

GEOHERMAL IN SCHOOLS

TREEDC Conference

Dec.15-16, 2016

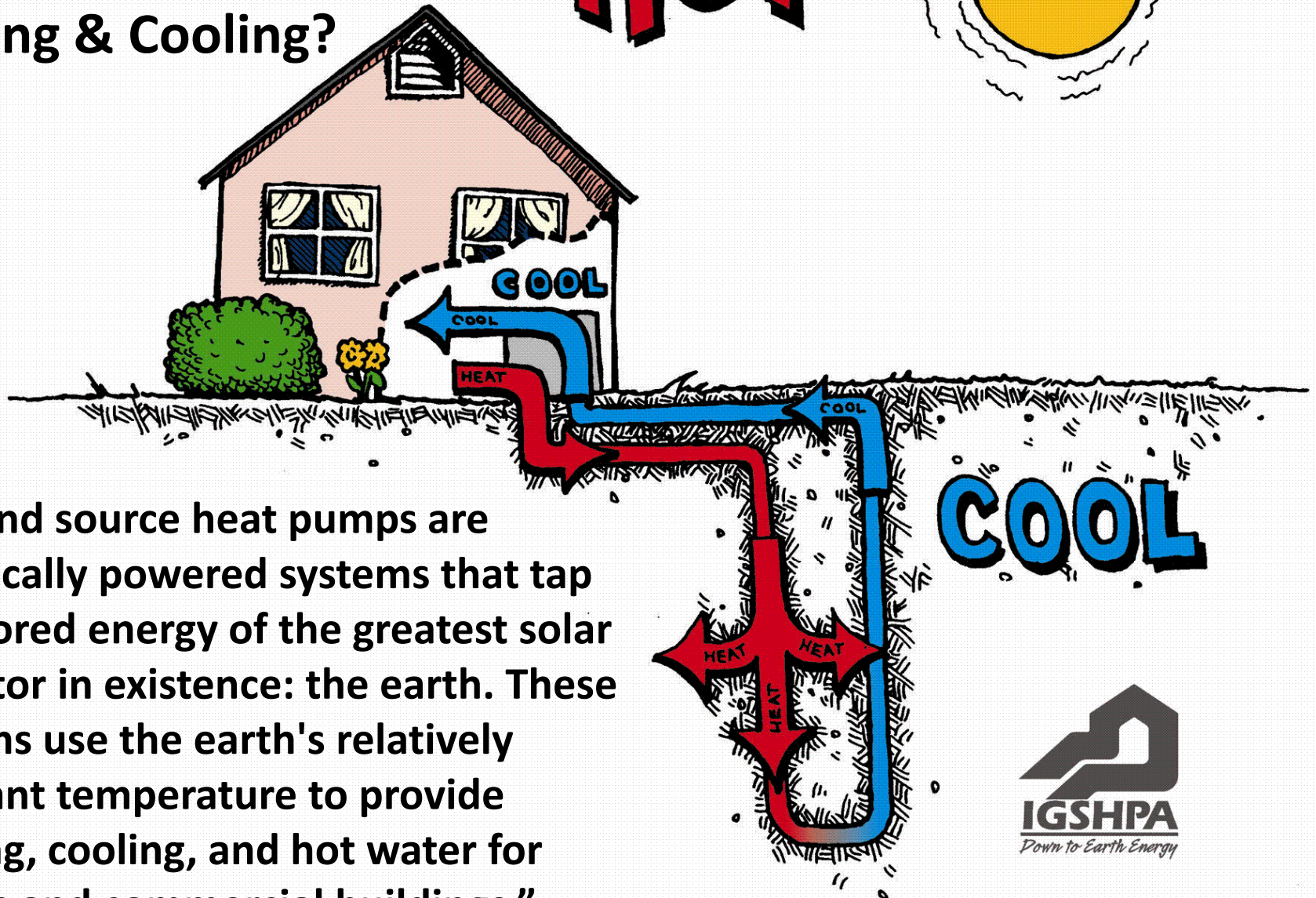
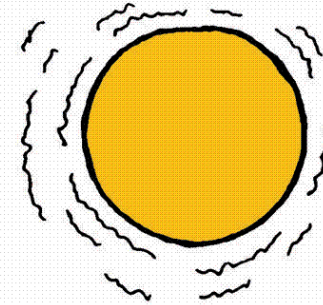




What is
GEOTHERMAL?

