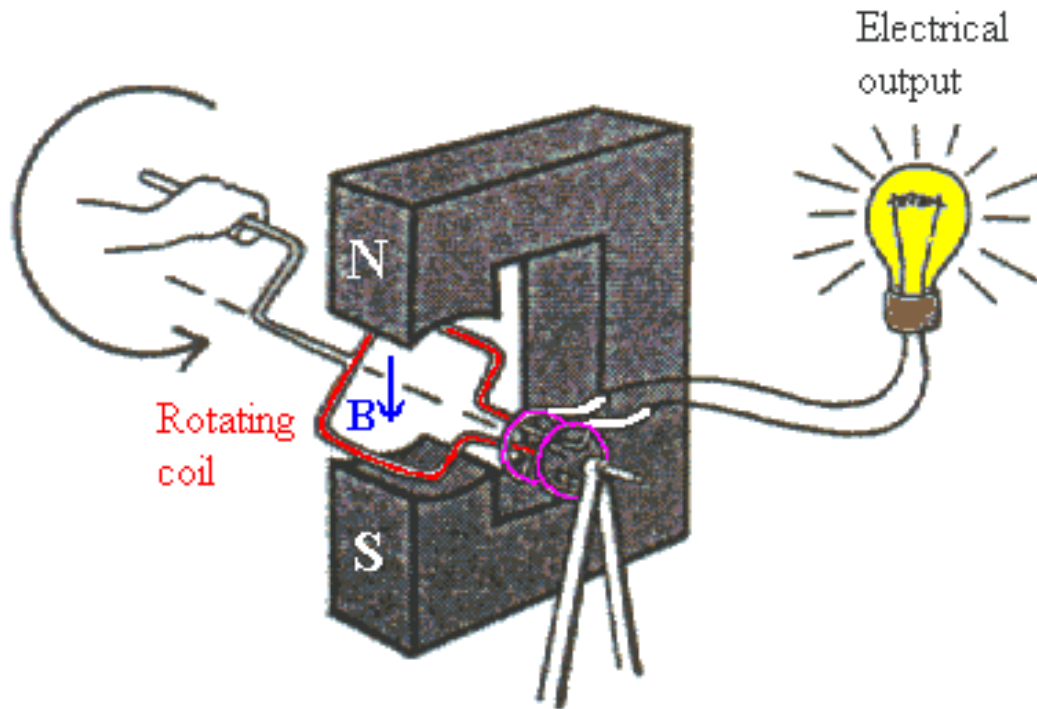




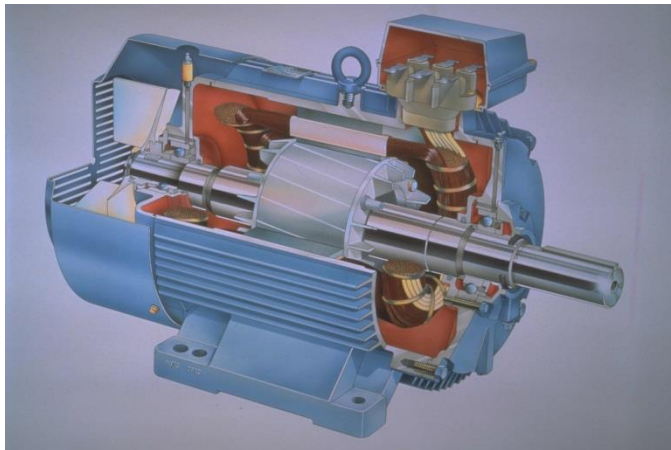
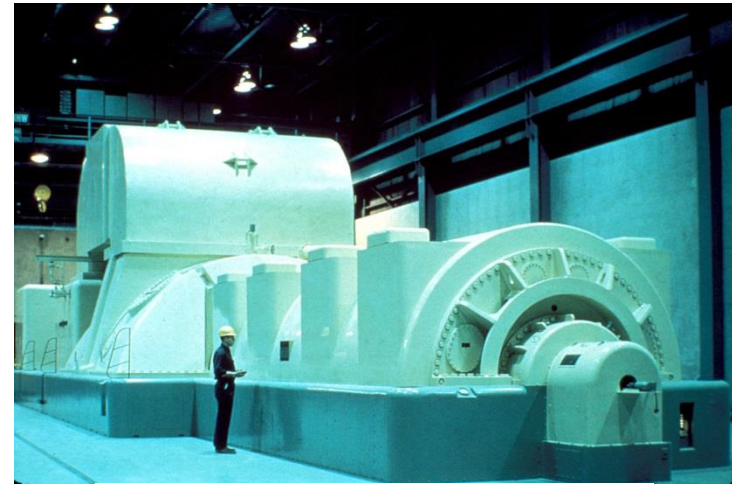
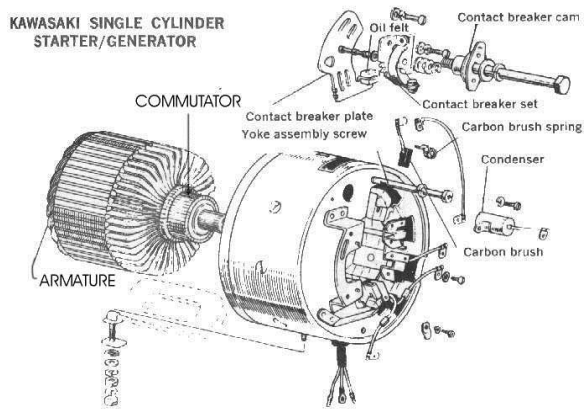
Energy and Power 9

