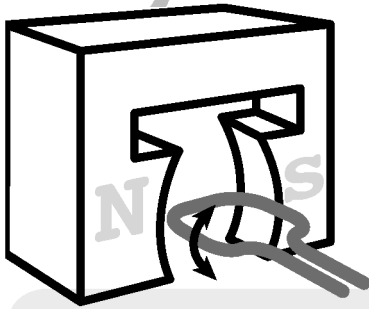


(some) Ways of generating electricity:

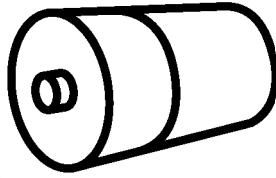


Electromagnetic Induction

Moving conductors past magnets (or vice versa) causes electrons to move. This turns kinetic energy (the energy of moving things) into electrical energy (the energy of moving electrons).

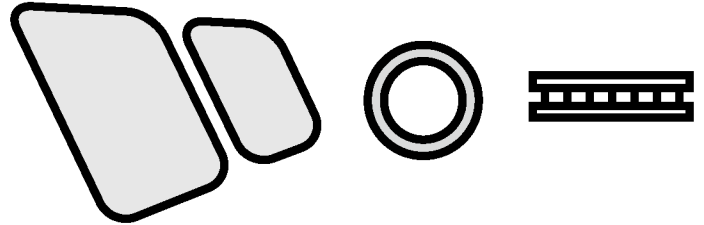
This is the principle behind most large-scale electricity generation. Thermal power plants (coal, natural gas, nuclear, etc.) heat steam to move turbines to spin generators; hydropower dams and wind turbines spin generators with falling water and moving air. PV, the only large non-induction means of electricity generation, is a fraction of the "other renewables" slice at right.

Induction also works in reverse – moving electricity makes a magnetic field. This is how electric motors work. In fact, most electric motors can work backwards as perfectly good generators (this is exploited by regenerative braking in electric or hybrid vehicles).



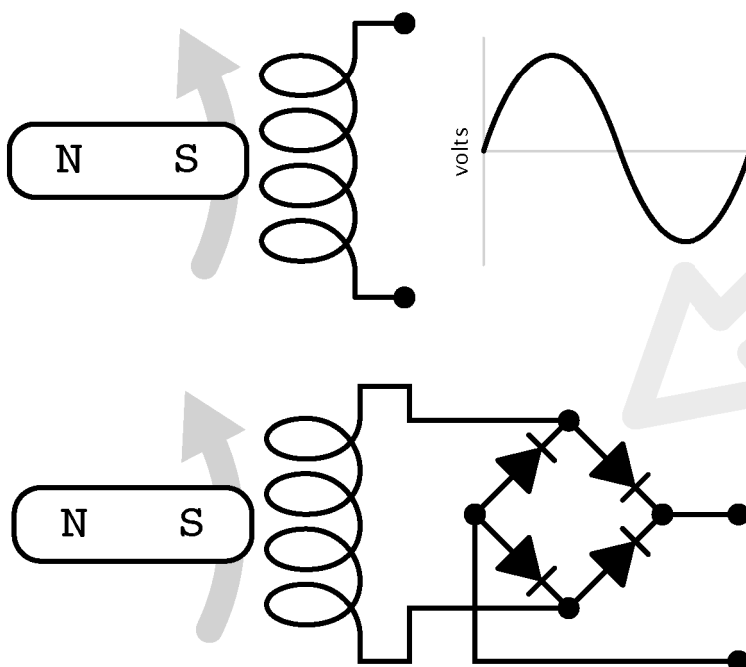
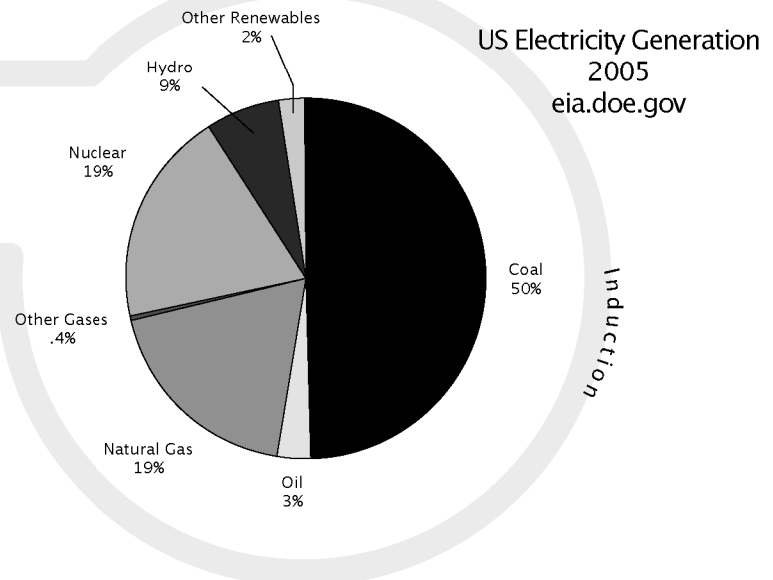
Batteries + Fuel Cells

Chemical reactions can move electrons. If the reactions are reversible, electricity from other sources can be stored this way, too.



Photovoltaics, Piezo, and Thermal

Semiconductors can directly convert light (via photovoltaics) or heat (via peltier junctions) into electricity. Certain materials exhibit the piezo effect, where pressure or stress generates electricity.



A magnet moving past a coil will produce electricity moving first in one direction and then the other – alternating current, or AC.

A diode is an electrical component that only lets electricity flow one way.



This arrangement of four diodes (called a bridge rectifier) will make AC into direct current, or DC.

