

MEMORANDUM

To: Logan Burke, Alliance for Affordable Energy
cc: Vic Prep, ERG Consulting; Jay Beatman, Dentons
From: Cliff McDonald and Jeff Loiter
Date: 3 August 2018
Subject: Responses to the comments submitted by the Alliance for Affordable Energy on the proposed measure list and other aspects of the DSM Potential Study

GENERAL CONCERNS

The Alliance recommends three potential scenarios – one with 100% incentives, one with 50% incentives, and one that follows the Council’s target of 2% savings per year

As stated in our work plan and in the responses to earlier comments to the Alliance, the scope of the study calls for two achievable potential scenarios – one with 100% incentives and one with 50% incentives. We will not be doing a scenario following the 2% target, as it is not in the study scope and would require an exercise in “goal-seeking” through adjustments to incentive amounts and program delivery models to achieve this. This is beyond the scope of our effort, nor would it be feasible to ask of our Delphi panels who will be developing measures penetrations as a function of incentive coverage. We believe that, based on the draft maximum achievable results, stakeholders and policy-makers will have sufficient information to assess the Council’s target in the context of achievable potential.

The Alliance recommends providing some information on savings potential from the Sewer and Water Board

The electricity used by the Sewer and Water Board is largely self-generated, and thus not included in Entergy’s load forecast. Since this study will be used as an input to Entergy’s IRP and thus specifically looks at the efficiency potential for Entergy provided electricity, it would not be appropriate to include savings specific to the Sewer and Water Board. That said, to the extent that some load from this customer is included in the forecast, this would get captured by the Industrial Process efficiency measure. Further, Optimal does recognize the separate value of increasing the efficiency of the Sewer and Water Board, and will briefly address this in the written report.

The Alliance affirms that if there are particulars in the Technical Resource Manual that are not appropriate to use, we should put forward our own assumptions with analysis and reasoning. As an example, they raise the fact the TRM deems a baseline groundwater temperature value of 70 degrees or more, thus removing the viability of many

water heating measures.

Optimal used the New Orleans TRM as one of many data sources for measure characterizations. If data points were obviously wrong, we would attempt to find alternative information. That said, the main limitation of the TRM was the range of measures characterized and not the quality of the deemed datapoints, and we do not believe there were any places where we determined that the TRM was incorrect. In regards to the specific example given of the groundwater temperature, we believe that the value in the TRM is reasonable for Louisiana, as shown by this groundwater temperature map: <http://www.hotspotenergy.com/heat-recovery-performance/groundwater-temperature-map.php>.

The Alliance points out that current Energy Smart Programs are achieving significant duct sealing savings, which does not appear in the top ten measure list from the draft report. They further recommend that the top ten measures identified in this potential study be evaluated for inclusion in the next Energy Smart programs.

Optimal has received the most recent results from the Energy Smart Programs and will revisit any measures that are achieving significant results in the program but not in the study. That said, there is no particular reason to believe that the top ten measures in an economic or max achievable scenario would match the current top measures from the currently implemented programs. We agree that measures identified in the study as having high savings potential are good candidates for promotion in future Energy Smart program years. However, this activity falls outside the scope of the current project and our role in the process.

The Alliance Highlights that a significant portion of major equipment in New Orleans was installed in 2006-2008 and may be reaching the ends of their useful lives in the next 3-5 years.

This may be true, but our methodology makes the simplifying assumption that major measure turnover is evenly distributed in time. There is not enough data available to enable us to confidently project which year may have higher “natural” turnover due to the effects of rebuilding efforts after Hurricane Katrina, nor would it significantly impact the cumulative 20 year potential.

SPECIFIC COMMENTS

In addition to the above general recommendations, The Alliance made the several requests for specific details. Optimal responses to each request are given in red.

Provision of More Detailed Measure and Program Data

- Please provide full characterizations of all measures
 - Optimal should provide their model’s input tabs or a version of their model, though if demand response (DR) measures were not modeled in Optimal’s tool those characterizations would need to be provided separately.

Optimal will provide the measure characterizations as an appendix to the final report.

