

**Mission Innovation Hydrogen Fuel Cell
Off-Road Equipment and Vehicles
Virtual Workshop Agenda**

September 22-24, 2021

Virtual Workshop powered by Zoom – All times are given in Eastern Time

Workshop Introduction and Objectives

Government and industry technology developers world-wide are realizing the potential for hydrogen heavy-duty, off road applications including fuel cells for agriculture, construction, and mining equipment. This workshop will help identify needed research to accelerate technology development and address barriers to industry commercialization.

This workshop is being hosted by the U.S. Department of Energy. We welcome workshop participants and look forward to exploring opportunities for cooperation and collaboration on agriculture, construction, and mining equipment areas of interest.

The objectives of this workshop are to:

- Assess the state of the art for heavy-duty applications specifically using hydrogen fuel cells for agriculture, construction, and mining equipment
- Discuss operational requirements and lessons learned on early equipment demonstration projects for agriculture, construction, and mining
- Understand current technology gaps and identify collaborative R&D opportunities
- Identify refueling infrastructure challenges

Wednesday, September 22 | Day 1

**Session I – Perspectives on Hydrogen for Mining, Construction and Agriculture Applications
(Session Moderator – Pete Devlin)**

- 1:00 PM **Mission Innovation: Clean Hydrogen Mission Opening Remarks**
Matthijs Soede, MI 2.0 Clean Hydrogen Mission Director, European Commission
- 1:05 PM **U.S. Department of Energy, Hydrogen and Fuel Cell Technologies Office**
Sunita Satyapal, Director
Pete Devlin, Technology Acceleration, Development Manager
- 1:15 PM **Ministry of Energy of Chile**
Max Correa, Head for Fuels and New Energy Carriers Division
- 1:30 PM **Australian Renewable Energy Agency**
Matt Walden, Investment Director
- 1:45 PM **U.S. Department of Agriculture**
Mark Brodziski, Deputy Administrator for Rural Business-Cooperative Service
- 2:00 PM **U.S. Environmental Protection Agency**

Britney J. McCoy, Center Director, Climate Analysis and Strategies Center, Office of Transportation and Air Quality

- 2:15 PM **California Air Resources Board**
William Robertson, Vehicle Program Specialist
- 2:30 PM **Association of Equipment Manufacturers**
Curt Blades, Senior Vice President
- 2:45 PM **ANL – Preliminary Equipment TCOs**
Rajesh Ahluwalia, Group Leader for Engineering and Systems Analysis
- 3:15 PM **Break**

**Session II – Agriculture Equipment
(Session Moderator – Greg Moreland)**

- 3:30 PM **John Deere**
Mike Duffield, Module Lead - Energy Storage
- 3:45 PM **CNH Industrial**
William Resende, Manager Electrified PWT Fuel Cell Engineering
- 4:00 PM **AGCO**
Ismo Hamalainen, R&D Manager of AGCO Power, Finland
- 4:15 PM **Schmuecker Renewable Energy System**
Jay Schmuecker, President
- 4:30 PM **Day 1 Feedback & Adjourn**

Thursday, September 23 | Day 2

**Session III – Construction Equipment
(Session Moderator – Ben Gould)**

- 10:00 AM **Caterpillar**
Brian Lowry, Engineering Manager
- 10:15 AM **Komatsu**
Michael Lewis, Technical Director – Technology
- 10:30 AM **Prinoth**
Martin Kirchmair, Technical Director
- 10:45 AM **Break**

Session IV – Mining and Loader Equipment
(Session Moderator – Fernanda Stegmaier Fernandez)

- 12:30 PM **Komatsu**
Michael Lewis, Technical Director – Technology
- 12:45 PM **Volvo**
Ray Gallant, Vice President Product Management and Productivity
- 1:00 PM **Anglo American**
Julian Soles, Head of Technology Development Mining & Sustainability at Anglo American
- 1:15 PM **McKinsey & Company – TCO Analysis for Hydrogen FCs in Mining Applications**
Clemens Müller-Falcke, Partner
- 1:30 PM **Break**

Session V – Fuel Cell Developers
(Session Moderator – Greg Moreland)

- 1:45 PM **Cummins**
Ryan Sookhoo, Director New Initiatives
- 2:00 PM **Ballard**
Tim Sasseen, Market Development Manager, US
- 2:15 PM **Nuvera**
Gus Block, Director of Marketing and Corporate Development
- 2:30 PM **Plug Power**
Rick Mason, Vice President of Business Development and Product Management
- 2:45 PM **PowerCell**
Johan Burgren, Business Manager
- 3:00 PM **Breakout Sessions, Equipment Development**
- Integrated equipment and power system development.
- Shock/vibration, air filtration, heat management.
- 4:00 PM **Breakout sessions report out**
- 4:30 PM **Adjourn**

**Session VI – Hydrogen Onsite Production and Refueling
(Session Moderator – Greg Moreland)**

- 10:00 AM **Air Liquide**
Dave Edwards, Director and Advocate for Hydrogen Energy
- 10:15 AM **Linde**
Al Burgunder, Director Clean Hydrogen
- 10:30 AM **Nel**
Kyle McKeown, Application Engineering Manager
- 10:45 AM **BayoTech**
Michael Koonce, President
- 11:00 AM **OneH2 (biogas)**
Paul Dawson, CEO
- 11:15 PM **NREL – Refueling Processes**
Mike Peters, Engineer
- 11:30 AM **Break**
- 12:00 PM **Breakout Sessions Hydrogen Production and Refueling**
- Refueling logistics, processes
- Hydrogen production
- 1:00 PM **Breakout Sessions Report Out**
- 1:30 PM **Concluding Remarks**
- 1:45 PM **Adjourn**