



Is smoke from cars, cigarettes, power plants and factories harmful? How does it affect your health? How does it affect nature (air, water, soil, plants, animals)? Why do people use cars, power plants and factories? Are there any alternatives?





Мақсат

□ 8.3.2.23 жылу машиналарының қоршаған ортаның экологиясына әсерін бағалау

□ You will estimate the effect of heat engines on ecology of environment



Non-Renewable Energy Sources

Fossil Fuels: These are found in three types- coal, petroleum and natural gas- all of which are derived from the decomposition of plant and animal matter.

Pros

- They are more easily available than other energy sources
- They are considered more affordable than many alternative energy sources.

Cons

- These fuels are the biggest producers of greenhouse gases.
- They are steadily decreasing in availability due to over-dependency on them that often results in overuse.



Nuclear Energy Sources

Nuclear energy can be obtained either using fission or fusion. Uranium atoms are split through fission to release large amounts of nuclear energy. The energy is then used to heat water which turns turbines that in turn produce electricity.

Pros

- A small amount of nuclear fuel can produce tremendous amounts of energy.
- There is no emission of greenhouse gases in production of energy.

Cons

- By-products from the use of nuclear fuel are highly toxic.
- Supply of sources of nuclear energy like uranium is very limited.
- Nuclear energy can easily be misused to carry out terrorist attacks.



Renewable Energy Sources

Sun

Solar power is obtained by collecting the sun's heat and/or light using solar panels and photovoltaic panels and converting it into useable energy.

Pros

- There is no emission of greenhouse gases in production of solar power.
- There is no fear of the sun “running out” or getting depleted.

Cons

- Solar power stations are costly to put up.
- Power generation is dependent on sunny weather conditions that aren't always available.



Wind

Wind towers have their blades turned by wind which in turn rotates magnets that produce electricity using a generator. They are usually used in large-scale on wind farms for greater profitability.

Pros

- The only cost incurred is that of building the wind towers.
- Safety risks are next to none when dealing with the turbines.
- Generation of wind power does not result in the production of greenhouse gases.

Cons

- Wind towers can only be in areas that are relatively windy and even then not every day is sufficiently windy for energy production.
- For adequate power generation, numerous wind towers must be built.
- Wind mills have been said to be aesthetically unpleasant to look at.



