

# Datacall 3

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## ENERGY STAR Connected Thermostats Datacall 3 Results and Observations

### Introduction

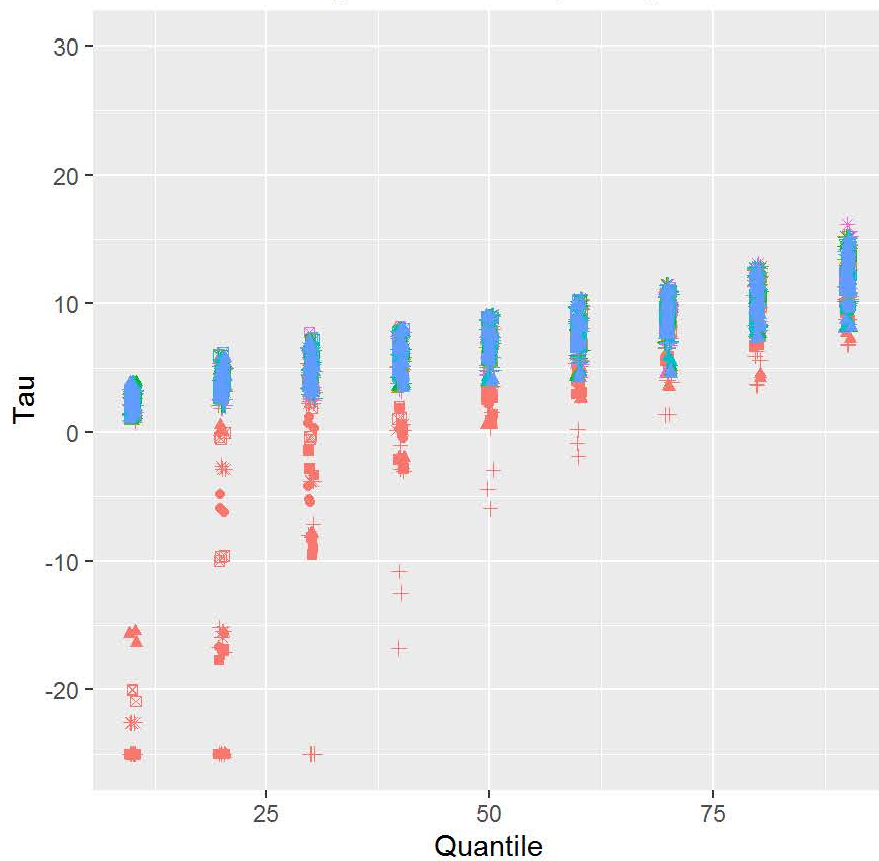
Vendor data was aggregated between datasets in all output values to ensure anonymity.

This document contains a summary of key findings and supporting figures. Additional analysis on included and other topics may be available upon request, please contact us at [ConnectedThermostats@energystar.gov](mailto:ConnectedThermostats@energystar.gov).

### Tau Distributions

As seen in the below figures, we note that Tau Filtering is still a necessary component of calculating the metric scores, as unfiltered values drift into unsuitable values for Tau. Note in heating particularly, the portion of negative Tau's is a large portion of the distribution, and would impact modelling results substantially.

Combined Dataset Tau with filtering, Heating  
(jittered to see points)



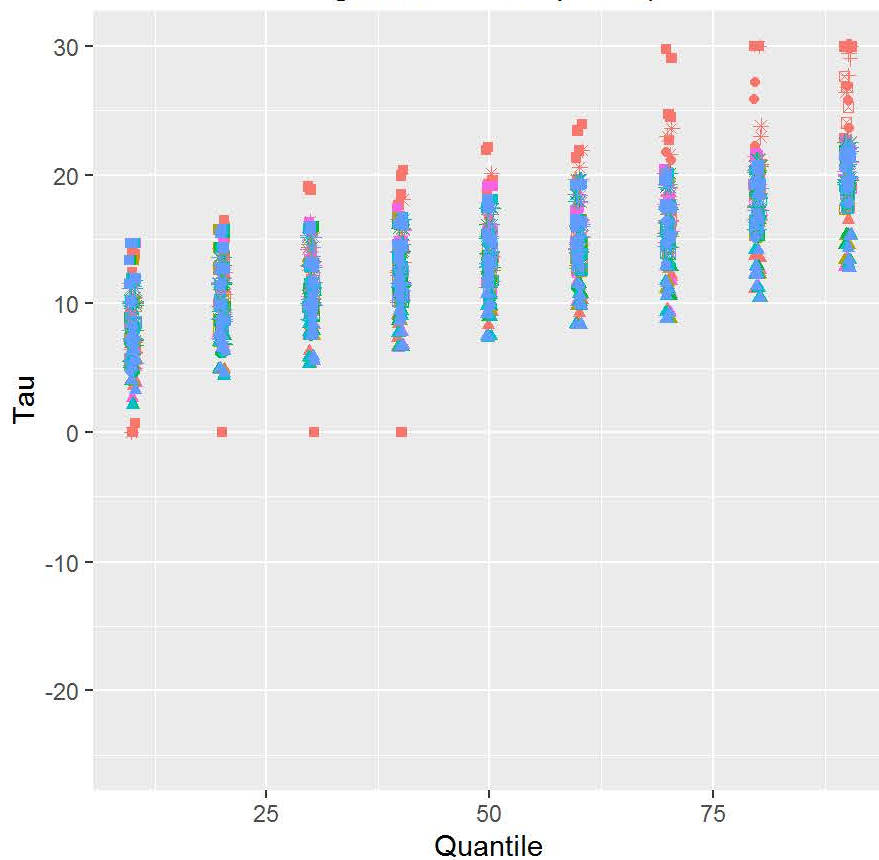
Climate Zone

- all
- ▲ hot-humid
- marine
- + mixed-dry\_hot-dry
- ⊠ mixed-humid
- \* very-cold\_cold