What is Geothermal Heating & Cooling?

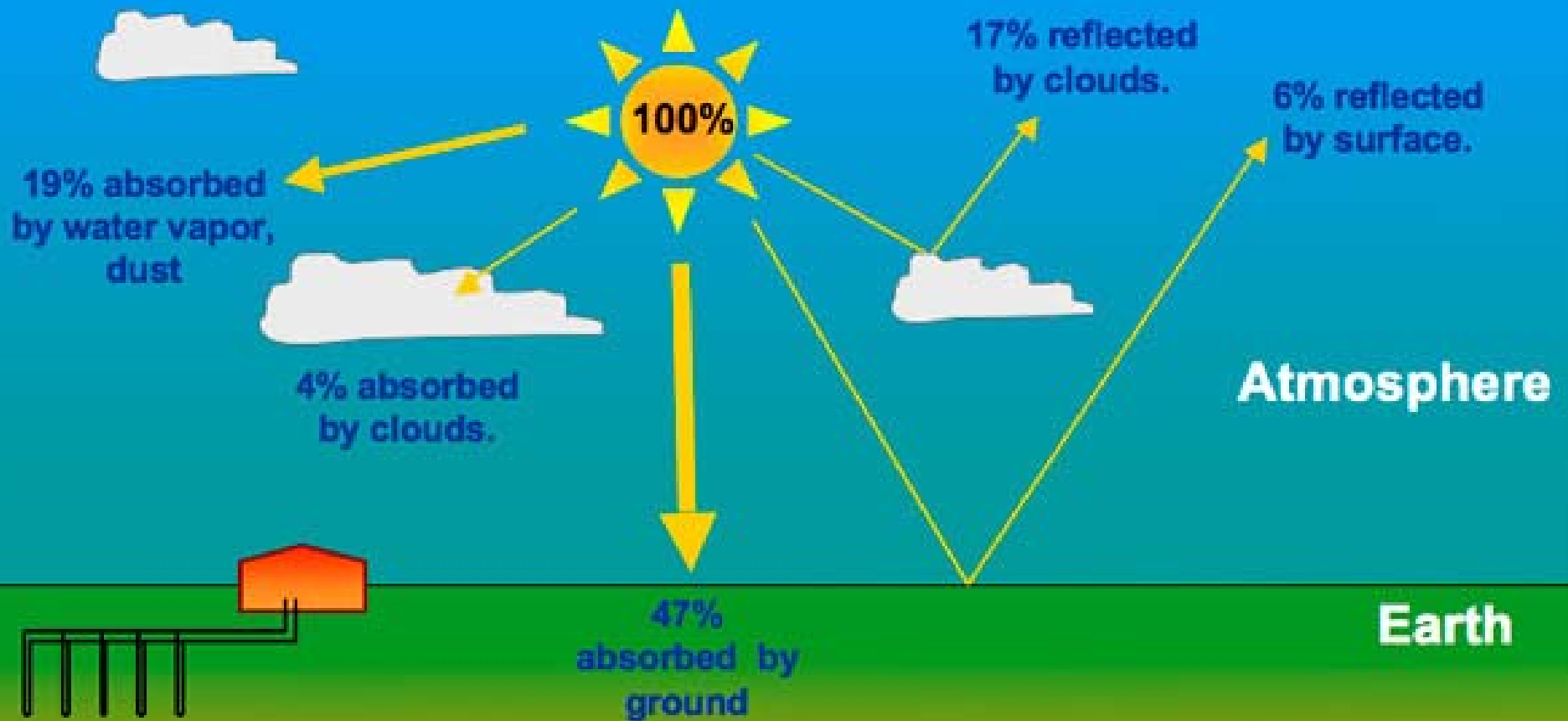
HOT



“Ground source heat pumps are electrically powered systems that tap the stored energy of the greatest solar collector in existence: the earth. These systems use the earth's relatively constant temperature to provide heating, cooling, and hot water for homes and commercial buildings.”



