

The Role of the Subsurface in a Hydrogen Economy

CER Spring 2023 Draft Meeting Agenda



Hydrogen is rapidly gaining attention as a sustainable and versatile fuel with potential to play a large role in the energy transition. Green hydrogen (produced by electrolysis using renewable energy) or other low-carbon sources of hydrogen (e.g., hydrogen produced from fossil fuels with carbon capture and storage) have the potential to aid in reducing greenhouse gas emissions from hard-to-decarbonize sectors, such as transportation, steelmaking, and various other industrial applications. A report by the International Renewable Energy Agency estimated that green hydrogen could account for 8% of global energy consumption by 2050. However, in order for this potential to be realized, a number of challenges must still be overcome, including challenges associated with the safe and cost-effective production, transport, storage, and utilization of hydrogen. The subsurface has an important role to play in enabling a hydrogen economy, particularly in the areas of hydrogen storage and potentially hydrogen sourcing. This meeting will cover the projected use of hydrogen, its storage needs, and the research and technology gaps and opportunities for a clean and safe hydrogen economy.

JUNE 8 OPEN SESSION

11:00 am Introduction

David Spears, Committee Chair

Introductory presentations

Moderated by Kray Luxbacher, Committee

11:10 am The Need for and the Production of Hydrogen

Ellen Stechel, ASU

11:30 am Natural Hydrogen

Geoffrey Ellis, USGS

11:50 am Hydrogen Storage

Angela Goodman, SHASTA

Nicolas Huerta, Joshua White, Mathew Ingraham, SHASTA

Panel presentations on hydrogen storage

Moderated by Dan Connell, Committee

12:15 pm Subsurface Storage - Project & Operational Perspectives Richard Fenza, Air Liquide

12:27 pm Computational modeling Srikanta Mishra, Battelle

12:39 pm Monitoring for fugitive emissions Samuel Voegeli, RESPEC

12:51 pm Panel Discussion

1:30 pm Wrap up and adjourn

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Speaker Biographies



Geoffrey Ellis is a geochemist within the Energy Resources Program (ERP) of the US Geological Survey with 30+ years of experience conducting research and exploration related to natural resources and environmental issues. Current research interests encompass the areas of organic-inorganic interactions in petroleum systems, gas isotope geochemistry, and the potential for natural hydrogen gas resources.

Richard Fenza is the Director of Operations, Hydrogen/Syngas at Air Liquide, where he is responsible for all hydrogen/syngas production and storage facilities in the US that are connected to pipeline systems. He has over 20 years of global experience in various aspects of the tonnage hydrogen industry.

Angela Goodman is a Chemist at US Department of Energy National Energy Technology Laboratory and a technical lab lead of the Subsurface Hydrogen Assessment, Storage, and Technology Acceleration (SHASTA) initiative to advance underground hydrogen storage capabilities.

Srikanta Mishra is the Technical Director, Geo-energy Modeling & Analytics at Battelle, where he is responsible for leading integration of computational modeling and machine learning assisted data-driven modeling activities for subsurface energy resource applications.

Ellen B. Stechel is Co-Director, ASU LightWorks®; Executive Director, Center for an Arizona Carbon-Neutral Economy; Professor of Practice, School of Molecular Sciences; and Senior Futures Scientist, Julie Ann Wrigley Global Futures Laboratory at Arizona State University (ASU). Her current research focuses on materials, reactors, and systems design for solar and e-technologies to produce sustainable hydrogen from advanced water splitting, liquid hydrocarbons from carbon dioxide, and renewable ammonia, as well as for thermochemical and chemical energy storage.

Samuel Voegeli is the Energy Services Lead for RESPEC. Mr. Voegeli's experience is dedicated to designing, developing, and optimizing energy and hydrocarbon storage projects. These projects include everything from initial project siting and planning, to maintenance and operations. In addition to numerous conventional energy projects, Mr. Voegeli has been at the forefront of alternative energy deployment projects in the areas of hydrogen, carbon sequestration, and compressed air energy storage.