



**EXCERPTS FROM  
2018 VELCO IRP FORECAST  
VSPC FORECASTING SUBCOMMITTEE MEETING**



# FORECAST DATABASE – WHAT WE HAVE

- » VELCO System Hourly Load Data
- » Zonal Hourly Load Data (16 zones)
- » Customer class hourly load data for BED (2016)
- » Historical billed sales and customer data
  - Residential
  - Commercial
  - Industrial
- » Historical hourly/daily temperature data
- » Vermont Economic Forecast (January 2017)
- » 2017 AEO Residential and 2016 Commercial End-Use Saturation and Efficiency Projections (New England)
- » VEIC EE program savings projections (2016)
- » Behind-the-meter (BTM) solar adoption data (installed systems and capacity)
- » Solar generation profile

# WHAT WE HAVE DONE

- » Organized the data inputs
- » Developed normal weather data
  - Normal daily degree-days (chaotic series)
  - Normal monthly HDD and CDD
- » Estimated system, zonal, and rate class (BED) hourly profile models
- » Updated intensities to reflect current AEO Outlook for New England
  - Calibrated to Vermont based on past appliance saturation surveys
- » Configured revenue class and system energy and demand forecast models

# MODELING ZONAL DEMAND

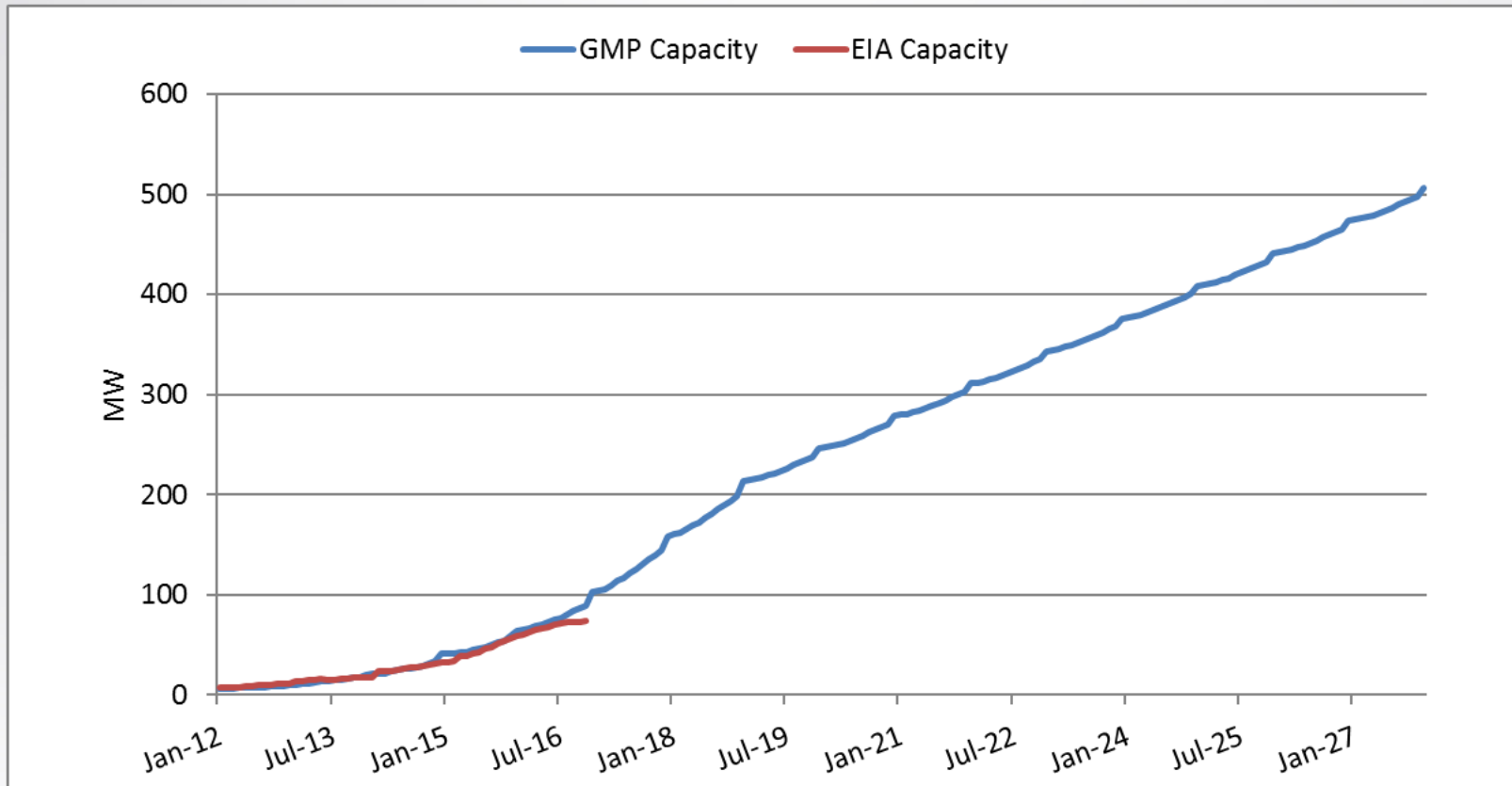
- » Availability of zonal hourly load data allows us to modify zonal load forecast approach
  