Geothermal Energy: Where does it come from?



The earth is like a solar battery absorbing nearly half of the sun's energy. The ground stays a relatively constant temperature through the seasons, providing a warm source in winter & a cool sink in summer.

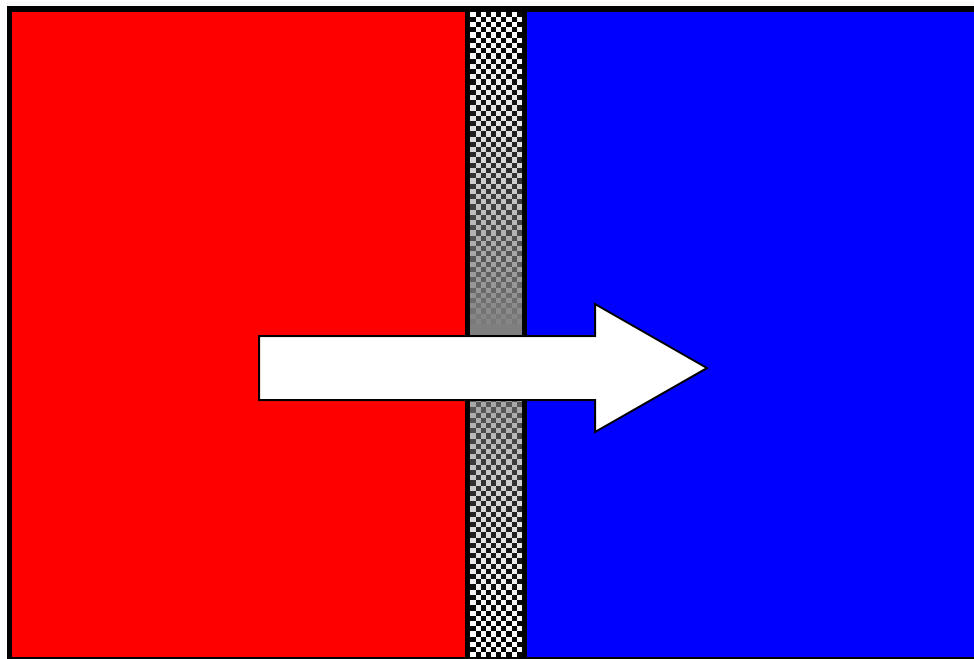


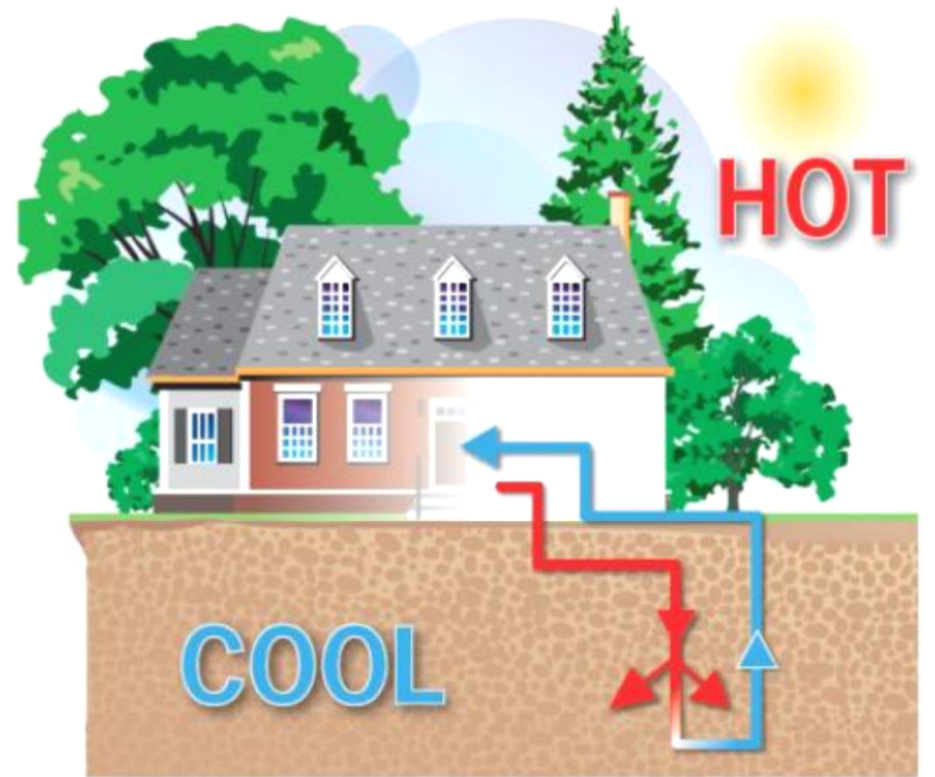
