



Dispatchable Capacity Needs in Southern California and the Los Angeles Basin

DOCKET

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General Resource Adequacy Concepts

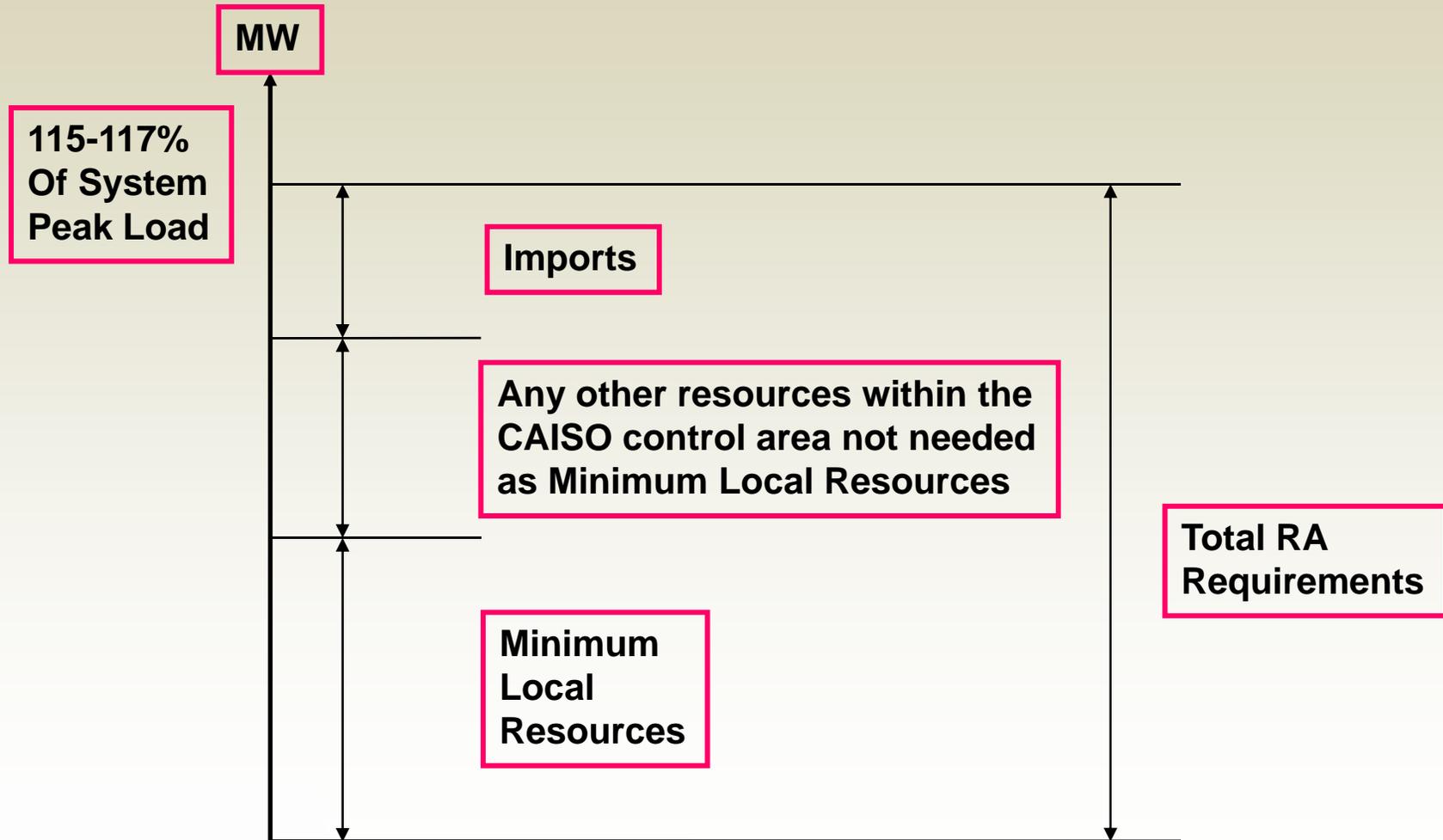
- Resource Adequacy (RA)
 - Ensure that capacity is made available when and where needed
 - Ensure that capacity exists and is under contract in order for all load to be served by responsible Load Serving Entities (LSEs)
 - Generally, LSEs will demonstrate that they have secured adequate qualified capacity to serve their peak load including planning reserve (every month in the month ahead timeframe).
 - Generally, LSEs will demonstrate, in the year ahead timeframe that they have secured minimum:
 - 90% of the next summer's peak load needs including planning reserve and
 - 100% of local resources needed to meet local capacity needs.
 - All resources participating in the ISO markets under an RA contract will have an RA must-offer-obligation to the ISO.

ISO Role in Resource Adequacy



- Deliverability
- Capacity Obligation
 - Local Capacity Requirement
 - Import Allocation
- Back stop procurement
- and Operations – of Course!

