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California Energy Commission
Docket No. 13-IEP-1D

Clean Coalition Comments on Preliminary Reliability Plan for LA Basin and San Diego

Prepared by Staff of the California Public Utilities Commission, California Energy Commission, and California Independent System Operator

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I. Introduction

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to local energy systems through innovative policies and programs that deliver cost-effective renewable energy, strengthen local economies, foster environmental sustainability, and enhance energy security. To achieve this mission, the Clean Coalition promotes proven best practices, including the vigorous expansion of Wholesale Distributed Generation (WDG) connected to the distribution grid and serving local load. The Clean Coalition drives policy innovation to remove major barriers to the procurement, interconnection, and financing of WDG projects and supports complementary Intelligent Grid (IG) market solutions such as demand response, energy storage, forecasting, and communications. The Clean Coalition is active in numerous proceedings before the California Energy Commission, the California Public Utilities Commission and other state and federal agencies throughout the United States, and works on the design and implementation of WDG and IG programs for local utilities and governments.

II. Summary of Recommendations

The Clean Coalition supports the Preliminary Reliability Plan's emphasis on reducing reliance on conventional resources in favor of preferred resources (energy efficiency, demand response, distributed generation, and storage). This approach is consistent with the Loading Order, the California Public Utilities Commission's proposed storage procurement targets decision, and Governor Brown's 12,000 megawatt distributed generation goal. However, the Preliminary Reliability Plan does not take full advantage of this opportunity to showcase the full value of preferred resources as alternatives to conventional resources and transmission for meeting system needs. The Clean Coalition urges the joint agencies to not rush to support new conventional generation and transmission investments before updating assumptions about the value and

availability of preferred resources and system needs assessments through public procurement and planning processes.

The Clean Coalition has two specific recommendations for improving the plan. First, the Reliability Plan should be informed by an assessment of the full operational value of preferred resources, including the reactive power capabilities of distributed solar and energy storage paired with advanced inverters. Second, the Reliability Plan should be developed with the objective of maximizing the use of cost-effective preferred resources to meet local area needs, rather than setting a target of meeting 50% of needs with preferred resources.

III. Discussion and Specific Recommendations

1) The Reliability Plan should be informed by an assessment of the full operational and planning value of preferred resources, including the reactive power capabilities of distributed solar and energy storage paired with advanced inverters.

Ratepayers will be best served by a Reliability Plan that is informed by an accurate assessment of the full operational and planning value of preferred resources. For example, preferred resources take much less time to permit and deploy than transmission lines or conventional generation. The Preliminary Plan should take advantage of the short deployment time associated with these resources, and incorporate into the Plan.

Specifically, this assessment should include the reactive power capabilities of distributed solar and energy storage paired with advanced inverters. Slide 7 of the workshop presentation makes the outdated statements that rooftop solar provides "no" voltage support and that energy storage "may" provide voltage support. As the Preliminary Reliability Plan includes transmission upgrades that have not received all Commission and environmental approvals, there is no reason why the Reliability Plan should exclude the ability of distributed solar and storage to provide cost-effective voltage support through advanced inverter functions that will be approved in the next few years.

- *The Reliability Plan should include advanced inverters.*

The Clean Coalition is actively involved in the Rule 21 Smart Inverters Working Group (SIWG) at the CPUC, which is focused on expediting revisions to operational safety technical standards to allow advanced inverters to ride-through voltage events and provision reactive power. The SIWG reasonably anticipates that the commercial implementations of advanced inverter systems will begin in October 2015.[1]

Table 1: Key milestones for advanced inverter approvals and implementation

Tasks	Milestones	Milestone Dates
Grp-A-1 Milestone	UL Publishes the Revised ANSI/UL 1741 with basic autonomous Phase 1 functions	March 31, 2014
Grp-A-5 Milestone	Start Commercial Implementations of Phase 1 DER Systems:	October 1, 2015
Grp-C-1 Milestone	UL Publishes the Second Revision of ANSI/UL 1741:	June 30, 2014
Grp-C-5 Milestone	Start Commercial Implementations of DER Systems	October 1, 2015
Grp-D-1 Milestone	UL Publishes the ANSI/UL 1741 Updates for Testing the Phase 3 Autonomous Functions:	September 30, 2014
Grp-D-5 Milestone	Start Commercial Implementations of DER Systems:	Jan 1, 2016

Source: CPUC Rule 21 (R.11-09-011) 'Recommendations for Updating DER Technical Requirements in Rule 21' Version 2, September, 2013.