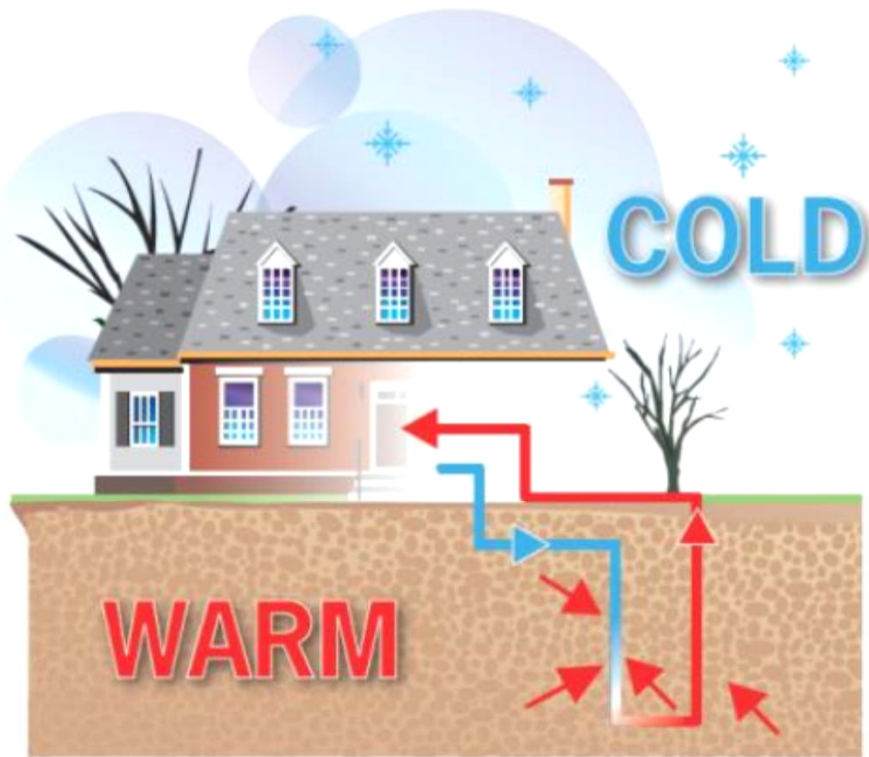
How/Why Does GEOTHERMAL Work?

① 1st Law of Thermo – Energy
(heat) can be stored or transferred, but
not created or destroyed

② 2nd Law of Thermo – Energy
(heat) flows down hill

HEAT





The possibility of receiving
\$5 of energy for every \$1
of energy used!

