

Natural Gas in Texas

Energy resources are available on a renewable, nonrenewable, or indefinite basis. Understanding the origins and uses of these resources enables informed decision-making. Students should consider the ethical/social issues surrounding Earth's natural energy resources, while looking at the advantages and disadvantages of their long-term uses. Fossil fuels are natural fuel sources formed by historical geological processes from the remains of living organisms. The most famous fossil fuels include coal, oil, and natural gas. These are non-renewable, meaning these sources of energy are depleted by use and can be permanently eliminated. Alternate fuel sources include solar, wind, biomass, hydroelectric, and geothermal energy, which are renewable. These sources occur naturally by the sun, wind, and plant life.

Natural gas is a combustible gas, and is typically a blend of hydrocarbons such as methane, ethane, propane, and butane. Household natural gas is almost entirely methane, an odorless molecule consisting of one carbon atom and four hydrogen atoms. Extraction and use of natural gas has been occurring for over a 100 years. Recently, improvements in our machinery and technology have lowered the economic costs and problems associated with extraction. This makes natural gas a future leader as an energy source.

Natural gas is classified as part of the fossil fuel family, along with oil and coal. Its formation can occur in three ways. The first is by compression and subsequent release from organic material due to the high temperatures and pressures found miles below the earth's crust. Secondly, microorganisms called methanogens are able to break down organic matter and produce methane as a byproduct. Finally, natural hydrogen and carbon rich regions deep within the Earth's crust and react as they rise towards the Earth's surface and form methane deposits.

In Texas, much of our natural gas is extracted in the Haynesville shale. The Haynesville shale extends from East Texas into Arkansas and Northwest Louisiana. This shale is a vast source of natural gas and was formed 150 million years ago when the area was underwater and received deposits of marine sediment over many years, making it rich in organic material. However, the process of fracking, or hydraulic fracturing, comes with considerable drawbacks including groundwater contamination and surface disturbances.

Further Resources and Extensions:

- Natural Gas Industry Timeline:
<http://www.mesaaz.gov/energy/nghistory.aspx>
- The Oracle of Delphi – how natural gas emissions played a role in ancient mythology:
<http://www.sciencedaily.com/releases/2001/08/010807075959.htm>