

Sources of Energy

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Chapter 16

Pages 484-515

Sources of Energy

- According to the Law of Conservation of energy:
“Energy cannot be created or destroyed, but may only change form.”
- So how do we convert (change) energy from one form to another, so we can use it and where does it come from?

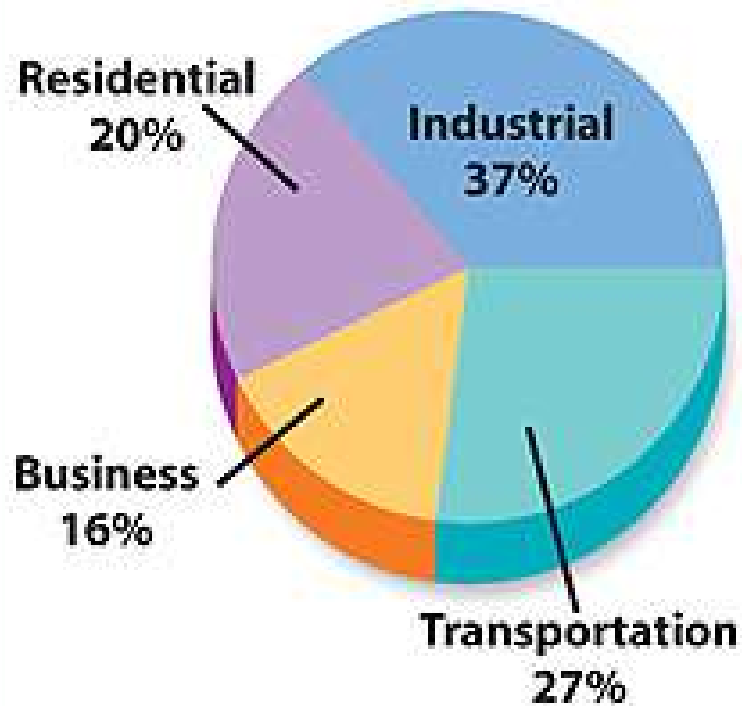
Sources of Energy

- We use energy for basic life functions and to help improve our daily lives.

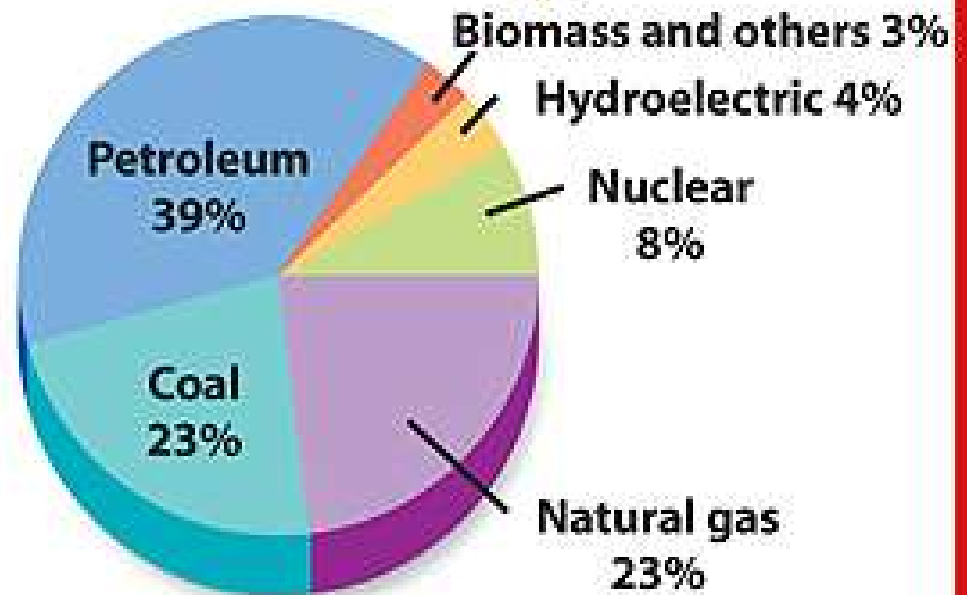


How We Use Energy

Energy Usage



Sources of Energy



Categories of Energy Resources

- Energy is a natural resource that humans can use for everyday activities.
- There are two basic categories of energy resources.
 1. Non-renewable energy resource – an energy source that cannot be replaced by natural processes as quickly as it is used.
 2. Renewable energy resource – an energy source that is replaced nearly as quickly as it is used.