Relying on near-term approvals for advanced inverters is no more speculative than relying on future Commission and permitting approvals for transmission upgrades. As the Preliminary Plan sets forth "the second project, the installation of a Static Var Compensator at San Onofre Mesa substation, requires an additional approval from the CPUC. *SDG&E is expected to file an application for approval by mid-2014, and if approved by*

[1] CPUC Rule 21 (R.11-09-011) 'Recommendations for Updating DER Technical Requirements in Rule 21,' Version 2, September 2013 (as edited by Francis Cleveland, appointed by the CPUC to lead the Working Group).

mid-2015, the project could be online by summer 2016." … Sycamore Canyon – Penasquitos Transmission Line - approved by CAISO, to be approved by CPUC by mid-2015."[2]

The Reliability Plan should also include acceleration of approvals for advanced inverters, consistent with Preliminary Plan's provision to accelerate authorizations and approvals for preferred resources. In addition, the Reliability Plan should include active collaboration with the Rule 21 SIWG to ensure consistency across regulatory agencies and to encourage a free flow of information.

- *The Reliability Plan should account for the full value of advanced inverters for distributed voltage control.*

Advanced inverters paired with distributed solar PV or storage facilities can provision reactive power 24 hours a day, regardless of whether the sun is shining. Advanced inverters can draw real power from the grid and convert it to reactive power, in the same manner that capacitor banks provision reactive power.

The Rule 21 SIWG has found that the implementation of advanced functions for inverters paired with distributed generation and storage can cost-effectively improve the reliability and power quality of the power grid. Further, the SIWG discovered that the European experience has shown that timely implementation is critical for avoiding costly upgrades and replacements in the future.[3]

Forward-thinking utilities across the country are embracing advanced features inherent in almost all inverters that are deployed throughout the world today. For example, Georgia Power's requires small solar generators use advanced inverters to provision reactive power in exchange for compensation.[4] Similarly, a group of Western utilities, including the California investor-owned utilities, is working to make advanced inverters mandatory for all new solar facilities within their service territories. In a letter

[2] "Preliminary Reliability Plan for LA Basin and San Diego," Prepared by Staff of the California Public Utilities Commission, California Energy Commission, and California Independent System Operator, DRAFT Version, dated August 30, 2013, pg. 4.
[3] CPUC Rule 21 (R.11-09-011) "Recommendations for Updating DER Technical Requirements in Rule 21" Version 2, September, 2013, pg. 1.
[4] See Section 1.8 of https://www.weboasis.com/OASIS/SOCO/Interconnection/SGIA.pdf

dated August 7, 2013, the Western Electric Industry Leaders urged state policymakers to encourage the "immediate" and "widespread" adoption of smart inverters, which they called "simple and inexpensive devices" that will play a "transformative role" in voltage control.[5]

Advanced inverters are not just a solution for integrating variable renewable generators – distributed voltage control can make the power grid more reliable and efficient system-wide. A report by the Oak Ridge National Lab found that distributed voltage control significantly outperforms centralized voltage control. Reactive power suffers far greater line losses than real power, and those losses increase as a line is more heavily loaded. Distributed reactive power minimizes these significant reactive power line losses. Moreover, excessive line congestion can be avoided if distributed generation, energy storage, and advanced inverters are installed throughout the grid. As a result, distributed voltage regulation provides substantial system efficiency while preventing blackouts.[6] Additionally, advanced inverters can be programmed to ride-through minor voltage fluctuations on the grid, which eliminates unnecessary grid disconnects.[7]