Filtering Level

- no\_filter
- tau\_cvrmsse\_filter
- tau\_cvrmsse\_savings\_p01\_filter
- tau\_cvrmsse\_savings\_p02\_filter
- tau\_cvrmsse\_savings\_p05\_filter
- tau\_filter

Combined Dataset Tau with filtering, Cooling  
(jittered to see points)



Climate Zone

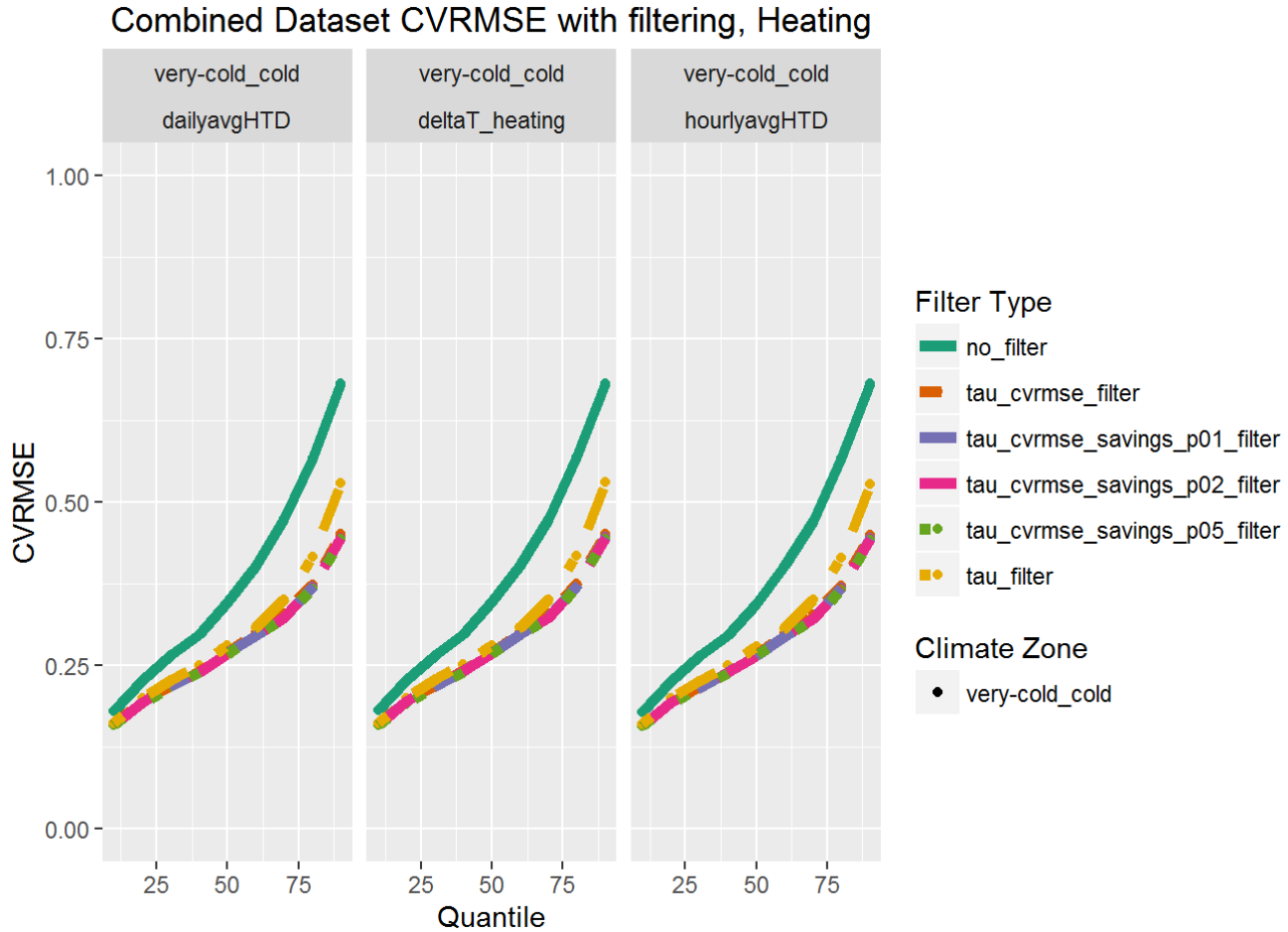
- all
- ▲ hot-humid
- marine
- + mixed-dry\_hot-dry
- ⊠ mixed-humid
- \* very-cold\_cold