Geothermal

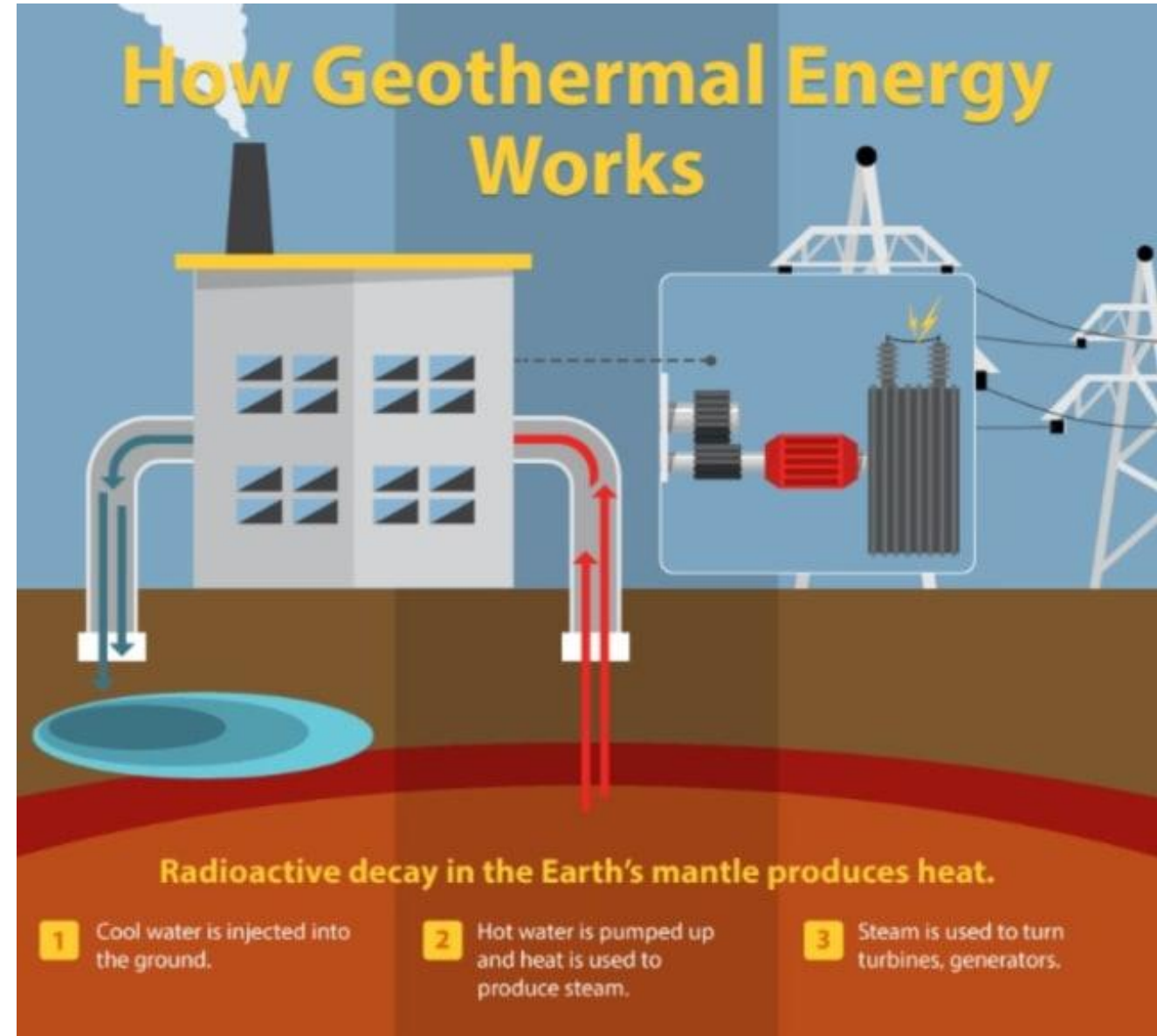
This is heat trapped in the earth's core that is harnessed to generate energy.

Pros

- There is no emission of harmful gases so long as the process is properly carried out.
- Power plants are relatively small thus have no adverse effects on the surrounding areas.

Cons

- Pollutants may be produced if drilling is done improperly.
- Geothermal sites can run out of steam.