Unit 1, Topic 4: Sources of
Energy for Electrical
generation

Outcome 1.13 – Producing Electricity (electric generator)



Outcome 1.13 – Producing Electricity

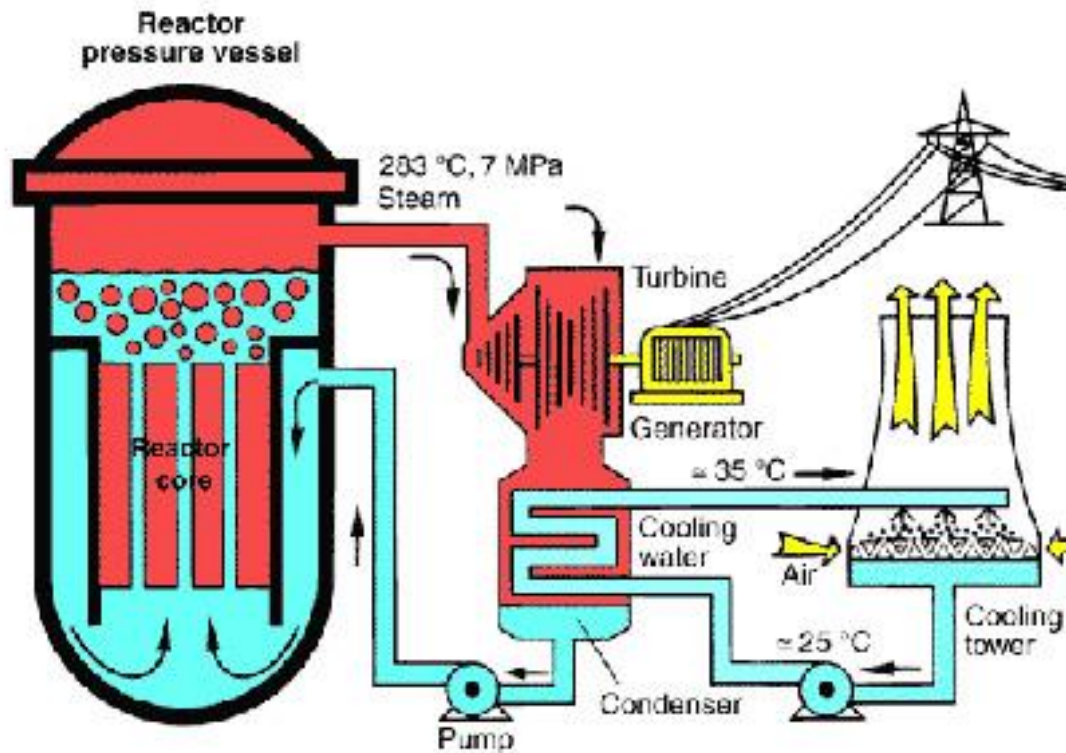


Outcome 1.13 – Producing Electricity (nuclear)



This is a turbine from a nuclear plant. Steam rushes past the blades and spins an electric generator.

