

# ONE DISCIPLINE, TWO ARENAS - RESERVOIR ENGINEERING IN GEOTHERMAL AND PETROLEUM INDUSTRIES

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## **ABSTRACT**

The similarities and differences in reservoir engineering in the geothermal and petroleum industries are not familiar to many. This unfamiliarity frequently leads to aberrant perception of the risks and rewards of geothermal development in the minds of developers and financiers who are accustomed to the petroleum industry but are new to geothermal. This paper is a comparative survey of the state-of-the-art of reservoir engineering in the two industries.

This survey leads to the following conclusions. First, compared to petroleum, geothermal reservoir engineering is more challenging in that conceptual modeling has more complexity, parameter estimation has more limitations, and volumetric reserve estimation has more uncertainty. However, the saving grace of geothermal reservoir engineering is numerical simulation, which allows one to overcome the above limitations and produce estimates of reserves and forecasts of reservoir and well behavior that are at least as reliable as in the petroleum industry. Second, the term "reserves" in the geothermal industry has no standard definition, and in fact is a misnomer compared to the usage in the petroleum industry. Third, unlike in the petroleum industry, reservoir engineering and geoscience are intricately intertwined in geothermal. Finally, empirical knowledge about the nature of geothermal reservoirs is minimal and the body of literature on geothermal case histories is minuscule compared to petroleum. This imposes a higher premium on the practical experience of the engineer in geothermal reservoir engineering.

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