Filtering Level

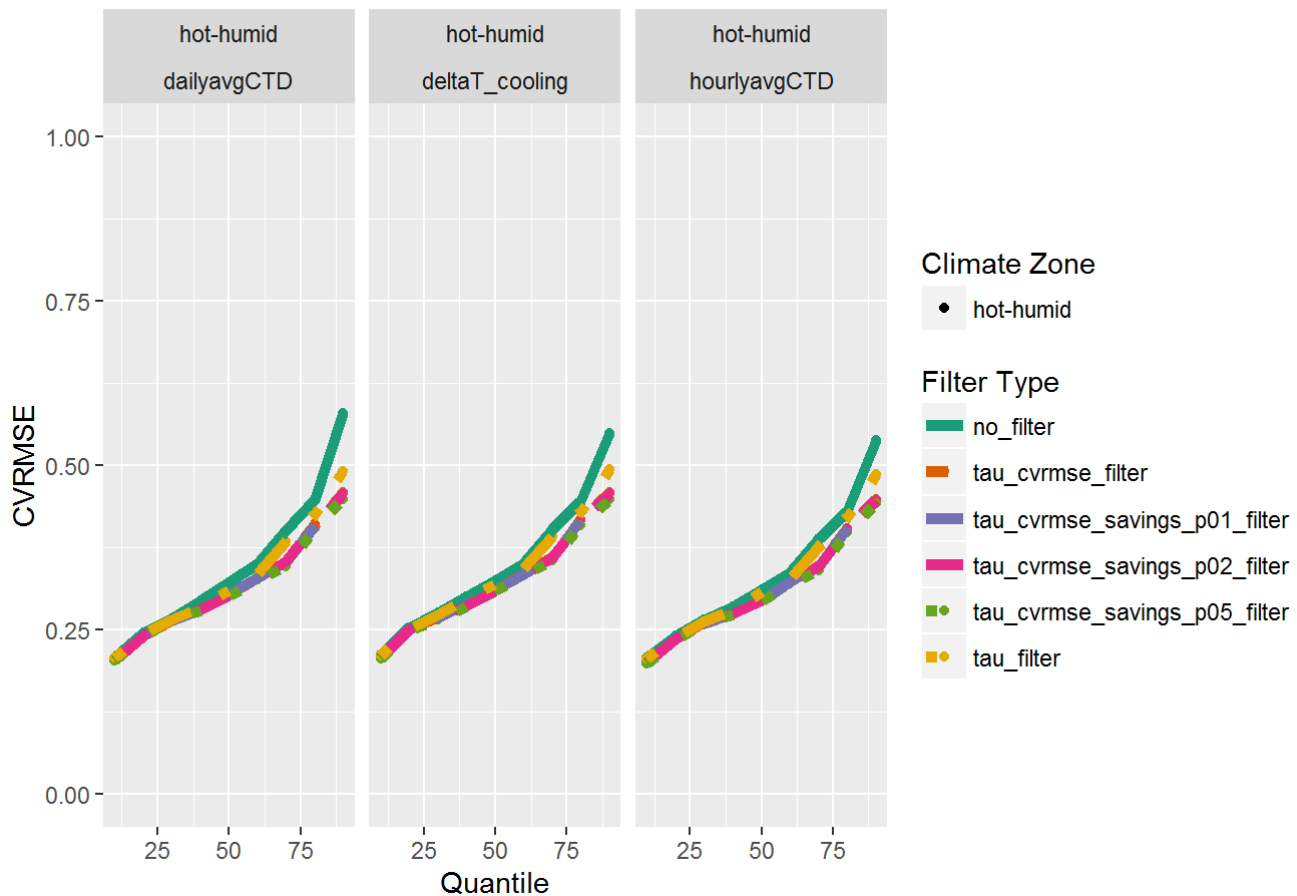
- no\_filter
- tau\_cvrmsse\_filter
- tau\_cvrmsse\_savings\_p01\_filter
- tau\_cvrmsse\_savings\_p02\_filter
- tau\_cvrmsse\_savings\_p05\_filter
- tau\_filter

# CVRMSE Distributions

This section demonstrates both the CVRMSE of unfiltered data, and the relationship between filtering level and CVRMSE reduction. The key observations include a Tau Filter alone will reduce the CVRMSE, but applying a filter to CVRMSE provides additional improvement over only Tau filtering. Additionally, filtering the top and bottom savings percentages does not significantly modify the CVRMSE distribution, which indicates that these high and low savings values are not directly correlated with above or below average model fits.



