A4: EXPLORING OCEAN AND TIDAL ENERGIES

Overview

One of the **EU 2020 goals** is to raise the share of energy produced from renewable sources to **20%** by **2020**.

Renewable energy sources accounted for almost **12%** of the **EU-28's gross inland energy consumption** in 2013. **This is almost one quarter of EU energy production**. Renewable energy production in the EU is growing at a rate of over **6% per year**. In 2013 Ireland's share of renewable energy in the final consumption was **7.8%.**

Over **97% of all the water on Earth is contained in the oceans**. However, it is saltwater, thus undrinkable for humans. Desalination might be the answer but this process is very energy intensive. Perhaps the fact that only **about 5% of the oceans have been explored** may be one of the reasons why the use of the ocean as a potential renewable source of energy is just beginning. Current research presently concentrates on harnessing tidal, and wave, energy. Both sources have their respective advantages and disadvantages. **Exploring Ocean and Tidal Energies** enables students to explore both of these energies – the advantages, disadvantages and ethical issues involved in developing each of these energies.

A4 ACTIVITY 1: FARADAY'S EUREKA MOMENT is an activity that introduces the students to the principle of electromagnetic induction and shows that electricity can be generated using a magnet and a coil of wire.

A4 ACTIVITY 2: WHAT MOVES? looks at how Faraday's principle is still being used in power plants to generate electricity.

In **A4 ACTIVITY 3: ENERGY FROM THE SEA**, students explore the emerging new technologies that use waves from the ocean to generate electricity.

Earth's non-renewable resources, particularly oil, are running out. Transport is one of the greatest consumers of energy, and currently relies predominantly on oil. **A4 ACTIVITY 4: EXPLORING ELECTRIC VEHICLES (EVS)** looks at an alternative transport programme being led by SEAI in the Aran Islands.

Suggested approaches:

- Ask the class to think about the following questions:

  ? ***What would a typical weekend be like if there was no electricity?***

  (Ask members of the class to tell you what they are doing this weekend. Point out all the ways in which it would be different without electricity.)

  ? ***How dependent are we on electricity?***

  The questions serve to highlight our **dependence** on electrical energy and to help students to understand how the issue of **renewable energy relates to them**.

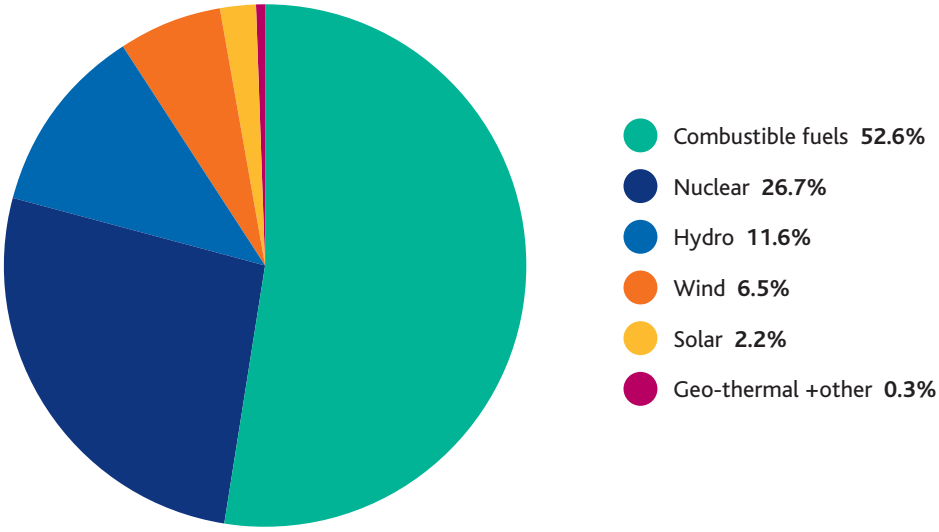
- Start by getting the students to list the various primary and secondary resources used to generate electricity. Then hand out the following, and ask the students to link the percentage of electricity generated (column A) to the sources that generate it (column B).

A: Percentage of Electricity	B: Generated by
6.5%	Hydro
52.6%	Wind
0.3%	Geothermal and others
2.2%	Combustible fuels
11.6%	Nuclear
26.7%	Solar

Source: Eurostat (online data code:nrg_105a)

When this is completed, show them the following chart.

A short discussion may take place comparing their results with those represented on the actual pie chart.



Source: Eurostat (online data code: nrg_105a)