DOCKETED	
Docket Number:	19-ERDD-01
Project Title:	Research Idea Exchange
TN #:	236765
Document Title:	DASH Clean Energy Comments on Clean Energy Alternatives to Diesel Backup Generator Systems Workshop
Description:	N/A
Filer:	System
Organization:	DASH Clean Energy/Gordon Dash
Submitter Role:	Public
Submission Date:	2/12/2021 3:07:57 PM
Docketed Date:	2/12/2021

Comment Received From: Gordon Dash
Submitted On: 2/12/2021
Docket Number: 19-ERDD-01

Dash Clean Energy Comments on Clean Energy Alternatives to Diesel Backup Generator Systems Workshop

Additional submitted attachment is included below.

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February 12, 2021

California Energy Commission
RE: Workshop to Discuss Research into Clean Energy Alternatives to Diesel Backup Generator Systems.

Docket No 19-ERDD-01

Dash Clean Energy is a renewable hydrogen development company focused on developing hydrogen energy solutions for the energy storage and transportation markets. Our company is in the process of building the state's first hydrogen storage system to demonstrate the ability for hydrogen fuel cells to provide a clean alternative to diesel backup generation. Our recommendations for further research include the following:

1. Funding for large scale demonstration projects.

   The Department of Energy H2 @ Scale currently funds large scale innovative demonstration projects which is required to go beyond KW scale to MW Scale. Funding support is required for early-stage projects in order to de risk integrated technologies and provide investor confidence in the marketplace. Pilot ideas include:
   - Demonstrate 100% renewable energy data center both with primary and backup power.
   - Demonstrate integration of solar, wind, and fuel cells as a microgrids.
   - Demonstrate multiple use applications for backup generation including hydrogen for transportation and industrial uses.

2. Advanced hydrogen energy storage management systems

   The challenge with hydrogen management systems stems from the complexity of hydrogen devices, including electrolyzers, compressors, storage and fuel cells. Research into developing a hydrogen management system to monitor the system, calculate data, controlling the system and operate with asset of protocols

3. Hydrogen Storage:

   Hydrogen storage is a key technological barrier to the development and widespread use of fuel cell power technologies. Research focus ideas include:
   a. Novel storage tanks including steel composite vessels
   b. Advanced solid state and liquid materials including metal hybrids, adsorbents, and organic frameworks.

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4. Hydrogen Production:

   Hydrogen can be produced from diverse domestic feedstocks using a variety of process technologies. Electrolysis can be used to produced hydrogen from curtailed wind and solar. Research ideas to focus on is how electrolyzer can support the utility grid while also providing a valuable fuel to replace diesel backup generators.

5. Fuel Cell:

   Fuel cells have the potential to replace the diesel engines for stationary and portable power applications because they are energy-efficient, clean, and fuel-flexible. Polymer Electrolyte Membrane (PEM) fuel cells have the most promise to replace diesel generators as this the preferred technology for the transportation sector due to their low operating temperature, rapid response, and power-to-weight ratio. Research should focus on the advancing the durability and efficiency of PEM fuels and integrating low-cost automotive fuel cells for stationary storage applications.

Thank you for your consideration of these research, development, and demonstration topics.

Sincerely,

Gordon H. Dash
President
Dash Clean Energy
www.dashcleanenergy.com