Fuelling The Future – Canada's Energy Resources

Unit 3 Continued

Energy Use In Canada

- Canadians use energy in all parts of their lives.
- Going to school, using your phone, and even going on vacation all require energy.

An Energy Dependent World

We are becoming more and more dependent on energy. Here are three reasons why:

- 1. The world population keeps rising, so more energy is needed.
- 2. Countries like China and India are becoming more industrialized and therefore need more energy.
- 3. People in industrialized countries like Canada and the USA keep using cheap energy to improve standard of living.

Canada's Energy Resources

- Canada has more energy resources than it will ever need, so we sell a lot of it for other things we need.

- Some of Canada's energy comes from minerals such as oil, natural gas, and coal.
- Other sources include hydroelectricity and nuclear power.

1) Coal Energy

- In Canada today, coal is mostly used to keep power plants running.
- Coke, a substance made from coal, is used in the smelting of steel.
- As a result, a lot of coal is sold by Canada to countries such as Japan and China.

- Coking coal is also needed in the Great Lakes region for the automotive industry there.

Coal Mining

Coal can be mined in 3 ways:

- 1. Open-Pit Mining – digging a giant pit to extract a mineral near the surface.
- 2. Strip Mining – removing ore along a deposit in a horizontal layer.
- 3. Underground Mining – following shafts and tunnels and setting off explosives to get at deposits deep underground.

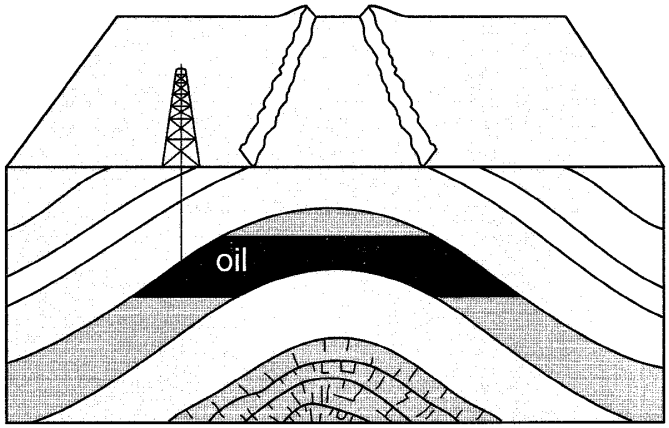
Facts About Coal

- Most of Canada's coal comes from Alberta.
- Cave-ins, poisonous gases, and cold, damp conditions make coal mining extremely dangerous work.
- Coal is shipped to ports, power plants, and factories, usually by train.

- Coal releases a lot of carbon into the atmosphere, which increases greenhouse gases.
- Coal releases 29% more carbon than oil, and 80% more than natural gas.

2) Oil Energy

- Without oil, modern society would shut down.
- Oil is used to make gasoline, cosmetics, tar, and plastics.



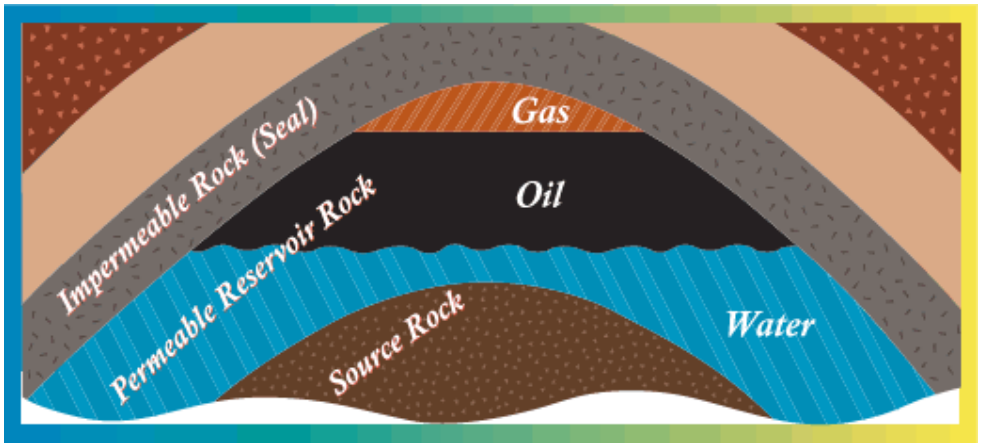
- Oil is found underground in the holes in porous rock, sandwiched between two layers of non-porous rock.

