



NONRENEWABLE ENERGY AND FOSSIL FUELS

FOSSIL FUELS

- A fossil fuel is a nonrenewable energy resource formed from the remains of organisms that lived long ago.
- Most of the energy we use comes from fossil fuels.
- We use fuels for 5 main purposes:
 1. Cooking
 2. Transportation
 3. Manufacturing
 4. Heating and Cooling
 5. Generating Electricity



MAIN PROBLEMS WITH FOSSIL FUELS

1. The supply of fossil fuels is limited (nonrenewable energy source)

2. Obtaining and burning fossil fuels causes environmental problems

TYPES OF FOSSIL FUELS

Coal



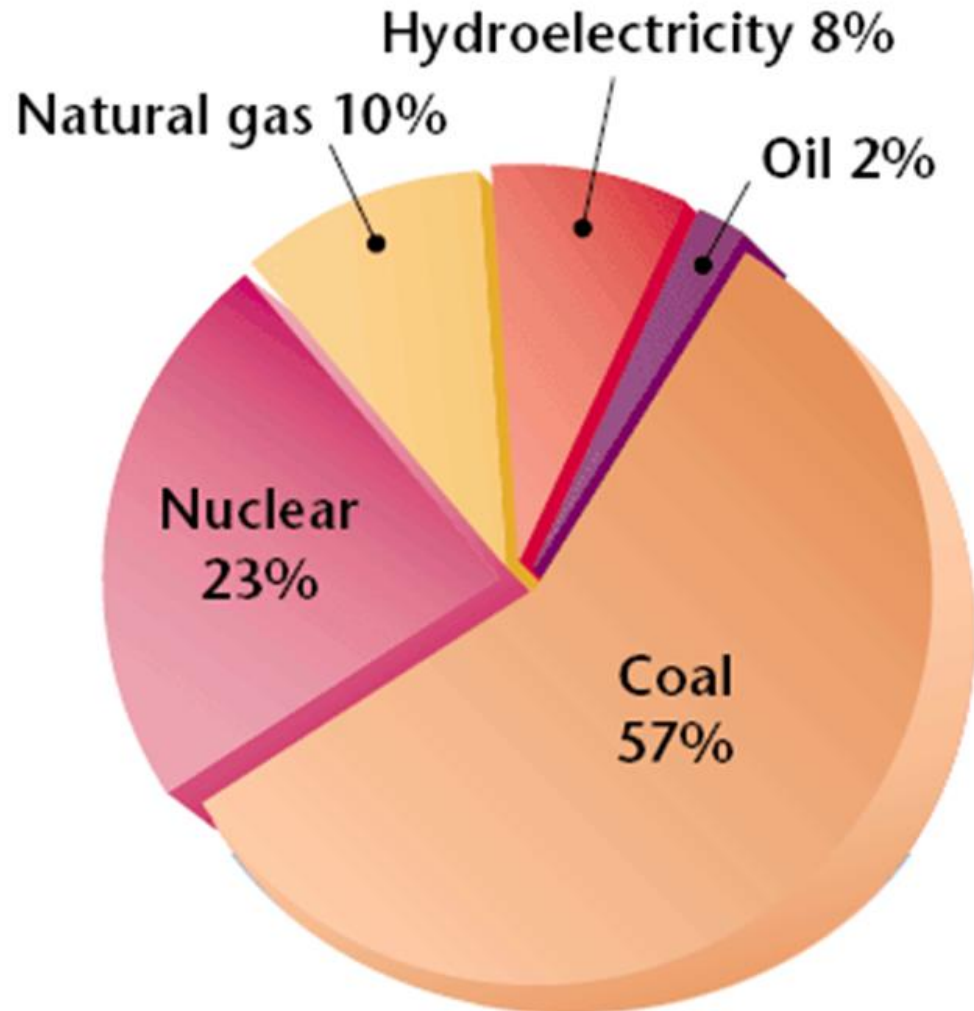
Oil



Natural Gas

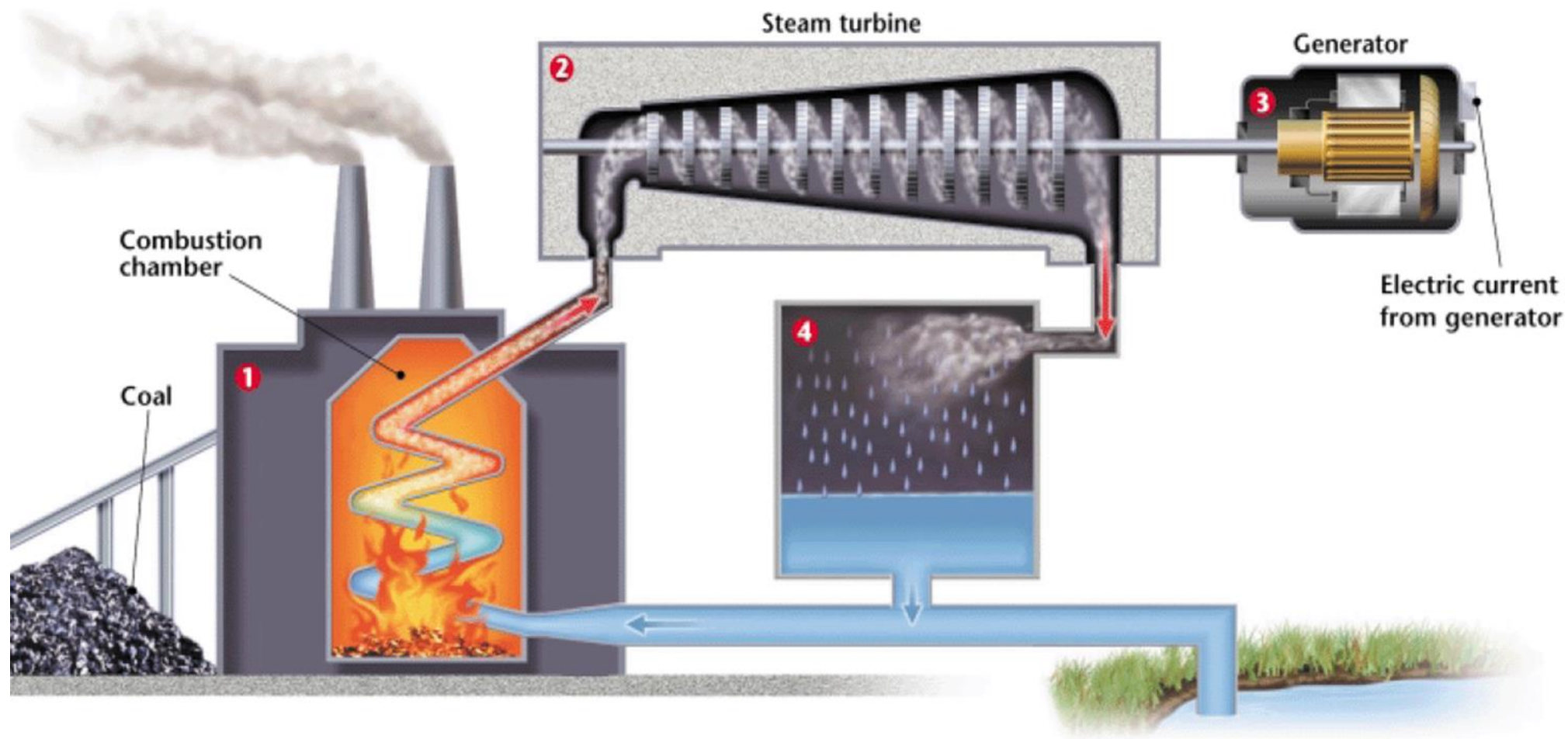


How Electricity Is Generated in the United States



COAL

- Most of the world's fossil-fuel reserves are made up of coal.
- Coal is relatively inexpensive and it needs little refining after being mined.
- Over ½ of the electricity generated in the United States comes from coal-fired power plants.



