



Erasmus+

The safeguarding of the environment

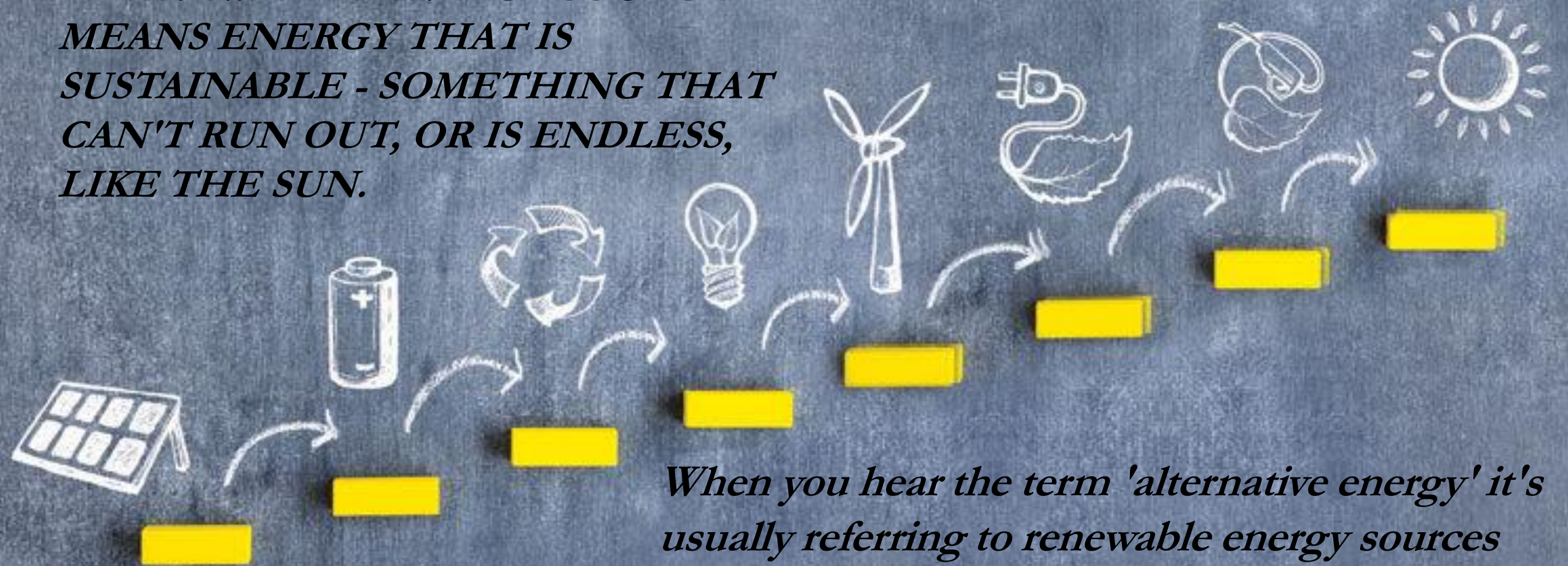


RENEWABLE ENERGY SOURCES

Gymnasium "Goce Delchev" – Kumanovo, North Macedonia

WHAT'S RENEWABLE ENERGY

***A RENEWABLE ENERGY SOURCE
MEANS ENERGY THAT IS
SUSTAINABLE - SOMETHING THAT
CAN'T RUN OUT, OR IS ENDLESS,
LIKE THE SUN.***



