Inputs & Results for the AB 3232 Study PLEXOS Production Cost Model

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PLEXOS Inputs and Results Overview

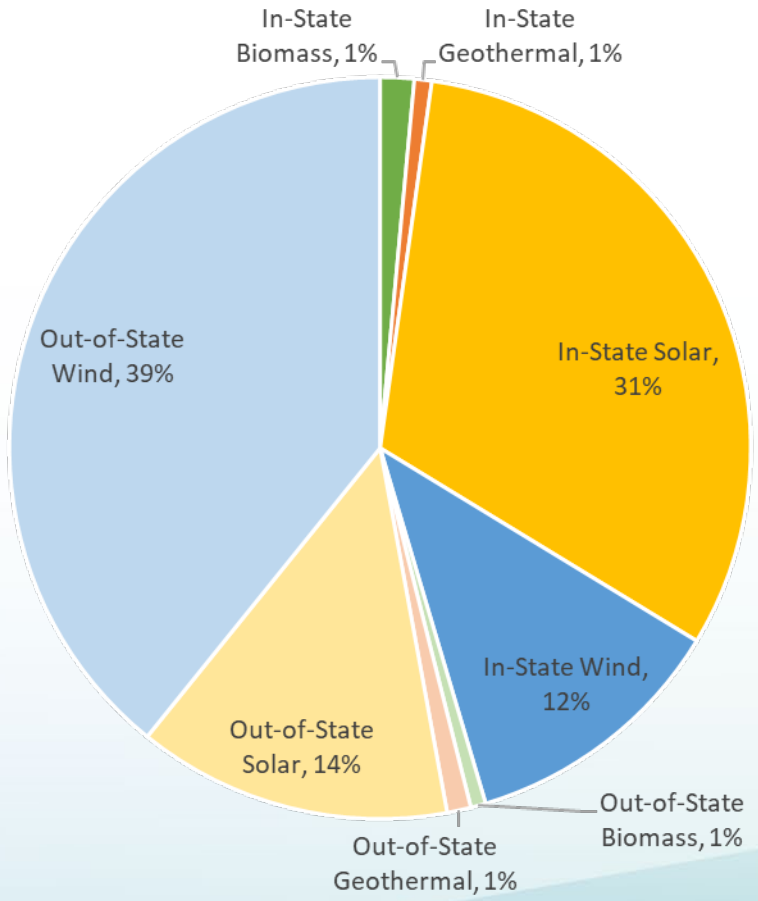
- Scenario Inputs to PLEXOS:
  - Additional Loads
  - Renewable Resource Additions
  - Battery Capacity Additions
- PLEXOS Results
  - Changes in 3 Hour Net Load Ramp
  - Renewable Energy Curtailment
  - GHG Emissions

2030 Additional Net Energy for Load by Scenario (GWh)

Scenario #	Base	02	03	05	08	09	10	11	12	14
Description	Base	Add EEE	Add PV	RPS +	Minimal Elec.	More Elec.	More Elec.	More Elec.	Agg Elec.	Agg/Eff Elec.
Added Load	0	(13,933)	(5,890)	N/A	23,414	30,115	34,135	39,737	45,914	47,708
Total Load	242,973	229,040	237,083	242,973	266,387	273,088	277,108	282,710	288,887	290,681

