Illinois Energy Efficiency Stakeholder Advisory Group
Meeting: Peoples Gas & North Shore Gas Potential Study Results

Wednesday, August 26, 2020

10:00 am – 12:00 pm
Teleconference Meeting

Attendee List and Meeting Notes

Meeting Attendees (by webinar)

Celia Johnson, SAG Facilitator
Greg Ehrendreich, Midwest Energy Efficiency Alliance (MEEA) – Meeting Support
Jennifer Alvarado, Franklin Energy
Matt Armstrong, Ameren Illinois
Brady Bedeker, ComEd
Kathia Benitez, Franklin Energy
Rick Berry, Guidehouse
Carmen Best, Recurve
Shonda Biddle, Walker Miller Energy Services
David Brightwell, ICC Staff
Craig Catallo, Franklin Energy
Katie Chiccarelli, Applied Energy Group
Mike Chimack, ICF
Leanne DeMar, Nicor Gas
Allen Dusault, Franklin Energy
Deb Dynako, Slipstream
Jim Fay, ComEd
Jason Fegley, Ameren Illinois
Scott Fotre, CMC Energy
Julia Friedman, Oracle
Omayra Garcia, Peoples Gas & North Shore Gas
Jean Gibson, Peoples Gas & North Shore Gas
Kevin Grabner, Guidehouse
Mary Ellen Guest, Chicago Bungalow Association
Randy Gunn, Guidehouse
Cliff Haefke, Energy Resources Center, UIC
Amir Haghighat, CLEAResult
Tyler Hammer, Cadmus
Dave Hernandez, ComEd
Travis Hinck, GDS Associates
Lalita Kalita, ComEd
Haley Keegan, Resource Innovations
Mike King, Nicor Gas
Paige Knutsen, Franklin Energy
Larry Kotewa, Elevate Energy
Ryan Kroll, Driftless Energy
Bruce Liu, Nicor Gas
Ashley Lucier, SEEL
Marlon McClinton, Utilivate

Abigail Miner, IL Attorney General's Office
Jennifer Moore, Ameren Illinois
Kelly Mulder, Illume
Chris Neme, Energy Futures Group, on behalf of NRDC
Rob Neumann, Guidehouse
Fuong Nguyen, Applied Energy Group
Victoria Nielsen, Applied Energy Group
Lorelei Obermeyer, CLEAResult
Maria Onesto Moran, Green Home Experts
Randy Opdyke, Nicor Gas
Antonia Ornelas, Elevate Energy
Christina Pagnusat, Peoples Gas & North Shore Gas
Hanh Pham, Willdan
Michael Pittman, Ameren Illinois
Ingrid Rohmund, Applied Energy Group
Reine Rambert, MEEA
Ramandeep Singh, ICF
Holly Spears, SEEL
Mark Szczygiel, Nicor Gas
Chris Townsend, CJT Energy Law
Andy Vaughn, Ameren Illinois
Ted Weaver, First Tracks Consulting, on behalf of Nicor Gas
Tiffany Welch, ICF
David Whittle, Leidos
Jessica Williams, Green Home Experts
Selena Worster Walde, Erthe Energy Solutions
Grace Wroblewski, Applied Energy Group
Joel McManus, TRC Companies
Arvind Singh, DNV-GL
Chris Vaughn, Nicor Gas
Salina Colon, CEDA
Jon Gordon, Enervee
Amy Jewel, Elevate Energy
Darnell Johnson, Urban Efficiency Group
Bruce Montgomery

Meeting Notes
Follow-up questions indicated in red.

Opening & Introductions
Celia Johnson, SAG Facilitator

Purpose of August 26 meeting:

- To discuss draft Peoples Gas/North Shore Gas potential study results.

Preliminary Peoples Gas & North Shore Gas Potential Study Results
Ingrid Rohmund, AEG

- First will discuss analysis approach, then through the analysis, following the steps. Walk through from beginning to estimates of potential. First Peoples Gas, then North Shore Gas.

- Granular, data driven approach. End-use forecasting approach.
- Summary of data sources & customer surveys conducted. Surveys with residential customers were completed using a mail-to-web format. Used to feed into market characterization. Intended to do C&I surveys, but COVID situation shut that down. C&I sectors rely on secondary data for the market characterization.
- Review of technical, economic, achievable potential. Analysis is done at measure level. Other measures not in potential study might end up in plan, measures in potential might not fit program design.

  [Chris Neme] How do you define achievable, is it maximum achievable, achievable in a budget, achievable at an incentive level?

  [Ingrid Rohmund] Key input to achievable is customer adoption estimates. Analysis is grounded on previous accomplishments of PG/NSG. Further slide will show.

  [Chris Neme] The amount adopted in the past is a function of past program designs, which is a function of available budgets. So indirectly, this is budget constrained achievable based on past budget limitations?

