Illinois EE Stakeholder Advisory Group
Large Group Meeting

Tuesday, November 10, 2020
10:00 am to 11:30 am
Teleconference

Attendees and Meeting Notes

Meeting Materials

- Meeting Page: Tuesday, November 10
- Tuesday, November 10 SAG Agenda
- Nicor Gas Energy Efficiency Potential Assessment Presentation

Attendees (by webinar)

Celia Johnson, SAG Facilitator
Samarth Medakkar, Midwest Energy Efficiency Alliance (MEEA) – Meeting Support
Foluke Akanni, Citizens Utility Board
Matt Armstrong, Ameren Illinois
Tyler Barron, Environmental Law & Policy Center
Patrick Burns, Brightline Group
Ben Campbell, Energy Resources Center, UIC
Andrew Cottrell, Applied Energy Group
Larry Dawson, IL Association of Community Action Agencies (IACAA)
Leanne DeMar, Nicor Gas
Ram Dharmarajan, Gas Technology Institute
Julie Drennen, Center for Energy & Environment
Deb Dynako, Slipstream
Katie Elmore, Community Investment Corp.
Jim Fay, ComEd
Scott Fotre, CMC Energy
Diana Fuller, IACAA
Omayra Garcia, Peoples Gas & North Shore Gas
LaJuana Garrett, Nicor Gas
Jean Gibson, Peoples Gas & North Shore Gas
Jon Gordon, Enervee
Kevin Grabner, Guidehouse
Randy Gunn, Guidehouse
Cliff Haefke, Energy Resources Center, UIC
Amir Haghighat, CLEAResult
Tyler Hammer, KBH Consulting
Amalia Hicks, Cadmus Group
Ryan Hoger, Temperature Equipment Corp.
Jim Jerozal, Nicor Gas
Amy Jewel, Elevate Energy
Maurice Kaiser, Honeywell
Haley Keegan, Resource Innovations
Mike King, Nicor Gas
Chester Kolodziej, Northern IL Summits and Expos
Larry Kotewa, Elevate Energy

John Lavallee, Leidos
Bruce Liu, Nicor Gas
John Mascarenhas, CLEAResult
Abigail Miner, IL Attorney General's Office
Zenia Montero Chang, ICF
Jennifer Morris, ICC Staff
Denise Munoz, ComEd
Chris Neme, Energy Futures Group, on behalf of NRDC
Dantawn Nicholson, ComEd
Victoria Nielsen, Applied Energy Group
Lorelei Obermeyer, CLEAResult
Maria Onesto Moran, Green Home Experts
Randy Opdyke, Nicor Gas
Antonia Ornelas, Elevate Energy
Stacey Paradis, MEEA
Kristen Pratt Kalaman, Resource Innovations
Beatrice Quach, Resource Innovations
Joe Reilly, Applied Energy Group
Zach Ross, Opinion Dynamics
Elena Savona, Elevate Energy
Charles Smith, Exxon-Mobil
Grant Snyder, IL Attorney General's Office
Mark Szczygiel, Nicor Gas
Rob Travis, Cascade Energy
Andy Vaughn, Leidos
Ted Weaver, First Tracks Consulting, on behalf of Nicor Gas
Shelita Wellmaker, Ameren Illinois
David Whittle, Leidos
Jessica Williams, Green Home Experts
Wen Yang, ICF
Cate York, Citizens Utility Board
Angela Ziech-Malek, CLEAResult
Julia Friedman, Oracle
Joel McManus, TRC Companies
John Pady, CEDA
Arvind Singh, DNV-GL
Chris Vaughn, Nicor Gas

Meeting Notes
Action items are indicated in red font.

Opening and Introductions
Celia Johnson, SAG Facilitator

- The purpose of this meeting is for Nicor Gas to report-out on an internal tool assessing EE portfolio potential.

Nicor Gas EE Portfolio Potential
Randy Opdyke, Nicor Gas and Tyler Hammer, KBH Consulting

- Introductions: Thank you for the opportunity to share details related to Nicor's internal tool on potential assessment. Nicor purchased this tool in 2016. It helps up in the

planning process, to understand load share and profile in the territory and by sector, segment, end-use. Stock forecast and potential savings. To better inform different avenues to designing plan. Top down approach to load-forecast. In planning, constraints of program, stipulation or regulatory requirements are the main guiding factors. The tool identifies opportunities. Tyler Hammer is the subject-matter expert on this tool, helps with development and integration of the model.