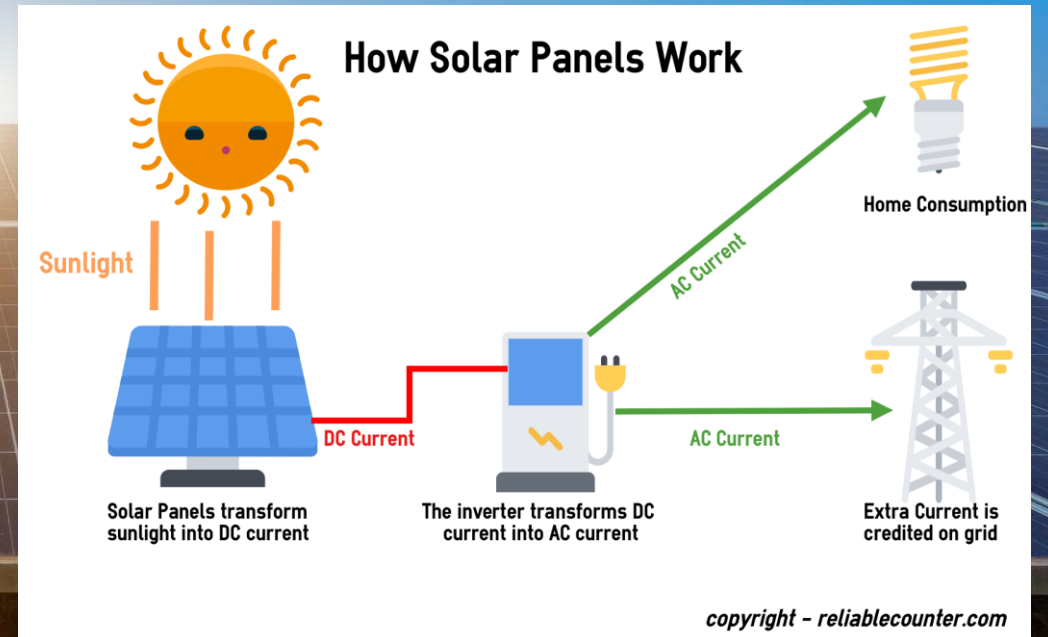
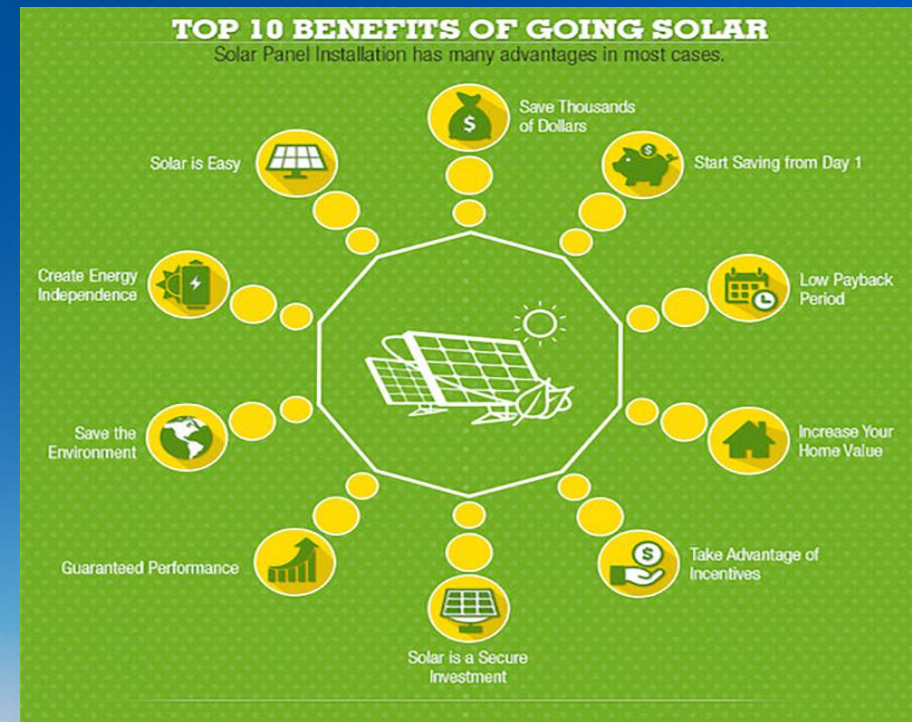
When you hear the term 'alternative energy' it's usually referring to renewable energy sources too.

THE MOST COMMON RENEWABLE ENERGY SOURCES

- Solar energy
- Wind energy
- Hydro energy
- Tidal energy
- Geothermal energy
- Biomass energy

SOLAR ENERGY

Sunlight is one of our planet's most abundant and freely available energy resources. The amount of solar energy that reaches the earth's surface in one hour is more than the planet's total energy requirements for a whole year. Although it sounds like a perfect renewable energy source, the amount of solar energy we can use varies according to the time of day and the season of the year as well as geographical location.