2030 Scenario Resource Distribution

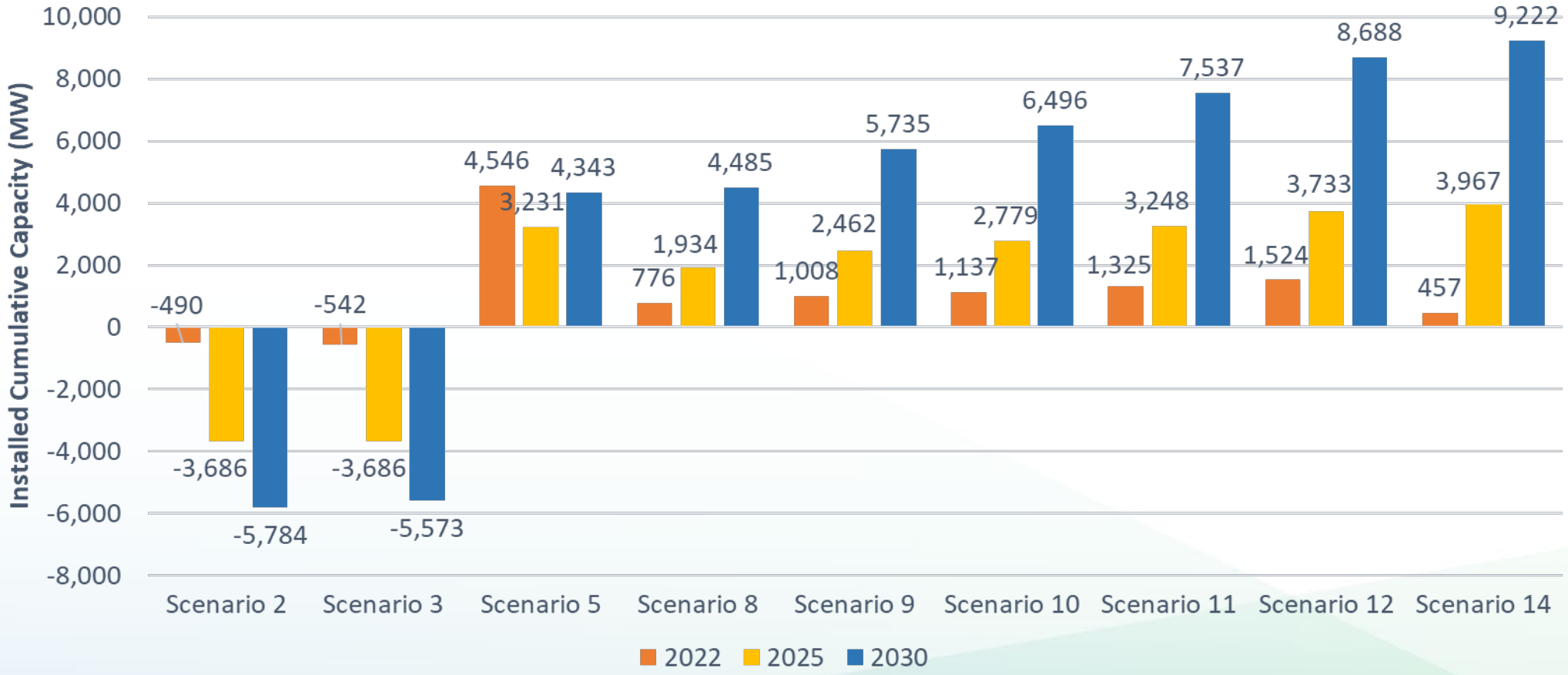
- Median 2030 Total Cumulative Renewable Resource Buildout



Resource Type	Incremental Installed Capacity Range (MW)
In-State Biomass	349 – 838
In-State Geothermal	170 – 430
In-State Solar	7,433 – 17,835
In-State Wind	2,752 – 6,607
Out-of-State Biomass	180 – 407
Out-of-State Geothermal	400 – 620
Out-of-State Solar	5,061 – 8,286
Out-of-State Wind	16,110 – 23,721