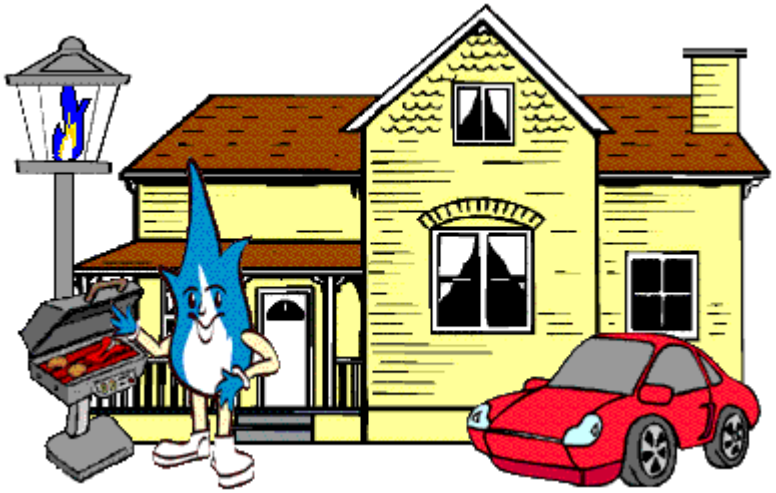
Oil Production in Canada

- There are oil fields offshore (under the ocean) in Canada.
- Two examples are Hibernia and Terra Nova.
- There is a finite amount of oil in all oil fields (they will eventually run out).
- The Hebron oil field is set to begin producing 150,000 barrels of oil per day beginning in late 2017.

3) Natural Gas Energy

- Natural gas is found above the oil in an oil trap.
- It is an unstable gas that can easily explode, so it is transferred in pipelines, not trucks.

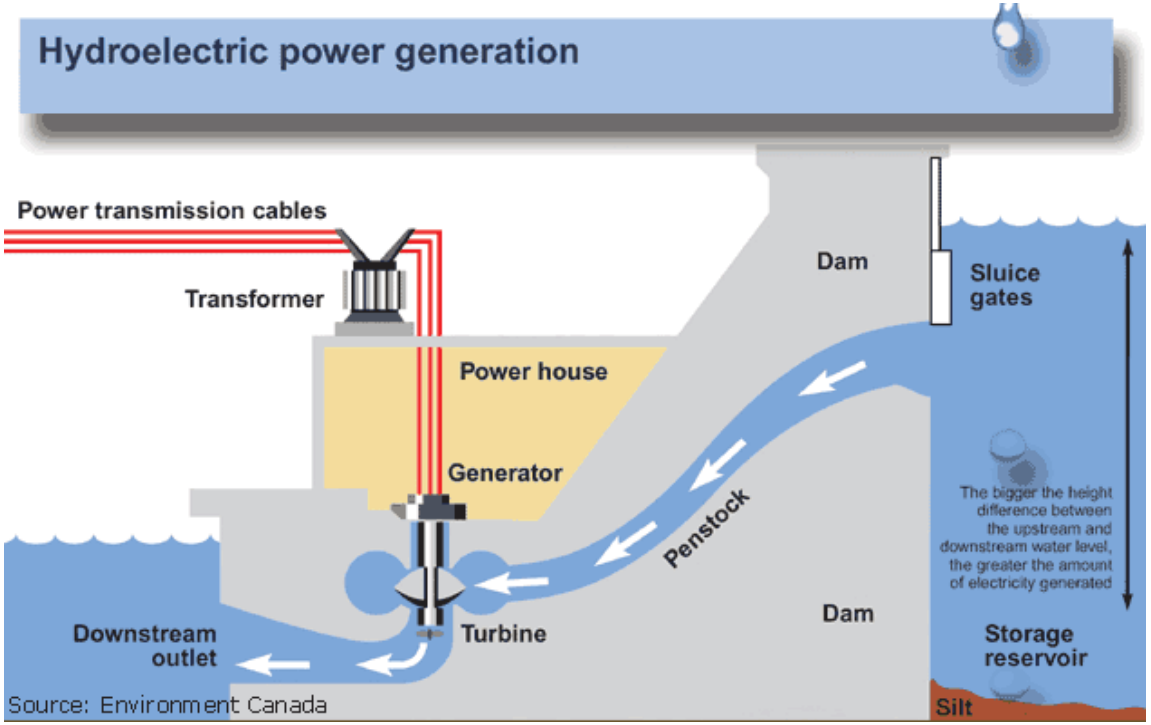




- Natural gas is used for home heating, in cars, and to generate electricity.
- It is cheaper than oil and coal and it produces less carbon dioxide than either (that's a good thing).

4) Hydroelectric Energy

- Hydroelectric energy needs water and a slope to work.
- The water runs into a turbine (a revolving engine) and creates mechanical energy.
- Canada has more running water AND more hydroelectric power than any other country.



BENEFITS INCLUDE…

- It is a clean energy, meaning it does not burn any of the three fossil fuels.
- It is also cheap and reliable. We have plenty of running water, remember?