Graphic 1: Distribution Voltage Regulation – Location Matters

[5] www.weilgroup.org/WEIL_Smart_Inverters_Letter_Aug-7-2013.pdf
[6] "Local Dynamic Reactive Power for Correction of System Voltage Problems," Oak Ridge National Laboratory, September 2008.
[7] See http://www.fiercesmartgrid.com/story/advanced-inverters-providing-voltage-regulation-where-it-needed-most/2013-09-11 for details

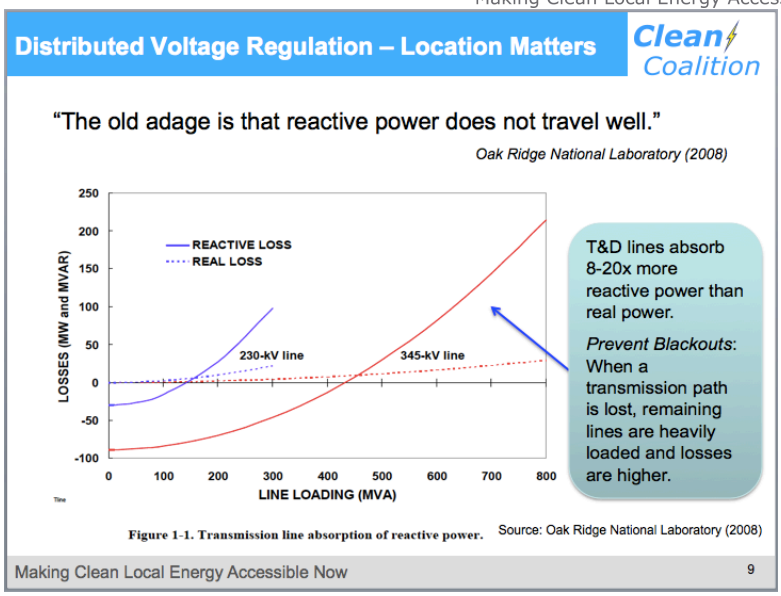


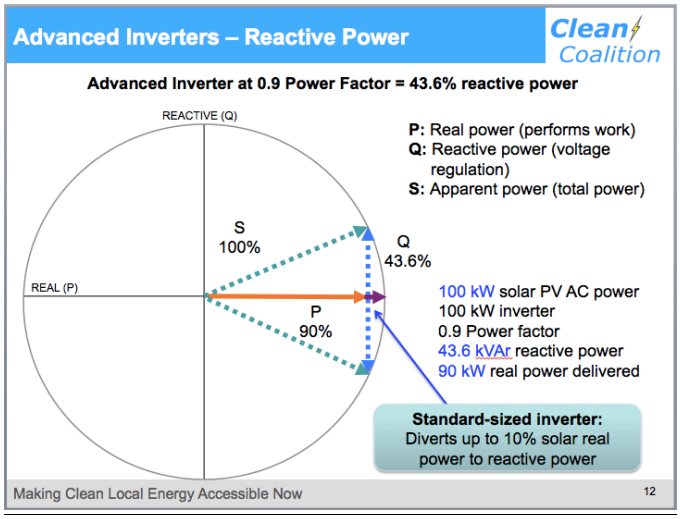
Figure 1-1. Transmission line absorption of reactive power.

Since advanced inverters are a cost-effective solution for improving voltage control system-wide, ratepayers will be well served by cost allocation policies that facilitate their rapid adoption. Most inverters on the market have advanced capabilities built-in, so there are no significant costs to installing the advanced inverter, which is simply a standard inverter with the advanced features enabled. However, solar and wind generators with standard-sized inverters must divert a portion of real power production to provision reactive power when sun or wind resources are at their peak. Without compensation for the provisioning of reactive power, generators would lose revenue for curtailing real power output to provide reactive power.

