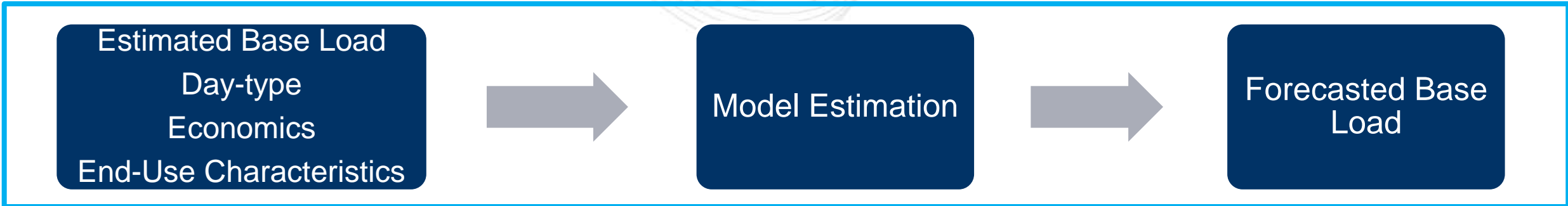


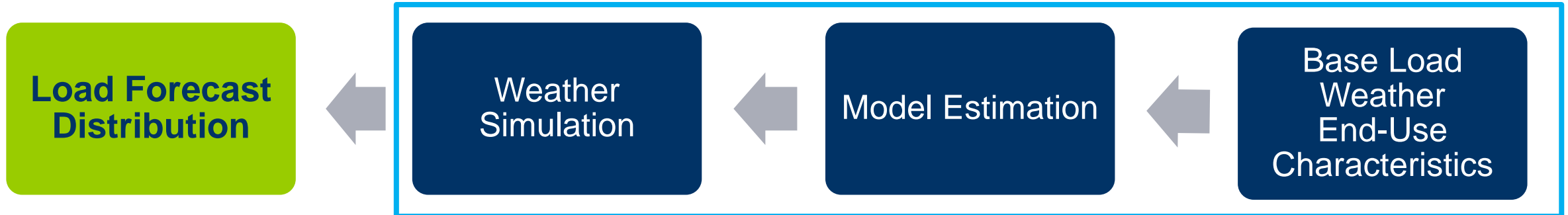
# Potential Forecast Model Changes: Working on the “Second Model”

