

Unlocking Hydrogen Markets with Low-Cost Nuclear Production



Workshop Overview:

Nuclear power – through both existing and new technologies – has the potential to catalyze carbon-free hydrogen and ammonia markets. The objective of this workshop is to bring together leaders from three industrial segments: industries that will use hydrogen; industries that supply hydrogen-producing equipment; and the nuclear industry. These industry representatives will be joined by thought leaders and research institutions in the alternative fuels and nuclear sectors.

The workshop aims to generate a discussion of collaboration opportunities across the value chain to create new market opportunities, facilitate RD&D, and build mutually beneficial policy frameworks – all with the goal to mutually advance a clean energy future.

Workshop participants include industry leaders, including downstream hydrogen users, hydrogen technology companies and nuclear companies, researchers and thought leaders in this space.

This virtual workshop will take place over the course of two days – December 2 and 3, from 8:00-11:00 Eastern Time each day.

The organizers are envisioning this to be the first of a series of workshops on this topic.

AGENDA

Day 1 – December 2 8:00-11:00AM Eastern Time

8:00 AM Introduction and Welcome

Armond Cohen, Co-Founder and Executive Director, Clean Air Task Force (CATF)

8:10 – 9:25 AM Part 1: Framing the Conversation – *Potential Markets for Low-Cost Hydrogen*

- **Moderator:** Mike Fowler, Director, Advanced Energy Technology Research, CATF, *Long-term Hydrogen Market Potential and the Gigatonne Challenge*
- **Speakers:**

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| Tom Hellstern Engagement Manager, <u>McKinsey</u> | <i>Global Hydrogen Momentum and Early Market Perspective</i> |
| Dr. William Chernicoff Senior Manager – Global Research & Innovation, <u>Toyota Mobility Foundation</u> | <i>Recent Activity and Potential Heavy Duty Vehicle Market for ZCF</i> |
| Dr. Tue Johannessen Head of Maritime Application & Viability, <u>Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping</u> | <i>Power-to-X-to-Power: Energy pathways for carbon-neutral shipping</i> |
| Tom Dower Senior Director, Government Relations, <u>ArcelorMittal</u> | <i>Potential Ironmaking Market for ZCF and Required Cost Points</i> |
| Heather Feldman Director, Innovation (Nuclear Sector), <u>Electric Power Research Institute (EPRI)</u> | <i>Low-Carbon Resources Initiative (LCRI): Creating Pathways to Advance Low-Carbon Energy Carrier Options</i> |
| Kirsty Gogan Co-Founder, <u>TerraPraxis</u> | <i>Missing Link to a Livable Climate: How Hydrogen-enabled Synthetic Fuels Can Help Deliver the Paris Goals</i> |

9:25 – 10:45 AM Part 2: H2 Production from Nuclear Energy – *Current and Future Capabilities*

- **Moderator:** Brett Rampal, Nuclear Team Manager, CATF
- **Speakers:**

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| Dr. Shannon M. Bragg-Sitton Lead, Integrated Energy Systems, <u>Idaho National Laboratory</u> | <i>The Critical Roles of Nuclear Energy in Securing a Clean Energy Future</i> |
| Dr. Uuganbayar Otgonbaatar Corporate Strategy Analyst, <u>Exelon</u> | <i>Value Propositions of Hydrogen Generation for Flexible Operation of Nuclear Plants</i> |
| Michael Green General Manager, Nuclear Policy & Associate General Counsel, <u>Pinnacle West Capital Corporation</u> | <i>Scaled Demonstration of Hydrogen Production for Natural Gas Plant Co-firing</i> |
| Shinji Kubo Deputy Director, Department of Hydrogen and Heat Application R&D, HTGR Research and Development Center, <u>Japan Atomic Energy Agency</u> | <i>Thermochemical Production of Hydrogen from Very High Temperature Reactors</i> |

9:25 – 10:45 AM Day 1 Closing Remarks

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| Andrew Sowder Sr. Technical Executive, <u>EPRI</u> <i>and</i> Eric Ingersoll Managing Director, <u>Lucid Catalyst</u> | <i>Rethinking Deployment Scenarios to Enable Large-Scale, Demand-Driven Non-Electricity Markets for Advanced Reactors-A Sneak Preview</i> |
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Day 2 – December 3 8:00-11:00AM Eastern Time

8:00 – 9:30 AM Part 3: Advanced Reactors – *New Technologies and Deployment Models*

- **Moderator:** Elina Teplinsky, Partner, Pillsbury Winthrop Shaw Pittman LLP
- **Speakers:**

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| Brett Rampal Nuclear Team Manager, CATF | <i>New Nuclear Technologies and Delivery Models</i> |
| Craig Stover Program Manager, Advanced Nuclear Technology, EPRI | <i>Advances in Manufacturing and Construction Technologies to Reduce Deployment Costs for Advanced Reactors</i> |
| Dr. Eben Mulder Chief Nuclear Officer, X-energy | <i>Xe100 Technology Overview and Opportunities for High Temperature Electrolysis</i> |
| Petr Fomichenko Deputy Head of the Complex, NRC Kurchatov Institute | <i>High-temperature Nuclear Reactor Technology for Large-scale and Ecologically Friendly Hydrogen Production</i> |
| Simon Irish, CEO, Terrestrial Energy | <i>IMSR® Technology Overview and Opportunities for High Temperature Electrolysis</i> |

9:30 – 10:30 AM Part 4: Hydrogen Technologies – Innovations in Electrolysis and Ammonia Synthesis

- **Moderator:** Trevor Brown, Executive Director, Ammonia Energy Association
- **Speakers:**

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| Tobias Birwe Head of Sales, Fertilizer and Methanol, thyssenkrupp Industrial Solutions | <i>Opportunities for Thermal Integration and Augmentation for Low-temperature Electrolysis Based on uhde Technologies</i> |
| John Bøgild Hansen Senior Principal Scientist, HaldorTopsoe | <i>High Temperature Electrolysis and Nuclear Power: A Path Towards Sustainable Fuels and Chemicals</i> |
| Juan Gomez Prado <i>Energy Lead, Technology Solutions – Consulting,</i> KBR | <i>Nuclear and the Low-carbon Hydrogen Revolution</i> |

10:30 – 11:00 AM Part 5: Reflections, and thoughts on possible further steps

- **Moderator:** Armond Cohen, CATF

