new england

Summer 2023 Peak Review

Load Forecast Committee

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CELT 2023 Gross Demand Forecast Evaluation

Data and Methods

- ISO has evaluated the "out-of-sample" performance of the CELT 2023 gross demand models during the recent period June 1, 2023 through September 12, 2023
    - Out-of-sample forecast performance is measured on test data that is not used in model estimation

- All load and behind-the-meter photovoltaic (BTM PV) data used in the evaluation are preliminary
    - Load data are subject to resettlement throughout the data reconciliation process
    - BTM PV data are based on an extrapolation of installed PV capacity data beyond the most recent data provided by Distribution Owners (up through April 30, 2023)
    - Preliminary results are expected to be indicative of final overall model performance

- Gross load values listed reflect the reconstitution of passive demand resources (PDRs) used for CELT 2023, which was calibrated to FCA 17 Capacity Supply Obligations (CSOs) for PDRs

- Forecast performance metrics used in the evaluation:
    - Mean error (ME): a measure of, on average, how much is ISO over/under-forecasting
        - Daily Peak Load Error = Actual minus forecasted peak load
            - Positive value indicates actual load is higher than forecast
            - Negative value indicates actual load is lower than forecast
    - Mean absolute percent error (MAPE): a measure of the magnitude of the errors irrespective of direction (i.e., over/under)

Summer 2023 Weather

- Three notable heat-waves occurred during this past summer season, during which observed weather neared the CELT 2023 summer 50/50 peak weather expectation
  - July 5 - 7
  - July 26 - 28
  - September 4 - 9

- All of the highest peak demand days for summer 2023 occurred during these three periods

- Plot below illustrates 8-city weighted dry bulb temperature, dew point temperature, three day weighted temperature-humidity index (WTHI), and daily cooling degree days (CDD)
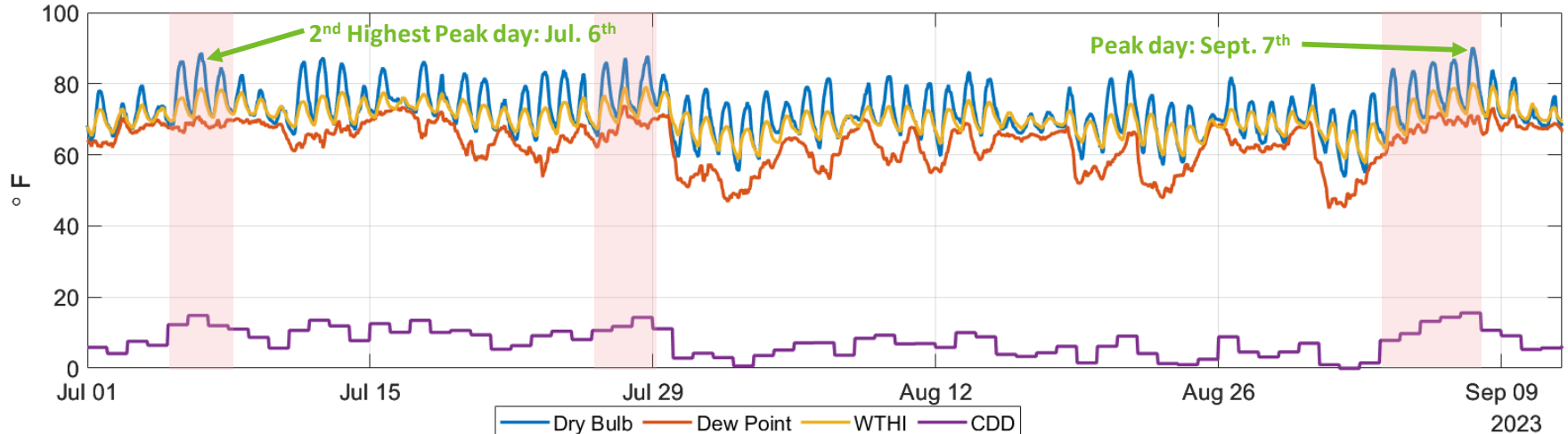
Summer 2023 Marks First September Summer Peak in Recent History (Since 1991)