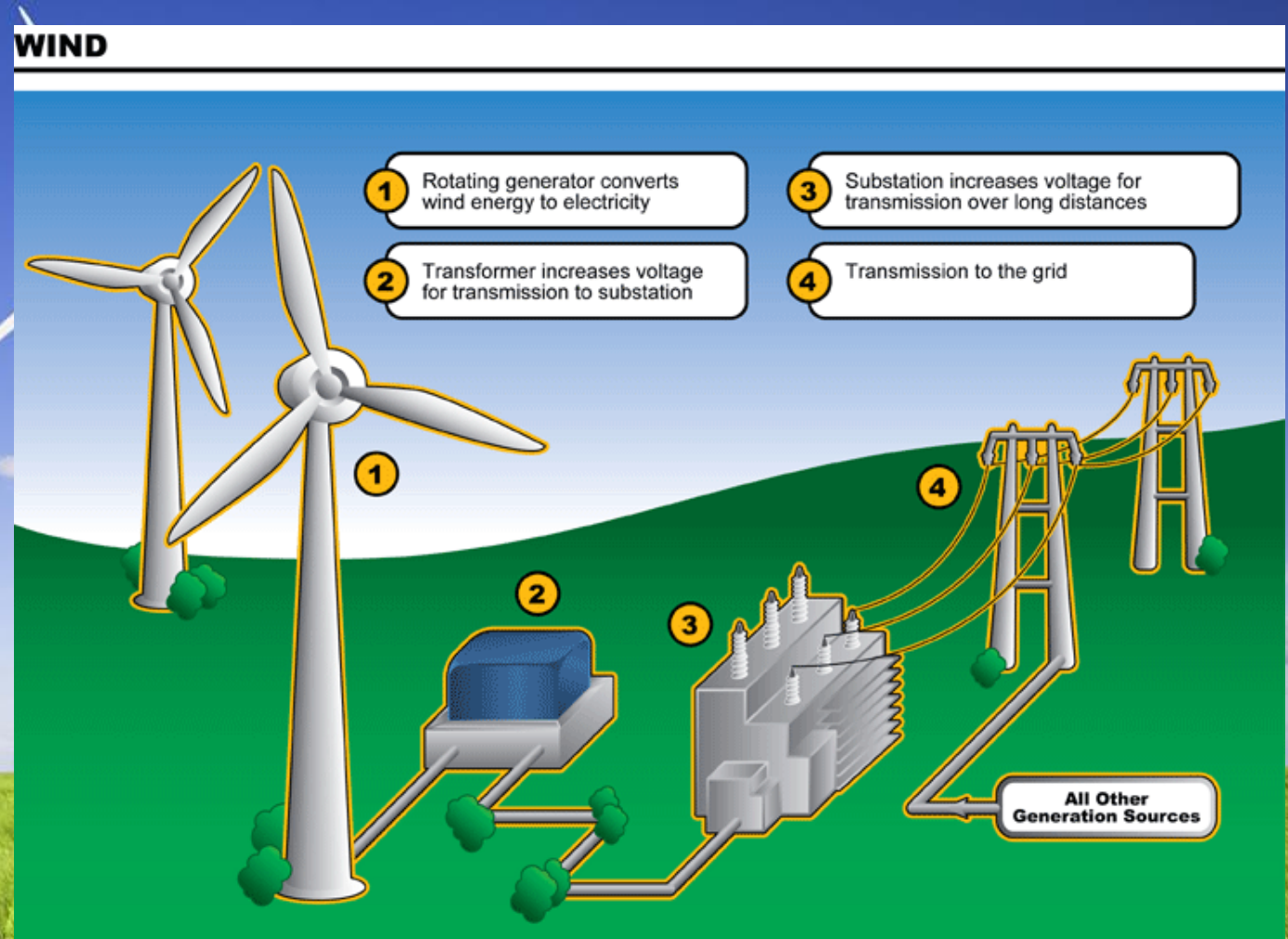
SOLAR ENERGY IN NORTH MACEDONIA

- ▶ North Macedonia is located in a very favorable geographical position where solar radiation is large and convenient for the installation of solar systems for the use of solar energy. That is why large areas in our country are covered with solar panels that accumulate solar energy and convert it into electricity.



