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Docket Number:	17-EPIC-01
Project Title:	Development of the California Energy Commission Electric Program Investment Charge 2018 â€“ 2020 Triennial Investment Plan
TN #:	215946
Document Title:	Mary Ann Piette Comments: BTUS Division Consolidated Comments 4_10
Description:	N/A
Filer:	System
Organization:	Mary Ann Piette
Submitter Role:	Public
Submission Date:	2/13/2017 11:08:57 AM
Docketed Date:	2/13/2017

Comment Received From: Mary Ann Piette
Submitted On: 2/13/2017
Docket Number: 17-EPIC-01

BTUS Division Consolidated Comments 4_10

Additional submitted attachment is included below.

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The Energy Commission is currently soliciting ideas and stakeholder input for the 2018 – 2020 EPIC Triennial Investment Plan. For those that would like to submit an idea for consideration in the 2018-2020 EPIC Triennial Plan, we ask that you complete the form below. Submittals are due by **5:00 p.m. on February 10, 2017.**

Part 1. Initiative Description and Purpose:

1. Please provide a brief description of the proposed initiative:

Streamlined grid signaling technology pathways to communicate with responsive loads, storage and other DER systems.

This initiative will improve the technology to manage a clean, affordable and reliable grid. California supply and demand side stakeholders need to improve and standardize methods to communicate with distributed energy resources. There needs to be a more common set of methods for end-use loads, storage (e.g., thermal and electrical), PV and related DERs. At this time there are a number of activities, standards, and demonstrations in this area, but there is great misunderstanding of the capabilities of these various systems, how to use them, and how to lower costs for interoperability.

This improvement needs to include two-way control, local distribution system identification, automation, ease of installation and testing, plug-and-play interoperability, and integration into grid management. These features are not present and in operation in today's technology.

2. What technical and/or market barriers would the proposed initiative help overcome? For scientific analysis and tools, what knowledge gaps would the proposed initiative help fill?

Technical Barriers - As we transition from historical hot summer day peak load shedding and demand response, and to a more dynamic grid with more dynamic tariffs, the need to both give and take load, and to store and shift load and PV energy, we need to revisit communication and control technology that has been in development of the last 10-15 years. For example, OpenADR 2.0 is now a national standard with a broad set of technical capabilities and a language of signals. There is a need to test, demonstrate, package and streamline these communication systems. California utilities, aggregators, end-use customers, technology providers and others are aware of that these standards exist, but are unaware of how they function and what their capabilities are.

Market Barriers - As the programs, tariffs, and markets evolve and California's grid changes with more PV and wind systems, there is a need to better understand how to communicate with DERs. While there are several technologies, programs and markets that use OpenADR, SEP 1.x, SEP 2 and other standards, there is an urgent need to develop and deliver clear pathways for communication technology and interoperability.

Part 2. Benefits and Impacts

3. If this initiative is successful, either fully or partially, what would be the expected impact? Who are the primary users and/or beneficiaries?

This initiative will increase the ability of California to have a smart, cost-effective, and modern grid by improving the use automation to communicate with end-use loads, storage and other DERS. This will increase the effectiveness of DERS and lower costs to own and operate them.

The impact is to allow better control of the grid, less over-generation that happens as we have more renewables, and move cost effective linkages between supply and demand.

The primary users and benefactors are utilities, electricity customers, aggregators, the CAISO, and technology and control companies.

4. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed initiative:

There are a variety of metrics we can use to evaluate this initiative

1 - Cost/kW for DER automation (This has many components of cost, first costs to install, costs to own and operate the automation, maintenance, etc.)

2 - Number of customers with DER automation

3 - Number of MW with DER automation

4 - Locational MW with DER automation

5 - Use of and compliance with Title 24 and Title 20 in supporting these communication systems

5. Please provide a list of peer-reviewed references that support the responses for questions 3 and 4. Proposed initiatives that include peer-reviewed references will be given stronger consideration.

Alston, P, et al., 2015 California Demand Response Potential Study, CPUC Study, Final report will be available March 1, 2017.
http://www.cpuc.ca.gov/General.aspx?id=10622

Ghatikar, Girish, David Riess, and Mary Ann Piette. Analysis of Open Automated Demand Response Deployments in California and Guidelines to Transition to Industry Standards., 2014. LBNLReport 6560E.

Ghatikar, Girish, Mary Ann Piette, and Ella Hae Yeon Sung. Diffusion of Automated Grid Transactions Through Energy Efficiency Codes. Proceedings of the ECEEE Summer Study on Energy Efficiency, 2015. France, 2015.

DOE Grid Modernization Invitation to Join Interoperability Project
https://energy.gov/under-secretary-science-and-energy/downloads/gmlc-invitation-join-project-3-interoperability

6. (For technologies only) What competitive advantages does the proposed technology solution have over current benchmark technologies? If the technology is beyond the prototype stage, what strategies do you suggest to bring to scale?

The advantage that the proposed technology has over the current benchmark is the following. First, the current technology is not being used in wide spread scaled practice and that is the biggest obstacle we need to overcome in streamlining these systems. Second, there are new features that need to be evaluated as the grid changes with new levels of distributed energy resources. Third, the locational signaling is needed. As we have more DERs we need to control them on a more local scale.

The strategies to bring this to scale include more clear direct and upstream incentives, better use of codes and standards, requirements for DER infrastructure, and improved links to existing customer systems.

Part 3. Connection to Energy Commission's EPIC Framework
Energy Commission staff have developed a draft strategic framework to guide the CEC's planning and implementation of EPIC across triennial investment cycles. One of the objectives of the draft strategic framework is to communicate a consistent set of priorities for organizing current and future EPIC investments.

7. Please indicate which of the following strategic framework themes you feel the proposed initiative best fits within:
    - Advance Technology Solutions for Deep Energy Savings in Building and Facilities
    - Accelerate Widespread Customer Adoption of Distributed Energy Resources
    - Increase System Flexibility from Low-Carbon Resources
    - Increase the Cost-Competiveness of Renewable Generation
    - Create a Statewide Ecosystem for Incubating New Energy Innovations
    - Maximize Synergies in the Water-Energy-Food Nexus
    - Develop Tools and Analysis to Inform Energy Policy and Planning Decisions
    - Catalyze Clean Energy Investments in California's Underrepresented and Disadvantaged Communities

If Other, Please Specify