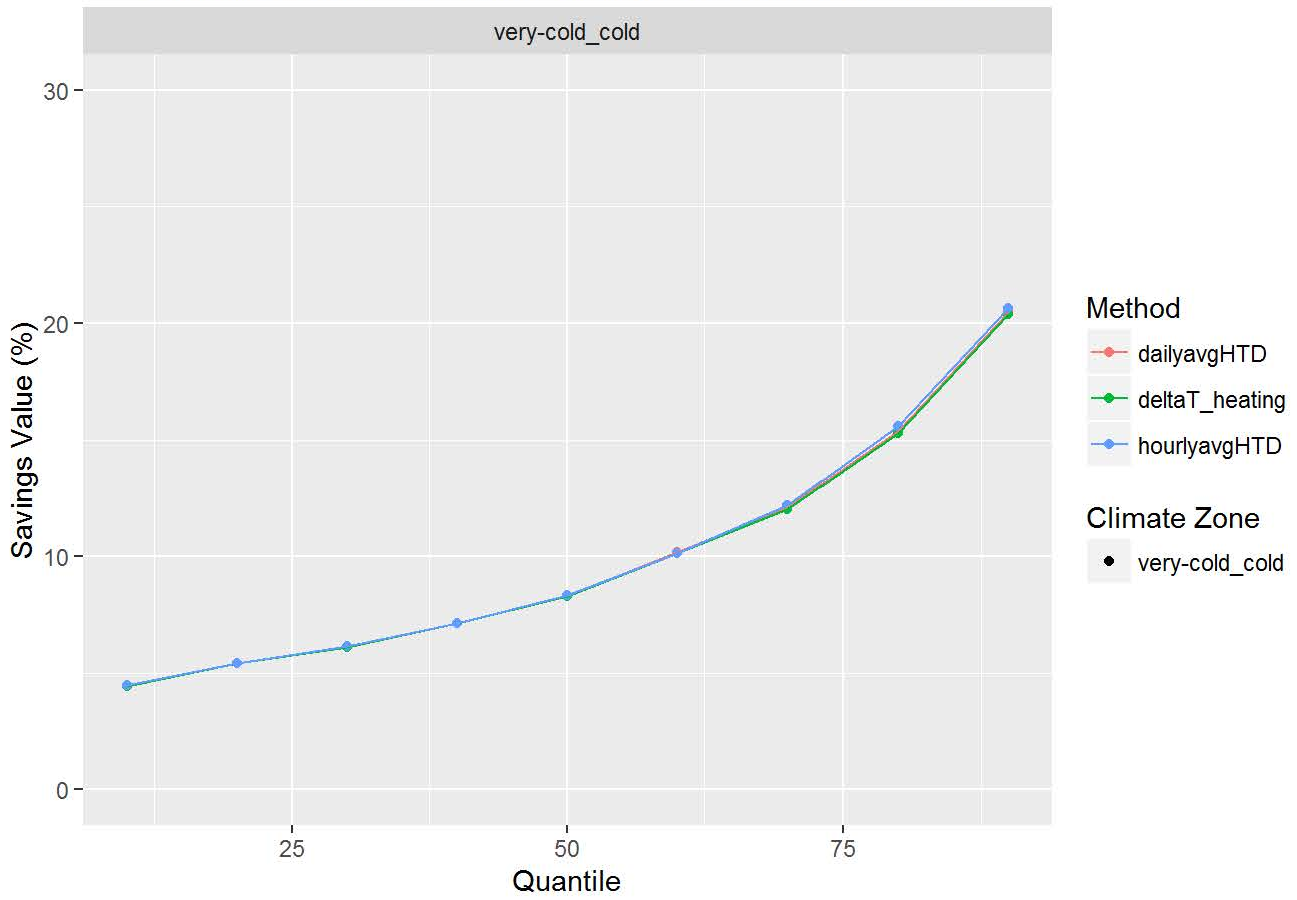
## Combined Dataset CVRMSE with filtering, Cooling



