STI GEM

Energy ressources

Wave power

Correction

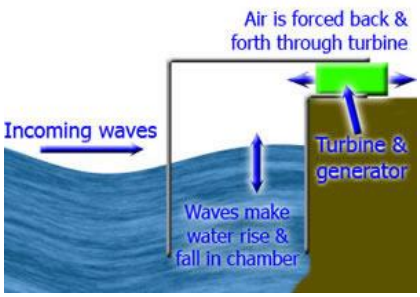
http://www.darvill.clara.net/altenerg/

1. Introduction

How are created the waves? _____ They are created by the wind and the tides _____

Why are wave power stations rare? _____.Power stations are rare because wave power is difficult to harness___

1. How it works



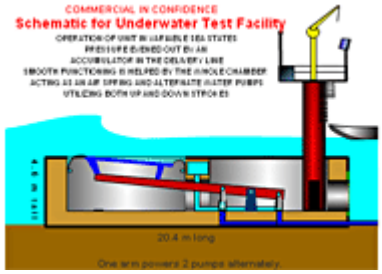
At a wave power station, the waves arriving cause the water in the chamber to rise and fall, which means that air is forced in and out of the hole in the top of the chamber.

We place a turbine in this hole, which is turned by the air rushing in and out.

The turbine turns a generator.

A company called Ocean Power Delivery are developing a method of offshore wave energy collection, using a floating tube called "**Pelamis**".

This long, hinged tube (about the size of 5 railway carriages) bobs up and down in the waves, as the hinges bend they pump hydraulic fluid which drives generators. Current production machines are 180m long and 4m in diameter with 4 power conversion modules per machine. Each machine is rated at 750kW. The energy produced by Pelamis is dependent upon the conditions of the installation site. Depending on the wave resource, machines will on average produce 25-40% of the full rated output over the course of a year. Each machine can provide sufficient power to meet the annual electricity demand of approximately 500 homes.



Their idea for generating wave power (called "**CETO**") uses underwater equipment on the sea bed near the coast. Waves passing across the top of the unit make a piston move, which pumps seawater to drive generators on land. They're also involved with wind power and biofuel.

The action of the waves moves the device, pumping hydraulic fluid to a shore station to drive a generator.

2. Advantages and disadvantages

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Advantages:	Disadvantages:
• The energy is free - no fuel needed, no waste produced. • Not expensive to operate and maintain. • Can produce a great deal of energy.	• Depends on the waves - sometimes you'll get loads of energy, sometimes almost nothing. • Needs a suitable site, where waves are consistently strong. • Some designs are noisy. But then again, so are waves, so any noise is unlikely to be a problem. • Must be able to withstand very rough weather.

2. Summary

- There's a lot of energy in waves on the sea. The hard part is getting it.
- Waves can make something bob up and down, and that can drive a generator.
- A wave power station needs to be able to stand really rough weather, and yet still be able to generate power from small waves.
- Renewable - the waves will keep on coming whether we use them or not.
- Needs to be built where there are plenty of reliable, strong waves.

Quiz:

Wave power is a **renewable** energy resource, needs no **fuel** and produces no pollution.

There are several ways to get energy from waves.

One is to use the waves to make **water** bob up and down in a chamber, allowing **air** to be blown in and out of the top which can drive a **turbine** and a generator.

Another is to tether objects where the **waves** can move them up and down or back and forth, and use this **movement** to drive generators.

A wave power station must be built where waves are **strong** and **reliable**, must be able to generate during **calm** weather and yet withstand violent **storms**.