Hydropower

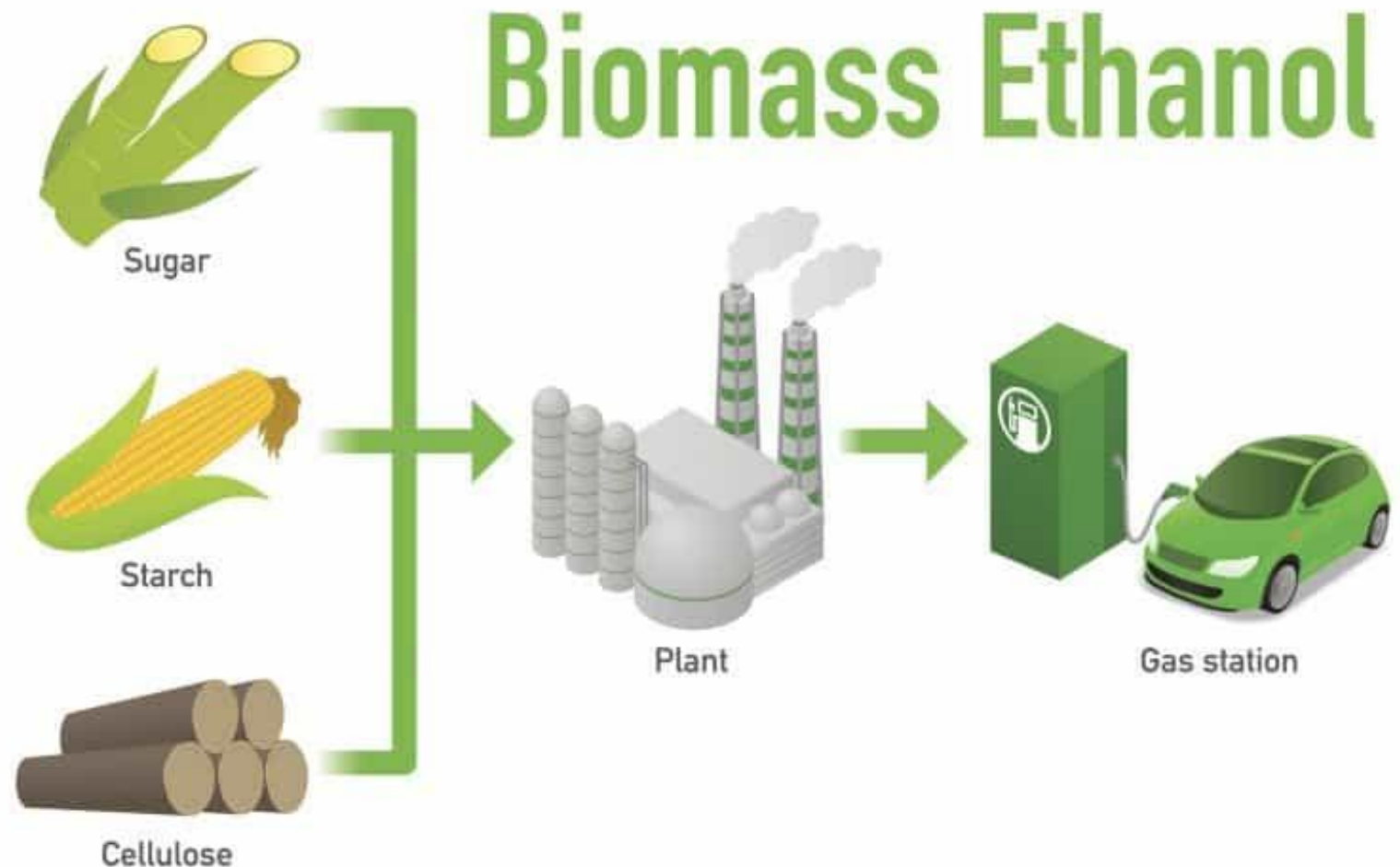
Water is stored in a reservoir, generating a lot of potential energy. Then it is forced through a dam, turning a turbine, which then turns a generator to produce electricity.



