THE SOURCES OF ENERGY

SOURCES OF RENEWABLE ENERGIES

- Hydroelectric
- Photovoltaic
- Wind
- Geothermal
- Biomass
- Sea Current

NON-RENEWABLE ENERGY SOURCES

- Fossil fuels (Petroleum, coal, methane, wood, uranium, natural gas, CDR *)
- Nuclear

Non-renewable energy sources:

Non-renewable energy sources are energies that tend to run out over time.
Non-renewable energy sources are often exploited because they can produce the greatest amounts of energy with technologically simple systems.

Advantages:

non-renewable energy sources include fossil fuels, they are the most convenient sources of energy, some of them are quite easy to transport like natural gas.

Disadvantages:

once the non-renewable energy sources run out they cannot be replaced in the short term.
The extraction of these sources causes irreparable damage to the environment.
the combustion of gas and other fossil fuels continues to increase producing carbon dioxide (CO_2) which climatologists believe is one of the main causes of global warming.

Renewable energy sources:

new technologies in development make it possible to obtain renewable energy for the future.

Advantages:

Human health and the environment. Unlike fossil fuels, the exploitation of these resources does not produce pollutants.

Disadvantages:

High cost of installation and deterioration over the years.
Visual pollution of the environment.

RENEWABLE ENERGY

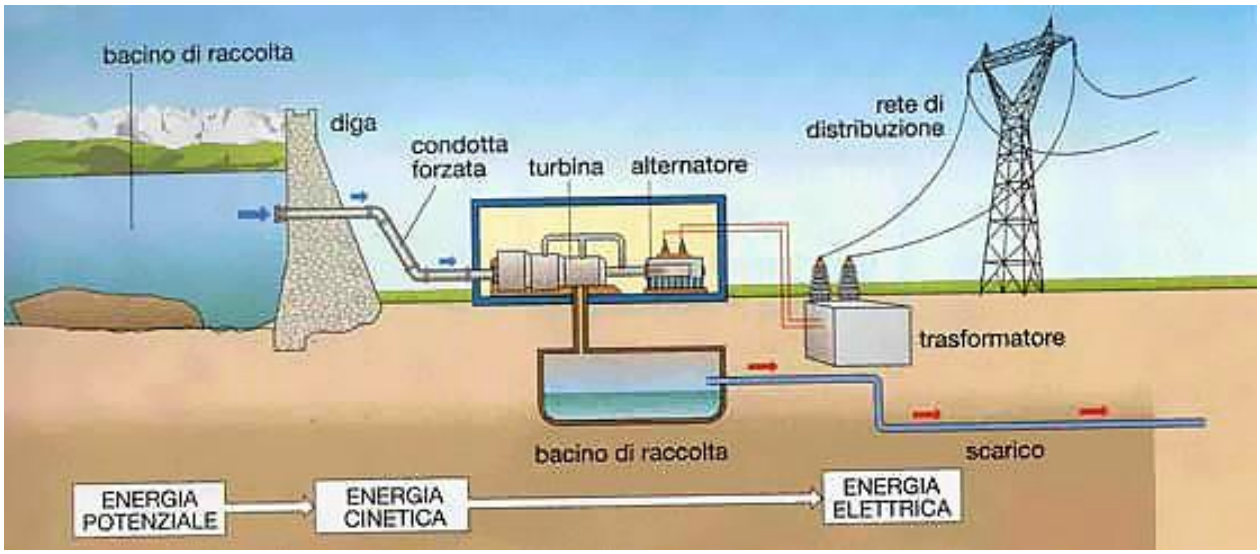
HYDROELECTRIC:

hydroelectric energy is an alternative and renewable energy source, which exploits the transformation of gravitational potential energy, this kinetic energy is transformed into electricity in a hydroelectric power plant thanks to an alternator coupled to a turbine.