Load Analysis Subcommittee  
May 22, 2018

## First Model



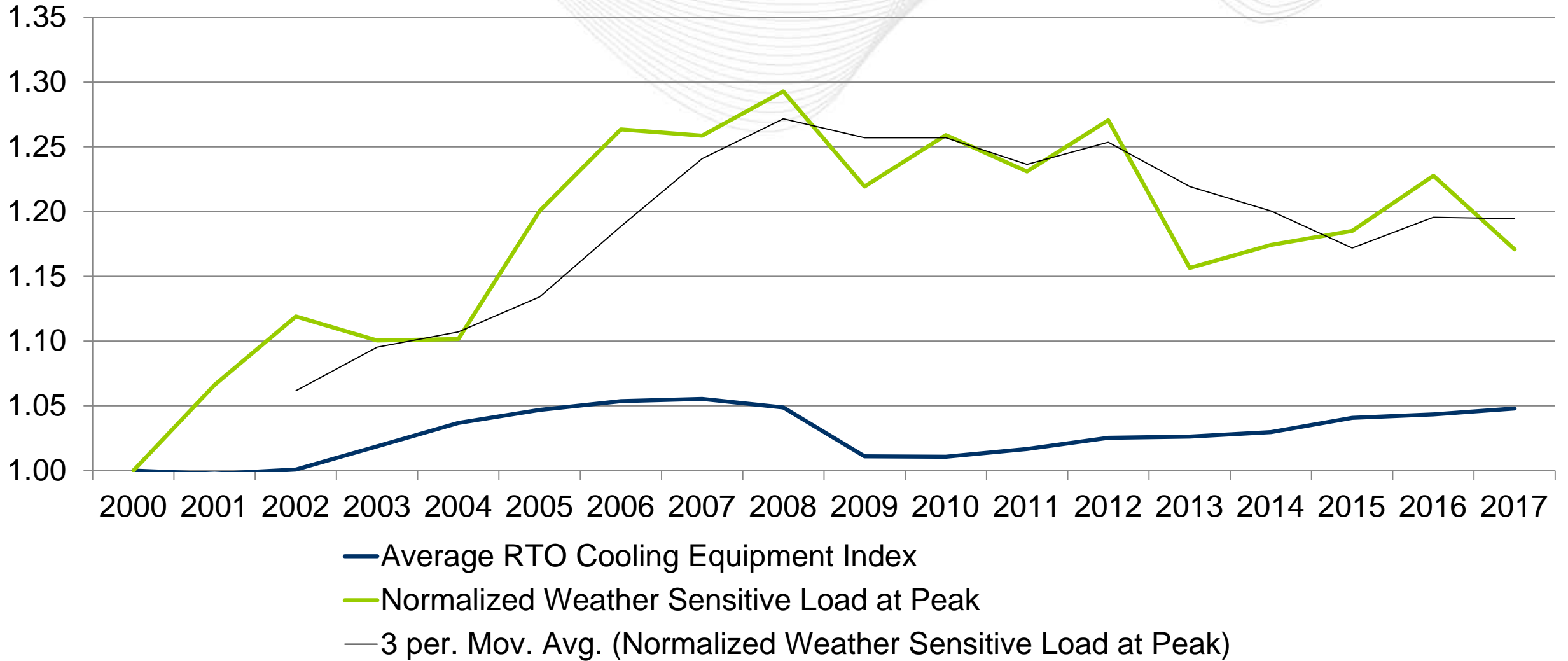
## Second Model

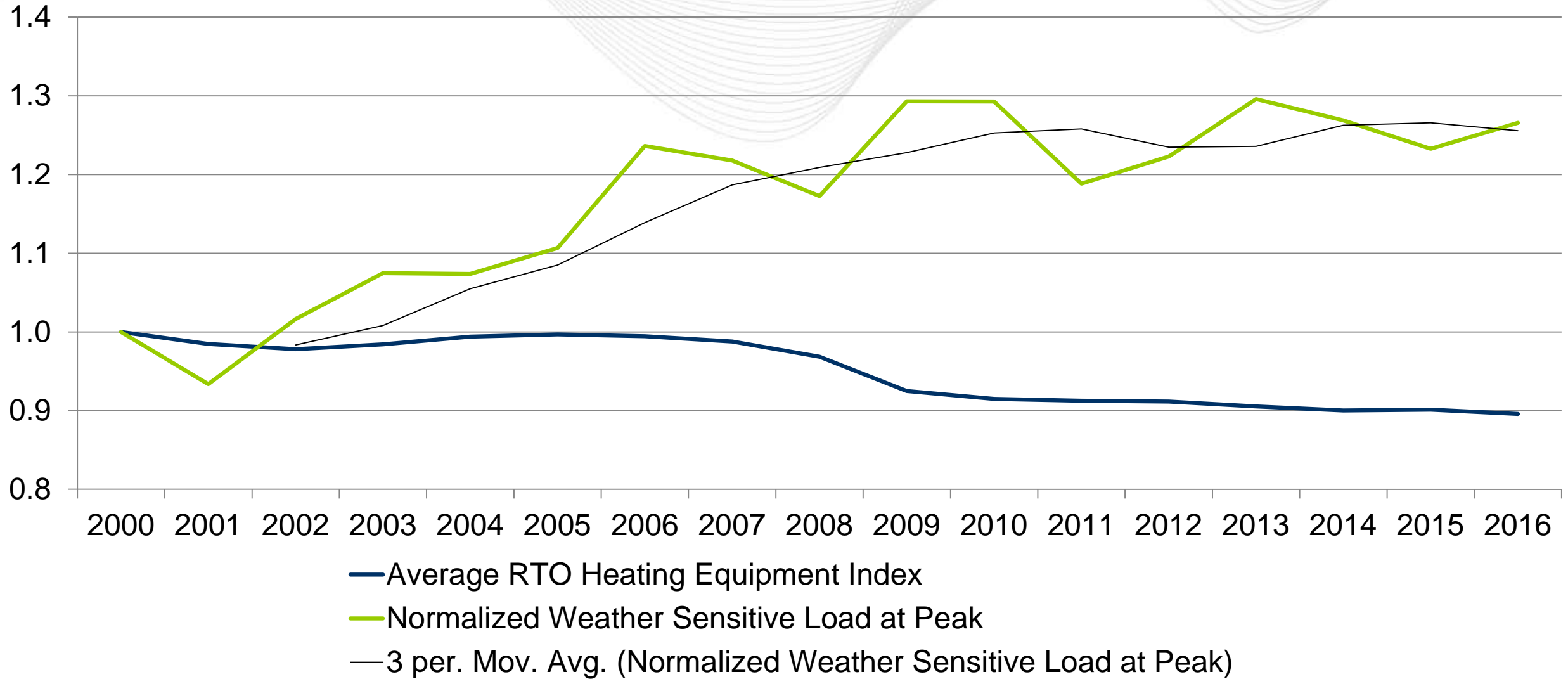


# *“Second Model” Weather Intensity*

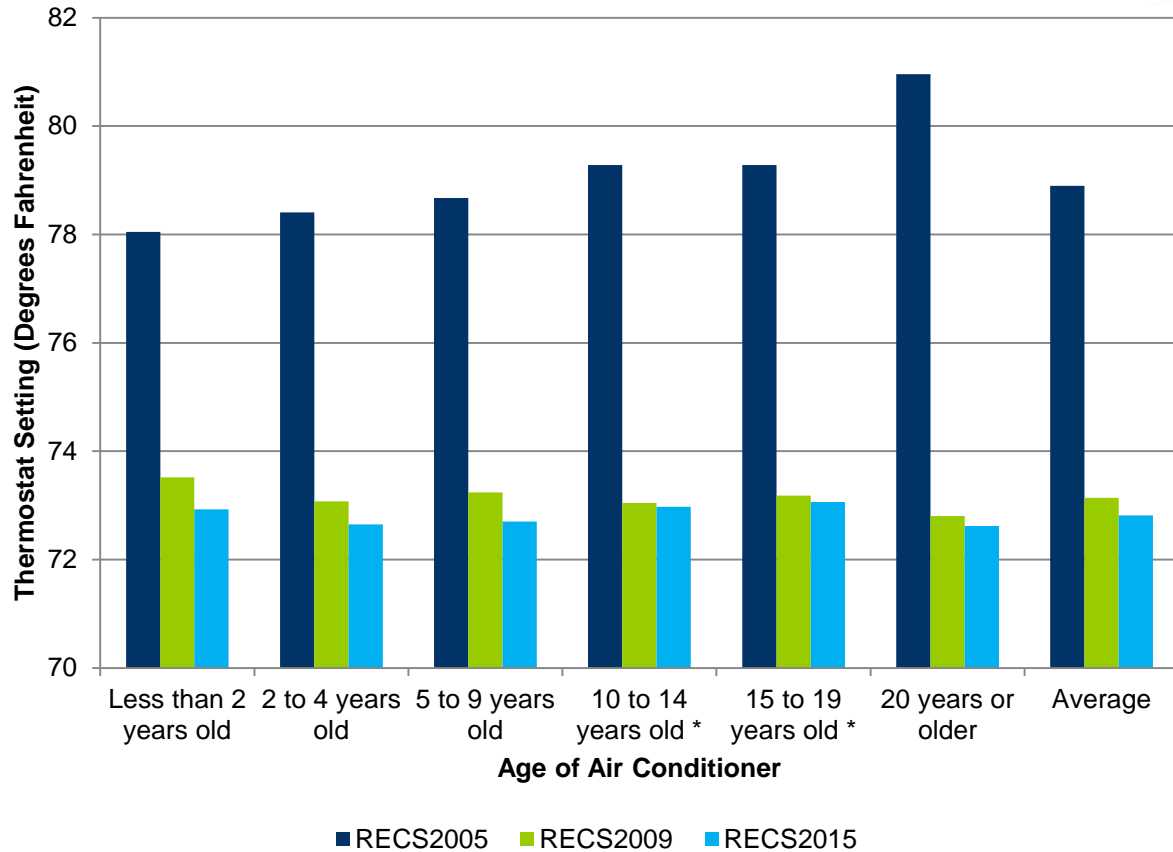
- Base is a single number per year, but can vary, so there are interactions with...
  - Month
  - Day of week
  - Holiday
  - Summer/Winter evening
    - Winter can peak in morning or evening, but given same weather evening peak is likely to be higher
    - Effect is much smaller (perhaps not necessary) in Summer...was attempting to control for days where peak occurs in early afternoon

- With more explicit control over non-weather sensitive load, we found that end-use variables would lead us to tend to understate weather-sensitive load