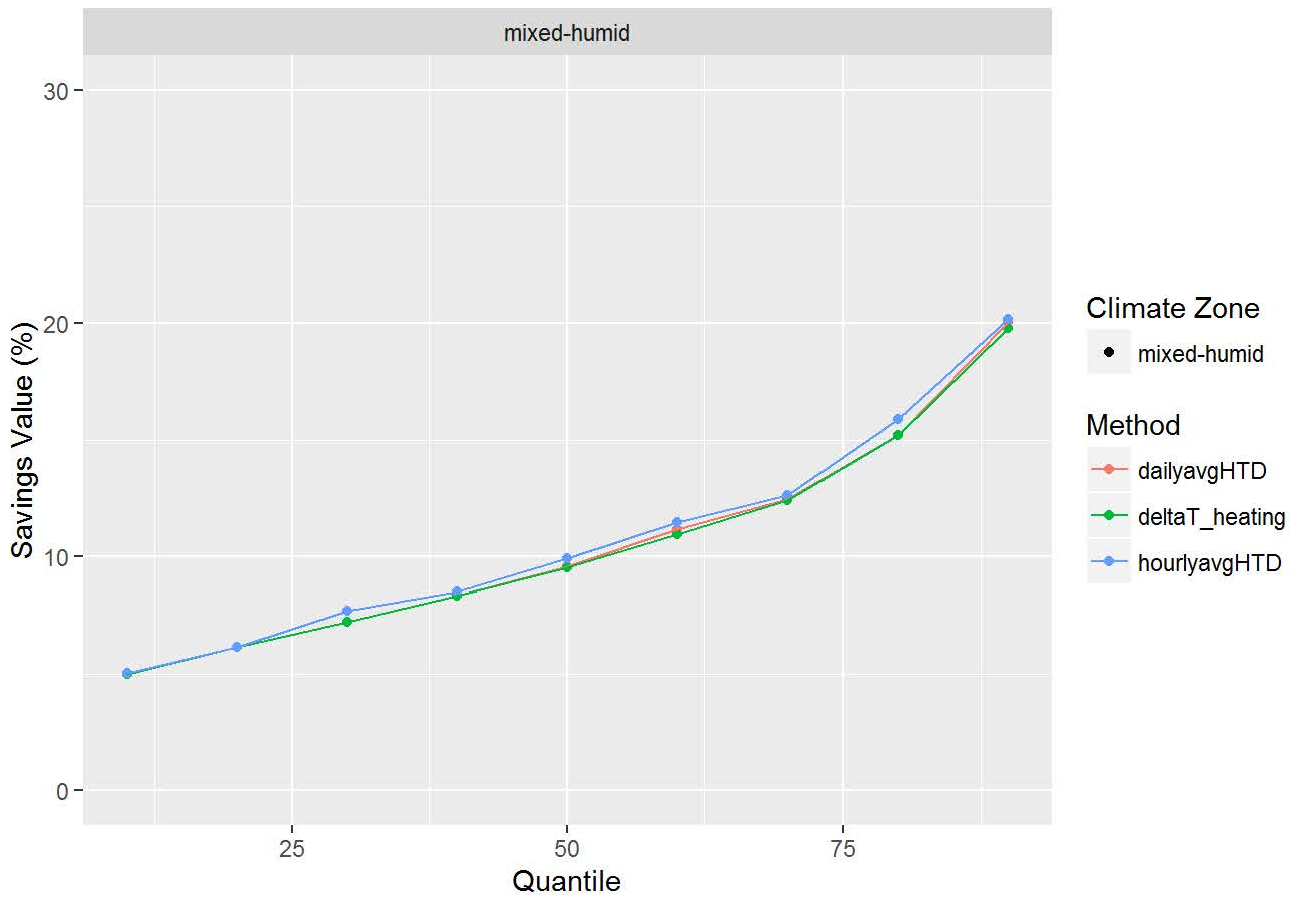
## Percent Savings by Model

This section demonstrates that the 3 Metric Models, DeltaT, DailyHTD/CTD, and HourlyHTD/CTD, all perform similarly in key climate zones. Cold-Very Cold and Mixed Humid are displayed in Heating, as nationally, they are the largest energy use zones for Heating. Similarly, Hot Humid and Mixed Humid are shown for Cooling, as they are the key national energy use zones for Cooling. We note that similar performance is demonstrated by close quantile values and similarity between overall distribution shapes for each method.

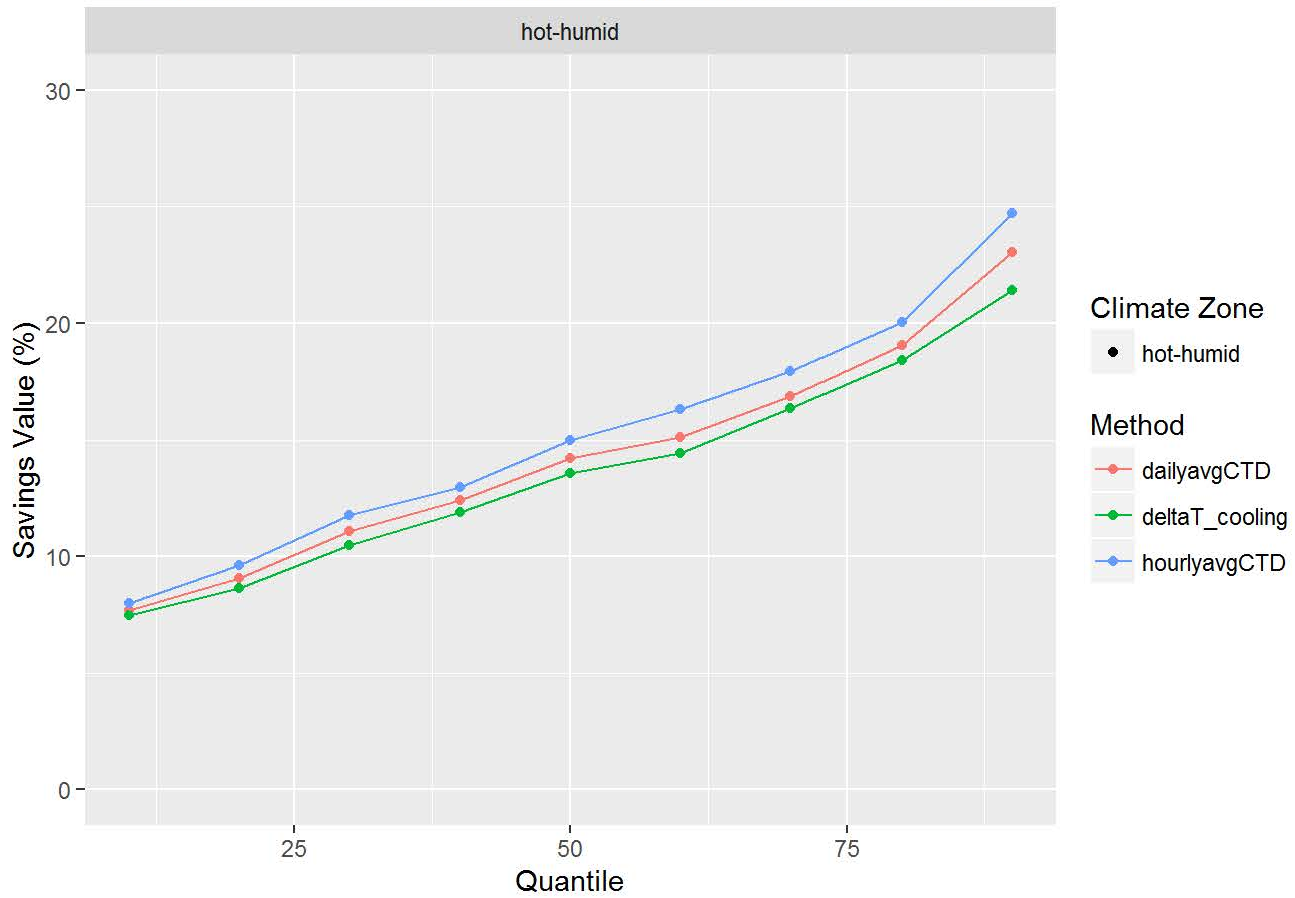
Combined Dataset Percent Savings with filtering, Heating