HISTORY

the Greeks and the Romans were the first civilizations in the world, to use the power of water or more precisely of kinetic energy.
A technical progress of enormous proportions occurred at the end of the nineteenth century at the beginning of the second industrial revolution that took place in Europe and beyond.
in the first half of the twentieth century hydroelectric energy became more and more perfected and functional.

OPERATION



Hydroelectric energy is obtained from the course of rivers and lakes thanks to the creation of dams and forced ducts.
the water of a lake or an artificial basin is conveyed downstream through forced pipes, thus transforming its potential energy into pressure energy.
thanks to the turbine the mechanical energy is created which is then transformed through the electric generator into electricity.

To allow you to store energy and have it available at the time of greatest demand.

ADVANTAGES:

the so-called blue gold is what makes this type of energy a renewable source, as it is available as long as there is water, both sweet and salty.

• Environmental protection: it is possible to produce current using potential energy contained in the water without releasing any emissions

• Savings on water bills for individuals: the new hydroelectric technologies allow small private individuals to install this type of system to meet their own energy needs

DISADVANTAGES:

• Costs too high for individuals: still today the incentive systems of our country are lacking, especially when compared to photovoltaic

• Periodic maintenance request to guarantee the operation of the plant

OPINION

lorenzo: "I think it is an excellent source of energy that produces a good amount of electricity, but on the one hand I don't like it because it ruins the landscape with the construction of dams that block the waterways."

victor: "This type of energy is innovative, it produces a lot of electricity for neighboring houses and for companies, I also believe that this type of complex favors the visual pollution of the landscape."

isac: "This type of energy produces enough energy to live even without fossil fuels but it pollutes the landscape because it is necessary to build in the environment with vast reserves of water."

filippo: "It is an excellent alternative to non-renewable energy sources, it is a major danger for aquatic species."

Leonardo: "I think it is a good source of energy because it does not pollute."

WIND ENERGY

wind energy uses the kinetic energy generated by the wind, the machine used is the wind turbine that transforms wind energy into mechanical energy which in turn transforms it into electricity.

HISTORY:

for thousands of years, sailing boats and sailing ships have used wind energy.
The use of wind to supply mechanical energy started a little later in history.
The first windmills were in use in Iran from the 9th century and perhaps as early as the 7th century.
starting from the year 1000 the windmills were used, both in China and in Sicily to pump sea water and to extract salt.

TYPES OF PLANT WIND AND OPERATION:

There are various types of wind farms:

• At high altitude: there are numerous projects, mostly still an experimental or pre-commercial level, for the exploitation of high-altitude wind energy. the challenges for such a

project include the guarantee of having a safe suspension able to keep the turbines hundreds of meters from the ground.
• Magnetic wind: an impressive development of wind energy is the wind-magnetic one, that is produced with some kind of wind turbine. this main rotor produces a remarkable energy efficiency and lower maintenance cost.

ADVANTAGES:

1. Wind energy is a valid source of renewable energy. this source is abundant, inexhaustible and available in many terrestrial locations.
2. Unlike photovoltaics, a wind farm occupies a smaller area
3.the wind is a clean source with low environmental impact, it does not produce emissions and the turbines themselves can face a very long life cycle
4. It is reversible, ie the area occupied by the park can be restored to renew the territory
5.plant costs and maintenance are relatively low. One cost per Kw produced, in very windy areas, is quite low.

DISADVANTAGES:

1. Energy is not always constant since the wind is not always predictable.
2. the large wind farms have a strong impact on the landscape.
3. Wind power plants have a negative impact on the surrounding fauna. The birds are not able to recognize the blades that move so fast (70Km / h) crashing brutally.

OPINION
lorenzo: "I think it is not a very valid form of energy because it produces small amounts of energy, pollutes the landscape and is a potential danger for birds."
Isac: "I think it is a useless energy because it can only be used in specific environments."
victor: "I think it is a very valid alternative energy since there are low installation and maintenance costs that facilitate private individuals."
Filippo: "I think it's not very useful as a source of energy because it has a low production of electricity."
Leonardo: "I think it is an excellent source of energy despite low production."

