Update on Los Angeles Basin and San Diego Reliability Planning

California Power Market Symposium

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Roughly 11,000 MW of gas-fired generation subject to meeting compliance under OTC regulations.

Generating Units Compliance with California Statewide Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling				
Plant (Unit)	**Owner**	**Final Compliance Date**	**Capacity (MW)**	**PTO Area**
Compliance Plan Yet to be Implemented (Natural Gas Fired)				
El Segundo Units 4	NRG	12/31/2015	335	SCE
Morro Bay Units 3 and 4	Dynegy	12/31/2015	650	PG&E
Encina Power Station Units 1-5	NRG	12/31/2017	946	SDG&E
Pittsburg Units 5 and 6	NRG	12/31/2017	629	PG&E
Moss Landing Units 1 and 2	Dynegy	12/31/2017	1,020	PG&E
Moss Landing Units 6 and 7	Dynegy	12/31/2017	1,500	PG&E
Huntington Beach Units 1-2	AES	12/31/2020	452	SCE
Redondo Beach Units 5-8	AES	12/31/2020	1,343	SCE
Alamitos Units 1-6	AES	12/31/2020	2,011	SCE
Mandalay Units 1 and 2	NRG	12/31/2020	430	SCE
Ormond Beach Units 1 and 2	NRG	12/31/2020	1,516	SCE
		Total MW	**10,832**	
In Compliance				
Humboldt	PG&E	Sept. 2010	105	PG&E
South Bay	Dynegy	1/1/2011	702	SDG&E
Potrero Unit 3	GenOn	2/28/2011	206	PG&E
Huntington Beach Units 3-4[1]	AES	12/7/2012	452	SCE
Contra Costa Units 6 and 7	NRG	5/1/2013	674	PG&E
San Onofre[2]	SCE	6/7/2013	2,246	SCE
El Segundo Units 3	NRG	7/5/2013	335	SCE
		Total MW	**4,720**	
Compliance pending study by Water Board Review Committee for Nuclear Plants				
Diablo Canyon	PG&E	12/31/2024	2,240	PG&E
		Total MW	**2,240**	
		Total of all OTC Units	**17,792**	

[1] HB Units 3-4 conversion into synchronous condensers, which requires operating the plant cooling system and will use ocean water at a rate of approximately 25% of the units operating in its prior mode.

[2] SONGS Units 2 & 3 have retired

San Onofre closure causes reliability problems in Southern California because Los Angeles and San Diego are load pockets with limited options