- Please describe how non-resource benefits were estimated and applied. Non-resource benefits are limited to measures with known quantifiable and well researched benefits, mainly operation and maintenance (O&M) and water savings.
- For which measures were values other than those in the TRM used? For these measures, why were different values used?
The TRM was largely used for those measures that were in the TRM, as well as for general hours of operation and coincidence factors. For example, although commercial mini-split heat pumps are not specifically in the TRM, we still used the cooling coincidence factors and full load hours.
- For replace at failure (ROF)/lost opportunity measures, what were the basis/source for the not complete factors, i.e., how, for each year, were the percentage of units already meeting efficient measure criteria estimated?
In our analysis methodology, percent not-complete factors are only used for retrofit measures, not ROF/lost opportunity. For lost opportunity measures, some baseline market penetration is captured by the net-to-gross ratios (free-ridership), which are based on the latest Energy Smart evaluations.
- Please provide details on the measure penetration and DR participation rates used in the analysis
 - Were the Delphi penetration rate estimates used directly by Optimal or further modified? If so, how?
Delphi curves were slightly modified for retrofit measures to better match how retrofit adoption works. For market driven measures, the adoption rate represents the portion of the market each year that selects the high-efficiency measure. Therefore, it makes sense for the adoption rate to reach 80% of the market and remain there for 10 years. For retrofit measure, the adoption rate represents the cumulative portion of the market that has completed the high-efficiency retrofit. Therefore, once the adoption rate reaches a maximum, no further potential remains. Therefore, for retrofit measures, we assume a linear increase in cumulative adoption between the current “not complete” rate to the maximum adoption rate determined by the Delphi Panel over the length of time the Delphi Panel believed it would take to reach the maximum. For market opportunity measures, the curves from the Delphi Panel were applied with no adjustments.
 - How were DR measure penetrations and event participation rates modeled?
They are based on achieved rates from current programs in other jurisdictions, with a particular emphasis on the South. More detail will be provided in the final report.
 - How were measures grouped under the broader Adoption Curve Scenario?

Measures were grouped under the broader adoption curve scenarios based on how well they met the qualitative description given to the Delphi Panel, which included factors such as first cost, whether or not they require active engagement from the customer, etc..)

- Provide assumed annual Residential and C&I new construction start data. Units for Residential, with SF and MF data provided separately, and square footage additions for C&I by building type.

We did not separately derive estimates of this information. Residential and commercial customer count growth is assumed to be 0.4% annually, as reflected in Entergy's forecasts.

- Please provide cumulative and annual participation numbers (quantities), costs, and savings outputs for each measure and Program

Because this is a "top down" study, we do not derive specific estimates of annual participation quantities. Our final report will include an appendix showing participation in terms of percent of eligible end use energy by measure. We will also include appendices showing total costs and savings by measure.

- Optimal could provide their model's output tabs or a version of their model, though if demand response (DR) measures were not modeled in Optimal's tool, these should be provided separately.

The outputs of the model will be provided in the final report.

- Please provide residential and low-income program savings separately.

Our study does not currently distinguish between low-income and non-low income residential buildings.

- Please provide DR costs and savings separately.

The final report will include all DR costs and savings

Integration/Comparison with Entergy Potential Assessment

- How will the results, including interim results, of the Optimal study be used to inform the Entergy Potential Assessment?

The two potential studies are separate independent estimates of potential. The results of one will not be used to inform the other and vice versa.

- Conversely, how will the results, including interim results, of the Entergy study be used to inform the Optimal Potential Assessment?

See above.

- How, if at all, will the Advisors reconcile differences in measure and program costs, savings, non-resource benefits assumptions, and savings between the two studies?

See above

Comments/Questions on Economic and Max Achievable Results (Excel file)

- What does the Residential "ElecTotal" end use comprise?

