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IEPR 2016-08-29 Workshop Comments

Additional submitted attachment is included below.

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From: Cogentrix Energy Power Management, LLC

Date: September 12, 2016

Subject: Workshop Comments of Cogentrix Energy Power Management, LLC on Southern California Electricity Infrastructure Reliability

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Cogentrix Energy Power Management, LLC ("Cogentrix") hereby submits these comments on the August 29, 2016 workshop that examined the Southern California Electricity Infrastructure held at the California Energy Commission ("CEC"). Cogentrix offers general comments and thoughts on the Workshop panel presentations, specific comments on the Staff Report titled, "Mitigation Options for Contingencies Threatening Southern California Electric Reliability", market commentary on the need and importance of fast start, flexible peaking generation and concludes with proposed solutions.

Cogentrix recommends a 3rd option be added to the CEC Staff Report titled, "Mitigation Options for Contingencies Threatening Southern California Electric Reliability". This option is called Contracting Existing Merchant Generation and is described in the following comments. Cogentrix respectfully suggests that the CEC recommend in the 2016 Integrated Energy Policy Report Update that the other two mitigation options should only be considered only after all merchant generation in the relevant area or subarea has first been placed under contracts for a minimum of five years.

I) Introduction

Cogentrix was founded in Charlotte NC in 1983. Cogentrix manages and operates power plants owned by private equity funds sponsored by The Carlyle Group ("Carlyle"). Carlyle is one of the world's largest multi-product global alternative asset management firms. Carlyle acquired Cogentrix in December 2012. Cogentrix's current portfolio consists of over 6,500 MW of natural gas-fired power generation assets across 9 states and five distinct power markets. The California

portfolio consists of six flexible natural gas-fired peaking plants with capacity of approximately 416MWs. Carlyle acquired this portfolio through several transactions in 2013 and 2015 with the goal of building a portfolio of assets well suited to accommodate the intermittency and ramping required by California's aggressive renewable portfolio build out.

The Cogentrix California portfolio is made up six natural gas-fired, simple cycle peaking facilities:

1) The CalPeak portfolio, consisting of four 49.5 MW facilities, two of which are located in the San Diego Subarea, one in Fresno County and one is located in Solano County between Vacaville and Dixon, 2) the 96 MW Malaga Power facility located in Fresno and 3) the 122 MW Midway Peaking Project, also located in Fresno County. The Midway project has a PPA with PG&E through 2024 while the other five assets operate in the merchant markets. The two projects located in San Diego do not have power purchase or resource adequacy agreements as of January 1, 2017 and the other Northern California projects are not contracted starting in 2018. This lack of medium term contracts introduces considerable risk regarding the future availability of the units.

Relative to comparably sized gas steamers, such as many of the OTC units, or even more modern CCGT units, the Cal Peak peakers require less land, consume less water, and emit less CO2, while providing superior flexibility and responsiveness. Please see Appendix A for details.

II August 29th Workshop

The general take away from the workshop was that the reliability for Southern California is in near term need of mitigation to prevent electricity shortages in certain areas.

Both SCE and SDG&E presented their Local Capacity Reliability (LCR) procurement for their service territories and both focused on procuring new preferred resources. Cogentrix notes that this procurement of local capacity and reliability needs is based on a three year old forecast.

The California Independent System Operator (CAISO) stated that the reliability of the LA Basin and San Diego have been impacted by the SONGS closure and the scheduled retirement of Once Through Cooling (OTC) resources. They also reported that delays in new generation and transmission projects are a cause for concern. These delays include the 500 MW Carlsbad Energy Center, the Mesa 500 kV Loop-In Project and the Sycamore-Penasquitos 230 kV Line Project.