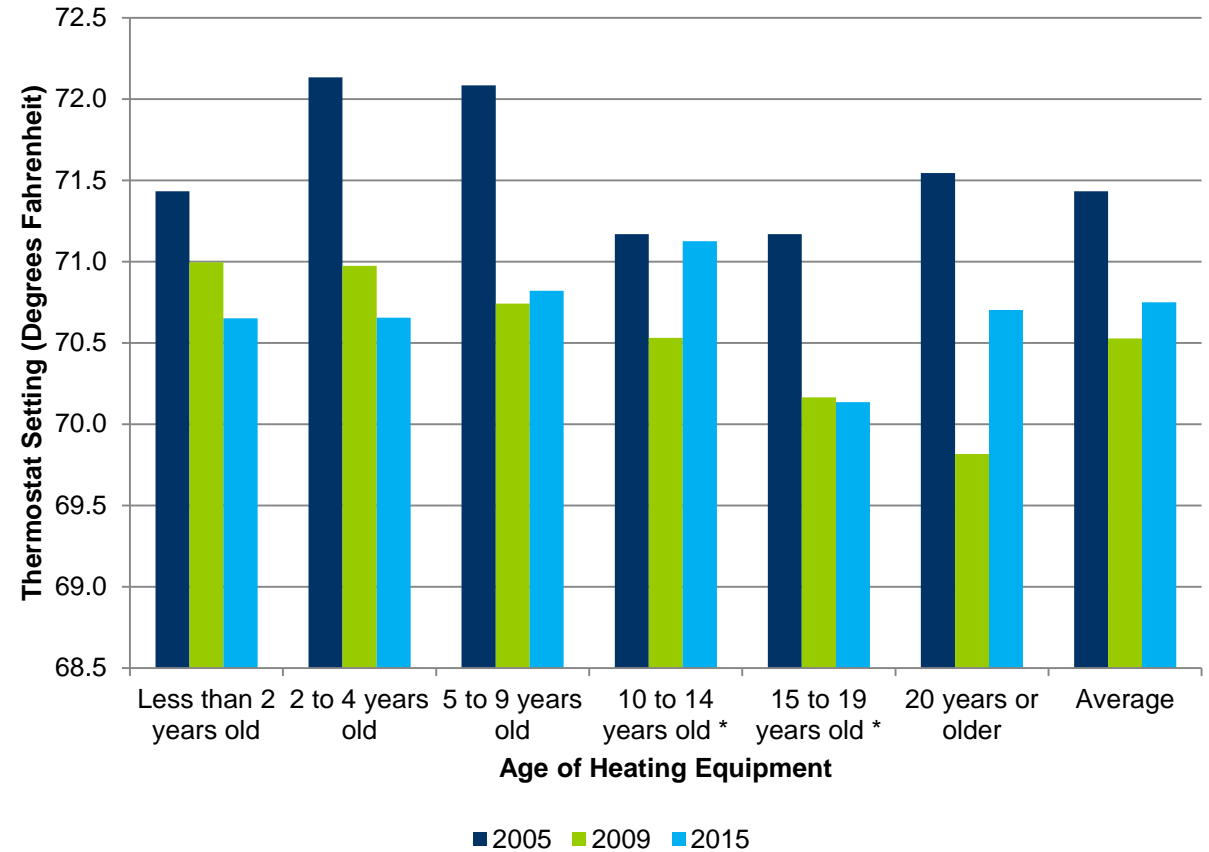




## Air Conditioner Thermostat Setting When Home



