



Innovation: The Environment

Renewable energy

Commentary

Britain has set target dates for increased percentages of energy generated from renewables. Is this a good policy?

Helm

If you take a country like Britain, it's hard to think of a more expensive way of de-carbonising than setting a short term target, 2020 that's very short term in climate change terms. To set a short term target where you've only got really one technology to use in that time period which is offshore wind, on-shore wind and off-shore wind. And to try to drive the economy to that particular outcome. The result for Britain will be one of the most expensive episodes in recent energy policy history and it's far from clear that it will be achieved and even if it is achieved it's far from clear it'll make much difference to the carbon emissions in totality. And if you look at the climate change problem going forward, you now one way of characterising it is to say, what is the question, to which a wind farm in the outer Hebrides is the answer? Now for me, it stretches me to think of any question to which that's relevant other than additional income to crofters and land owners in the outer Hebrides. It's a long way from the market, it's extremely expensive and it makes no difference to the parts per million in the atmosphere.

Commentary

So are there less costly alternatives to wind?

Goodwill

The UK is potentially the single best country in the world for waves, for tidal current energy for tidal range energy. There's absolutely no reason why a sensible government policy shouldn't be putting reasonably large sums of money into it. At the moment for example investment in tidal current energy is running at £10, £20million a year, less than the total yearly subsidy to for example the Royal Opera House. Got our priorities wrong there. We need to put a lot more research and development money into the marine technologies which give the UK a chance of becoming a world leader in some extremely important new industries.

Falconer

The tide has one very big advantage over the other sources in that it is predictable. Now, we can split hairs over the pros and cons of that but from an engineering point of view, that is very attractive. We know what the tide will be next week. We know what it'll be next year and we know what it'll be in ten years' time.

Hepburn

The tides created by the interaction of the moon and the earth generate a fairly consistent source of power actually. And, so, an investment that the UK government is considering at the moment is a barrage over the Severn estuary which would generate, depending on the configuration, enough power to displace one or two big coal-fired power stations so, a lot of power, over a gigawatt, potentially. And, it's not actually incredibly expensive on the narrow cost estimates of what it would take to build.

Commentary

So how does the proposed Severn barrage scheme work?

Falconer

The scheme here is to build two hundred and sixteen turbines, each nine metres diameter, through the centre part of this wall, sixteen kilometres long, a hundred and sixteen sluice gates, each forty metres long. So on the incoming tide, the water would come through the sluice gates, upstream, it would then be held upstream for three hours, the water would then

go out after three hours and the head difference of seven metres will be generated and then would go out through the turbines, the sluice gates would close as you saw in this model here, earlier, it will then go out through the turbines, generating power on the outgoing tide.

There is one very big advantage of the Severn Estuary and that is we can capture a huge amount of energy in a very localised region. For example, the power that we can get from an estuary is proportional to the planned surface area that we can impound upstream. We can impound a lake of over five hundred square kilometres if we were to build a Severn Barrage, and that's one and a half times the size of Lake Geneva, for example. And we can impound that needing a perimeter of two hundred and twenty five kilometres, and we only need to build a wall sixteen kilometres long to impound that very large lake. So, from a purely engineering point of view, that makes a Severn barrage very attractive. We can get a large amount of energy from a relatively short wall. I think Britain has all the engineering skills in this field. I think Britain can build this project, Britain can design the turbines but that turbines will come from overseas because we don't have the supply chain, the turbine manufacturing is a cottage industry but, if, we can, I understand that we can get these turbines produced if need be, but they can, this project can be built by British expertise.