The CEC Staff presented their Local Capacity Annual Assessment Tool (LCAAT) as the basis for their Staff Report on Mitigation Options for Contingencies Threatening Southern California Reliability. The two options analyzed were to defer the OTC shutdown date and to have a pool of already permitted plants that could be built in faster timeline than normal. Specific comments on those documents will follow, however the CEC Staff concluded that the San Diego Subarea, even with the addition of the Carlsbad plant, is short of generation throughout the study period up until 2025. As a result of this shortfall, it is likely that a shutdown deferral request for certain once through cooling units slated for retirement due to their use of unfavorable environmental characteristics would be recommended. They also stated that there is possibility of a shutdown deferral request would also be needed for Redondo Beach Plant or the Alamitos Plant.

The State Water Resources Control Board informed the workshop that the deferral request process for deferrals longer than 90 days takes about 12 months to complete and needs approval by the Board.

None of the presenters at the workshop mentioned or discussed existing generation or the need to keep that generation available. The assumption is that the units will stay on the system regardless of the project economics. Cogentrix respectfully suggests that this assumption is incorrect.

Cogentrix prepared a PowerPoint presentation for the workshop but was unable to show it. It is attached to this document as Appendix B.

III LCAAT and the Staff Report on Mitigation Options

The Local Capacity Area Assessment Tool (LCAAT) is designed to show the generation resource surplus or deficit for different Local Capacity Areas. This is the tool being used to support any mitigation needs for the different areas. The LCAAT is incorrectly premised on the assumption that all existing merchant fossil generation will remain on line. The 2016 LCAAT shows that the San Diego Subarea, where our two uncontracted merchant 49.5 MW plants (Border & Enterprise) are located, is short generation in almost every year of the ten year study even with the inclusion of the 500 MW Carlsbad plant.

Below is the baseline results of the 2016 LCAAT for the San Diego Subarea. We have added to the bottom of the results what it would look like if our Border and Enterprise projects were shut down due to lack of a contract. This should be very alarming for SDG&E, the local governments and the people and businesses located there.

Table B-5: Baseline Results for San Diego Subarea

	Variables (Summer Peak MW)	Source	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
San Diego Sub-Area													
	Base Load Forecast	2014 IEPR Up	5324	5372	5453	5529	5602	5654	5698	5742	5778	5814	5850
less	Load Forecast Adjustment (positive is a decrease)		0	0	0	0	0	0	0	0	0	0	0
less	AAEE	2014 IEPR Up	39	78	118	146	181	213	245	280	319	358	401
less	Preferred EE	ISO 14/15 TPP	0	0	0	3	7	10	13	17	20	18	16
less	Preferred BTM Energy Storage	ISO 14/15 TPP	0	0	0	0	26	26	26	26	26	26	26
less	Preferred BTM DG	ISO 14/15 TPP	0	0	0	0	0	0	0	0	0	0	0
=	Managed Load Forecast		5285	5294	5335	5380	5389	5405	5414	5420	5413	5413	5407
	Gross Local Capacity Requirements		3382	3430	4011	4227	3963	3937	4129	4187	4248	4309	4375
less	T-system Upgrade Impacts		(240)	(240)	(840)	(1086)	(846)	(846)	(846)	(846)	(846)	(846)	(846)
less	LCR Change from Demand Adjustments	input value	(39)	(78)	(118)	(149)	(213)	(249)	(284)	(322)	(365)	(401)	(443)
=	Adjusted LCR Base		3103	3112	3054	2992	2904	2842	2999	3018	3037	3062	3086
less	OTC Non Nuclear	ScenTool	965	965	859	0	0	0	0	0	0	0	0
less	OTC Nuclear	ScenTool	0	0	0	0	0	0	0	0	0	0	0
less	Hydro	ScenTool	44	44	44	44	44	44	44	44	44	44	44
less	Solar	ScenTool	37	37	37	37	37	37	37	37	37	37	37
less	Wind	ScenTool	5	5	5	5	5	5	5	5	5	5	5
less	Geothermal	ScenTool	0	0	0	0	0	0	0	0	0	0	0
less	Biomass	ScenTool	21	21	21	21	21	21	21	21	21	21	18
less	Cogeneration	ScenTool	135	135	135	135	135	154	154	154	154	154	154
less	Pump	ScenTool	0	0	0	0	0	0	0	0	0	0	0
less	Non OTC Peaker	ScenTool	513	626	513	513	513	513	513	513	513	513	513
less	Non OTC Thermal	ScenTool	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218
less	Various and Unknown	ScenTool	1	1	1	1	1	1	1	1	1	1	1
less	Incr. Peaker Additions	Picker AD	0	0	308	808	808	808	808	808	808	808	808
less	Incr. Thermal Additions	D14-03-004	0	0	0	0	0	0	0	0	0	0	0
less	Incr. RPS Calc - Renew	14/15 Port	0	0	0	0	0	0	0	0	0	0	0
less	Incr. RPS Calc - DG	14/15 Port	0	25	36	37	41	45	52	53	64	64	64
less	Storage Additions	D14-03-004	0	0	0	0	0	0	0	0	0	0	0
less	DR Program Capability/Preferred DR Capab	multiple	19	19	19	20	20	21	21	21	21	21	21
=	Total Resources Base		2956	3094	3195	2838	2842	2866	2874	2875	2886	2886	2883
=	Resource Need (Surplus/Deficit) Base		(147)	(18)	141	(154)	(62)	24	(126)	(144)	(152)	(176)	(203)
	Border & Enterprise		-	-	(99)	(99)	(99)	(99)	(99)	(99)	(99)	(99)	(99)
	Adj. Resource Need (Surplus/Deficit) Base		(147)	(18)	42	(253)	(161)	(75)	(225)	(243)	(251)	(275)	(302)