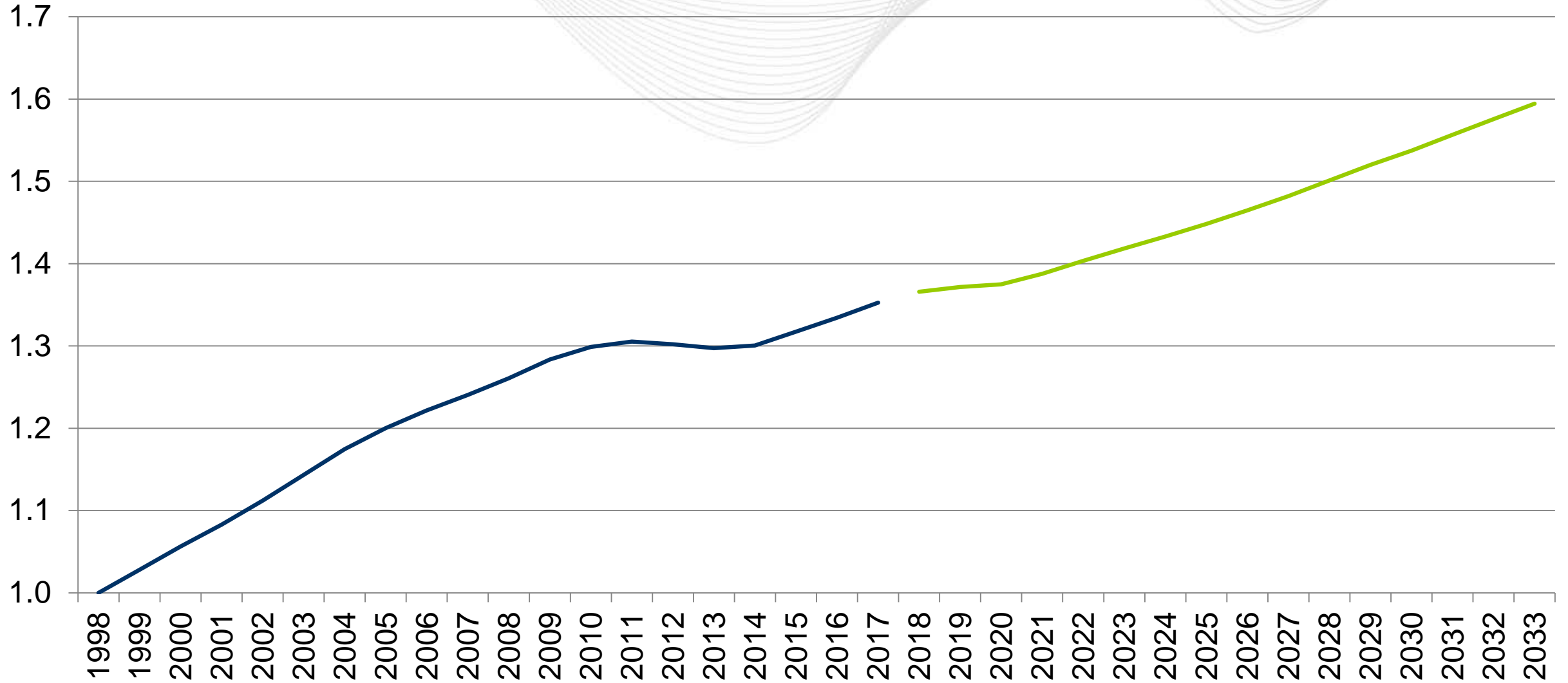
## Electric Heating Thermostat Setting When Home