- » Forecast system energy, demand, and profile
  
- » Zonal Forecast
  - Forecast zonal monthly energy (based on rate class sales weighting within zone)
  - Combine energy forecast with zonal profile forecast (rather than modeling coincident peak)
  - Calibrate to system hourly load forecast – zonal hourly load forecasts
  - Find maximum and coincident peaks
  
- » For BED, use current long-term energy and demand forecast and BED profile forecast

# ISSUES (WHERE WE NEED HELP FROM YOU)

# ITEMS TO ADDRESS

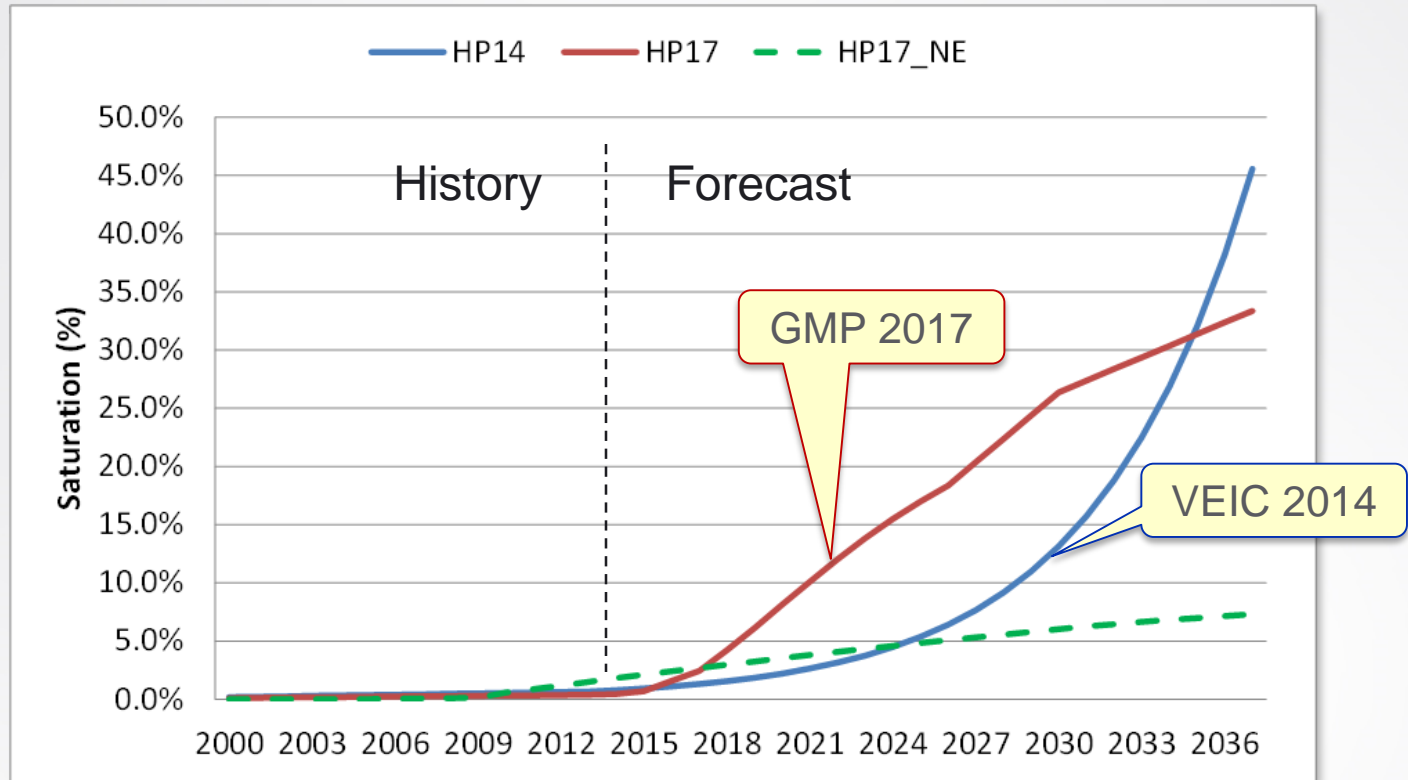
- » Calibrate end-use intensities into 2016 survey
  - Residential: end-use saturations and annual energy use (UEC)
  - Commercial: end-use intensity by building-type (kWh per sqft)
  
- » Update EE savings projections
  
- » Update Solar Load Forecast
  
- » Update Electric Vehicle Forecast
  
- » Tier 3 Electrification Impacts
  - Cold Climate Heat Pumps
  - Heat pump water heaters
  - Other ?