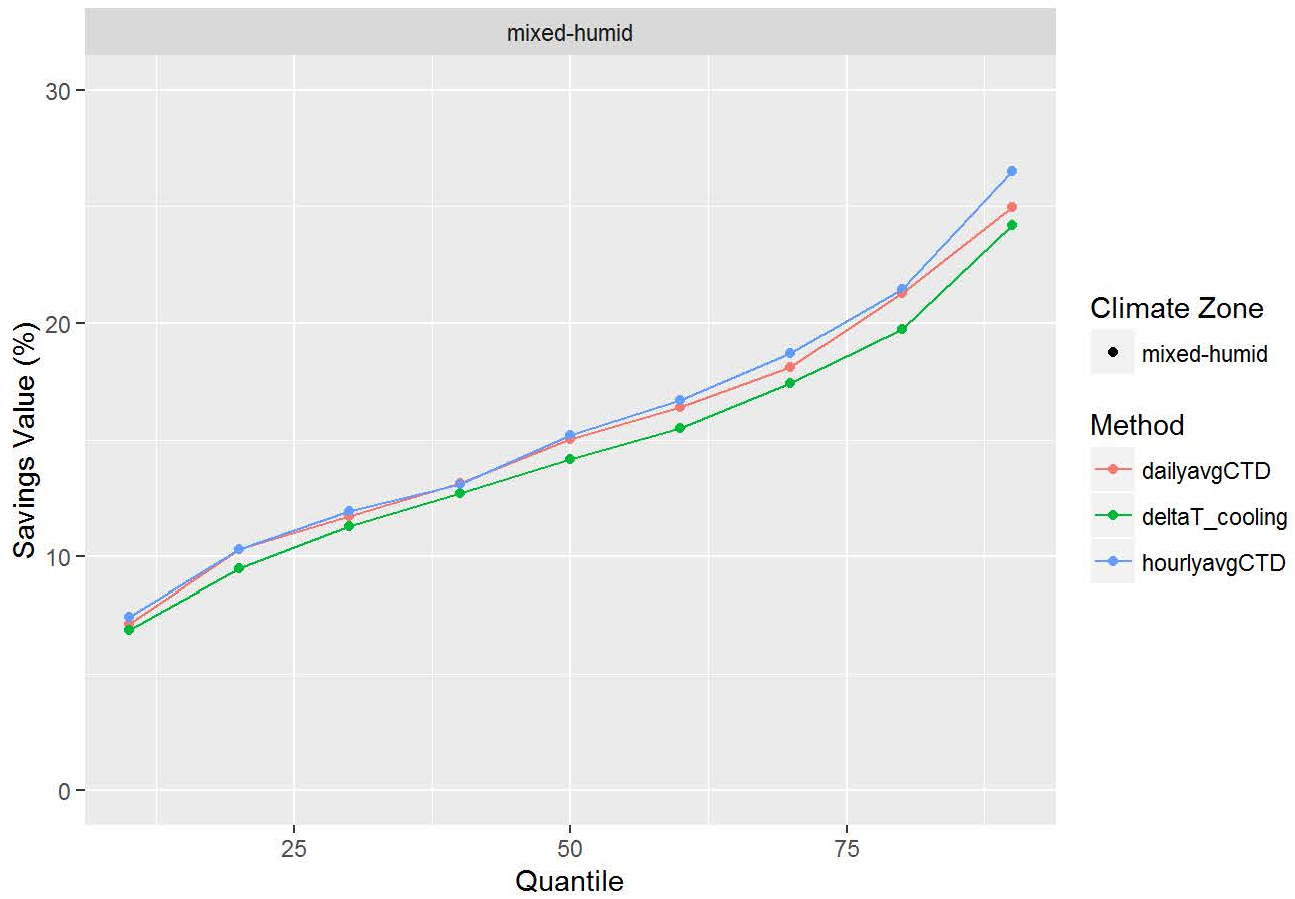
Combined Dataset Percent Savings with filtering, Heating