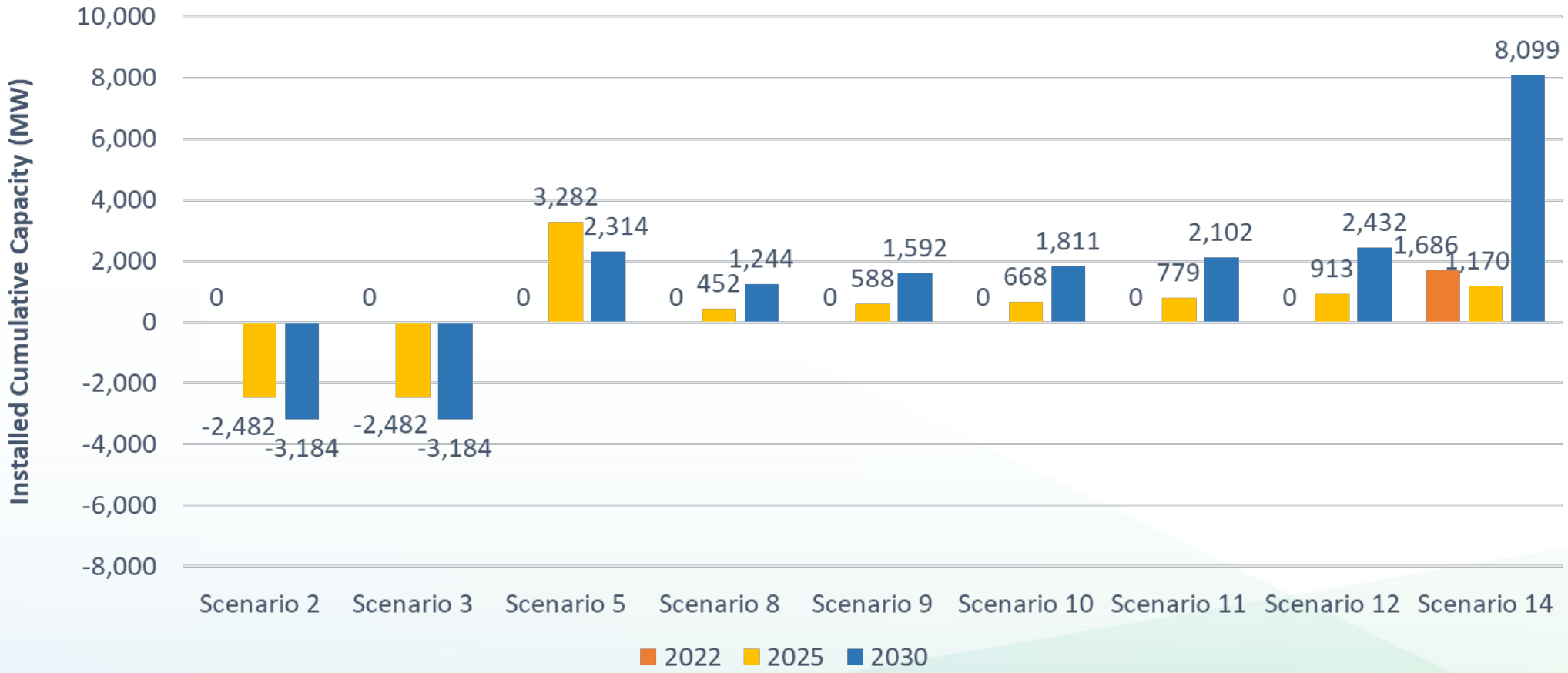
In-State Incremental Renewable Capacity

- Incremental to the base case.



Out-of-State Incremental Renewable Capacity

- Incremental to the base case.



Incremental Battery Storage

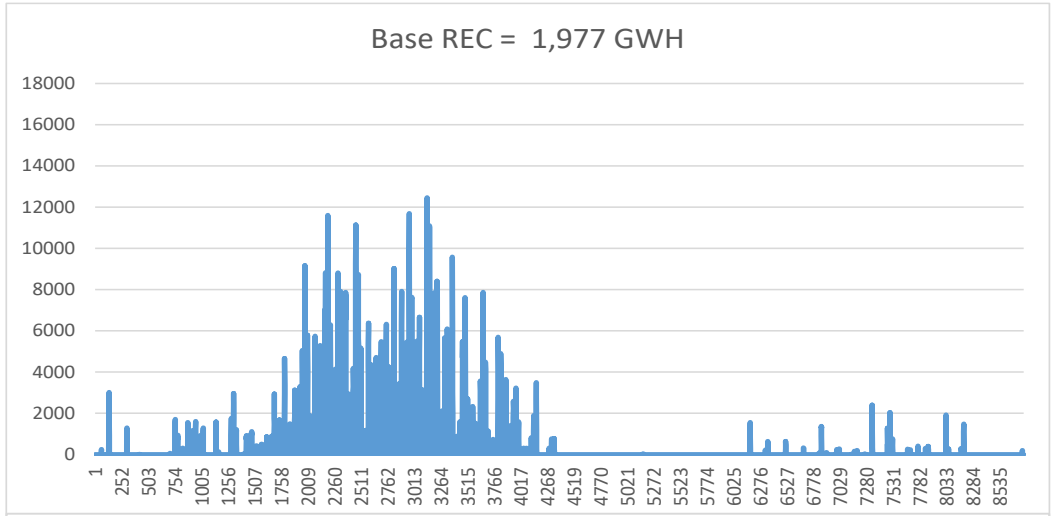
- 4-hour battery storage added to the base case in California for the scenarios with increased demand.

