9 Science (10FI)

Learning Opportunities

May 11 – 15

Sources of Energy

All sources of energy fit into one of two categories: renewable energy resources and non-renewable energy resources.

Renewable sources can be easily replenished. An example of this is solar energy.

Non-renewable sources can sometimes be replenished, but not in a reasonable amount of time. An example of this is fossil fuels; these would take millions of years to replenish.

Electricity Generation

Energy cannot be created or destroyed, but only changed from one form to another.

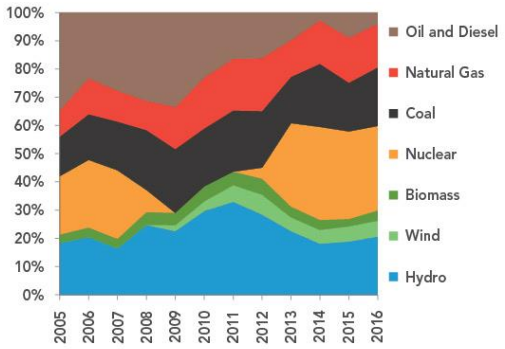
To create electrical energy, we need to use another energy source, such as….

1. **Mechanical energy.** By moving an object we can create electricity. This can be as simple as rubbing two objects together to create static electricity, or as complicated as squeezing certain crystals to cause them to produce small amounts of power.
2. **Thermal Energy.** By digging deep into the earth, we can use the heat from the Earth's core to produce electricity
3. **Solar power.** Photovoltaic cells convert light from the sun into electrical energy. You have seen them in small devices like calculators, but they have the potential to be one of the big energy producers of the future.
4. **Chemical energy.** Batteries store energy in the form of chemical bonds. They release this energy as electricity.
5. **Generators** – Used in areas without powerlines such as remote construction sites and camps. They are usually gas powered and use the gasoline's chemical energy to spin a turbine and produce energy.

In New Brunswick, there are 3 main sources for electrical energy.

1. Fossil fuel (oil, diesel, natural gas, coal) generation stations. Fossil fuels are burned and the heat is used to boil water. The steam from the water spins a turbine connected to a generator which produces electricity. This type of electricity is produced at Colson Cove in West Saint John, as well as other places around NB.
2. Nuclear Generation – Nuclear reactions generate heat, which boils water. The steam from the water spins a turbine connected to a generator which produces electricity. This type of power production is done in Point Lepreau.
3. Hydroelectric Generation – Water which has been dammed is allowed to flow past a turbine, spinning it. The turbine is connected to a generator that produces electricity. This type of production is done at Mactaquac.

   The diagram below shows the sources of Electricity in New Brunswick



https://www.cer-rec.gc.ca/nrg/sttstc/lctrct/rprt/2017cndrnwblpwr/prvnc/nb-eng.html accessed May 7, 2020

The energy that powerplants produce cannot be stored effectively, so it must be made at the same rate as it is used. Power companies buy and sell power from each other to make up for shortfalls.

New sources of energy are being developed. Wind energy is being tried in coastal areas of the province, and researchers are looking into ways of using the huge tides in the Bay of Fundy to produce renewable energy.

Power is sent from the powerplants to homes along high voltage lines. Outside homes, a **transformer** changes the voltage from the very high levels in the lines to 120 V that can be used in the home.

Activity

Choose a source of energy used to make electricity.

You can get information from Internet research, talking to people you know or use knowledge you already have:

Consider questions such as:

- Is the energy source renewable or nonrenewable?
- Where is the energy source found and how do we get access to it?
- How is the energy stored in the source and how is it released?
- Advantages and disadvantages of the energy source
- Environmental impacts of the energy source
- Do you think this is a good energy source for the future?

Make a brochure that could be used to explain this source of energy.

If you want to email me a picture of your finished brochure, I would love to see it.

Here is a picture of the potato we planted in class: