



NARUC Electricity Committee Meeting

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MRTU ...

Delivers **real-time prices**
and long-term market signals that
guide operational and
investment decisions.



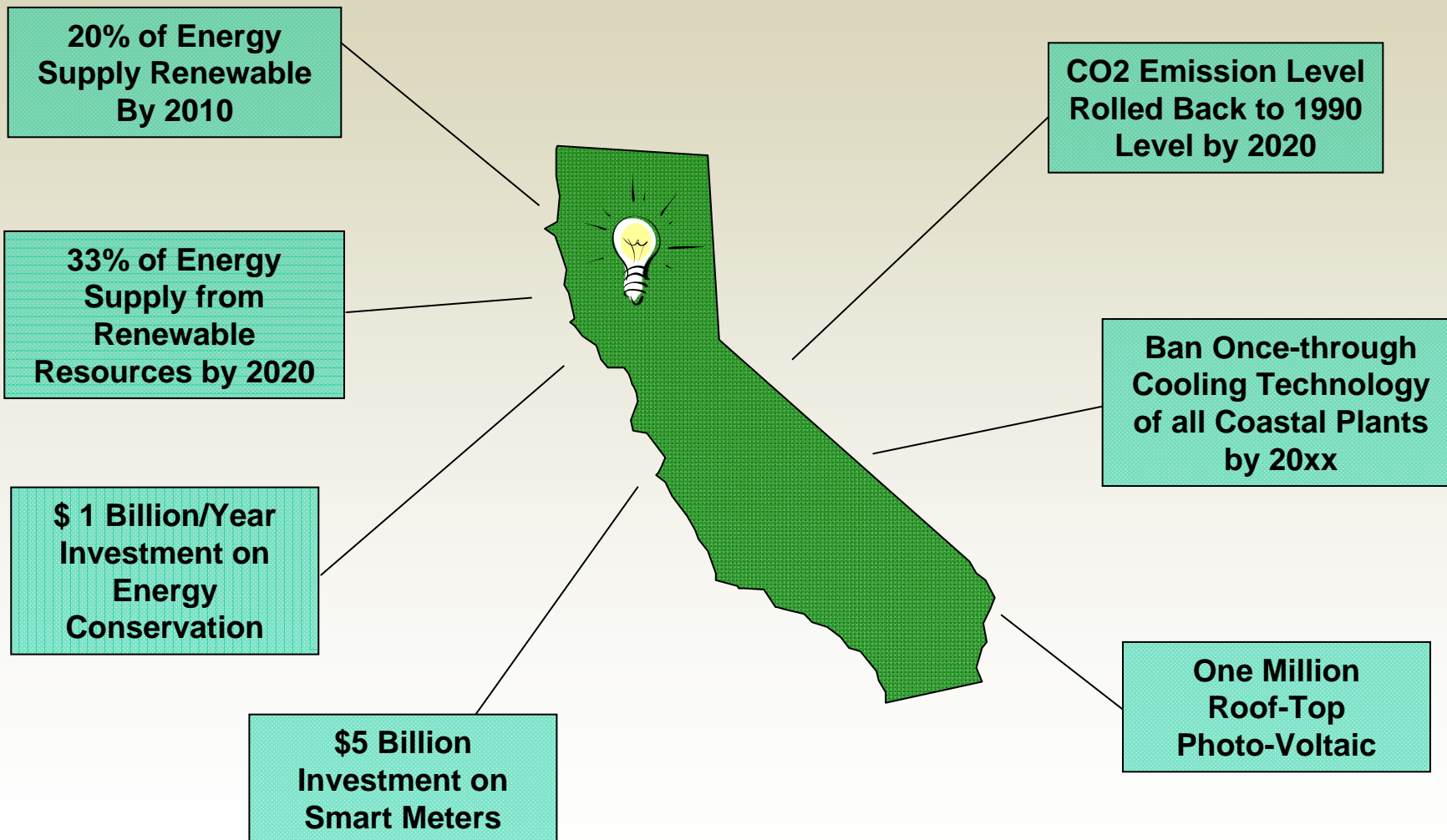
MRTU ...

Works in concert with the
California Public Utilities Commission's
Resource Adequacy plan that ensures
enough **power is procured in advance**
to serve customer demand.

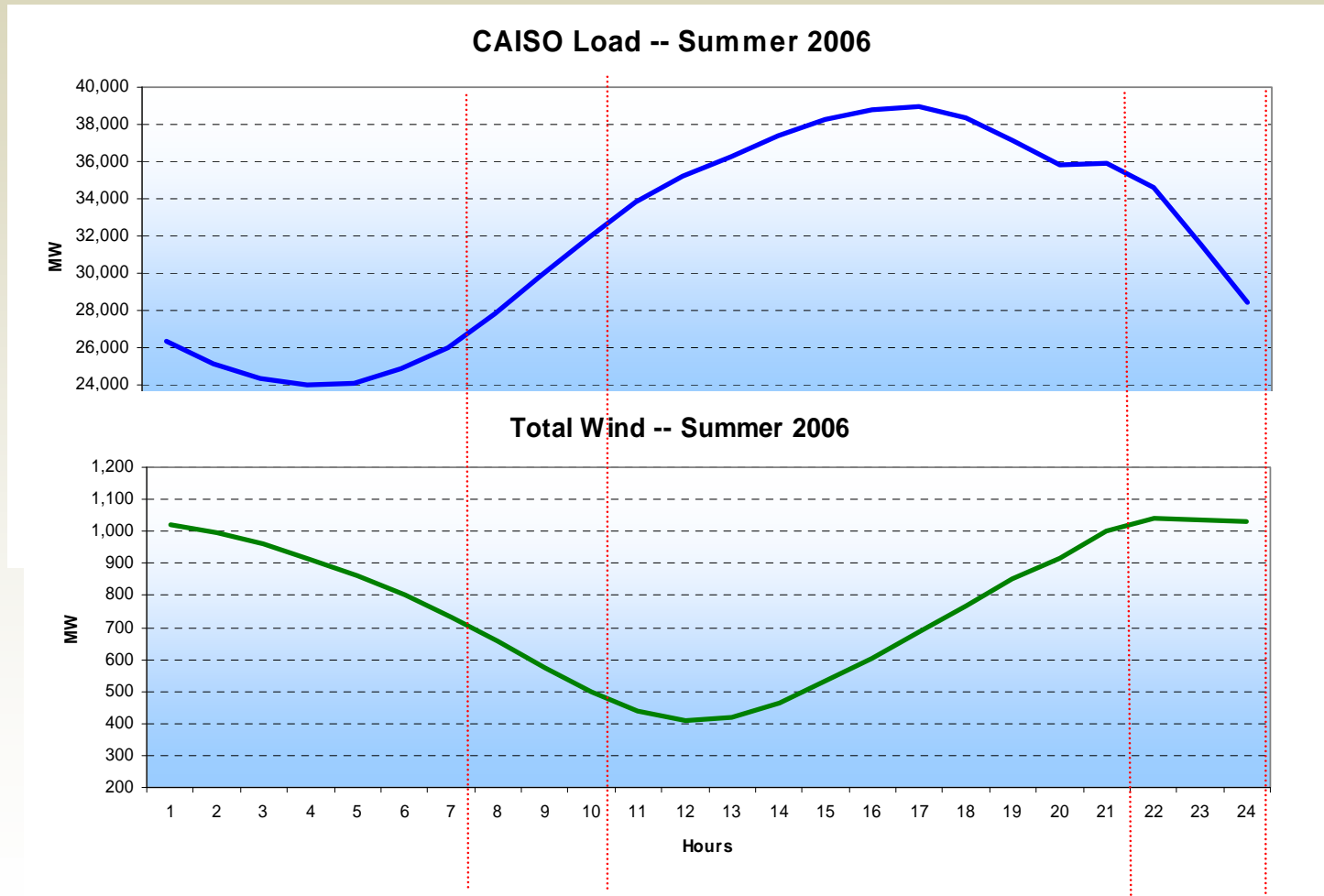


Into the Future

Accommodating the Climate Change Initiatives

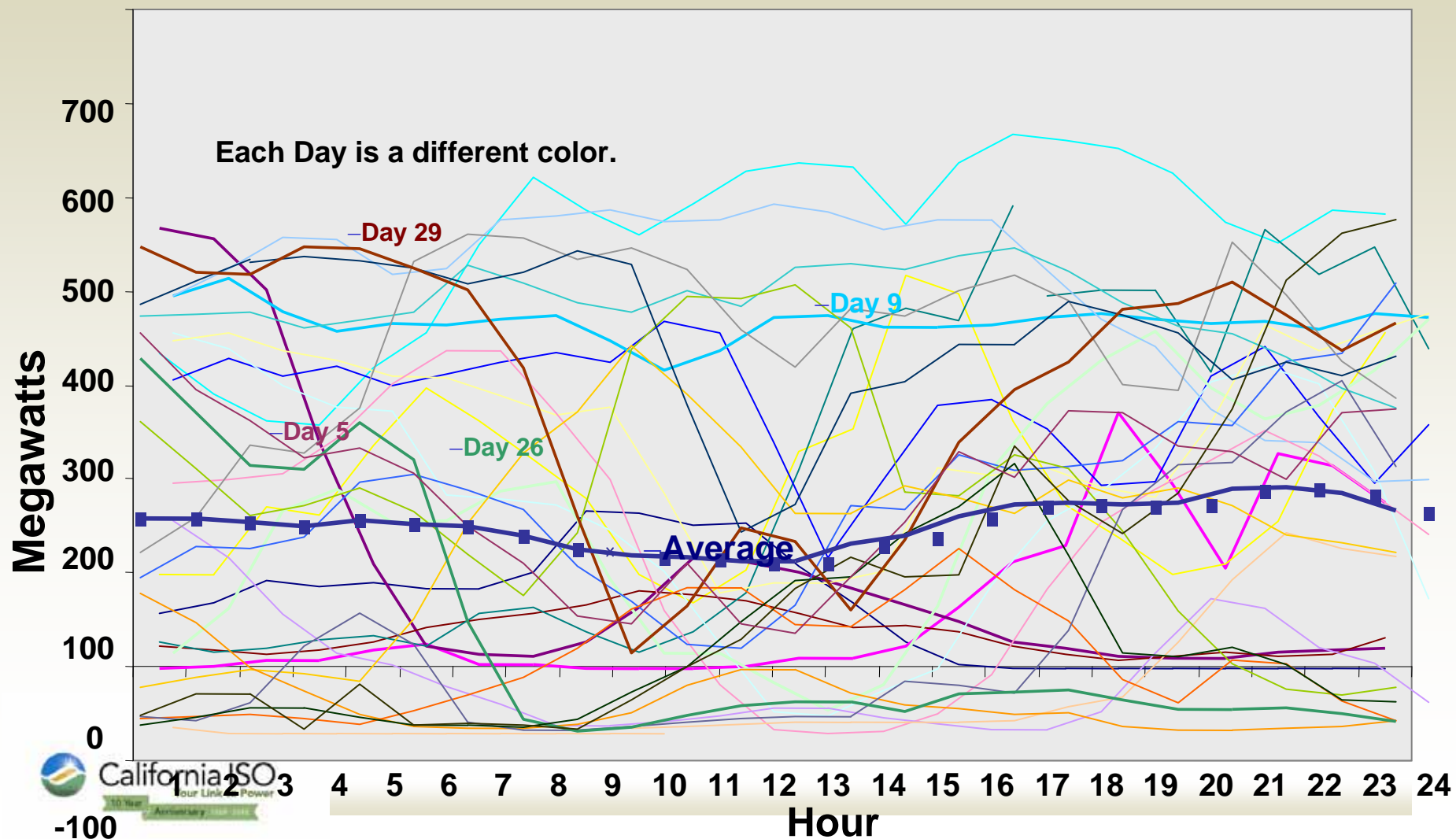


Wind generation tends to be inversely correlated to daily load curve, creating ramping impacts.



Tehachapi area wind generation varies widely from day to day and hour to hour.

The average for April 2005 is smooth, but the day-to-day variability is great, showing the importance of improved forecasting tools and telemetry to the operating floor.



Results of the CAISO's November 2007 Integration of Renewable Resources Study

- **Load Following is necessary to maintain stable operations**
 - Load following Capacity requirements will increase



