

Energy in Réunion Island

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I) The different types of energy in Reunion Islands

In Reunion Island we have different types of energy that can be fossil energy or sustainable energy.

Hydroelectric dam

Hydrolic energy is a sort of sustainable energy that uses the kinetic energy of the water from the rivers , the waterfall or the tide, for produce mechanic energy, and more precisely electricity.

One of the three types of hydrolic energy is the hydroelectric dam.

The hydroelectric dam can contain a part of the water and the rest continue to flow. So it's a way to stock sustainable energy. The water actives turbines and these turbines trains an alternator. This system produce electricity.

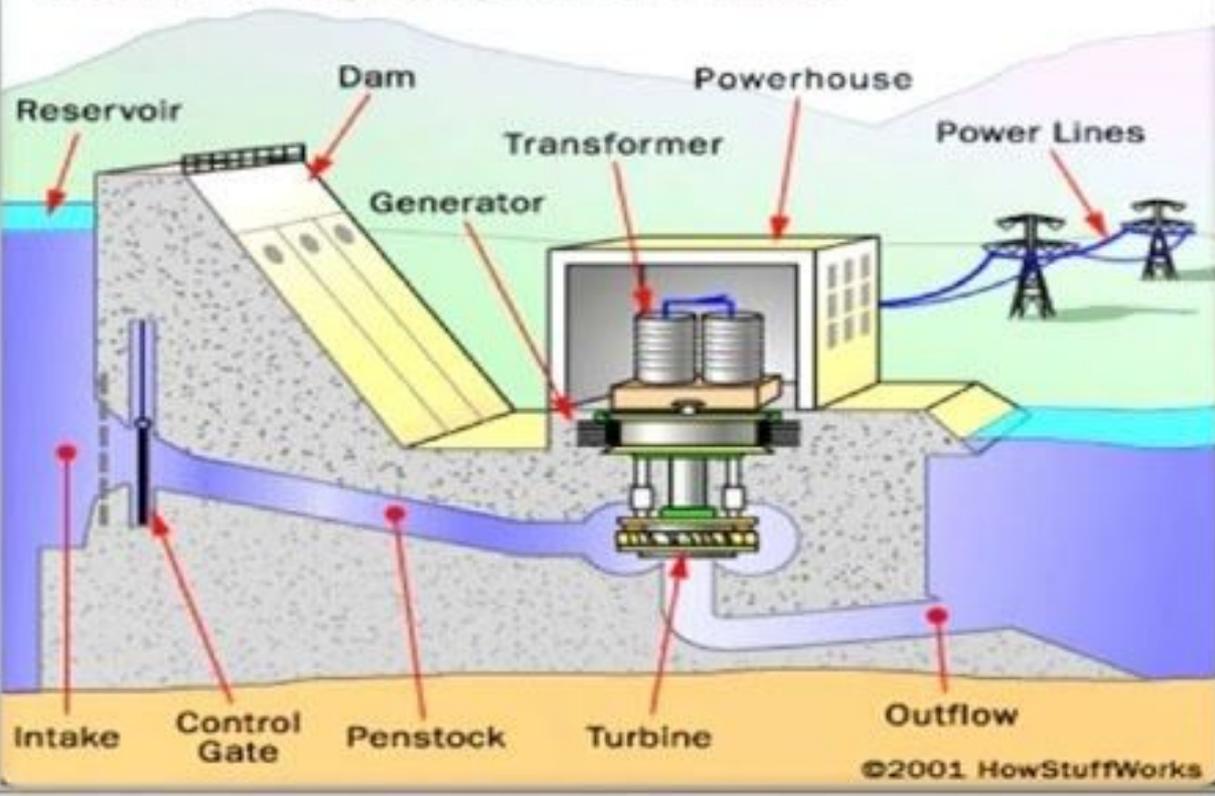
Inconveniences:

It's a problem for the ecosystem and it also is a problem for the swimming because the flow of the water is too powerful and it can cause drowning.

In Reunion Island we have the hydroelectric dam of **Takamaka II** , built by EDF in 1985 . This dam uses the water of the Rivière des Marsouins.



Inside a Hydropower Plant



The bagasse

The bagasse is part of one of the two most important renewable energies of Réunion.

The bagasse is a residue of grinding of sugar cane, burnt to produce electricity.