# SOLAR CAPACITY



- » But not that much difference in reported capacity
- » GMP is forecasting 56 additional MW of solar in 2017 and 55 MW in 2018 (so far, the GMP forecast has been tracking well)

# COLD CLIMATE HEAT PUMP SATURATION



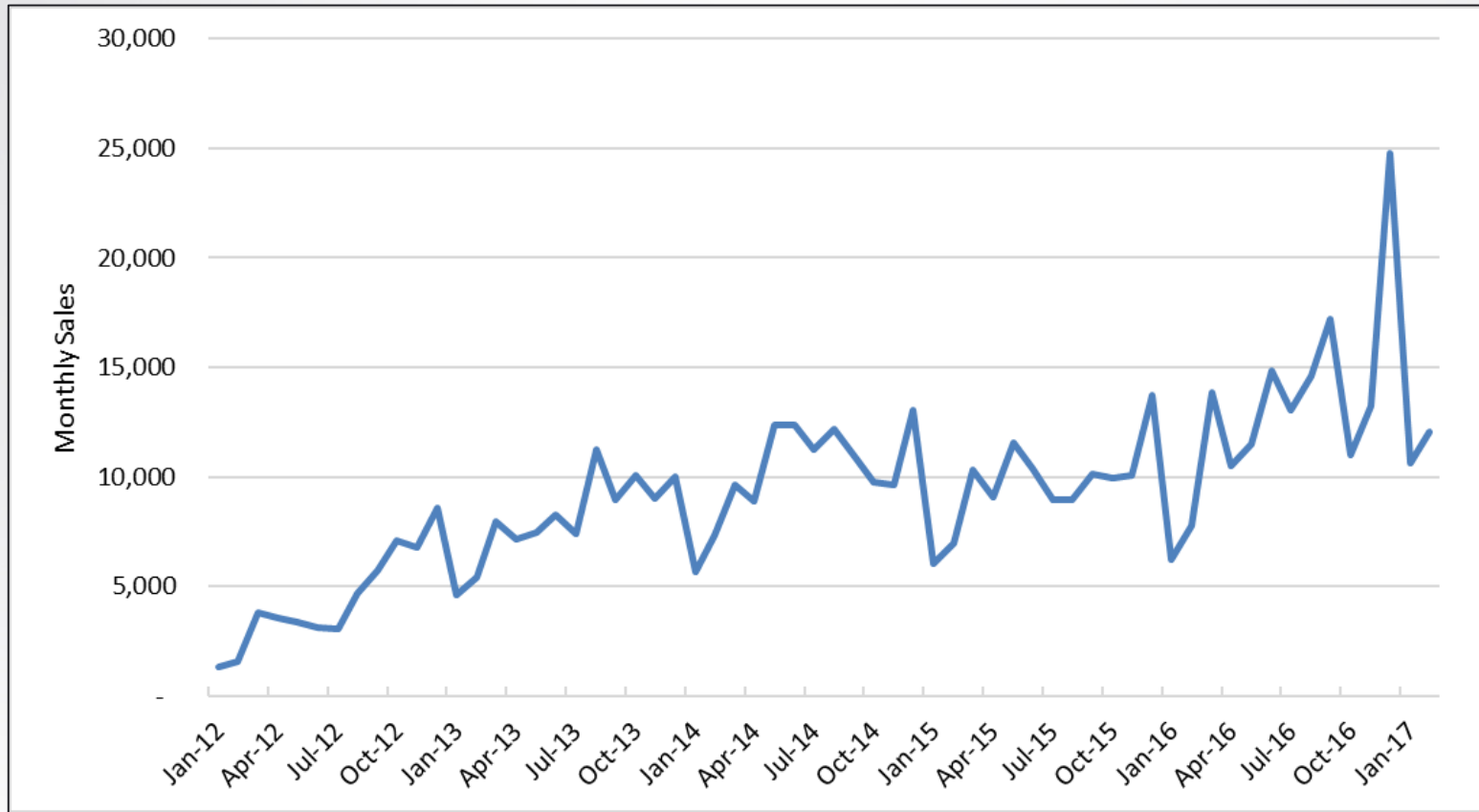
Assumptions of strong market penetration had large impact on the 2015 forecast



