The San Onofre Nuclear Plant Shutdown – Frequently Asked Questions on the Impact of San Onofre Retirement and the Need for Replacement Electric Generation

The following sets forth answers to frequently asked questions (FAQs) on the shutdown of San Onofre and evidence highlighting the lack of need for new gas plants as replacement capacity.

1. Does the unexpected loss of the San Onofre Plant create an immediate need for new generation to "keep the lights on"?

No. Despite the loss of San Onofre, the planning reserve margin forecast for Southern California in 2013 is essentially unchanged from 2012, due in part to the recent addition of nearly 2,000 MW of new gas-fired generation in the Los Angeles Basin.[1] This new capacity roughly matches the 2,246 MW of capacity provided by San Onofre. There is no crisis requiring the immediate need for new generation to maintain grid reliability.

Longer term, there is a question of whether the retirement of San Onofre and other generation such as "once through cooling" ("OTC") facilities[2] will require new replacement generation. The California Public Utilities Commission ("CPUC") determines long-term resource needs and is making such an evaluation now in its Long-Term Procurement Planning ("LTPP") proceeding.

2. What about the loss of reactive power (voltage support) provided by San Onofre?

One concern raised with the loss of San Onofre is whether there is a need to replace the "reactive power" provided by this facility. Reactive power, also referred to as "voltage support," is required to maintain sufficient voltage to deliver power through transmission lines and must be supplied by sources reasonably close to the load being served. The loss of this voltage support reduces the ability of transmission lines to deliver power under heavy load conditions.

San Onofre was capable of providing approximately 1,100 MVAR of reactive support.[3] As SCE recently testified in the San Onofre proceeding before the CPUC, replacement of lost voltage support is well under way. In early 2013, 320 MVAR of capacitors were installed in Orange County immediately north of San Onofre.[4] In March 2013, the California Independent System Operator ("CAISO") approved the Talega Area Dynamic Reactive Support and the South Orange

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[1] CAISO, *2013 Summer Loads and Resources Assessment*, May 6, 2013, Tables 1 and 2, pp. 4-5, 16 ("this report assumes all 2,246 MW [of San Onofre] will not be available during 2013 summer."). Major new generation projects coming online by mid-2013 in the Los Angeles Area include: Walnut Creek Energy Center (500 MW, City of Industry); NRG El Segundo Repowering Plant (570 MW, El Segundo); Sentinel Peaker Project (850 MW, Desert Hot Springs).

[2] OTC plants use a technology that withdraws billions of gallons of seawater each day to cool steam for generating electricity. Due to their significant impacts on marine life, the State Water Resources Control Board ("SWRCB") adopted a policy in 2010 requiring OTC plants to reduce their use of seawater by 93 percent. In practice, this requires the plant to shut down or modernize its equipment. Compliance dates range from 2013-2029. Several Southern California OTC plants, including Redondo Beach and Huntington Beach, have a compliance deadline of December 2020.

[3] R.12-03-014, SCE Track 4 Rebuttal Testimony, p. 10.

[4] *Id.*

Reactive Support Projects, which will add an additional 740 MVAR of reactive support in the vicinity of San Onofre.[5] An additional 150 MVAR of shut capacitors at Penasquitos 230kV Substation is also currently under development by SDG&E.[6] Therefore, *no new generation is needed to provide voltage support to compensate for the loss of San Onofre*.

In addition, distributed (rooftop and small-scale) solar and energy storage resources, paired with advanced inverters, can supply the grid with reactive power. The CPUC is also currently evaluating revisions to its technical standards to permit use of advanced inverters. Once approved, this will enable local clean energy to provide the grid with voltage support in lieu of fossil fuel generation or potentially more costly transmission system upgrades.

3. What are the San Onofre Task Force and the "Preliminary Reliability Plan for LA Basin and San Diego"?

Following SCE's announcement in June 2013 that San Onofre would be permanently retired, Governor Jerry Brown assembled a San Onofre Task Force comprised of the CEC, CPUC, SWRCB, California Air Resources Board ("CARB") and the CAISO. The Task Force developed a plan by mid-September identifying options to meet reliability needs resulting from San Onofre's retirement. The "Preliminary Reliability Plan for LA Basin and San Diego" was then prepared by staff of the CEC, CPUC, and ISO on August 30, 2013.[7] The Preliminary Reliability Plan assessed impacts from the San Onofre closure, the scheduled compliance deadlines for 5,068 MW of OTC generation (largely occurring in 2020), and projected load-growth. The Preliminary Reliability Plan suggested procurement of 3,000 MW of gas-fired generation and 3,250 MW of preferred resources (energy efficiency, demand response, renewable generation, combined heat and power and energy storage) for a roughly 50/50 percent procurement split between fossil fuel generation and preferred resources.

