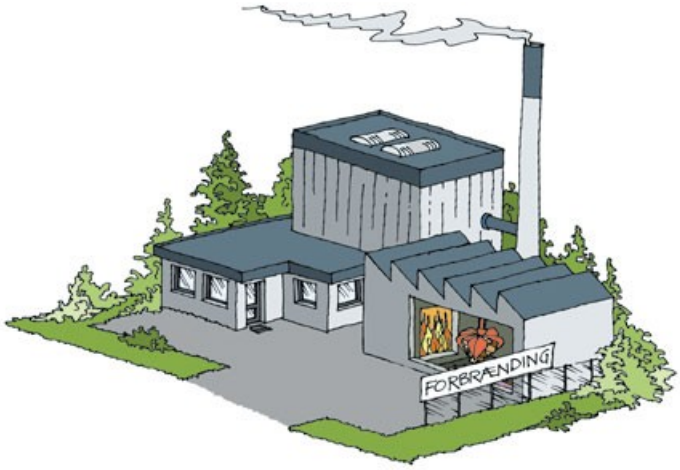
Climate Connections – Background information

Sequester Carbon Dioxide

Carbon dioxide (CO_2) is created when something burns or is consumed. For example carbon dioxide forms when we drive cars that consume gasoline. Carbon dioxide also forms when you burn wood, coal or waste to produce heating or electricity. The more heat we use and the more cars we drive, the more carbon dioxide we produce.

There is carbon (C) in oil and coal. There is also carbon in straw, trees, waste foodstuff, paper and cardboard. For every ton of trash a district heating station burns about 1 m^3 carbon dioxide is released into the air.



This increasing amount of carbon dioxide in the atmosphere is effectively stopping heat from escaping the Earth's atmosphere into space. This is called the greenhouse effect. An animated diagram can be found at http://earthguide.ucsd.edu/earthguide/diagrams/greenhouse/ .

Everything on Earth is dependent on the Earth's atmosphere. The atmosphere contains the air that we breathe and it protects us against the sun's ultraviolet rays. It also contains different forms gasses that help to keep the sun's heat constant, so the temperature around us remains at a relatively comfortable level.

The most important gases that maintain temperatures are condensation, carbon dioxide, methane and nitrous oxide. Without these the Earth would remain in the ice age. Greenhouse gases, which these gases are also called, are an important natural part of the Earth's atmosphere.

Since we began using coal, oil and natural gas, the amount of a particularly concentrated type of carbon dioxide being released into the air has increased. Coal, oil and natural gas are called fossil fuels. They are made up of the remains of living organisms over millions of years. They release CO_2 when they are consumed in electricity power stations, car engines and oil burners. There is also an increase in the amount of methane in the atmosphere, which comes from things like coal mining, rice fields and waste disposal sites.

Other greenhouse gases are also accumulated in the Earth's atmosphere and increasing the greenhouse effect. Examples are various nitrous oxides, which originate from manure and fertilizer,

various other industrial gases used for example in refrigerators or as a waste product from the production and from the incineration of expanded polystyrene or as waste products in the production of aluminium.

All of these gases keep the heat within the Earth's atmosphere, just like glass in a greenhouse. So the greenhouse effect can mean that the world's climate is changing; that it is becoming warmer, so the ice in the North and South poles begins to melt and there are more storms and irregular weather.

Read more here: www.foeeurope.org/climate/index.htm

One way to solve the problem of too much CO_2 in the atmosphere is to find a way to store or deposit it. There are currently new methods under investigation, to find ways to deposit CO_2 in deep geological layers under the ground; for example in empty oil fields under the seabed, or under the Earth's surface in porous sandstone layers covered by airtight clay.

Suggested areas of study:

- What is the greenhouse effect?
  See: http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/04/climate_change/html/greenhouse.stm
- How can you reduce your level of CO_2 emissions into the atmosphere?
- How can CO_2 be stored?

Possible activities:

- Exploring 'Stuff in the sky'
  http://eo.ucar.edu/kids/sky/pollution1.htm
- Exploring, understanding and measuring gases present in the atmosphere.
  http://www.ucar.edu/learn/1_5_2_24t.htm

Other links:

- BBC discussing sequestering carbon dioxide (2004)

http://news.bbc.co.uk/2/hi/science/nature/3667979.stm