



# Potential Electricity Sector Needs for PM-10 ERCs in SCAQMD

**IEPR Workshop**

California Energy Commission

**DOCKET**

**09-IEP-10**

DATE 9/24/2009

RECD. 9/25/2009

September 24, 2009

Dave Vidaver

Electricity Analysis Office

Energy Supply Analysis Division

[dvidaver@energy.state.ca.us](mailto:dvidaver@energy.state.ca.us)/ 916-654-4656

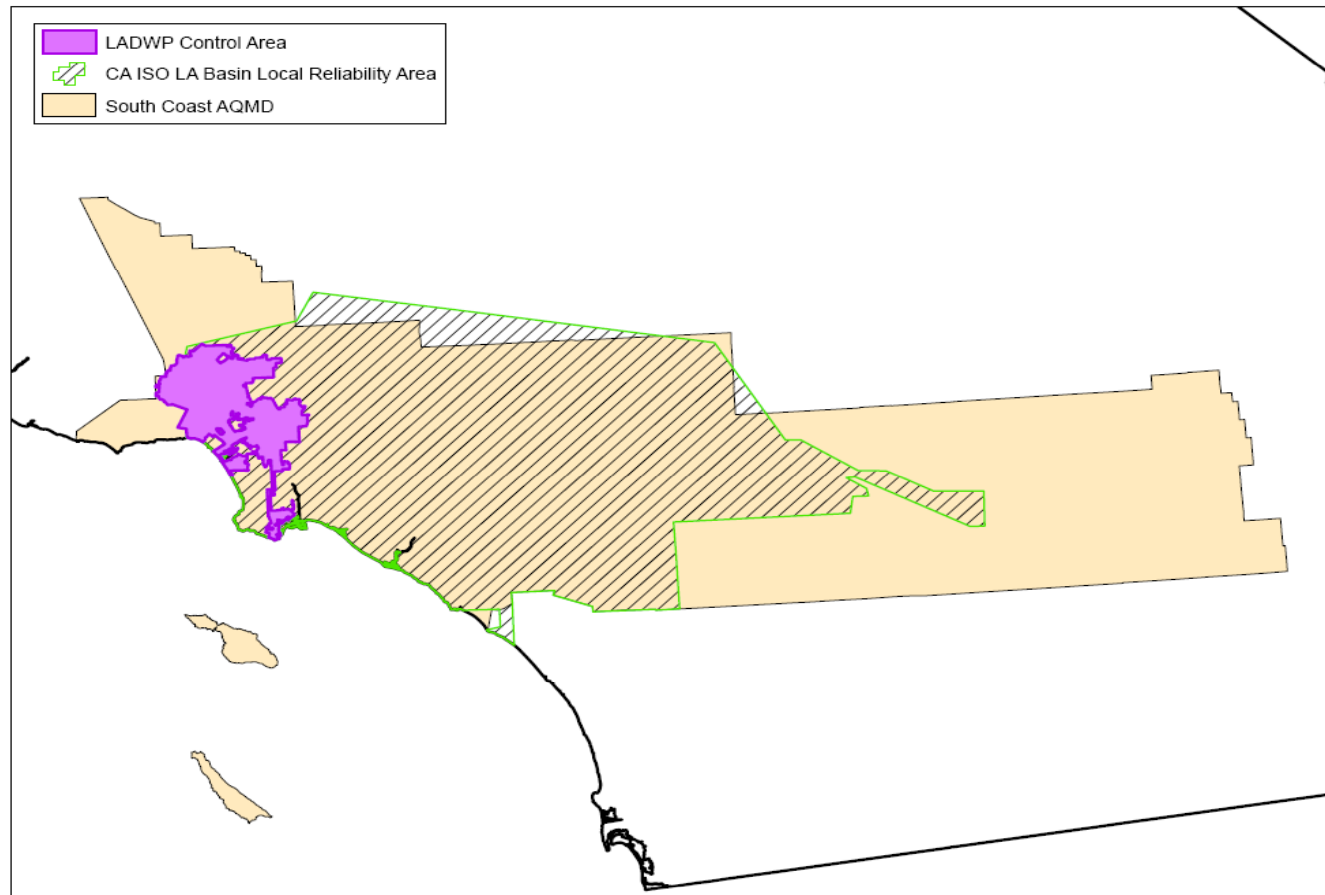


# Goals of Workshop

- Refine Understanding of Planning Issues...
  - Identify potential range of need for capacity in the Los Angeles basin, drivers
  - Identify studies necessary to determine the need for new capacity in the Los Angeles Basin
- ...and of Emission Reduction Credit Issues
  - Drivers of the demand for ERCs by individual generation facilities
  - Options for generating and procuring ERCs/offsets
- Identify key follow-up topics