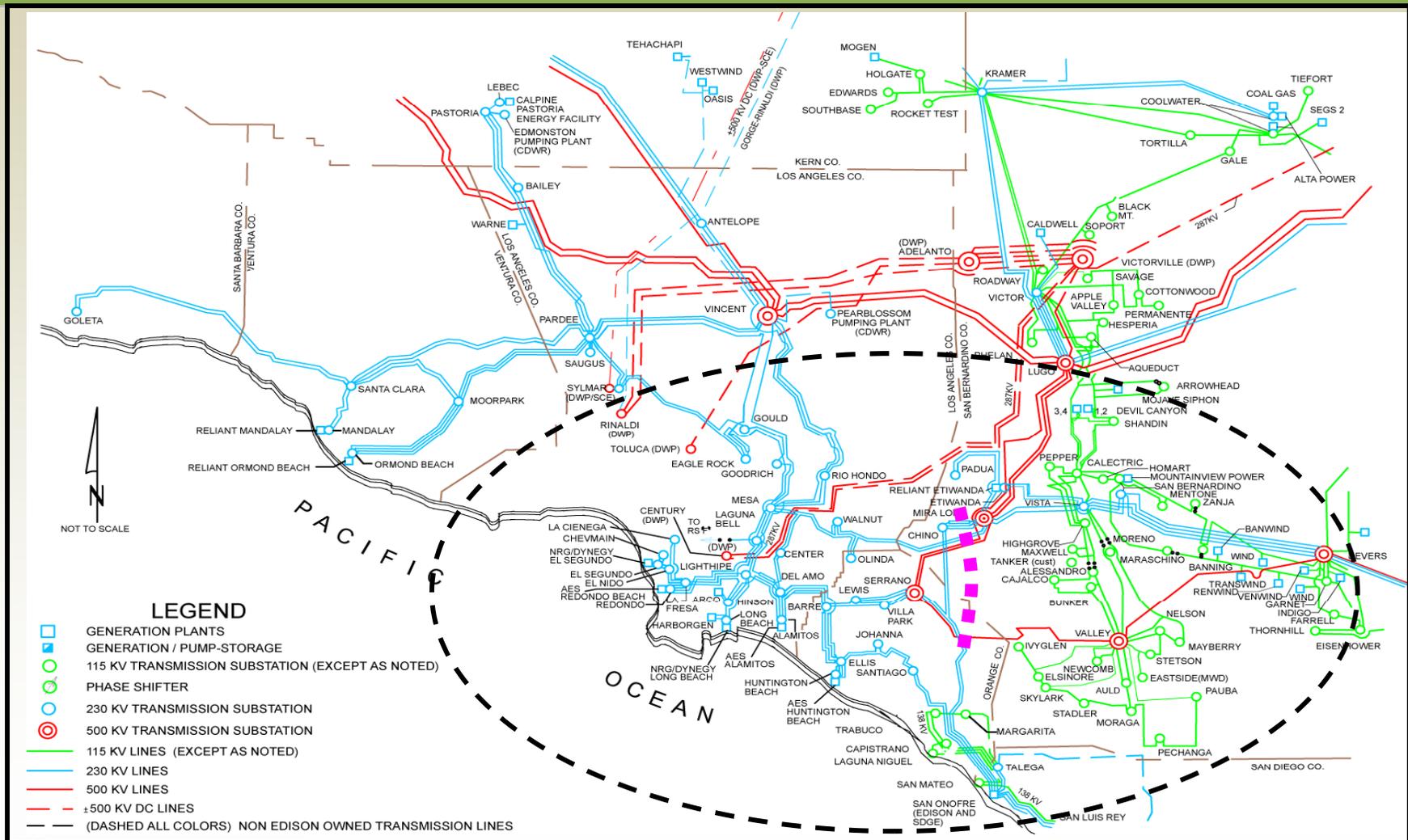
Total Resource Adequacy Procurement



Local Capacity Requirements (LCR)

- Limited import capability local areas
 - Load modeled at 1 in 10 peak
 - Maximize transmission imports into local areas
 - Some local resources are needed to meet reliability
- Currently there are 10 local areas
 - 7 in Northern California
 - 3 in Southern California
- LA Basin is the biggest local area

LA Basin Area



LA Basin Area 2010 Load & Resources

Load

Load (MW)	Pump Load (MW)	Transmission Losses (MW)	Total (MW)
19527	14	517	20058

Available Generation

	QF/Wind (MW)	Muni (MW)	Nuclear (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available Gen	879	793	2246	8212	12130

2010 Western LA Basin Sub-area

Contingency: The loss of the Serrano – Villa Park #1 or #2 and Serrano – Lewis 230 kV lines

Limiting components: thermal overload of the remaining Serrano – Villa Park #1 or #2 230 kV line

LCR Need: 4909 MW (includes 615 MW of QF/Wind, 388 MW of Muni and 2246 MW of nuclear generation)

