

Energy Reserves and Costs of Geothermal Resources in Hawaii

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ABSTRACT

A new assessment has been performed of the capacity for electrical generation of seven geothermal resource areas in the State of Hawaii. The assessment has included an estimate of costs for future geothermal power plants in the state. The potential of geothermal resources for hydrogen generation and direct-use applications is also discussed. Five geothermal resource areas on the Island of Hawaii are estimated to have a combined minimum megawatt (MW) capacity of 488 MW, and a combined most likely MW capacity of 1,396 MW. For the two geothermal resource areas on the Island of Maui, the combined minimum MW capacity is 38 MW, and the combined most likely MW capacity is 139 MW. The mean levelized power cost for new geothermal plants in Hawaii is estimated to be 7.84 cents per kilowatt-hour ($\text{\$/kWh}$), with a standard deviation of 0.70 $\text{\$/kWh}$. With a cumulative probability of 90%, levelized cost is expected to be higher than 7.0 $\text{\$/kWh}$ but lower than 8.7 $\text{\$/kWh}$. Forecasts are presented for the potential growth of electrical generation capacity from geothermal resources on the islands of Hawaii and Maui. Potential exists for using surplus geothermal capacity during off-peak hours for the generation of hydrogen. There is also potential for certain direct uses, especially if the use of geothermal resources for electrical generation becomes more widespread in the state.

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