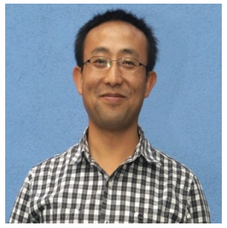

Aichun Feng is currently a PhD student of Fluid Structure Interaction Group in the University of Southampton. Before that he received his bachelor degree in Harbin Engineering University and then master degree in Shanghai JiaoTong University in China. His research interest mainly lies in the nonlinear hydrodynamic analysis for floating structures.

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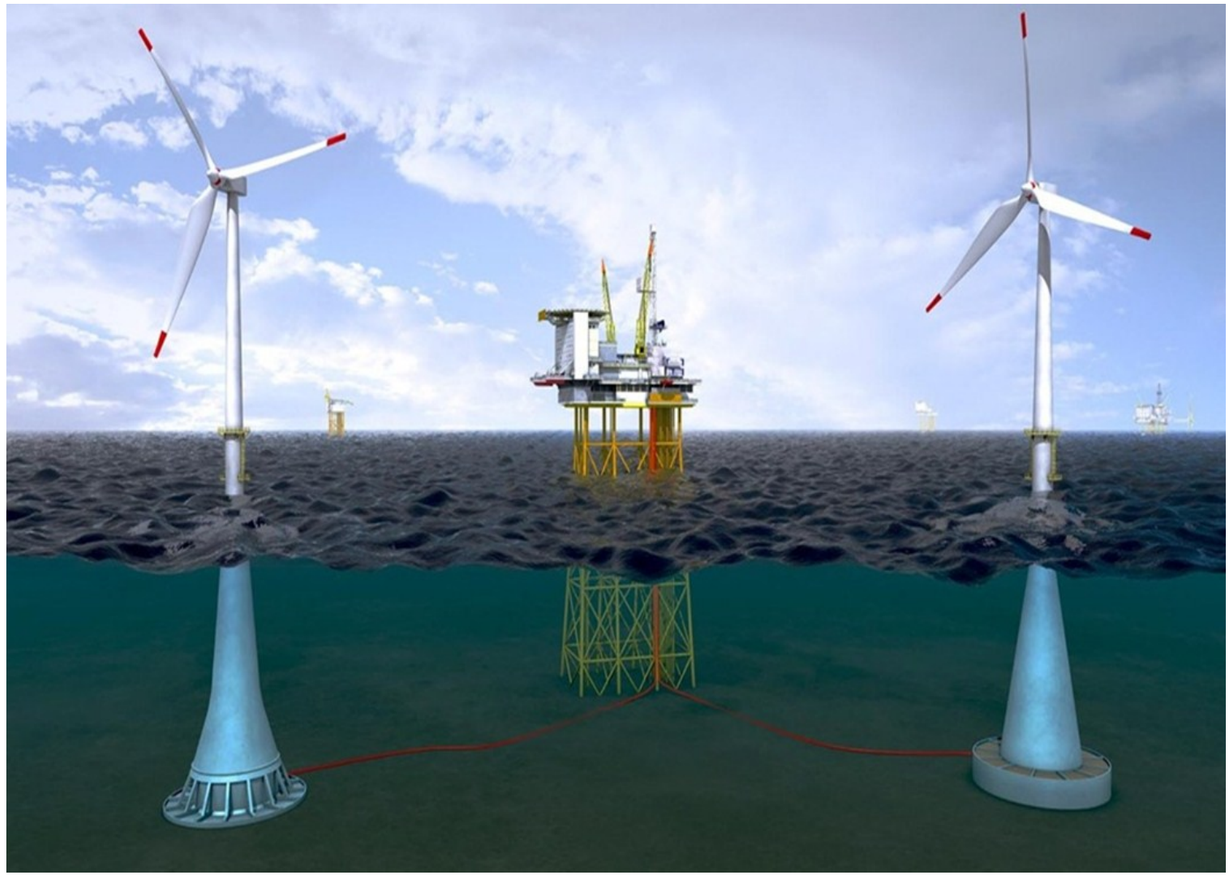
This concept design study was funded by The Lloyd's Register Educational Trust (The LRET). The LRET is an independent charity that was established in 2004. Its principal purpose is to support advances in transportation, science, engineering and technology education, training and research worldwide *for the benefit of all*. It also funds work that enhances the safety of life and property at sea, on land and in the air.

Carbon Capture & Sequestration in Ocean Space The LRET Collegium 2011 Series, Volume 4

Using renewable energy to store carbon dioxide

An eco-friendly way to combat global warming



A concept by SCarF (Small Carbon Footprint Designers)

AICHUN FENG, TAEYOUNG KIM, XIAOJUN LI, ZEESHAN RIAZ & JUSTIN WEE

Lloyd's Register Educational Trust

UNIVERSITY OF Southampton

What is carbon dioxide and why all the fuss about it?

