

Nuclear Reactors

Nuclear reactors transform the thermal energy produced in nuclear fission reactions into electrical energy. These reactors generally use uranium. Natural uranium consists mostly of the isotope uranium-238. Only about 0.7% is uranium-235, which is the isotope that fuels nuclear reactors. Inside a nuclear reactor, uranium-235 atoms undergo fission. If enough of this uranium is present, the neutrons emitted in the fission of one uranium nucleus can be absorbed by other uranium nuclei. This sets off a chain reaction that releases an enormous amount of energy.

A nuclear reactor contains and controls fission reactions and the energy they release. A liquid coolant flows through pipes close to the fuel and carries thermal energy away from the reactor. The liquid carries the thermal energy to another set of water-filled pipes, which the heat converts into steam. The steam turns turbines that generate electrical energy. The Canadian CANDU reactor in **Figure 3.27** uses natural uranium. This differs from other reactors, which use fuel enriched with uranium-235.

Figure 3.27 At this time, there are 18 CANDU reactors operating in Canada and about 20 in other countries.

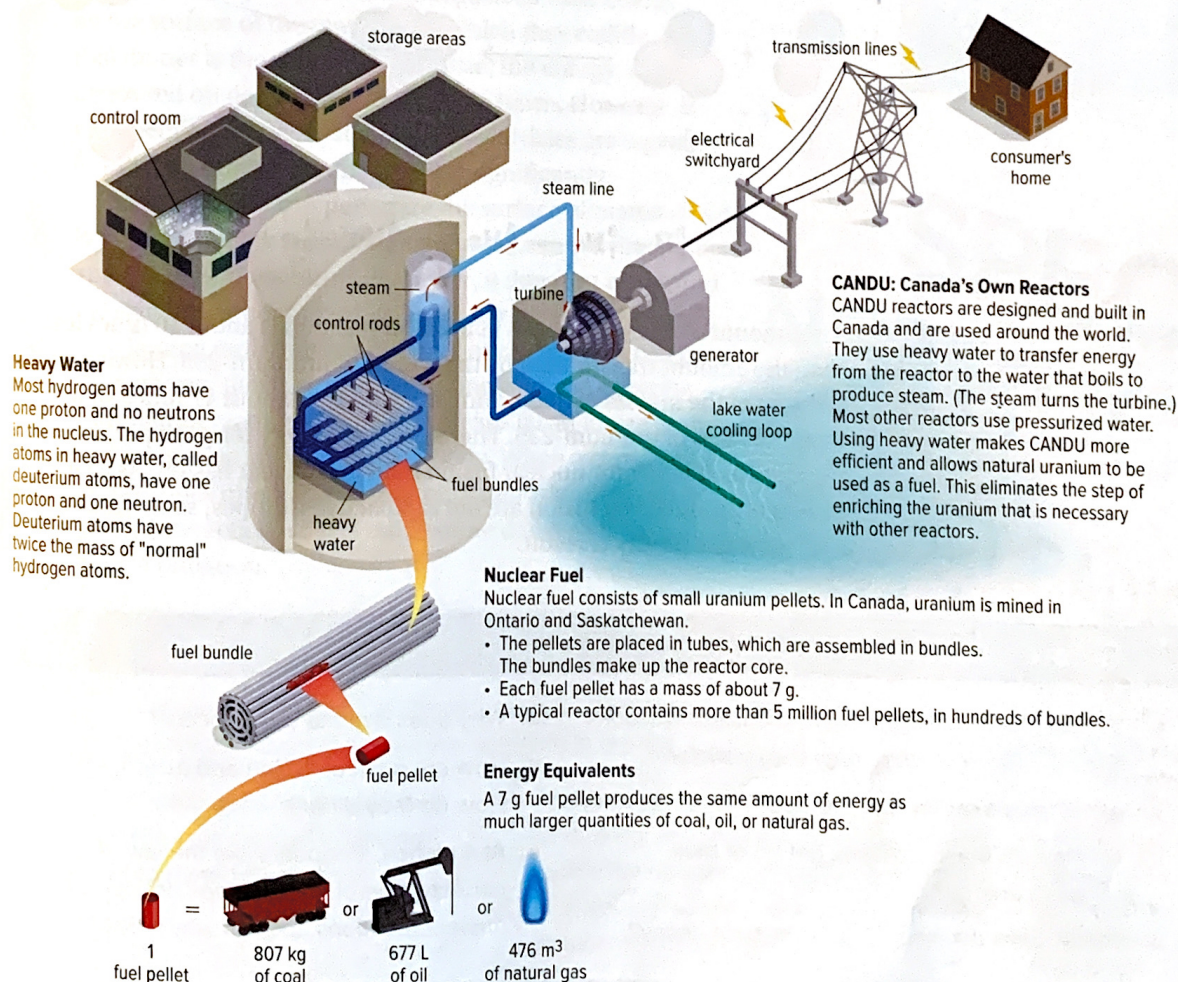


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