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Resource Adequacy

Mechanisms Affecting Renewables

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Scope

- Overview of resource adequacy
- Net qualify capacity
- Implications for resource development



Background

- From the CAISO perspective, its reliability responsibilities have to be primary over other responsibilities.
- The CAISO needs a mechanism to allow it to commit and dispatch generators when market forces fail to provide enough, or the right kind, of generation, especially to mitigate contingencies.
- FERC has long been pressuring the CAISO to create mechanism to ensure enough capacity rather than rely upon MOO requirements of the June 2001 FERC decision.



Resource Adequacy Processes

- CAISO has tariff provisions governing requirements for all LSEs in its area
 - Local regulatory authorities establish planning reserve margins, resource counting rules, etc.
 - Default mechanism if an LRA fails to act
 - CPUC is the LRA for the 3 IOUs and 11 ESPs
- AB 380 established:
 - A legislative basis for CPUC control over ESPs serving direct access customers in IOU service areas
 - CEC oversight for all POUs (information collection and reporting to legislature)

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System Resource Adequacy

- A monthly capacity requirement for May - September established for the forthcoming calendar year
- Each LSE has a monthly peak load set by CEC
- Resources have net qualifying capacity (NQC)
- Imports are limited to historic levels/allocated to LSEs
- Year-Ahead showings require LSEs to procure 90% of their obligation for May – Sept
- Month-Ahead showings have to provide remainder of any RA requirements 30 days ahead of each month
- CAISO can commit and dispatch any RA generator



Local Resource Adequacy

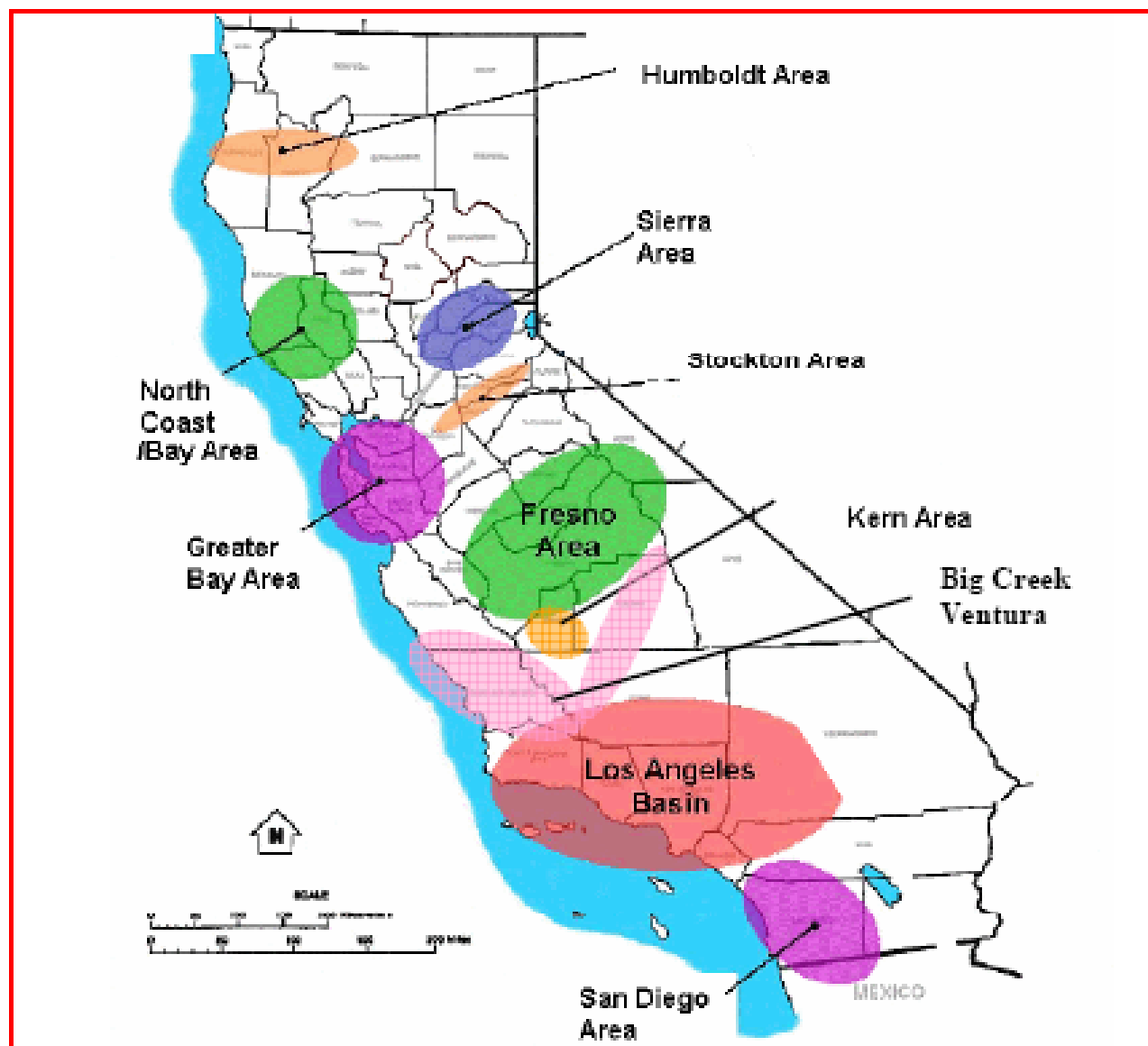
- 10 load pockets have been established by the CAISO
- Each year an LCR study is prepared by CAISO. It is reviewed, and results adopted, by CPUC
- LCR establishes minimum generation to cover load assuming maximum imports into load pocket
- 1:10 peak conditions of summer establish capacity requirements for the entire year
- Local requirements have to be satisfied by local resources
- Local resources also count for system requirement, but not vice versa