- Presentation agenda:
    - Study approach; market characterization findings; adoption curves; potential findings
- Study Team
    - Three main players - Nicor Gas Staff, KBH Consulting, First Tracks Consulting Services
    - Nicor did analytics. Customer billing data. Measure parameters and market research
    - Tyler Hammer served as the project manager. Has worked with over 20 DSM programs. Tyler was involved in the 2016 evaluation.
    - Ted Weaver is a subject-matter expert.
- General Methodology
    - Standard industry approach
    - Begins with load shares by sector, segment and end-use (disaggregated forecast)
    - Integrates forecast with measure parameters
    - Then laded into model, provides economic, maximum achievable and program potential
- Potential Assessment Types
    - Economic potential – TRC screen
    - Achievable potential - additional constraint on market barriers
    - Program potential – incorporates budget and planning constraints.
- Study Data Sources
- TEAPot Tool
    - Applies individual measures to available end-use load (bottom-up)
- Model Set-Up
    - Considered useful outputs, which informed model inputs.

Discussion on Model:

[Chris Neme] How do you distinguish between low-income and non-low income residential?

[Tyler Hammer] This is done by including market data that Nicor has on the share of customers, SF vs. MF that are low income and non-low income.

[Chris Neme] How do you distinguish different end-use saturations between low-income and non-low income residential?

[Tyler Hammer] We have results that break up available potential for market-rate and low-income. Where we have data that supports understanding this break down is

incorporated. There are instances where we didn't have data support, but they did distinguish wherever possible.

[Chris Neme] You mentioned 50-something residential measures. Are half low-income, so you have a basis? Or do you assume on the back end that a portion is low income?

[Tyler Hammer] Within each sector, we break up by technology type, and then there are some measures, for instance air sealing, that are more common in the low income sector, we looked at program performance of these measures in the low income program.

[Ted Weaver] The savings are also characterized based on what we know about program participants. Square footage of insulation, for instance.

[Randy Opdyke] We separate regular residential for certain measures, which are different than what we've seen in low income participation.

Discussion on Study Horizon:

[Chris Neme] When you say the horizon is 2021-2040, how do you deal with measures installed in 2025 that have a 20-year measure life?

[Tyler Hammer] You'd still get the full benefits of the life of the measure in the TRC screen.

[Chris Neme] So your avoided costs go beyond 2040?

[Tyler Hammer] Yes

[Chris Neme] So you look at the installation of measures through 2040 and their full life-cycle benefits are captured because their avoided costs extend beyond that?

[Tyler Hammer] Correct

[Ted Weaver] We will show life-cycle savings metrics. We looked at savings installed each year, and if they go beyond 2040, they're still counted.

Savings Algorithm

- Simplified; calculated for each measure within a competition group, savings factors applied to against available load.

[Chris Neme] What you described makes sense for retrofit measures. But for equipment that is being turned-over, (i.e. water heaters) is the remaining metric your forecast that would be efficient without a program?

[Tyler Hammer] Remaining factor more in play for early replacement. If you have 1 mil water heaters in the market, turning over in a 10-year period, then you have 100,000 eligible water heaters.

[Chris Neme] That 100,000 is multiplied by only savings and applicability factors?

[Tyler Hammer] Yes

[Chris Neme] How do you account for the percentage of new purchases of efficient appliances? How does this factor in the savings potential?

[Tyler Hammer] The model is calculated on a gross level. Post model we apply the results a net-to-gross factor.

[Chris Neme] Presumably it would vary by aggressiveness of the program and level of savings you're going after?

[Tyler Hammer] We looked at what Nicor has been getting (NTG) with current program.

Model Taxonomy

- Each measure applied to all segments as applicable. Some constraints – for example cooking measures for the restaurant segment.
- Looked at end-uses within each sector.
- List of equipment types. Average energy consumption and load.
- Each measure was only applied to respective load.

[Chris Neme] What is 'space heat other'?

[Tyler Hammer] That could be a fireplace, other msc equipment, not a furnace or boiler.

[Chris Neme] I know Nicor has been looking at gas-fired heat pumps. Are those not among the measures?

[Tyler Hammer] When we look at a measure, we apply it to the baseline of what it's replacing.

[Randy Opdyke] We actually had gas heat pump water and space heaters in this. They fall under the furnaces.

[Ted Weaver] These are sub end-uses, not measures. Measures apply to various end-uses.

[Chris Neme] On the non-res, what is RNG?

[Tyler Hammer] That's renewable natural gas. Did not do anything with that in this study, but available for future analyses.

[Chris Neme] On the commercial side, demand control ventilation, that is a measure that would be applied to any of the space heat end-uses?

[Tyler Hammer] Yes. For non-equipment measures, that savings and measure is applied to each equipment types. Equipment measures apply to a specific equipment type. One exception, boiler control measures, while it's non equipment, constrained to boiler load share.

[Chris Neme] What about custom measures?

[Tyler Hammer] Custom is treated as a non-equipment measure and would apply to any specific measures. For example, HER are applied to all sectors.

