CPUC Comments on SWWH033-01 Gas Heat Pump Water Heater, Multifamily

Lead PA: SCG

Workpaper Submittal Date: 9/6/2021

CPUC Review Date: 10/5/2021

SoCalGas Review Date: 10/8/2021  
CPUC Review Date: 11/5/2021

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CPUC Review Date: 2/11/2022

SoCalGas Response Date: 2/28/2022

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| CPUC Comment | PA Response |
| **CPUC Review 2/15/22:** To ensure this measure is applied as intended, please include additional details in the workpaper for how the GAHP should be sized, and define what baseload is for this application. | Added language to the Program requirements section for system sizing. |
| **CPUC Review 2/15/22:** Please document the range of applicable building sizes for this measure. Is there a minimum multifamily building size where the measure is applicable? Is there a maximum? | Added language to the Program requirements section for minimum building sizing. |
| **CPUC Review 1/18/22:** In the narrative description both gas engine and absorption heat pumps are mentioned. Just describe the one the measure is about. | We removed the one mention of gas engine driven heat pumps from the technology summary section. |
| **CPUC Review 1/18/22:** In the measure case description, please define what the default conditions, outside air temperature and supply temperature, for the measure case minimum COP, “≥1.25”. | We added the following text to the measure case description and eligible products section “*Standard conditions are defined as 70 °F outdoor air temperature and 130 °F outlet temperature.”* |
| Is the normalizing unit the input capacity of the new GAHP water heater? | Yes, the savings were normalized on the size of the new GAHP water heater. |
| It is not clear where the electric savings is coming from. The measure case appears to have one additional primary loop pump for the GAHP. Additionally, the hot water draw should not change between the baseline and measure cases, so the same volume of water would be pumped in both cases. | After talking with installers of GAHP systems, it was determined that these Robur systems are installed with a variable speed pump in the secondary circulating loop. The variable speed pump in the measure case is needed for the GAHP to lower the return water temperature. The amount of water pumped did not substantially change between the baseline and measure case.  We will remove the electric savings as they are coming from the pump rather than the GAHP |
| We reviewed the model descriptions, and inputs provided in the tables. The model methodology appears to be reasonable, however the model itself was not included in the workpaper submission. Please provide any OpenStudio files, and any post-processing examples to review the methodology. | Ok. We will include them in the resubmission. |
| What is the reason for modeling this measure with 84 residential dwelling units? Would small MF building with fewer dwellings still achieve similar savings? | GAHP functions best when it can run continuously and serve the base load of the building. It does not run at part load. For this reason, small buildings would not be a good application for this technology, so it was modeled in a larger building type. The savings would depend on the base hot water load of the building, not the number of dwellings. Our program staff is working on an outreach campaign to target buildings with a large hot water load for this measure.  This is not a technology that can be bought at a retail store and installed by the home or building owner. Typically, this is only installed by professional installers, after an engineering assessment is done by the manufacturer/distributor to verify that it will perform appropriately. |
| Was the baseline energy consumption for this new model compared to similar baseline energy of other multifamily central boiler measures. Such as SWWH011 Central Hot Water Boiler. The baselines conditions approximately the same, however the normalizing units are different.  Our attempts to compare these two baselines showed that the energy consumption in this measure is greater by nearly a factor of 2. Even after accounting for the increased dwelling quantity in this measure. | Yes, it uses a similar baseline. The models were calibrated with RASS data for the baseline consumption data for all 16 Climate Zone. In workpaper SWWH010 Boiler, Multifamily the baseline consumption is ~147 Therm/unit/yr which is very similar to this workpaper. See the chart comparing the 2 baselines below. |
| This measure package is for gas absorption heat pumps. The Measure Package Plan indicated that this technology is for engine-driven and absorption cycle. Does SCG intend to submit two separate measures in the future? | We plan to investigate gas engine driven heat pumps in the future. It may be a separate workpaper or a new measure in this package. |
| Please provide data or modeling that demonstrates an absorption heat pump can be accurately modeled as a boiler. | We can provide the assumptions used. We modeled it as a boiler, and then used a load curve from the manufacturer in post processing to edit the efficiency. The inputs of the “Boiler” in the model were changed to match the specs of the heat pump such as no turn down ratio. |
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Please reach out to Workpaper Review Team to set up a call to discuss.

 