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LCR Areas





Net Qualifying Capacity

- Net Qualify Capacity is the concept used to describe the capacity from each resource that can be used by an LSE to satisfy its overall obligation.
- Most technologies have a single value, such as dependable capacity, used year-round.
- Some technologies (wind and solar without backup) have monthly NQC values reflecting the variability in performance using historic data.



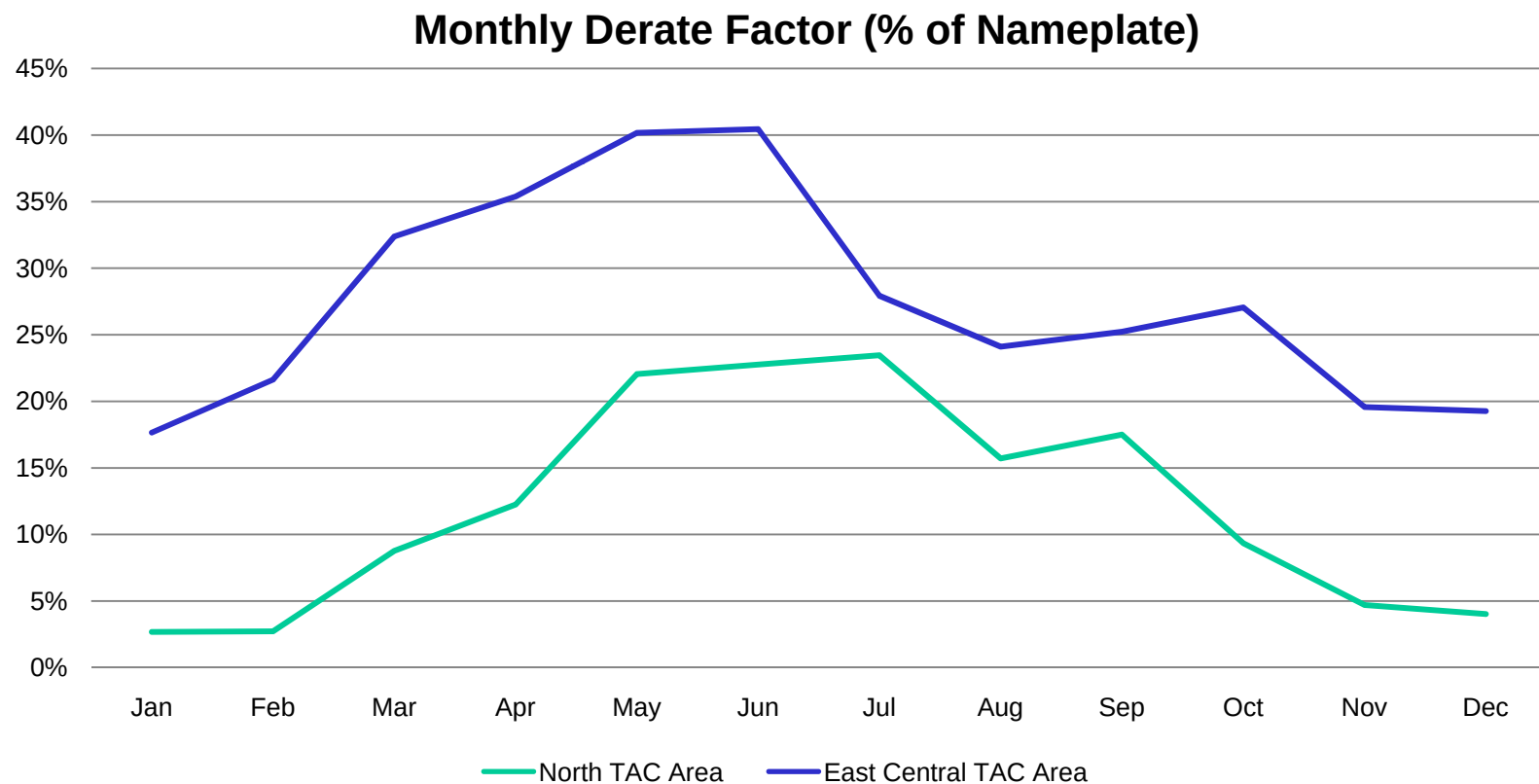
Wind/Solar NQC Formulas

- Monthly NQC value is:
 - Rolling three year average
 - Average hourly production during Noon-6PM period
 - TAC area average performance is used for new projects that do not have three years of production data
- CEC staff updates these NQC values annually
 - Data for preceding year obtained from IOU QFs or RPS contracts through CPUC data request
 - CEC acquires some additional data for POU and merchant projects

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Illustration of TAC Area Values



