

HYDROELECTRIC ENERGY



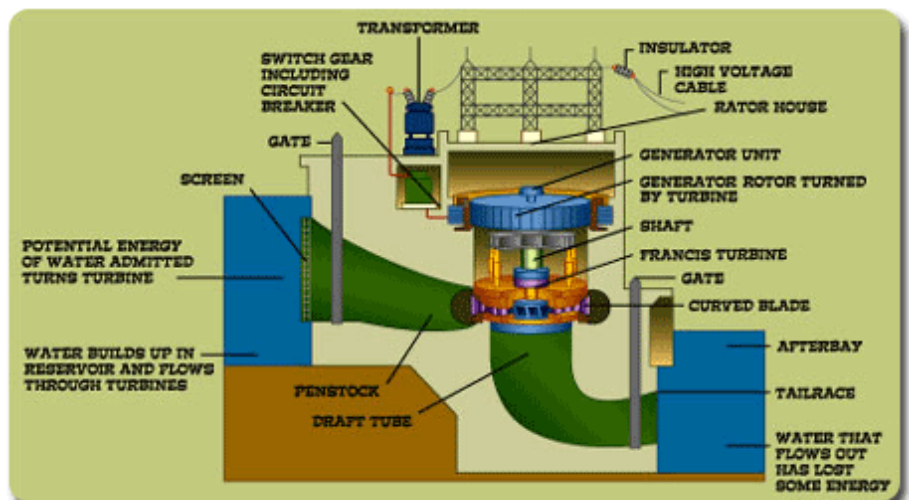
1st Epaggelmatiko Lykeio of Drama, Greece

Εκπαίδευση και Πολιτισμός
ΠΡΟΓΡΑΜΜΑ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗ
COMENIUS

Water, always moves around on earth, covering every part of it. As a result, it has potential energy, when it is at high altitude, which is converted into kinetic energy when the water flows to lower areas. The use of this form of energy is known for a very long time even from our ancestors (water mills for grinding grain for example) while today this form of energy is used for producing electricity. In a hydroelectric power plant (water reservoir, dam, water intake tube, turbine, power plant chamber, generator, water escape tube) we take the potential energy from water to produce electricity, which is given for consumption to houses, factories, public transportation etc through the electric grid. Hydropower plants can only be built on areas with significant rainfalls, water sources (lakes, rivers) and proper earth configuration. In most cases the energy that is produced is only being used in addition with other conventional non renewable energy sources.



Of all the forms of renewable energy, hydroelectric large-scale applications are those that receive greater utilization and perhaps are more energy efficient.



The reduction of the chute, variable speed generators, reducing equipment cost and environmentally friendly technologies are also expected to stimulate interest and for small hydro applications .

ADVANTAGES

- Hydropower plants are capable in producing electricity in no time (as soon as additional electricity is required from the system) , unlike thermal power stations (coal , diesel , LNG etc) which demand significant time to start producing electricity .
- It' s a clean renewable energy source , with the known benefits and have good efficiency .
- With the use of water reservoirs of the dams we have the ability to supply the water and for other uses such as: irrigation, city water supply, halting streams, wetlands creation, recreation, water sports etc.

DISADVANTAGES

- The cost of constructing dams and power plants equipment is great
- The time that is required for the completion of the project is very long.
- The environmental alteration in the water reservoir area is strong (possible displacement of people, landscape degradation, changing the use of land, deterioration to flora and fauna of the surrounding areas, changing of local climate, reservoirs filled with debris, increased seismic hazard, etc.). The international process today directed in construction of small dams.
- Hydropower plants find wide application in countries or areas with significant rain fall, big lakes or rivers. Their operation requires large amounts of water which may create a problem in flora and fauna of the area.

HYDROELECTRIC PRODUCTION IN DRAMA

The biggest electric power projects of Drama are the two hydroelectric dams of the river Nestos . The works began in 1983 with the construction of diversion tunnel of the river. Today they have constructed and operate two hydroelectric dams, those of Thyssavros and Platanovryssis .They have also created upstream of the dams two major lakes.

The hydroelectric dam of Thyssavros :



- Altitude of the dam 390m measured from the sea level
- Dam height 175 m
- Lake level altitude 320-380 m
- Lake surface 18 sq.km
- Energy generated 426 GWh



The hydroelectric dam of Platanovryssis:



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- Dam altitude measured from sea level 230,5 m
- Dam height 95 m
- Lake level altitude 223,5-227,5 m
- Lake surface 3,25 sq.km.
- Power generated 248 GWh

Areas flooded by the completion of the project reservoirs are mainly public forests and community pastures. The only private land flooded by the construction of the dam are in the communities of Potami and Perasma .

The Construction of the third dam of Temenos, is not accomplished yet .