Non-Renewable Resources of Energy

1. Fossil Fuels – formed from decaying remains of dead plants and animals (hydrocarbons)
 - Burned to release energy from chemical energy to heat and light
2. Nuclear Energy – energy found in an atomic nucleus

Fossil Fuels

A. Petroleum (oil) – liquid fossil fuel

- Can be separated into different types of hydrocarbon compounds
- Used in plastics,
- Synthetic fabrics
- Oils
- Fuels



Fossil Fuels

- B. Natural gas –
gaseous fossil
fuel
- Most cleanly
burned fossil
fuel (least
pollution
released when
burned)



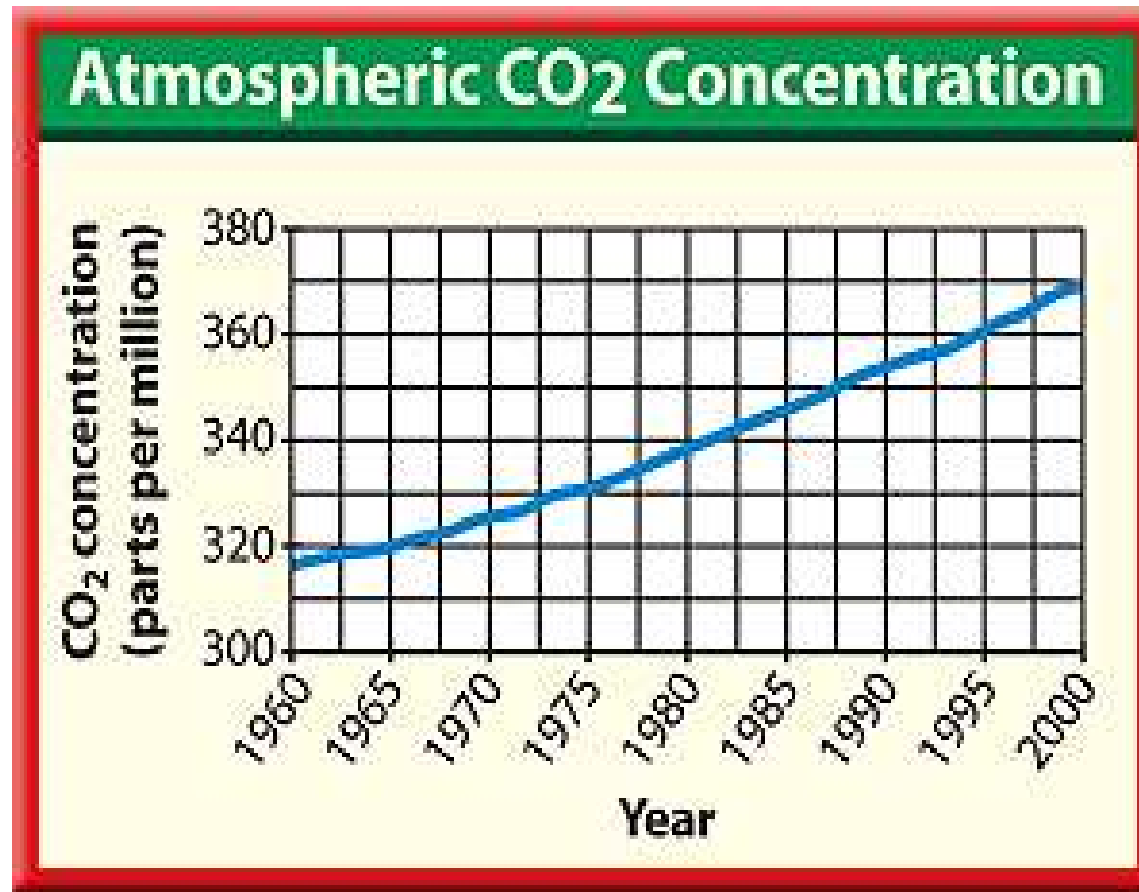
Fossil Fuels



- C. Coal – solid fossil fuel
- Least cleanly burned fossil fuel (most pollution released when burned)

