

What can be done (to reduce the emission of greenhouse gases)?

What is the carbon counter?

The counter represents the rising concentration of carbon dioxide in the Earth's atmosphere, minute by minute, from April-December 2005.

Carbon dioxide (CO₂) is harmless to breathe, and essential to life as we know it. As a "greenhouse gas", it keeps the Earth warmer than it would otherwise be.

But if the atmospheric concentration gets too high, the planet can heat dangerously.

Before the industrial age, the concentration was around 270 parts per million (ppm). Then, humans started to burn "fossil fuels" – first coal, later oil and gas. This released greenhouse gases into the atmosphere much faster than natural processes could reabsorb them.

Today, the concentration is around 378ppm. Almost no one questions the evidence of a rapid rise in CO₂ or that it is the result of human action. But people do differ as to its significance.

<http://www.opendemocracy.net/debates/article-6-129-2434.jsp#>

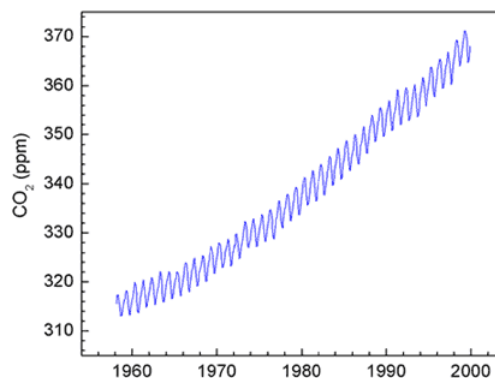
Solar power has been growing in a global capacity by 33 percent annually. Greenpeace and industry research shows that with some government support, the solar industry could supply electricity to over 2 billion people globally in the next 20 years.

By 2040 solar photovoltaics could supply nearly 25 percent of global electricity demand.

A report conducted by global financial analysts KPMG shows that solar power would become cost competitive with traditional fossil fuels if the production of photovoltaic panels was increased to 500 megawatts a year.

A renewable power plant in Asia could have the same costs and provide the same jobs as a coal fired plant, but with significant environmental advantages.

<http://www.greenpeace.org/international/campaigns/climate-change/solutions>



Ever since regular measurements began in 1959, a steady increase in atmospheric concentrations at Mauna Loa, Hawaii has been directly observed



Greenpeace activists install solar panels on houses in Docklands, London.

Hammerfest Strom AS: the Blue Concept

Tidal currents are highly predictable, repeating themselves in known cycles. This simplifies the design of a plant, since the components will be subjected to loads that are known with high accuracy.

In contrast to wind that may come from almost any direction, tidal currents move only back and forth, unless the strait is very wide. By rotating the propeller blades around their own axis at slack water when the current turns, the mill is ready for the reversing current ("pitch control"). Thus the nacelle of a tidal mill with pitch control can remain fixed, while the windmill nacelle needs to be rotated into the direction of the veering wind.

<http://www.e-tidevannseenergi.com/index.htm>



Arcology Concept

Arcology is Paolo Soleri's concept of cities which embody the fusion of architecture with ecology.

An arcology would need about two percent as much land as a typical city of similar population. Today's typical city devotes more than sixty percent of its land to roads and automobile services. Arcology eliminates the automobile from within the city. The multi-use nature of arcology design would put living, working and public spaces within easy reach of each other and walking would be the main form of transportation within the city.

<http://www.arcosanti.org/theory/arcology/intro.html>



San Francisco as EcoCity

Associated Press (11 May 2005) Qatar:

....a secret process will use cobalt to turn natural gas into a powerful, clean-burning diesel fuel [called GTL = Gas-To-Liquid].

Petroleum experts who have sniffed vials of gin-clear GTL [comment]: "The kerosene smells like perfume."

The clean-burning fuel, with almost none of the smelly sulfur soot belched by engines firing on conventional diesel, appears tailor-made for countries looking to reduce emissions in line with the Kyoto Protocol on global warming.