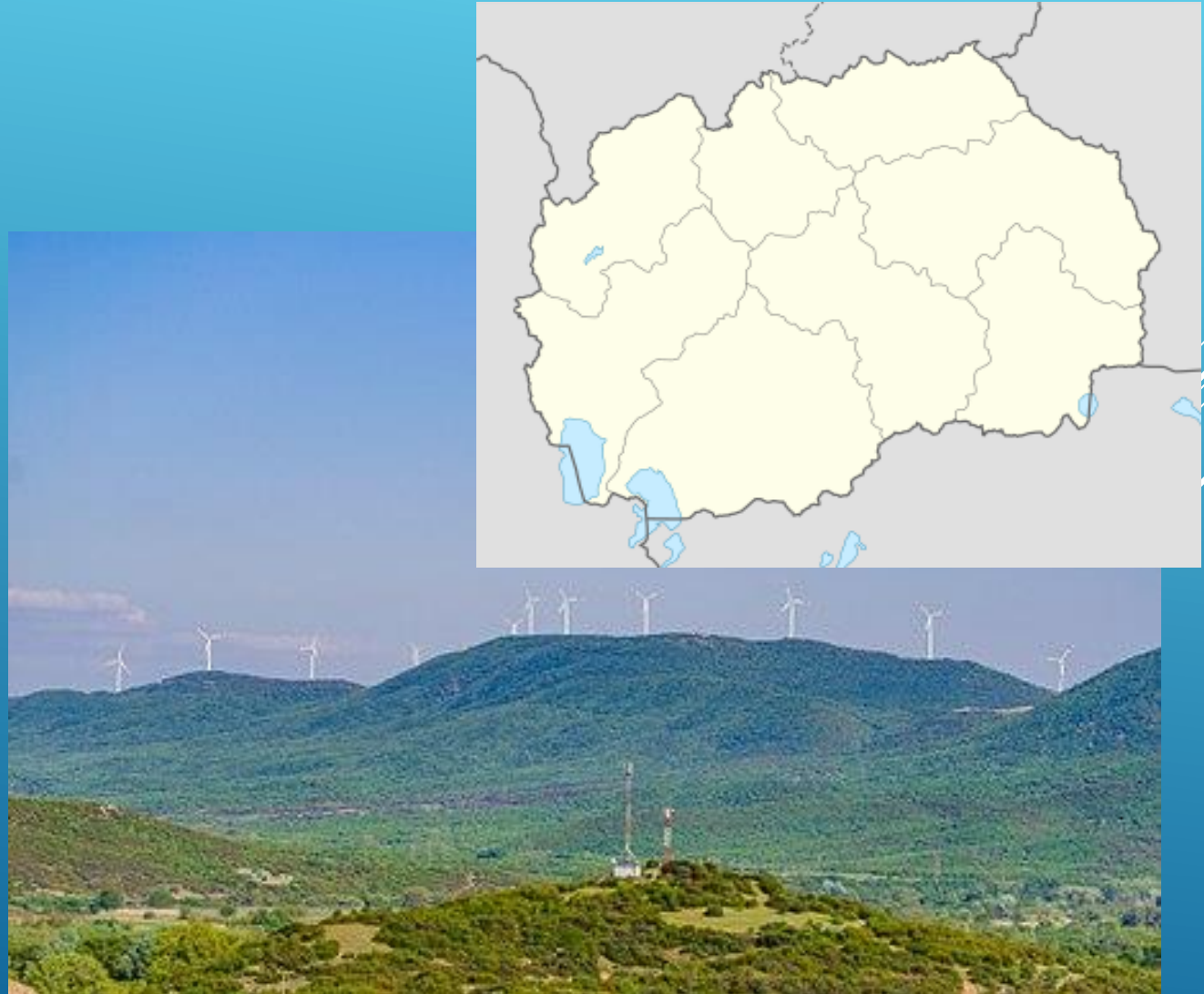
WIND ENERGY

- ▶ Wind is a plentiful source of clean energy. To harness electricity from wind energy, turbines are used to drive generators which then feed electricity into the National Grid. Wind energy is a clean energy source, which means that it doesn't pollute the air like other forms of energy.



WIND ENERGY IN NORTH MACEDONIA

- ▶ With North Macedonia being a smaller country, it itself does not have high energy consumption compared to other world capitals and countries. Nevertheless, we have large areas with windmills that have a large energy contribution. They are located in Bogdanci in southeastern North Macedonia.

