

2021 CELT Load Forecast Development: Interim Update

*June 2020 Moody's Economic Forecast and
Preliminary Review of 2020 Summer Demand*



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Today's Presentation

- The purpose of this presentation is to review the update on the Moody's Analytics' macroeconomic forecast and performance of the peak load forecast model in preparation for the upcoming 2021 CELT load forecast development cycle
 - The 2020 CELT load forecast will be used for developing the FCA 15 Installed Capacity Requirements and those for the annual reconfiguration auctions (ARAs) to be conducted in 2021
- This presentation includes:
 1. An evaluation of the 2020 CELT summer demand forecast performance using available 2020 summer weather and demand data
 2. An updated macroeconomic outlook for New England that considers the likely impacts of COVID-19 and resulting economic implications
 3. A summary of estimated impacts of the updated macroeconomic outlook on the summer demand forecast using the CELT 2020 forecast as a benchmark

REVIEW OF 2020 SUMMER PEAK LOADS

June 1 – July 31, 2020

CELT 2020 Gross Demand Forecast Evaluation

Data and Methods

- ISO has evaluated the “out-of-sample” performance of the CELT 2020 gross demand models during the recent period June 1, 2020 through July 31, 2020 (i.e., 61 days)
 - 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, 2020)
 - Preliminary results are expected to be indicative of final overall model performance
- 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)

Preliminary Review of Summer 2020 Peak Days

CELT 2020 Peak Forecast Vs. Actual* (June 1 – July 31)

**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 2020 50/50	Forecast		29,224	25,125		79.8	16.7	787
CELT 2020 90/10	Forecast		31,182	27,084		81.8	19.5	787
7/28/2020	Actual	Tue	29,705	24,692	14(15)	80.1	18.7	1,554
7/27/2020	Actual	Mon	29,472	25,054	16(18)	79.8	19.0	959
7/20/2020	Actual	Mon	28,689	24,270	16(18)	80.9	17.8	959
7/21/2020	Actual	Tue	27,810	23,700	17(18)	78.7	14.9	651
7/30/2020	Actual	Thu	27,165	22,518	15(16)	77.1	12.9	1,187
7/29/2020	Actual	Wed	27,067	22,949	17(18)	78.4	13.5	659
7/9/2020	Actual	Thu	26,959	22,564	16(18)	77.8	13.5	935

Notes:

Net Peak = Peak load net of both passive demand resources and BTM PV

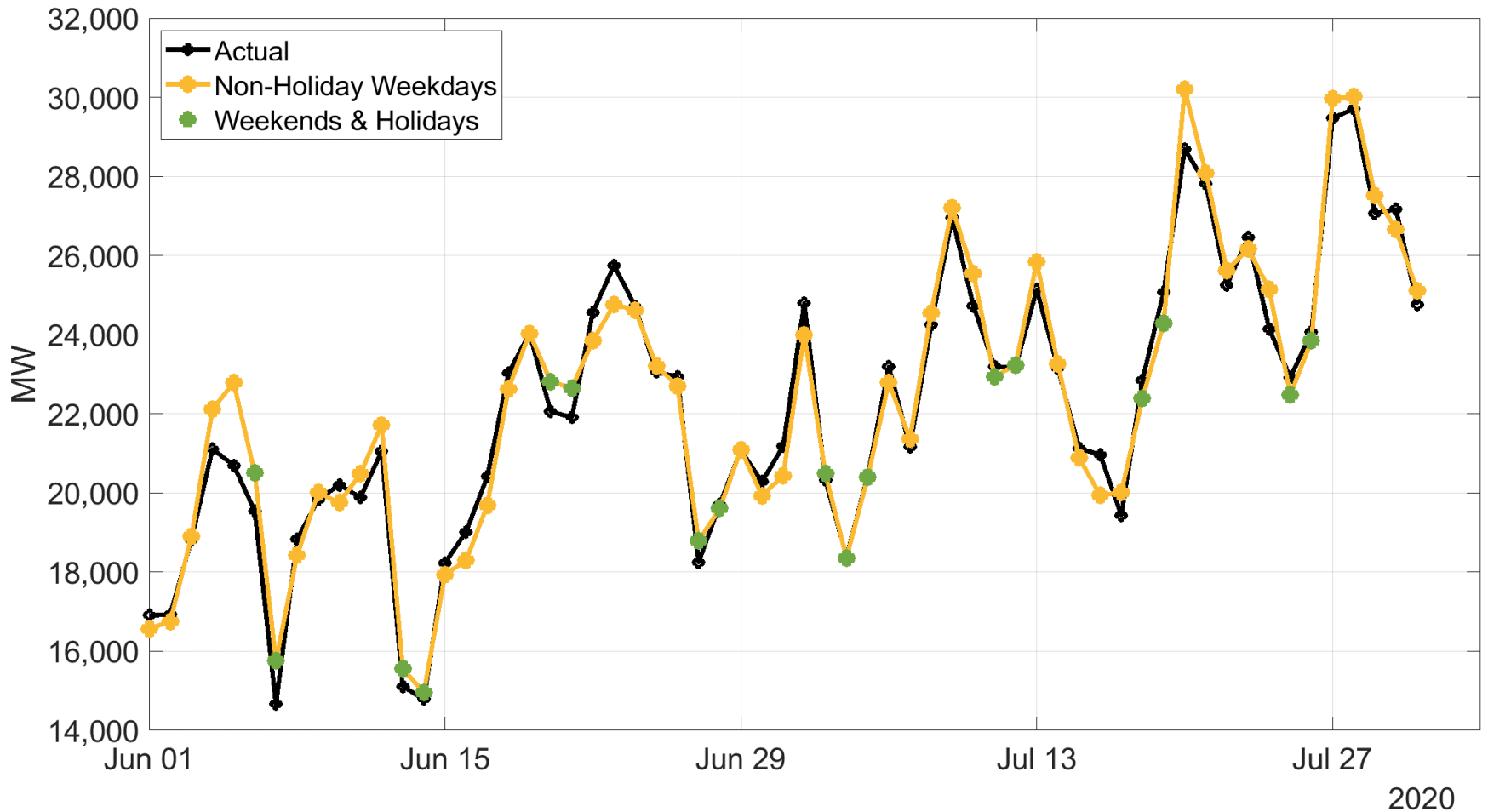
WTHI = 3-day weighted temperature-humidity index