Tests of GTL fuel are under way in several countries. Shell is already selling the fuel in Thailand, The Netherlands, Greece and Germany, charging slightly more than its oil-based diesel. In Europe, Shell calls the fuel V-Power Diesel.

<http://www.cleanairnet.org/caiasia/1412/article-59965.html>



Shell V-Power Diesel –
die Zukunft fährt mit Synthetik

The EU Emissions Trading Scheme (EU ETS) is one of the main policies being introduced across Europe to tackle emissions of carbon dioxide and other greenhouse gases and combat the serious threat of climate change.

The scheme is due to start in 2005, establishing the world's largest market in greenhouse gas (GHG) emissions.

In the UK, up to 2,000 installations, or sites, are set to participate in this market and collectively they emit about half of the economy's carbon dioxide emissions.

- Energy activities
 - Combustion installations
 - Oil refineries
 - Coke ovens
- Production and processing of ferrous metals
 - Iron and steel production
- Mineral industries
 - Glass manufacturing
 - Cement clinker and lime production
 - Brick and tile manufacturing
 - Ceramic products
- Other activities
 - Pulp
 - Paper

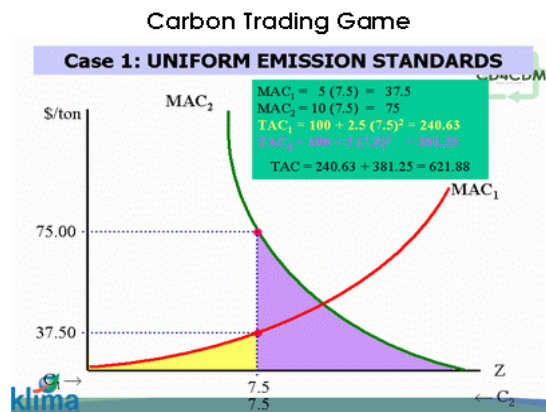
http://www.dti.gov.uk/ccpo/eu_emissions.htm

Wind power plants, or wind farms as they are sometimes called, are clusters of wind machines used to produce electricity. A wind farm usually has dozens of wind machines scattered over a large area. Unlike coal or nuclear plants, many wind plants are not owned by public utility companies. Instead they are owned and operated by business people who sell the electricity produced on the wind farm to electric utilities. These private companies are known as Independent Power Producers.

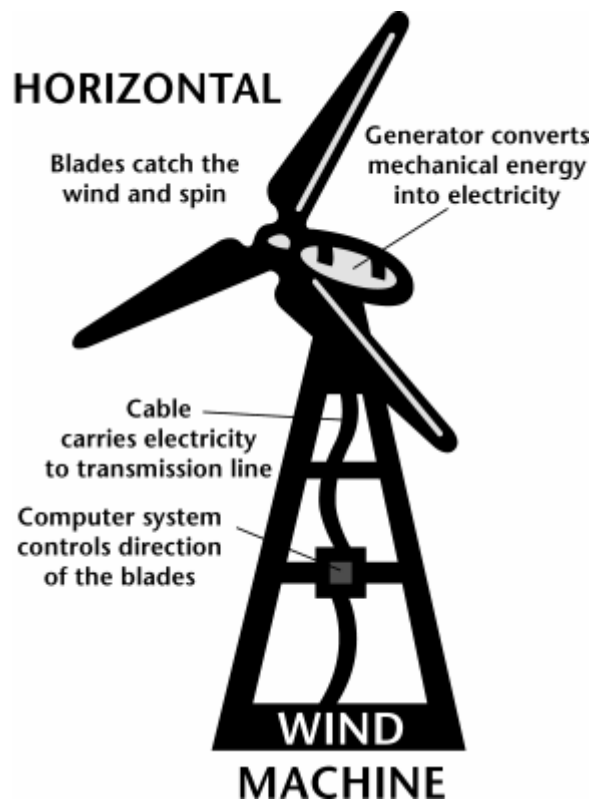
Operating a wind power plant is not as simple as plunking down machines on a grassy field. Wind plant owners must carefully plan where to locate their machines. They must consider wind availability (how much the wind blows), local weather conditions, proximity to electrical transmission lines, and local zoning codes.

