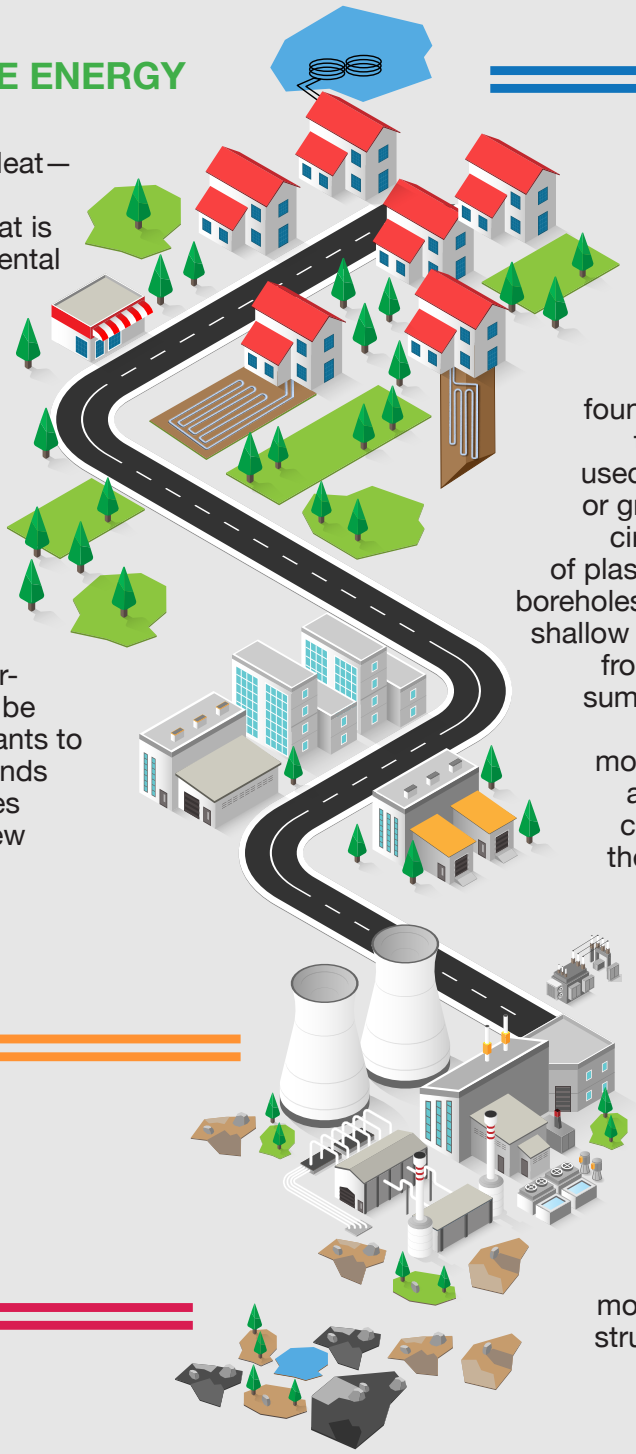
THE GEOTHERMAL ECOSYSTEM

CLEAN & RENEWABLE ENERGY FROM THE EARTH

Geothermal Energy or Earth Heat—is a clean, abundant, and renewable natural resource that is helping us meet our environmental vision. Geothermal heat pumps can be installed almost anywhere and are an ideal way to heat and cool our homes, schools and workplaces. Where Nature creates the right conditions, geothermal hot springs can provide energy for fish farms, greenhouses and municipal heating systems. And in some places, deep geologic activity creates super-hot water and steam that can be used by geothermal power plants to generate electricity for thousands of consumers. All of these uses offer renewable energy with few environmental impacts.

200˚~700˚F "Volcanic" Deep Resource Temperatures

90˚~200˚F "Hot Spring" Aquifer Temperatures



0˚~70˚F Average U.S. Ground Temperatures

GEOTHERMAL HEAT PUMPS

Residential and Commercial Heating and Cooling

Ground-source geothermal heat is found everywhere just a few feet below the surface of the Earth. In a widely used installation method, geothermal—or ground-source—heat pumps (GHPs) circulate water through a closed loop of plastic pipe that is inserted into vertical boreholes or laid out horizontally in relatively shallow trenches. The fluid discharges heat from a building into the ground during summer, and taps the ground's warmth during winter. GHPs are among the most efficient technologies for heating and cooling buildings. Compared to conventional systems, GHPs reduce the amount of energy used by homes and commercial buildings by 40% to 70% (including fossil fuels and power from the electric grid). They can also heat water for domestic use as a bonus. GHP systems require little maintenance, and provide reliable heating and cooling year round. GHPs use a small measure of electricity to move much greater volumes of renewable energy from the Earth to and from buildings. As a result, GHPs deliver three to four times more energy to a home or commercial structure than the unit itself consumes from the power grid.

Geothermal Exchange Organization • 312 S. 4th St., Ste. 100 Springfield, IL 62701 • (217) 572-1261 • www.GeoExchange.Org

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GEOEXCHANGE®

GEOTHERMAL POWER

Large-Scale Electricity Generation for the Grid

In unique locations primarily in the western United States, nature's volcanic and other geologic forces have created deep and very hot geothermal fluid systems that are suitable for power plant development. Heat from these geologic sites produces steam that is then used to drive turbines to produce electricity.

Attributes of Geothermal Power:

- Renewable resource
- Provides power 24/7 compared to wind and solar
- Domestically sourced
- Small footprint compared to conventional power plants
- Produce no greenhouse gas emissions

GEOTHERMAL DIRECT USE

Aquaculture, Greenhouses, Resorts and Spas

In some mountainous and geologically active parts of the country, geothermal springs and aquifers yield waters that are useful directly from the Earth. Direct-Use geothermal resources are usually found at economical drilling depths and have few if any efficiency losses, because their hot water resource is applied directly from the well to its purpose.

Direct-Use Geothermal Applications:

- Heating pools
- Fish farming or aquaculture
- Greenhouses
- Spas
- Hot spring resorts

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