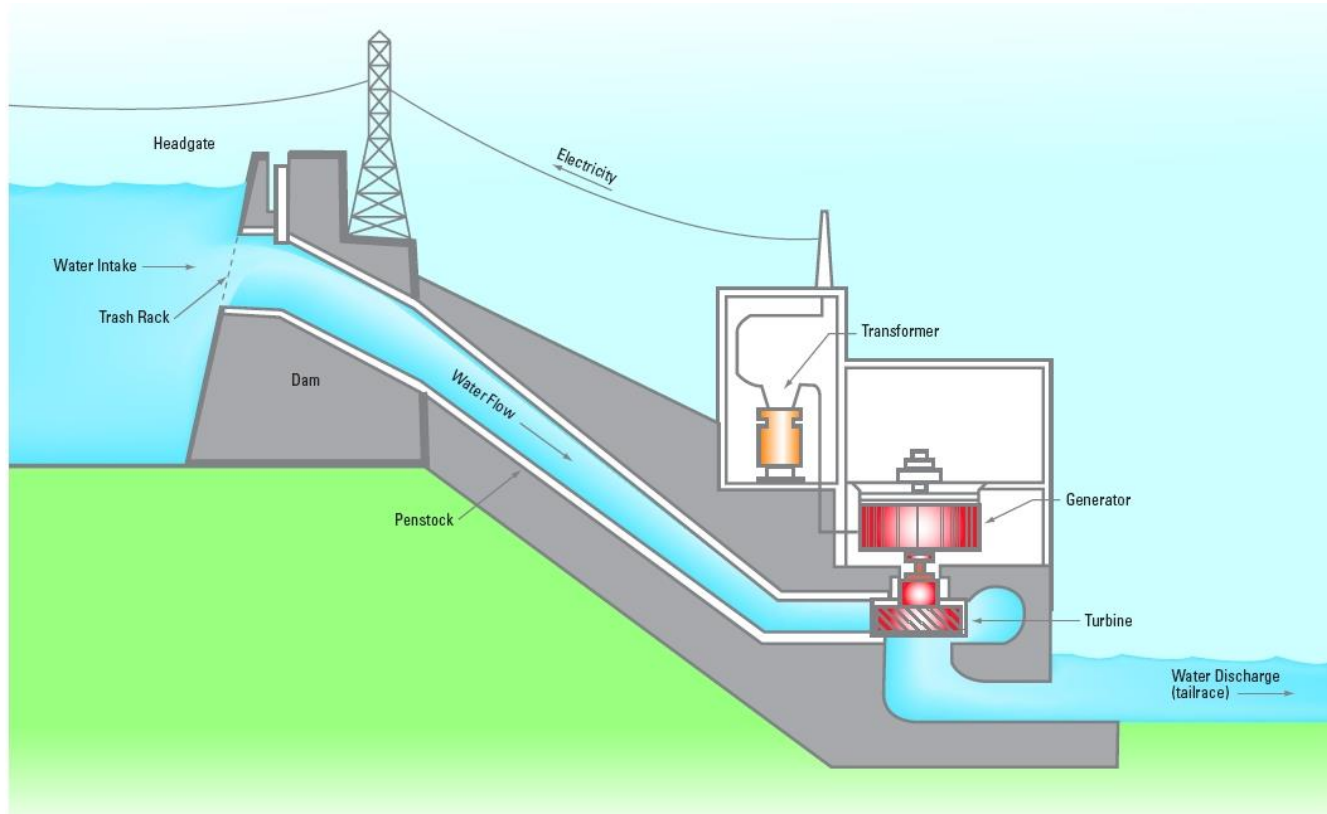
Outcome 1.13 – Producing Electricity (nuclear)