# Los Angeles Basin LRA



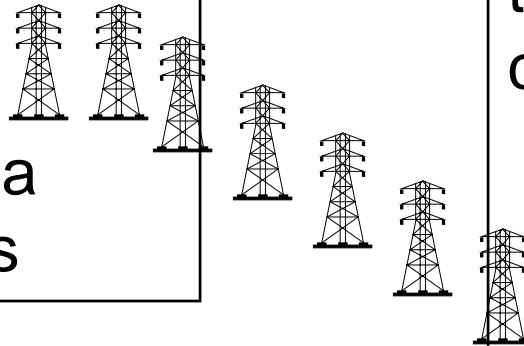


# Conceptual piece of cake...

Los Angeles Basin –

Sufficient capacity, with  
the right dispatch  
characteristics

- To meet LCR
- To meet sub-area  
constraints



Rest of So Cal–

Sufficient capacity, with  
the right dispatch  
characteristics

- To meet So Cal-wide  
capacity requirements
- To meet system inertia  
needs
- To meet system  
ramping requirements



# Uncertainties...

- How many existing in-basin plants can continue to operate
- Transmission upgrades and their impact on LCR, sub-area commitment requirements
- Timing and nature of renewable additions
- Demand growth; effectiveness of energy efficiency, demand response programs



# Translating Capacity Additions into ERC Needs

- PM-10 is the constraining pollutant
- Market-sourced ERCs are scarce and extremely expensive
- SCAQMD's ability to issue offsets through Rule 1304 exemptions (for repowerings) and Rule 1309.1 (priority reserve) has been precluded by litigation
- ERC needs for new power plants are not well understood
  - How are limits on monthly operation set?
  - What are the relative ERC needs for peaking vs. load-following units?
  - What latitude exists for reducing the amount of ERCs needed by a fixed amount of generation capacity?



# OTC Plants

- ISO's Los Angeles Basin LRA (7,219 MW)
  - Alamitos (2056 MW)
  - El Segundo (670 MW)
  - Huntington Beach (904 MW)
  - Redondo Beach (1343 MW)
  - San Onofre (2,246 MW)
- LADWP (2,579 MW)
  - Harbor (224 MW)
  - Haynes (1, 569 MW)
  - Scattergood (803 MW)



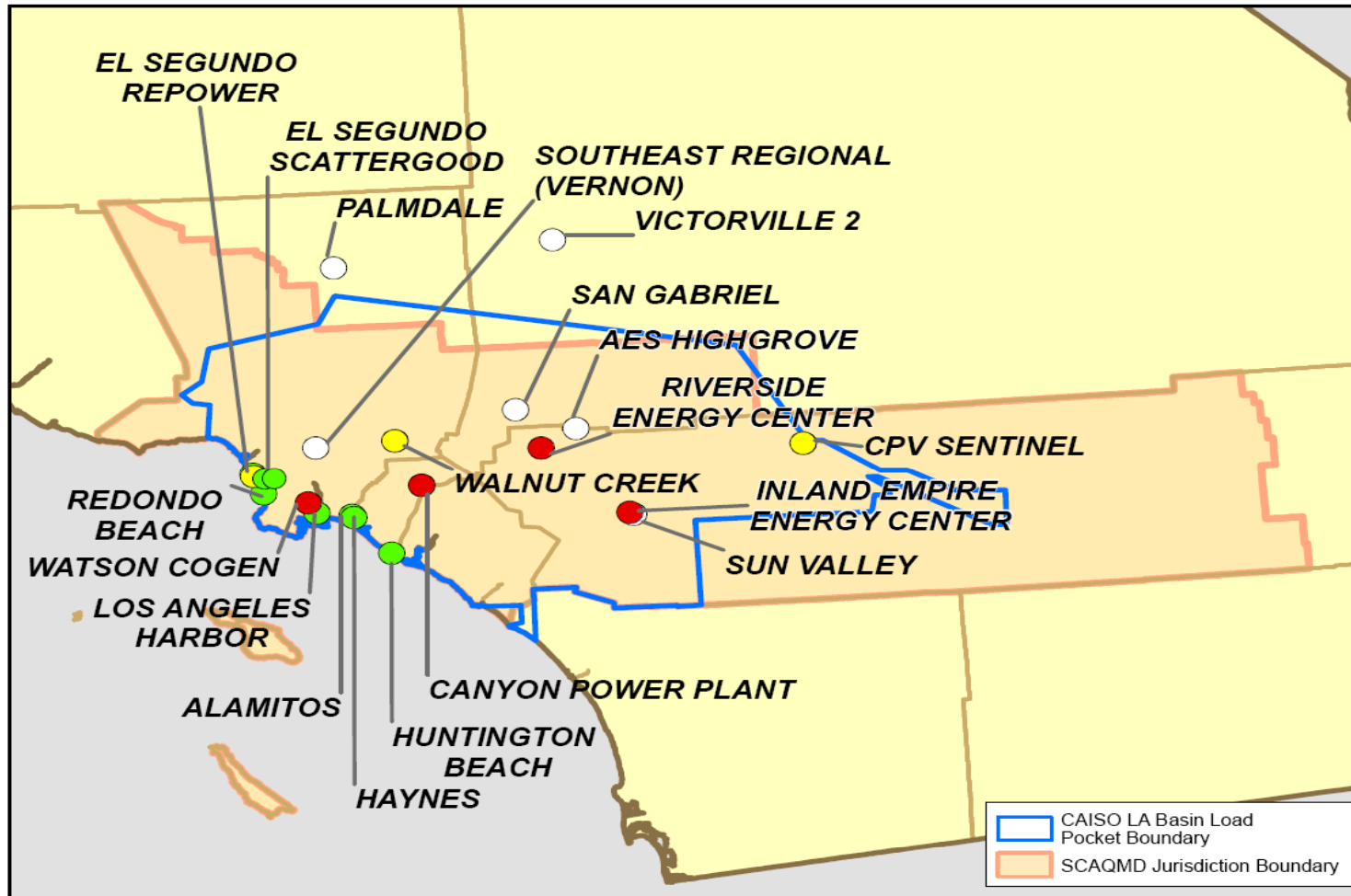
# Timelines...

