

# How reactor scale affects nuclear power plants siting in Saudi Arabia

*Wednesday, 15 November 2023 11:40 (20 minutes)*

Saudi Arabia plans to diversify its energy sector by focusing on low-carbon generation and nuclear energy is being explored in this context. Siting Nuclear Power Plants necessitates careful consideration of many factors such as water access, hazard exposure, proximity to anticipated load, and possible coproduct generation (e.g., desalination). Existing studies have only explored large light water reactors and identified limited coastal sites as possible due to consequent water requirements. However, small and micro modular reactors could mitigate this issue and open up a larger swath of the country. Here, we consider the added potential for nuclear when considering different sizes of reactors. We perform country-scale geospatial analyses at high resolution, using multiple reactor scales and corresponding criteria following internationally recognized guidelines. We identify viable sites across Saudi Arabia, and we show that decreasing the size of the reactors significantly increase the potential locations of nuclear power plants. We use existing infrastructure density to indicate the most economically promising sites. The power and siting flexibility of smaller reactors makes them good candidates to replace existing power generation infrastructure. This path can help Saudi Arabia develop a successful civilian nuclear program.

## Speaker Bio

**Primary authors:** Dr L'HER, Guillaume (Colorado School of Mines); Mr ALQAZLAN, Saleh (King Fahd University of Petroleum and Minerals); Prof. DEINERT, Mark (Colorado School of Mines)

**Presenter:** Dr L'HER, Guillaume (Colorado School of Mines)

**Session Classification:** Day 3- Parallel Session - II : Safety and Severe Accidents

**Track Classification:** Fusion and Advanced Reactors