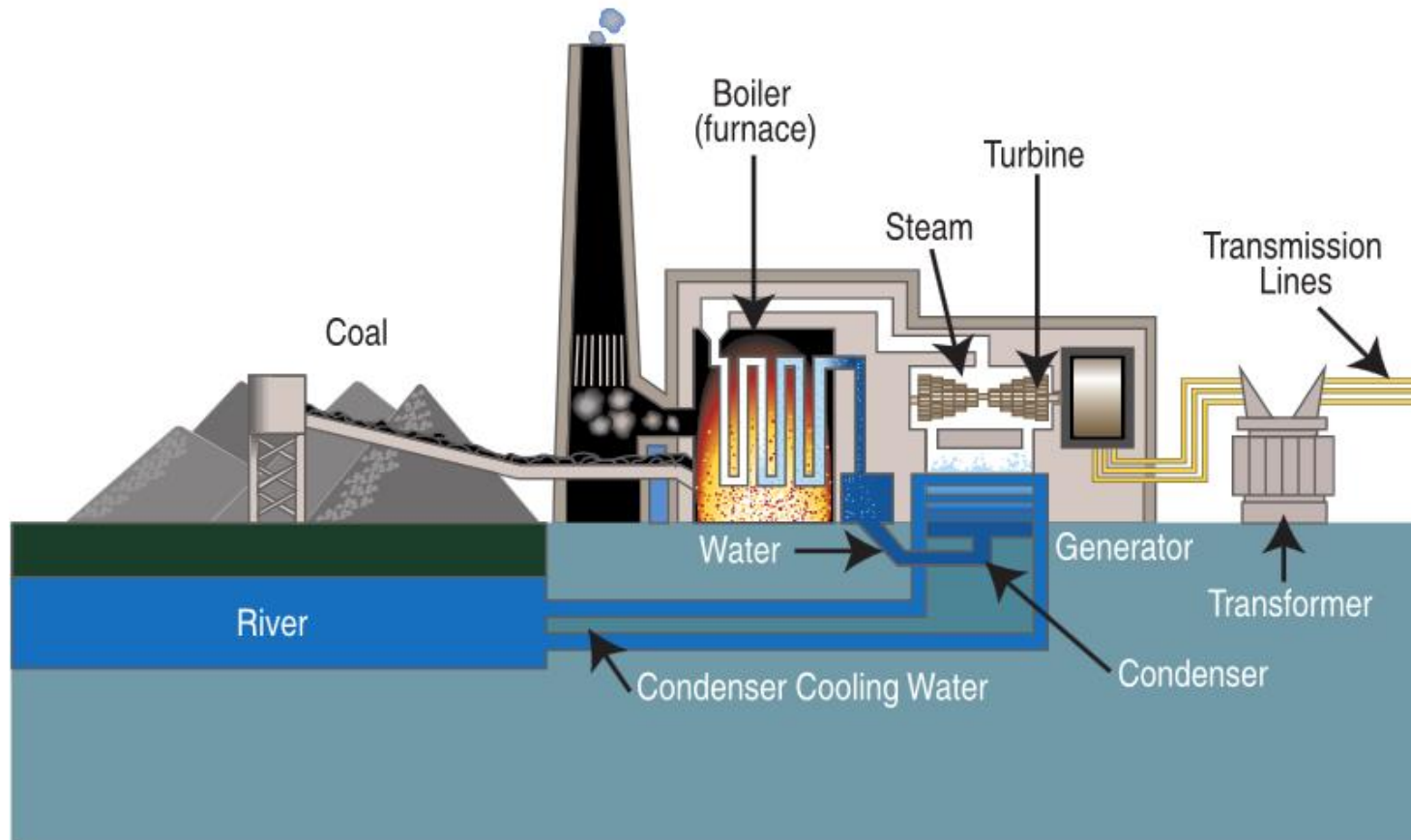
Outcome 1.13 – Producing Electricity (hydro)



Outcome 1.13 – Producing Electricity (hydro)



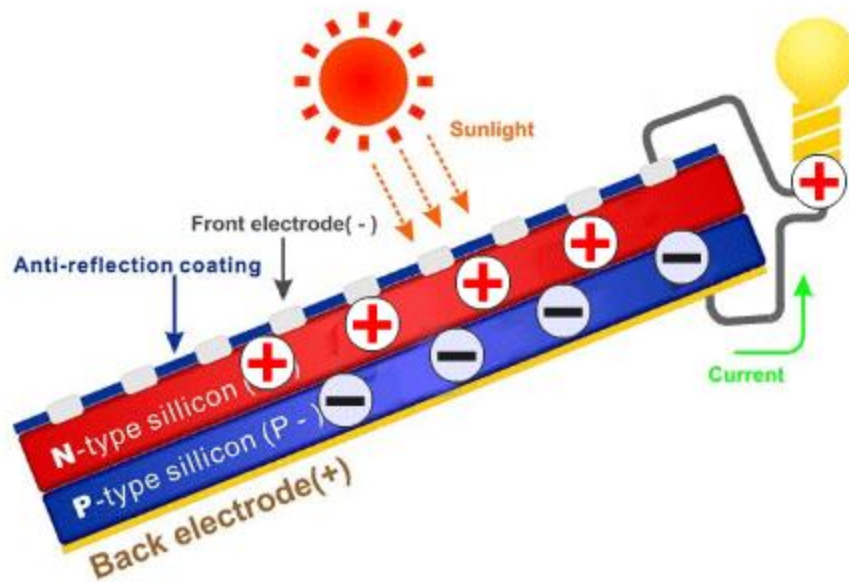
Outcome 1.13 – Producing Electricity (fossil fuel)