The Staff Report: Mitigation Options for Contingencies Threatening Southern California Electric Reliability was presented by CEC and they proposed two contingency mitigation options: 1) OTC facility deferral and 2) new conventional generation

- OTC facility deferral beyond 90 days requires review by the SACCWIS, which can take up to one year given the review and approval timeline and if approved keeps 40-50 year old coastal power plants running which will result in further damage to the sea life and the ecology of the ocean.
- New conventional generation would take upwards of 4-5 years to complete and bring online and would increase cost for SCE and SDG&E ratepayers. Developing new conventional generation does not fit within the timing needs of the grid.

The Staff report does not include any discussion of existing conventional generation's role in providing reliability. The CalPeak Southern California peakers currently serve as a necessary insurance policy to support the reliability needs of the grid. Contracting with existing peakers offers a "path of least resistance" to counter further delays at Carlsbad and address other

reliability concerns: it is superior to both of the other options in terms of environmental impact, certainty of execution, and cost.

A third option that needs to be analyzed is Contracting Existing Merchant Generation. Uncontracted flexible generation needs to be prioritized over any other options. This means that the other two mitigation options should only be considered if all merchant generation in the relevant area or subarea has first been placed under contract for a minimum of five years. The advantages of this third option is a better solution than extending the life of coastal power plants or bringing new fossil plants online because;

- Existing generation already has both electric and gas interconnections compared to new build.
- Peakers offer greater flexibility;
- Shorter start times
- Shorter minimum run times
- Multiple starts per day
- Much smaller environmental footprint
- Can be contracted for at a fraction of new build cost

It is important to note that the Staff report recognizes the need for PPAs to keep both options viable and that they would not be able to obtain their needed revenues from the CAISO market alone. This is consistent with our view regarding the need for a contract for our existing plants. In order for local flexible uncontracted generation to remain available to California, utilities or CAISO need to enter into PPA, just like other two options.