1 Burning fossil fuels release energy in the form of heat, which is used to boil water and produce high-pressure steam.

2 The steam is directed against the blades of a turbine, which is set into motion.

3 The turbine is connected to an electric generator. The turbine sets the generator in motion, generating electricity.

4 Steam from the turbine is directed to a condenser where it cools and becomes liquid water to be cycled again.

ENVIRONMENTAL EFFECTS OF COAL

- Underground mines can have minimal effect on the environment at the surface. However, surface coal-mining operations sometimes remove the top of an entire mountain to reach the coal deposit
- If waste rock from coal mines is not properly contained, toxic chemicals such as heavy metals, sulfates, and salts can leach into nearby water.
- Air pollution and the quality of coal
 - Higher grade coal (bituminous) produces more heat and less pollution
 - Lower grade coal (lignite) is high in sulfur and releases more pollution



OIL (PETROLEUM)

- Petroleum is a liquid mixture that is used widely as a fuel source (also known as crude oil).
- Anything that is made from crude oil, such as fuels, chemicals, and plastics, is called a petroleum product.
- Much of the world's energy needs are met by petroleum products



ENVIRONMENTAL EFFECTS OF USING OIL



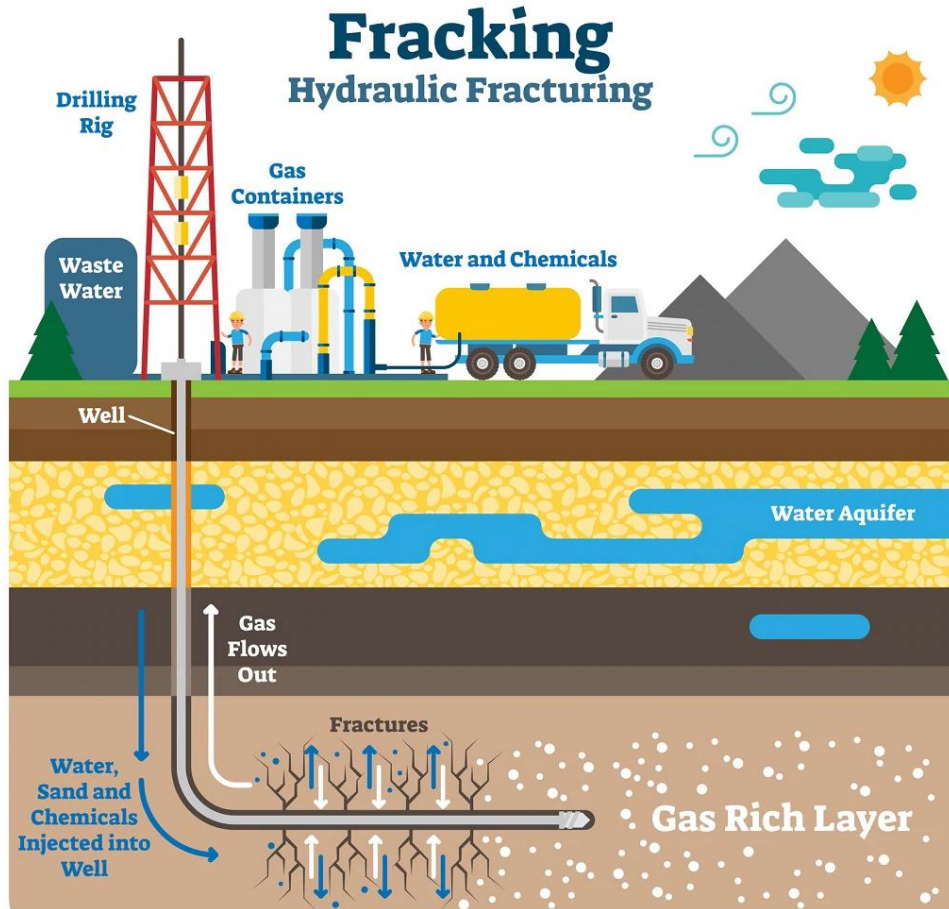
- When petroleum fuels are burned, they release pollutants. In many cities, these pollutants contribute to the formation of smog and cause health problems.
 - Emissions regulations and technology such as catalytic converters have helped reduce air pollution.
- Oil spills are potential environment problem
 - Deep Water Horizon
 - <https://www.youtube.com/watch?v=BVxlfSQq8OE>

NATURAL GAS

- About 20% of the world's nonrenewable energy comes from natural gas.
- Natural gas, or methane (CH_4), produces fewer pollutants than other fossil fuels when burned.



ENVIRONMENTAL EFFECTS OF NATURAL GAS



- Fracking (short for fracturing) is the process of injecting liquid at high pressure into underground rock to force open existing fissures and extract natural gas.
- Fracking has been linked to several environmental concerns including contaminating drinking water supplies and triggering earthquakes

<https://www.youtube.com/watch?v=4LBjSXWQRV8>