CDD = Cooling degree days



Preliminary Review of Summer 2020 Peak Days

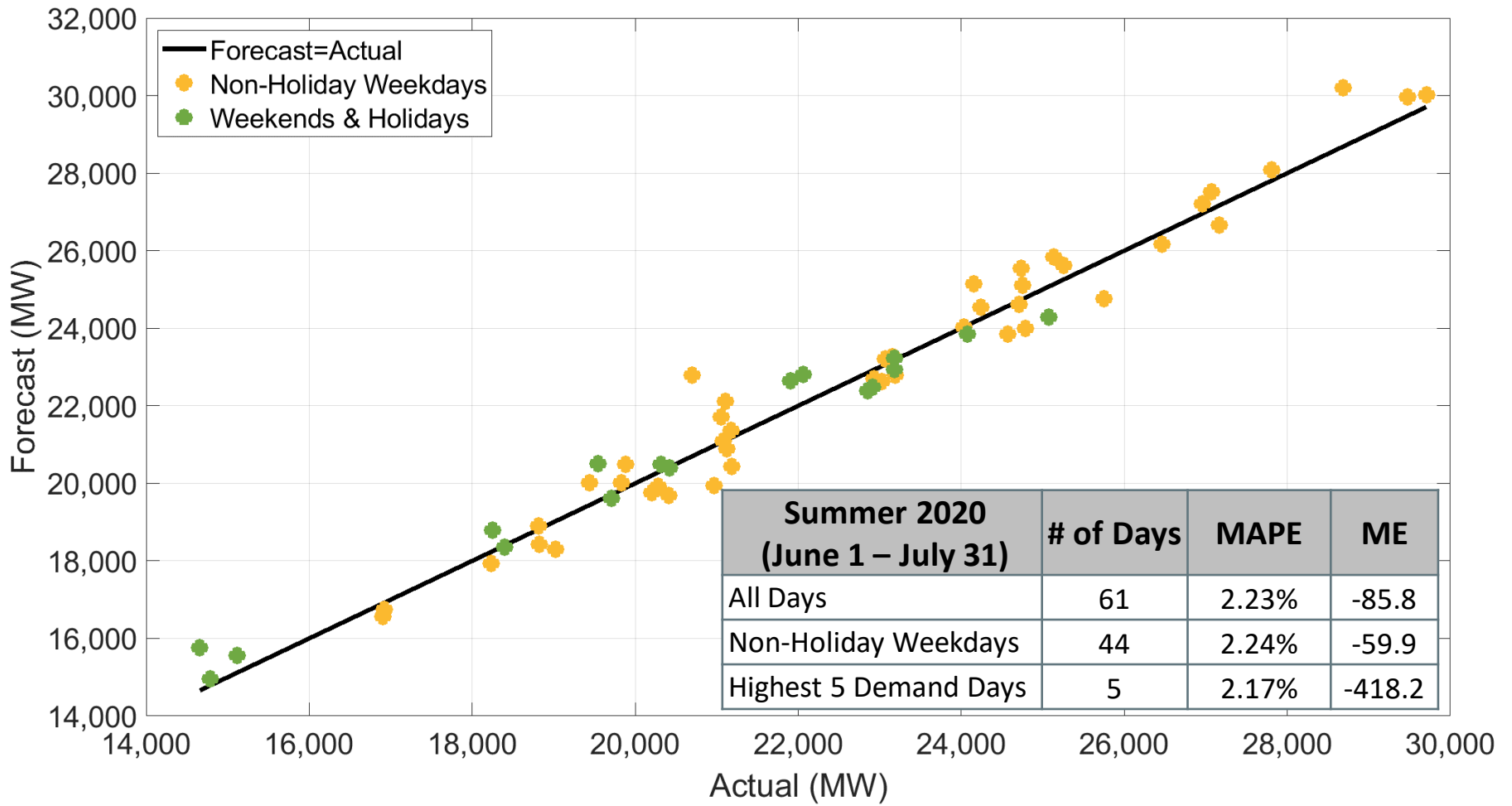
Gross Demand Forecast Vs. Actual (June 1 – July 31)*