2010 LA Basin Overall

Contingency: Palo Verde-Devers 500 kV line with SONGS #2 unit out of service

Limiting Component: South of Lugo operating rating (6400 MW with new Rancho Vista 500kV substation)

LCR Need: 9735 MW (includes 879 MW of QF/Wind, 793 MW of Muni and 2246 MW of nuclear generation)

LA Basin Area 2011-13 Load & Resources

Load

	Load (MW)	Pump Load (MW)	Transmission Losses (MW)	Total (MW)
2011	19964	22	422	20408
2013	20633	22	458	21113

Available Generation

	QF/Wind (MW)	Muni (MW)	Nuclear (MW)	Market (MW)	Max. Qualifying Capacity (MW)
2011	908	788	2246	8581	12523
2013	908	788	2246	11411	15353

Major new projects modeled:

- Palo Verde – Devers #2 500 kV line
- Rancho Vista 500 kV Substation
- Green Path North (LADWP) – 2013 only
- Tehachapi Transmission Project (phased in)
- Vincent-Mira Loma 500 kV (part of Tehachapi) – 2013 only

2011-13 Western LA Basin Sub-area

Contingency: The loss of the Delamo – Laguna Bell 230 kV and Sylmar – Gould 230 kV lines

Limiting components: thermal overload of the remaining Laguna Bell – Rio Hondo 230 kV line

2011 LCR Need: 5885 MW (includes 630 MW of QF/Wind, 383 MW of Muni and 2246 MW of nuclear generation)

Contingency: The loss of the Mira Loma – Chino #1 230 kV with SONGS #3 unit out of service

Limiting components: thermal overload of the remaining Mira Loma – Chino #3 230 kV line

2013 LCR Need: 8585 MW (includes 630 MW of QF/Wind, 383 MW of Muni and 2246 MW of nuclear generation)

2011-13 LA Basin Overall

Contingency: Palo Verde-Devers 500 kV line and Harquahala-Devers 500 kV line (no SPS modeled)

Limiting Component: South of Lugo operating rating (6400 MW with new Rancho Vista 500 kV substation)

2011 LCR Need: 10,019 MW (includes 908 MW of QF/Wind, 788 MW of Muni and 2246 MW of nuclear generation)

Due to numerous transmission addition is estimated that 2013 overall LCR needs are below the Western LA Basin LCR needs

ISO Operations

- Resource adequacy is: A mandatory planning and procurement process to ensure adequate resources to serve all customers in real-time at reasonable prices.
- For Real-time operations, the ISO ensures reliability through dispatch instructions
 - A Set of Generators to meet security-constraints
 - Least-cost dispatch capable of meeting the load, within the existing transmission constraints
- Minimum daily and hourly dispatch is driven by
 - Load forecast
 - Transmission and generation out of service
 - Imports
 - Ramping/Regulation needs



Can the current fleet be replaced with Peakers?

- The answer is most likely NOT
- Transmission system operation is very dynamic with unexpected twists and turns
 - Existing fleet is permitted to run year round
 - Peakers generally have a limited numbers of hours
- Imports into Southern California is supported by inertia
 - Existing fleet represents majority of inertia (mass)
 - Peaker and renewables have small to insignificant inertia
 - If high imports can not be supported then many more new resources are needed into the load pockets then retired
- Peakers have usually higher energy costs and are more polluting when in operation

2020 Sensitivity case for renewable integration

Major Projects modeled (beyond those modeled in 2013):

- Vincent – Rio Hondo 230 kV line #2 (part of Tehachapi)
- Gould – Eagle Rock 230 kV line (part of Tehachapi)
- Chino – Mira Loma 230 kV line #1 (part of Tehachapi)
- Chino – Mira Loma 230 kV line #2 (part of Tehachapi)
- Chino – Mira Loma 230 kV line #3 (part of Tehachapi)
- Vincent - Mesa 230 (500) kV line (part of Tehachapi)

2020 Former LA Basin Area

Western LA Basin Area

Contingency: The loss of the Serrano-Villa Park #2 230 kV line and Serrano-Lewis #1 or #2 230 kV line

Limiting components: thermal overload of the remaining Serrano-Villa Park #1 230 kV line

LCR Need: 6728 MW (available resources 9882 MW)

Eastern LA Basin Area

Contingency: The loss of the Devers-Vista #2 230 kV line and Devers-El Casco #1 230 kV line

Limiting components: thermal overload of the remaining San Bernardino-Devers #1 230 kV line

LCR Need: 1660 MW (available resources 2293 MW)

Overall Observations about Long-term studies

- LA Basin local area will most likely be eliminated
- Two new local areas will be formed Western LA Basin and Eastern LA Basin
- All resources connected at Devers will most likely be outside the Eastern LA Basin local area boundary
- Upgrades for the “West of Devers” path are expected
- New resources and/or new 500/230 kV transmission projects are envisioned for the Western LA Basin