Market Characterization – Load by Sector

- These findings do not include exempt customers. Significant difference between 2016. Once you take out exempt customers, about half in 2016.
- Impact of Exempt Gas Customers
    - Eligible load reduced by load.
    - In 2016, we didn't have exempt customers in that assessment. You will see a gross savings level difference due to this.

[Chris Neme] What's the criteria for large customer exemption?

[Randy Opdyke] 4 million therms annually for individual site or multiple facilities.

Residential Load

- Majority of load in SF.
- EIA data
- SF, data wasn't there to break up, but for MF data is there.

[Chris Neme] If a MF building has a central boiler system, did that get moved to residential? Or keep as Commercial?

[Tyler Hammer] Moved to residential.

[Chris Neme] Did you have any insights into why heating is a smaller portion of MF LI vs non-LI?

[Tyler Hammer] Central systems, across a full building, the heating is more efficient and shared across residents, as opposed to water heating might be bigger load share.

[Chris Neme] Is this normalized to show percentages? Is consumption for LI SF and MF higher or lower than non-LI counterpart? Could you share this information? With total therms per year? What does 100% therms represent?

[Ted Weaver] Therms per household for each group?

[Chris Neme] Yes.

Discussion of Small Commercial Sector and Large Commercial Sector:

[Chris Neme] Which share of the total Nicor consumption is represented by eligible large commercial?

[Tyler Hammer] Large Commercial is 7.8% of load

[Chris Neme] Smaller than small commercial?

[Tyler Hammer] Yes, small commercial is 25%, large, 8%, public 9%, Industrial 8%

Adoption Curves

- Developed primarily by equipment type.
- Residential Furnace Adoption Curve: Nicor is converting about 15% of burnt-out furnaces

[Chris Neme] I understand why historic starting point is important, but basing everything from the starting point is a concern. This does not consider improvements in program design for achieving more savings.

[Tyler Hammer] Absolutely, achievable base, result and model matches with empirical observations. It lines up with past performance. Achievable moderate - If we look at what potential adoption could be for residential furnaces if it's incented more or change in program delivery, that's the delta. Later, we'll see the additional savings opportunity beyond baseline.

[Ted Hammer] We don't think this tool is the appropriate way to come up with scenarios for attaining more savings through program design. The focus is market segmentation and opportunity for savings with more rebates and budget.

Findings: Savings – Accounting Method

- See legend in slides

Portfolio Results

[Chris Neme] Achievable max is so much less than achievable economic. How are retrofit measures captured in economic? Do you assume it's spread out over 10 years?

[Tyler Hammer] Yes, spread over time. Average number of households that had measures installed.

Residential Results

- Found more potential in residential sector, uptake of longer life measures.
- Reviewed residential results and residential cumulative lifecycle savings
- [Chris Neme] For air sealing and insulation, is it fair to assume it's the rolling up of LI and non-LI components? The cost for LI customer would be higher on a per therm basis? Do you have the breakdown of low income and non-low income? It would be useful to split out low income and non-low income, for categories where it may have an impact (ex: furnaces, air sealing, insulation).

Non-Residential Results

[Chris Neme] How did you estimate custom savings?

[Tyler Hammer] Project level. Avg expected savings per buildings, avg cost and lifetime savings per building. Then broken out by segments.

[Chris Neme] How did you estimate available savings?

[Tyler Hammer] Likely an avg of individual equipment responses.

[Chris Neme] Surprised that demand control ventilation isn't a larger savings potential.

[Tyler Hammer] We would've gotten the savings parameters from the TRM (% of end use load reduction). Then tied into the fact there isn't a lot of uptake. Then some assumptions on what is that measure most akin to.

[Chris Neme] So either TRM is more modest, or your diffusion curve indicates lower uptake.

[Tyler Hammer] Yes, these are the biggest two factors.

[Ryan Hoger] The TRM also excludes all VAV systems for gas savings, so most buildings not eligible on gas side.

[Chris Neme] The diffusion curves are based on customer willingness to pay and adopt. How did you factor in the effects of alternative program designs like upstream rebates? Where WTP is less of an issue, savings driven by supply chain.

[Tyler Hammer] We did not vary things by program delivery approaches. This is looking at the market opportunity. This was then used to cross check with Nicor's program planning tool. Did not want to get too program planning focused.

[Chris Neme] For future reference, if you're dealing with upstream programs, the incremental distributor costs are around a one-third. And market penetration rates could be higher, with lower administrative costs.

Closing & Next Steps
Celia Johnson, SAG Facilitator

Follow-up items include:

1. Presentation Slide 16: Provide the total therms per household, per year for the six residential sector categories, for income qualified and non-income qualified.
2. Presentation Slide 31: Split out income qualified and non-income qualified, for categories where it may have an impact (ex: furnaces, air sealing, insulation).