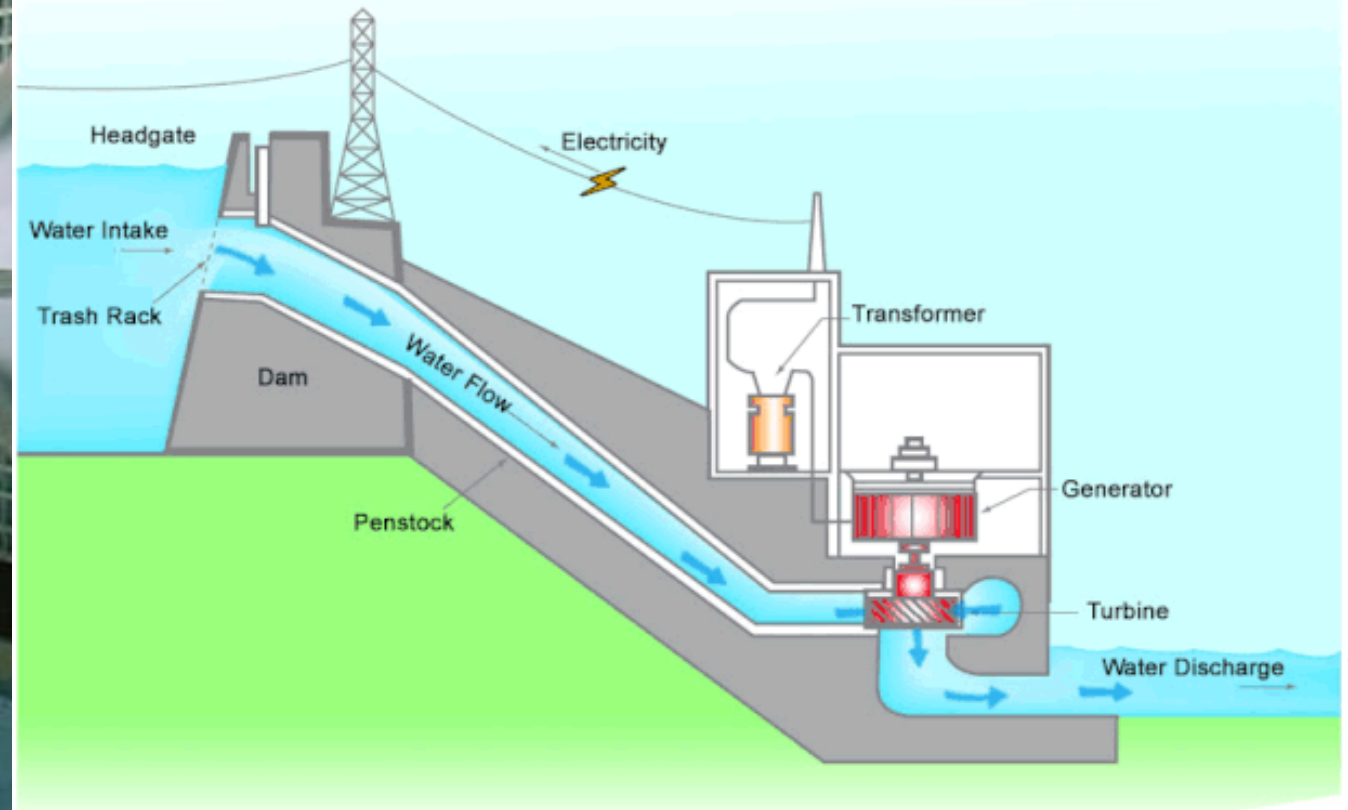


HYDRO ENERGY

- As a renewable energy resource, hydro power is one of the most commercially developed. By building a dam or barrier, a large reservoir can be used to create a controlled flow of water that will drive a turbine, generating electricity. This energy source can often be more reliable than solar or wind power.

