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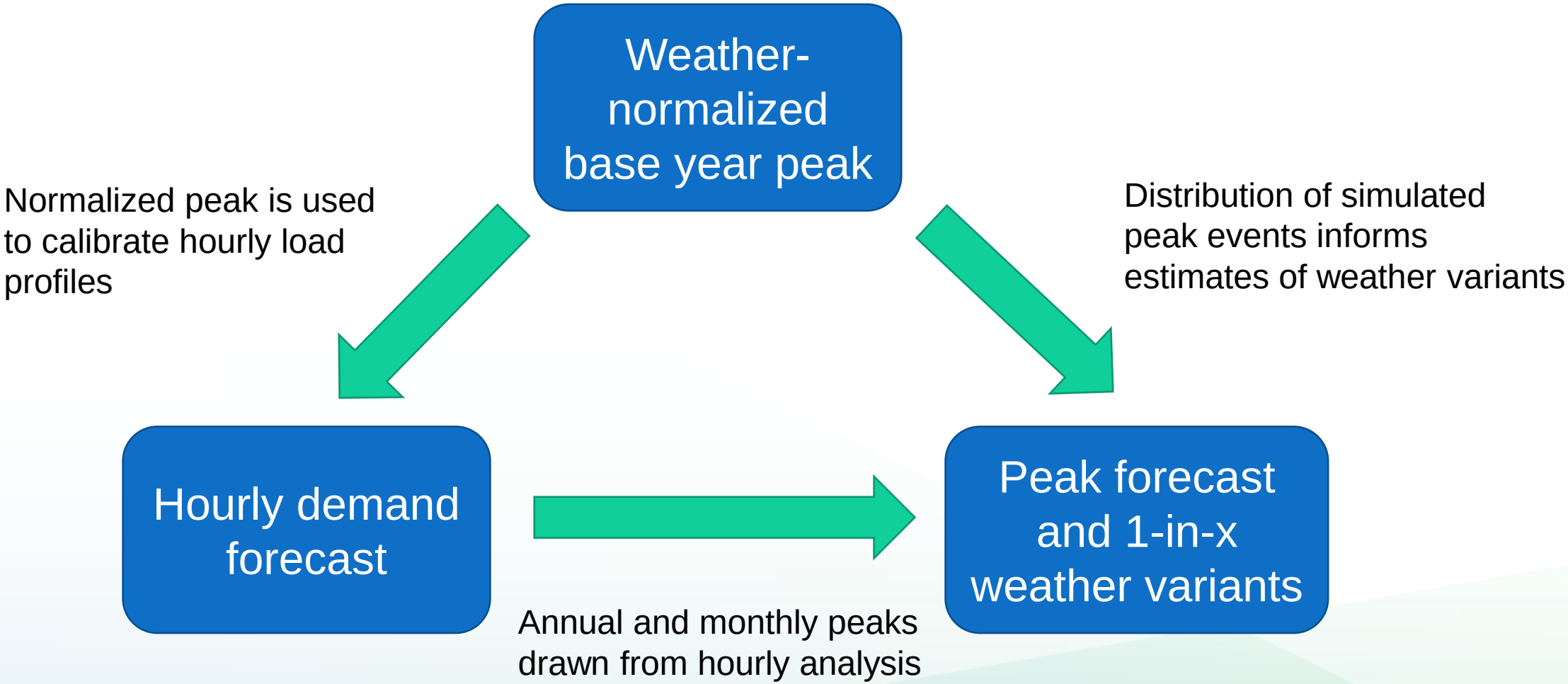
California Energy Commission