Combined Dataset Percent Savings with filtering, Cooling



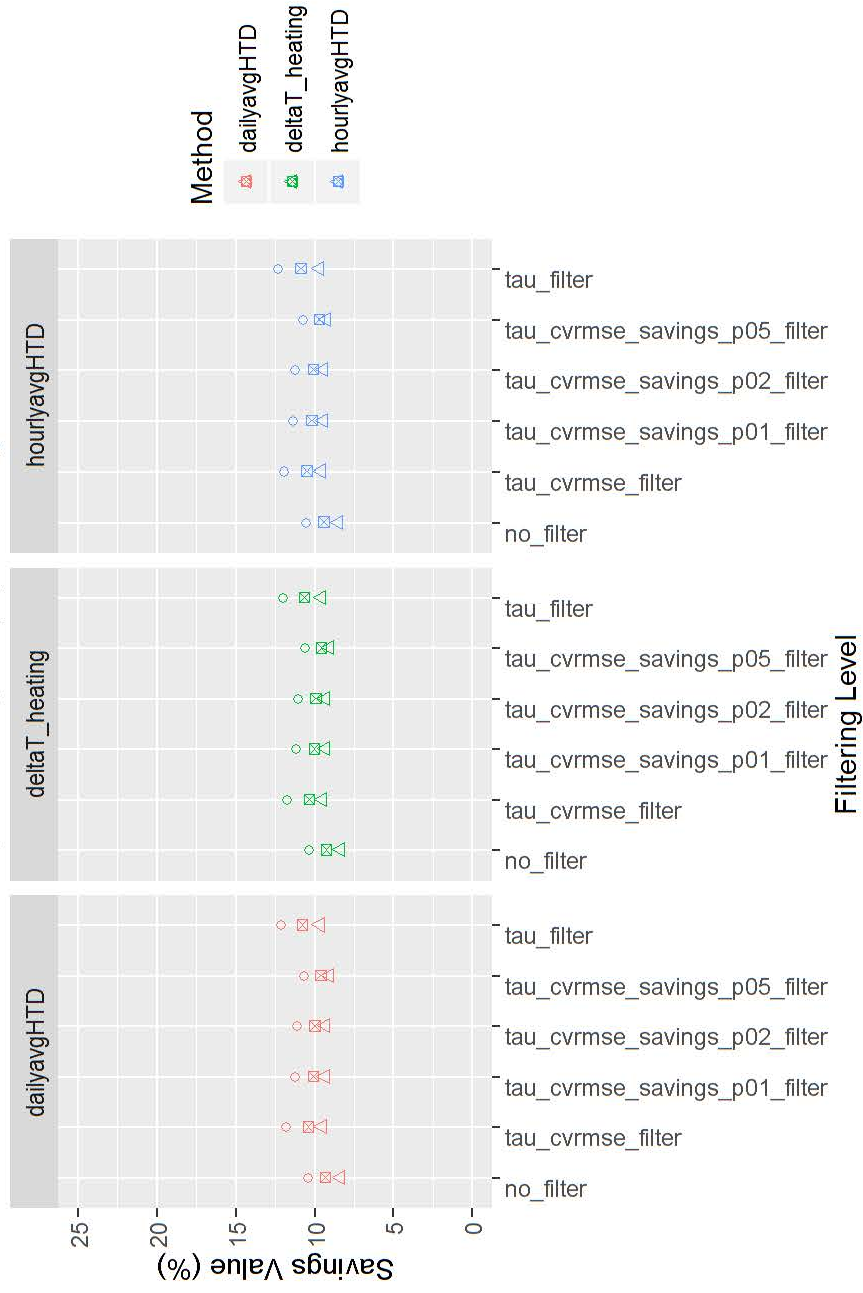
Combined Dataset Percent Savings with filtering, Cooling



