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Clean Coalition Comments on Southern California Edison's Preferred Resources "Living Pilot"

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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.

Southern California Edison's Preferred Resources "Living Pilot" is the ideal opportunity to showcase the ability of advanced inverters to cost-effectively replace conventional resources for providing voltage control 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."[1] Accordingly, the Clean Coalition recommends the inclusion of

[1] "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-

advanced inverters for distributed voltage control in the pilot. Since California utilities have recognized that this tool has been proven effective for improving grid reliability in Germany, this is a low risk addition to the pilot.

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 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 and reduces line congestion. As a result, distributed voltage regulation provides substantial system efficiency while preventing blackouts.[2] Additionally, advanced inverters can be programmed to ride-through minor voltage fluctuations on the grid, which eliminates unnecessary grid disconnects.[3] Note that benefits of advanced inverters are addressed in more detail in the Clean Coalition's Track 4 testimony in R. 12-03-014.[4]

Forward-thinking utilities across the country are embracing advanced features inherent in inverters that are deployed throughout the world today. For example, Georgia Power requires small solar generators to use advanced inverters to provision reactive power in exchange for compensation.[5] Similarly, a group of Western utilities, including all of the California investor-owned utilities, is working to make advanced inverters mandatory for all new solar facilities within their service territories. In a letter dated August 7, 2013, the Western Electric Industry Leaders urged state policymakers to encourage the "immediate" and "widespread" adoption of smart inverters, which they

19_workshop/comments/Southern_California_Edison_Comments_on_Evaluation_of_Electricity_System_Needs_in_2030_2013-09-03_TN-71934.pdf

[2] "Local Dynamic Reactive Power for Correction of System Voltage Problems," Oak Ridge National Laboratory, September 2008.
[3] See http://www.fiercesmartgrid.com/story/advanced-inverters-providing-voltage-regulation-where-it-needed-most/2013-09-11 for details
[4] CLEAN COALITION REPLY TESTIMONY TO THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR AND SOUTHERN CALIFORNIA EDISON TESTIMONY, OPENING TESTIMONY ON ADVANCED INVERTER CAPABILITIES IN R. 12-03-014 dated September 30th, 2013.
[5] See Section 1.8 of https://www.weboasis.com/OASIS/SOCO/Interconnection/SGIA.pdf

called "simple and inexpensive devices" that will play a "transformative role" in voltage control.[6]

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 and safety technical standards to allow advanced inverters to ride-through voltage events and 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.[7] The final UL standards for all US Advanced Inverters are scheduled to be established within the coming months. Now is the perfect opportunity to take advantage of testing advanced inverters in preparation for the final UL standards and in the interest of fulfilling the true objective of a pilot. The SIWG reasonably anticipates that the commercial implementations of advanced inverter systems will begin in October 2015.[8]

Advanced inverters have been proven effective for enhancing grid reliability in Germany. In a collaborative paper with the University of California, Berkeley, the Clean Coalition studied the opportunity for localized management in the use of advanced inverters coupled with distributed PV systems to provide reactive power adjacent to the point of use. Germany is one of the world leaders in installed PV capacity and as of 2012 has been using advanced inverters to manage local voltage via reactive power. Germany passed new grid codes that require PV systems to be capable of frequency dependent active power manipulation during abnormal grid conditions as well as reactive power provision during normal grid operations. The German experience showed that advanced inverters can be set to automated mode, so no additional communications equipment or protocols will be needed.[9]

[6] www.weilgroup.org/WEIL_Smart_Inverters_Letter_Aug-7-2013.pdf
[7] CPUC Rule 21 (R.11-09-011) "Recommendations for Updating DER Technical Requirements in Rule 21" Version 2, September, 2013, pg. 1.

[8] 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).
[9] ADVANCED INVERTERS FOR DISTRIBUTED PV: Latent Opportunities for Localized Reactive Power Compensation. Cal & Clean Coalition Energy C226, dated Spring 2013. http://www.clean-coalition.org/site/wp content/uploads/2013/10/CC_PV_AI_Paper_Final_Draft_v2.5_05_13_2013_AK.pdf