4. Is the Preliminary Reliability Plan's recommendation to procure 3,000 MW of gas and 3,250 MW of preferred resources advisable?

No. First, the Preliminary Reliability Plan errs by attempting to recommend replacement capacity needed for both the unexpected retirement of San Onofre and compliance dates for OTC facilities. *Additional generation capacity required to replace scheduled OTC retirements has already been thoroughly evaluated and determined in Track 1 of LTPP before the PUC.* This is no longer an open question.

Second, the CPUC is the agency charged with analyzing and determining the need for new generation though a robust evidentiary process with multiple stakeholders including ratepayer advocates and environmental groups. A proceeding to determine what, if any, long-term need

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[5] *Id.*
[6] R.12-03-014, CAISO Track 4 Testimony, p. 15 (Sparks).
[7] CEC, CPUC, CAISO, Preliminary Reliability Plan for LA Basin and San Diego, Aug. 30, 2014, *available at* http://www.energy.ca.gov/2013_energypolicy/documents/2013-09-09_workshop/2013-08-30_prelim_plan.pdf.

results from the retirement of San Onofre is now taking place in Track 4 of LTPP. The Plan's recommendation for new gas-fired plants was based on preliminary analysis by the CAISO, well in advance of the CPUC stakeholder process, and does not account for new demand forecast information by the CEC. The Preliminary Reliability Plan should not be relied upon because it is based on stale information that was never vetted through a public process.

5. How was replacement capacity for OTC retirements resolved?

The LTPP is a bi-annual proceeding at the CPUC that authorizes investor-owned utilities to procure new generation determined to be needed to maintain grid reliability. In Track 1 of the current LTPP proceeding, the CPUC examined future need in the L.A. Basin resulting from anticipated retirement of OTC plants.[8] After a thorough analysis that included evidentiary hearings and testimony and briefing by interested parties, the CPUC authorized SCE to procure 1,400 to 1,800 MW of capacity in the L.A. Basin. At least 1,000 MW, but no more than 1,200 MW of that capacity could be procured from conventional gas-fired resources. At least 50 MW must be procured by energy storage and at least 150 MW must be procured by preferred resources and/or energy storage. The CPUC also authorized SCE to procure up to an additional 600 MW of capacity from preferred resources and/or energy storage.[9] A separate proceeding examined future need in the SDG&E Service area and authorized 298 MW of procurement beginning in 2018 assuming retirement of the Encina OTC plant.[10]

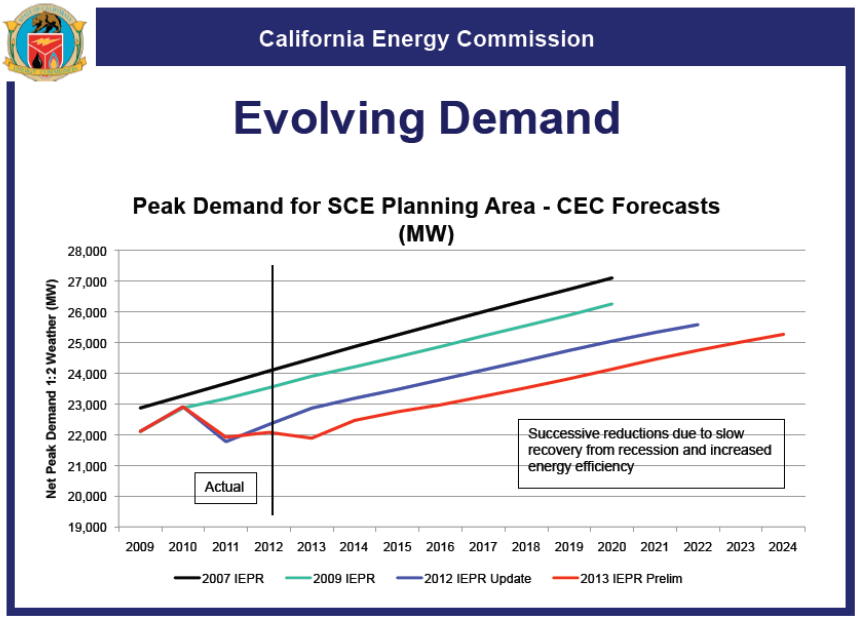
6. Why is there no additional need for new fossil fuel resources resulting from the retirement of San Onofre?