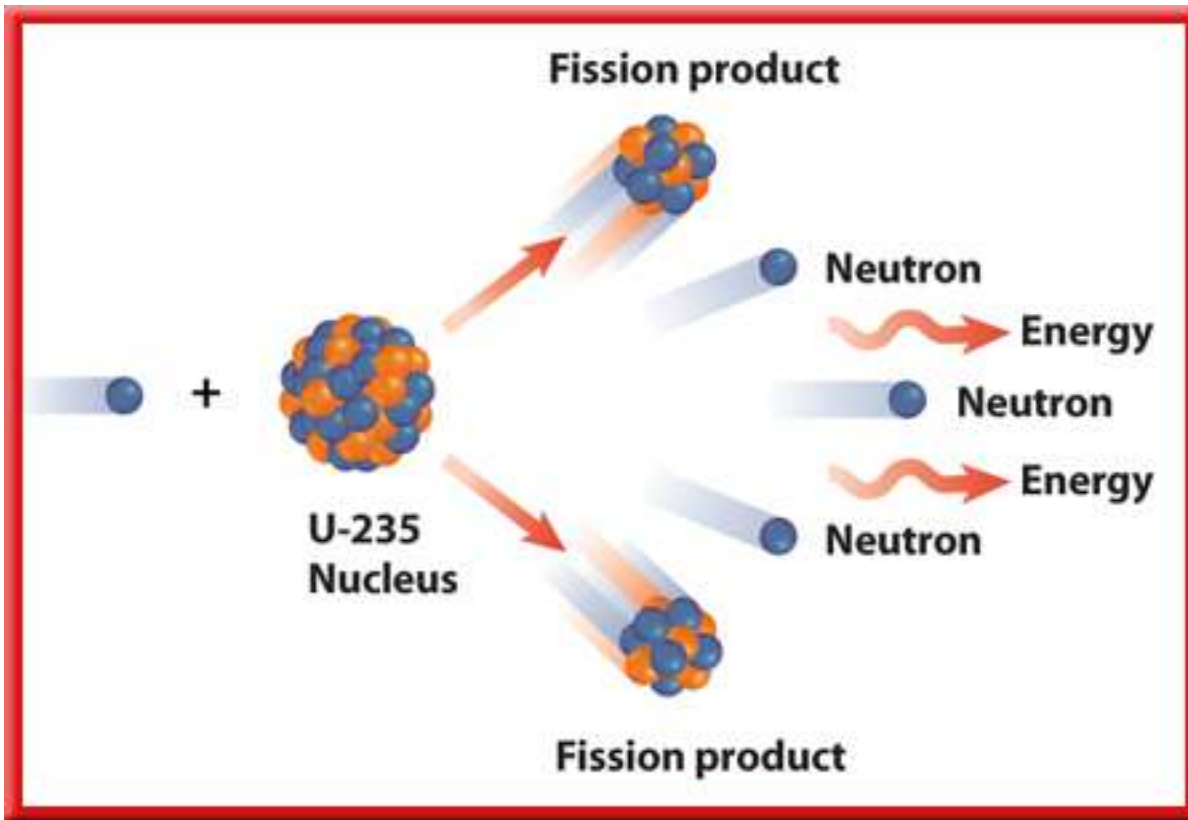
Fossil Fuels

→ Burning fossil fuels adds carbon monoxide and other undesired compounds into the air.



