

TEM 106 Breakout Sessions Topics

Topic 1: Infrastructure and Grid Integration of Clean Hydrogen

September 6th, 1:15 – 2:15 PM

This topic is on the relationship of clean hydrogen production with infrastructure and the grid.

Online Breakout Jamboard Link: <https://jamboard.google.com/d/1MmY82tGX668yDWrXX-9-pJQo6mApawexXrWmqrnny94/edit?usp=sharing>

Overall Question: What is the current state of these areas, what are the future directions and opportunities, and what needs to be addressed for this technology to move forwards?

- Grid/Off Grid
 - What are the decision factors for choosing a grid-connected plant vs. an off-grid plant or onshore vs. offshore?
- Storage and Transport/Infrastructure
 - What are the different roles of storage in grid and off-grid scenarios, and how does that vary with battery-electric and hydrogen storage?
- Renewable Generation
 - What is the significance of forecasting for renewables (demand, price, and resource forecasting)?
 - Are there opportunities to re-imagine renewable power generation technologies tailored specifically to optimize hydrogen production?
- Takeaways
 - What are the top three research questions that need to be addressed in this area to move this technology forwards?
 - How can the TCP address these research questions?

Topic 2: Policy and Market of Clean Hydrogen

September 6th, 2:15 – 3:15 PM

This topic covers the policy strategy and market opportunities of clean hydrogen.

Online Breakout Jamboard Link:

https://jamboard.google.com/d/1c_PgyKBulDLzAfl5J2j0fiG3Ye2OCv_VQnB2P0Jct78/edit?usp=sharing

Overall Question: What is the current state of these areas, what are the future directions and opportunities, and what needs to be addressed for this technology to move forwards?

- System Level Thinking in Market Adoption
 - How do we encourage whole systems thinking (price signaling, technology subsidization, etc.) from a policy perspective in terms of market incentives?
 - What kinds of policies are working to prevent high prices for consumers transitioning to clean hydrogen?
- International Codes and Standards
 - What are the regional or country specific standards needed to operate an electrolyzer in a particular country(gas safety, pressure vessels, electrical etc.)?
- Takeaways
 - What are the top three research questions that need to be addressed in this area to move this technology forwards?
 - How can the TCP address these research questions?

Topic 3: Systems Design and Operations of Clean Hydrogen Plants

September 7th, 9:00 – 10:15 AM

This topic is on the plant and technology design and operation of clean hydrogen systems.

Online Breakout Jamboard Link:

https://jamboard.google.com/d/1SEd4lighiwnBW8yysFDxIYv2qkt2mc_NioO7OErlxtY/edit?usp=sharing

Overall Question: What is the current state of these areas, what are the future directions and opportunities, and what needs to be addressed for this technology to move forwards?

- Energy Mix/Hybrid Systems
 - Integrating hydrogen with a single clean power generation technology (e.g., renewables, nuclear, waste conversion with CCS, etc.) vs. with a hybrid systems integrating multiple generation sources?
 - What is the role of storage (both hydrogen and electric) in hybrid systems?
- Electrolyzer Design and Dynamic Operation
 - How does electrolyzer type, size, cost, and flexibility of operation (including dynamic response) play into optimal plant design
 - How important are control strategies (at the component and system levels) for renewable/electrolyzer integration; and how can integrated power electronics play a role, including potential cost savings?
- Takeaways
 - What are the top three research questions that need to be addressed in this area to move this technology forwards?
 - How can the TCP address these research questions?