Photovoltaics

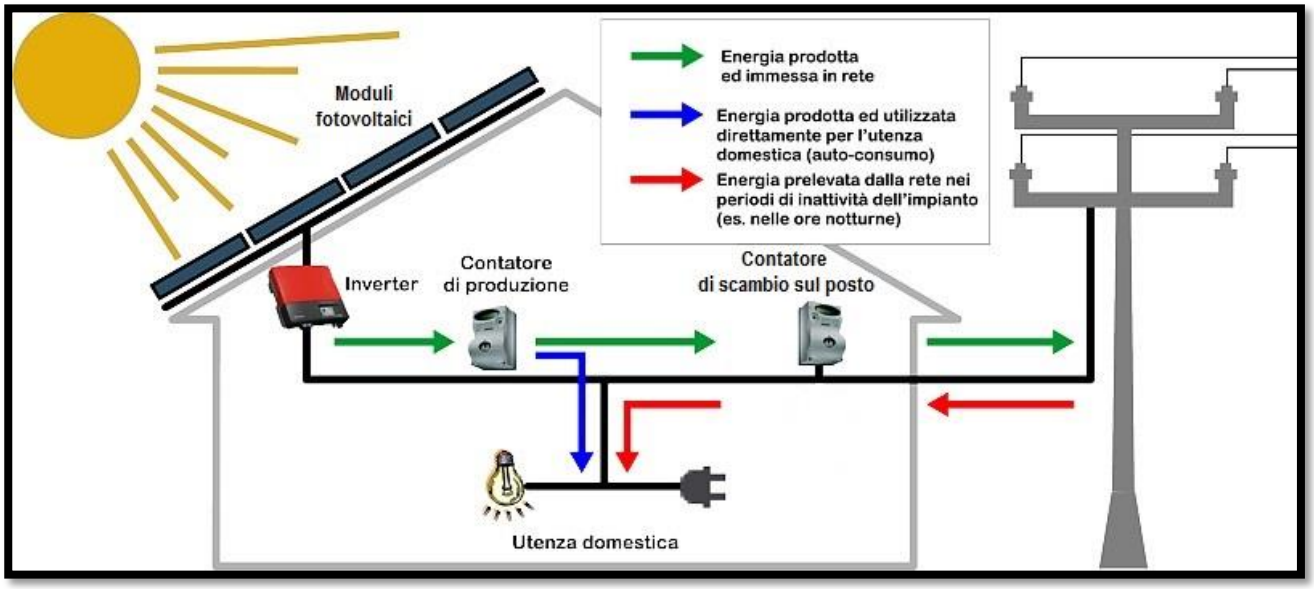
What is that?

Photovoltaics is a technology for the production of electricity.
in electrical energy, exploiting the properties of silicon crystals (semiconductor used in electronic devices).

the transfer of energy from the photovoltaic system to the user occurs through additional devices, necessary to transform and adapt the direct current produced by the modules (panels composed of several cells) to the needs of the end user.
History:
here are the main stages of photovoltaic technology:

• In 1839 the French Alexandre Edmond Bécquerel notes that "some electric current is generated during some light-induced chemical reactions".
• In 1883 the American inventor Charles Fritz produces a solar cell of about 30 square centimeters based on selenium with a conversion efficiency of 1-2%.

OPERATION



the photovoltaic system allows to produce energy through the installed panels.inside these panels there are silicon crystals that capture the ultraviolet rays produced by the sun, through an inverter the energy is transformed into high voltage current (220V) which ends up directly in our meter.