Nuclear Energy

- Nuclear fission (splitting of atomic nucleus to release energy) of Uranium-235

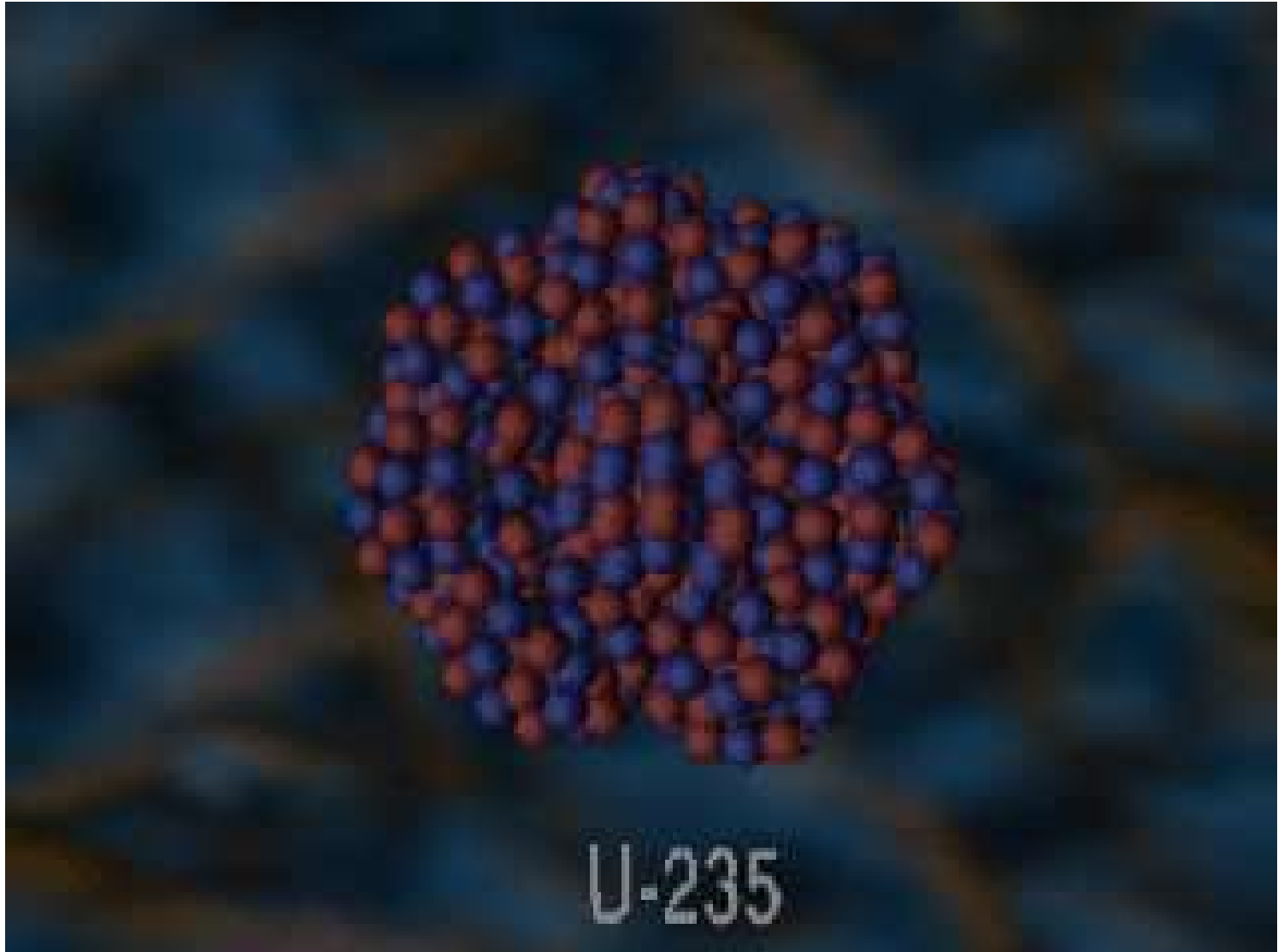


produces heat which is captured to produce steam in a nuclear plant.