New CEC demand forecasts and projections of additional savings from energy-efficiency programs significantly reduce the need for capacity provided by San Onofre. Remaining need is met as a result of the state's investments in clean energy mandates such as energy storage procurement. To the extent that there is still additional need, it can be met through targeted procurement of clean energy or, if necessary, transmission system upgrades, such as the proposed Mesa Loop-In, that will allow additional import of power into the L.A. Basin.

The updated CEC demand forecast reduces future demand projections for the L.A. Basin and SDG&E Service Area by over 1,300 MW by 2022—over half the 2,246 MW provided by San Onofre. The CPUC determines the need for procurement of new resources based on forecasts of future energy demand supplied by the CEC. The CEC periodically updates its energy demand forecast as part of its Integrated Energy Policy Report (IEPR). In examining additional need

[8] D.13-02-015, Decision Authorizing Long-Term Procurement for Local Capacity Requirements, Feb. 13, 2013, *available at* http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M050/K374/50374520.PDF.
[9] *Id.* at 2.
[10] D-13-03-029, Decision Determining San Diego Gas & Electric Company's Local Capacity Requirement and Granting Partial Authority to Enter into Purchase Power Tolling Agreements, Mar. 28, 2013, *available at* http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M063/K535/63535568.PDF.

following retirement of San Onofre, the Preliminary Reliability Report used the forecast adopted by the CEC in the 2012 IEPR. However, the CEC's most recent demand forecast in the 2013 IEPR projects that peak demand in 2022 will be over ***1,300 MW less*** in the L.A. Basin and SDG&E Service Area than estimated in the 2012 IEPR. This decreased baseline projection of demand, in part due to the benefits resulting from adoption of new, more stringent building and appliance codes,[11] meets over half the need resulting from the retirement of San Onofre.



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Since at least 1990, the end-point of every CEC demand forecast has overestimated actual energy consumption.[13] An evaluation of San Onofre replacement capacity should not be based on outdated and inflated estimates of future demand. Indeed, CAISO has also stated it "wants to consider incorporating the 2013 IEPR demand forecast" in assessing the need for new procurement.[14] When current demand projections for the L.A. Basin and SDG&E Service Area are accounted for, the need for new generation resulting from the San Onofre closure is cut by more than 50 percent.

Reliability Plan Used 2012 CEC Forecast[15]	**Updated CEC Sept 2013 Baseline[16]**	**Difference (MW)**

[11] CEC, California Energy Demand 2014-2024 Preliminary Forecast, Vol 1., p. 1 (May 2013), *available at* http://www.energy.ca.gov/2013publications/CEC-200-2013-004/CEC-200-2013-004-SD-V1.pdf.
[12] Michael Jaske, CEC, Overview of Southern California Electricity Infrastructure Issue, Joint CEC/CPUC Workshop, July 15, 2013, Slide 4.
[13] *See*, California Energy Commission, California Energy Demand 2010-2020 Adopted Forecast, p. A-10 (Dec. 2009), *available at* http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF.
[14] R.12-03-014, Track 4 Testimony of Robert Sparks in Behalf of the Independent System Operator at 30, Aug. 5, 2013.
[15] CEC, Documents for 2012 IEPR Update Proceeding, Mid-Case LSE and Balancing Authority Forecast, Form 1.5d http://www.energy.ca.gov/2012_energypolicy/documents/index.html
[16] CEC, Oct. 1, 2013 Lead Commission Workshop on Revised Electricity and Natural Gas Forecasts 2014-2024, Demand Forecast Spreadsheets, Mid Case LSE and Balancing Authority –baseline.xlsx, Form 1.5d, http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-01_workshop/spreadsheets/

	2018	2022	2018	2022	2018	2022
LA Basin	21,870	22,917	20,609	21,704	(1,261)	(1,213)
SDG&E	5,652	6,056	5,705	5,948	53	(108)
Total	27,522	28,973	26,314	27,652	(1,208)	(1,321)

The Preliminary Reliability Plan significantly understated additional demand reductions from future energy efficiency. In reaching its need recommendation, the Preliminary Reliability Plan assumes 1,000 MW of incremental energy efficiency savings by 2020.[17] This estimate was based on an incomplete assessment of future energy savings and does not reflect more recent projections by the CEC on achievable savings in the 2013 IEPR. Estimates in the 2013 IEPR are more accurate because they incorporate a comprehensive analysis of energy efficiency potential in California.[18] Updated IEPR estimates on the "most likely" expected savings from energy efficiency (the mid-case scenario) further reduce demand by over 1,400 MW by 2020 (as compared to the 1,000 MW reduction assumed in the Preliminary Reliability Plan) and over 1,800 MW by 2022.[19]