- “ElecTotal” comprises the full electric use of residential buildings. Measures that impact the energy use at the full building level, such as behavioral and conservation voltage reduction, are applied against the “ElecTotal” end use.
- What end use category includes Conservation Voltage Reduction (CVR)?
CVR is applied against the “ElecTotal” end use
 - What end use category includes Residential lighting?
Residential lighting is included in the indoor and outdoor lighting categories. These do not appear in the year 2037 potential estimate because we assume there will be no remaining residential lighting potential that long after EISA regulations eliminate most savings opportunity starting in 2020, in combination with expected continued improvement in LED lighting cost and performance.
 - How were competing/overlapping measures treated?
In the economic potential estimates, the competing measure with the highest savings (and that passed the TRC) was selected and applied to the total relevant available end-use energy. For achievable potential, these issues were handled through the penetrations.
 - Why does economic potential fall over time?
The draft results show 10-year economic potential at 42% of the forecast and 20-year economic potential at 45%. While the economic potential is not decreasing in years 11 through 20, it does level off. This is largely because by year 10 most of the retrofit potential has been achieved and all market opportunities measures with a life of 10-years or less have been fully turned-over. Therefore, new potential is largely limited to measures that may otherwise revert to baseline on replacement. We believe that given the large uncertainties regarding what will happen between 10 and 20 years from now, the results for the first 10 years of the study are much more reliable, and should be the focus of any scrutiny and system planning.
 - How were measures with BCRs of less than 1.0 treated? Were all such measures excluded, or was some threshold of less than 1.0 used? Please provide a list of all measures that were included in the analysis, but that were excluded from the estimate of Economic potential.
Measures with BCRs of less than 1.0 were excluded from both the economic and achievable potential analyses. This list was provided as part of the information on the draft results sent on July 9.
 - For the maximum achievable results, were 100% incentives assumed for all measures?
Yes.

Comments/Questions on Measure Level Information (Excel file)

Overall

- Why are no early retirement measures listed? Though, we note that there are some Residential direct install lighting measures included.

All early retirement measures will be included and clearly listed in an appendix in the final report.

- There [sic] do most (all?) Residential and C&I “(Heating)” measures have “n/a” in the TRC and \$/kWh columns, but the “(Cooling)” version of these measures have values in these two columns? Are the combined heating and cooling BCRs and \$/kWh just listed for the “(Cooling)” measures?

Yes – measures that affect more than one end use are called “linked measures.” These allocate all measure costs to one of the end uses, but the sum of costs and benefits for all components are used to derive the total measure BCR.

- How, if at all, were differences in operating hours and costs addressed by building type, e.g., schools vs. hospitals and single family vs. multifamily? Differences in operating hours mainly impact the cost per kWh used in the analysis. So, for example, for a high-efficiency cooling measure, the percent savings are the same regardless of operating hours, but a building with longer hours would realize a lower \$/kWh saved. The top-down methodology avoids the need to determine building-specific costs and savings for each measure.
- What assumptions were made as to which distribution lines would benefit from CVR, or was it assumed that the average CVR savings fraction of 2% applied to all sales?

We assume that CVR would apply to 75% of the total number of distribution lines.

- Were baselines for measures always assumed to be code or the minimum federal standard? For standards covered measures, there is almost always a distribution of efficiencies above the federal minimum.

Baselines were typically assumed to be code minimum, as is standard practice in claiming savings (and is reflected in the TRM). To the extent that some households have more efficient than code equipment in place, this should be reflected in the free-ridership and percent not complete factors.

- What federal standards not currently in effect, were assumed to be effective over the 2018-2037 analysis timeframe?

The major code new code assumed to be effective in the 2018-2037 time frame is EISA, which effectively eliminates the potential for residential and commercial screw-in lighting. There is often an implicit assumption in studies with a time horizon of greater than 10 years that future efficiency gains will roughly keep pace with energy code, so above code potential is likely to remain similar.

- What was the assumed baseline for screw-in LEDs? Incandescent or halogen lamps, or some blended average?

The baseline for screw-in LEDs is assumed to be EISA compliant screw-in halogen incandescent lamps. There are no screw-in LED measures after 2021, due to EISA standards that come into effect in 2020.

- How was the 2020 EISA general service lamp sales prohibition modeled? There are 2020 Residential LED measures with a two-year measure life and C&I measures with a 3.4-year measure life? Is the latter some blended average as there is no install year specified in the C&I screw-in LED measure name?
We assume that savings for bulb types impacted by EISA in both residential and C&I sectors will go away by 2022.
- Why is the Mini Split Ductless HP BCR so much lower for C&I (0.3) than for Residential DMSHP (5.2-6.0)?
We will look into this and ensure all assumptions are consistent and accurate
- Were savings levels/efficiencies above ENERGY STAR considered? For example:
 - Heat pump dryers have a considerably higher % savings than the 21% listed
In general, for measures with available models exceeding ENERGY STAR, an average value was used. In the case of the clothes dryer measure, the characterization was based on the NOLA TRM, which uses the ENERGY STAR specifications as the minimum standards.