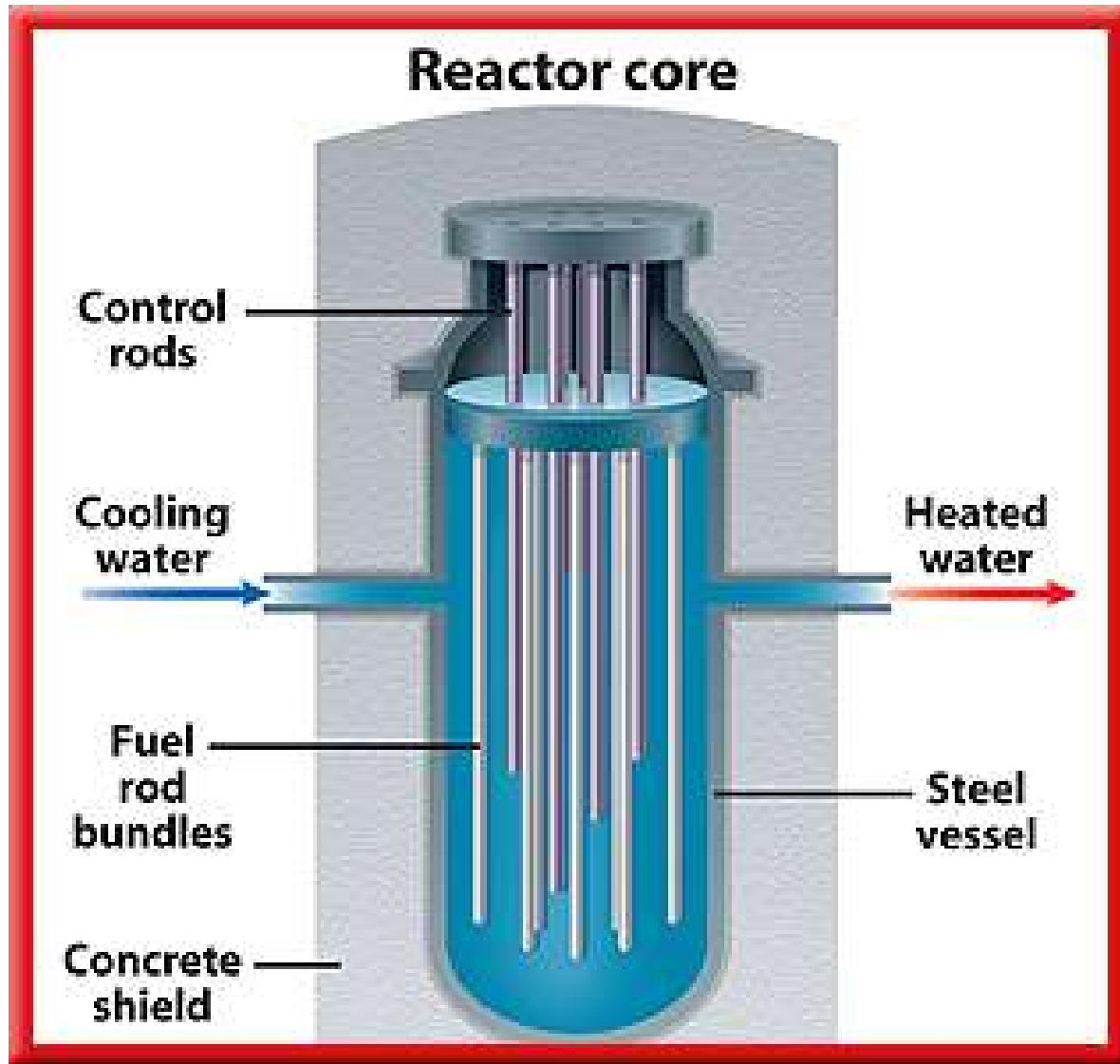
Nuclear Power Plant



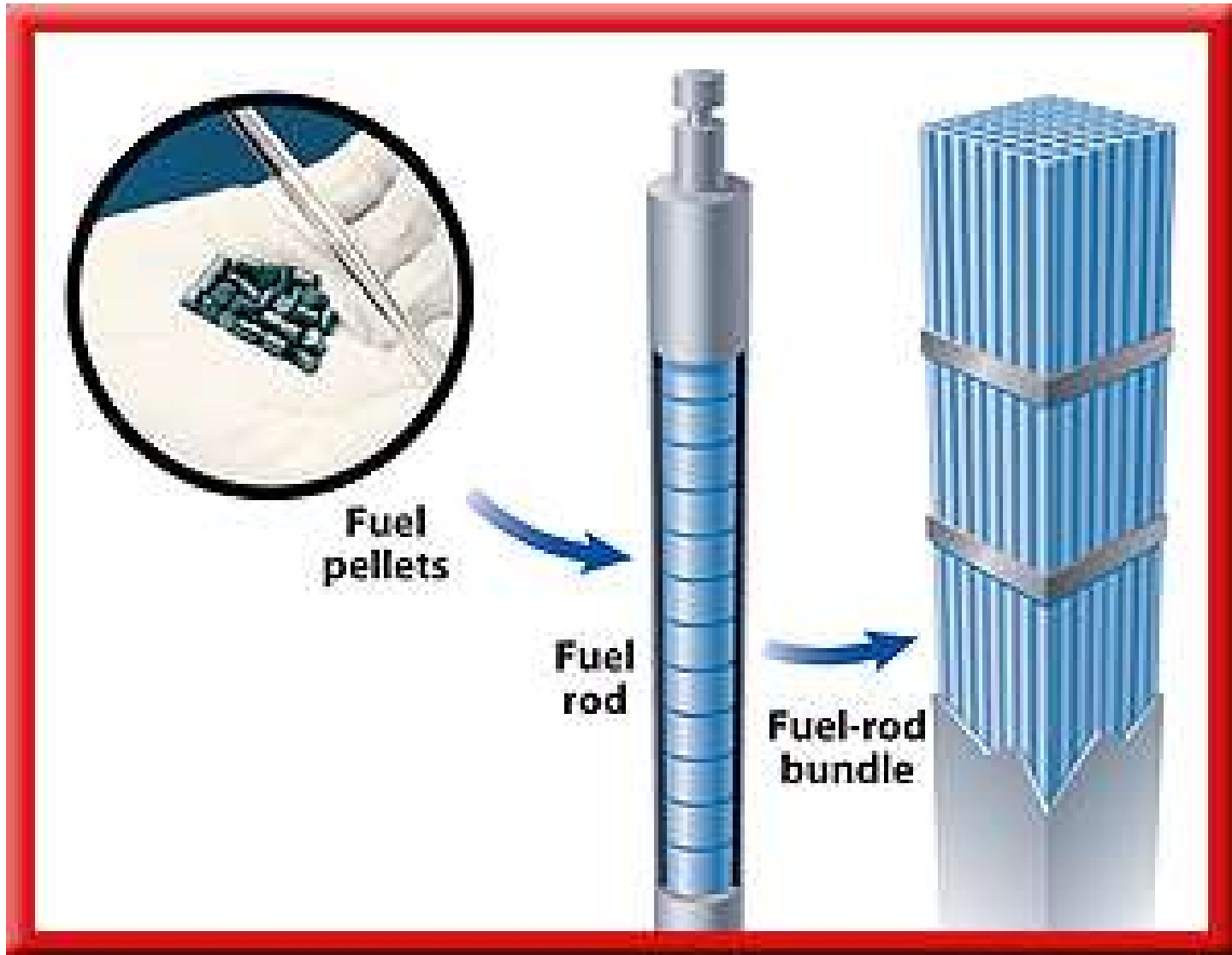
Nuclear Energy



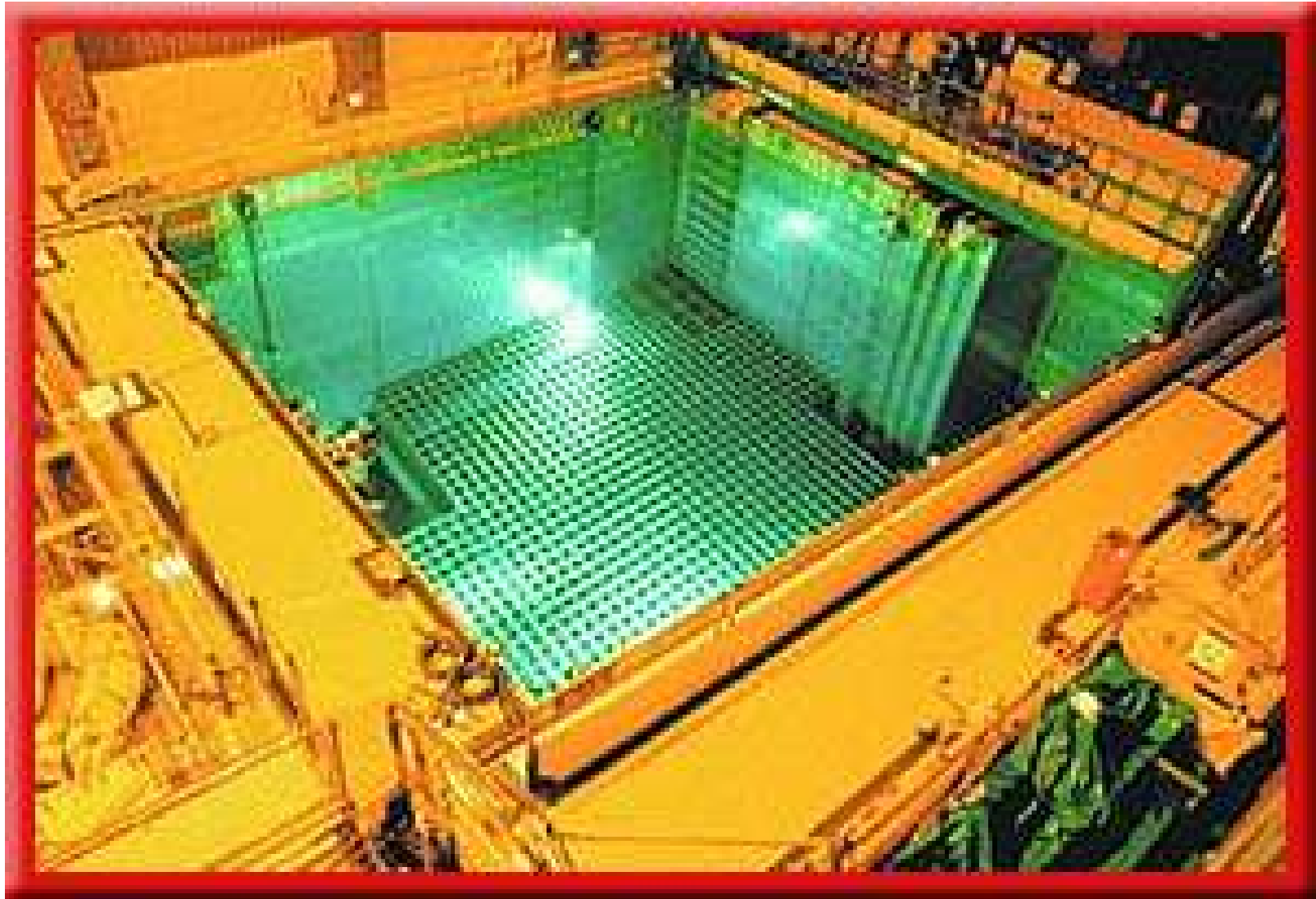
