

DOCKETED

Docket Number:	17-IEPR-01
Project Title:	General/Scope
TN #:	220557
Document Title:	Gene Nelson, Ph.D. Comments CGNP's Reply Brief in FERC Docket AD17-11-000
Description:	N/A
Filer:	System
Organization:	Gene Nelson, Ph.D.
Submitter Role:	Intervenor
Submission Date:	8/5/2017 6:15:17 PM
Docketed Date:	8/7/2017

Comment Received From: Gene Nelson, Ph.D.

Submitted On: 8/5/2017

Docket Number: 17-IEPR-01

CGNP's Reply Brief in FERC Docket AD17-11-000

Based on CGNP's experience with the CEC, the concluding sentence in Clack et.al's 16 June 2017 Proceedings of the National Academy of Sciences article abstract is particularly relevant, "Policy makers should treat with caution any visions of a rapid, reliable, and low-cost transition to entire energy systems that relies almost exclusively on wind, solar, and hydroelectric power." (Emphasis added)

CGNP's careful analysis in its extensive written submissions and oral testimony in CPUC A.16-08-006 establish that a heavy reliance on wind and solar generation in particular yields an electric generation system where in most locations the inherent intermittency of solar and wind is buffered by reliance on "Thermal" plants - those powered by the fossil fuels of natural gas and (out-of-state) coal. Because those plants are operated in "back down" mode, still powered by fossil fuels to keep the plants in a hot-ready status while they are not generating electricity, the emission reductions associated with solar and wind generation is negligible. CGNP also documented in its testimony that scant use of energy storage occurs in California, with no near-term change in that policy being apparent.

The only cost-effective way to integrate solar and wind into California's power grid while reducing emissions per California legislation and executive orders is to increase utilization of nuclear power by keeping Diablo Canyon Power Plant (DCPP) running past 2025 and re-commissioning San Onofre Nuclear Generating Station (SONGS.)

Additional submitted attachment is included below.

1 **RE: FERC Docket AD17-11-000 State Policies and**
2 **Wholesale Markets Operated by ISO New England Inc.,**
3 **New York Independent System Operator, Inc., and PJM**
4 **Interconnection, L.L.C.**
5

6 **Californians for Green Nuclear Power, Inc. (CGNP) submits this extended bibliographic**
7 **entry as its summary response in the above FERC Docket. The purpose of this**
8 **submission is to insure that FERC and the Parties to this proceeding are aware of this**
9 **relevant, important, and recent paper that rebuts the 2015 claims of Jacobson et.al.**
10 **Jacobson has been identified as an anti-nuclear power advocate. (For example, see the**
11 **Wikipedia article "Anti-nuclear movement in the United States"**
12 **https://en.wikipedia.org/wiki/Anti-nuclear_movement_in_the_United_States for details.)**
13 **CGNP believes that some regulatory bodies and some Party's reliance on Jacobson's**
14 **claims are not supported by sound, mainstream scientific and engineering principles**
15 **and facts.**
16

17 ***Proceedings of the National Academy of Sciences* Volume 114, No. 26** 16 June 2017
18 **www.pnas.org/cgi/doi/10.1073/pnas.1610381114** (The entire article is available via open
19 access at this URL)

20 **Evaluation of a proposal for reliable low-cost grid power with 100% wind, water, and solar**

21 Christopher T. M. Clack^{a,b,1,2}, Staffan A. Qvist^c, Jay Apt^{d,e}, Morgan Bazilian^f, Adam R. Brandt^g, Ken
22 Caldeira^h, Steven J. Davisⁱ, Victor Diakov^j, Mark A. Handschy^{b,k}, Paul D. Hines^l, Paulina Jaramillo^d,
23 Daniel M. Kammen^{m,n,o}, Jane C. S. Long^{p,3}, M. Granger Morgan^d, Adam Reed^q, Varun Sivaram^r, James
24 Sweeney^{s,t}, George R. Tynan^u, David G. Victor^{v,w}, John P. Weyant^{s,t}, and Jay F. Whitacre^d

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10 University of California, Berkeley, CA 94720; ^o Renewable and Appropriate Energy Laboratory, University
11 of California, Berkeley, CA 94720-3050; ^p Lawrence Livermore National Laboratory, Livermore, CA 94550;
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22 ³ Retired.

23 This article contains supporting information online at

24 www.pnas.org/lookup/suppl/doi:10.1073/pnas.1610381114/-/DCSupplemental.

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26 Edited by B. L. Turner, Arizona State University, Tempe, AZ, and approved February 24, 2017 (received for review
27 June 26, 2016)

28 **ABSTRACT:** A number of analyses, meta-analyses, and assessments, including those
29 performed by the Intergovernmental Panel on Climate Change, the National Oceanic and

1 Atmospheric Administration, the National Renewable Energy Laboratory, and the
2 International Energy Agency, have concluded that deployment of a diverse portfolio of
3 clean energy technologies makes a transition to a low-carbon-emission energy system both
4 more feasible and less costly than other pathways. In contrast, Jacobson et al. [Jacobson
5 MZ, Delucchi MA, Cameron MA, Frew BA (2015) Proc Natl Acad Sci USA 112(49):15060–
6 15065] argue that it is feasible to provide “low-cost solutions to the grid reliability problem
7 with 100% penetration of WWS [wind, water and solar power] across all energy sectors in
8 the continental United States between 2050 and 2055”, with only electricity and hydrogen
9 as energy carriers. In this paper, we evaluate that study and find significant shortcomings in
10 the analysis. In particular, we point out that this work used invalid modeling tools, contained
11 modeling errors, and made implausible and inadequately supported assumptions. **Policy**
12 **makers should treat with caution any visions of a rapid, reliable, and low-cost**
13 **transition to entire energy systems that relies almost exclusively on wind, solar, and**
14 **hydroelectric power.** (Emphasis added)

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16 (Please note that the term "nuclear" appears 14 times in the above 6-page article.)

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19 14 July 2017 /s/ Gene A. Nelson, Ph.D., Central Coast Government Liaison,

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