IV Market Commentary

Cogentrix believes that the existing fleet of peaking resources is an essential bridge to the future low carbon grid, including battery storage, which is the ultimate goal of California. As more intermittent generation is added to the grid the CAISO needs tools to deal with the effects of the duck curve. Until the storage market is large enough to be an actual CAISO tool then peaking plants are critical to reliability. There may even be a permanent role for peakers in the future market. The only market besides the CAISO energy markets that is currently available to the peaking plants is the Resource Adequacy (RA) market. Cogentrix continues to be concerned about this market. The current RA market is a short term market of one year or less with many utilities actually selling their excess RA to other market participants. RA prices continue to decline due to RA credit given to renewables. Current RA is at an 80%+ discount to new build contracts. This should be of particular concern, considering exceptionally tight reserves of dispatchable capacity. A CAISO Statewide Flex Advisory on July 27th underscores that concern

Peaking Plants rely on capacity payments given their limited run time. California cannot have a weak RA market when dispatchable resources are needed on the system. The CAISO also has a weak energy market. The results of these poor market economics helps explain recent withdrawals (or attempts to withdraw) from market by Calpine (Sutter) and Rockland Capital (La Paloma). Distressed economics are more easily explained for combined cycles outside of load

pockets. However it is more difficult to be complacent about distressed economics for plants in San Diego Subarea with near zero dispatchable reserves looking into 2018

The need for flexible peaking resources has been expressed by numerous stakeholders, market experts and key stakeholders, including:

1. CAISO[1] - To reliably operate the green grid, requires flexible resources which have ability to perform the following functions:
    - Sustain upward or downward ramp;
    - Respond for a defined period of time;
    - Change ramp directions quickly;
    - Store energy or modify use;
    - Meet expected operating levels;
    - Start with short notice;
    - Start and stop multiple times per day; and
    - Accurately forecast operating capability
2. National Bureau of Economic Research[2] - "As the share of renewable generation increases, so will the requirements for increased back-up capacity and serious stresses will be put on the energy system unless the relationship between fast-ramping and renewable technologies are appropriately acknowledged."
3. IHS Energy Consulting[3] - "As solar's grid penetration increases, its value declines. Power system planners will need to develop and refine methodologies for assessing this value. They will also need to ensure that other units are sufficiently compensated for the backup capacity that they provide."
4. CalPERS[4] – Highlighted their investment in our CalPeak and Midway facilities in the "CalPERS for California" 2015 report noting it represents attractive long-term investment given the increasing role peaking plants will play meeting California's energy needs as it progresses towards its renewable energy goals.

V Solutions to Market Weakness for Flexible Resources

There are a number of different solutions that could help resolve the market weakness and properly compensate flexible resources for the value they provide to the grid while ensuring their continued availability and benefits to the grid. Any one of these solutions will incentivize the peaking plants to remain online to provide their critical service needed for grid reliability.

- 5 to 7-year Standard Offer "Green Shaping" Contracts to transition to greater energy storage buildout and CA renewable goals which are awarded based on certain plant characteristics.

[1] http://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf
[2] http://www.nber.org/paperes/w22454
[3] HIS Energy: Power and Renewables – Pushing Solar's Boundaries in California (August 2016)
[4] http://www.calpers.ca.gov/docs/forms-publications/calpers-for-ca-2015.pdf, Pg 21

- 5-year flexible Capacity Procurement Mechanism Contracts from the CAISO.
- Stronger Resource Adequacy requirements for all LSEs that prioritize the procurement of fast-start flexible resources and recognize the shift in peak net demand to hours after the sun has set.

VI Conclusion

A long-term solution is urgent: as more units continue to roll off long-term contracts, additional downward pressure will be applied to the merchant RA and energy markets exacerbating the ability of generators to remain viable. Revenue uncertainty beyond one year at a time is critical to existing generation to continue to be the insurance policy for reliability. Loss of existing flexible generation will result in increased cost to ratepayers to support new generation or increased environmental harm caused by keeping OTC plants open beyond their scheduled shutdown. Peakers are particularly at-risk given their reliance on RA contracts for cash flow visibility. Weakening economics in the RA and energy markets will force peakers to forego required maintenance or shutdown, similar to the Sutter and La Paloma facilities. Since the Staff Report states it is a work in progress, Cogentrix urges the CEC to add a third option of Contracting Existing Merchant Generation to the list of mitigation options, that California adopt our recommendations for the entire state, and that this third option be prioritized over the other two options presented at the Workshop.