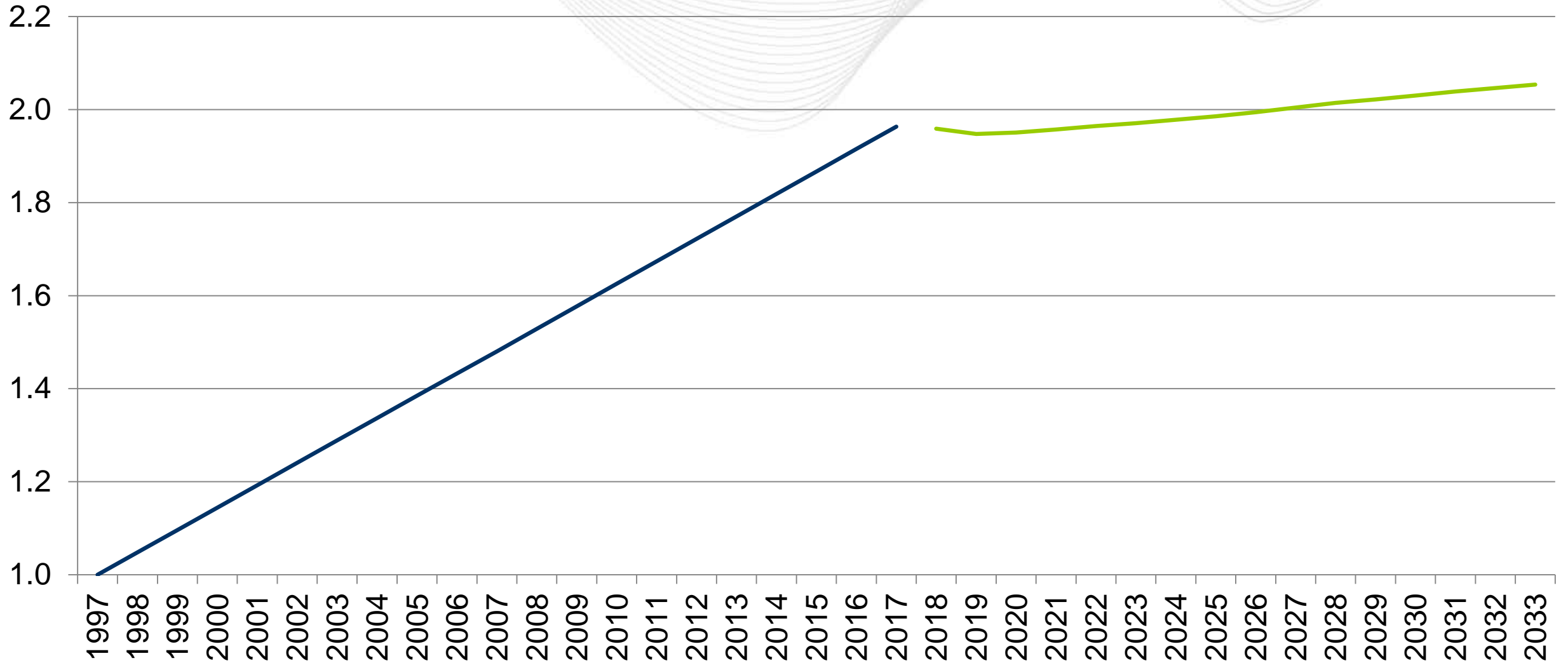


- Aggregate load data and to some extent survey data (more so on the cooling side) indicate that changing comfort levels are at least partially offsetting efficiency improvements....that is a steepening slope on weather terms over time.
  - We model weather sensitive load as a function of CDD over time (3 year periods) and use the change in slope over time as a variable
    - Drive it forward using cooling equipment index
  - Do the same for heating

