



## On-Line Workshop

May 19, 2020 10:00 am MDT



*We invite you to attend a virtual workshop to be held May 19<sup>th</sup> 10am-2:30pm via Zoom.  
Open to All that [Pre-Register](#) (Zoom opens at 9:45 am)*

# Large-scale Subsurface Seasonal Solar Heat Storage for Future Value

The Geothermal Battery Energy Storage (or “GB”) concept has been proposed as a large-scale, renewable energy storage method. This is particularly important as solar and wind electricity are being introduced into electric grids. And, economical utility-scale storage has not yet become available to handle the variable nature of solar and wind.

The concept uses solar radiance to heat water on the surface and then inject this heated water deep into the earth. This hot water creates a high-temperature geothermal reservoir acceptable for conventional geothermal electricity production, or for direct heat applications. Storing hot water underground is not a new idea, but the unique feature of the GB is considering regions in sedimentary basins with high-porosity, high-permeability, water-saturated formations. For certain reservoirs, calculations suggest that nearly one hundred percent of the stored heat can practically be recovered, and long-term, even seasonal storage is possible.

Several publications have been presented by the authors on the GB considering reservoir parameter variations. This is a review of calculations made and conclusions for a GB system inferred from the calculations. Potential GB system layout of wells and injection and production possibilities and ultimate heat recovery for economic value are noted.

## AGENDA

- 9:45 am** Zoom opens
- 10:00 am** Introduction ..... John McLennan & Sidney Green
- 10:15 am** Heat and Fluid Flow Calculations ..... Palash Panja & John McLennan
- 11:00 am** Operational Considerations and Well Layouts ..... John McLennan
- 11:30 am** Challenges of Sedimentary Basins ..... Richard Allis
- 12:00 pm** 15-minute **Break** ..... Brief Recess
- 12:15 pm** Site Potential from an Oil & Gas Industry Perspective ..... Richard Newhart
- 12:45 pm** Geochemical Considerations ..... Joe Moore
- 1:15 pm** Surface Facilities ..... Kevin Kitiz
- 1:45 pm** Facilitated Discussion and Summary ..... Sidney Green
- 2:30 pm** Adjourn

## To Register

e-mail [jmclennan@egi.utah.edu](mailto:jmclennan@egi.utah.edu) and an invitation will be sent

## About the Presenters

**Dr. John McLennan** is a USTAR Professor, in the Dept. of Chemical Engineering at the University of Utah. He had nearly thirty years working in industry prior to joining academia in 2008, and is an ARMA Fellow.

**Sidney Green** is founder/president Enhanced Production, Inc. in Salt Lake City, Utah and a Research Professor, at the University of Utah. He is a founder and past president of TerraTek, acquired by Schlumberger in 2006. He is an ARMA Fellow and member of the US National Academy of Engineering.

**Dr. Palash Panja** is a Research Scientist at the Energy & Geoscience Institute and an Instructor in the Dept. Chemical Engineering, Univ. of Utah. He has over ten years of research experience and five years of industrial experience.

**Dr. Richard Allis** is retired as the Director of the Utah Geological Survey and Utah State Geologist. He has worked extensively on geothermal energy in the US, New Zealand, and other countries. He is a licensed Professional Geologist in Utah.

**Richard Newhart** is a retired VP of Encana Energy. He has forty years' experience with exploration and production for oil and gas in various basins throughout the US. His background is in geology and play characterization.

**Dr. Joseph Moore** holds appointments as a Research Professor in the Department of Civil and Environmental Engineering and as an Adjunct Professor in the Department of Geology and Geophysics at the Univ. of Utah. His research has focused on the geology and geochemistry of geothermal systems. He currently serves as the Managing Principal Investigator of Utah's Frontier Observatory for Research in Geothermal Energy (FORGE), a U.S. Department of Energy initiative to develop Enhanced Geothermal Systems.

**Kevin Kitz** is a Professional Engineer and founder/owner of KitzWorks, LLC. He has worked in geothermal development, renewable energy, and waste heat recovery for over thirty years in the US and other countries.

## Acknowledgments

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