



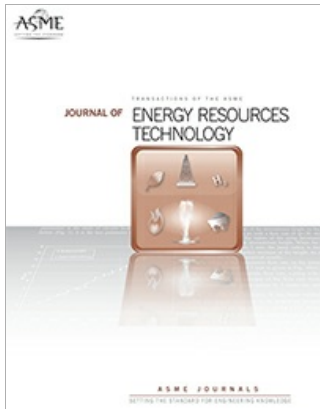
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Macro Energy Trends and the Future of Geothermal Within the Low-Carbon Energy Portfolio

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Abstract

Exploratory analysis was conducted to understand energy diversification trends within the oil, gas, and power industry and to examine whether geothermal technologies play a role in the low-carbon energy mix. Investigations were completed using the 2018 end of year financial reports for 36 companies. Macro-scale insights reveal a significant split between European and US-based oil and gas companies in terms of strategy which is mirrored by the power companies. Diversification into low-carbon technologies is driving an energy convergence between the oil and gas and power sectors. Presently, the oil and gas industry is not actively investing in geothermal technologies, favoring instead solar photovoltaic (solar PV), onshore/offshore wind, biomass/gas, gas to power and storage. The macro-scale analysis is coupled with, 20, semi-structured interviews with geothermal and energy specialists. The interviews provided an insight why oil and gas companies have resisted entering the geothermal industry. In addition the interviews were organized into a Political, Economic, Social, Technological, Legal and Environmental, PESTLE, analysis to understand the present-day external environment of the geothermal industry in the USA today. The combined analyses indicate that the regulatory, business and finance environment for geothermal, in the USA, is challenging. Recent geothermal innovations that increase the footprint of the geothermal industry, offering new scalable, low-carbon baseload concepts, might provide an avenue for the oil and gas industry to enter the geothermal domain, while leveraging their existing core competencies, intellectual property (IP), technology, assets, and workforce knowledge skills and experience.

Issue Section: [Geothermal Energy](#)

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Within the transport sector our roadmap envisages the mass adoption of electric vehicles in place of traditional petrol and diesel cars with heavy goods vehicles running on biogas in the form of compressed biomethane. This coupled with the electrification of public transport could reduce transport emissions by up to 94%. The evolution to a low carbon economy will require an energy transition; a fundamental shift in the way that energy is both generated and consumed. 5 Transitioning to a low carbon energy system. Transitioning to a low carbon economy will create direct health benefits. Recent Brexit developments have raised concerns about the future of the Single Electricity Market. Lower-carbon energy solutions such as wind, solar, geothermal, hydro, marine and nuclear power, zero net energy schemes, microgrids, and district heating all have a part to play in addressing the Energy Trilemma. In the video below, our experts discuss the challenges of devising energy systems that meet demand in more sustainable ways. Cutting demand through energy efficiency is a vital part of tackling the trilemma, as the low-carbon routemap we created for the UK Green Construction Board demonstrates. It shows that cutting greenhouse gas emissions by 80% by 2050 will only be possible if, along with more renewable energy, organisations take responsibility for making the built environment

more energy-efficient. Geothermal energy is produced in Iceland, Italy, Japan, New Zealand, Russia and the United States. At the present time, it accounts for only 0.1% of the world's energy production but its relative importance may grow in the future as the potential resources of geothermal energy are believed to be very large. In geothermal energy extraction, use is made of hot steam or water derived from high-temperature rocks deep inside the earth. The geothermal fluids carry natural radionuclides and especially ^{222}Rn , which is discharged into the atmosphere. From measurements