

Water Energy

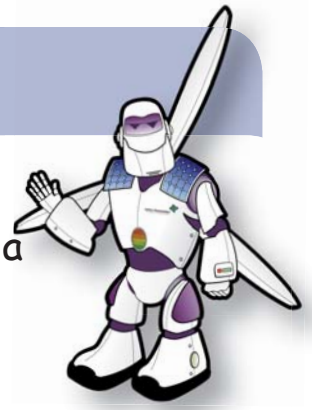
Do you know that 70% of the world is covered with water in the form of seas, lakes and rivers?



Courtesy of Creggan Country Park

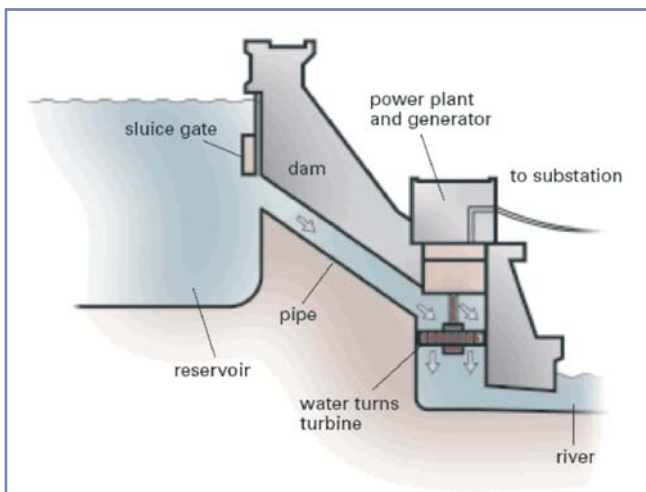
Renewable Robbie has found out that energy from moving water is called **hydro-energy**. **Hydro** comes from the Greek word for water. Watermills have been used to grind corn for hundreds of years in Northern Ireland. Look at the picture of an old waterwheel:





- At Castleward on the shores of Strangford Lough, a mill was used to grind corn in the 1700's.
- In Cookstown, water was used to power a mill to beat out flax to make linen in the 1800's.
- In Lisburn, the River Lagan was used to power the looms which turned flax into linen
- In 1919 in Templepatrick, water started to be used to power machinery to make spades. This continues today!

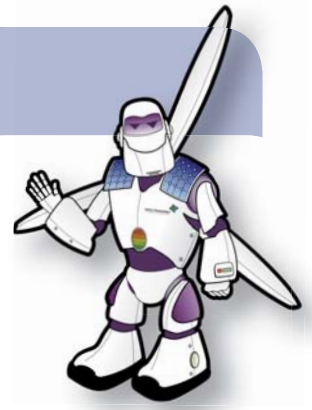
Today, electricity can be produced by building dams which forces water to turn machinery. This is called **hydroelectric energy**. Look at the diagram below:



This is how it works:

- The dam blocks a river which is flowing through a valley.
- The blockage causes the river to flood the valley which creates a **reservoir**. A reservoir looks like a lake.

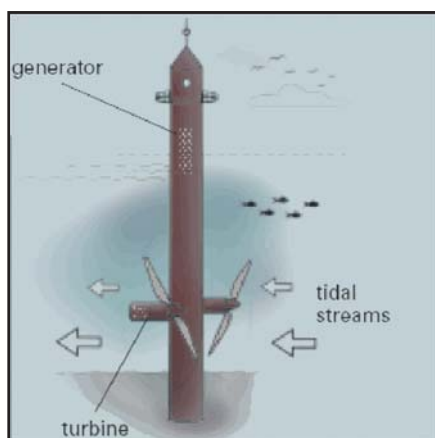




- Sluice gates open to let the water into the pipes.
- Large **pipes** in the dam forces the water to flow through under pressure.
- The water turns the **turbines** inside the pipes. The turbines are connected to **generators**.
- The generators spin round to produce **electricity**.
- The water from the pipes flows away down the river.

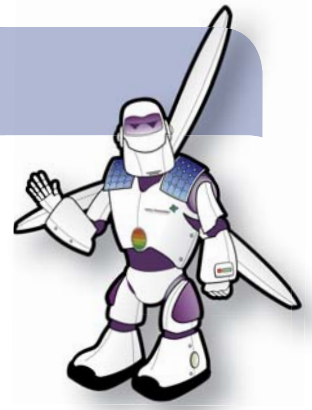
Oceans and seas can also be used to make electricity. Tides come in and out twice every day. Tides occur due to the pull of the moon on our oceans. Two ways of gaining electricity from the sea are by using:

- **A tidal barrage** which is a large dam that is built across a river estuary or a bay on the coast.
- **A marine turbine** which works like a wind turbine but they are turned by sea currents. Machinery inside the turbine produces electricity which is passed to the shore by a cable:



Sourced DTI





There are **advantages** of using water as energy:

- Water energy is more reliable than wind or solar energy.
- It causes no pollution.
- It is a renewable energy because rain keeps falling.
- Marine turbines do not affect sea life because they turn slowly.

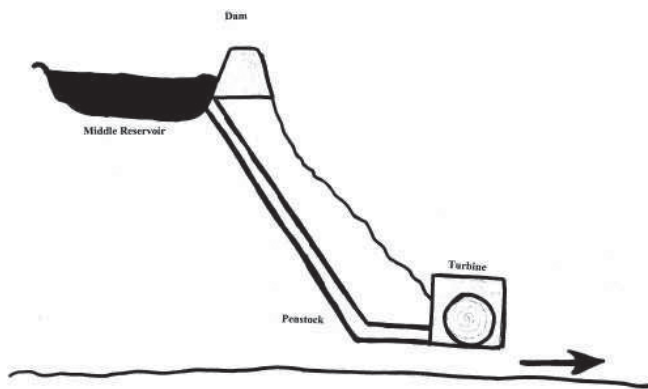
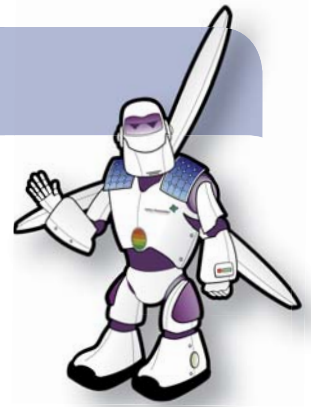
There are some possible **disadvantages**:

- Hydroelectric schemes are very expensive to set up.
- It is difficult to find suitable sites to build dams and homes might have to be destroyed to build them.
- Wildlife can be disturbed when land is flooded.
- It is difficult to find sites for tidal schemes.
- Tidal barrages make it difficult for ships to pass through estuaries.

Example of Water Energy

When Renewable Robbie was in Creggan Country Park in Derry, he got to see their hydroelectric scheme.





As the diagram above shows, water is stored in the middle reservoir and then flows through the dam to turn the turbine. The turbine is connected to a generator which causes electricity to be produced:



Courtesy of Creggan Country Park

Electricity is sent to local businesses who buy the power. The water is then sent back into the river. Renewable Robbie discovered that the people who work in Creggan Country Park find that this is a reliable energy source and it means they use less fossil fuels.

Renewable Robbie is impressed by the scheme. Join him to do some activities on water energy!