Advantages:

• Absence of any kind of polluting extension
• Savings of traditional fossil fuels
• Extreme reliability (there are no moving parts) and lasts over 25 years

Disadvantages:

• High initial cost of the systems
• Variability and uncertainty of the energy source: it depends on the latitude and the season of the year

• High surface area used compared to the power obtained (low yields, from 4% to 16%)

Opinions:

Victor: "I think it is an innovative energy, they should lower the installation costs for an accessibility for the whole population."
lorenzo: "I think it is a very valid source of energy to replace the high consumption of fossil fuels, all in all it also has accessible costs."
Isac: "I think it's the best source of energy to use."
filippo: "I think it is an excellent source of non-polluting energy, but at the same time, as it is developed today, it is not enough to satisfy the needs of the whole world."
Leonardo: "I think that photovoltaic energy is the best solution to power houses, buildings, etc. given its advantages and its costs. "

GEOTERMIC ENERGY

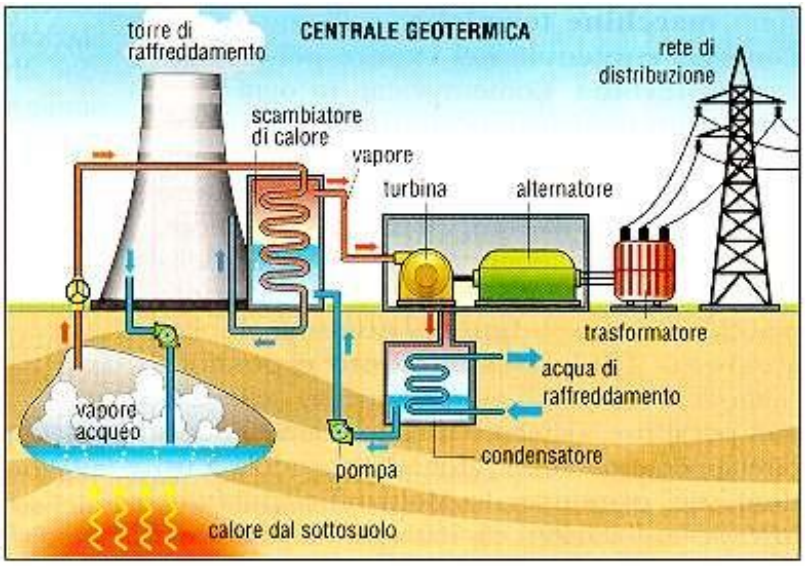
WHAT IS it?

the geothermal energy is the energy generated through geology heat sources and can be considered an energy alternative and renewable.

the geothermic energy uses the heat of the ground

HISTORY:

the hot sources had altering used



operation of geothermic energy

the heat produced is transformed into steam then it goes into the turbine that turns the alternator that produces current.

ADVANTAGE OF GEOTERMIC ENERGY

1) has less impact on the environment

2) it is always available and is constant

3) it is silent

4) it is not dangerous

5) it's cheap

THEASEDVANTAGES

1) it has a visual impact on the land scape

2) it has unpleasant odors

OPINION:

it is excellent energy because it does not cause much damage.

BIOMASS

biomasses are animal or plant organismic present in a centime quantity.