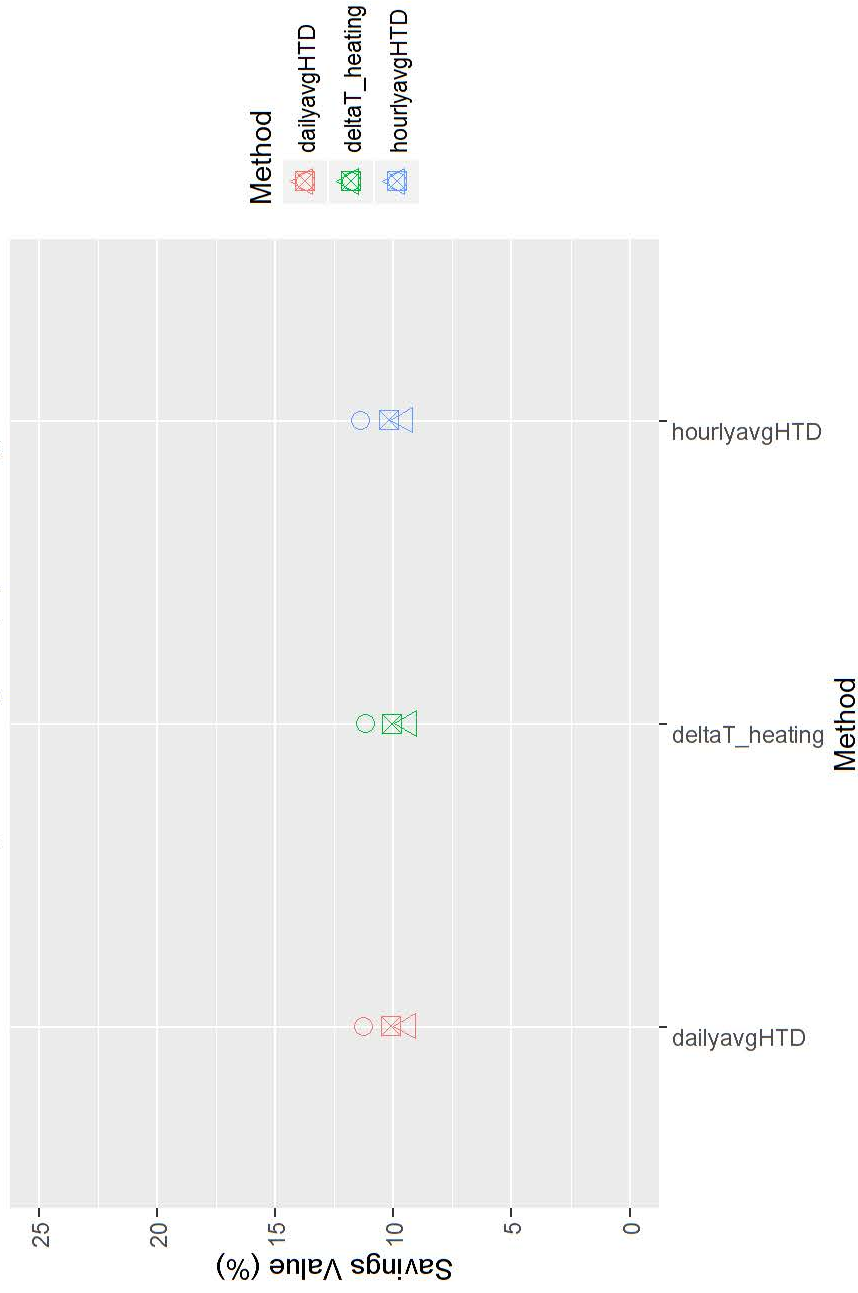
# National Weighted Values

This section demonstrates the similarity of metrics results under different filtering levels. Additionally, this section has charts showing key Nationally Weighted values, comparing the results between Metric Models. We note that differences between the models are minimal, allowing model selection to consider factors beyond saving calculations, including level of complexity of the modelling metric.

Combined Dataset National Weighting, Heating  
mean-circle, lb95 - square, q50-Triangle

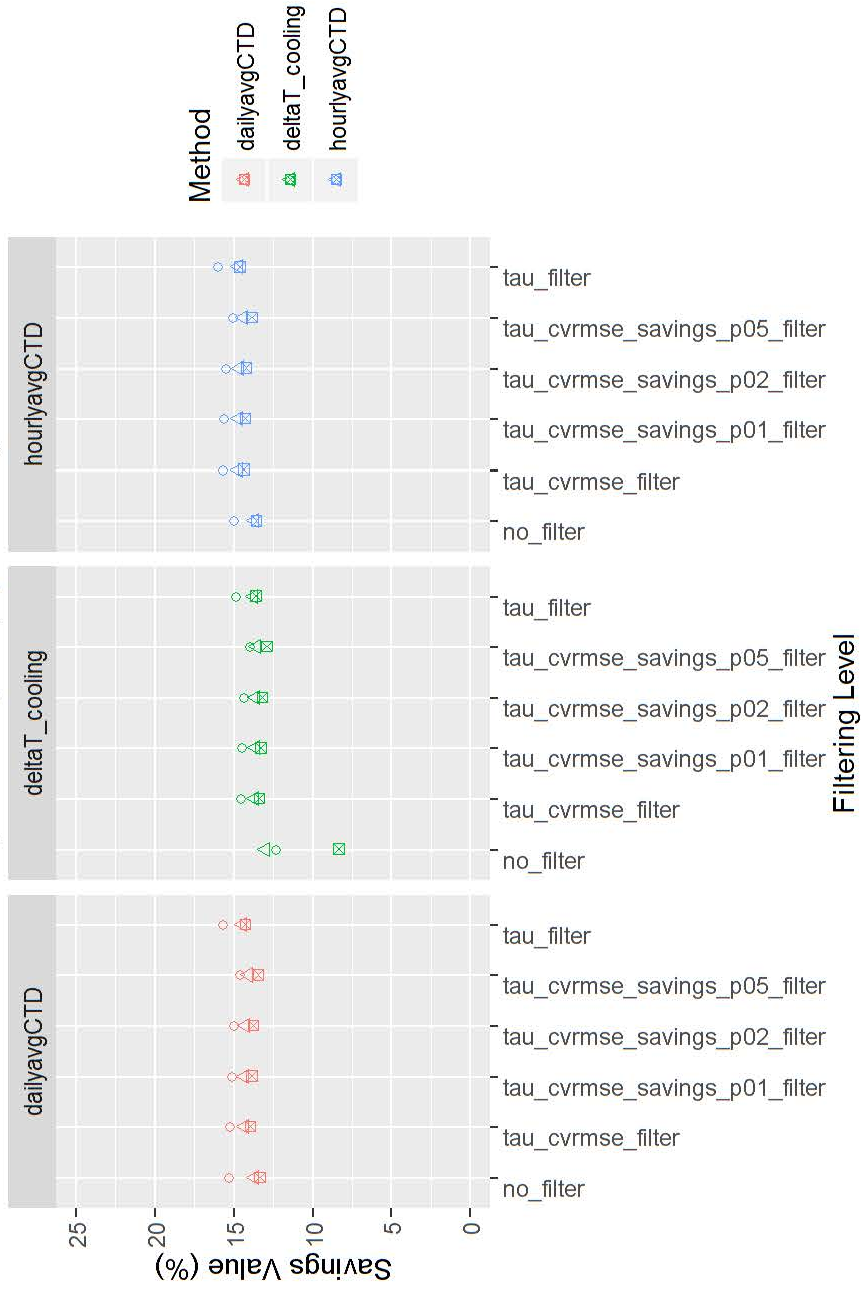


Combined Dataset National Weighting, Heating  
mean-circle, lb95 - square, q50-Triangle





Combined Dataset National Weighting, Cooling  
mean-circle, lb95 - square, q50-Triangle



Combined Dataset National Weighting, Cooling  
mean-circle, lb95 - square, q50-Triangle