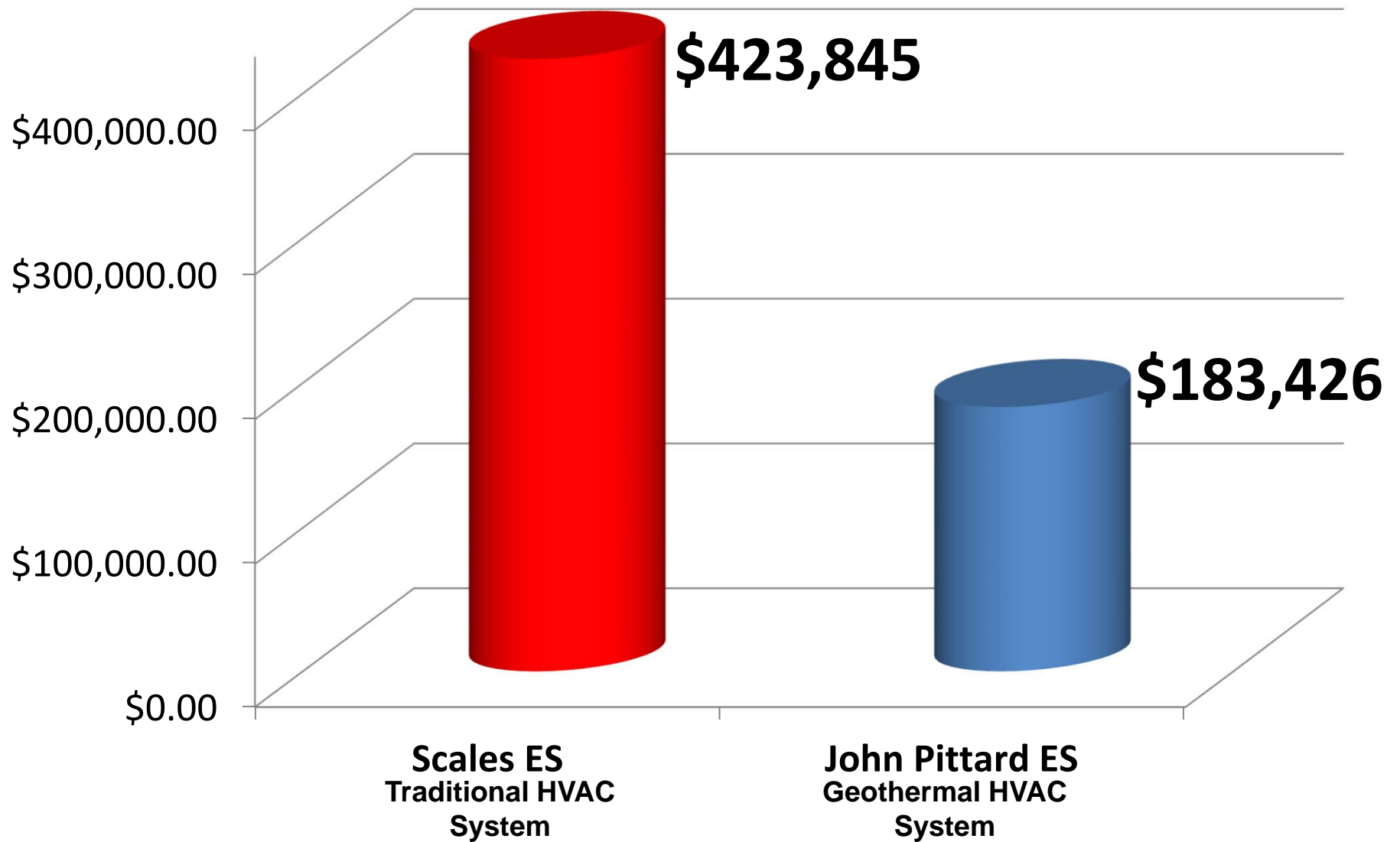


Does
GEOTHERMAL
really work?
Will it work for
Schools in
Tennessee?

Murfreesboro City Schools

- Scales Elementary School
- John Pittard Elementary School
- Same Architect
- Same square footage & floorplan
- Same number of students
- Different HVAC systems
- Drastically different energy cost

Annual Utility Costs




In other words it cost
\$.11/ft² to heat and cool
Pittard ES and \$.23/ft² to
do the same at Scales ES!

“The school system will see a
payback on the more expensive
heating and cooling system in less
than two years.”

~Gary Anderson, finance and administrative services director for
Murfreesboro City Schools

“Energy costs are undoubtedly one of the highest expenses schools face today. Teaching educators how to work with students to **conserve energy** not only generates a cost savings for the school, but fosters a sense of responsibility at an early age, creating a win-win solution for schools and students.”