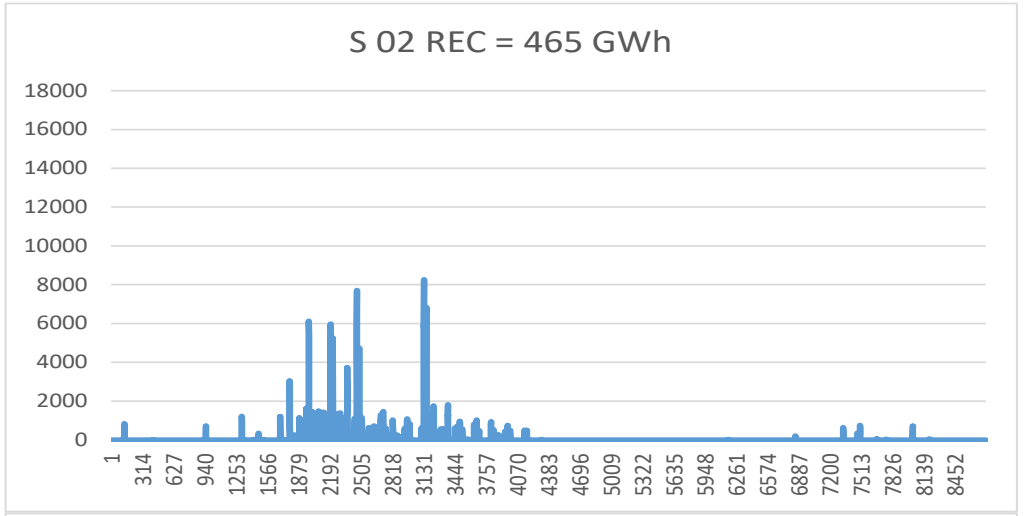
	Cumulative Installed Capacity (MW)								
Year	Scenario 2	Scenario 3	Scenario 5	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12	Scenario 14
2022	0	0	0	0	0	0	0	0	0
2025	0	0	0	1,227	1,578	1,788	2,082	2,405	2,500
2030	0	0	0	2,208	2,840	3,220	3,748	4,330	4,500

