength	Increasing marketing strength increases adoption rate of measures in the nascent stage (i.e. having low initial consumer awareness). Less useful for measures having moderate to high initial consumer awareness.
	Word-of-Mouth (WOM) Strength	Increasing WOM increases adoption ramp rate, particularly in a measure's growth stage.
Willingness	Implied Discount Rate (iDR)	the iDR is adjusted when perceived market barriers are higher or lower than normal, or when factors other than cost effectiveness may play a larger role in purchase decisions.
	Sensitivity	the consumer sensitivity is adjusted when markets are considered mature and customer primary focus is measure cost effectiveness
	Incentive levels	Spending and savings are sensitive to incentive levels, so changes in incentive levels by small increments are explored.

Question

There are three years of budgets (p. 18), 6 “levers” for calibrating the model. How will the team decide to prioritize among the levers? Awareness will be prioritized. They will start with adjustments at the end use levels.

NRDC

NRDC has a fundamental issue with calibration at all. NRDC requests that the calibrated results are presented as A scenario not THE scenario.

Calibrating to the past is short-sighted – that is the fundamental advocacy perspective because the model is based on past performance rather than showing some efficiency potential that is available to capture if new programs/approaches are able to do so. TURN agrees with this perspective.

Focusing on end-uses/technologies is one way to distinguish between past achievements and opportunities for new program designs.

Comment

In the Northwest the energy efficiency potential and goals studies set the “achievable” potential at 85 percent of the economic potential, without doing a bunch of additional analysis about adoption, willingness, etc. Those studies have a 20 year timeline, and are updated every two years or so. Thus, the endpoint isn’t as important as the near-term potential (similar approach to CA). Surya has done work in the NW, and indicates that although the NW sets “achievable” potential at 85 percent of “economic” potential, the measure/technology descriptions include some concepts like “ramp rates.” This information comes from groups like NEEA Northwest Energy Efficiency Association <http://neea.org/>. Concepts like “ramp rates” align somewhat to concepts being used in this CPUC energy efficiency potential study – “awareness” “willingness” etc. So the distinction isn’t quite as cut and dry as the NW simply declaring 85 percent of the economic potential as “achievable.”

- Scenarios
 - Key variables that can be considered in scenario analysis
 - Developing scenario pathways
 - Collectively brainstorm with stakeholder the opportunities and barriers to incorporating the SB350 mandate into scenarios.

In the past CPUC energy efficiency potential studies, the goals were informed by one reference forecast – scenarios were only considered afterwards. This time the energy efficiency potential study will literally include scenarios.

The CPUC will adopt one set of goals in August 2017. To emphasize: there will be **one** set of goals. But the study will include scenarios. The scenarios will focus on the things that the IOUs and CPUC have control over – policy and program design issues. Factors like the economy, estimated measure savings, etc. will not inform the scenarios – those are factors over which CPUC/IOUs do not have control, for purposes of this study.

Factors included in the scenarios will include uncertainty about about cost effectiveness tests, incentive levels, marketing and outreach, and budget.

See slide 22 – The team is still considering whether/to what degree financing should be considered in the modeling. So question: is financing something the CPUC and IOUs have within their control? Or is it something that local

governments have control over so it's not a factor that would be varied in the study – if it's a dimension wherein IOUs are just “going along for the ride.”

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It might be beneficial for the CPUC energy efficiency potential study to use the same terminology that is being developed in the Integrated Distributed Energy Resources (IDER) working group in terms of cost effectiveness. CPUC agrees this is a good idea.

If you were to be aggressive with C&S there is more program potential. Since we're in a 10 year cycle, is this important? C&S have 2 aspects – the internal controllable aspect vs. uncertainty about what federal budget will do.

NRDC may submit comments related to fuel switching. They have been looking at a technology that switches from gas to a very high efficiency electric furnace – this might require a policy change in order to be included in the study (and therefore possibly the programs).

Question

How can new program approaches be modeled? For example, is there a dataset that can show how new kinds of financing (for example) would help? E.g., raising the incentive in the model (or resulting program) when there is split incentive doesn't really translate to increased uptake. So for example is it possible to model a program like e.g., community solar for tenant sharing?

Navigant can try to approach something like this by leveraging some data from solar installations, perhaps. Surya has done work on distributed solar – situations where the value proposition is no longer based on cost, but rather on dimensions like cashflow, etc.

Turn would like to see a composite measure that equates to “efficiency bundled with DR and storage” (the key opportunity for such a measure would be in HVAC). Otherwise HVAC tends to drop out of programs since it does not appear to be cost-effective from an energy efficiency perspective, given current C/E tests, even though HVAC uses a lot of energy and should be a target rich opportunity. HVAC is increasingly the driver of peaks and superpeaks.

In prior CPUC energy efficiency potential studies, the team indicated that creating a composite measure like this was out of scope. So at some point there has to be an opportunity to envision measures like this rather than just rely on results from prior program years. This sort of produces a tautology when past accomplishments are used to forecast the future – doesn't really allow for new concepts like energy efficiency bundled with IDER. TURN will address this in comments.

CPUC response – modeling IDER technologies is out of scope since this study is for the energy efficiency proceeding. An approach like the one mentioned above could be explored in IDER proceeding. It would require effort to be able to model it.

CUMULATIVE savings slide 31.

HOW DO WE CUMULATE SAVINGS OVER TIME?

- Cumulative savings represent the total energy efficiency program savings from measures installed since a “start year” and are still “active” in the current year
- “Active” savings are calculated by accounting for:
 - Decay of savings as measures reach the end of their useful lives
 - Codes & standards that come into effect over time
- Unlike annual savings, cumulative savings include savings from reparticipants
 - In the past, only savings from first-time adopters were counted towards the goals
 - Sustained savings from re-adoptions needs to be accounted for in the CEC demand forecast
 - Model assumes reparticipants re-adopt measures at the same rate as new participants

“Active” savings are calculated by accounting for decay of savings as measures reach the end of their useful lives.

Reparticipation is an issue. In the past only new participants counted toward savings goals. The model in the past assumed that new participants adopted at the same rate as the general public *during that year of the forecast horizon*. (For most technologies the model assumes that awareness, willingness, availability, etc. increase over time. However, different technologies also become more attractive over time, so the rate of adoption varies for each year of the forecast horizon.)

Question

In the new model, should the effective useful lives (EULs) should be adjusted to show that a lot of customers are not replacing items when “we” (the modeling

community) think that they should? In other words, EULs are longer than we assume. As described in AB 802, lots of people continue to repair their equipment/buildings rather than replace them on schedule according to estimated EULs.

The model currently does not reflect this potential change in the EUL concept. See slide 32.

QUESTIONS ON CUMULATIVE SAVINGS

Question for Stakeholders

1. When do we start cumulating savings?

2. There is no new research to inform treatment of decay/reparticipation in the PG model. What should we assume about decay?
 - a. Starting with the 2013 PG model, reparticipation estimated based on market penetration rates (varies by measure)
 - b. 2011 PG model assumed a blanket reparticipation rate of 50% based on CPUC D. 09-09-047

3. D. 09-09-047 required that the utilities make up 50% of the savings decay as measures expire.
 - a. 2015 PG study annual market potential included only new participants
 - b. Thoughts on how to address with regard to cumulative savings?

Comments are due December 20. Please email them to:

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