

**RENEWABLE ENERGY
SOURCES
-
GREEN ENERGY**

WHAT EXACTLY IS RENEWABLE ENERGY SOURCES?

Renewable energy sources
are the **alternatives** to fossil fuels.

A green-tinted image showing a white power plug connected to a globe representing Earth. The globe is partially obscured by the plug, and the background is a solid green color. The text is overlaid on the image.

BUT THE QUESTION IS

WHY SHOULD WE TURN TO ALTERNATIVES TO FOSSIL FUELS?

Because, nowadays, it is rather urgent to achieve:

- 1) a reduction of greenhouse gas emissions,
- 2) the differentiation of the energy supply
and
- 3) the reduction of dependence on unreliable and unstable fossil fuel markets, especially oil and natural gas.

PURPOSE?

**Electricity
production!**



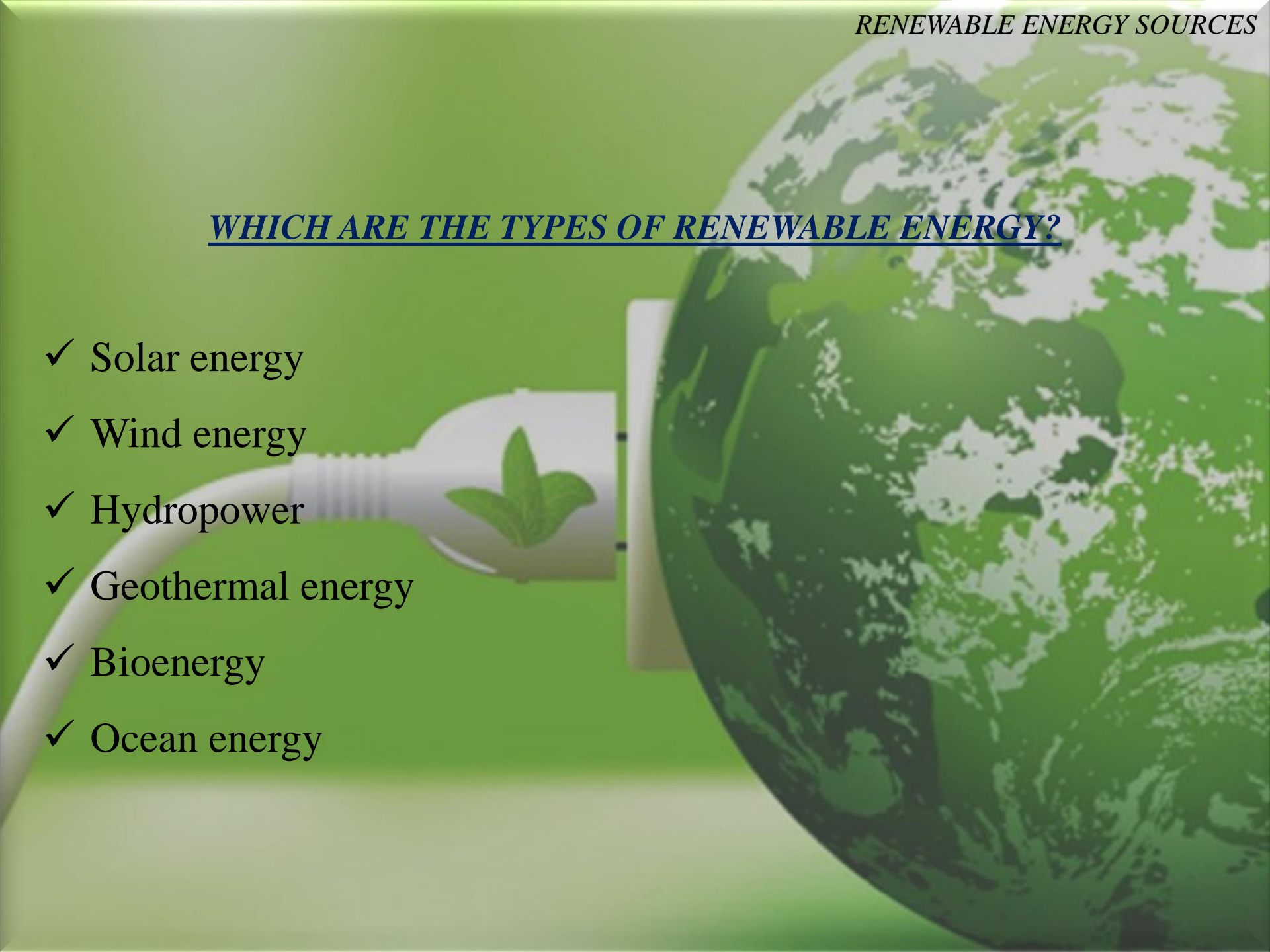
WHICH ARE THE FOSSIL FUELS
WHOSE USAGE HAS TO BE REDUCED?