Required procurement of 745 MW of energy storage by SCE and SDG&E can be designed to further reduce the need for fossil-fuel generation resulting from the closure of San Onofre. The need for San Onofre replacement capacity is further reduced by the deployment of energy storage. In its recent landmark energy storage decision, the CPUC required SDG&E and SCE to collectively procure 745 MW of energy storage by 2020.[20] Guiding principles for procurement include "optimization of the grid, including peak reduction."[21] To maximize value of energy storage to ratepayers and avoid costly overprocurement of gas-fired plants, a significant portion of the energy storage requirement can and should be targeted and designed to meet peak capacity needs.

Demand response can relieve 1,000 MW of need. In determining the need for new resources, the CPUC looks at the need that would occur on the hottest day in ten years. CAISO forecasts very hot, high demand days at least a day or two in advance. Nonetheless, in estimating need, CAISO discounted 997 MW of demand response resources that the CPUC estimated would be available by 2018 on the grounds that they may not respond within 30 minutes following an unexpected

[17] Preliminary Reliability Plan, p. 6. Similarly, in its Revised Scoping Memo, the PUC assumes only 933 MW of EE savings in the San Onofre area by 2022 based on "low" estimates of savings in the 2012 IEPR. "Mid-level" savings are defined as "most likely" to occur and should therefore be used to determine future need.
[18] CEC, Estimates of Additional Achievable Energy Savings, Supplement to California Energy Demand 2014-2024 Revised Forecast, Sept. 2013, p.1, *available at* http://www.energy.ca.gov/2013publications/CEC-200-2013-005/CEC-200-2013-005-SD.pdf.
[19] CEC, Oct. 1, 2013 Lead Commission Workshop on Revised Electricity and Natural Gas Forecasts 2014-2024, Demand Forecast Spreadsheets, Mid Case LSE and Balancing Authority –AEEE adjustment.xlsx, Form 1.5d, http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-01_workshop/spreadsheets/ (reduction attributed to achievable EE is derived by subtracting baseline forecast with AEEEE adjusted forecast).
[20] D.13-10-040, Decision Adopting Energy Storage Procurement Framework and Design Programs, Oct. 21, 2013, p. 15, *available at* http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M079/K533/79533378.PDF.
[21] *Id.* p. 9.

contingency event, such as the loss of a transmission line due to fire.[22] Because demand response resources are intended to be deployed on very hot days to reduce grid stress, discounting 997 MW of demand response is unwarranted.

7. If there is additional need, what are the best solutions to meet that need?

To the extent there is any additional need, it can be met with targeted procurement of preferred resources and energy storage. For example, SCE has initiated a "Preferred Resource Pilot" intended to strategically deploy a mix of preferred resources (energy efficiency, demand response, and renewables) and energy storage to offset load growth in Orange County. This approach, which examines how a mix of clean energy resources works to complement one another and improve grid reliability and resilience, can be used to meet any remaining need.

In addition, transmission improvements can also avoid the need for new fossil fuel generation. Because the L.A. Basin is a transmission constrained area, transmission improvements can significantly reduce any remaining need by allowing more power to be imported during peak periods from outside the Basin. As one example, SCE has testified that the Mesa Loop-In project, which would primarily require improvements at an existing SCE substation on SCE owned land, would reduce generation need in the L.A. Basin by 1,200 MW.[23] As SCE has recognized, "development of Mesa Loop-In and the strategically located Preferred Resources could displace the need for any additional LCR resources."[24] Because adoption of transmission solutions will significantly affect need, the CAISO recommended that the CPUC "wait to make a decision about the need for additional resources until the ISO has completed its studies of potential transmission mitigation solutions [in the 2013/2013 Transmission Planning Process]."[25]

[22] R.12-03-014, Revised Scoping Ruling, May 21, 2013, p. 3; LTPP Track 4 Transcript, Oct. 29, 2013, pp. 1575-76 (CAISO, Sparks).
[23] R.12-03-014, SCE LTPP Track 4 Testimony p. 36.
[24] *Id.* p. 3.
[25] R.12-03-014, CAISO LTTP Track 4 Testimony (Sparks) p. 30.