

WORLD OUTLOOK FOR GEOTHERMAL ELECTRICITY 2014

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Geothermal energy has undergone a renaissance over the past ten years, as many new technologies and new countries have joined the industry. Historically high oil prices since 2005 have focused attention on renewable energy, supported by a global ambition to address greenhouse gas reduction. Geothermal developments have accelerated in many parts of the world, both in countries (such as New Zealand, Indonesia and the US) that have a traditional interest in "conventional" geothermal resources, as well as countries without a historical interest in geothermal energy (such as Australia and Germany). Some new developments have followed well-worn paths using conventional hydrothermal resources in volcanic regions, while others have struck out in new directions in Enhanced Geothermal System (EGS) projects in nonvolcanic regions.

As an example of the development of traditional, volcanic geothermal resources, the United States is the world's largest producer of geothermal electricity, with an installed capacity of 3093 MW (in 2010), as well as having added more capacity since 2006 (520 MW) than any other country. In 2010, the states of California and Nevada both generated about 6% of their electricity from geothermal sources.

As an example of the development of untraditional, nonvolcanic geothermal resources, Germany has adopted an aggressive pursuit of green energy, in a strategy known as Energiewende. The provision of generous feed-in tariffs for renewable energy of all kinds has made dramatic changes in the overall energy mix of the country during the past 10 years. As of November 2013, there were a total of 26 operating geothermal projects in Germany, out of which eight were generating electricity (five of the eight projects are combined heat-and-power, and three are electrical generation only). 19 of the projects provide direct heat, without generating electricity. The total geothermal electrical generation capacity was 26.31 MWe. Another 13 projects are under construction, with an expected capacity of more than 40 MW.

Technology has allowed for developments of conventional resources with lower temperature, restricted water access, and constrained surface utilization. EGS projects have launched in a variety of different directions and places (the US currently has six active EGS developments). The use of innovative hybrid plants, lower resource temperatures and enhanced reservoir stimulation has made geothermal energy accessible in a much wider variety of places.