- 2010 – Compliance plans filed by all OTC plants
- 2011 – Exclusion screens, cessation of intake flows unless generating or performing maintenance
- 2015 – Mitigation of impingement and entrainment impacts
- 2015 – El Segundo, Haynes compliant
- 2017 – Harbor, Scattergood compliant
- 2020 – Alamitos, Redondo Beach, Huntington Beach compliant
- 2021 – Diablo Canyon compliant
- 2022 – San Onofre compliant





# Map of Power Plants





# Plants waiting...

- Stalled projects with contracts
  - Walnut Creek (500 MW)
  - CPV Sentinel (850 MW)
  - El Segundo Repower (560 MW)
- Stalled projects without contracts
  - Highgrove (300 MW)
  - San Gabriel (696 MW)
  - Southeast Regional Energy Center (300 MW)
  - Sun Valley(500 MW)
- Stalled projects outside Los Angeles Basin LRA
  - Victorville II (563 MW)
  - Palmdale (617 MW)



# LADWP

- Planned replacements of Haynes 5, 6 and Scattergood 1, 2
- Uncertainty regarding ability to continue operating other units
- Local capacity needs; limited ability to replace other units, implement transmission solutions



# Illustrative SP-26 Supply Demand Balance (MW)

	2010	2011	2012	2013	2014	2015	2016	2017	2020
<b>Peak Demand</b>	27,880	28,289	28,794	29,221	29,553	29,904	30,261	30,656	31,813
<b>Existing Generation</b>	22,927	22,927	22,927	22,927	22,927	22,927	22,927	22,927	22,927
<b>Net Imports</b>	10,100	10,100	10,100	10,100	10,100	10,100	10,100	10,100	10,100
<b>DR &amp; Interruptible</b>	1,491	1,512	1,534	1,547	1,551	1,553	1,555	1,556	1,560
<b>New Thermal</b>	995	1,707	1,992	1,992	1,992	1,992	1,992	1,992	1,992
<b>New Renewable</b>	162	251	533	965	1,157	1,454	1,743	1,743	1,743
<b>Retirements</b>	(354)	(354)	(354)	(354)	(708)	(708)	(708)	(708)	(708)
<b>Total Generation</b>	35,321	36,142	36,731	37,177	37,020	37,318	37,608	37,610	37,614
<b>Reserve Margin</b>	27%	28%	28%	27%	25%	25%	24%	23%	18%
<b>Surplus over 15%</b>	<b>3,259</b>	<b>3,609</b>	<b>3,618</b>	<b>3,573</b>	<b>3,034</b>	<b>2,928</b>	<b>2,808</b>	<b>2,356</b>	<b>1,028</b>
<b>SWRCB Retirements</b>						(670)	(670)	(1,620)	(7,953)
<b>Reserve Margin</b>						23%	22%	17%	-7%
<b>Surplus over 15%</b>						<b>2,258</b>	<b>2,138</b>	<b>736</b>	<b>(6,925)</b>



# Assumed Additions

- Total of 1,992 MW
  - Inland Empire Unit 2 (405 MW)
  - Riverside Energy Center expansion (96 MW)
  - Canyon (200 MW)
  - Watson Cogen (85 MW)
  - Blythe 1 (520 MW)
  - Otay Mesa (590 MW)
  - Orange Grove (96 MW)



## The LA Basin has sufficient capacity for the moment....

- Supply is in excess of current LCR requirements
- LRA contains 11,943 MW of generation capacity, 10,720 MW provided RA in summer 2009
- 2010 LCR of 9,735 MW will rise with load growth, will fall due to transmission upgrades.
- This assumes that there are no OTC policy-induced retirements.