The cane is crushed and there are 70 % of juice and 30 % of fibers (bagasse). The bagasse is composed of 50% water, 49 % of lignocellulose and 1 % of sugar.



One part of this Bagasse is directed to the boiler and the rest will be stored in a warehouse. It can only be kept for one week because exceeded this time his temperature increases very strongly and there is a risk of fire.

During a sugar campaign, the Gol and Bois-Rouge thermal plants each produce about 18,000 tonnes of bagasse ash.

The bagasse represent 10 % of electric production in Reunion Island.



SOLAR ENERGY

Solar energy is a source of energy that depends on the sun. This energy makes it possible to manufacture electricity from photovoltaic panels or solar thermal power plants, thanks to the sunlight captured by solar panels.

Solar energy is clean, emitting no greenhouse gases and its raw material, the sun although distant from more than 150 million kilometers from us, is free, inexhaustible and available all over the world.



HOW DOES A SOLAR INSTALLATION WORK

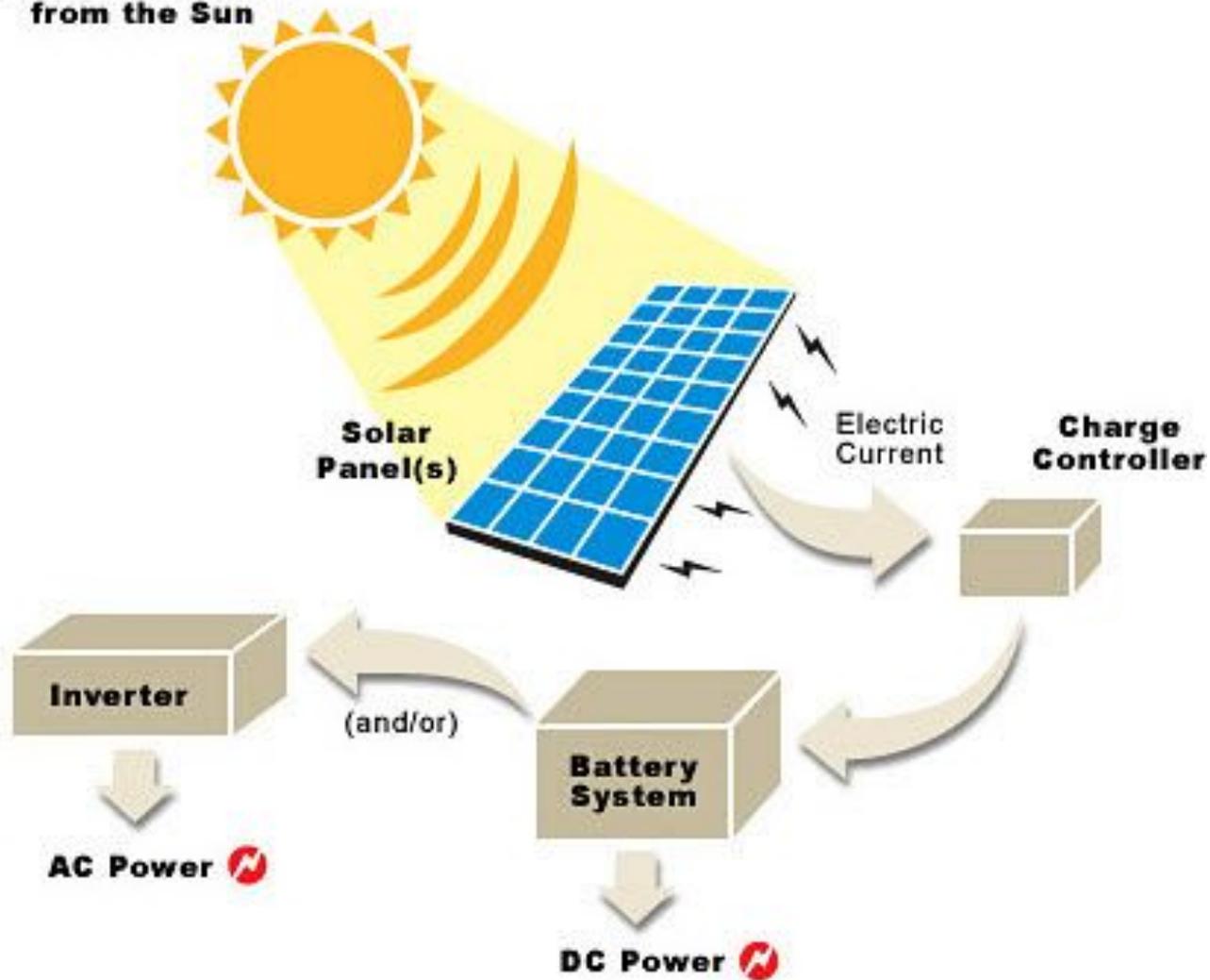
Three elements are needed for a photovoltaic system: solar panels, an inverter and a meter.