- Relatively mild June – August, combined with a warmer than usual start to September
  - The hottest summer weather occurred on September 7, 2023, and was slightly milder than "50/50" weather

Summer (Jun-Aug) CDDs

First 12 Days of September CDDs
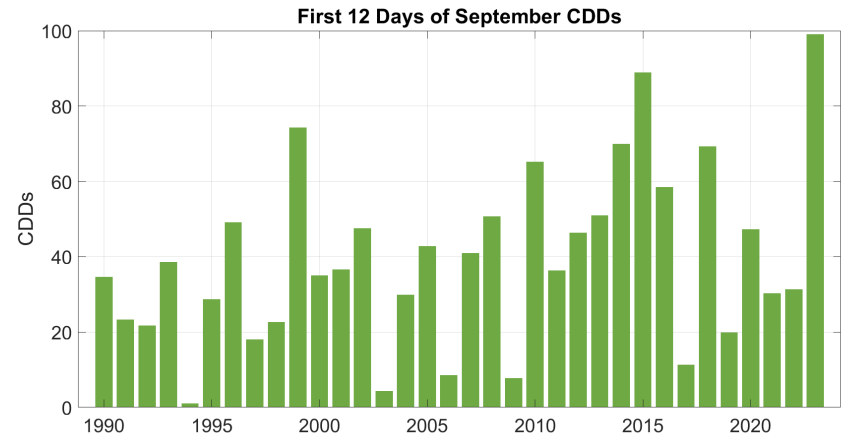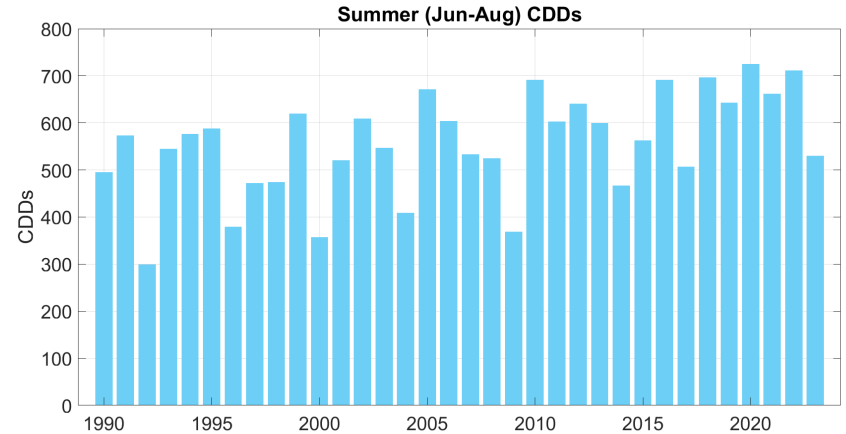
Preliminary Review of Summer 2023 Peak Days

CELT 2023 Peak Forecast and Actual* (June 1 – September 12)

*All values are based on preliminary data

| Peak Day	Type	Day of Week	Gross Peak (MW)	Net Peak (MW)	Peak Hour Gross (Net)	WTHI @ Gross Peak	CDD @ Gross Peak	BTM PV Peak Load Reduction (MW)
CELT 2023 50/50	**Forecast**		**27,556**	**24,605**		**79.8**	**16.7**	**981**
CELT 2023 90/10	**Forecast**		**29,372**	**26,421**		**81.5**	**20.0**	**981**
9/7/2023	Actual	Thu	27,167	24,016	16(18)	79.8	15.6	1,182
7/6/2023	Actual	Thu	26,369	22,975	16(18)	78.6	14.8	1,425
7/28/2023	Actual	Fri	26,206	22,786	16(18)	78.9	14.3	1,451
7/27/2023	Actual	Thu	25,923	22,627	16(17)	79.0	11.7	1,327
9/6/2023	Actual	Wed	25,890	22,915	16(18)	78.5	14.3	1,006