  [Ingrid Rohmund] Yes, that's fair that a budget level is implied in there.

  [Chris Neme] Is utility load forecast including no new EE?

  [Ingrid Rohmund] Yes, that's our reference. That's what we asked for.

  [Chris Neme] Can anyone at the utility speak to that? It's not an easy thing to do. Most forecast based on past sales, which includes EE. Is it "load reconstitution" to generate?

  [Ingrid Rohmund] We can circle back with an answer.

  [Chris Neme] Conclusion that it is in essence a broadly budget constrained potential – should note that in the report to make sure it is understood.

Peoples Gas Analysis

- Start with market characterization from surveys and billing data. 4 segments for Peoples. Income & housing type. Largest segment is SF at 60%.
- Annual consumption by end use – space heating and water heating is major use. Single family uses more than MF. LI uses more than non-LI because of less efficient equipment.

  [Chris Neme] Average consumption shown for a single-family non-LI home is significantly less than what I think the last Peoples potential study showed. Something like 1300 therms per household, which is 40% higher than what you are showing here. Why did it drop so much in 4 years? Also looks like big decrease in the Space Heating portion. Do you have any thoughts or insights about what is different between the two studies?

  [Ingrid Rohmund] Certainly seeing improvements in efficiency over that time period. Other big variable is weather, especially for natural gas. Can't confirm that right now, but that's where I would look first.

[Chris Neme] Not weather normalized then?

[Ingrid Rohmund] Going forward it is but is trued up to actuals in 2019.

[Ingrid Rohmund] Baseline Projection of how usage would be by end use. Load forecast is aligning well with the baseline projection. Decrease between 2019 and 2020 is the adjustment to normal weather.

[Chris Neme] Weather normalization doesn't have much of an effect since it is pretty flat?

[Ingrid Rohmund] 2019 was a colder year so 2020 normalization drops it down.

[Chris Neme] Still not seeing all the impact, should make sure nothing is missed in that.

- Technology and measures covered in study. Equipment and non-equipment measures. Analyzed 59 measures for residential sector. 590 combos with permutations and vintages.
- Slide 12 – computed adoption rates. Took all measures and grouped in categories that align with program measure categories. Then calculated adoption rate as prior year savings/technical potential for year 1. Some measures have high adoption rates. Imposed a minimum of 10% for any measures that fell lower than that. Accounted for new furnace standard. This was applied to estimate achievable potential. Welcome your feedback on this, looking for feedback from the group.

  [Chris Neme] What's in the denominator here? For water heaters, assume estimated number of customers with gas heaters in territory and made an assumption about turnover each year, that becomes the technical potential?

  [Ingrid Rohmund] Yes, the turnover shows how many are available to upgrade.

  [Chris Neme] For attic insulation, for example, no turnover. Technical potential all the homes that don't have R-38 or whatever and the savings from upgrading all of those homes. But can't do all in 1 year. This is 19% of what?

  [Ingrid Rohmund] There is an applicability factor and an assumption about how fast turnover takes place.

  [Chris Neme] So, you assume all heaters turn over in measure life. Technical potential reflects that. For non-equipment measures there is an estimate of how long time period for savings to be achieved. Hard to understand this without knowing the achievement period for each one. Can you provide those?

  [Ingrid Rohmund] Yes, that's a good point.

- Cumulative technical and economic potential, ranked by amount of technical potential. Look at this to make sure results make sense. Furnaces are a big use and should be at the top. Similar water heaters. Does it make sense, is anything missing, what refinements we can make. Green bars show economic potential for those measures that are cost effective. So furnaces, economic is 85% of technical potential, so for some the

most efficient furnace is most cost effective. There is no cost effective HE water heaters, so no economic potential for those. Interactive effects of measure stacking can have some effects. Let us know if anything doesn't look right.

[Chris Neme] Are window measures treated as full measure cost retrofits or time of replacement upgrades?

[Ingrid Rohmund] Don't know answer of the top of my head; will check the model.

[Chris Neme] Air sealing – you have aero-seal passing and traditional air leakage failing. Is that because there are competing measures and you can only pick one, or is it really that air leakage not aerosol fails?

[Ingrid Rohmund] These are treated as two independent measures with their own market share. Not competing.

[Chris Neme] It would be helpful to know the underlying cost, savings, measure life assumptions for each of these.

[Ingrid Rohmund] That will come with report. Will talk with PG/NSG team and discuss with them.

[Chris Neme] It's hard to comment on this without understanding the underlying assumptions. Also, whether things failed at 0.9 or if they failed at 0.4.

[Ingrid Rohmund] Do you want to see the model? It's all in spreadsheet form. We can show you that if you want. It's hard to summarize all that for a 2-hour presentation.
AEG to send model to Chris Neme.