Outcome 1.13 – Producing Electricity (solar collector)

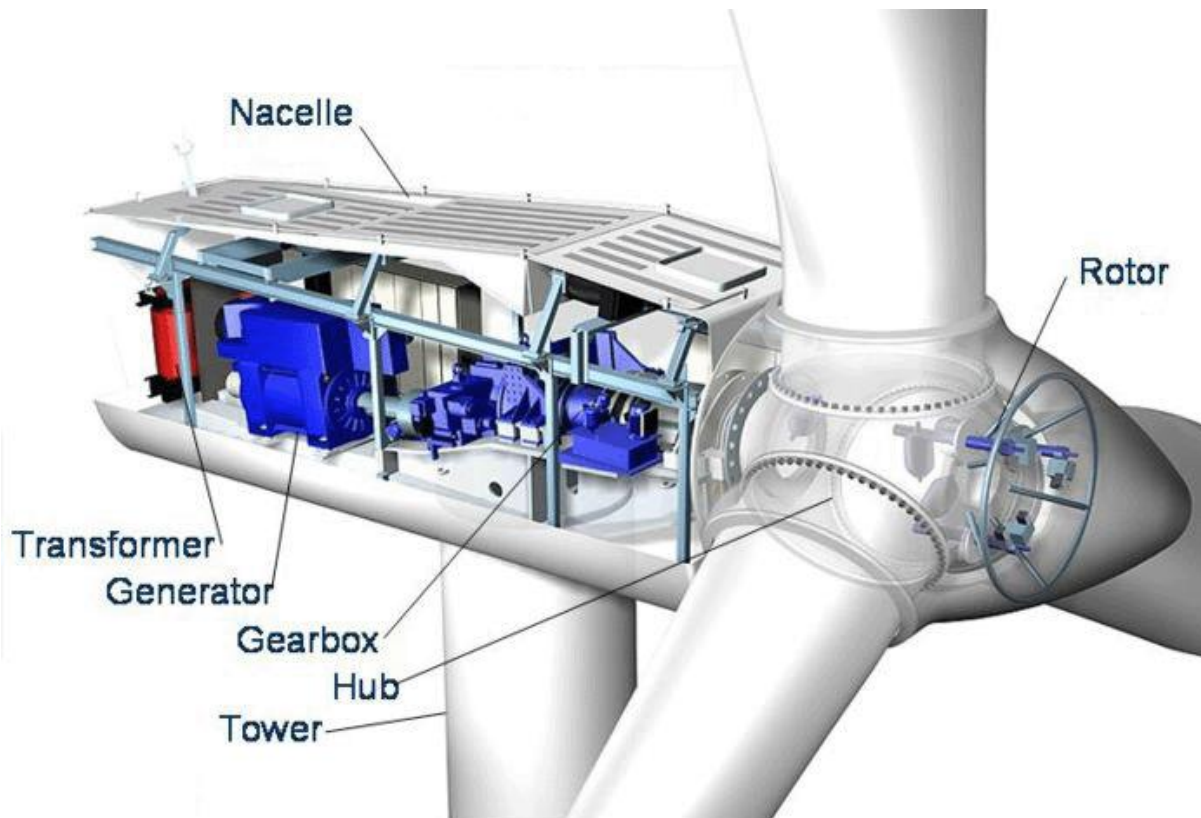


Outcome 1.13 – Producing Electricity

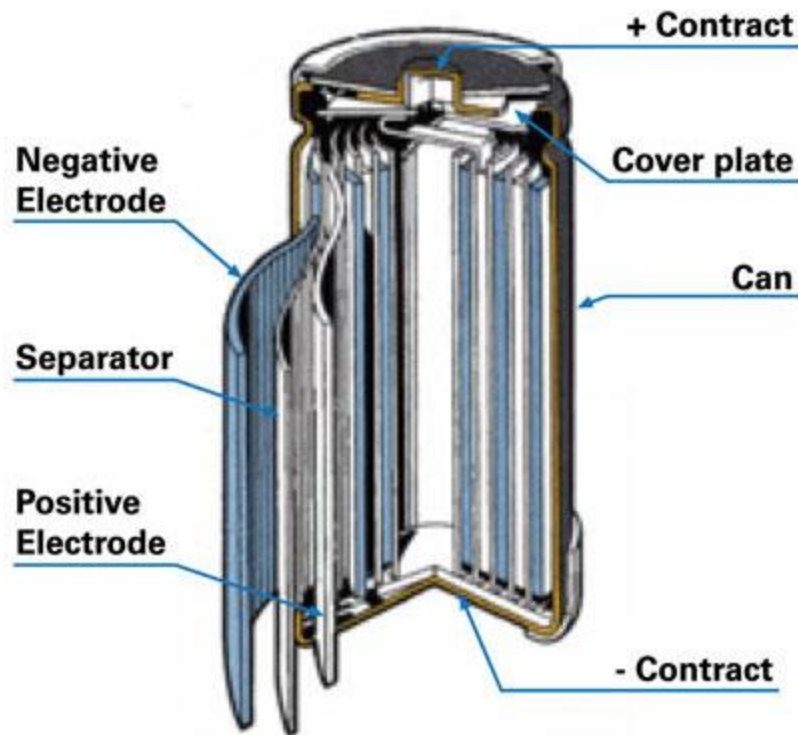


Light increases the tendency of semiconductors to acquire a charge.

Outcome 1.13 – Producing Electricity (wind turbine)



Outcome 1.13 – Producing Electricity (battery)



Construction of an eneloop battery

Outcome 1.13 – Producing Electricity (hydrogen cell)

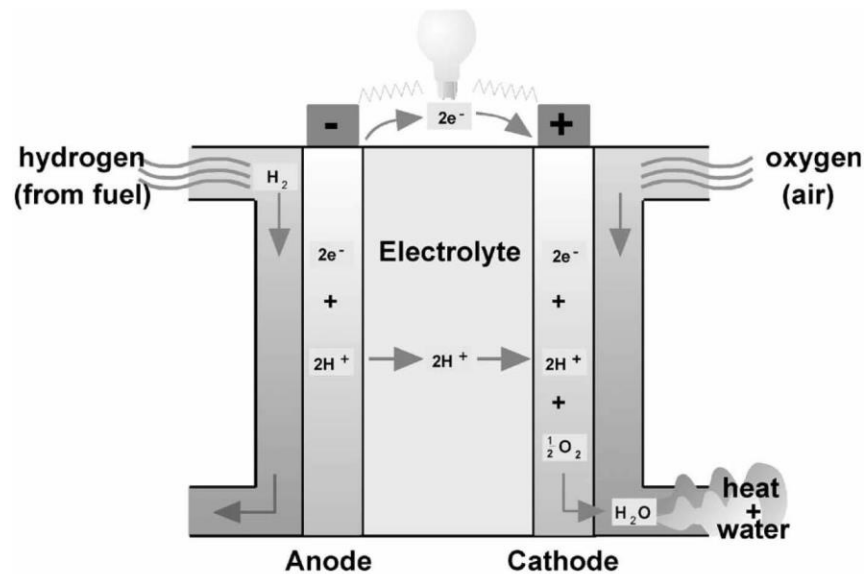


Fig. 2. Schematic of a PEM fuel cell operation. Source: World Fuel Cell Council.



Outcome 1.14 – Electrical Distribution



List of Generating Stations



Outcome 1.14 – Electrical Distribution

- Electricity is normally carried in overhead wires with very high voltages between communities. The reason for this is to reduce energy loss (the higher the voltage the less energy loss over long distance). Voltage is reduced at substations in or near each community for distribution to consumers and is further reduced near the consumer's premises.

Outcome 1.15 – Legal, Ethical & Environmental Issues

ELECTRICAL SOURCE	ISSUE
Wind Turbine	Kills bats & birds Low-frequency irritation for humans Ice build-up hazard
Hydro	Water reservoirs contain rotting vegetation (mercury)
Battery	Dangerous chemicals Difficult to recycle
Nuclear	Any leaks result in radioactive contamination

Outcome 1.16 – New Technologies

- Transmission issues and the re-emergence of interest in
- DC power
- Consumption issues and hybrid vehicles
- Miniaturizing of electronic circuitry
- Quantum computers
- The introduction of fluorescent and LED technologies
- Conversion advances with photovoltaic solar cells, wind,
- small hydro, and biomass technologies

Outcome 1.17 – Developing Personal Conservation Rules

- Turn off lights when leaving a room
- Unplug adaptors/HD Televisions
- Adjust thermostat (not opening a window during the winter)
- Educating oneself about rechargeable batteries
- Using equipment properly (ovens are not designed to heat a room)

END of Unit 1, Topic 4

Created for Energy & Power 9
By Mr. Davis

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