All information used in the development of this infographic was taken from the Department of Energy sponsored ‘National Geothermal Academy’. If you are interested in learning more about geothermal energy industry, please visit: https://energy.gov/eere/geothermal/geothermal-technologies-office or http://www.geothermal.org/

Geothermal Heat Pumps (GHPs)

Geothermal heat pumps (GHPs) make it possible not only to heat, but also cool a house without traditional, noisy, and expensive air-conditioning units. GHPs are the most commonly used form of direct-use geothermal energy, accounting for approximately 40% of worldwide usage.

Agriculture

Geothermal energy is commonly used in cold-weather environments where low to high temperature geothermal resources are abundant.

District Heating

Geothermal district heating is very similar to GHP. The main difference is in the scale of heat being provided. District heating can provide heat to whole cities instead of just singular houses. Displayed below is the geothermal district heating grid for Klamath Falls, Oregon.

Geothermally heated liquid, called brine, is collected from the geothermal reservoir. When heated from geothermal brine, the working fluid evaporates to steam, the steam drives a turbine, the turbine powers a generator, the generator creates electricity and electricity is sent to the power lines.

Klamath Falls Geothermal District Heating System

Typical heating systems used to heat the greenhouses are shown to the right.

Application Benefits:

- Reduction of greenhouse operating costs
- Operation in cold climate conditions
- Perfect for low & high-temperature geothermal resources (75-195°)
- Controls internal humidity/condensation (prevents agricultural diseases)

Design Considerations:

- Geothermal systems may need to be isolated from the rest of the grid for Klamath Falls, Oregon.
- This process is continued and contained within 2 closed loop systems.