



Nuclear Energy and the Power of the Atom

A pellet the size of a fingertip, the energy of a ton of coal

How fission makes power

1

A neutron hits uranium-235

The nucleus splits in two

2

Energy and more neutrons fly out

A tiny bit of mass becomes energy

3

Those neutrons split more atoms

A controlled chain reaction

4

The heat boils water

Steam spins a turbine and generator

$$E = mc^2$$

A very small mass (m) times the speed of light squared (c^2) equals a huge amount of energy.

The scale of it

1 pellet

of uranium fuel

≈ 1 ton

of coal in energy

$\sim 1/5$

of U.S. electricity

24/7

steady power, rain or
shine

A typical fuel pellet is about the size of a fingertip.

Inside a reactor



Fuel rods

Hold the uranium pellets



Moderator

Usually water; slows neutrons so fission continues



Control rods

Absorb neutrons to speed up or slow down the reaction



Containment

Thick steel and concrete around the reactor

Sources: U.S. Department of Energy; U.S. Energy Information Administration; Nuclear Energy Institute

Remember

Fission turns a little mass into a lot of energy; control rods and engineering keep it steady and safe.