Updating the CED 2019-2030 Demand Forecast

August 26, 2020

Peak and Hourly Forecasting

Three related analyses



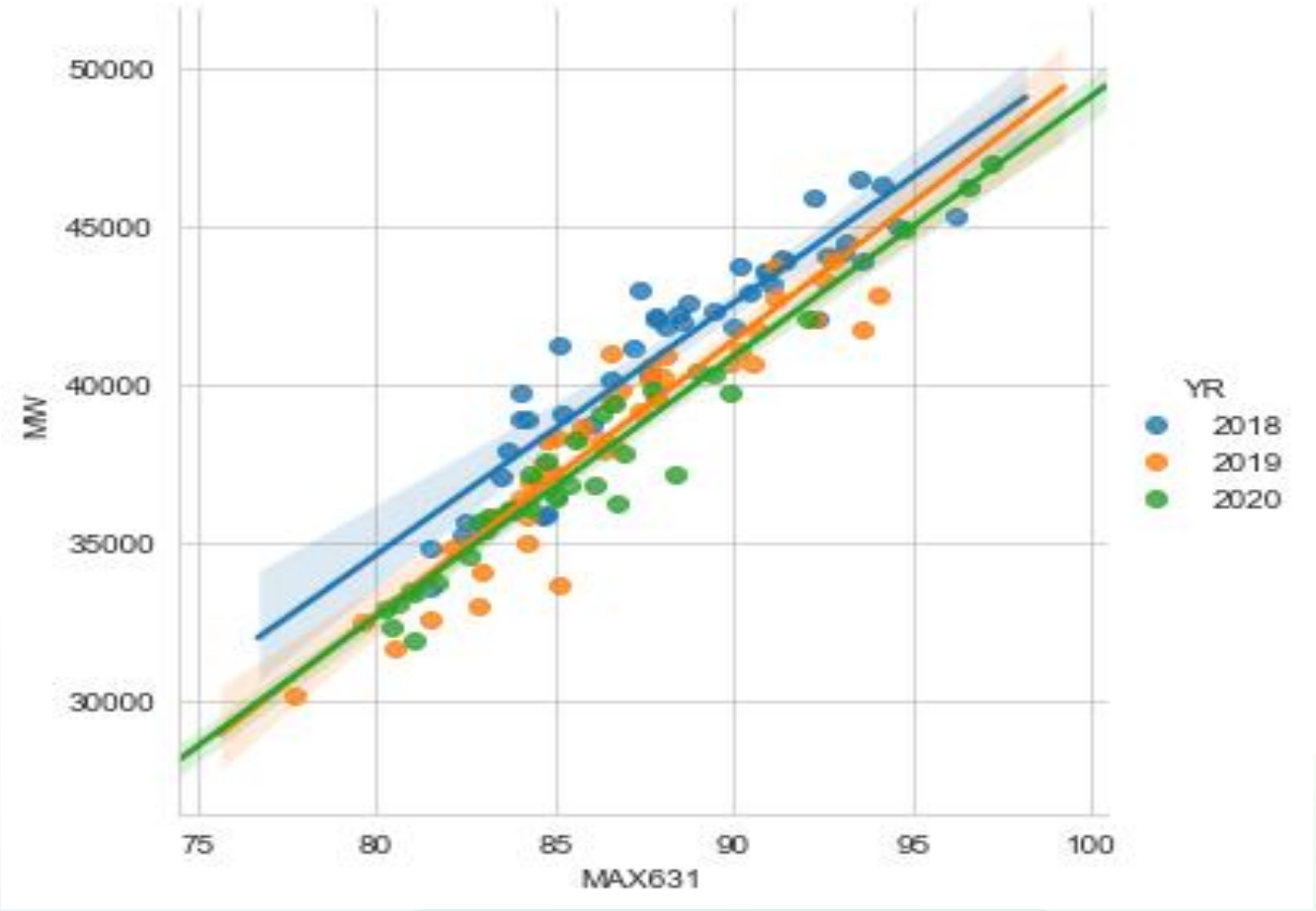
Weather-normalized base year

- In early October, CEC requests load data from CAISO and demand response called event data from utilities
- Using data from the most recent three summers, staff model peak load as a function of weather statistics
- Staff use the modeled load response to weather to simulate summer peaks using the last 30 years of historical weather
  - The median value from this distribution is the weather-normalized base-year peak value
  - The ratio between the 80th percentile and the median is used to estimate a 1-in-5 peak event
  - Similarly, the 90th percentile is used for a 1-in-10 estimate

CAISO Load-Temperature Response

This year's initial peak load-response to warm temperatures in June and July appears similar to previous years, indicating the normalization process may still be appropriately applied.

Staff welcome feedback on this approach, and propose to discuss the process in detail with interested stakeholders at a late September DAWG meeting.