**All values are based on preliminary data*

Preliminary Review of Summer 2020 Peak Days

Gross Demand Forecast Vs. Actual (June 1 – July 31)*



**All values are based on preliminary data*

UPDATED MACROECONOMIC FORECAST

Moody's Analytics, June 2020



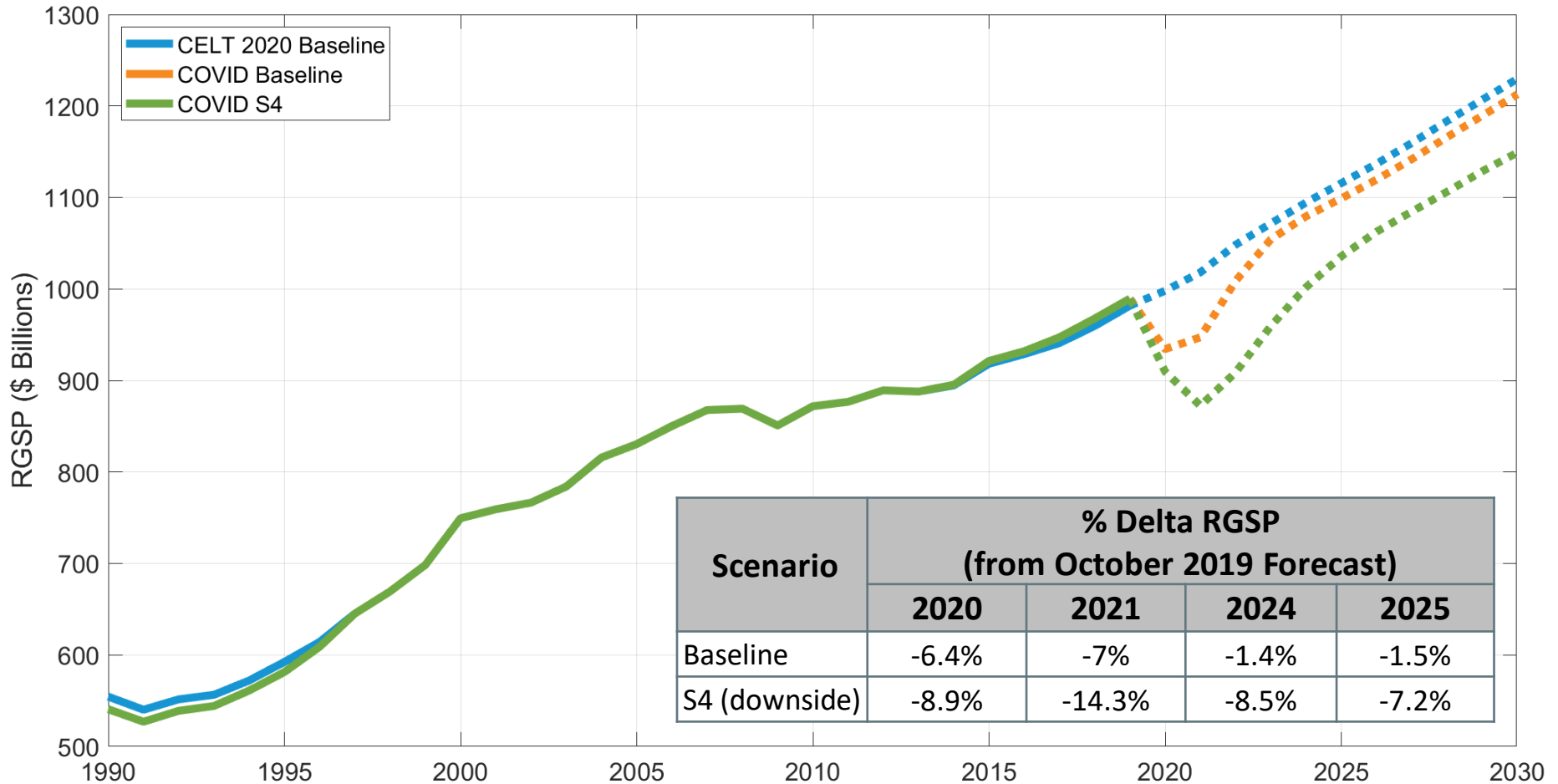
Moody's Analytics Economic Outlook

June 2020

- The ISO used the October 2019 (i.e., pre-COVID) Moody's macroeconomic forecast in the development of CELT 2020
- The ISO recently acquired Moody's June 2020 macroeconomic forecast, which reflects the expected impacts of the COVID-19 pandemic at that time, to help initially understand what these impacts may be in developing the 2021 CELT load forecast
- The next slide illustrates the regional gross state product (RGSP) from two of Moody's updated scenario forecasts
 1. Baseline scenario (i.e., the scenario that ISO typically uses in its CELT forecasts)
 - 50% probability that economy perform worse
 - No second-wave of infection that causes states to shut down again
 - 2.4 million confirmed cases
 - New COVID-19 infections peaked in April
 - 6% confirmed case fatality rate, 10% hospitalization rate
 2. Downside scenario ("S4")
 - 4% probability that economy perform worse
 - Much higher than expected incidence of new infections and deaths in the latter part of 2020 cause businesses to reopen much more slowly than anticipated
 - Concern for the rising infections, results in restrain from buying a wide range of services and goods indefinitely, especially air travel, retail and hotel stays
 - 4.1 million confirmed cases
 - New COVID-19 infections peaked in May
 - 12% confirmed case fatality rate, 17.5% hospitalization rate

Real Gross State Product (RGSP)

New England



ESTIMATED IMPACTS OF UPDATED MACROECONOMIC FORECAST

Summer Peak Demand

Estimating Pandemic's Impacts on Summer Demand

Methods

- The ISO developed updated versions of the CELT 2020 summer demand forecast to reflect the two macroeconomic scenarios described on slide 9:
 - Baseline and Downside (“S4”) scenarios
- All data used in developing the CELT 2020 forecast were kept static *except* for the new macroeconomic forecast scenarios
- Resulting summer demand scenario forecasts are tabulated on the next slide
- Understanding any potential impact of the pandemic on 2020 summer demand will help as the ISO begins its load forecasting development work for CELT 2021

