NRECA Supplementary Information Re Issues Discussed at July 10, 2013 Ex Parte Meeting

ACEEE recently submitted to DOE supplemental information to Docket No. EERE-2012-BT-STD-0022 expressing a desire for a quantification of costs and benefits of grid-enabled water heart to consumers. In their submission, ACEEE stated:

> "For a waiver for a "grid-enabled" water heater to make sense to consumers, the lifetime economic cost of the water heater should be less than a water heater that meets the new 2015 DOE standards. DOE found that for water heaters greater than 55 gallons, an EF of 2.0 was economically justified. In our meeting we mentioned a preliminary analysis of ours which we have since somewhat refined. A copy is attached and should be considered a working estimate – DOE can and should refine this. Essentially this analysis seeks to find the point at which a consumer is life-cycle cost neutral between a heat pump water heater and a grid-enabled water heater. For a grid-enabled water heater to be competitive, either the consumer needs to receive a monthly payment for the grid-enabled features, or a discount on the price of off-peak power to heat hot water. The attached illustrates what types of payments or discounts are needed."

NRECA notes that in DOE's prior analysis, no value was assigned to the benefits associated with the use of these water heaters in demand response programs. As previously submitted in comments for the record, the ability to control water heaters to reduce peak load on electrical systems saves consumers tens of millions of dollars annually, helps to store variable renewable energy that might otherwise have to be curtailed, and negates the need to build new power plants to meet peak demand.

In its submission, ACEEE included a worksheet entitled "Illustrative Calculation of Economics for Heat Pump and "Grid-Enabled" Water Heaters" that included an economic analysis of the difference in costs to consumers of using a heat pump versus an electric resistance water heater. NRECA agrees with the general methodology used by ACEEE and was able to streamline the analysis and to make it more consistent with DOE's analysis by using data from the spreadsheet developed as part of the rulemaking process and included in the Technical Support Documents (see the "Summary" tab of the file "2010-03-26_Life_Cycle_Cost_Electric_Storage_Water_Heaters.xlsx"). The results are as follows:

- According to DOE's analysis, the average life cycle cost (LCC) in 2009 dollars for a heat pump water heater with an efficiency factor (EF) of 2.0 is $3,749 (cell J41) and the LCC of a .94 EF large electric resistance heater is $4,330 (cell J39).
- Therefore the benefits of grid-enabled heaters for LCC break-even are $581.
- Therefore, using a discount rate of 4.7188% discount rate from ACEEE's spreadsheet, the annual demand response benefit to consumers would need to be $61 for a break-even LCC.

A preliminary analysis of the comments sent in from co-ops to DOE (after removing overlapping and duplicative information submitted by G+T, distribution, and statewide co-ops) shows a weighted average benefit of $105 to the consumer per year. If the benefits of other ancillary services to the market/grid were added, this benefit would be even greater. Therefore, it is clear that there is a net benefit to consumers of maintaining the ability to use large electric resistance water heaters to participate in demand response programs.

By using the results of DOE's analysis in this calculation, NRECA does not imply that we agree with the assumptions of the analysis are accurate. We believe the assumptions used by DOE favor heat pump water heaters over electric resistance water heaters. An example, these assumptions include unrealistically low up-front costs of large heat pump water heaters and an assumption that purchasers of large electric resistance water heaters always have a higher demand when many have average or below average demand but have the larger units to participate in a demand response program. However, we use these assumptions to illustrate cost-effectiveness.