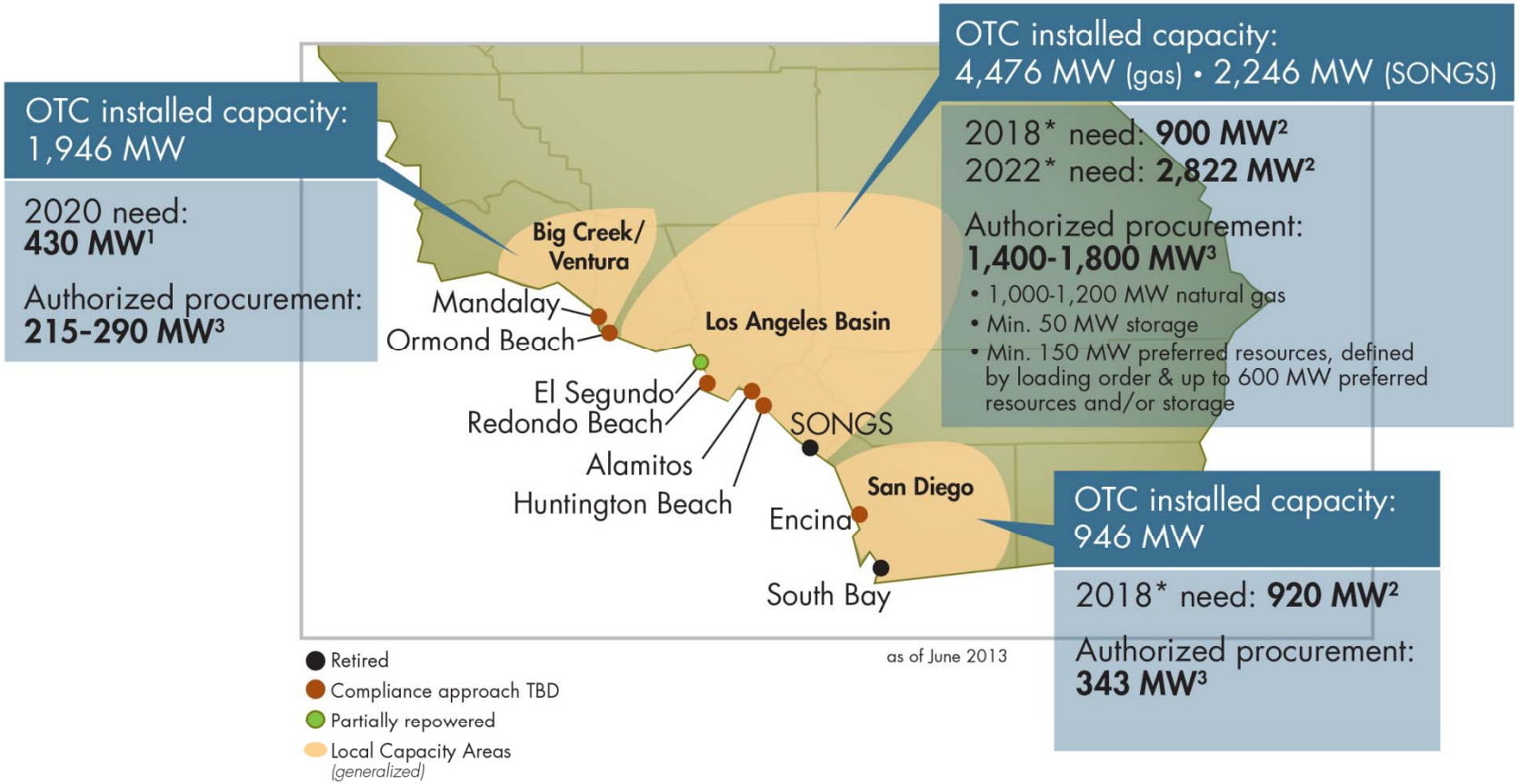
Real-time changes (contingency response)
- System must be ready to respond to events
- Some events are instantaneous; others allow 30 minutes

Real power (Watts)
- Runs lights and appliances
- Requires correct voltage for delivery (like pressure in water pipes)

Reactive power (Vars)
- Over or under supply of Vars causes voltages to climb or fall
- Local needs must be met locally

- All three characteristics are needed – not all resources can provide.
- Compliance with once-through cooling schedule compounds the issues.
- San Onofre provided: 2,246 MW in the LA Basin
  1,100 MVars supporting voltages between Los Angeles & San Diego

Gas-fired generation retirements and SONGS closure create local capacity shortfalls.