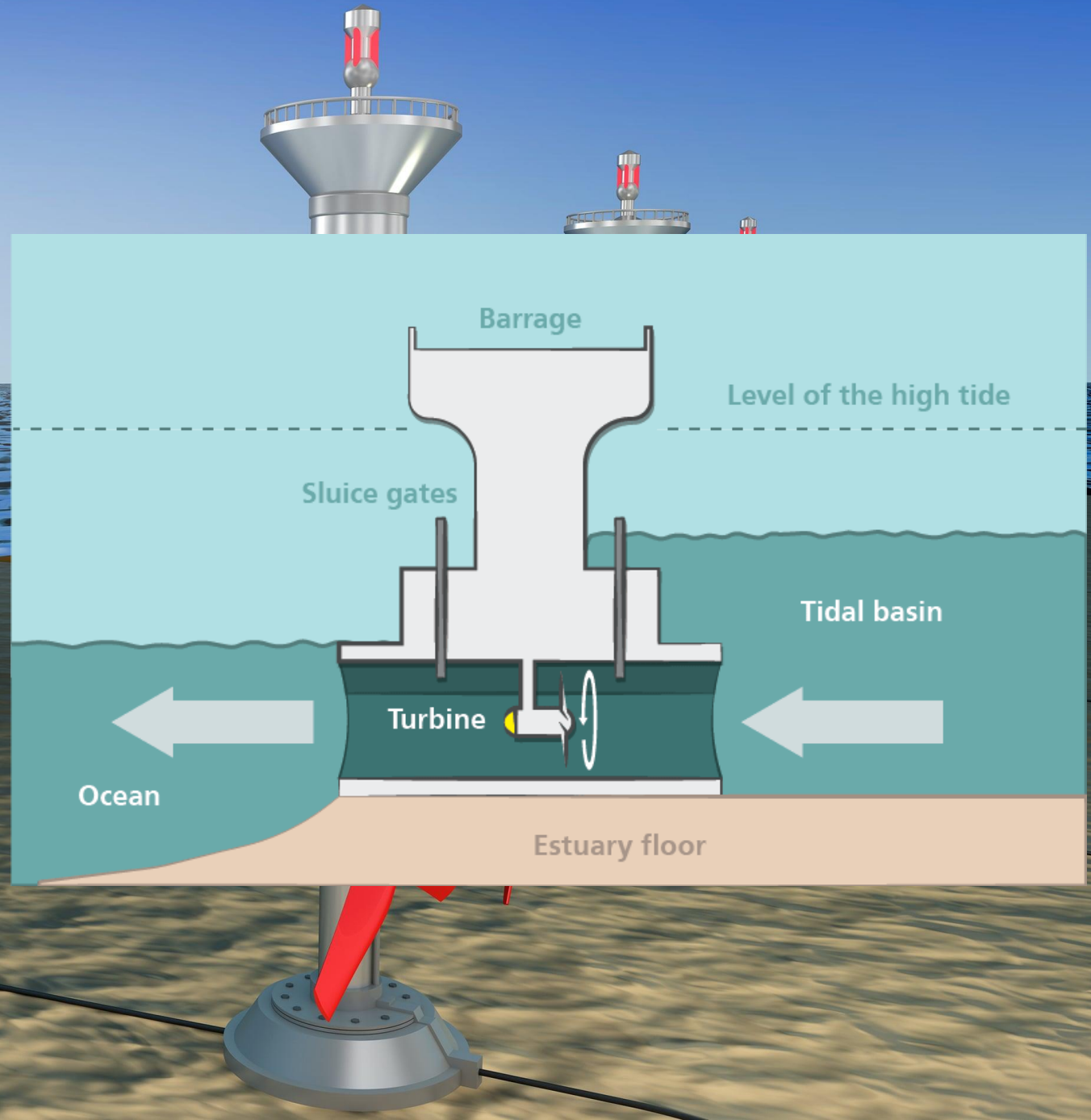
#HowThingsWork

Hydroelectric Power System



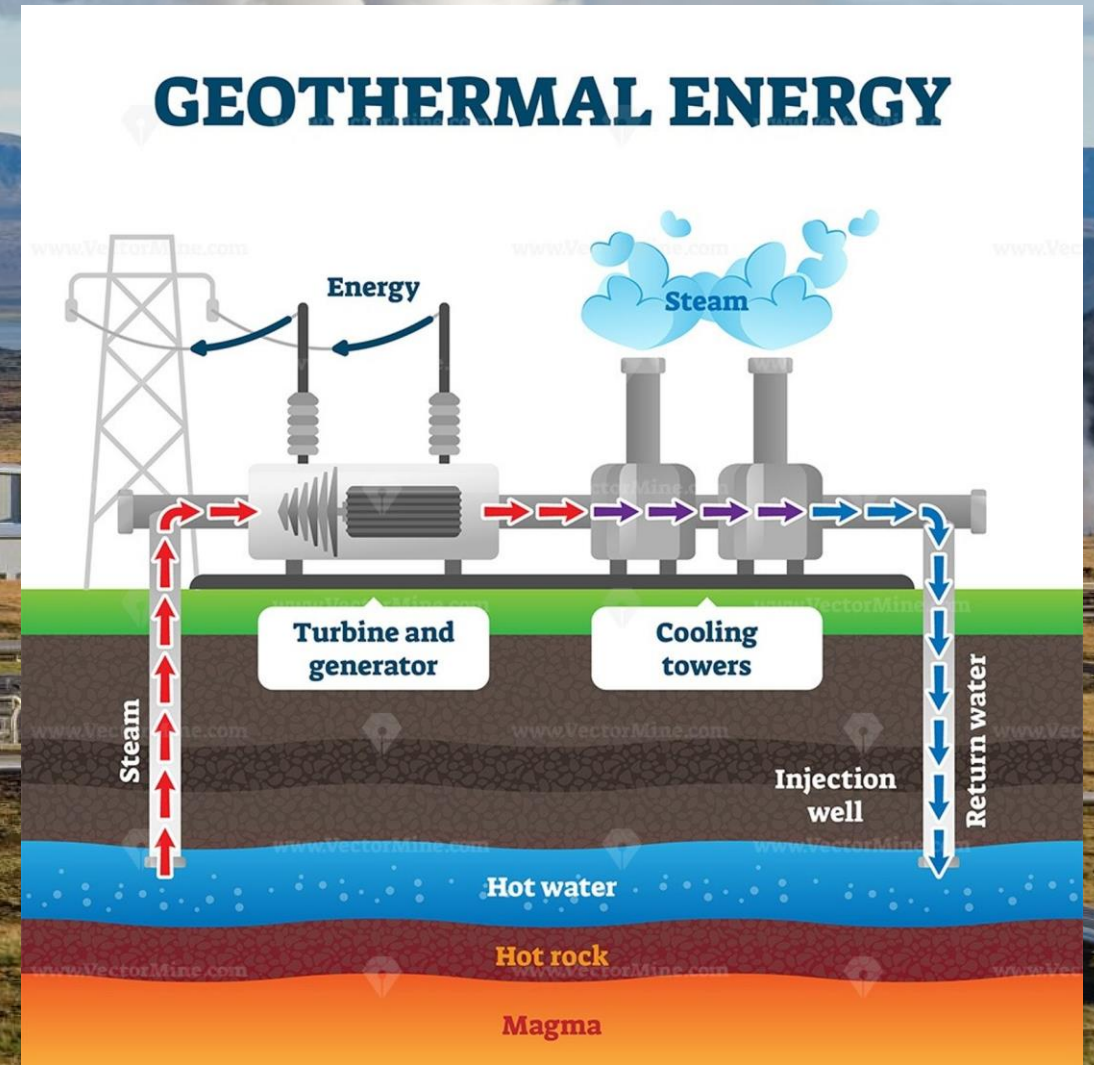
TIDAL ENERGY

This is another form of hydro energy that uses twice-daily tidal currents to drive turbine generators. Although tidal flow unlike some other hydro energy sources isn't constant, it is highly predictable and can therefore compensate for the periods when the tide current is low.