[Marlon McClinton] Can you define the whole home aerosol sealing?

[Ingrid Rohmund] We will circulate information with measure definitions.

- Three levels of potential shown, ranked by achievable. Using the previous adoption rates shown. Highest ranking is ES connected thermostats. Then steam trap maintenance, then behavioral. These are cumulative savings over the 4 program years.
- For 2030, the scale changes and much more activity in furnaces the longer the time horizon. Same with building shell.

  [Chris Neme] Behavior programs savings look like they double from 2025 to 2030. How?

  [Ingrid Rohmund] That's on our list to look deeper into as we put these slides together.

  [Abby Miner] Can you discuss furnace high efficiency measure. Is that full replacement? Is that unique to income qualified?
  [Ingrid Rohmund] Yes, full replacement. Results are rolled up across all segments so it would cover income qualified and non-IQ.

- Savings rolled up by end use – cumulative savings from space heating are largest. Steam traps and maintenance also significant. Across measures, across segments for

residential sector. First year/incremental savings on the range of 4500-5500 thousand therms per year. Percent of baseline shown in table as well. Roughly consistent with past. But of course, different mix of measures and different potentials.

[Marlon McClinton] Regarding thermostats, what is the essential difference between smart and programmable – that may explain the wide difference in performance in the analysis?

[Ingrid Rohmund] Programmable is "set once and forget it" type of thermostat. Smart thermostat learns from behavior and makes more adjustments on a real time basis.

[Marlon McClinton] Okay, set one time but with overrides or changes, but no frequent response. And smart thermostat adjusts. That's good. Thank you.

[Ingrid Rohmund] Savings are proscribed by the TRM for those.

[Chris Neme] If we could go back to slide 7, back to the sales levels we're looking at. Showing 968k households consuming 714 thousand million therms. Don't have the data for 2019, but gas reports to EIA on form 176, 2018 residential for PG show 82M therms (but was a cold year) associated with 730k residential customers. Is part of what is going on here, your number of households includes MF housing that is master metered, whereas perhaps those show up under commercial in 176. Gas sales numbers seem consistent with EIA reports, but not the number of households shown here.

[Ingrid Rohmund] We scratched our heads about that as well. We aligned with the information from the load forecast group. Will have to revisit.

[Chris Neme] Being different from both EIA and past potential study, I question it.

PGL C&I

- Used Google Places API to obtain building type information and validated top 200 manually. Billing data doesn't have NAICS codes, so had to do it that way. Misc segment includes industrial. Not big enough to break out on its own.
- Compared with other studies, and both breakout and per square foot usage seems consistent with those. Misc is largest segment. Health, office, schools are next tier. There is a lot of mixed use in Chicago, and that's a challenge for commercial sector analysis. SIC or NAICS code by account would make that easier, but didn't have that.
- Energy use by end use by building type. Space heating and water heating. A lot of food prep in the restaurants and in health and lodging.
- Baseline end use projection. Lines up with load forecast. Some weather adjustment between 2019 and 2020, and must be something else going on there as well. C&I is declining slightly over the forecast period. Not a lot of customer growth in the C&I sector and efficiency is pulling usage down over time.
- Summary of measures used for both PGL and NSG C&I. Total 1600 permutations. Was reminded by team that measure list was provided to stakeholders earlier in the study. Might be on SAG site. Will make sure you have access to them again.

- Same process for C&I adoption rates as for residential. A few measures with high adoption rates. Imposed minimum - not sure why it's 11% here and not 10%... And the answer for that is we scaled up all of the adoption rates to account for custom measures.

  [Chris Neme] Custom is about 10% of total?

  [A: yes]

  [Chris Neme] Gas optimization and Rx are not equipment measures. So that adoption is very different if it is spread over 5 or 20 years. Hard to comment in the abstract without knowing those functions for that graph.

  [Ingrid Rohmund] Should be able to provide more clarity on that.

  [Ingrid Rohmund] Here we have the diagnostic slide with technical and economic potential. Economic approaches or is equal to technical for most of the measures. Let us know if anything looks out of place.

  [Randy Gunn] How about smart thermostats not being cost effective?

  [Ingrid Rohmund] Don't know why that is the case. We'll get back to you.

  [Chris Neme] Those numbers, both Technical and Economic include the accounting for custom?

  [Fuong Nguyen] No, that's just for achievable adoption rate.

- Now looking at achievable. Top is steam trap maintenance. That's where we applied the custom measure adjustment. Cumulative savings over 4 program years on scale of 12k. On next slide, over 9-year period and there is more potential for water heaters and just about everything. Higher adoption percentages as well.

[Randy Gunn] Can you talk about why water heaters are cost effective for commercial but not residential?