Residential Measures

- Were larger non-resource benefits assigned to low-income measures? If so, wouldn't they have higher TRC BCRs? Are any of the listed measures specific to low-income housing?
No, the avoided costs are assumed to be the same for Low Income and Non-Low Income Programs. We are investigating the feasibility of distinguishing between Low Income and market-rate programs and whether or not to use a lower TRC threshold for Low-Income program measures.
- ASHP QI is the largest savings Residential measure, yet efficient ASHP does not make the Residential top ten list of savings measures. Does QI ASHP comprise a new, efficient ASHP with quality installation (QI)? Does QI include duct sealing?
The ASHP QI measure represents an air source heat pump with a quality install. The other ASHP measure is just the heat pump, without additional savings from the quality install. These measures are thus mutually exclusive, and thus if there is substantial potential for ASHP w/ QI, there may not be much remaining potential for ASHP without the quality install.
- The savings fraction for certain measures seem low:
We will double check these numbers for the final report and ensure all are accurate
 - Central AC (19%) – what was the assumed efficient SEER?
We assume a 16 SEER for the efficient case.
 - Duct sealing (5-10%) - was Aeroseal considered? Especially considering E/S dependence on duct sealing.

We will ensure the savings for duct sealing in the final report reflect the current savings rate being achieved in the Energy Smart Programs.

- Efficient New Homes (35-37%) – What code and/or construction practices are assumed as baseline? What heating/cooling/DHW systems and fuels are assumed as baseline?

The Savings estimates used for the ENERGY STAR New Homes measure is in line with what ENERGY STAR claims to be the average savings. See here: https://www.energystar.gov/about/origins_mission/energy_star_numbers. These homes are assumed to be all electric.

- Conversely, some savings fractions seemed high:
 - Water heater pipe insulation (60%).
This is in line with the NOLA TRM, which gives a pre-installation U-value of 0.49 and a post-installation value of 0.2, assuming R-3 insulation.
 - Water heater jacket (28%) – is this for existing or new water heaters?
This is for existing un-insulated water heaters.

C&I Measures

- Were C&I LED troffers with integrated controls included? Is that the “Int Ltg Control” measure?
If controls are connected via a network, it is the “Network Connected LED” measure. If not, it is the “Int Ltg Control” measure.
- How was the savings estimate of 21% for Industrial Process derived?
This is based on an analysis of common industrial measures and typical savings.
- Were ROF/lost opportunity and direct install/retrofit lighting measures characterized separately?
Yes, though ROF/lost opportunity measures are assumed to be larger new construction/major renovation projects and characterized under the full building new construction and lighting power density measures.
- Was the cool roof savings (32%) applied equally to high rise and to low rise C&I buildings?
The study does not differentiate between high rise and low rise C&I buildings, nor would there be enough data to support such a distinction.
- How were water and waste water treatment savings modeled, including storm and flood control measures?
See response to earlier question on Water and Sewer Board.

Comments/Questions on Demand Response Materials

Overall

- See above re: measure characterizations and outputs
- Please describe how the Residential peak time rebates and critical peak pricing programs would be implemented, i.e., what rate structures would be implemented.
This detail will be provided in the final report.

- What Residential and C&L measures are assumed to be subject to direct load control (DLC)? CAC, pool pumps, hot water equipment, etc.?
The analysis was performed by examining achievements from DR programs in other jurisdictions, not by building ground-up estimates based on the number and per unit savings of various equipment types.
- Please provide a copy of the cited FERC national demand response study and the Arcturus study on dynamic pricing study.
The link to this study will be cited in the final report.
- Do the DR costs and BCRs assume any amount of co-delivery with efficiency program activity? If not, why not?
No. As stated in the original work plan, the estimates of EE and DR are treated separately in the study.