Wind plants also need a lot of land. One wind machine needs about two acres of land to call its own. A wind power plant takes up hundreds of acres. On the plus side, farmers can grow crops or graze cattle around the machines once they have been installed.

www.eia.doe.gov/kids/energyfacts/sources/renewable/wind.html



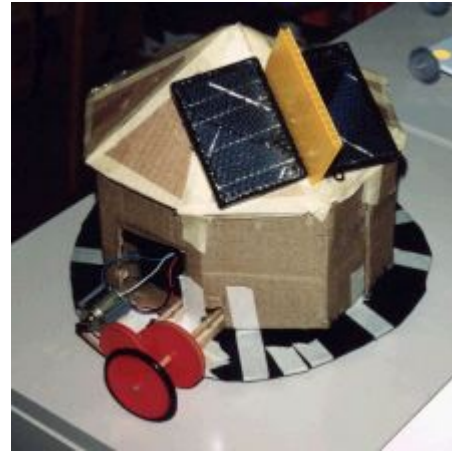
http://www.klima.ph/cd4cdm/training_workshop/training/Iloilo_RTC/day1/carbon_trading.htm



Solar Models

Mark Mateus' Solar House - a tracking device, playing with a simple design to make a whole house track the sun. House is mounted on a turntable. P.V. panels are wired to a single motor so that light exposure on one panel causes the motor to turn one way; and light exposure on the other causes it to turn the other way. When the panels are equally illuminated the house is at rest. When one cell is shaded, this arrangement will turn to seek the sun again until both panels are equally illuminated once more. Again, screw eyes hold the axle shafts, rubber tubing snippets keep the shaft from sliding sideways, elastic band is the drive belt from motor.

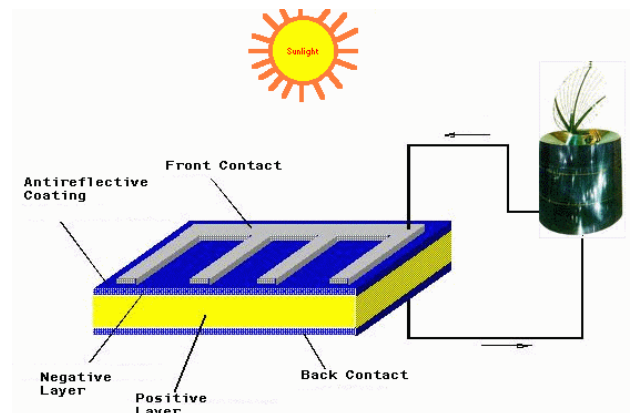
http://www.sunwindsolar.com/a_solar/solar-models.html



Electricity from Sunlight is the most important source of energy on planet Earth. Each day, the Earth receives hundreds of millions of watts of energy from the sun. Most of that energy is in the form of visible light. This is the energy that powers weather, climate, and all living systems on our planet. Sunlight can be converted into other useful forms such as heat and electricity.

Sunlight can be converted into useable amounts of electricity with the help of special devices called photovoltaic (PV) cells. PV cells are most commonly made from silicon, the same material used to make computer chips. Silicon is one of the Earth's most common elements, and is a major component of sand and many kinds of rocks. A PV cell is built like a sandwich, with two layers of silicon separated by a thin "junction layer."

<http://www.re-energy.ca/pdf/CAR%20POSTER%20SMALL2.pdf>



Hydrogen

One of the most promising developments in transportation technology is the hydrogen fuel cell. A fuel cell is a device that combines pure hydrogen with oxygen from the atmosphere to produce electricity, without creating pollution. The electricity is used in powerful electric motors that drive the wheels of the car. A hydrogen-powered car is quiet to drive, and extremely clean in terms of pollutants. Modern charge controllers often come equipped with their own built-in power inverters.