These three elements make it possible to recover the energy transmitted by the sun, to transform it into electricity and then to distribute it to all the customers connected to the network.

- The solar panels convert the light directly into direct electric current.
- The inverter then transforms the electricity obtained into alternating current compatible with the network.
- The meter measures the amount of current injected into the network



**Solar Irradiance
from the Sun**



A WIND TURBINE

A wind turbine produces electricity using wind. Its force activates the blades of the rotor, which sets in motion an alternator.

1. The rotation of the blades

Under the effect of wind, the rotor starts. His blades turn.

The rotor is located at the end of a mast because the winds blow higher in height. Depending on the type of wind turbine, the mast varies between 10 and 100 m high. The rotor generally has 3 blades.



2. Electricity generation

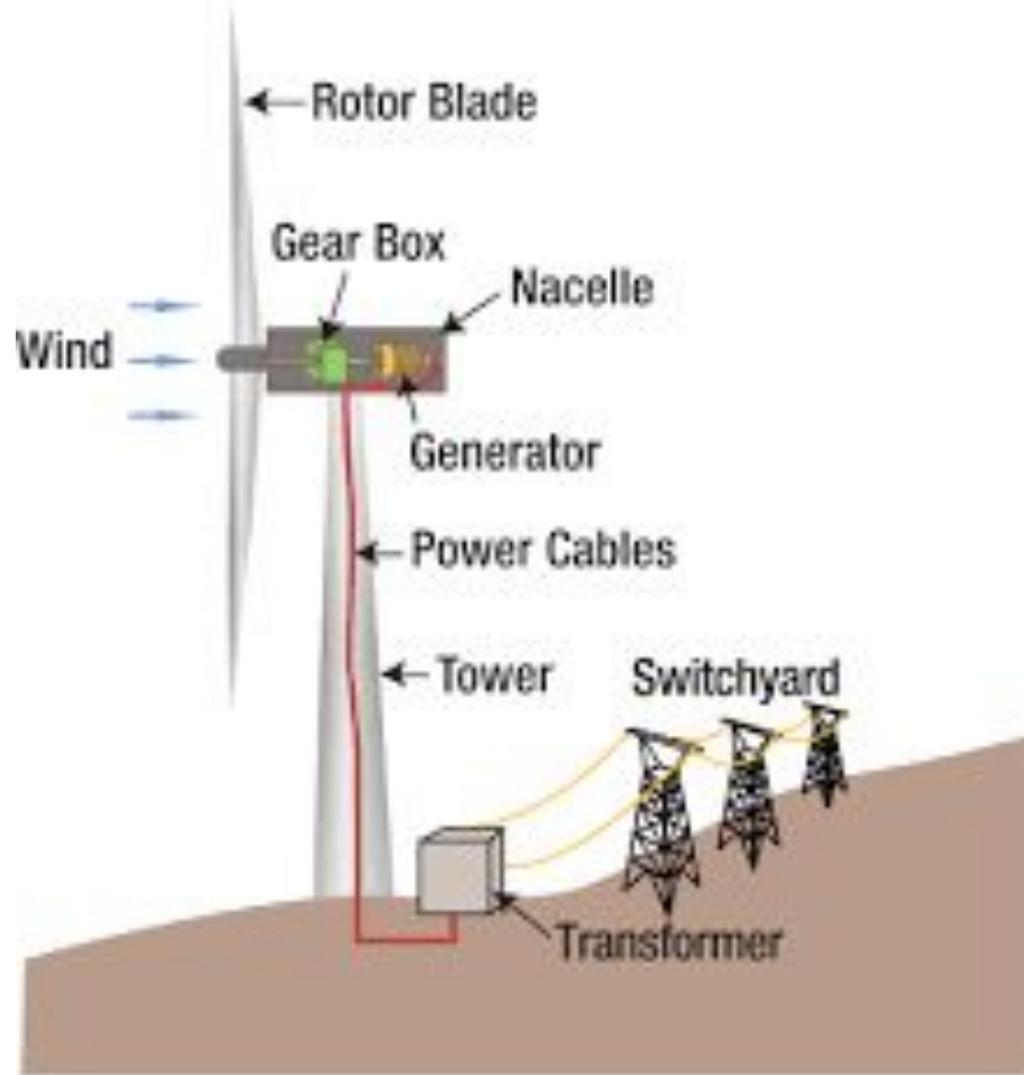
To start, a wind turbine requires a minimum wind speed of about 15 km / h.