# Sample Cooling Intensity Variable



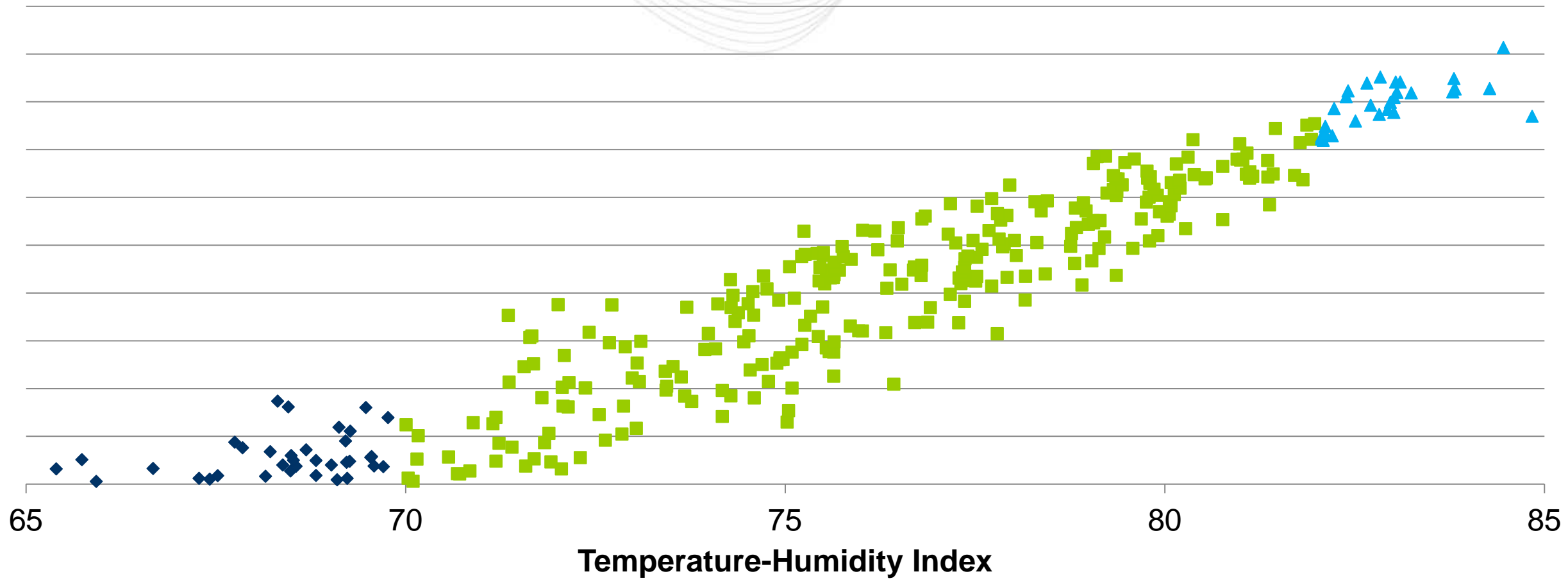
# Sample Heating Intensity Variable



# *“Second Model” Splines and Evening Treatment*

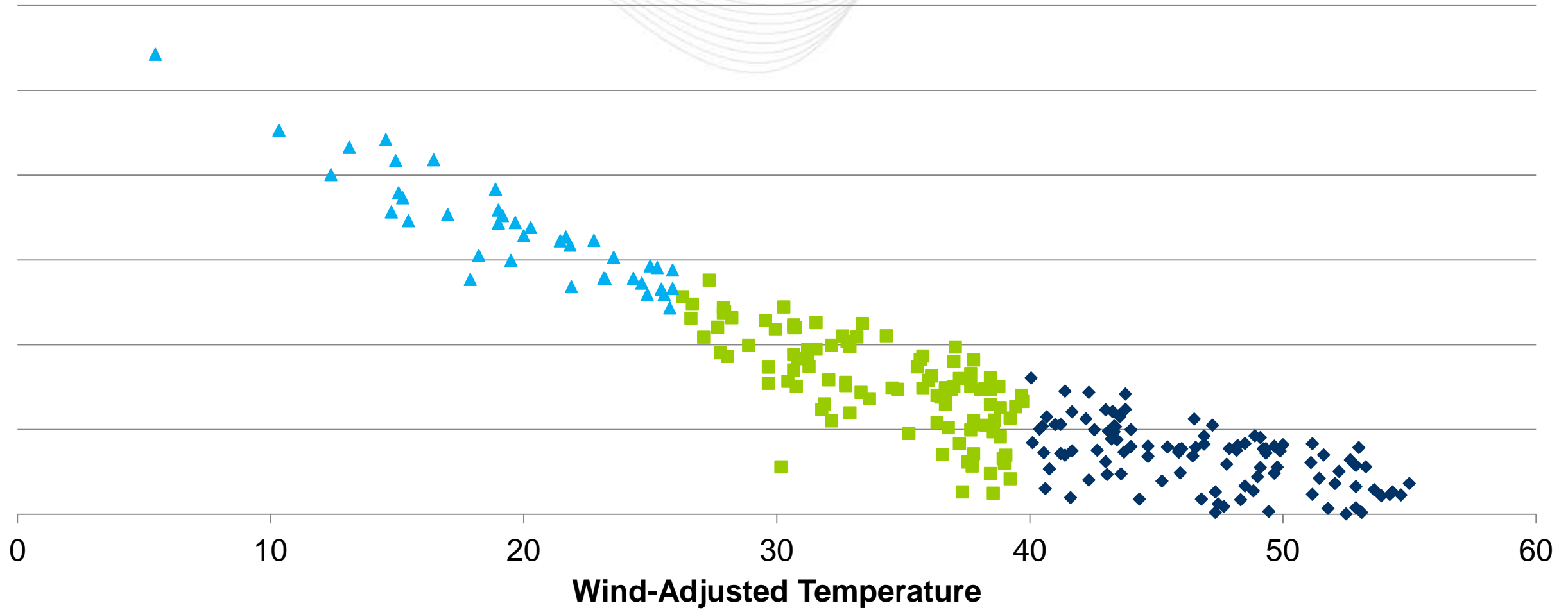
- Continue to use Temperature-Humidity Index (THI) with a small change:
  - Current model uses max THI from the day
  - Potential model uses 3 hour moving average THI coincident with the peak
- THI spline will now be based on 90<sup>th</sup> percentile
- Will still continue to use both Cooling Degree Days and 1-day lag Cooling Degree Days