- 1) Carbon
- 2) Oil
- 3) Natural Gas



WHICH ARE THE TYPES OF RENEWABLE ENERGY?

- ✓ Solar energy
- ✓ Wind energy
- ✓ Hydropower
- ✓ Geothermal energy
- ✓ Bioenergy
- ✓ Ocean energy



BEFORE ANALYZING EACH ONE TYPE

LET'S DISCUSS SOME *BASIC CHARACTERISTICS*

THAT ALL TYPES OF RENEWABLE SOURCES HAVE!

- 1) They are based on the *elements of nature*. (sun, wind, biomass, ocean waves etc)
- 2) They are *abundant*.
- 3) Their exploitation does not require any active intervention, e.g: pumping, mining or burning. The *flow of energy that already exists in nature* is actually used.
- 4) Their use does not pollute the environment.
- 5) They ensure the *reduction* of oil usage and the *independence* of it.
- 6) They improve the quality of the environment
- 7) They are *the only way out* as far as the depletion of the non renewable energy sources is concerned.



Solar Energy

- ❑ Solar technologies convert sunlight into electrical energy either through photovoltaic panels or through mirrors that concentrate solar radiation.
- ❑ The cost of manufacturing solar panels has plummeted dramatically in the last decade, making them not only affordable but often the cheapest form of electricity. Solar panels have a **lifespan of 30 years**, and come in variety of shades depending on the type of material used in manufacturing.



Wind Energy



Wind energy harnesses the kinetic energy of moving air by using large **wind turbines** located on land (onshore) or in sea- or freshwater (offshore).



Hydropower

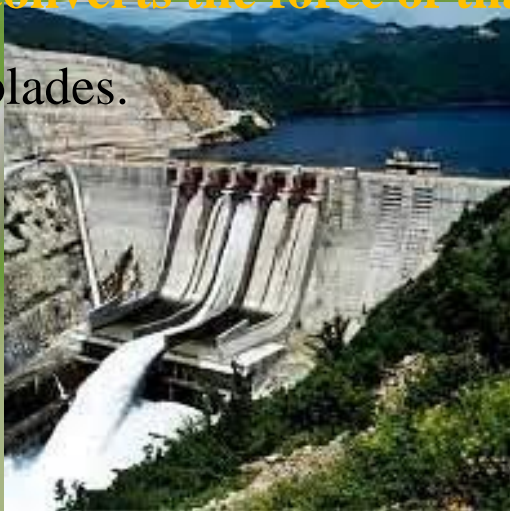


Hydropower is the largest renewable energy source for electricity in the United States, though wind energy is soon expected to take over the lead.

Hydropower relies on water—typically fast-moving water in a large river or **rapidly descending water from a high point**—

and

converts the force of that water into electricity by spinning a generator's turbine blades.



