

The Awkward, Realistic Choices on Low Carbon Electricity

by Blog Admin

June 5, 2012

Following on from the Evaluating the Impacts of Climate Change event, [James Smith](#) of the Carbon Trust writes that kicking our fossil fuel habit will be hard, but we must now turn to available research to evaluate low carbon technologies if we are to end our lethal dependence on fossil fuels.



As the public debate on securing our future energy needs continues to heat up, one thing is certain. Kicking the fossil fuel habit will be hard. Over two billion people in the developing world need more energy. Even with major improvements in energy efficiency and huge growth in alternative energy, fossil fuels will be the dominant source of energy in mid-century.

But the fossil energy bonanza cannot go on as it is. Climate change must be tackled because of its environmental and economic impacts – mainly from floods and droughts.

Unfortunately, energy from the sun, though huge in aggregate, is dilute compared with fossil fuels. Solar panels would need to cover an area over two hundred times that of a gas fired power station to deliver the same amount of electricity. A ton of water would need to be lifted ten miles high to have the potential energy available from a gallon of petrol. This means that alternative energy won't be cheap.

The extra costs for the right choices on low carbon energy are about 1-2% of the economy and, though not trivial, are affordable. Major improvements in energy efficiency are key to keeping these costs down. Crucially, the cost is lower than the economic damage from climate change.

But the wrong technology choices can waste of tens of billions of pounds that could otherwise be spent on houses, schools and hospitals. That is why engineering reality, costs and markets should guide us, not emotion.

So beware the paradox of perfection and let's get real about the awkward and messy choices for electricity. Development of future generation technologies must continue but for the next twenty years or so there are three big low carbon electricity technologies that matter. These are nuclear, wind (mostly offshore) and carbon capture and storage (CCS) – applied to coal, gas and biomass. Government has acknowledged this in its recently published Carbon Plan.

But time is short and each of these technologies needs a big push. They must be fully evaluated at scale and then deployed. Carbon markets on their own are not yet strong enough to make this happen. Equally, blank cheques for everlasting subsidies undermine innovation and create waste. So an approach in two phases is needed. The first phase is shorter and involves technology evaluation stimulated by competitive launch aid. In the second, long term phase, the electricity and carbon markets must set a market based, competitive framework.

The first phase of evaluation, using launch aid, should be limited to a few new gigawatts of each of the three technologies. This will do three things – begin to create a supply chain; generate ideas for future cost reduction; and confirm the costs of each technology, both absolute and relative. There are already plenty of opinions about these technologies. We should encourage launch aid for evaluation and suspend judgement until the evaluation has been done.

The launch and evaluation phase will last for much of the coming decade. Costs should be shared internationally. We should do those parts in the UK that play to our advantages such as IT, advanced design and large scale process engineering.

Clearly the positions of nuclear, offshore wind and CCS are far from identical. So the launch aid will take a variety of forms and must be kept to a minimum through competition and tough negotiation. Companies should be encouraged with launch aid but they should not earn excess profit from it.

In the second phase, the unseen hand of a competitive market, with carbon costs included, will make the most cost effective choices. There is likely to be some combination of nuclear, wind and carbon capture and storage. It is quite possible that biomass, sourced sustainably, will be an important fuel. The carbon market should ensure that increasingly plentiful gas is used mainly with carbon capture and storage.

Much of what is needed for this two phased approach already exists in Government policy. Carbon capture and storage demonstrators and electricity market reforms are examples. New institutions, based on a 'systems operator', have already been signaled by Government.

But the idea of this two phased approach, focussing on three big technologies has not been spelled out. Perhaps Government fears being criticised as intervening in the market. But launch aid is an established tool in modern market economies. The two phased approach offers the best chance for reliable, low carbon electricity at the lowest cost. It also offers high value jobs from low carbon technological edge.

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