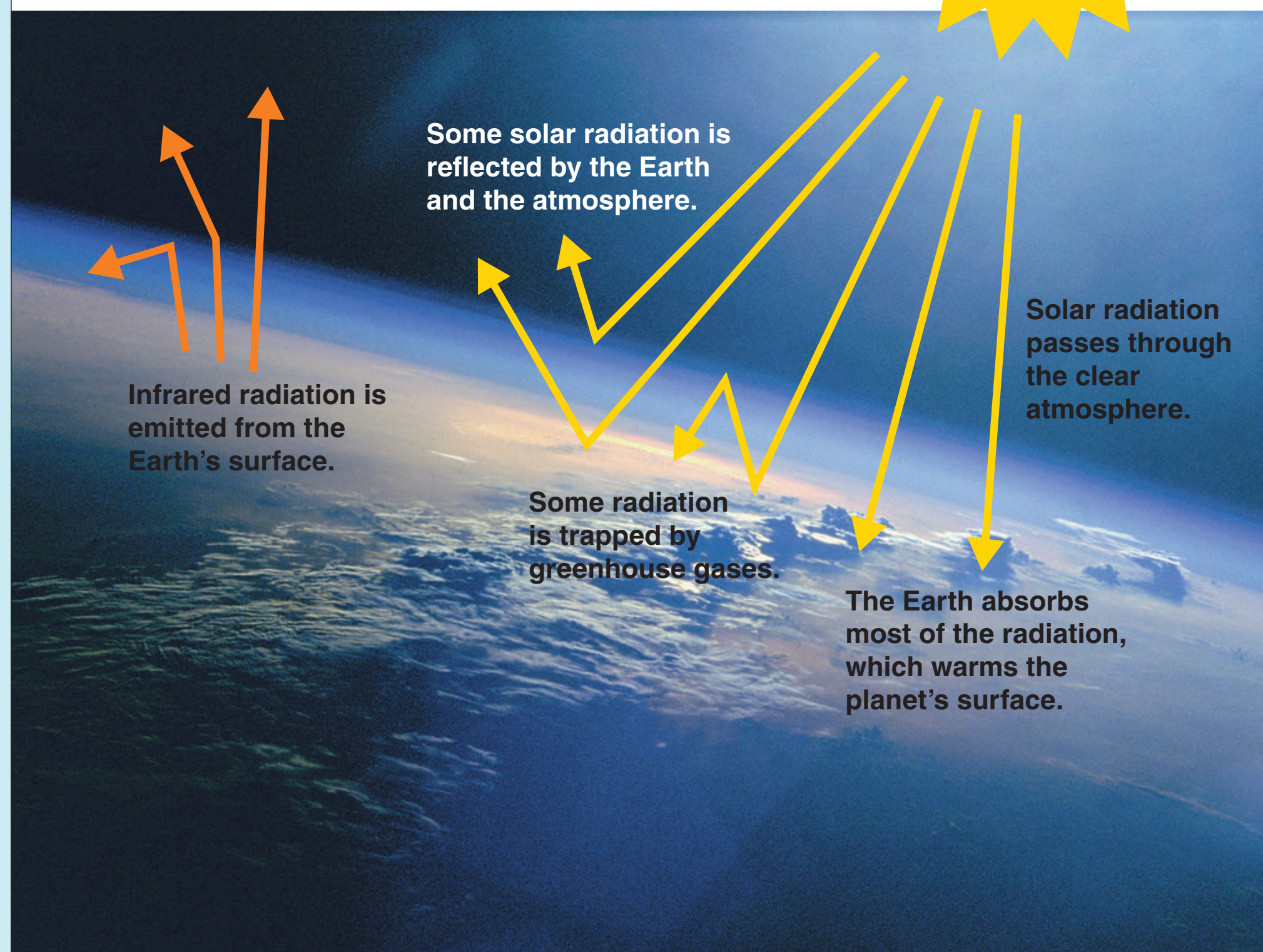


Carbon Capture and Sequestration: Bridging the Gap

Greenhouse Effect

Some solar radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. This process warms the Earth's surface and lower atmosphere.



- In 1827, J. B. J. Fourier discovered the greenhouse effect.
- The atmosphere warms the planet by trapping the Earth's heat. The gases in the atmosphere raise the average temperature approximately 60°F.

Figure modified from www.epa.gov

Global Warming

Global warming is the average increase in the Earth's temperature over time.

- The Earth's temperature has changed over geologic history.
- Average temperatures have increased 1°F over the past century. Leading scientists think humans have contributed to this increase in emission of greenhouse gases.

Common Greenhouse Gases

Carbon dioxide (CO₂)

- Emissions come from burning fossil fuels (oil, natural gas, and coal).

Methane (CH₄)

- Emissions come from landfills, rice paddies, livestock, organic waste such as sewage, and coal seams.

