ENERGY FUTURES GROUP

Memorandum

To: Lisa Skumatz, CT EEB Evaluation Consultant

CC: Craig Diamond, CT EEB Executive Secretary

From: Glenn Reed, CT EEB Residential Technical Consultant

Date: 2/7/2016

Re: Residential Technical Consultant comments on the January 22, 2016 Single-Family Potential Study Draft Report (R15)

Provided below are summary and additional comments on the January 22 review draft of the Single-Family Potential Study. These comments supplement those contained in the marked-up draft report that was also submitted. Most of the comments below are included in the marked-up draft report, but are provided here as a high level summary and for emphasis. Note that a number of comments and questions below were previously noted or asked of the September 2014 draft report.

1. While better organized and more clearly presented than the previous draft of this study, it remains a challenging report to absorb given its goal of addressing solar, efficiency, and fuel switching. Nonetheless, unlike the vast majority of potential studies done this report is based on both detailed onsite surveys and the discrete modeling of each of the 180 surveyed homes.
2. Strongly consider renaming Maximum Achievable Potential. As defined and applied in the report, the Achievable Potential estimated by the authors is not consistent with the typical use of this term. As noted, this Maximum Achievable Potential assumes no incentives. The low level of calculated savings (5%) is significantly below nearly all similar estimates of Maximum Achievable Potential in other jurisdictions and will leave the reader with the mistaken impression that the remaining efficiency opportunity is small. An option might be to rename this Market Achievable Potential.
3. Interpretation of the results is still a challenge, particularly as to whether and how fuel switch savings are, or are not, included in the presentation of the different potential

savings estimates. Are all of the results prior to the fuel switch section presented such that fuel switching savings – and increased consumption for the fuel switched to – are always reported clearly and discretely from efficiency savings? That does not appear to be the case given the 83% first year fossil fuel Standard Technical savings vs. the 17% for electricity (Figure 2).

4. Similarly, it appears that the entire Chapter 6 Fuel Switching discussion only addresses Technical Potential. The exclusion of Cost Effective Potential fuel switching impact estimates appears to be a major omission that will limit the usefulness of this report.
5. Most (all?) of the equipment, appliance and lighting measures are treated as early retirement measures. The Companies, by contrast, screen nearly all of these measures as replacement at failure (ROF) measures and their incentive levels and program designs reflect this. NMR's treatment of cost and savings should be discussed and compared to the Companies'. This may also help explain low BCRs for key measures currently offered by the Companies', e.g., gas boilers and furnaces.
6. Only cost effective measures are included in the Cost Effective Potential. Is this the same policy that the Companies apply and it is a regulatory requirement in CT? How much of the cost-effective potential is lost to efficiency measures that fail BCR?
7. Note more explicitly the exclusion of plug load measure upgrades.
8. It is noted that electricity savings potential declines over time due to codes and standards impacts, most notably for lighting and to a lesser extent appliances. While the 2020 EISA standards are discussed several times, it's not clear whether and how lamp types not covered by EISA, e.g., reflector lamps, are treated.
9. To what extent do the baseline consumption growth rates (Table 9) already include some amount of embedded fuel switching, e.g., the -2.1% annual growth for fuel oil? Should this be discussed, even if it can't be fully quantified? Would it impact the results, particularly the fuel switching ones, in any appreciable way?
10. Propane savings are less, on a percentage basis, than natural gas or oil savings. This requires an explanation.
11. While there is a logic to using the Residential New Construction UDRH equipment efficiencies as baselines for the fuel switch baselines, some of the values in Table 6 do not seem to reflect likely baselines for *existing* homes. The 92.4% baseline for boilers is likely too high and the gas storage and DMSHP SEER values are below current federal minimums.
12. The low BCR for PVs (0.3) is surprising. Absent information on costs (see below) it is difficult to assess the accuracy of this estimate. Also, what is the average kWh produced per kW of installed PV? What is the average solar fraction for solar DHW?

13. The very high Solar Technical fossil fuel savings of 83% are not well explained. Besides solar DHW, were any other solar thermal measures considered?
14. The 2013 PSD is cited several times. Can this cite be changed to the 2015 or 2016 PSD, assuming that the cited values are the same? Note, however, that standard lamp lifetimes will decline in each year due to the assumed impacts of the 2020 IESA standard. Was this considered in the analyses? Would using 2013 PSD lamp lifetimes skew the study findings?
15. DMHSPs are highlighted several times as the measure most contributing to Technical Potential savings. This point should be expanded on to more clearly note that this is largely due to fuel switching (yes?) and that this fuel switch measure largely does not screen as cost effective. The negative BCR for DMSHPs should be at least noted in the main body of the report. Note that other studies, including analysis done by EFG and a follow-up post-CES analysis by RMI, show positive consumer economics for DMSHP oil fuel switch.
16. Did the fuel switch analysis include the impact of increased cooling load when DMSHPs were installed in homes w/o central cooling? If so, state this more clearly and explain how it was quantified.
17. On average, what percent of fossil fuel heating loads were met by DMSHPs in the fuel switch scenarios?
18. There are two fuel switching recommendations. In prior comments on the September 2014 draft report it was requested:

    > Prior to the next draft there should be a discussion as to how best to put forward the fuel switching savings and recommendations given the historic fuel neutral stance of the EEB and the Board's general position not to support fuel switching using CEEF resources. While there may be benefits to both consumers and to the state in promoting fuel switching, the large increases in gas usage associated with the fuel switching scenarios may raise questions as to gas availability.

    Did these conversations occur?

19. A quantification of GHG emission reductions arising from the fuel switching scenarios would provide additional information to allow for a better-informed discussion of fuel switching policies. This was noted in comments on the 2014 report draft.
20. All measure cost assumptions, including gas hook up costs, should be provided in the appropriate appendix. This was noted in comments on the 2014 report draft and

continues to be a major study omission. Further, the study's measure costs, which for equipment assume early retirement should be compared to the Companies' ROF cost assumptions. In this report a number of key measures, gas boiler and furnaces most notably, fail TRC as noted above. This may be one reason why they do not pass.

21. Please confirm and note clearly in the report that while the study analysis period was only ten years that savings for longer lived measures were calculated for the full measure life in the cost-effectiveness screening. Please provide all measure life assumptions in the appropriate appendix. This was requested previously.
22. Did NMR request that the utilities screen the same measure using the utilities' BCR model to ensure that the BCR outputs of the NMR screening model are identical? The utility and NMR BCR models should produce identical results. This comment was made on the 2014 draft report.
23. Throughout the report the starting values for the Y-axis vary. In particular this is a concern when a set of figures are addressing the same results for different fuels, e.g., fuel switch savings by fuel type. As a result, the graphic depiction of savings is misleading when different scaling is used. When the Y-axis values do not start at zero, the slopes of the savings lines visually overestimate the savings relative to the presentation of savings for a different fuel where the Y-axis starts at zero. This occurs fairly frequently in the fuel switch section.