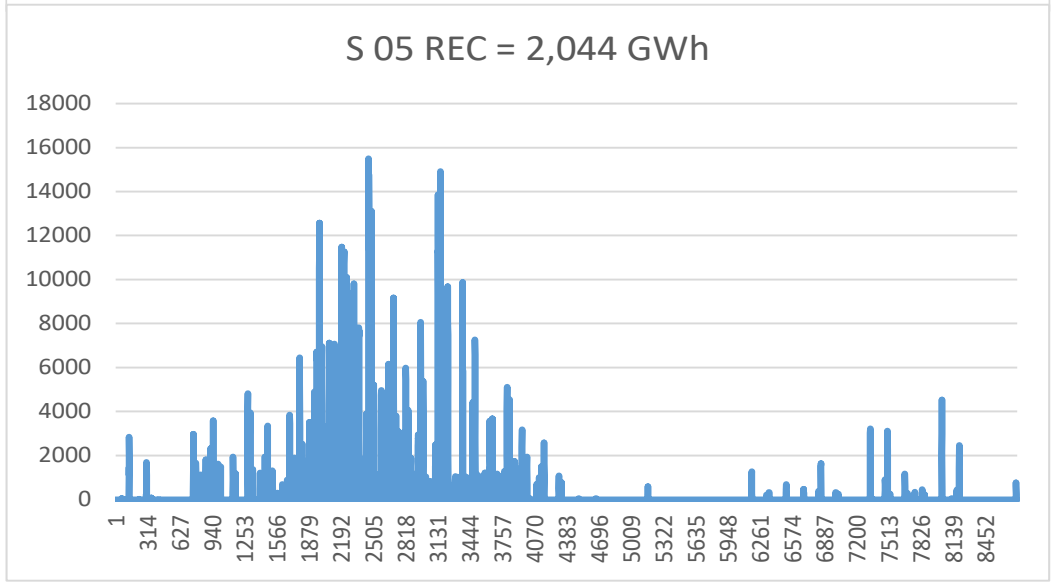
2030 Three Hour Net Load Ramp

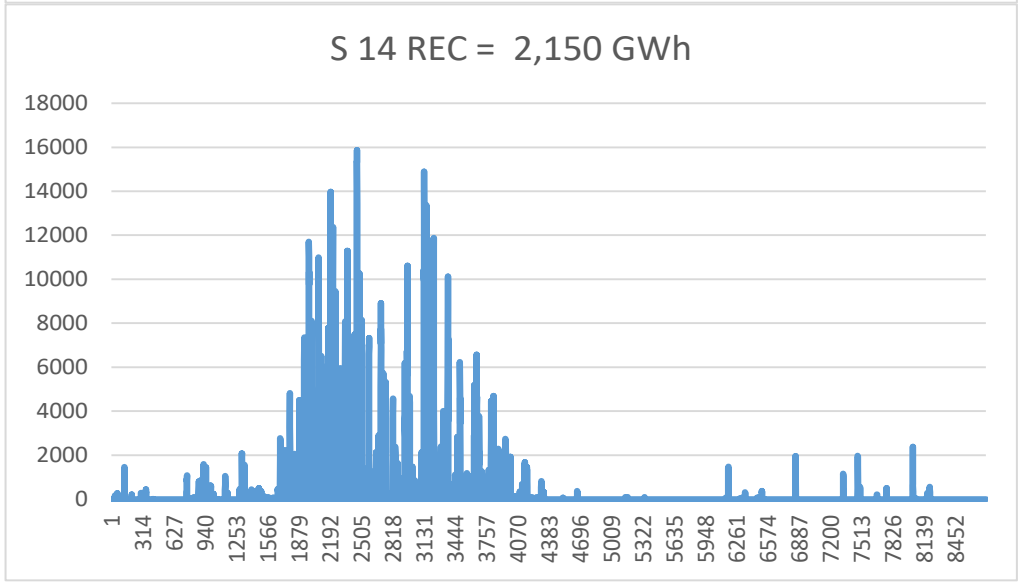
Scenario	Base	S 02	S 03	S 05	S 08	S 09	S 10	S 11	S 12	S 14
GWh	26,306	24,172	25,539	28,816	27,911	28,677	28,840	29,854	29,687	33,218