## Supply exceeds local capacity requirements for now...

	2010	2011	2012	2013	2014	2015	2016	2017	2020
<b>LCR</b>	<b>9,735</b>	<b>10,019</b>	10,266	<b>8,585</b>	8,888	9,129	9,385	9,649	10,488
<b>Existing Generation</b>	11,943	11,943	11,943	11,943	11,943	11,943	11,943	11,943	11,943
<b>New Thermal</b>	405	501	786	786	786	786	786	786	786
<b>New Renewable</b>	45	87	129	175	217	224	224	224	224
<b>DR /Interruptible</b>	984	985	996	1,005	1,008	1,009	1,010	1,010	1,012
<b>Total Generation</b>	13,377	13,516	13,855	13,910	13,955	13,962	13,963	13,963	13,965
<b>Surplus above LCR</b>	<b>3,642</b>	<b>3,497</b>	<b>3,588</b>	<b>5,325</b>	<b>5,066</b>	<b>4,833</b>	<b>4,578</b>	<b>4,314</b>	<b>3,477</b>
<b>SWRCB Retirements</b>	0	0	0	0	0	(670)	(670)	(670)	(4,927)
<b>Surplus above LCR</b>						<b>4,163</b>	<b>3,908</b>	<b>3,644</b>	<b>(1,450)</b>



## A Big But...(actually three)

- Grid stability in the Los Angeles Basin requires the commitment of units in specific sub-areas in the basin under high load conditions
- Generation on-line in Southern California must provide sufficient inertia to sustain imports.
- System must have sufficient ramping capability to absorb intermittent resources.





# Committed Capacity Requirements in the LA LRA

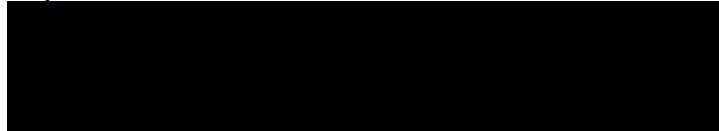
- Grid stability in the Los Angeles Basin requires the commitment of increasing amounts of capacity in specific sub-areas in the basin under as loads increase.
- To meet a local area generation constraint for Orange County
- To meet a local area generation constraint for South of Lugo
- Existing capacity cannot be retired in amounts and at locations that would threaten being able to satisfy these constraints unless it is replaced



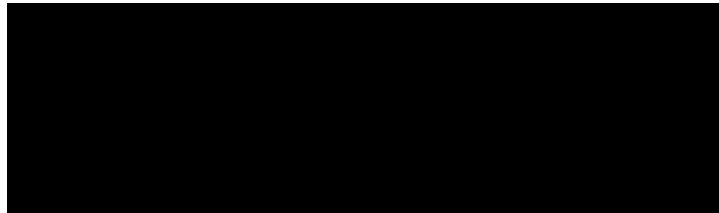
# Local Generation Constraint – Orange County

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	G-219
		Version No.	8.0
		Effective Date	4/2/09
SCE Local Area Generation Requirement for Orange County		<b>Distribution Restriction:</b> Market Sensitive System Security	

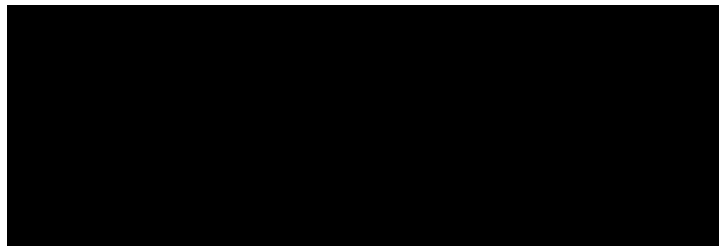
## Purpose



## Background



## 1. Generation Requirement for Orange County





# Inertia – The SCIT Nomogram

- Sufficient generation must be operating in Southern California to provide inertia needed to sustain imports.
- Inertia varies by technology; steam turbines provide exceptionally large amounts.
- Existing capacity cannot be retired in amounts that would threaten being able to satisfy these constraints; replacement capacity would be necessary to make up any shortfall.



# System Ramping Capability

- Increased reliance on intermittent resources may increase the peak-trough ratio and thus the amount of capacity needed for the morning and evening ramps.
- Need for ramping capacity will depend upon the composition of renewables
- Existing capacity cannot be retired in amounts that would threaten being able to satisfy these constraints; replacement capacity would be necessary to make up any shortfall.