700 - 800 MW



500 - 900 MW

- **Regulation is required to maintain frequency and maintain interchange schedules**
 - Regulation capacity requirements can double certain hours



170 - 250 MW



100 - 500 MW

“To 20 Percent and Beyond”!!!

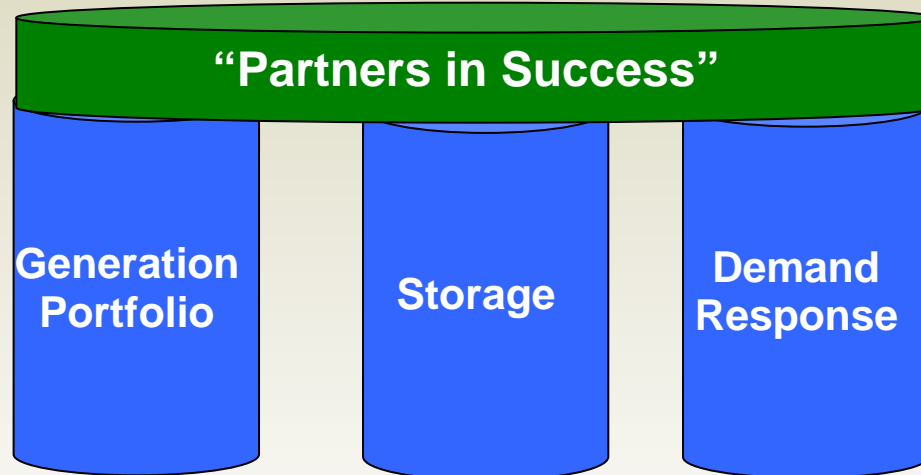


Wind Generation



Solar Generation

Resources Required for Renewables Integration



Hydro Generation

Quick Start Units
Fast Ramping
Wider Operating Range (lower P_{min})
Regulation capability

Shift Energy from off-peak to on-peak
Mitigate Over Generation
Voltage Support
Regulation capability

Price sensitive load
Responsive to ISO dispatches
Frequency Responsive
Responsive to Wind Generation Production