Geothermal Energy

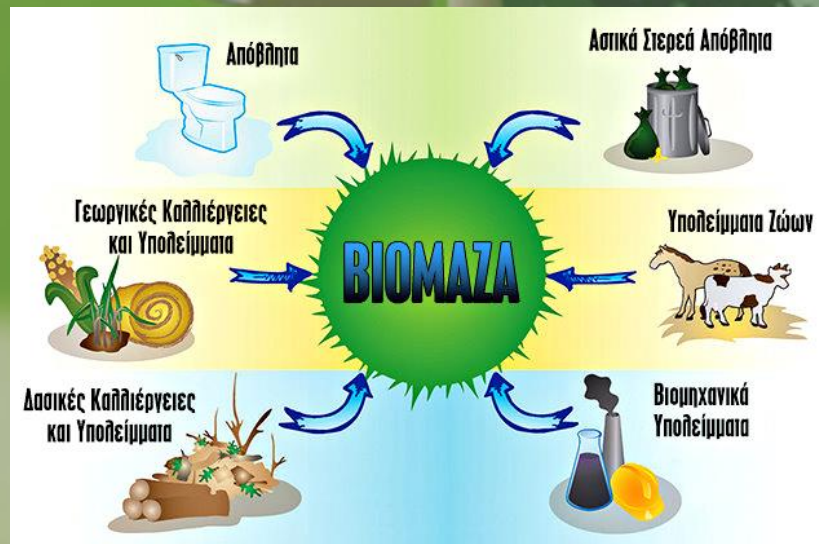
- ❖ If you've ever relaxed in a *hot spring*, you've used geothermal energy.
- ❖ The earth's core is about as hot as the sun's surface, due to the slow decay of radioactive particles in rocks at the center of the planet.
- ❖ Drilling deep wells brings very hot underground water to the surface as a hydrothermal resource, which is then *pumped through a turbine to create electricity.*

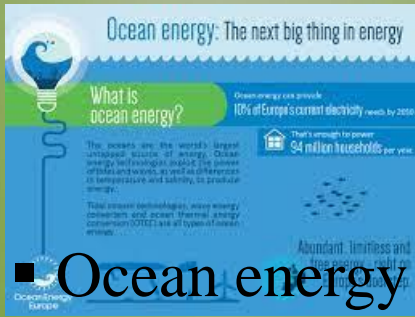


Bioenergy

Bioenergy is produced from a variety of organic materials, called *biomass*, such as wood, charcoal, dung and other manures for heat and power production, and agricultural crops for liquid biofuels.

✓ Energy created by burning biomass creates greenhouse gas emissions, but at lower levels than burning fossil fuels like coal, oil or gas.



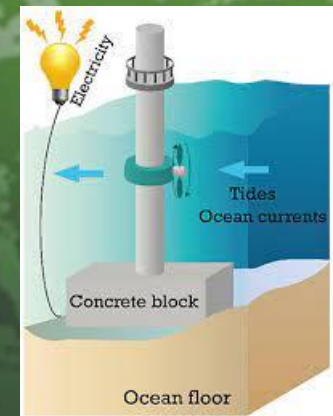


Ocean Energy



- Ocean energy derives from technologies that *use the kinetic and thermal energy of seawater - waves or currents for instance - to produce electricity or heat.*

- Ocean energy systems are *still at an early stage of development*, with a number of prototype wave and tidal current devices being explored.