Respectfully Submitted,

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APPENDIX A

All four CalPeak projects use the Pratt & Whitney FT8-2 TwinPac gas turbines. The 96 MW Malaga project which utilizes two natural gas-fired simple cycle GE LM6000 PC combustion turbines and the 122 MW Midway project which uses a Pratt & Whitney FT8-3 turbine. The table below shows operating characteristics of Cogentrix plants as compared to other reliability based gas fired generation:

Operating Parameter	CalPeak Unit	Average Peaker	100 MW Gas Steamer	500 MW Efficient CCGT
Start Time	5 minutes[1]	15 minutes	8 hours	5 hours
Maximum Starts	4 per day	2 per day	1 or 2 per day	1 or 2 per day
Minimum Run Time	1 hour	2 hours	4 to 6 hours	4 to 6 hours
Shutdown Time	5 minutes	7 minutes	1.5 hours	30 minutes
Ancillary Services	Synchronous condensing[2], Spinning and Non-Spinning Reserve	Non-spinning reserve	N/A	Spinning and Non-Spinning Reserve, Regulation

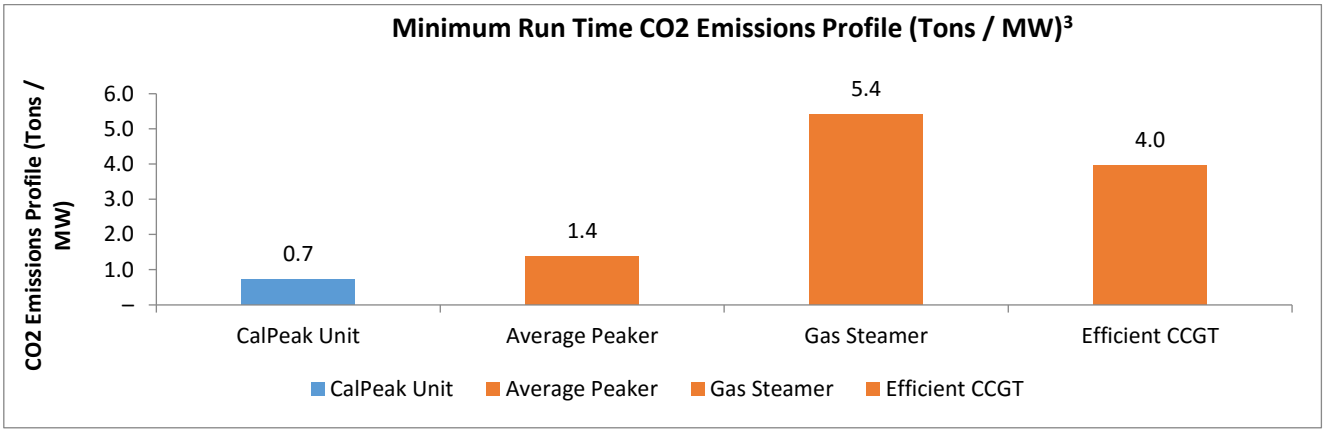
[1] CalPeak units are synchronized to the grid in 5 minutes
[2] No market for voltage in CAISO; would require minor plant modifications to be remotely operable