For safety reasons, the wind turbine automatically shuts off when the wind exceeds 90 km / h.

The rotor drives an axis in the nacelle, called a shaft, connected to an alternator.

Thanks to the energy provided by the rotation of the axis, the alternator produces an alternating electric current.





DID YOU KNOW?

Wind turbines turn more than 80% of the time, at variable speeds depending on the wind power. Thus, a wind farm with 4 to 6 wind turbines covers the electricity needs of nearly 12,000 people.

3. The adaptation of the tension

A transformer located inside the mast raises the voltage of the electric current produced by the alternator so that it can be more easily transported in the medium voltage lines of the network



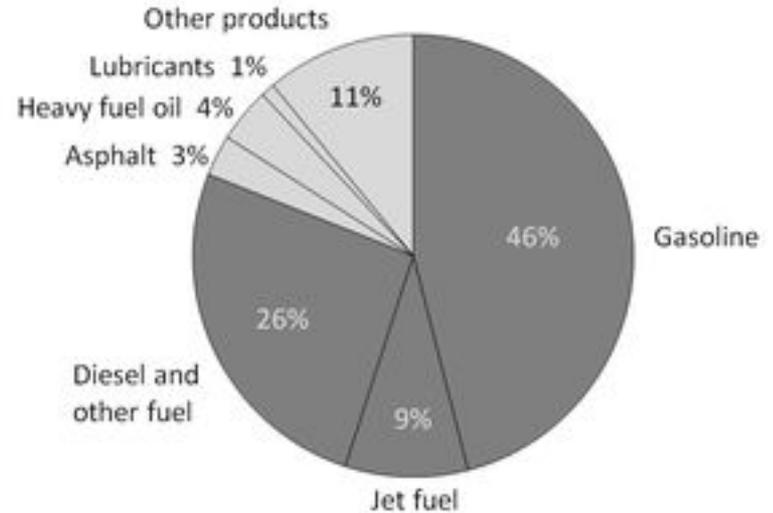
OIL-PRODUCING

Oil-producing are usable derivatives of crude oil from its refining. Unlike petrochemical compounds, which are basic chemical compounds, petroleum products are complex mixtures. The majority of oil is converted into petroleum products including several types of fuels



TYPE OF OIL PRODUCING

Depending on the type of crude oil and market demand, refineries can refine the crude into different types of petroleum products. Most of the refined oil producing are used as a source of energy, that is, as fuels. These include, or may be blended to produce JP-5, diesel, fuel oil and heavier fuels. Heavier (less volatile) fractions are used to produce bitumen, tar, paraffin or lubricants. Refineries also produce other chemicals, some of which are used in chemical processes to produce plastics, for example. Since oil contains a small percentage of organosulfur compounds and hydrogen sulphide, sulfur is extracted from the crude as a oil producing



Agro-fuel

Agro-fuel, also called bio-fuel, is a type of fuel made with organic material that are mostly sustainable. Bio-fuel also included bio-diesel.

Agro-fuel doesn't add new carbon to the atmosphere. Unfortunately , there are some limits to this type of fuel because there are some risks of chemical pollution and a water consumption's rising with more deforestation. There also have economic and human limits because the production cost is to expensive. So we can't say if it's a form of sustainable energy or not.

In Reunion Island we have the company Bioalgostral Océan Indien, created in 2008 that is specialized into the bio-energy and bio-industry.