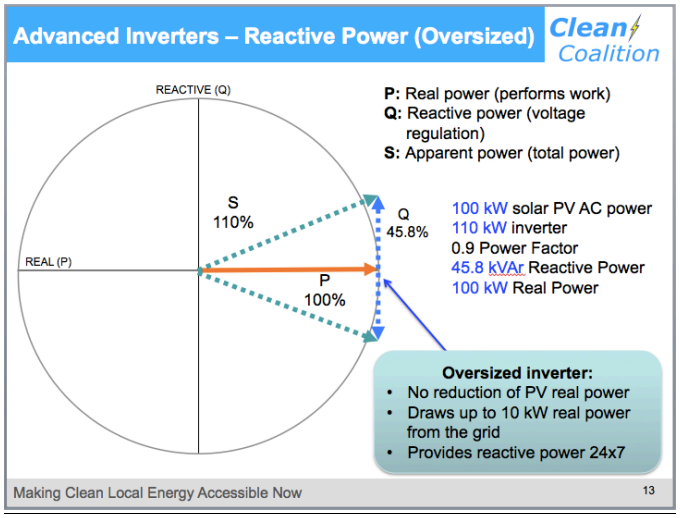
If reactive power will be regularly needed during a generator's peak production hours, installing an "oversized" inverter makes economic sense. For example, a 100 kW solar facility with a 10% oversized inverter (110 kW inverter) set at a 0.9 power factor can draw 10 kW of real power from the grid to convert to 46 kVAr of reactive power even when the solar facility is producing a full 100 kW of real power. In comparison, a 100 kW solar facility with a standard-sized inverter (100 kW inverter) set a 0.9 power factor may need to divert up to 10 kW of real power output to deliver 44 kVAr of reactive

power.

Graphic 2: Advanced Inverters and Reactive Power (Standard-Sized Inverter)



Graphic 3: Advanced Inverters and Reactive Power (Oversized Inverters)



2) Reliability Plan should be developed with the objective of maximizing the use of preferred resources to meet local area needs, rather than setting a target of meeting 50% of needs with preferred resources.

Rather than setting an arbitrary target of meeting 50% of needs with preferred resources, the Reliability Plan should be informed by an accurate assessment of the full value of preferred resources and should have the objective of maximizing the use of cost-effective preferred resources to meet local area needs. The Clean Coalition urges the joint agencies to not rush to support new conventional generation and transmission investments before updating assumptions about the value and availability of preferred resources and system needs assessments through public procurement and planning processes. This "no regrets" approach is consistent with the Loading Order and will best serve the interests of ratepayers.

This is the right time to showcase the extent to which distributed generation and intelligent grid resources can meet local area system needs. In addition to its work on advanced inverters described above, the CPUC has proposed significant energy storage procurement targets and has opened a demand response rulemaking to increase use of preferred resources. Meanwhile, the California Independent System Operator has proposed a new methodology for evaluating and planning for "non-conventional alternatives" to transmission and conventional generation projects as part of its transmission planning process.

This is also the right place for demonstrating the ability of distributed generation and intelligent grid resources to meet local area system needs. Southern California Edison's Preferred Resources "Living Pilot" is the ideal opportunity to showcase the ability of preferred resources to cost-effectively replace conventional resources for providing real power, reactive power, and grid services. As noted in recent comments to the CEC from SCE, the SCE living pilot is "a means of informing future policy decisions surrounding the procurement of preferred resources and their ability to meet local reliability. A key component of this program…will be leveraging SCE's extensive

experience in developing and managing EE, DR, and Advanced Technology projects and programs."[8]

IV. Conclusion

The Clean Coalition appreciates the opportunity to comment on the Preliminary Plan and looks forward to continued collaboration.

Respectfully submitted,

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[8] "Southern California Edison Company's ("SCE's") Comments on the California Energy Commission Docket No. 13-IEPR-1D Workshop on Evaluation of Electricity System Needs in 2030," September 3rd, 2013. http://www.energy.ca.gov/2013_energypolicy/documents/2013-08-19_workshop/comments/Southern_California_Edison_Comments_on_Evaluation_of_Electricity_System_Needs_in_2030_2013-09-03_TN-71934.pdf

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