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Pacific Gas and Electric Company_Zero Net Energy

Additional submitted attachment is included below.

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California Energy Commission
Dockets Office, MS-4
Docket No. 15-IEPR-05
1516 Ninth Street
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Re: Docket 15-IEPR-05: Workshop on Zero Net Energy Buildings: Comments of Pacific Gas and Electric Company

I. Introduction

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the Integrated Energy Policy Report (IEPR) Staff Workshop on Zero Net Energy for Newly Constructed Buildings (ZNE Workshop) that was held on May 18, 2015. PG&E has previously submitted comments on ZNE to the California Energy Commission (CEC or Commission) on August 1, 2013[1] and October 9, 2013,[2] as part of the 2013 IEPR Proceeding, and on April 21, 2015, [3] as part of PG&E comments on Strategy 3.4 (Zero Net Energy Retrofits) of the Commission's Draft of California's Existing Buildings Energy Efficiency Action Plan (the Plan or Draft Action Plan).[4]

Since the 1970s, PG&E has been a leader in energy efficiency and has worked closely with government, nonprofit, and private sector partners to design and implement programs and policies that allow Californians to do more with less energy. PG&E's energy efficiency portfolio includes a robust suite of rebates, incentives, services, and tools to provide every customer choices from a comprehensive set of tools and technologies through multiple delivery channels

[1] *Comments of the Joint Utilities on Draft 2013 Integrated Energy Policy Report,* August 1, 2013. Retrieved from http://www.energy.ca.gov/2013_energypolicy/documents/2013-07-18_workshop/comments/PGandE-SCE-SCGC_and_SDGandE%20Joint_Comments_08-01-13_TN-71784.pdf

[2] *Comments of Pacific Gas and Electric Company on Draft 2013 Integrated Energy Policy Report*, October 29, 2013 Retrieved from http://www.energy.ca.gov/2013_energypolicy/documents/2013-10-15_workshop/comments/Pacific_Gas_and_Electric_Company_Comments_2013-10-29_TN-72292.pdf

[3] *Comments of Pacific Gas and Electric Company on California's Existing Buildings Energy Efficiency Action Plan*, April 21, 2013. Retrieved from http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-05/TN204280_20150421T134422_Valerie_Winn_Comments_Pacific_Gas_and_Electric_Co_Comments_on_C.pdf

[4] *Existing Buildings Draft Energy Efficiency Action Plan*. California Energy Commission. (2015) Sacramento, CA. Retrieved from http://www.energy.ca.gov/ab758/

to help them reduce energy usage and save money. These programs and services are supported by utility staff, government partnerships, trade professionals, retailers, distributors, manufacturers, and other third-party providers. From 2010-2014, PG&E's energy efficiency programs helped customers avoid the release of more than 2,000,000 metric tons of carbon dioxide (CO2), which is equal to the annual greenhouse gas emissions from nearly 460,000 passenger cars or more than 1,400,000 homes in PG&E's service territory.[5]

The key points of PG&E's comments are:

- In achieving ZNE, it is important that three areas must work together—efficiency, renewables, and the grid integration of the renewables— in an integrated fashion to achieve least cost to society.
- Flexibility around the location of renewables may yield additional, very substantial benefits for cost effectiveness of ZNE installations.
- Including (or redefining) the approach to ZNE from the current framework (zero energy on an annual basis with time dependent valuation (TDV) consideration) to an approach that includes zero peak (load flattening), zero carbon, and demand responsiveness (including more controllable loads), may better help the State reach its greenhouse gas emission (GHG) reduction goals.
- The CEC should continue to work with the California Public Utilities Commission (CPUC) to ensure ZNE is implemented in a way that aligns the interests of all utility customers.

II. Definition of ZNE

PG&E supports the core principles in the IEPR definition of ZNE,[6] particularly that ZNE buildings require:

- Very high levels of energy efficiency (to reduce the building's energy footprint as much as possible), with
- The remaining energy requirement to be provided by renewables.

In PG&E's view, which we believe to be consistent with that of the Commission, it is important that the building energy efficiency be achieved at least cost to all utility customers; likewise, it is important that the renewable energy system be approached based on least cost principles. To these points, PG&E would add that the grid integration of the renewables should also be approached based on least cost principles. Summarizing, from the point of view of society, it is important that all three areas—efficiency, renewables, and the grid integration of the renewables—taken together, achieve least cost.

[5] PG&E Customer Data Warehouse, 2010-2014 inclusive

[6] See 2013 IEPR, beginning at page 34: http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-CMF-small.pdf

III. Location and Accounting of Renewables in the ZNE Context

PG&E agrees with the point made in workshop announcement[7] that "there is a need to allow for meaningful flexibility as a significant number of buildings may be unable to meet the on-site renewable energy sources." *The Technical Feasibility of Zero Net Energy Buildings in California,* a 2012 report authored by Arup and overseen by PG&E,[8] points out that a significant number of buildings will not be able to meet ZNE performance with on-site renewables (even though a majority of buildings will be able to do so). In this regard, flexibility is essential.

Consistent with the least cost approach, PG&E also believes that flexibility around the location of renewables may yield additional, very substantial benefits for cost effectiveness. In addition, locational issues may improve energy "accounting," as well as enforcement, related to ZNE. These points bear examination whether or not off-site generation is "essential" based on the building type and solar access. PG&E looks forward to continuing to work with the CEC and CPUC to ensure that this flexibility is developed transparently and in a way that protects the interests of nonparticipating utility customers.

