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Advanced Manufacturing Capacity & Workforce Training for Energy Storage

Re-submitting this document with a new PDF as per the instructions received via email.

Additional submitted attachment is included below.

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

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:

1. We propose a comprehensive effort to bolster the scale-up, development, manufacturing, and deployment of advanced energy storage technologies. This would be done through two parallel thrusts:

1) Technology and Manufacturing:
a. Access to shared RD&D infrastructure heavily leveraging existing facilities to provide industry access to high volume production technologies needed to support investment decisions, while bridging the "valley of death" and minimizing commercialization risk.
b. The end goal isto de-risk technology and prepare it for manufacturing scale-up (MRL/ TRL 4-7). This program would largely leverage and increase the utilization of existing assets, while providing a platform for hands-on workforce development described below.
c. Core partners would be research universities, existing manufacturers, and national laboratories.
d. One possibility is to develop public/private state-of-the-art manufacturing test center

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?

This effort addresses the manufacturing scale-up gap:

The disconnect between research and manufacturing has slowed American commercialization efforts with the transfer of technology from lab to market taking, on average, more than a decade and ultimately occurring overseas.
Advanced battery manufacturing in the U.S. requires an educated and highly trained workforce to compete in the global advanced battery economy. Without a foundation of qualified and highly-skilled employees, U.S. manufacturing will continue to require the import of skilled workers from other nations or to rely on overseas production. National and regional education and workforce development efforts need to be jumpstarted and accelerated to meet today's call for talent and tomorrow's call for a coordinated pathway for next generation technologies. Currently, lithium-ion manufacturing in the U.S. will demand thousands of U.S. jobs led by 6,500 direct jobs in support of the $5 billion investment in the Gigafactory by Tesla (not including construction jobs).

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?

Near-term (1-3 years): we will have our first pilot running in Richmond, California. Richmond is home to the Chevron refinery that is the largest emitter of GHG's in the state, and has been wreaking havoc on the local community for decades. Richmond represents the triple whammy of race, poverty, and environment converging nationwide to create communities near pollution sources where nobody else wants to live. Though it is just one of many beleaguered towns, it offers an ideal place to start.

We have been working with the leadership of Richmond, including the Workforce Investment Board, and State Assemblymember Tony Thurmond to develop a plan to invest in workforce training and provide jobs within the battery industry. We expect to employ dozens of people and to train hundreds more. This would be done at Richmond Field Station, owned by University of California, who is a key partner and eager to participate in this work- already committing an appropriate building to it.

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

Metrics:

Job creation, both direct and indirect

Economic opportunity

Energy storage cost to deploy (levelized cost of storage)

Manufacturing capacity (MW of capacity)

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.

Energy Storage Requirements for Achieving 50% Penetration of Solar Photovoltaic Energy in California, P Denholm, R Margolis, National Renewable Energy Laboratory, 2016. http://www.nrel.gov/docs/fy16osti/66595.pdf

Lazard's Levelized Cost of Storage – Version 2.0, December 2016. https://www.lazard.com/media/438042/lazard-levelized-cost-of-storage-v20.pdf

DOE Clean Energy Manufacturing Analysis Center. "Automotive Lithium-ion Battery (LiB) Supply Chain and U.S. Competiveness Considerations." June 2015. http://www.nrel.gov/docs/fy15osti/63354.pdf

DOE Clean Energy Manufacturing Analysis Center. "Automotive Lithium-ion Cell Manufacturing: Regional Cost Structures and Supply Chain Considerations." April 2016.

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?

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

Create a Statewide Ecosystem for Incubating New Energy Innovations

If Other, Please Specify