<http://www.re-energy.ca/pdf/CAR%20POSTER%20SMALL2.pdf>

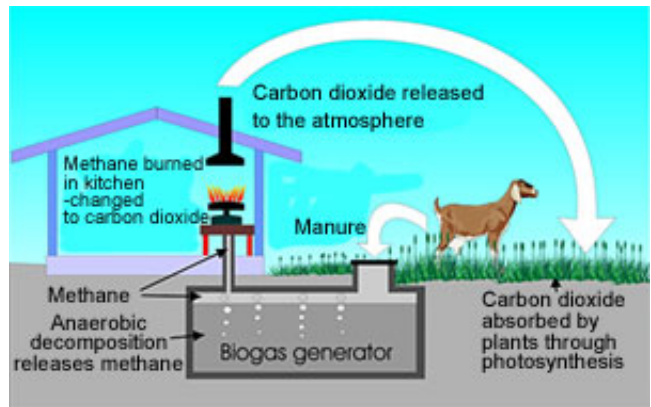


Flammable biogas can be collected using a simple tank, as shown here. Animal manure is stored in a closed tank where the gas accumulates. It makes an excellent fuel for cook stoves and furnaces, and can be used in place of regular natural gas, which is a fossil fuel.

Biogas is a form of renewable energy, because it is produced with the help of growing plants.

Biogas is considered to be a source of renewable energy. This is because the production of biogas depends on the supply of grass, which usually grows back each year. By comparison, the natural gas used in most of our homes is not considered a form of renewable energy. Natural gas formed from the fossilized remains of plants and animals—a process that took millions of years. These resources do not "grow back" in a time scale that is meaningful for humans.

http://www.re-energy.ca/t-i_biomassbuild-1.shtml



You are familiar with what happens to a dark-colored surface when sunlight strikes it: it will get warm. But without a little help, there is usually not enough heat produced to cook foods. To produce enough heat for cooking, it is necessary to shine additional sunlight from a wider area onto the black surface. This is easy to do with mirrors or other reflective surfaces, or with glass or plastic lenses.

The solar oven you will be building from this plan uses aluminum foil to gather sunlight. The foil-covered panels of the oven reflect sunlight into the cooking chamber, which is painted black. Heat is produced when the concentrated sunlight is absorbed by the black surface of the cooking chamber. The heat is contained inside the chamber with the help of insulation and a clear plastic oven bag. The result is a great solar cooker and yummy food!

http://www.re-energy.ca/t-i_solarheatbuild-1.shtml



Geothermal heat comes from pressure and nuclear reactions at the Earth's core. Geothermal heat has been used to heat homes and businesses on a commercial scale since the 1920s. In most cases, communities take advantage of naturally occurring geysers, hot springs, and steam vents (called fumaroles) to gather hot water and steam for heating. Geysers and fumaroles occur when ground water seeps through cracks and comes in contact with volcanically heated rocks. In Iceland for instance, wells are drilled into volcanic rocks to extract hot water and steam. The hot water or steam is carried to communities in insulated pipes and used to heat homes and businesses. In some cases, the water is superheated (heated under pressure to temperatures greater than 100° C). Superheated water quickly turns to high-pressure steam, which can turn high-speed turbines that drive electrical generators.

http://www.re-energy.ca/t-i_othereclean.shtml

In 1992 Greenpeace initiated the development of the world's first climate and ozone safe refrigerator technology: Greenfreeze.

Greenfreeze uses hydrocarbons as the blowing agent for the insulation foam and for the refrigerant. Hydrocarbons are completely ozone friendly, and have minimal global warming potential.

Greenfreeze hydrocarbon technology is the most environment friendly technology available worldwide for refrigeration. Its benefits are considerable, particularly for developing countries.

Greenfreeze is cost effective, technologically mature and commercially accepted.

<http://www.greenpeace.org/international/press/reports/greenfreeze-from-snowball-to>



A geothermal heat utility in California.



Greenfreeze - ozone friendly refrigerator containing no freons or CFCs. (Sep 1993)