Hourly Load Model (HLM)

Top-down method for developing hourly forecast used in past three CED forecasts

Each hour of the day is modeled as a function of weather and calendar effects

Predicts load in any given hour as a ratio of average hourly load

Hourly forecasts developed by applying hourly load ratios to annual consumption forecasts

Load ratio profiles are scaled so that peak load in the base-year aligns with the weather normalized peak

Hourly Electric Load Model (HELM)

Bottom up method for developing hourly forecasts by applying whole-building and end-use load profiles to annual consumption forecasts

Fell out of use in recent forecast cycles, due to out-dated load shapes

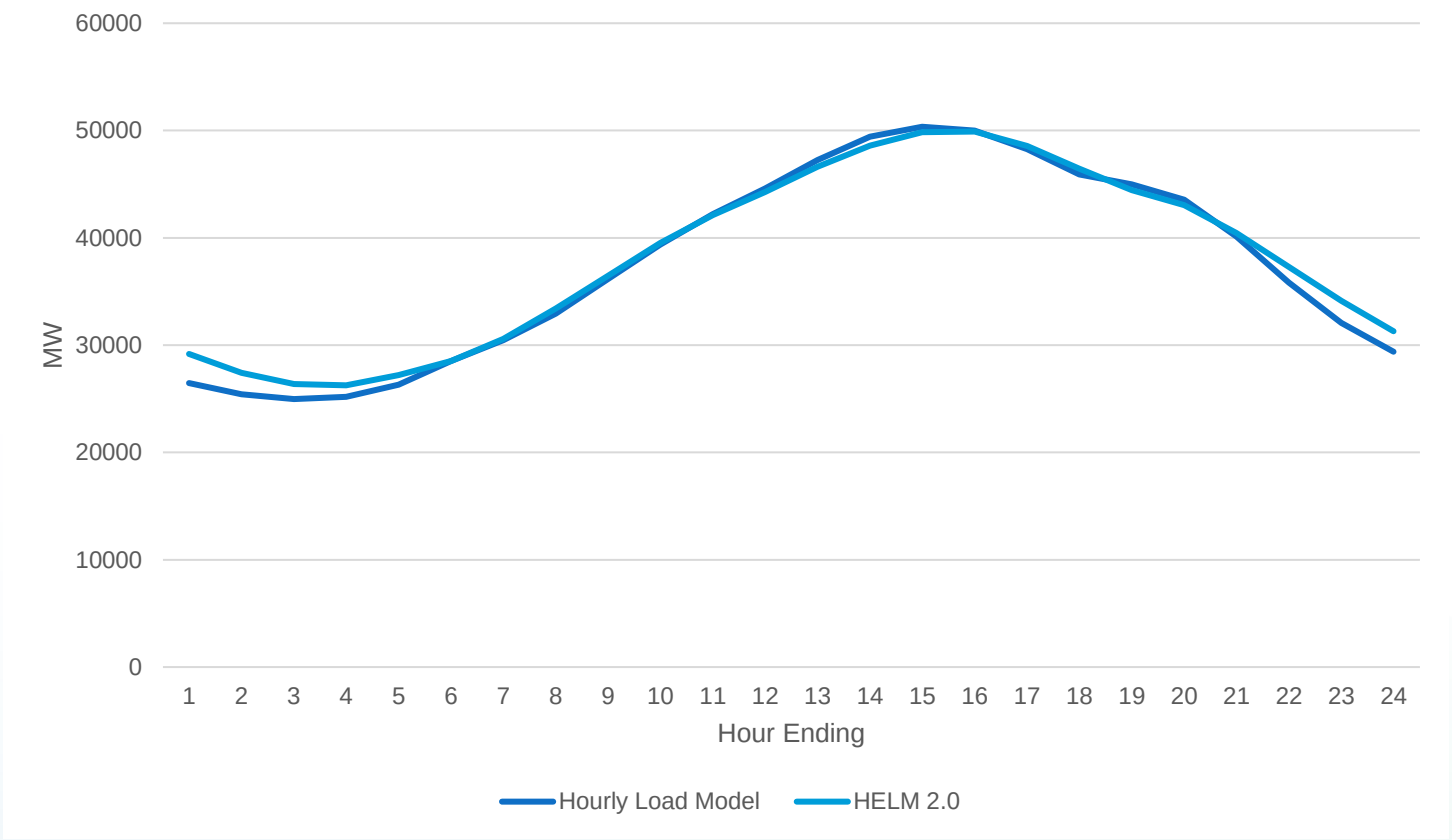
Under an EPIC-funded contract, ADM Associates, Inc developed new load shapes for buildings and end-uses specific to IOU forecast zones