~Gary Anderson, finance and administrative services director for
Murfreesboro City Schools

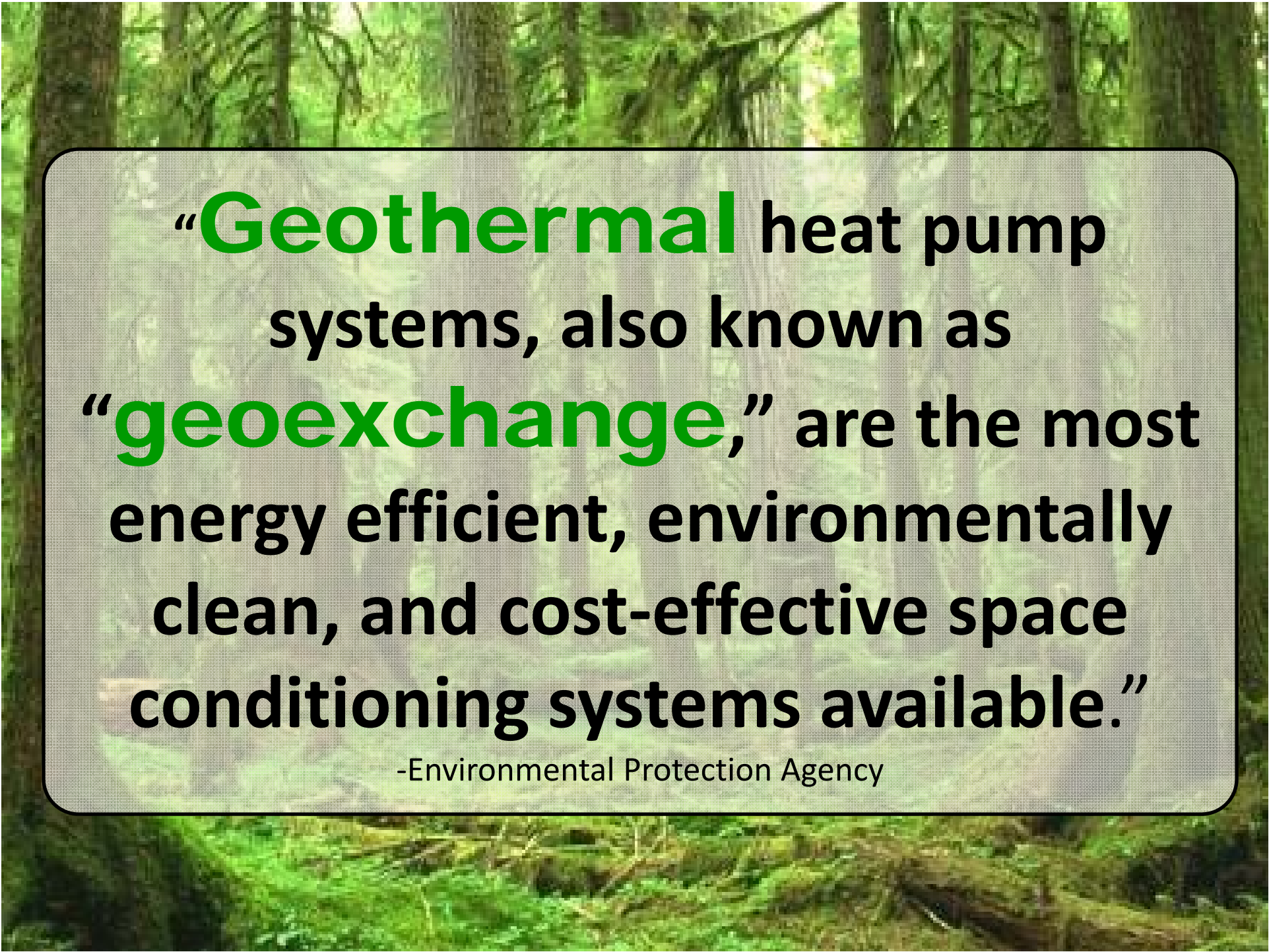


262,250 ft²
362 Bores @ 300' Ea
+\$270,000

**Signal Mt. Middle-
High School**

“At Signal Mountain Middle-High School, which opened in the fall of 2008, going underground with **geothermal** pipes for the school's heat pumps saved **\$185,000** in energy costs in the first school year.”

~Gary Waters, Hamilton County Schools Assistant Superintendent



“Geothermal heat pump systems, also known as “geoexchange,” are the most energy efficient, environmentally clean, and cost-effective space conditioning systems available.”

-Environmental Protection Agency



Questions