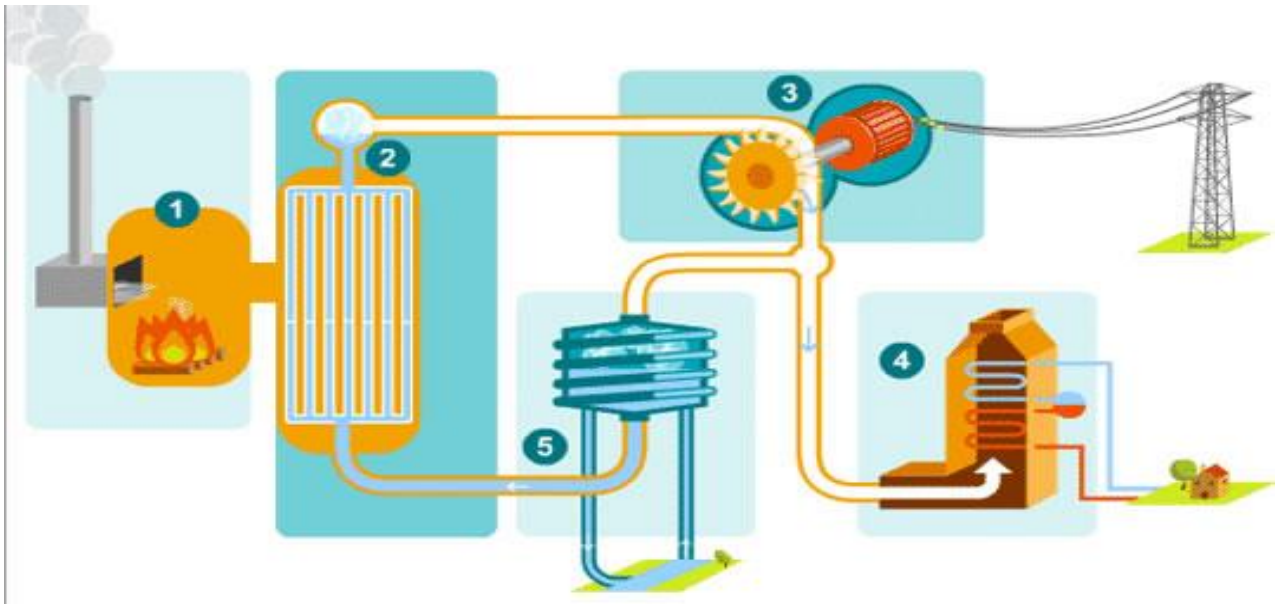
HISTORY

the biomass was discovered in the 20 s of the twentieth century.

use organic material for energy production.

these materials are used to heat a fluid that produces mechanical energy.

and activates an electrical generator that produces energy.



ADVANTAGE:

1) theses mall telling of waste

2) use easy resources

3) use waste resource

THESEDVANTAGE

1) they need treatment
2) combustion
3) fermentation or digestion

OPINION:

it is a useful energy to the produce without polluting

Sea currents

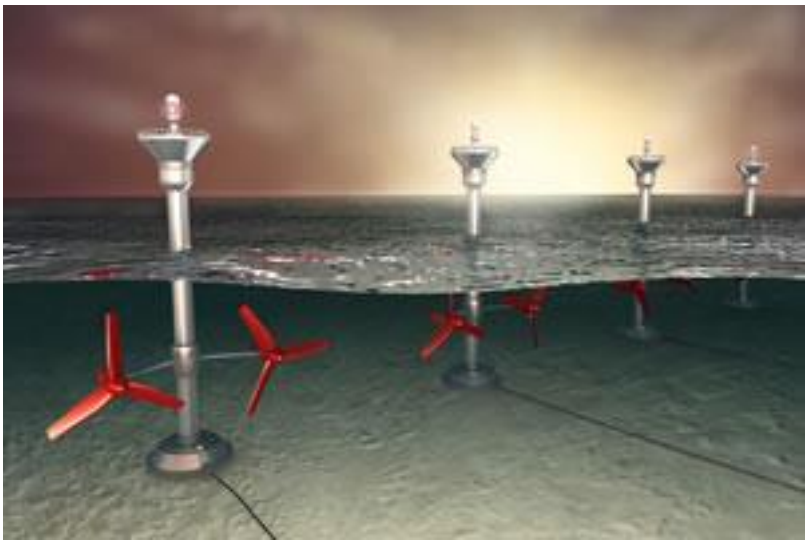
What is it?

It is the kinetics energy produced by ocean currents.

Types:

- Coastline current
- Open sea current
- Stable or seasonal current

Example:



How it work?

It work same as wind power, there are whirlwind, they rotate with mass of water

Advantages and disadvantages:

This energy has only disadvantages because it does not produce energy pollutes the landscape and can
hurt marine life as the turbines are free.