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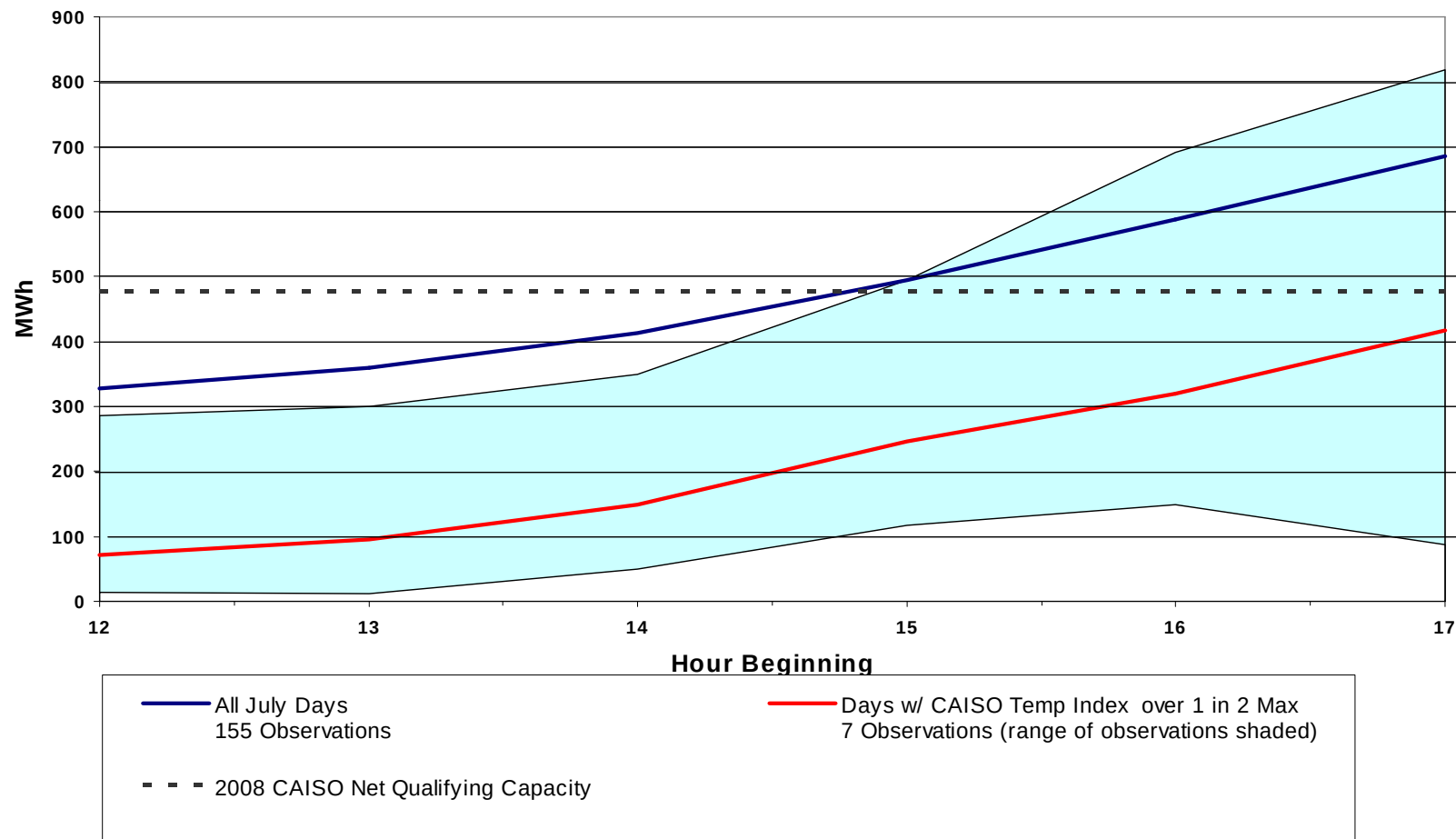
NQC Issues in CPUC R.08-01-025

- Wind facilities frequently do not produce at NQC levels at time of monthly peaks.
- The CAISO has been pressing for more accurate formula now that better data is available.
- In depth examination of the concern was conducted, but solutions were too controversial to resolve by June 2008, so topic was postponed to Phase 2.
- Current NQC formula is being used for 2009.



Wind Performance on Hot Days

CAISO Average Hourly Wind Generation July 2003-2007



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Local RA Requirements

- In D.08-06-031, the CPUC adopted a total local RA requirement of 27,915 MW.
- Only a limited amount of this can be satisfied with renewables, e.g. geothermal in the North Coast/North Bay load pocket.
- Wind and central solar development is happening completely outside of the ten recognized load pockets.



Implications

- Local RA requirements might limit how much wind/solar without backup can be used in LSE RA portfolios.
- If wind/solar without backup can only satisfy system RA requirements, then the capacity payment to these resources could be smaller than other resources that can be used to satisfy zonal requirements.
- Lower NQC values for wind without backup also means that additional capacity will be acquired that can be dispatched at peak.



Implications, cont'd

- Performance profile for supplemental capacity:
 - Highly irregular need for output
 - Seasonal operational differences as well as daily
- Technologies that seem to match:
 - Simple cycle combustion turbines
 - Daily storage
 - Long term storage