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## Searaser device in uphill battle for clean energy



Pumping is made possible by the motion of waves lifting the device as it floats in the sea

Lewis Smith, Environment Reporter

A device that harnesses the power of the sea to push water uphill has been developed to provide cheap renewable electricity. The invention is designed to pump water hundreds of feet above sea level from where it can gush downhill to drive hydroelectric generators.

Pumping is made possible by the motion of waves lifting the device, Searaser, as it floats in the sea, and gravity bringing it down again in the wave troughs. A prototype has just completed tests in which it pumped water more than 160ft (50m) uphill through a pipe the diameter of a saucer. The full-size device is expected to pump water through a pipe the diameter of a dustbin lid up at least 650ft (200m) – or easily enough to clear the top of Beachy Head, which is 530ft (160m) high.

A series of reservoirs would be built – and in some areas would be reopened – at the top of coastal cliffs and hills to store water until it was needed to generate electricity.

Alvin Smith, the engineer who developed Searaser, envisages alternative uses such as pumping desalinated water inland for irrigation in dry countries.

However, he said its main use would be to help Britain to end its reliance on fossil fuels and so reduce the man-made emissions of carbon dioxide that are blamed widely for causing, or at least contributing significantly to, climate change.

Under climate change legislation – expected to be finalised in Parliament this week with Royal Assent next week – Britain will commit itself to reducing greenhouse gas emissions by at least 26 per cent by 2020. A six-month preproduction trial is being planned and, if successful, the device could help Britain to meet its target of getting 15 per cent of its energy from renewable sources.

One of the big advantages of the wave device, its creator said, is that the turbines that would be used to generate electricity are a proven technology and have been in use for years in hydroelectric installations in hilly areas where water can be held in reservoirs.

The wave pump consists of two floats, one above the other, fitted to a double-acting piston. Water is pumped as the floats are forced together and apart by the motion of the waves.

Chains and weights fix the device to the sea floor and the pump is able to operate in water as shallow as 30ft (9m) as well as in extreme weather conditions.

Each of the pumps has a capacity of just 0.25mw, but they are expected to be used together in their dozens, or even hundreds, side by side along the coast or further out at sea.

Mr Smith, and his colleague Geoff White, calculate that one full-size device would be able to pump enough water to keep 470 homes supplied with electricity. To supply 20 million homes would take 43,000.

They maintain that with Britain surrounded by the sea it would be a tremendous waste to ignore the potential it has for providing green energy. "We have any amount of sea water out there," Mr Smith said. "We have got to start using it."

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