Nuclear Reactor Core



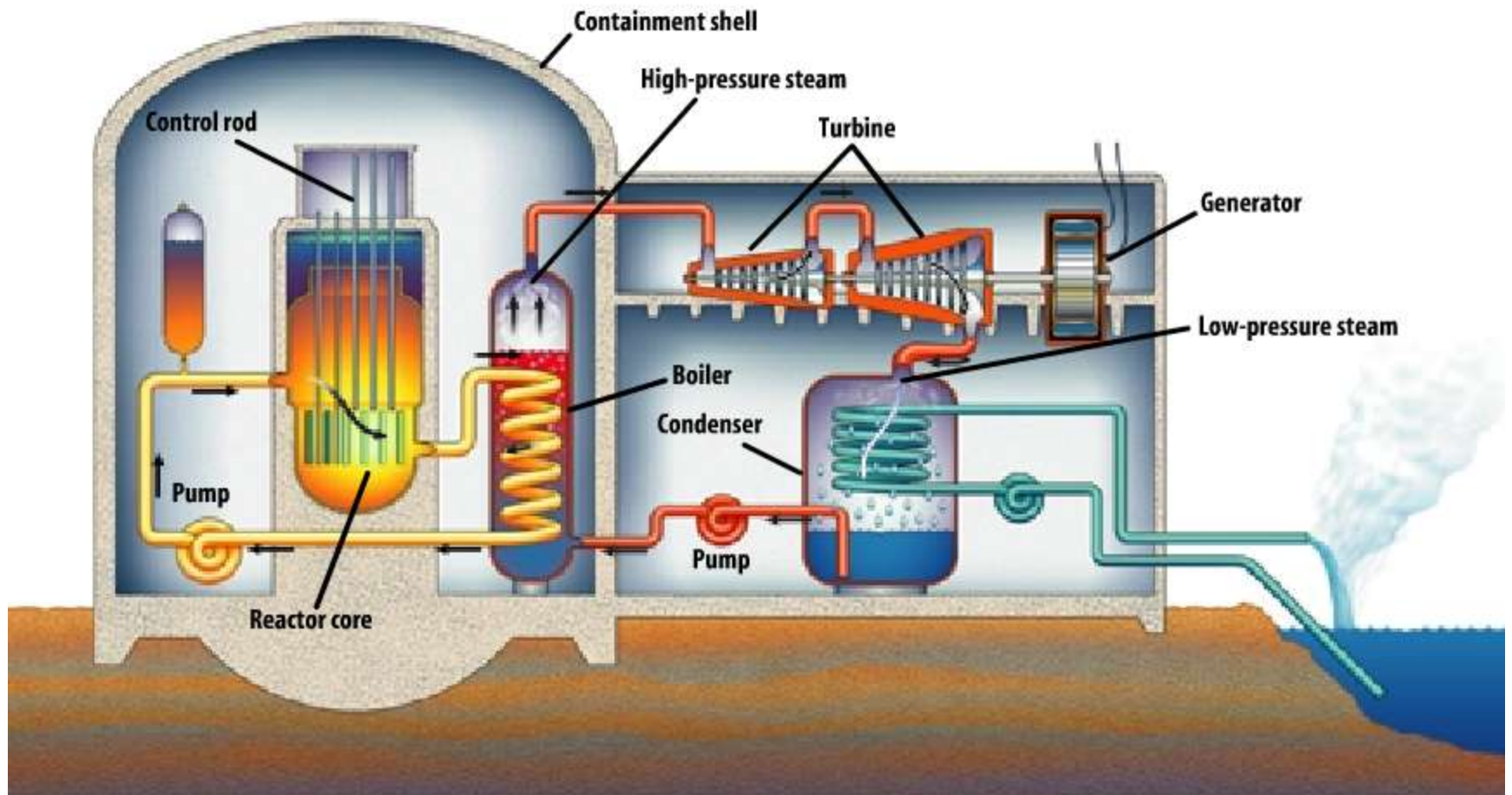
Nuclear Fuel Rods



Storage Pool for Fuel Rods



How Nuclear Plant Works



Nuclear Energy

- Nuclear waste is radioactive and harmful to living creatures
- Low-level waste – dangerous for a short time and in small amounts
- High-level waste – dangerous for 1000's of years



Nuclear Energy

B. Nuclear Fusion – atomic nuclei are combined to form a larger new nucleus and releases energy during formation

→ This process occurs in stars at very high temperatures