Opinions:

Victor: "I think it's an innovation for our world.
Filippo: "For me it is a useless energy because it will never produce enough energy to satisfy the world. "
Lorenzo: "I think it's not a good energy because it don't always have a constant energy production as the tides change continuously. "
Leonardo: “I think it is an innovative method of producing electricity and probably also unlimited ”.
Isac: “I think it is useless because it does not produce sufficient energy and only destroys the
landscape."

ENERGY OF TIDES OR TIDAL

What is it?

The tidal energy works with the raising or lowering of the level of the sea, this movement is caused by the action of the sun or the sea.
There are various types of systems but with different functioning:

• Movement of wheels or blades
• Filling of reservoirs and later emptying through some turbines

How does it work?

The water flows and flows into a vast reservoirs, passing through a series of tunnels in which, gaining speed, makes rotate the turbines connected to generators.
During low tide the water in the reservoirs
flows out to the open sea, putting rotating the turbine again.
When the sea level begins to rise again and the tidal wave is enough high,
makes the sea water flow into the reservoirs and the turbine goes into a rotation again.
To obtain energy production both with rising and falling tides, they are used special reversible turbines, that they work with both directions of the flow.

History:

Already in antiquity they tried to use this type of energy, through the construction of "tidal mills".
The water was collected, during the flow, in a small reservoirs, which was later closed
with a bulkhead.
At the time of outflow the water was conveyed through a channel to a wheel that moves a millstone.

Opinions:

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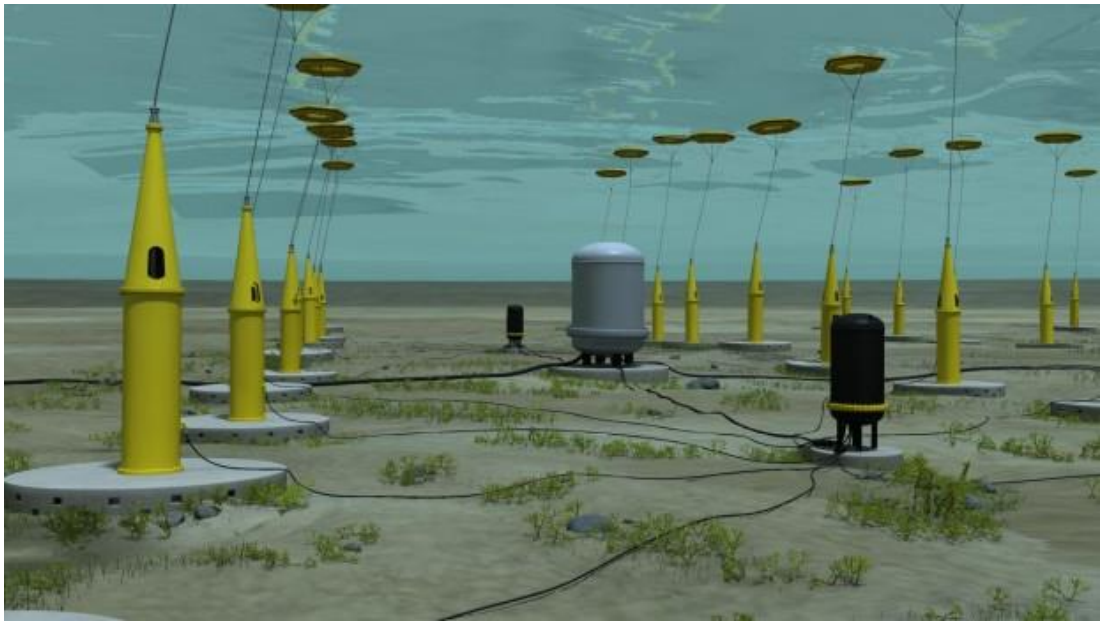
(In this image we retract how the current is produced by waves) in Sweden



NON-RENEWABLE ENERGY:

Nuclear(functioning):

Nuclear energy comes from the possibility of using large energies present in the nucleus of the atom.