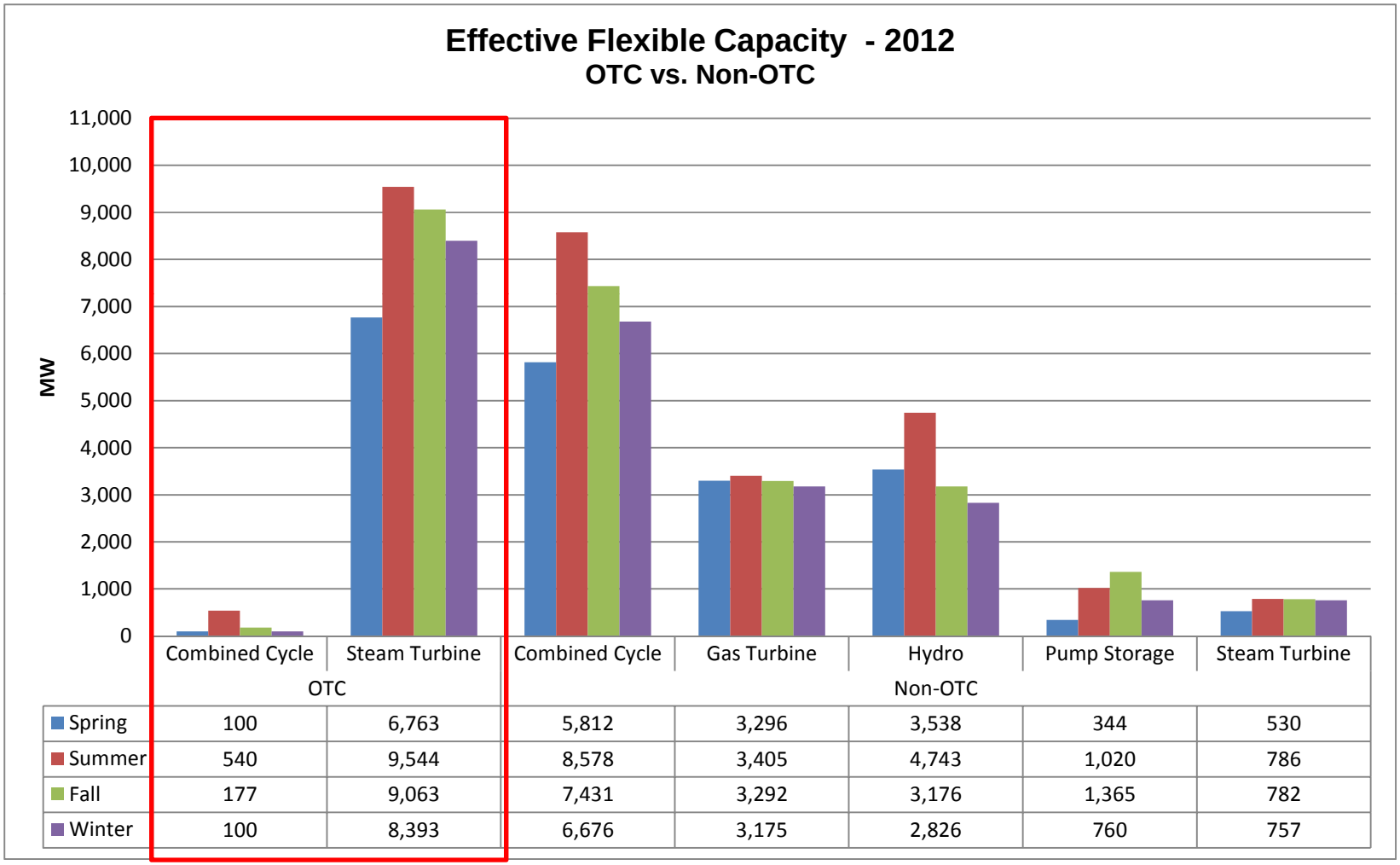
[1] ISO 2011-2012 Transmission Plan – Table 3.3-1

[2] CAISO analyses submitted to CPUC 2012 Long Term Procurement Proceeding, Track 4.

[3] Authorized procurement was based upon analyses that included SONGS online through 2022. The CPUC has an ongoing proceeding to consider additional procurement authorization to address SONGS retirement and 1,088 MW of additional non-OTC generation retirements.

*Represents one scenario; others are possible, including a different mix between the LA Basin and San Diego

System flexibility will be significantly reduced as OTC resources retire.



	OTC		Non-OTC				
	Combined Cycle	Steam Turbine	Combined Cycle	Gas Turbine	Hydro	Pump Storage	Steam Turbine
Spring	100	6,763	5,812	3,296	3,538	344	530
Summer	540	9,544	8,578	3,405	4,743	1,020	786
Fall	177	9,063	7,431	3,292	3,176	1,365	782
Winter	100	8,393	6,676	3,175	2,826	760	757

Southern California reliability needs being addressed through a collaborative, public process.

- CAISO
  - Technical studies on system and local needs
  - Consideration of transmission options
- CPUC
  - Long-term Procurement Proceeding (LTPP)
    - Local needs for San Diego & LA Basin
    - System needs for flexible capabilities
- Other key California regulators – air, water, energy
- Utilities and other interested stakeholders
- Sep 9th - Joint Workshop on Southern California Electricity Infrastructure and Reliability Issues
  - http://www.energy.ca.gov/2013_energypolicy/documents/#09092013