ADM used these load shapes to develop HELM 2.0

Final project report on electric load shapes:

https://ww2.energy.ca.gov/2019publications/CEC-500-2019-046/CEC-500-2019-046.pdf

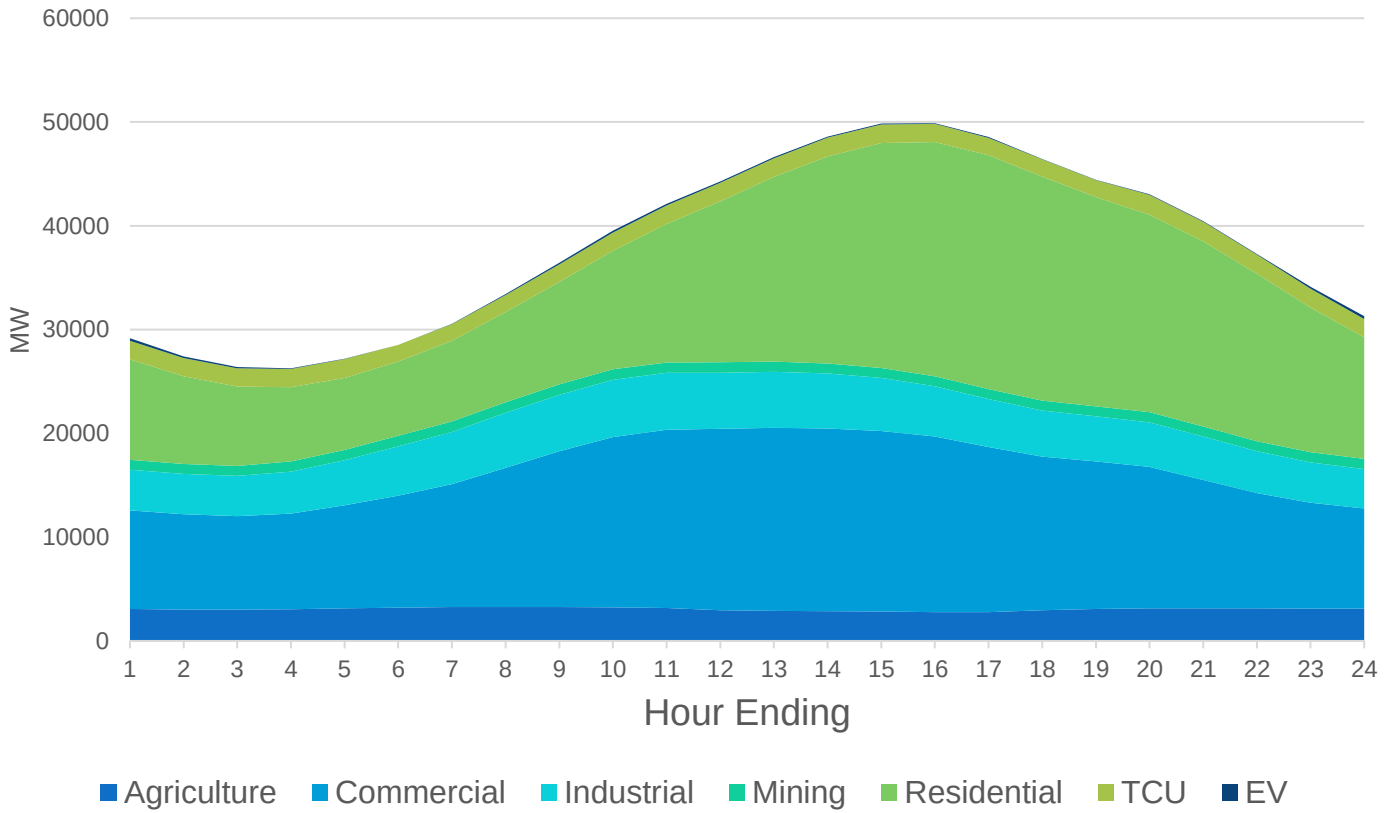
HLM vs HELM 2.0



Compares CAISO peak day consumption profiles taken from HLM and HELM 2.0 for forecast year 2020

Similar overall shape, but the bottom-up nature of HELM 2.0 allows for an examination of individual sector contributions to peak

HELM 2.0 Sector Profiles



If the updated energy consumption forecast shows greater decline in non-res sectors, then a strict application of HLM profiles may underestimate peak consumption load

HELM 2.0 could be used to adjust HLM profiles

Next Steps

Formal comments due **September 16**

Stakeholders can contact staff directly with informal comments and questions

IEPR workshop to present updated forecast results, **December 3**

Forecast update presented for adoption at a CEC business meeting, **January 2021**

DAWG meetings* to review weather normalization, peak and hourly forecasting, preliminary forecast results, **September – November**

*Subscribe to the DAWG listserve to receive upcoming meeting notices:

https://www.energy.ca.gov/programs-and-topics/topics/energy-assessment/demand-analysis-working-group-dawg

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Thank You!