Notes: Net Peak = Peak load net of both passive demand resources and BTM PV
WTHI = 3-day weighted temperature-humidity index
CDD = Cooling degree days
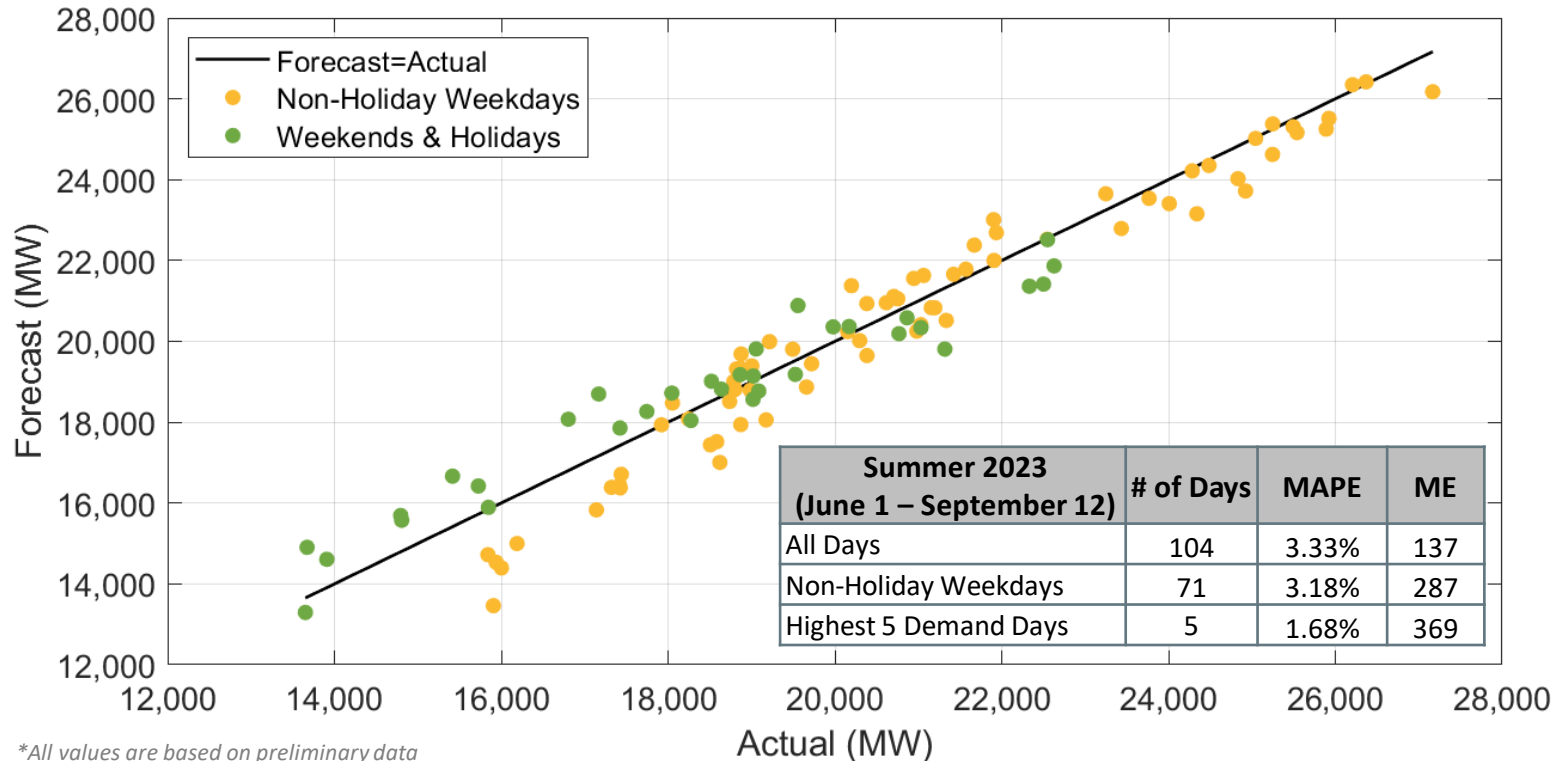
Preliminary Review of Summer 2023 Peak Days

