

Join the Webinar on
**CO₂ CAPTURING,
STORAGE AND
SEQUESTRATION**
CASES OF KSA
AND LEBANON



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10:00–11:30 am Beirut Time
WebEx Events



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**An Overview of the
Geological Storage Potential
of CO₂ in Saudi Arabia**

With the current escalating global concern about climate change, the oil & gas industry is facing unprecedented pressure to commit to the transition for low-carbon economies by reducing GHG emissions without disturbing the world's energy supply. As one of the world's leading oil and gas producers, the Kingdom of Saudi Arabia (KSA) has committed to reducing its emissions, as stated in its INDC for the Paris Agreement, and introduced the concept of the "Circular Carbon Economy". This framework is based on 4 principles (4Rs): Reduce, Reuse, Recycle, and Remove. While the first 3 Rs incorporate options such as efficiency improvement, renewables, utilization, and forestation, the 4th R is only achievable by long-term carbon storage in the subsurface as a viable and scalable technology. This talk provides an overview of different storage technologies applicable in KSA, including the evaluation of surface emissions, supercritical CO₂ storage in deep aquifers and depleted hydrocarbon reservoirs, and CO₂ mineralization in ultramafic and volcanic formations, a review of the first principles of entrapment mechanisms, which require an in-depth assessment of various chemo-hydro-thermo-mechanical processes, and a discussion about the challenge in accessing subsurface data, and a workaround.

Biography: Hussein Hoteit is an Associate Professor in Reservoir Engineering and the Energy Resources and Petroleum Engineering (ERPE) Program Chair at King Abdullah University of Science and Technology (KAUST). Before joining KAUST, Prof. Hoteit worked for ConocoPhillips and Chevron Companies for about 12 years, where he conducted projects related to chemical-EOR, CO₂-EOR, steam flood, EM-heating, and others. Prof. Hoteit's current research includes chemical EOR, geological CO₂ storage, IOR optimization, data-driven modeling, and reservoir simulation development. Prof. Hoteit earned several SPE awards, including SPE distinguished lecturer in 2009, and served as Associate Editor for SPE Journal for more than ten years.



Kassem Ghorayeb
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Advanced Energy,
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**CO₂ Capturing and Sequestration in
Lebanon – A Full Cycle Assessment and
Optimization towards Minimizing the
Country Emissions Footprint**

Carbon Capture and Sequestration (CCS) is one of the mitigation approaches needed to achieve the global climate targets. Without CCS, the cost of mitigating climate change will increase by 138%, thus limiting global warming may not be possible. In 2020, Lebanon declared its Intended Nationally Determined Contributions where it pledged to reduce Greenhouse Gas (GHG) emissions by 20% by 2030 as an unconditional target (at the current national conditions) and by 31% as a conditional one (with additional international support).

The "CO₂ Capturing and Sequestration in Lebanon – A Full Cycle Assessment and Optimization towards Minimizing the Country Emissions Footprint" project funded by the The Munib and Angela Masri Institute of Energy and Natural Resources contributes to addressing the CCS challenges. In this seminar, we will present the status of the research performed by the research team with a focus on the first component of the CCS value chain; that is carbon source characterization. CO₂ emissions from the energy sector was assessed under the current baseline scenario. In addition, based on the future development trends of influencing factors, Long Range Energy Alternatives Planning System (LEAP) was used to perform scenario analysis for the energy sector, assessing the 2020-2030 planning horizon.

Biography: Kassem Ghorayeb joined the Department of Chemical and Engineering and Advanced Energy in August 2016 after a long journey with Schlumberger where he held senior technical positions in the UK, Saudi Arabia, Kuwait and the UAE. Kassem's research focuses on field development planning optimization and CO₂ capturing and sequestration.

Kassem is still active in the industry as Global Reservoir Engineering and Field Development Planning Advisor at Schlumberger. In this position, he contributes to challenging FDP projects and integrated reservoir studies in which his roles include hands-on reservoir engineering, team leading, business development, peer review and mentoring.