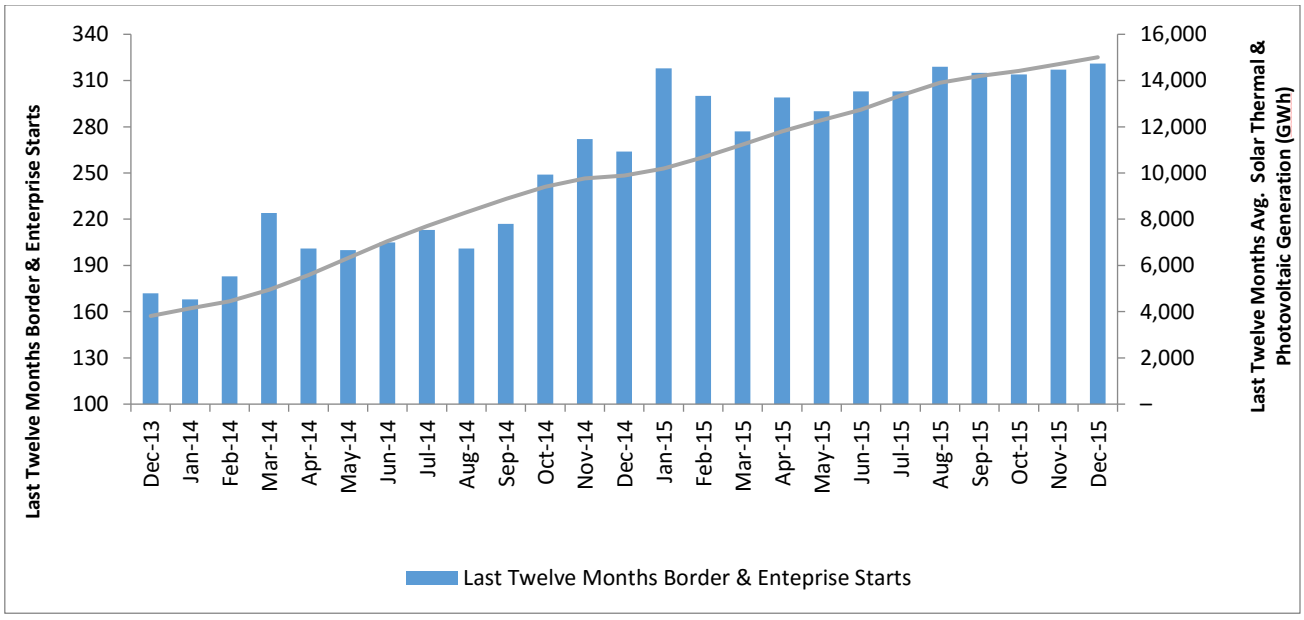
Not only are the CalPeak units currently configured to be one of the most flexible, fast-ramping but also environmentally friendly generating fleets in California. The CalPeak facilities are configured to be minimally invasive to the California environment while providing maximum flexible capacity to the grid.

In addition to their flexibility characteristics, the CalPeak portfolio offers other favorable environmental characteristics, including:

1. Land Use: The Cogentrix units are located on significantly smaller sites than comparable utility scale solar farms. Cogentrix is able to provide ~200 MW of fast-start flexible capacity to grid while only occupying ~13 acres of land while a 150 MW utility scale solar farm in San Diego provides non-dispatchable capacity to the grid while occupying over 1,100 acres of land
2. Water Consumption: All four units were built using Dry Low NOx ("DLN") technology, which significantly reduces water consumption. Gallons per MWh consumption is 1/12th that of a water-injected LMS100 unit and 1/20th that of a GE 7FA combined cycle with chillers

3. Emissions Profile**:** The CalPeak Unit's GHG footprint is substantially reduced by short startups and minimum run times versus nearly all other gas fired technologies as shown on table below:



[3] Minimum run time includes shutdown time

CalPeak's San Diego units have been reliable generators contributing to grid stability dating back to the energy crisis. As renewable generation has expanded, the units have seen rapidly increasing unit starts, highly correlated to renewable expansion. The chart below shows the correlation between the increase in renewable generation and the number of starts from our two San Diego plants. This is strong evidence that the CalPeak units are needed by the grid yet they remain uncontracted beyond this year.