Biomass

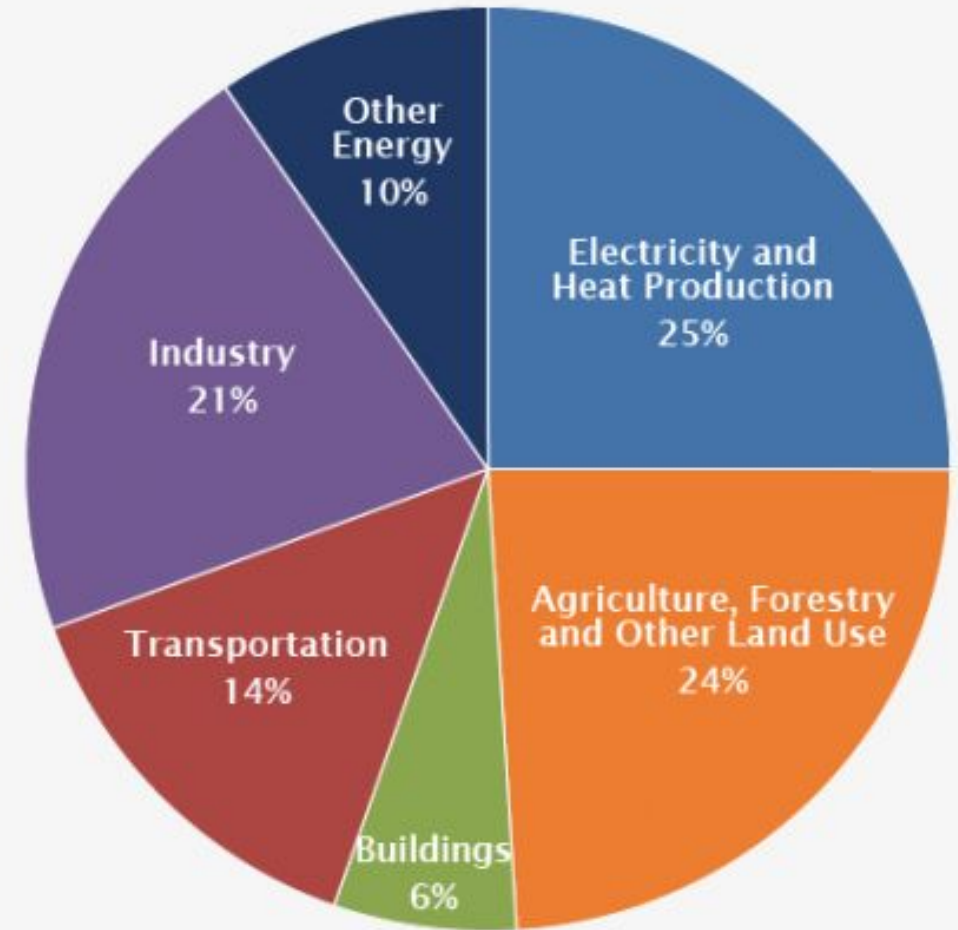
Biomass refers to the organic material that is used for production of energy. Biomass is primarily found in the form of living or recently living plants and biological wastes from industrial and home use

It is such a widely utilized source of energy, probably due to its low cost and indigenous nature, that it accounts for almost 15% of the world's total energy supply and as much as 35% in developing countries, mostly for cooking and heating.



- **Electricity and Heat Production** (25% of 2010 global greenhouse gas emissions): The **burning of coal, natural gas, and oil** for electricity and heat is the largest single source of global greenhouse gas emissions.
- **Industry** (21% of 2010 global greenhouse gas emissions): Greenhouse gas emissions from industry primarily involve **fossil fuels burned** on site at facilities for energy. This sector also includes emissions from chemical, metallurgical, and mineral transformation processes not associated with energy consumption and emissions from waste management activities.
- **Transportation** (14% of 2010 global greenhouse gas emissions): Greenhouse gas emissions from this sector primarily involve **fossil fuels burned** for road, rail, air, and marine transportation. Almost all (95%) of the world's transportation energy comes from petroleum-based fuels, largely gasoline and diesel.