Carbon dioxide is an air pollutant. It is the main air pollutant that is responsible for the environmental problems we are facing.

Why do we need to store carbon dioxide?

The world is getting warmer because mankind's activities are spewing copious amounts of carbon dioxide into the air. If nothing is done to stem the flow of air pollutants, the future of humanity seems bleak. The need to dispose of carbon dioxide in a sustainable manner is imperative.

What can we do?

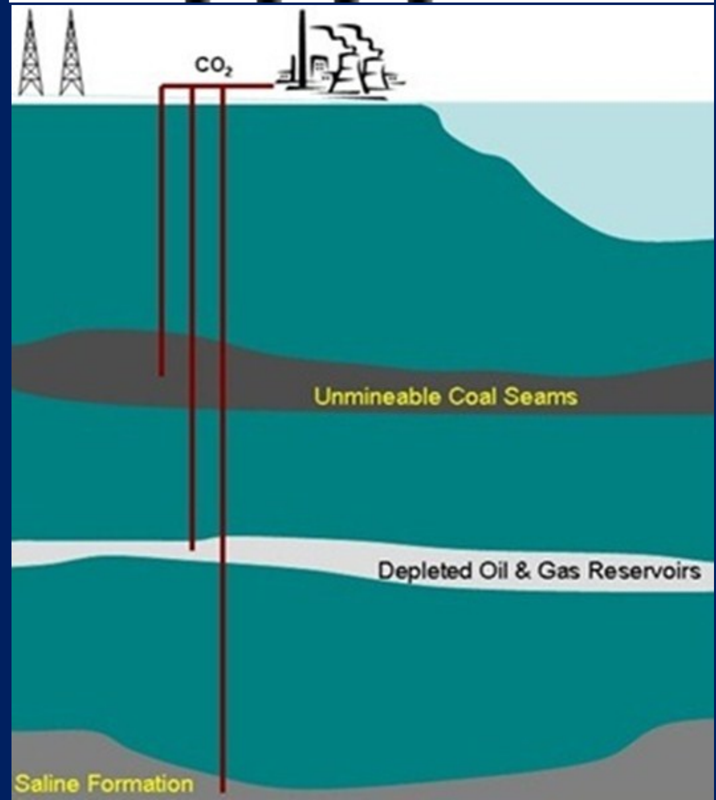
One option is to store the carbon dioxide safely away underground. There are large porous spaces underground that mankind has no other uses for. These spaces could be used to dispose of carbon dioxide.

How will we go about it?

Engineers and Scientists are thinking of ways to dispose of the carbon dioxide we emit. One way is to pump the gas into depleted oil and gas reservoirs. We can use renewable energy to run the processes required to dispose of the gas.

What is renewable energy?

Think of renewable energy as clean, inexhaustible energy. Mankind has been using renewable energy for centuries. Try to imagine windmills in the countryside turning to grind grain or a water wheel along a fast flowing stream. Similarly, we can use this wind energy to generate electricity. This clean electricity that has been derived from non-polluting sources is then used for powering machinery to safely store away the carbon dioxide indefinitely.



A reversion to the age of sail?

The UK is a windy country and her coastal waters are dotted with windmills. These windmills generate electricity which can be used to power the disposal operations.

Where can we expect to first see a demo project?

The nature of such projects are one-off, bespoke designs and may be adapted to several countries. The UK and Europe have the sophistication and know-how to lead the rest of the world in the disposal of carbon dioxide. The UK in particular is ably suited to be a pioneer in this field. The UK has always been an environmentally conscious country and it seems only logical that the UK should lead the way by example.

What's the plan?

The plan is to capture the carbon dioxide emitted from a major power plant in the UK and pipe the gas to a depleted reservoir in the Southern North Sea (see map below). Upon arrival at the site, the carbon dioxide is literally pumped into the reservoir, thereby effectively and safely disposing of it. The act of injecting the carbon dioxide is powered by marine renewable energy. A nearby wind park, (Sheringham Shoal) will supply the clean electricity needed to inject the carbon dioxide into the reservoir, thereby not contributing to the emissions problem.

The concept is an environmentally friendly solution to air pollution in the UK.

How does the public stand to benefit?

The concept, if implemented, would create jobs and generate wealth for the UK. It would stimulate the UK's economy and bring trade and commerce to the nearby towns involved in the project. Local suppliers and service providers would prosper as a result.

Where can we know more?

For further information, refer to
The 1st LRET Collegium series of titles (ISBN:9780854329304) on CCS published by the University of Southampton
OR
visit the website:
www.southampton.ac.uk/ses/news/events/

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