Gross Demand Forecast and Actual* (June 1 – September 12)
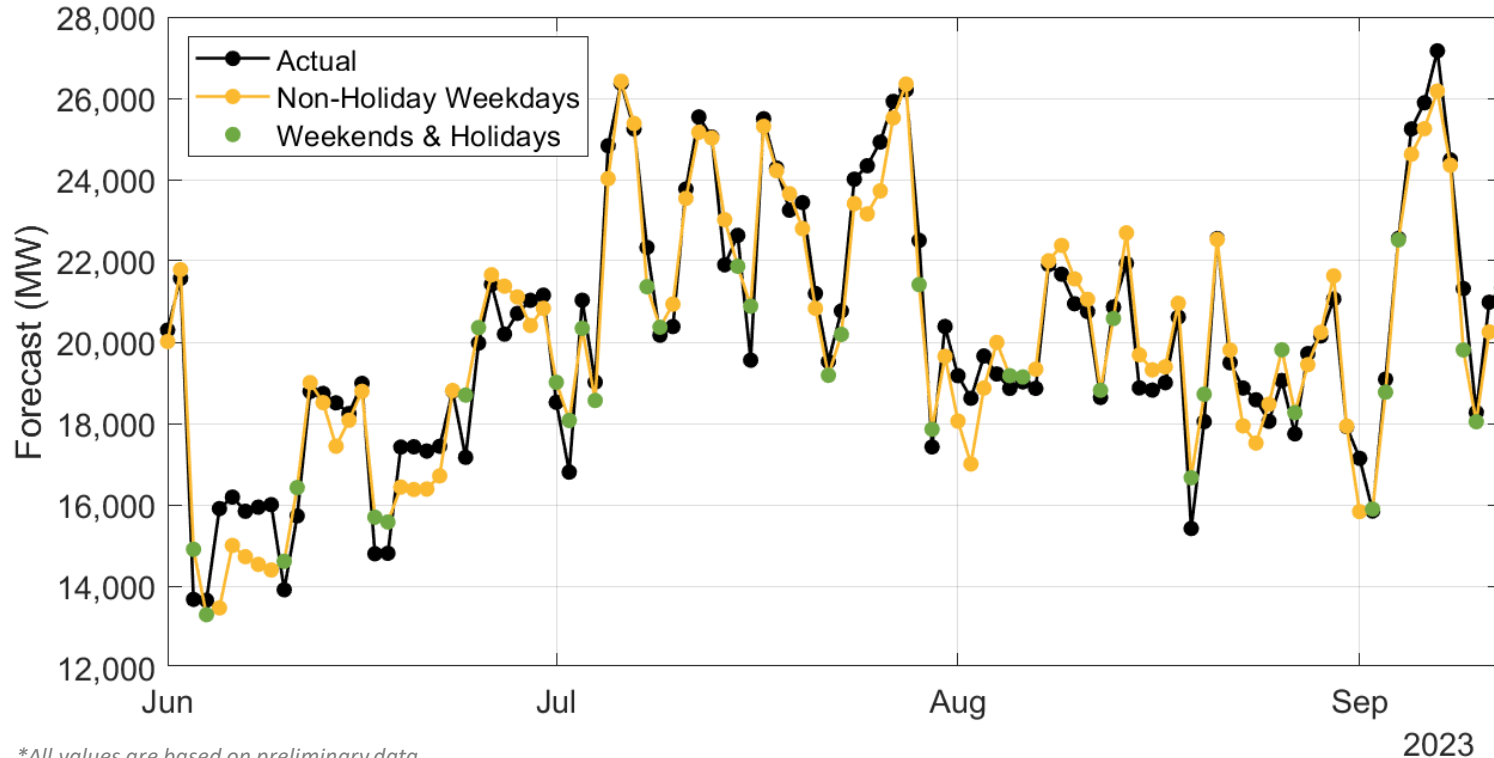
All values are based on preliminary data

Preliminary Review of Summer 2023 Peak Days

Gross Demand Forecast Vs. Actual (June 1 – September 12)*

Summer 2023 (June 1 – September 12)	# of Days	MAPE	ME
All Days	104	3.33%	137
Non-Holiday Weekdays	71	3.18%	287
Highest 5 Demand Days	5	1.68%	369