## Weather Sensitive Load vs Temperature-Humidity Index 2015-2017



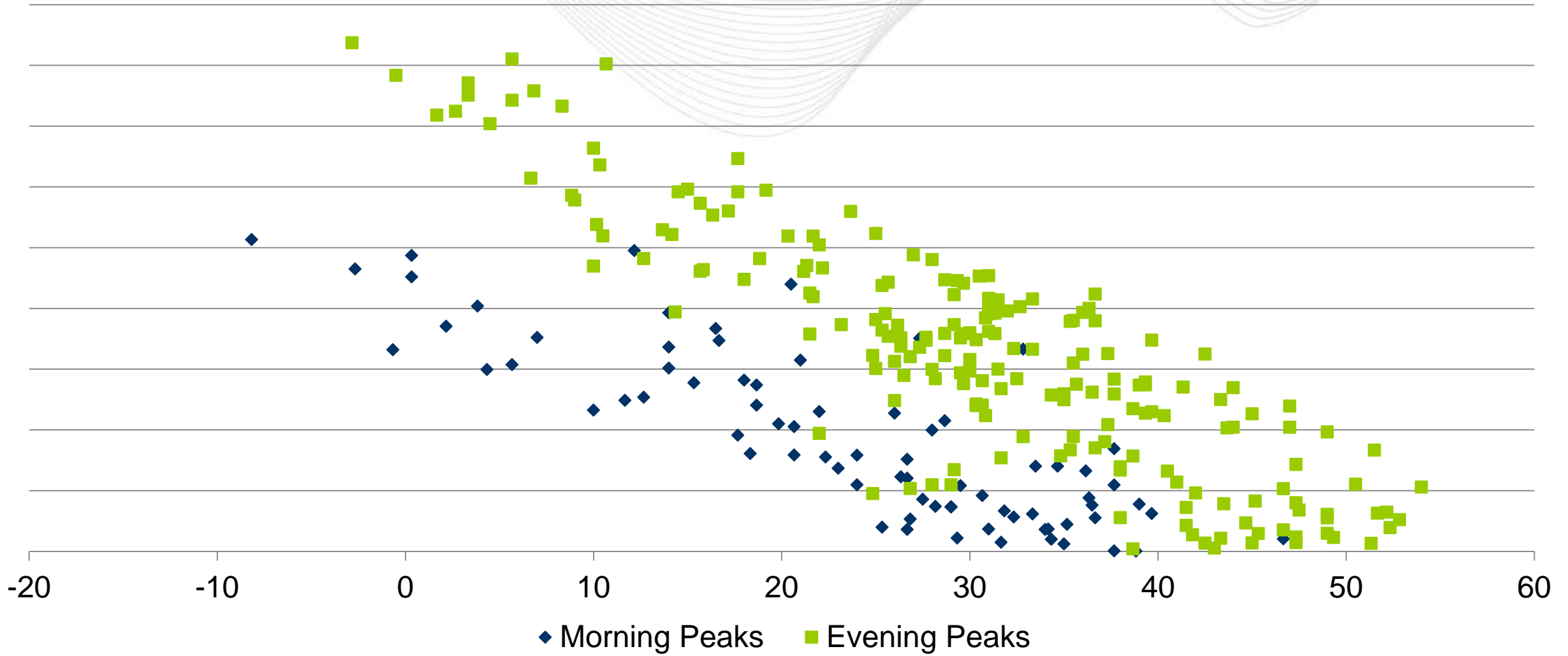
- Continue to use Wind-Adjusted Temperature (WWP) with a small change:
  - Current model uses WWP from HE19
  - Potential model uses 3 hour moving average WWP coincident with the peak
- WWP spline will now be based on 90<sup>th</sup> percentile
- Will still continue to use both Heating Degree Days and 1-day lag Heating Degree Days

### Winter Sensitive Load vs Wind-Adjusted Temperature 2014-2016 DY





- Winter load shapes tend to have a double hump, with the ability to peak in either the morning or evening.
  - However, all else held equal, a winter evening peak is likely to be higher than a winter morning peak
- To capture this, the model would include a variable that is a winter evening binary interacted with the base variable.
- Additionally, it was investigated whether there is the case for a WWP slope modification (i.e. the winter evening binary interacted with the WWP variables), though was generally not found to be significant



- Finalize model
  - Testing thus far has been focused on coincident peak models
  - Document sensitivity to assumptions
- Finalize accuracy and report out results
- Investigate a challenger model
  
- Future LAS Meetings
  - June 20, 2018
  - July 18, 2018