

Appendix 1

Some Potential Advantages of Electricity Power Generation from Montana's Geothermal Resources

- ✓ **The availability of geothermal power resources in Montana will increase.**

Many oil wells in eastern Montana produce not only oil, but also sizeable quantities of hot water at temperatures sufficient to run small binary cycle turbines to generate electrical power. While the geothermal energy resource at any one oil well is likely to be small (less than a megawatt), aggregating the wells in a large oil field could produce significant power at low cost, since the wells have often already been drilled for oil and gas production. In addition, the technology for generating electricity from geothermal energy is constantly improving, and price drops for this equipment should continue.
- ✓ **Geothermal power is reliable.**

Electricity generated from geothermal energy is a preferred type of energy known as “base load power.” This base load power from electrical generation is always “on” or always available at the flip of a switch. Existing geothermal power plants in the western United States have a “capacity factor,” or availability, of 85 to 95 percent or more, which is well above the capacity factor for coal power plants or other traditional base load power generators. Very little goes wrong with a geothermal power plant — often they only need to shut down for a day or two a year for normal maintenance. A properly designed and sited geothermal power plant takes advantage of deep reservoirs of hot water under pressure. These geothermal energy reservoirs, if properly managed, will provide the thermal energy needed for power generation for years into the future.
- ✓ **Electricity produced from geothermal energy is one of the cheapest sources of power available.**

The price of geothermal power is comparable to that of wind power, new coal plants, or biomass. While considerable investments may be needed to discover and assess geothermal resources, the power generation equipment available today is modular, quick to install, and fairly easy to operate. And if geothermal resources from existing oil and gas wells can be used, the economics are even more attractive, since no new wells need to be drilled.
- ✓ **Geothermal power systems have a small environmental footprint.**

Where solar and wind farms gather energy over large areas, a geothermal plant gathers heat from the hot rock or fluids below ground by means of one or a few wells. The footprint of the generator and associated pumps and cooling tower would be much smaller than the footprint of a coal fired plant generating the same amount of power. And most geothermal systems are “closed-loop,” with only the heat energy extracted from the water. No geothermal fluids are exposed to the atmosphere, and there are almost no emissions of carbon dioxide or other pollutants. The fluids are simply pumped to the surface, the heat is extracted, and then the fluids are returned via an injection well to a permeable layer beneath the earth's surface.
- ✓ **Geothermal energy is a renewable resource.**

After the heat is extracted from geothermal water for power generation, it is reinjected into the earth where it can be heated again by the earth's natural temperature gradient.

Adapted from *Geothermal, the Other Baseload Power*

www.altenergystocks.com/archives/2007/10/geothermal_the_other_base_load_power.html