Nuclear energy can be produced either by nuclear fission (separation of nuclei) and through fusion (union of nuclei).

- Fission: in fission the uranium nucleus collides with a neutron, it breaks in 2 or 3 neutrons, releasing energy in the form of heat
- Fusion: nuclear fusion is the reaction that occurs when two nuclei of hydrogen collide, merging together into a larger core e releasing energy in the form of heat

Advantages:

1. It does not produce greenhouse gases
2. Large-scale electricity production
3. Life cycle of the plant from 40 to 60 years
4. Production of nuclear weapons with waste

Disadvantages:

1. Radioactive wastes
2. Consume a lot of water
3. Capital intensive technology (management of combustion cycle)
4. It needan high security in power stations
5. Deadly consequences in the case of an accident

Opinions:

Lorenzo: "I think it is a risk that can be taken because it produces an enormous amount of energy and the risk of an accident is almost null. "

Victor: "I think it's very dangerous, so it shouldn't exist."

Isac: "I think it pollutes because the radioactive waste will take up too much space after so many years."
Filippo: "I think it is an excellent energy for the future development of the world."

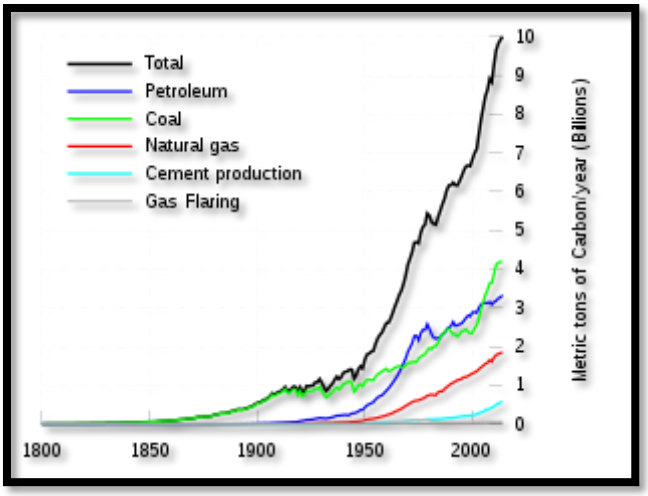
Leonardo: "I think they are very dangerous but it is a risk that can be taken.

Fossil fuels

What are?

Fossils are defined as those fuels arising from the transformation, naturally developed over millions of years, of organic substance, buried underground during the geological time, in molecular forms more and more stable and rich in carbon. It can be said that fossil fuels constitute the accumulation, underground, of energy that comes from the sun, directly collected in the biosphere in the course of geological periods, from plants through chlorophyll photosynthesis and from single-celled aquatic organisms such as protozoa and blue or algae indirectly through the food chain, from animal organisms.

Functioning:



Fossil fuels are still used practically everything and it is a lot hard to say for how long they will exist. From the diagram above the natural gas and the oil is very at risk.

Advantages:

- Currently they are the cheapest source of energy (but the costs are not almost never calculates the environmental impact of their use)

- They are quite easy to transport especially in the case of natural gas

- An installation can serve many people

Disadvantages:

- They are pollutants, even if with the use of modern machines this problem has been greatly reduced. A form of pollution is given by diffusion in the atmosphere of substances naturally associated with these fuels.

- Their use causes an increase in the amount of CO2 in the atmosphere, a gas not directly polluting, but today considered as the major accused of global warming.

- They are not renewable resources, given that the combustion process of the organic substance is extremely long and the amount that is fossilized today is negligible compared to the energy needs of the society in which we live.

Opinions:

Victor: “I think this energy is not very beneficial for our world either for our body”
Isac: “They should stop using them because the world is in the last few years affected”
Filippo: “I think it's harmful, we should find other energy to replace it”
Lorenzo and Leonardo: “We should find other energies because the materials will not be unlimited and they are very harmful”