DRAWBACKS INCLUDE…

- Dams are built to divert water for hydroelectric plants.
- This creates artificial lakes that confuse the local wildlife, making it difficult for them to adjust.
- Hydroelectric plants cost billions of dollars to construct (Muskrat Falls)

5) Nuclear Energy

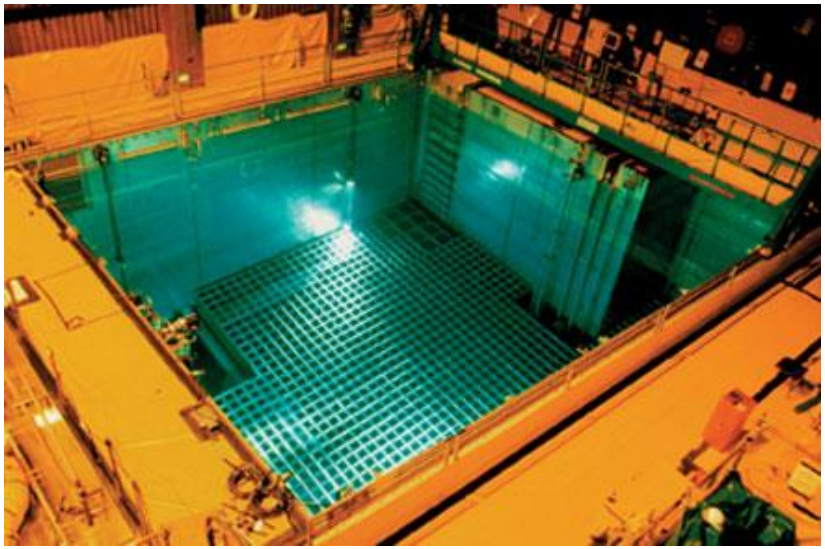
- Nuclear plants do not produce any air pollution.
- The fuel used for nuclear power (uranium, radium) is cheap and abundant.
- Not a lot of fuel is needed to run a plant, so we'll likely never run out.

- Ontario is the largest user of nuclear power in Canada.
- Fuel rods containing radioactive uranium or radium are used to heat water. The steam created powers the turbines to create energy.

Nuclear Energy

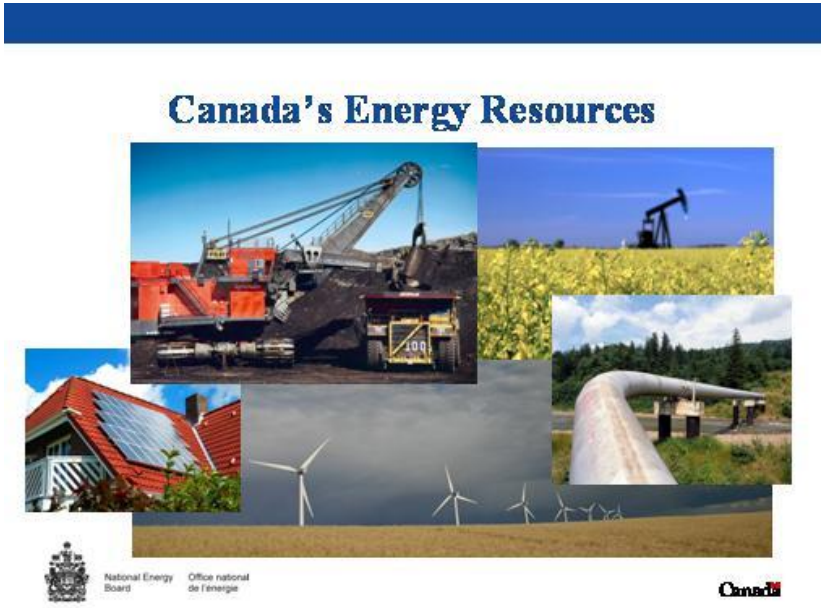
- The construction costs for nuclear plants are very high.
- Tearing down old plants also costs a lot of money.

- A potential problem is that these rods are still radioactive and dangerous, even after they are no longer useful. They must be stored in giant pools in the plants to avoid contamination.

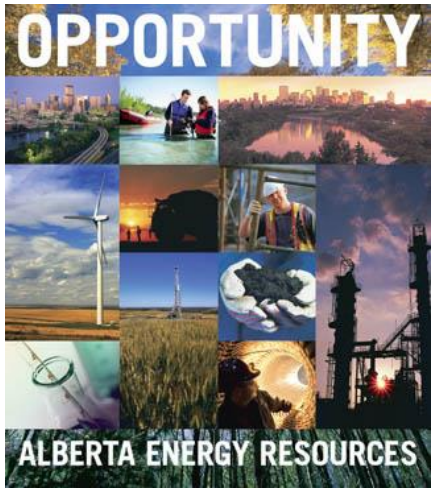


Energy Resources and the Economy

- Canada depends on the USA buying our oil, natural gas, and hydroelectric power.
- If the USA gets their natural resources from somewhere else, Canada's economy will suffer greatly.



Energy Resources and Politics



- In most cases, provinces and territories control their own natural resources.
- So, Alberta is very rich because they profit from their oil while a province like New Brunswick, with very few natural resources, has much less money.

- Newfoundland and Labrador has recently seen a jump in their economy over the last 20 years, due mainly to an increase in oil production.
- The value of oil production to the province in 2011 was $10.7 billion.
- **HOWEVER:** Drops in world oil prices can also mean economic losses for places like NL.
- So we have seen the positives and negatives of having energy resources to sell.