2030 Renewable Energy Curtailment Base Case, Scenarios 02, 05, 14

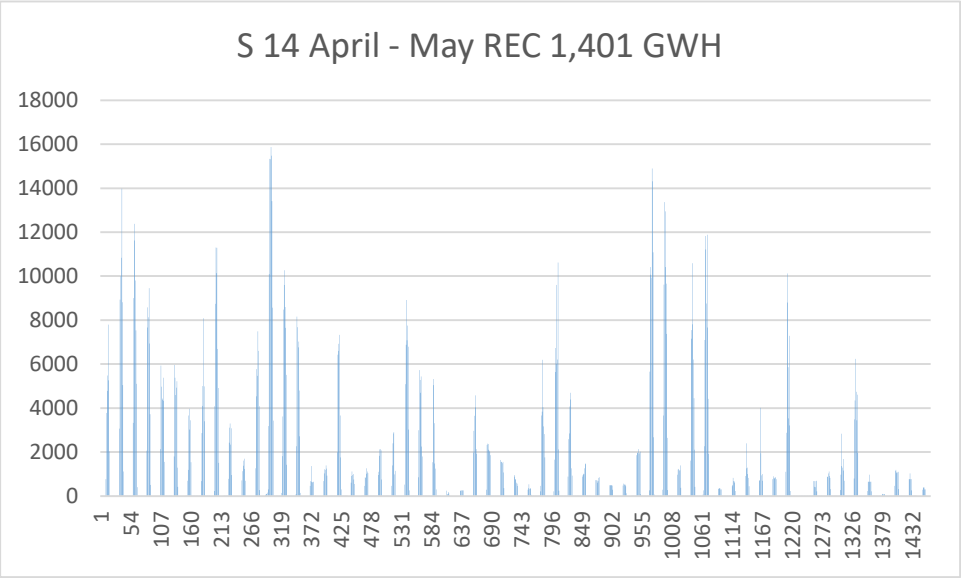






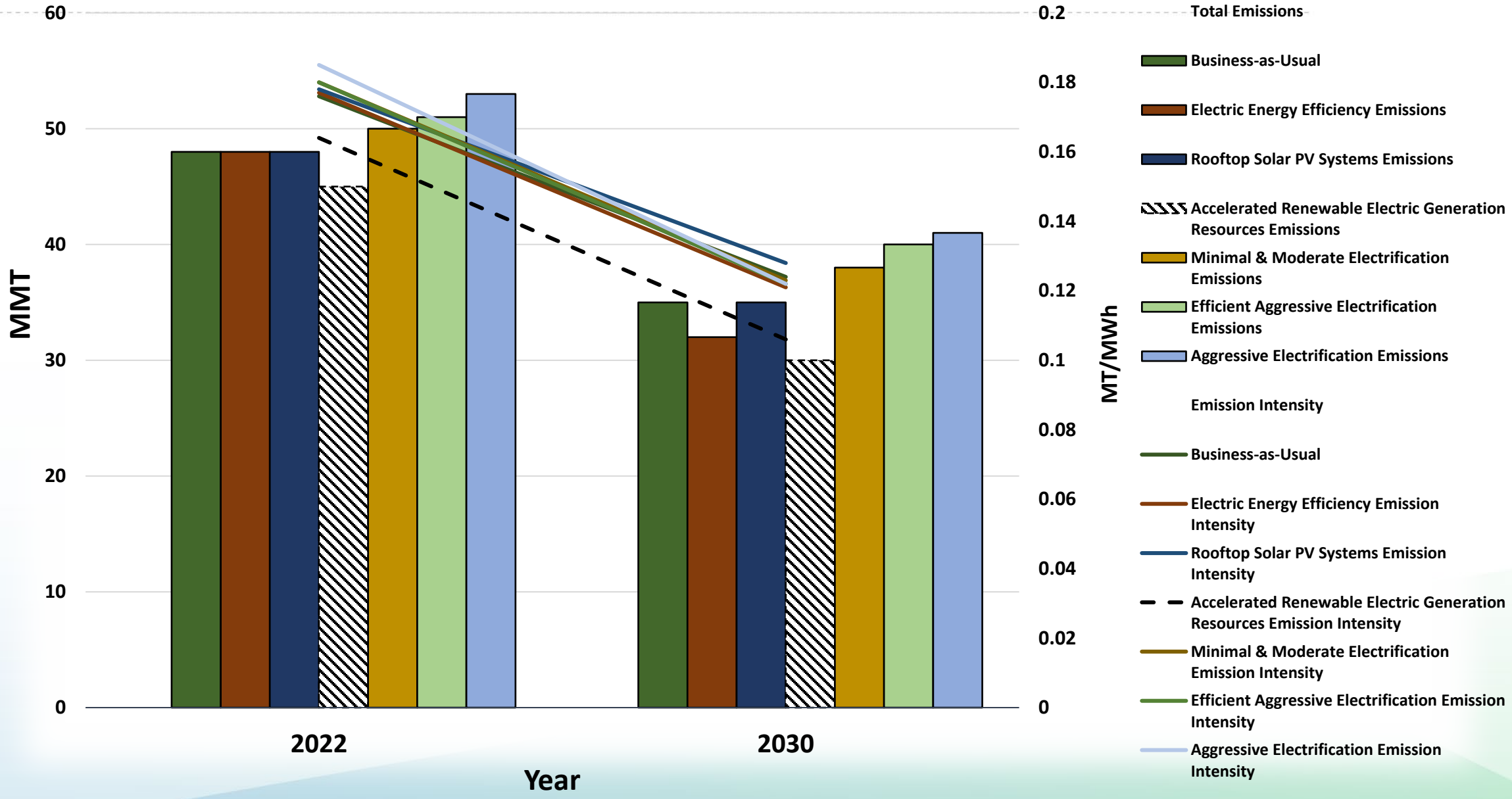


RE Curtailment Detail: S 14 April – May 2030



- Approximately 2/3 of REC occurs in April & May in all scenarios
- Curtailment occurs mainly during hours of highest solar output of 0900 to 1600
- PLEXOS storing energy during those hours, but reaches limits on ability to use, store, and export energy

Projected California Electric Sector GHG Annual & Average Emission Intensity



Background material for slide 11

Background material for slide 11, “Projected Electric Generation Sector California GHG Emissions & Emission Intensity”

- June 7, 2018 IEPR Committee Workshop on Doubling Energy Efficiency Savings
  - Greenhouse Gas Emission Intensity Projections – Methods and Assumptions
  - https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2018-integrated-energy-policy-report-update-0

Thank you.
Questions, comments?

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