Nitrous oxide (N₂O)

- Emissions come from fertilized croplands and burning fossil fuels.

Water vapor (H₂O)

- Emissions come from natural sources, industrial processes, and transportation.



Carbon Sequestration

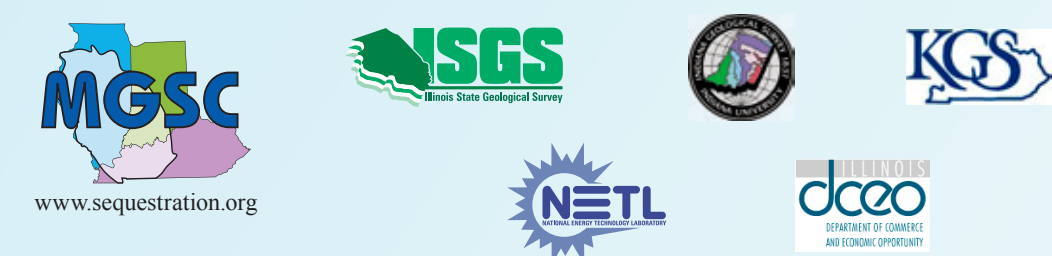
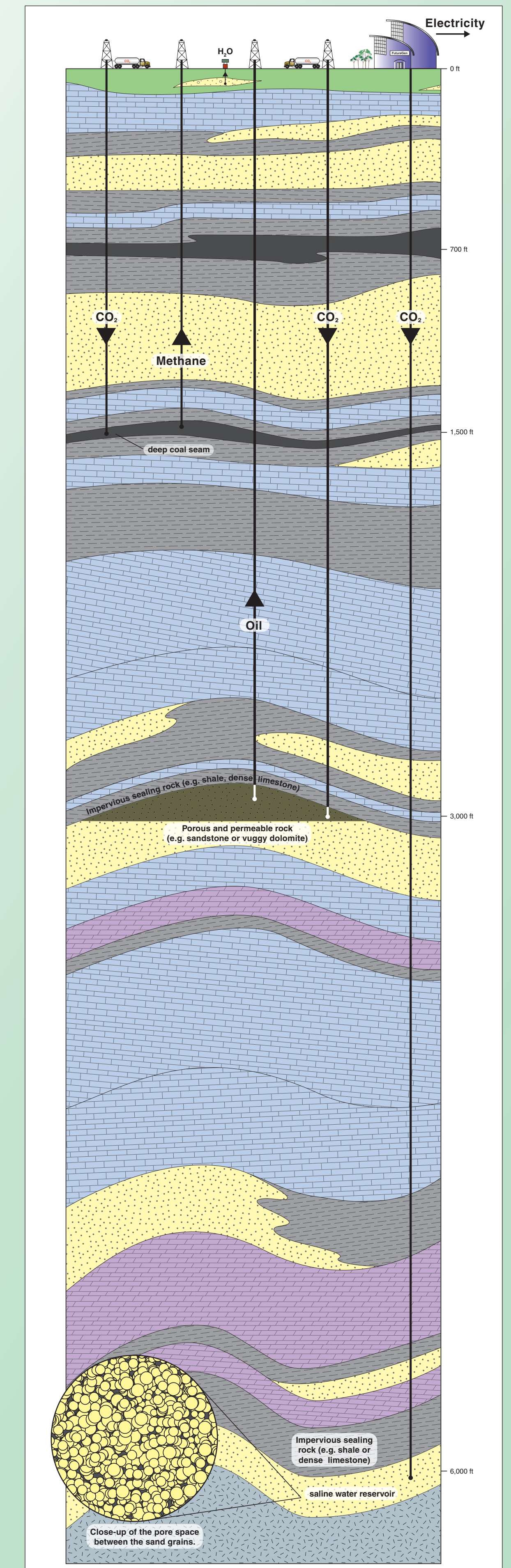
Carbon sequestration is the capture of carbon dioxide from point sources before the gas enters the atmosphere. Reducing the amount of CO₂, a greenhouse gas, emitted into the atmosphere may help slow global warming.

Sequestration options:

- Geologic sequestration stores carbon underground in coal seams, saline aquifers, or oil reservoirs.
- Terrestrial sequestration stores carbon in soils, crops, or other plants.
- Oceanic sequestration stores carbon at the bottom of the ocean.

The Illinois Basin is a good place for geologic sequestration:

- The Basin offers long-term storage deep in the Earth.
- Side benefits may include enhanced recovery from oil reservoirs and methane from coal seams.



Authors: Sallie E. Greenberg, Robert J. Finley, and Edward Mehnert for the Midwest Geological Sequestration Consortium. Produced by the Illinois State Geological Survey, William W. Shilts, Chief, 615 E. Peabody Dr., Champaign, IL 61820-6964 (217-244-2414; <http://www.isgs.uiuc.edu>).

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