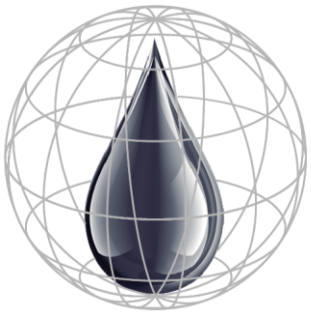

SPE IMPROVED OIL RECOVERY CONFERENCE

IOR 2026

Enabling IOR: Proven and Emerging Strategies for Maximizing Recovery

SPE International Mid-Continent Section

Challenges in Developing Low-Carbon Energies (Hydrogen, Geothermal and Carbon storage)

Prof. James Sheng, Texas Tech University

Course objectives

To mitigate climate change, production of clean energies or low carbon energies are becoming more and more important. These energies include hydrogen energy and geothermal energy. In producing and using traditional fossil energy and hydrogen, carbon is emitted. The carbon must be sequestered in the downhole formation. However, production of clean energies and sequestration of the emitted carbon are technically and economically challenging. This 1-day course will discuss the challenges. It will provide business decision makers, professionals in energy companies, and researchers with a picture in terms of technical barriers, commercial feasibility, and practical achievability. It may also provide a reference for their career adventures.

Topics to be Covered

1. Fundamental reactions, reaction conditions and products of hydrogen generation
2. Energy input and output of the hydrogen generation process from hydrocarbon fuel
3. What is the percentage of hydrogen in the produced syngas?
4. The amount of hydrogen compared with the amount of oil produced from an oil reservoir.
5. What are the constraints in hydrogen generation in oil and gas reservoirs?
6. Sustainability of heat production by cycling cold fluid to produce geothermal energy
7. Well productivity requirement for geothermal wells
8. Issues of storage capacity in aquifers, leakages through type II oil and gas wells and through cement
9. Current methodologies to study carbon storage

Target audience

This course is suitable for business decision makers in new energy development, and professionals in the oil and gas industry looking for career adventures in hydrogen and geothermal energy production, and carbon storage.

Instructor Bio

Dr. James Sheng is Professor in the petroleum department of Texas Tech University, a US Fulbright scholar, and a distinguished SPE member. He had worked in the oil industry for 20+ years before entering

academia. His main research areas are enhanced oil recovery, new energy development, and CO2 sequestration. The huff-n-puff gas injection in tight and shale reservoirs he proposed and developed has been widely accepted as the most feasible EOR method.

He holds his Ph.D. degree from The University of Alberta. He has (co)authored over 300 papers, and holds 8 US patents, and has published three books. His research work is ranked 13150th (Career) and 2727th (in Year 2023) in Stanford University's most-cited global researchers and is also ranked by ScholarGPS #10 Petroleum Engineering, #3 Enhanced Oil Recovery, #4 Unconventional oil in 2024; ranked #3,583 Overall (All Fields), #3 Petroleum in the past 5 years.