



Geothermal Energy, Clean Power from the Earth's Heat: Usgs Circular 1249

By Wendell A Duffield, John H Sass

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****. Societies in the 21st century require enormous amounts of energy to drive the machines of commerce and to sustain the lifestyles that many people have come to expect. Today, most of this energy is derived from oil, natural gas, and coal, supplemented by nuclear power. Local exceptions exist, but oil is by far the most common source of energy worldwide. Oil resources, however, are nonrenewable and concentrated in only a few places around the globe, creating uncertainty in long-term supply for many nations. At the time of the Middle East oil embargo of the 1970s, about a third of the United States oil supply was imported, mostly from that region. An interruption in the flow of this import disrupted nearly every citizen's daily life, as well as the Nation's economy. In response, the Federal Government launched substantial programs to accelerate development of means to increasingly harness alternative energies - primarily biomass, geothermal, solar, and wind. The new emphasis on simultaneously pursuing development of several sources of energy recognized the timeless wisdom found in the proverb of not...



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Geothermal power is already an important energy resource for our nation and the world. Hydrothermal plants in the western states now provide about 2,500 megawatts of constant, reliable electricity, which meets the residential power needs for a city of 6 million people. Over 8,000 megawatts are currently being produced worldwide. A variety of industries, including food processing, aquaculture farming, lumber drying, and greenhouse operations, now benefit from direct geothermal heating. The alligators in the following picture are grown in geothermally heated water in Idaho. Hydrothermal systems ...¹ Duffield, W. A. Geothermal Energy – Clean Power From the Earth's Heat. Reston, Virginia: United States Geological Survey, 2003. Geothermal Today. Development of geothermal energy provides an attractive opportunity to address greenhouse gas emissions and decrease reliance on nonrenewable resources (Murphy & Niitsuma 1999; Fridleifsson 2001). Recovery of even a small percentage of the heat contained within the upper 10 km of the Earth's crust could provide an amount of energy equivalent to several hundred times that contained within the world's oil and gas reserves (Duffield & Sass 2003). A recent study by Tester et al. (2006) estimates that geothermal energy could meet a significant percentage of the electricity demand. Geothermal energy is the heat emanating from underneath the surface of the earth.² The term geothermal originates from the Greek words; Geo, which means earth and Thermal, which means heat. This derivation quickly points to the definition of geothermal energy, which is heat emanating from underneath the surface of the earth. The energy inside the earth was formed by the decay of minerals and forests several years ago.³ The power plant harnesses the steam from the hot water beneath the earth's surface to turn turbines, which later activates a generator to produce electricity. Some geothermal power plants utilize steam to directly turn the turbine. Others utilize the steam to heat a liquid that is used to turn the turbine. Geological Survey Geothermal Energy Earth's Heat.⁴ Circular 1249. U.S. Department of the Interior U.S. Geological Survey. Geothermal Energy – Clean Power From the Earth's Heat. By Wendell A. Duffield and John H. Sass. C1249. U.S. Department of the Interior U.S. Geological Survey. ii.⁵ Geothermal energy is present everywhere beneath the Earth's surface, although the highest temperature, and thus the most desirable, resources are concentrated in regions of active or geologically young volcanoes.