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Storing CO₂ Deep Underground

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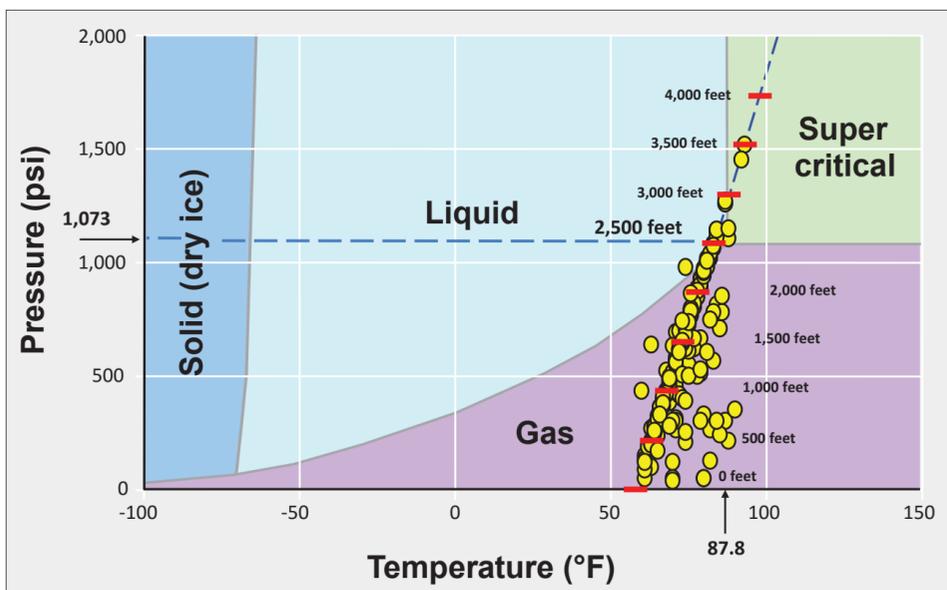
Storing CO₂ Deep Underground



Stephen F. Greb

What Is Supercritical CO₂?

In chemistry, the term “supercritical” does not imply danger. Rather, it defines a phase in which materials have properties of both gases and liquids.



This graph shows the phases of carbon dioxide (CO₂) at different pressures and temperatures. The yellow dots represent pressures and temperatures recorded from wells drilled in Kentucky. Pressure and temperature increases with depth. At surface pressure and temperature, CO₂ is a gas. At a pressure of 1,973 psi and temperature of 87.8°F, CO₂ is a supercritical fluid. This pressure and temperature occur at depths of approximately 2,500 feet in Kentucky.

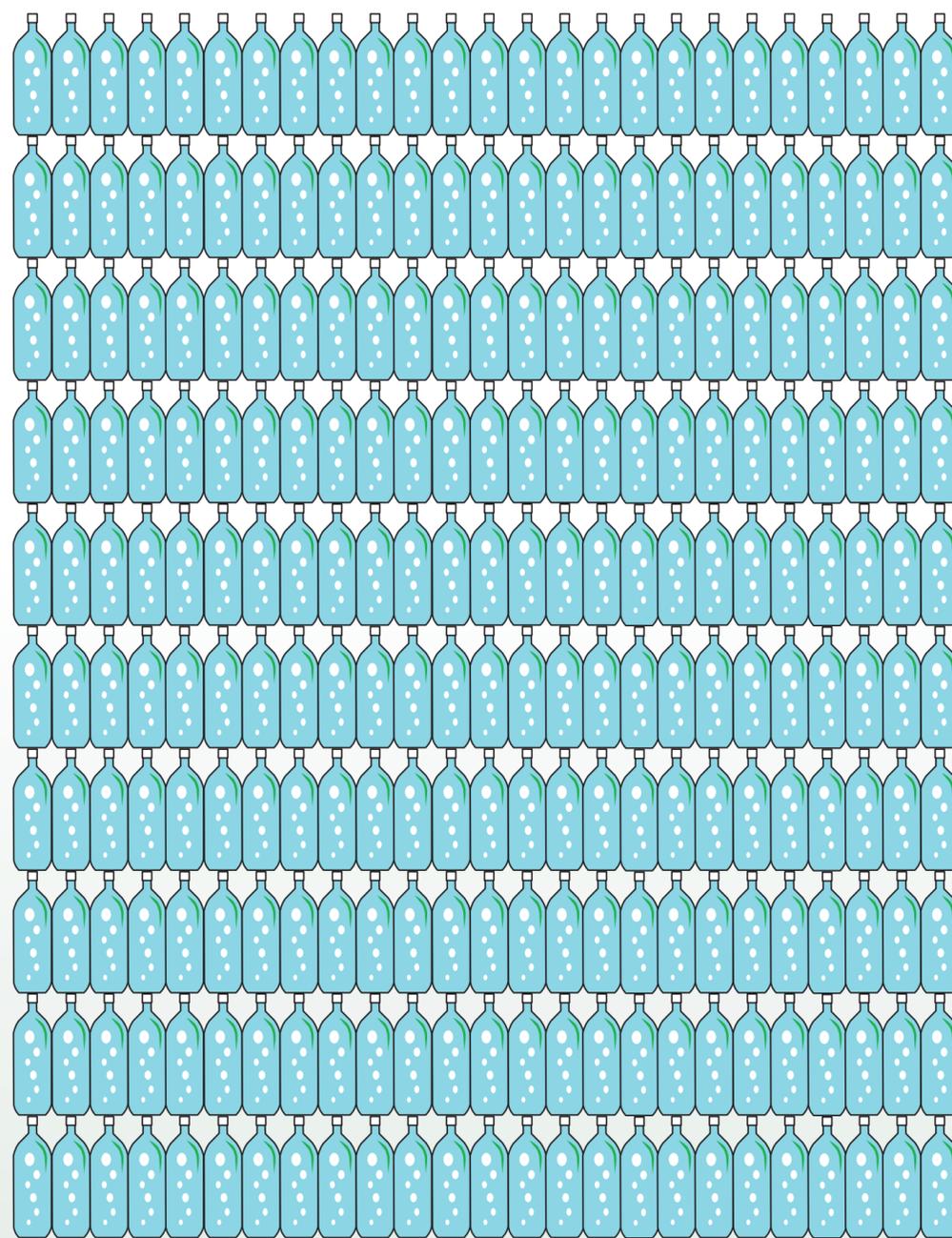
At depths of more than 2,500 feet, the volume of CO₂ is reduced more than 250 times. This is an important aspect of geologic CO₂ storage.

Average coal-fired power plants emit more than 10,000 tons of CO₂ per day. Vast amounts of CO₂ may need to be reduced in the future.

Because of the large amounts of CO₂ that may need to be reduced, the volume reduction in the supercritical phase is one of the advantages of geologic sequestration.

Bubbles in Soft Drinks Are CO₂

If you had 250 bottles of CO₂ at the surface and you injected them more than 2,500 feet below the ground...



...the supercritical CO₂ would occupy the space of only one bottle!

