Hydrogen and Fuel Cells for Data Center Applications Project Meeting

Sponsored by U.S. Department of Energy (DOE) Fuel Cell Technologies Office

Hilton DoubleTree (The Arctic Club), Seattle, WA

March 20, 2019

Overview

Fuel cells can be used to support critical loads for energy reliability, security, sustainability, and economic benefit. Data centers have become critically important for a wide range of data services. Their use has increased dramatically in the last decade with commensurate power consumption. Fuel cells provide an integration option with a range of potential benefits. There are several integration strategies that could be adopted for different situations:

- Prime power - A larger capacity fuel cell sited adjacent and outside of the data center sized to meet the critical loads, electrical integration with optional thermal integration.
- Prime distributed - Smaller fuel cells integrated at the rack level inside the data center, electrically with the option of thermal integration.
- Backup - Either a larger capacity or distributed fuel cells used as back-up and sized to meet the critical loads of the center.

Fuel options could include on-site hydrogen storage, intermediary fuels, or hydrogen infrastructure by pipeline, delivery or on-site production.

Objective

The meeting aims to assess the application of hydrogen and fuel cells for primary/backup power for data centers. This workshop is expected to engage stakeholders in determining the suitability and needs of hydrogen fuel cell systems in supplying prime and or backup power to critical loads of data centers. By bringing together knowledgeable stakeholders from data center as well as hydrogen storage and fuel cell industries, this workshop aims to identify the research and development (R&D) needs to enable hydrogen fuel cells to be a competitive technology in providing power to data centers. This includes overcoming gaps in understanding and then setting achievable metrics, in collaboration with stakeholders, to ensure component developers can meet the needs of these emerging applications.

Outcomes from this workshop will help identify R&D and demonstration activities that can enable hydrogen and fuel cell technologies to be an affordable, reliable and resilient option for data centers. The aim is to enumerate specific metrics, identify opportunities and barriers to adoption, and obtain feedback from industry and key stakeholders.

Schedule for Wednesday March 20, 2019

7:30 - 8:00 am	**Registration and Continental Breakfast**
8:00 - 8:15 am	**Welcome, Introductions, Opening Remarks and Workshop Objective**: Ned Stetson (DOE)
8:15 - 8:30 am	**DOE Fuel Cell Technologies and H2@Scale Overview**: Dimitrios Papageorgopoulos (DOE)
8:30 - 8:45 am	**Business Case Analysis**: Genevieve Saur (NREL)
8:45 - 9:15 am	**Presentation: *The Hydrogen Data Center Proof of Concept* -** Steve Hammond (NREL)
9:15 - 9:30 am	**Break**
9:30 - 10:30 am	**Panel I: Data Center Requirements and Priorities - Ned Stetson (DOE)**
10:30 - 12:00 pm	**Breakout Session I**
12:00 - 12:45 pm	**Lunch**
12:45 - 1:15 pm	**Joint Session** – Report outs from breakout I
1:15 - 1:45 pm	**Presentation: *In-Rack Direct DC Powering of Servers with Solid Oxide and Proton Exchange Membrane Fuel Cells*** - Jack Brouwer (UCI)
1:45 – 2:45 pm	**Panel II: Experience with Hydrogen and Fuel Cells for Data Centers - Dimitrios Papageorgopoulos (DOE)**
2:45 - 3:00 pm	**Break**
3:00 - 4:30 pm	**Breakout Session II**
4:30 - 5:00 pm	**Joint Session** – Report outs from breakout II
5:00 pm	**Concluding Remarks** (DOE)