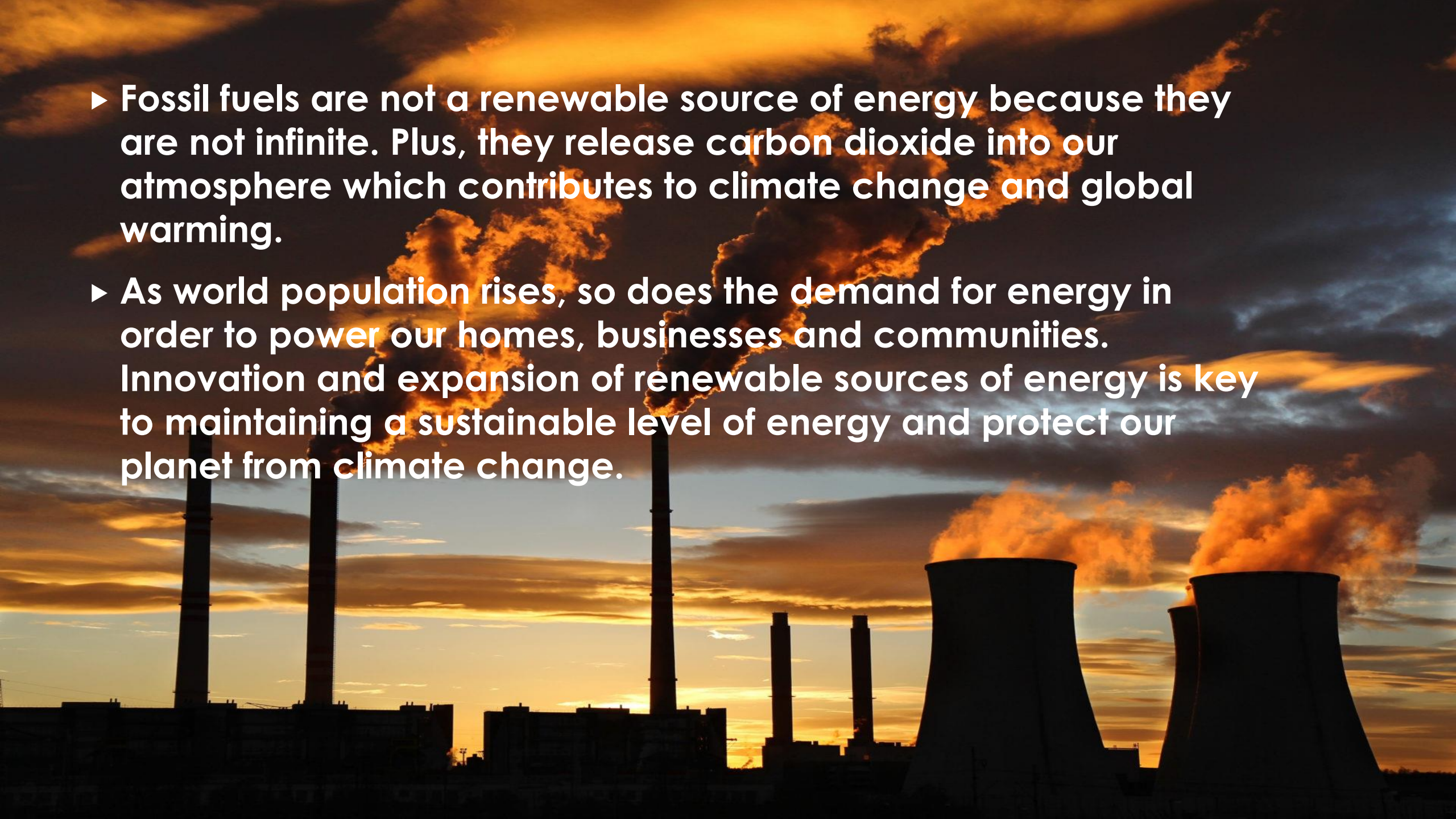
GEO THERMAL ENERGY

Geothermal energy is heat derived within the sub-surface of the earth. Water and/or steam carry the geothermal energy to the Earth's surface. Depending on its characteristics, geothermal energy can be used for heating and cooling purposes or be harnessed to generate clean electricity. However, for electricity, generation high or medium temperature resources are needed, which are usually located close to tectonically active regions.