# HEAT PUMP MARKET ASSUMPTIONS

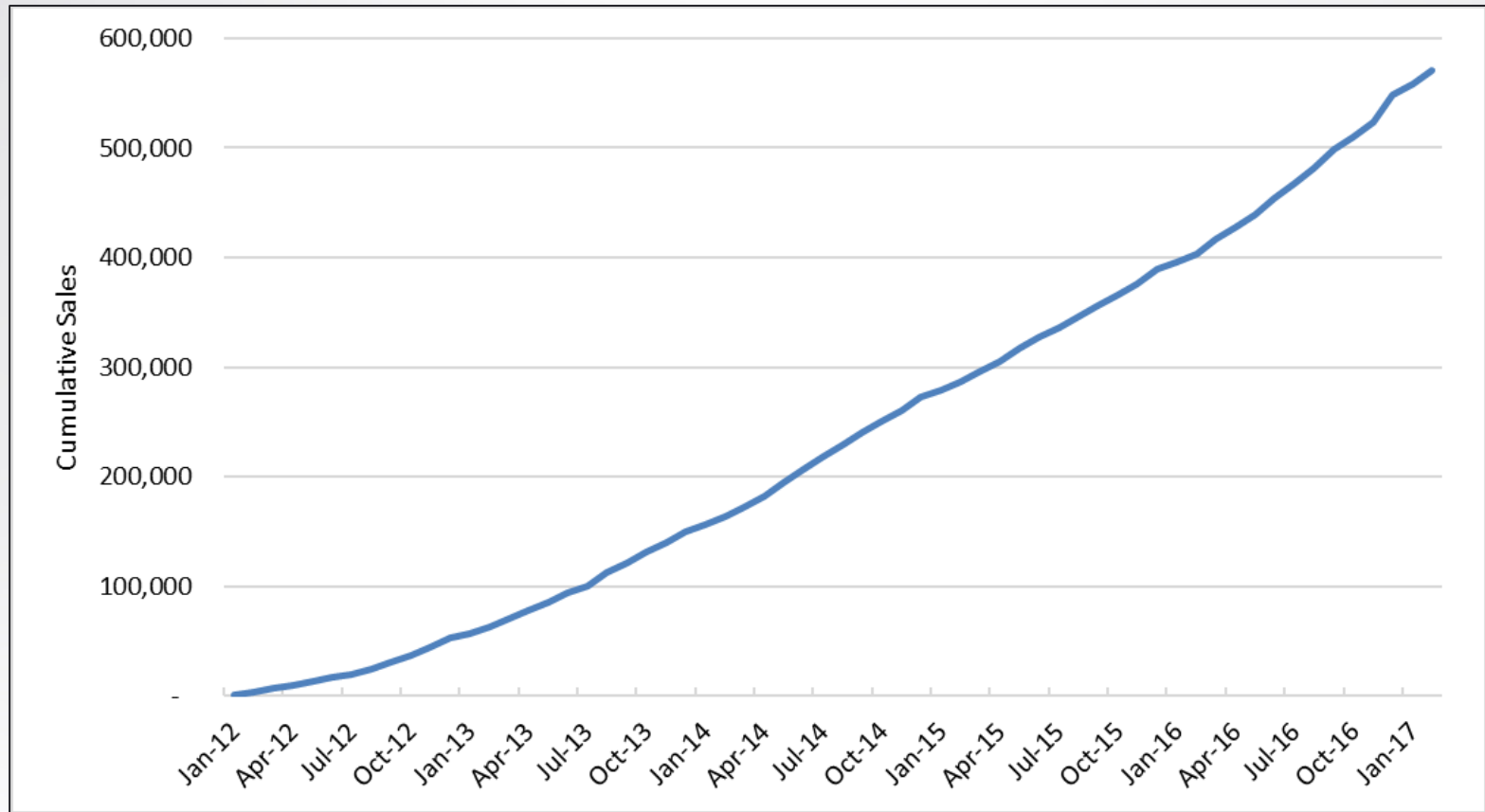
- » Saturation Projections
- » Heating and Cooling UEC
- » How much of existing electric heating is replaced or is it all new?
  - Replacing baseboard electric and secondary heat
- » How much is new cooling load vs. replacing existing room air conditioning or reducing CAC utilization?
  - A small increase in cooling energy use has a large impact on demand. Cooling is concentrated in a relatively few days

# NATIONAL ELECTRIC VEHICLE SALES



\* Source: InsideEVs.com, Monthly Plug-in Sales

# NATIONAL EV SALES TRENDS



\* Source: InsideEVs.com, Monthly Plug-in Sales

# NEXT STEPS

- » Project is on schedule – finalize forecast
  - May 31<sup>st</sup>
  
- » Complete Base Case forecast
  - April 14<sup>th</sup>
  
- » Preliminary Forecast Scenarios
  - May 19<sup>th</sup>
  
- » Zonal energy, hourly load, and peak forecasts
  - May 31<sup>st</sup>
  
- » Forecast Report
  - July 28<sup>th</sup>