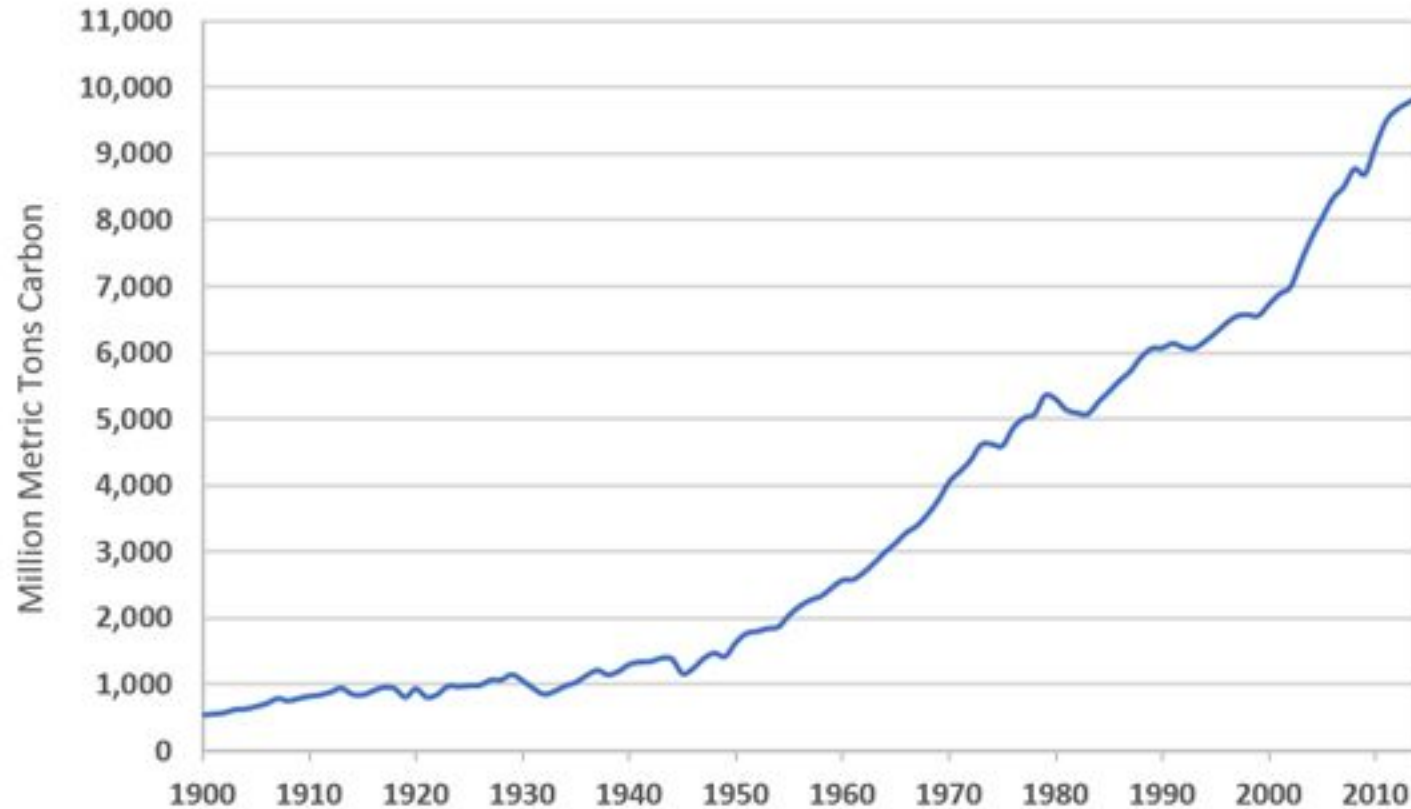
Global Greenhouse Gas Emissions
by Economic Sector



Source: [IPCC \(2014\)](#); based on global emissions from 2010. Details about the sources included in these estimates can be found in the [Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change](#).



Global Carbon Emissions from Fossil Fuels, 1900-2014



Global carbon emissions from fossil fuels have significantly increased since 1900.

Since 1970, CO₂ emissions have increased by about 90%, with emissions from fossil fuel combustion and industrial processes contributing about 78% of the total greenhouse gas emissions increase from 1970 to 2011.

Agriculture, deforestation, and other land-use changes have been the second-largest contributors.

Source: Boden, T.A., Marland, G., and Andres, R.J. (2017). [Global, Regional, and National Fossil-Fuel CO₂ Emissions](#). Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. doi 10.3334/CDIAC/00001_V2017.





Terminology

Power Plant– Электр станциясы/электростанция

Factory– зауыт/завод

Alternative – балама/альтернатива

Harmful waste – зиянды қалдықтар/вредные
ОТХОДЫ

Renewable – жаңартылатын/возобновляемый