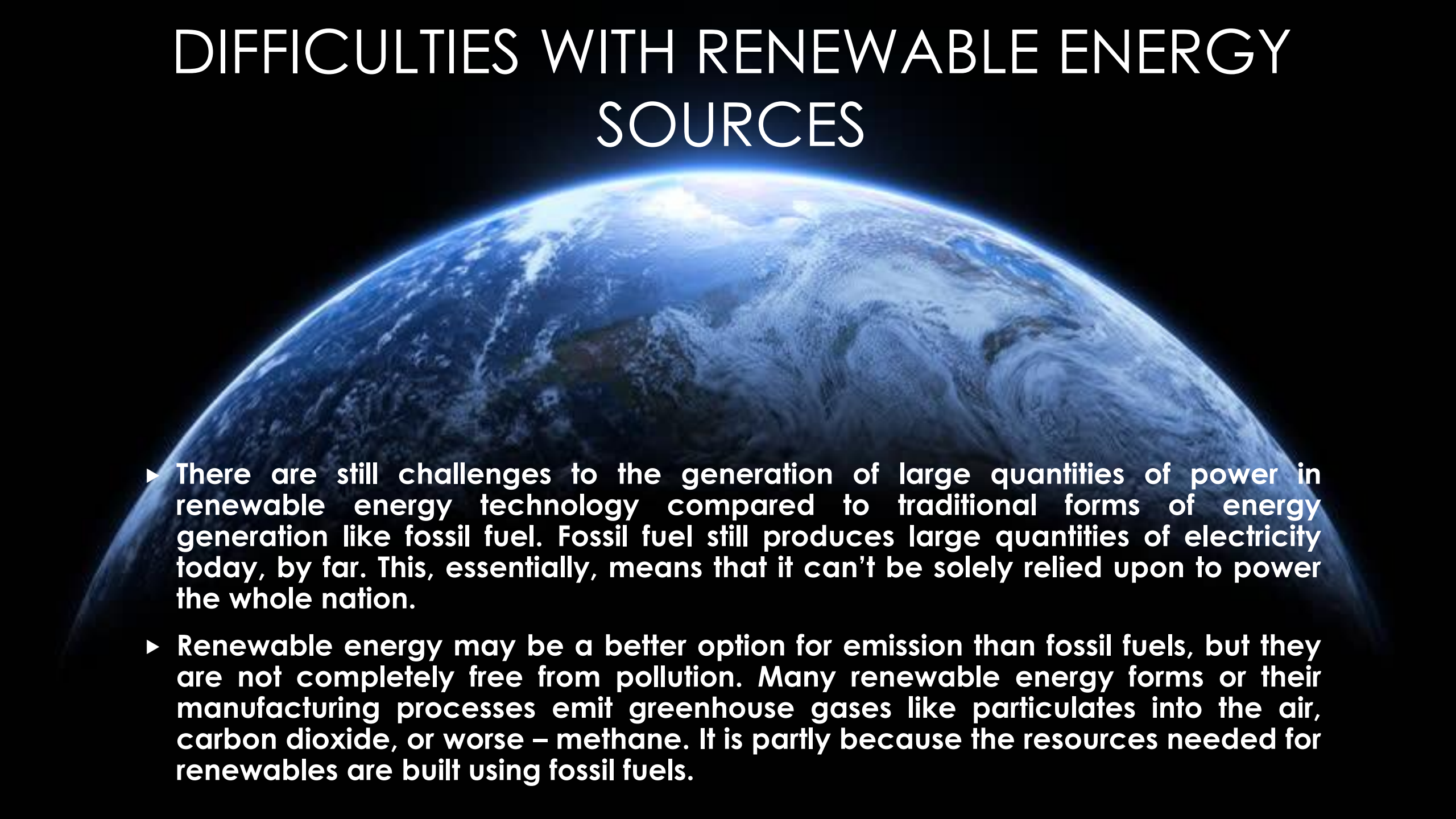


BIOMASS ENERGY

This is the conversion of solid fuel made from plant materials into electricity. Although fundamentally, biomass involves burning organic materials to produce electricity, and nowadays this is a much cleaner, more energy-efficient process. Biomass energy tends to have this specific benefit that more than any other form of renewables. Biomass consumes used organic products such as used vegetable oil, corn and soybean byproducts, or even algae to generate energy. At the same time, it reduces the amount of waste that goes into landfills, also reducing the amount of overall carbon that goes into the atmosphere.

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- ▶ Fossil fuels are not a renewable source of energy because they are not infinite. Plus, they release carbon dioxide into our atmosphere which contributes to climate change and global warming.
 - ▶ As world population rises, so does the demand for energy in order to power our homes, businesses and communities. Innovation and expansion of renewable sources of energy is key to maintaining a sustainable level of energy and protect our planet from climate change.

DIFFICULTIES WITH RENEWABLE ENERGY SOURCES

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- ▶ There are still challenges to the generation of large quantities of power in renewable energy technology compared to traditional forms of energy generation like fossil fuel. Fossil fuel still produces large quantities of electricity today, by far. This, essentially, means that it can't be solely relied upon to power the whole nation.
 - ▶ Renewable energy may be a better option for emission than fossil fuels, but they are not completely free from pollution. Many renewable energy forms or their manufacturing processes emit greenhouse gases like particulates into the air, carbon dioxide, or worse – methane. It is partly because the resources needed for renewables are built using fossil fuels.



THANK YOU!