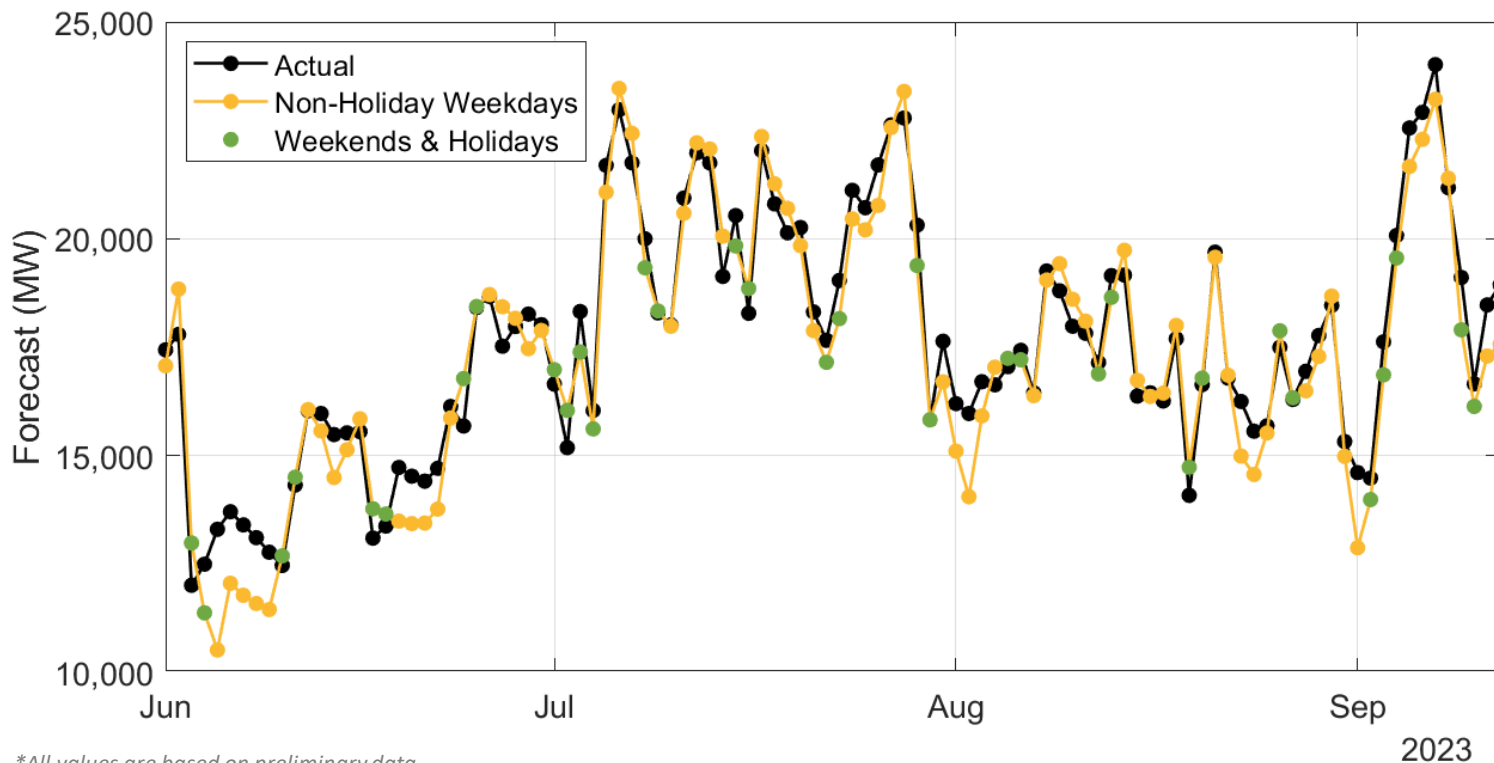*All values are based on preliminary data

