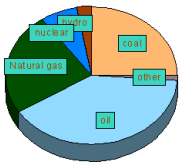
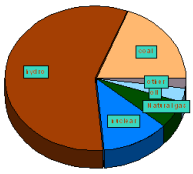
Where do we get our energy from?
Is it Sustainable?

World Wide Energy Pie



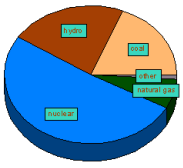
Coal 25%
Hyrdo 3%
Nuclear 7%
Natural Gas 24%
Oil 40%
Other 1%

In Canada



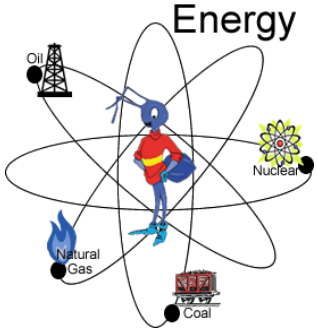
Coal 19%
Nuclear 12%
Oil 3%
Hyrdo 56%
Natural Gas 6%
Other 2%

In Ontario

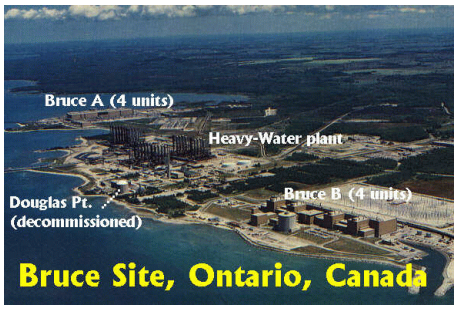


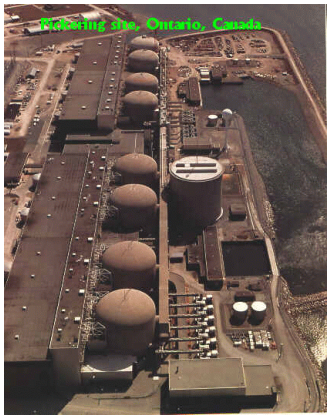
Coal 19%
Nuclear 51%
Oil 0%
Hrydo 22%
Natural Gas 7%
Other 1%

Non-Renewable Energy



Nuclear Power Plants in Ontario



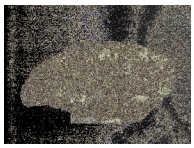


The source of Fuel for Nuclear Reactors in Ontario is Uranium

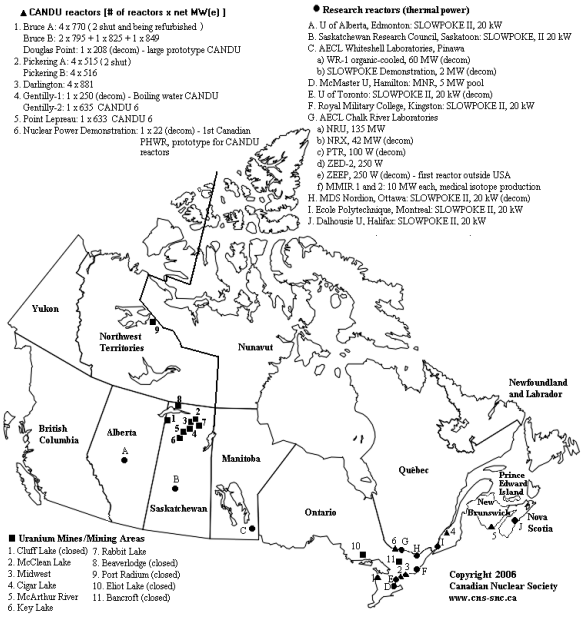
Uranium is an element found in naturally occurring pitchblende contains uraninite UO

Mined and Refined in Canada

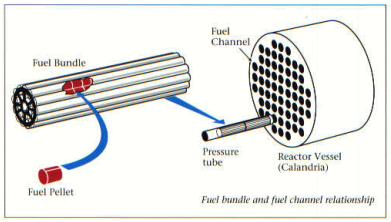
Uranium is a radioactive element (it's atoms are unstable and break down releasing energy)



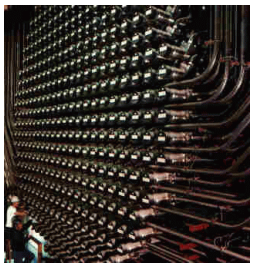
Canada's Nuclear Reactors and Uranium Mines



Uranium is converted into pellets
Those pellets are placed in fuel bundles
Fuel bundles are placed in the reactor
The reactor is submerged in heavy water

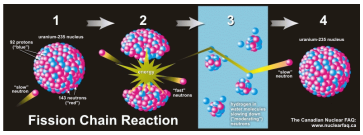


Candu Reactor Face



Nuclear Fission

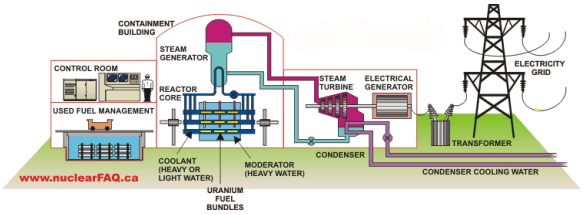
The fuel bundles are bombarded with neutrons
These neutrons split the uranium atom (fission)
This releases energy and creates a chain reaction



The CANDU REACTOR

The energy turns the heavy water into steam.

The steam is used to turn a turbine which generates electricity



Pros

Ontario jobs both in mining and reactor sites.

Uranium markets currently more stable that oil and gas

Once established have high energy outputs compared to the operating cost

Nuclear power takes up very little space (a volley ball size piece of uranium will provide you with enough energy for your life time)

Nuclear Plants have no atmospheric emissions.

Cons

Uranium mining is
Extremely hazardous to miners health
210 million tones of mining waste (tailings) have been produced so far

Power plants consume large amounts of water for cooling an release heated water back into lakes disrupting ecosystems

Nuclear Safety Risks (Chernobyl, Three Mile Island, Fukushima)

Highest set up and maintenance costs Eg. Bruce refurbishment cost 4.8 billion

Nuclear waste is extremely hazardous and will be around for 1000's of years?