DC vs AC

Direct Current vs. Alternating Current

- **Direct Current** (DC)
- Current always flows in the same direction between the positive (+) and negative (–) terminals
- Ex: Batteries, fuel cells and solar cells
- The positive terminal is always positive; the negative terminal is always negative.

Direct Current vs. Alternating Current

- In 1887, there were 121 Edison power stations in the U.S. delivering DC electricity to homes and businesses.

- DC had a great limitation -- power plants could only send DC electricity about a mile before the electricity lost power.

Direct Current vs. Alternating Current

- **Alternating Current** (AC)
- The direction of the current reverses, or alternates, 60 times per second in the U.S. (50 cycles in Europe).
- Ex: power that comes from a power plant
- The power at a wall socket in the U.S. is **120-volt, 60-cycle AC power**.

Direct Current vs. Alternating Current

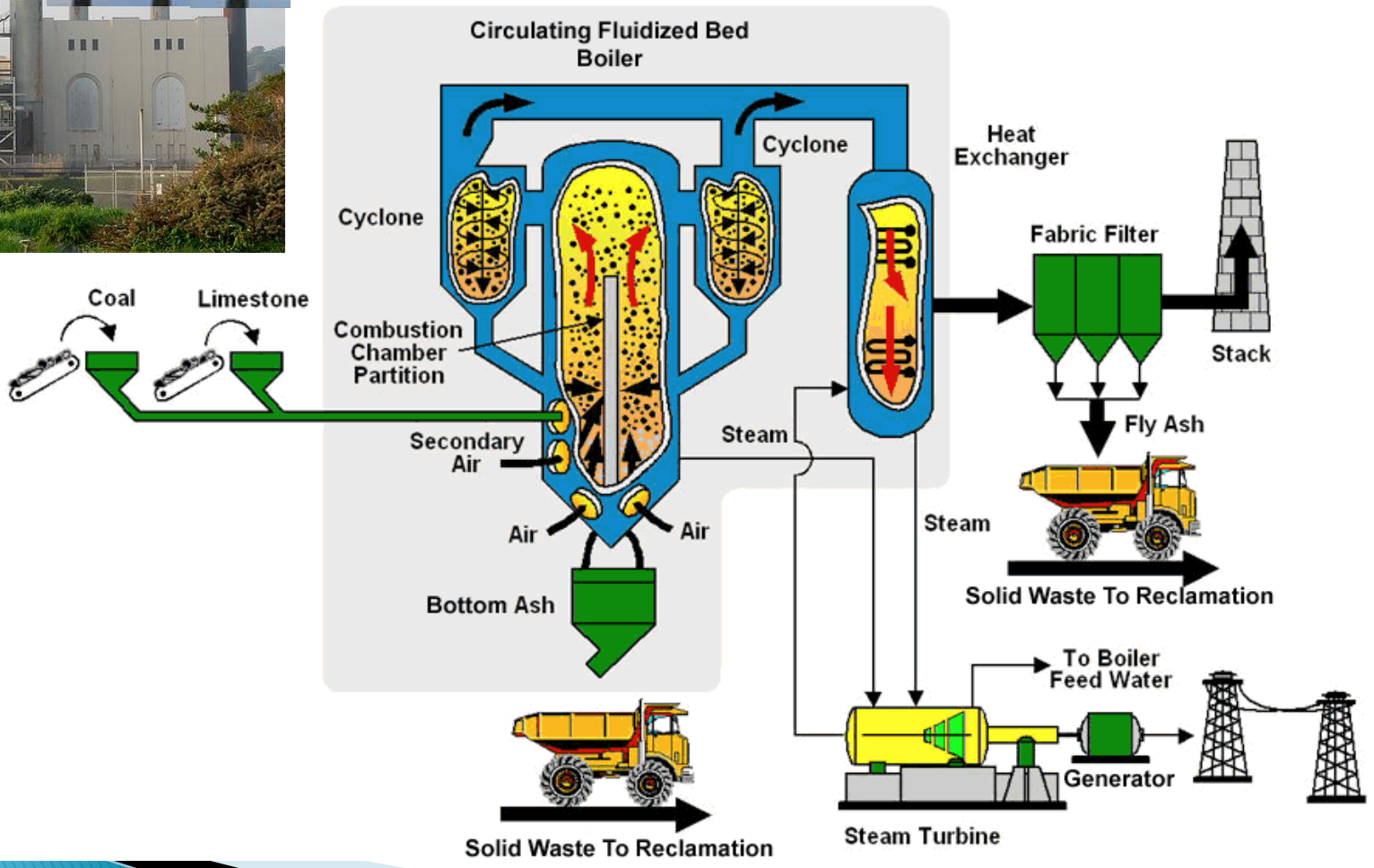
- George Westinghouse introduced his system based on high-voltage alternating current (AC), which could carry electricity hundreds of miles with little loss of power.

- A "battle of the currents" ensued which Westinghouse's AC won.

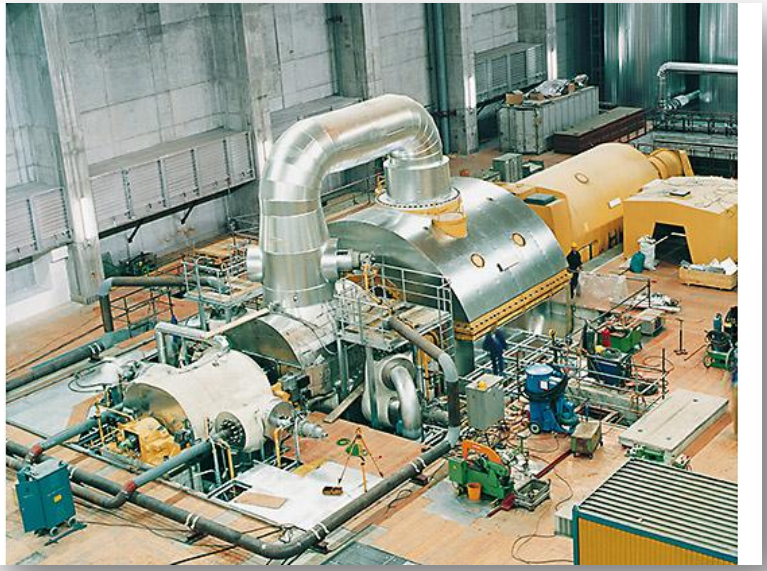
Direct Current vs. Alternating Current

- The heart of a power station is a large generator that extracts energy from a fuel. Some power stations burn fossil fuels (coal, oil, or gas) or produce energy by splitting apart atoms of uranium like at a Nuclear power station.
- The heat produced turns water into steam.
- This steam turns a windmill-like device called a turbine.
- The turbine is connected to an electricity generator.
- Creating electricity takes multiples stages.
- Some energy is wasted at each stage of extracting heat from a fuel.

Direct Current vs. Alternating Current



Direct Current vs. Alternating Current



Direct Current vs. Alternating Current