CELT 2023 Net Demand Forecast Evaluation

- Net load forecast values result from subtracting the EE forecast and the BTM PV forecast from the gross load forecast
  - Performance of net load forecast includes uncertainty in the accounting for the BTM PV and EE
  - As a result there tends to be greater uncertainty in the net load forecast
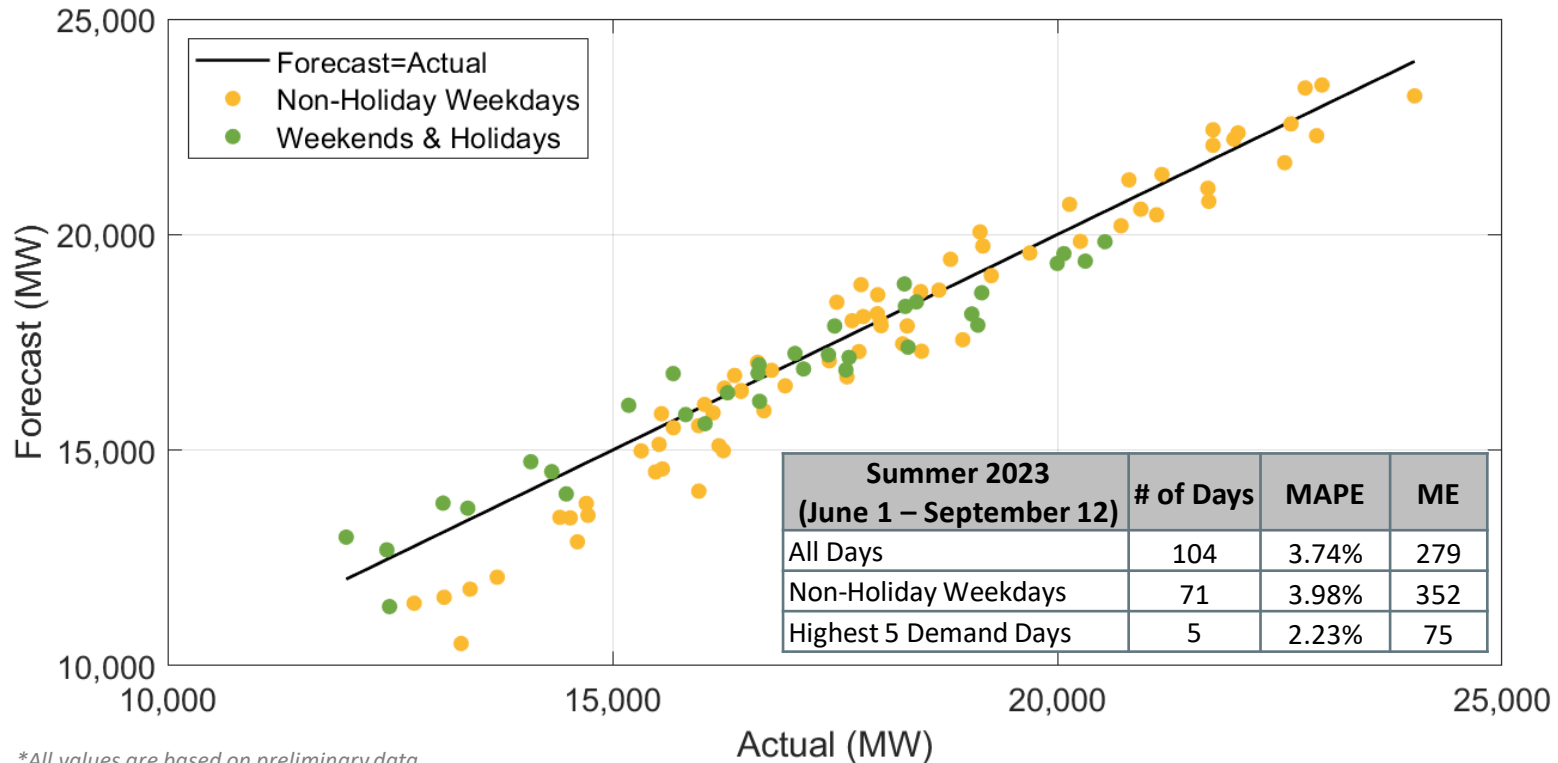
Preliminary Review of Summer 2023 Peak Days

Net Demand Forecast and Actual* (June 1 – September 12)

*All values are based on preliminary data

Preliminary Review of Summer 2023 Peak Days

Net Demand Forecast Vs. Actual* (June 1 – September 12)

Summer 2023 (June 1 – September 12)	# of Days	MAPE	ME
All Days	104	3.74%	279
Non-Holiday Weekdays	71	3.98%	352
Highest 5 Demand Days	5	2.23%	75

*All values are based on preliminary data

Questions