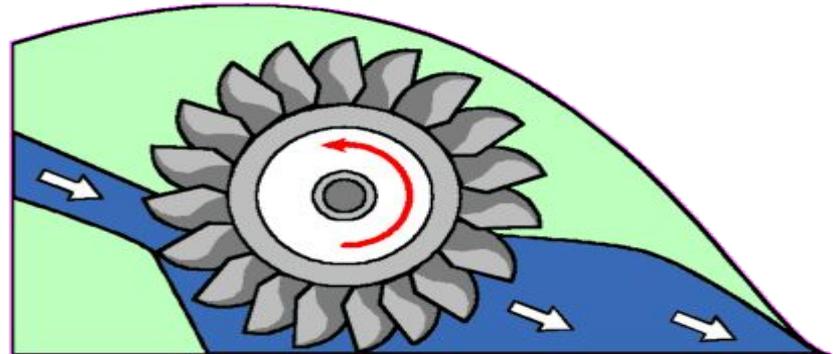
BIOALGOSTRAL

Hydraulic energy

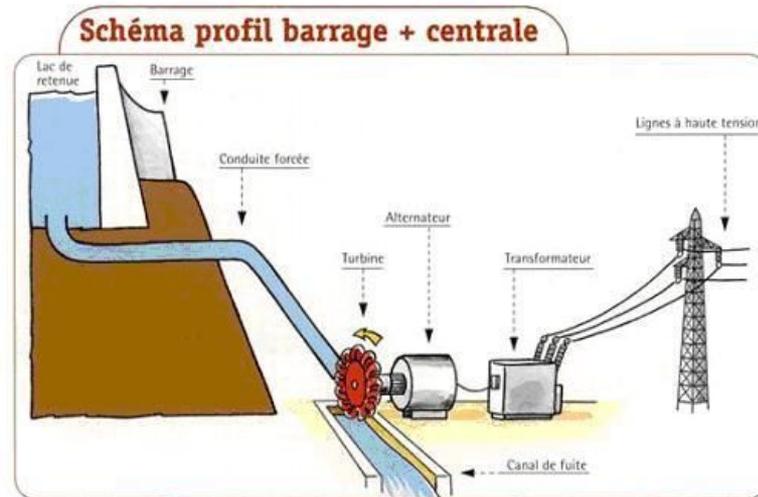
Hydraulic energy uses the force created by waterfalls caused by the opening of dam gates. The water flows down to the plant along penstocks.

At its exit it has a high energy, thanks to its loss of altitude it turns the wheel of a turbine. This drives an alternator that produces electricity. Then, the transformer adapts the energy for the system. A turbine is a wheel that transforms the movement of a fluid body (water) into a rotational movement.

A turbin



An alternator is a machine that rotates to convert a rotational movement into electrical energy. The electrical transformer allows the electrical energy to be adapted for the system.



The main hydraulic plants (the most productive) in Reunion Island today are: l'usine de la riviere de l'est in Saint Rose and Takamaka in Saint Benoît.

These dams supply about 30% of the electricity requirements.

II) The link between energy and human activity

Today Reunion Island is still dependent on oil, so we import necessary combustibles. Reunion Island has an energetic dependency of 87% including 65% of fossil energies.

The energy need of the population rises more and more. We can justify this energy necessity by the increase of the population. Unfortunately, this energy necessity rise faster than the quantity of inhabitant, that is, 1,0% per inhabitant every years.

To the scale of the french territory, the energetic situation of Reunion Island is distinguished itself by a dominance of the fossil energy. The rising recourse to the fossil energies worsening the energetic dependency of the Island.



III) The consequences and the solutions

The consequences

In Reunion Island, the emission of green gas effect is mostly caused by the transformation of energy into electricity (that is 44%) and the road transportation (that is 29%).

Indeed, the recourse to the fossil combustibles to produce energy and for the means of transport are the two principal causes of green gas effect and a damaging pollutant for the human health in Reunion Island.



Green gas effect has a big impact on environment, that can be link with the climate changing, acid rain or population's health.

The quantity of green gas effect is progressing every years. At the gross domestic level, the pollution in Reunion Island is higher than the average quantity of pollution in France.

At the inhabitant level, in Reunion is also higher than inhabitant of France.

In Reunion Island, the pollution by inhabitants is higher than the France inhabitants' pollution.

The solutions

Reunion Island aims the energetic autonomy with the control of the energetic need and especially the development of the sustainable energy.

So, for the future,,we can have a better perspective about energy in Reunion Island, even if today we still have some problems.