[Ingrid Rohmund] Underlying cost and savings, don't have those numbers in front of me.

[Chris Neme] Also volumes of water consumed. HE boilers must be getting the minimum 11% penetration – leading programs across the country getting higher. Must be a function of program design assumptions here.

- By end use. More savings from so-called miscellaneous (includes industrial and cross-cutting). Steady progression upward. Rolled up to totals, can see much of the technical potential is economic.
- Savings at the achievable level of 1.2% after codes, standards and naturally occurring is healthy compared to what we are seeing in other studies.
- Summary of all sector savings rolled up. (slide will be fixed for Peoples Gas because it only shows residential).

  [Kevin Grabner] For smart thermostats, is it only gas benefits, excluding electric?

[A: Yes]

[Chris Neme] Seems problematic

[Ingrid Rohmund] Yes, I agree, we should revisit that.

- Combined total achievable for all sectors. 8k-9.5k over the 4 years. Percent of baseline total 0.8-0.9%. 55-58% of potential from residential.
- Cumulative by sector, we see that residential has largest share. Seems a tad counterintuitive might need to make some C&I adoption rate adjustments.

North Shore Gas Analysis

- Same set of slides for NSG. Much smaller territory and more homogenous in residential sector. Modeled it as a whole based on survey and billing data.
- Small Low Income segment, but it was not broken out because of the small size of the segment. Not surprisingly, space heating followed by water heating.
- Baseline projection for residential shows weather adjustment and an increasing forecast driven by customer growth.
- Adoption rates we calculated in the same manner as for Peoples. Thing that jumps out here that we will be looking at is behavioral reports with an adoption rate of 85%. Not sure exactly what that means. Will take another look at that. Any measure besides behavioral reports is something they could do independently. The only program-driven measure.
- Economic and technical potential. Highest TP is water heaters, but not cost-effective. Followed by furnaces and ES connected thermostats. Some measures not cost-effective here.
- Achievable potential – will be taking another look at behavioral since it is the highest here.

  [Chris Neme] For Peoples, ES thermostats got more than behavioral?

  [Ingrid Rohmund] Yes, was highest for peoples and behavior was third. Developed it based on previous years. Will be relooking at behavioral.

  [Chris Neme] Troubled by the idea that things are all based on past achievements. Seems almost like circular logic/self-fulfilling prophecy. Doesn't leave room for consideration of what could be achieved with different program design, market changes, delivery, other alternatives. What we've done in the past is all we can do.

  [Christina Pagnusat] We certainly will take that point back and can follow up on that. Budget is a big part of that, but your point is noted.
  [Ingrid Rohmund] I agree, we can talk this over and think about how we might do it differently.

- Not very different mix at the top end, persistent pattern between 2025 and 2030.

- Savings by end use very weighted toward space heating in residential sector. Roll up for residential sector shows achievable of about 0.7% of baseline.
- C&I sector, same approach as for Peoples study. Billing data, google places, and manual validation of top customers. Not very different than Peoples, but breakout is different and does make sense. More retail, less lodging. More warehouses.
- Breakdown by end use and building type. Space heating is a little more than for Peoples. Food service is similar.
- Load forecast for C&I declining over time. Good alignment with load forecast. Maybe a tad lower than NSG.
- Used same measure list as earlier. Slightly different adoption rates. Steam traps and industrial steam traps leading the pack here.
- Technical potential tremendous potential for steam traps and all cost-effective. High efficiency water heating and RCx are effective. Many measures have very high economic potential. Smart thermostats are low. We will take a look at that.
- Achievable potential – large amount from steam traps, Cx, RCx. Looking out to 2030, larger scale but same list of measures at the top.
- Savings by end use, slightly different path. More early year potential and then a leveling off, suggesting some markets transformed/exhausted. Begs the question of which measures, and we will provide some insights into that.
- Rolled up to C&I sector as a whole. Much more potential compared to residential. Reflecting more cost-effective potential for this sector.
- All sector roll-up. This one is right with both residential and C&I. Capturing about half of the economic potential each year, which is pretty good.
- Breakdown by sector – Residential has more contribution in terms of total numbers, though C&I has a higher share by sector.
- Cumulative 1% per year across the program years, leveling off a bit toward the end of the study. Cumulative savings by sector.

  [Chris Neme] Back to the question of residential consumption, I found another reference that suggests higher. PG reporting as residential heating customers in quarterly report for system modernization plan. 2019 Q4 shows average residential heating customer consumption of 1010 in the calendar year. Which is much higher than the 700 and change on your slide.

  [Christina Pagnusat] Yes, we'll look into that.

Next Steps

- AEG will share follow-up information from this meeting within two weeks. When follow-up information is circulated to SAG, a due date for any additional feedback will be shared.