PG&E believes the questions raised by the Sacramento Municipal Utilities District (SMUD) presentation *Pathways to ZNE: SMUD Perspectives, Grid Impacts, Shared Solar*[9] speak to these issues and are the correct questions. These questions address the best ways for building efficiency standards to help California (1) reach its carbon reduction goals, (2) rapidly decarbonize the electricity supply, (3) reduce the energy footprints of new buildings (4) keep utility bills low in context with de-carbonization and (5) minimize grid impacts of new loads (which we take to mean new renewable generation). To re-emphasize, PG&E continues to believe and strongly supports the concept that "efficiency first" should remain a foundational principle for the building efficiency standards.

PG&E agrees that accounting methods for renewable energy offsets must be developed, that these methods be as clear and simple as possible, and that they be enforceable by the appropriate agency. With adequate methodology, rules and enforceability, PG&E believes "choice" around renewables location will produce better outcomes for the state.

Regarding grid integration, PG&E agrees with SMUD and others that additional analysis is required to fully understand the costs and benefits various deployment alternatives for

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[7] *Notice of IEPR Staff Workshop on Zero Net Energy for Newly Constructed Buildings*, May 8 2015, p.2. Retrieved from http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-05/TN204552_20150508T152046_Notice_of_IEPR_Staff_Workshop_on_Zero_Net_Energy_for_Newly_Cons.pdf

[8] *The Technical Feasibility of Zero Net Energy Buildings in California*, Arup et. al., December 2012. Retrieved from http://www.energydataweb.com/cpucFiles/pdaDocs/904/California%20ZNE%20Technical%20Feasibility%20Final%20Report.pdf

[9] *Pathways to ZNE: SMUD Perspectives, Grid Impacts, Shared Solar*. Bartholomy, Obadiah; Rundle, Rebecca; Frantz, Stephen. p. 2. Presented at the CEC on May 18, 2015. Retrieved from https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-IEPR-05

renewables. Issues around integration of renewable generation, locational benefits, grid control, dispatch of demand response (DR) programs, and related issues need further study. With additional, higher resolution information, it will become possible for the state to provide the best possible policy rules for ZNE deployment.

Further, there are concerns that requiring on-site generation equivalent to annual consumption may allow overinvestment in supply and underinvestment in efficiency and increased electrification. Utility investment in required back-up infrastructure and generation capacity may not be recoverable by ratepayers who must pay for it. PG&E questions the assertion by a speaker at the workshop that a 7 kilowatt-hour (kWh) system will be the average needed for new homes to meet the State's current ZNE defined goal. We would like to see more analysis done on this, and believe that the data will show that the average system needed to reach ZNE defined goals would be closer to a 4 kWh system. PG&E looks forward to continuing to work with the CEC and CPUC to ensure that grid investments necessary to accommodate the ZNE goals are accomplished without undue cost-shifts to non-ZNE utility customers.

III. Time Dependent Valuation Metric

PG&E continues to support the TDV metric for use within the building code, and agrees that "zeroing out" TDV is an effective metric within the code. PG&E points out that this metric is inherently arcane and difficult for the lay public to understand, and that there will be ongoing communications challenges associated with commonly understood definitions of ZNE (e.g., a site definition of ZNE) and the TDV definition of ZNE.

As PG&E has noted in previous comments, the TDV metric may not be appropriate for evaluation of renewable DG. Further, PG&E suggests the CEC may want to consider whether the current TDV values should be modified to recognize the value of energy saved in a future where the California's RPS implementation leads to a high penetration of intermittent renewable power. PG&E looks forward to working with the CEC to develop appropriate TDV or other metrics for projects that include energy efficiency, demand response, and distributed generation.

PG&E agrees with SMUD that consideration of including (or redefining) the approach to ZNE from the current framework (zero energy on an annual basis with TDV consideration) to an approach that includes zero peak (load flattening), zero carbon, and demand responsiveness (including more controllable loads), may better help the State reach its GHG reduction goals.[10]

California should maintain "line of sight" to other ZNE definitional efforts in the US (and internationally), such that unintended consequences and miscommunications around what constitutes ZNE performance can be minimized. PG&E notes that accounting methods such as the Living Building Challenge (from the International Living Futures Institute)[11] and the

[10] *Pathways to ZNE*, SMUD, p. 4
[11] http://living-future.org/lbc

database of ZNE buildings established by the New Buildings Institute (NBI)[12] both use site energy as definitional metrics. The National Institute for Building Science (NIBS) is developing a definition which is likely to be based upon a source energy metric (using national average figures).[13] Because the different systems for measurement (TDV, site energy, and source energy) yield different results, achieving ZNE with the different systems imposes different costs on building construction and can require different design choices by building designers. It will be important that these measurement systems be understandable in relation to each other. It will likewise be important for stakeholders to develop and disseminate messaging in this area that is viable for the building industry.

VI. Conclusion

PG&E thanks the CEC for the opportunity to review and provide comment on the ZNE Workshop. PG&E looks forward to continued collaboration with the CEC on this subject in the future.

Sincerely,

/s/

Valerie Winn

cc: F. Nasim by email (farakh.nasim@energy.ca.gov)

[12] http://newbuildings.org//getting-to-zero-buildings-database
[13] http://www.nibs.org/; based on Personal Communication with Peter Turnbull of PG&E with Ryan Colker of NIBS