

Sang-Mi Lee

From: Smith, Allison <AFSmith@socalgas.com>
Sent: Wednesday, March 11, 2020 10:44 AM
To: Sang-Mi Lee
Subject: RE: Release of NEAT tool

Sang-Mi

Thank you for the opportunity to provide late comments on the NEAT model. As we discussed our consultant, Ramboll, ran a variety of scenarios on the beta tool. Our comments can be broken into three types of comments:

1. Comments on ease of use of the model
2. Questions on data
3. Questions on analytical results

Ease of Use of Model:

- We were not able to download the model results into a simple format. Instead, we had to take screen shots and manually enter data into an Excel file to analyze the results. It would be helpful if the input and export data could be exported into a PDF or EXCEL format.
- While the NEAT model allows the user to save the model run to the disk, the NEAT tool appears to load the saved results file independently from its associated inputs file. This results in confusion, for instance, when one flips back to the "Demand" window when trying to understand the results and does not see the corresponding input parameters reflected there. It would be helpful to set up the NEAT model to couple input and result files.

Data:

- We attempted to compare the UEC for different appliances in your model. The results were unexpected and we request that you review the data in the model.

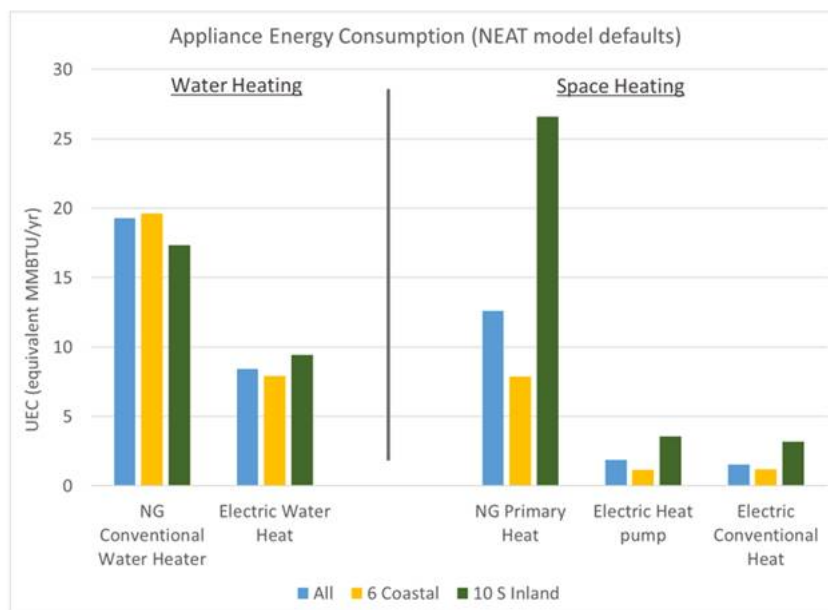


Figure 1: NEAT default appliance UEC for natural gas and electric water heaters by climate zone (converted into equivalent MMBTU/year)

- o Electric water heaters: While electric heat pump water heaters may have lower energy usage than conventional NG water heaters, we would expect the relative UEC in different regions to follow similar

trends. In the chart above, the UEC for Coastal region is higher than Inland for NG water heating. Whereas, the UEC for electric water heating is in the Inland sector. We would recommend you revisit the UEC factors for water heaters. If you have used the 2009 RASS data, there may be some disparity due to the housing stock that is electric in the coastal and Inland regions. For example, the penetration of electric water heating in the coastal region may be from smaller homes than the actual housing stock in the region.

- Electric space heating: We would expect the efficiency of a heat pump to be better than a conventional furnace, whether gas or electric. The implied UEC from our analysis shows the electric heat pump and electric conventional heat to have similar UEC for each region.
- The NEAT model uses CA-GREET 2.0 and EMFAC2014 to estimate the well-to-pump and tailpipe emissions from gasoline and diesel light duty-vehicles. Newer versions of both these models, i.e., CAGREET 3.0 and EMFAC2017 are now available.

Analytical Results:

- The GHG reductions are shown in aggregate. It would be useful to understand the relative contribution of different types of emissions – CO₂, CH₄, HFC. It was difficult to assess from the model results how these different types of emissions from a building are treated in the model. For example, it was unclear how you reflected the increase in HFC leakage due to addition of electric heat pumps.
- The NEAT model allows the user to zero out the NO_x and GHG emission factors for increased electricity use by choosing the “All additional electricity from centralized photovoltaics, wind, and centralized battery storage” option in the “Power Supply” window. This outcome is unrealistic at the current time. The NEAT model provides a snapshot of the incremental NO_x and GHG emissions around calendar year 2017, when the electric grid mix did not have a high percentage of renewables. The CAISO shows that in 2019, approximately 961 gigawatt-hour (GWh) of solar and wind power was curtailed during periods of over-generation,^[1] indicating that electricity from renewable resources are not stored in batteries and cannot be made available 24/7/365 at this time.
- Similarly, it is unclear how the model treats thermal storage using electric water heaters. There have been parties that suggested the water heaters could be “pre-heated” during high renewables periods for utilization during other parts of the day. The typical usage pattern for a water heater has two peaks, one in the evening and one in the morning. While, the “pre-heat” concept may be able to meet part of the evening peak. It is unlikely it would be able to meet the entire hot water demand, especially the second peak in the morning. Therefore, it’s unlikely the all renewables model would actually be able to meet the total demand.

Please let me know if you have questions about these comments or would like to set up a call with our consultant to review their scenarios.

Allison Smith
Energy & Environmental Affairs Manager
Southern California Gas Company
555 West Fifth Street | Los Angeles, CA 90013
W: 213.244.5369 | M: 213.215.1277
afsmith@socalgas.com

From: Sang-Mi Lee <slee@aqmd.gov>
Sent: Tuesday, March 10, 2020 1:12 PM
To: Smith, Allison <AFSmith@socalgas.com>; Gregori, Matt M <MGregori@socalgas.com>; Hamilton, Priscilla R <PHamilton@socalgas.com>
Subject: [EXTERNAL] RE: Release of NEAT tool