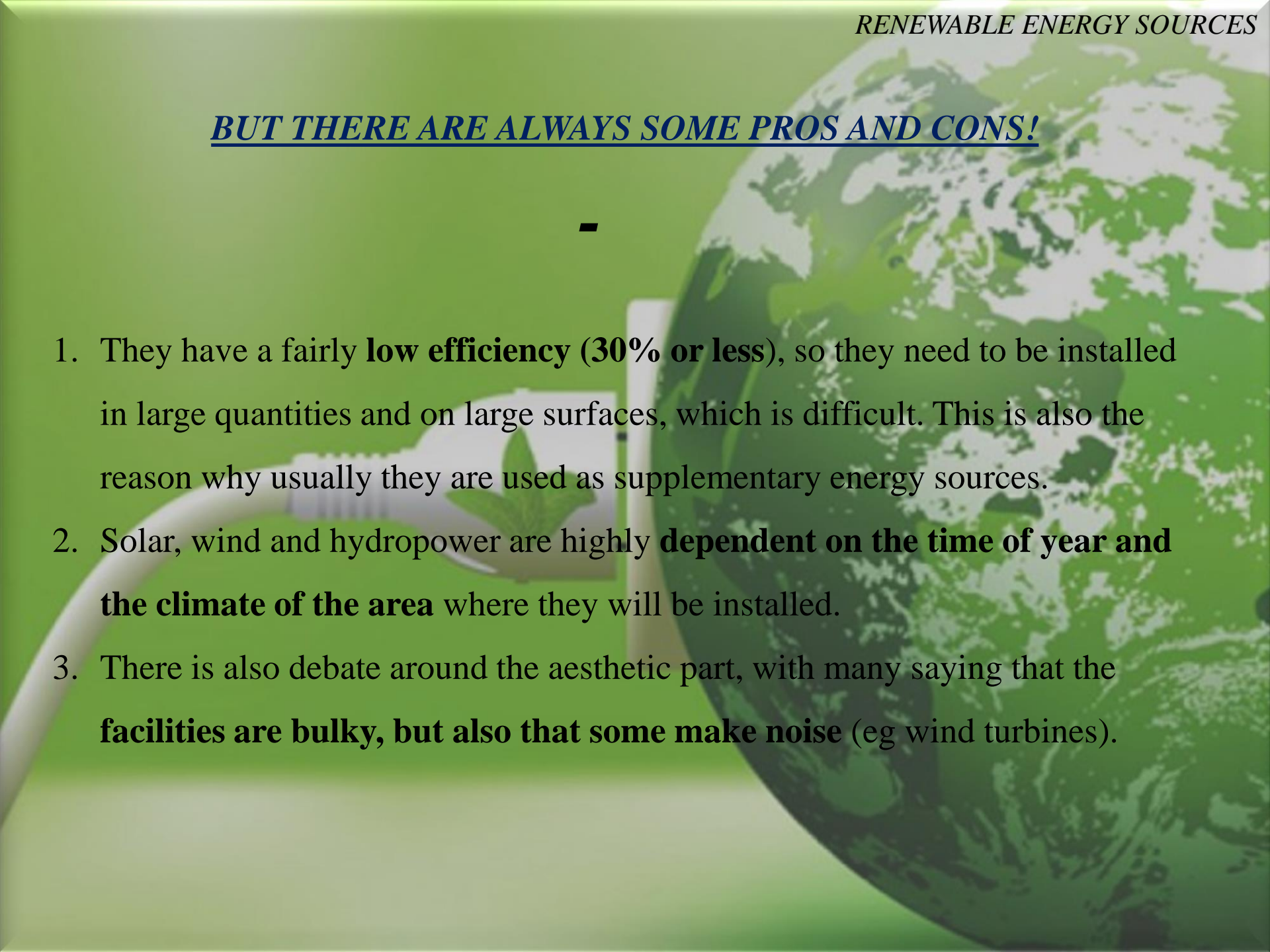


BUT THERE ARE ALWAYS SOME PROS AND CONS!

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1. They are **inexhaustible** and in abundance, unlike fossil fuels (eg oil) which we know will run out sooner or later.
2. They contribute to the **energy autonomy of an entire country** and the security of its energy supply.
3. Their construction and maintenance are simple and they have a very long spanlife.
4. Most governments give subsidies for their installation.
5. They have **low operating costs** that are not affected by the fluctuations of the international economy, as is the case with conventional fuels.
6. They are completely **human-friendly**.

BUT THERE ARE ALWAYS SOME PROS AND CONS!

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- A hand holding a green leaf in front of a globe. The background is a green gradient with a globe of the Earth on the right side. The hand is holding a single green leaf in front of the globe.
1. They have a fairly **low efficiency (30% or less)**, so they need to be installed in large quantities and on large surfaces, which is difficult. This is also the reason why usually they are used as supplementary energy sources.
 2. Solar, wind and hydropower are highly **dependent on the time of year and the climate of the area** where they will be installed.
 3. There is also debate around the aesthetic part, with many saying that the **facilities are bulky, but also that some make noise** (eg wind turbines).

TIMELINE – E.U & GREECE

- ✓ **2009**: the leaders of the European Union set as a target by 2020 a share of 20% of energy consumption to come from renewable energy sources.
- ✓ **2018**: the goal was agreed that by 2030 a portion of 32% of the energy consumption of the European Union should come from renewable energy sources
- ✓ **2021**: the target changed to 40%.
- ✓ **After the russian invasion to Ukraine**, and the energy crisis that broke out, the European Union agreed that the complete independence from russian market concerning the fossil fuels should have been achieved by 2030.

WHAT HAS GREECE ACHIEVED SO FAR...?

*The amount of renewable energy sources from solar, wind, and hydroelectric power rose to **46%** of the country's electricity in the last eight months up to August 2022, according to the Greece-based environmental think tank 'Greek Tank,.*

Thank you!