Gross 50/50 Summer Peak Forecast

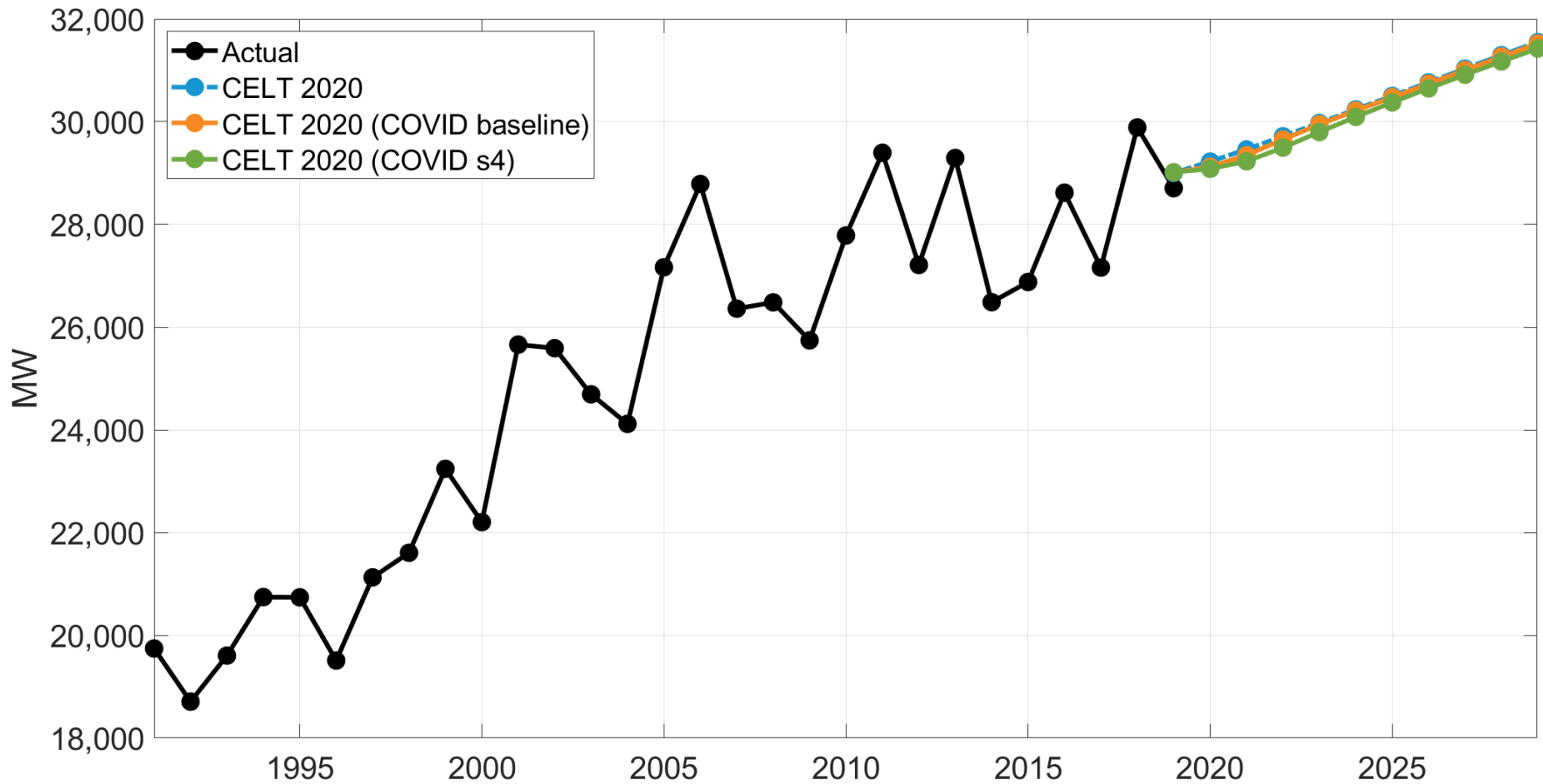
New England – 2020 CELT Vs. COVID Macroeconomic Scenarios

Year	CELT 2020	CELT 2020 (COVID Baseline)	CELT 2020 (COVID S4)	MW Change: CELT 2020 (COVID Baseline)*	MW Change: CELT 2020 (COVID S4)*
2020	29,224	29,123	29,084	-101	-141
2021	29,461	29,348	29,229	-113	-232
2022	29,717	29,654	29,495	-63	-222
2023	29,977	29,950	29,799	-28	-178
2024	30,241	30,217	30,094	-24	-147
2025	30,504	30,477	30,377	-26	-127
2026	30,768	30,740	30,650	-28	-118
2027	31,034	31,006	30,915	-28	-119
2028	31,297	31,269	31,174	-28	-123
2029	31,550	31,523	31,426	-28	-124

**The 2020 CELT Load Forecast is not being revised. These values are estimates of potential load forecast impacts of the macroeconomic implications of COVID-19 relevant to the development of the 2021 CELT load forecast.*

Gross 50/50 Summer Peak Forecast

*New England – 2020 CELT Vs. COVID Scenarios**



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Summary

- A review of forecast performance suggests summer demand during the period June 1, 2020 and July 31, 2020 is consistent with the 2020 CELT forecast
 - These results align with results of [ISO's recent weekly analyses of demand impacts of COVID-19](#) performed by System Operations
 - The ISO will perform this analysis again when all summer data are available and discuss results at the Load Forecast Committee
- When compared to the October 2019 macroeconomic forecast used in the 2020 CELT, the June 2020 forecast for regional gross state product is approximately 7% lower in the near-term (i.e., 2021) and recovers to 1.4% lower in 2024
 - A greater downside risk scenario from June suggests a low likelihood that RGSP may be as much as 14.3% lower in 2021, but will recover to approximately 8.5% lower by 2024
- Compared to 2020 CELT, the new expected (i.e., baseline) macroeconomic outlook results in a summer demand forecast that is approximately 113 MW lower in 2021 and 26 MW lower in 2025
 - Consideration of a lower probability, greater downside economic risk scenario suggests greater summer demand impacts in 2021 (-232 MW) and 2025 (-127 MW)
- The ISO expects to use Moody's October 2020 macroeconomic outlook to develop CELT 2021

Questions

