

# The future is disruptive



The government is committed to reducing carbon, and promoting innovation. So why is it making life so hard for innovative entrepreneurs offering dramatic carbon savings?

**Rebecca Willis** reveals the obstacles – and the opportunities – for the ‘disruptive innovators’.

## When Andrew Mercer

founded his renewable energy company, 2OC, he knew that it would be difficult to establish a presence in the UK's competitive energy market. But he was surprised at just how tough it turned out to be – and how little the government wanted to help.

Mercer's aim was to bring geo-pressure energy to the UK. This harnesses the immense pressure under which natural gas emerges from the ground – pressure which helps drive the gas through the pipeline network. 2OC plans to fit a small turbine within the pipe. The pressure turns the turbine and generates electricity, working in the same way as a wind turbine. It's a simple, clean way to generate around a gigawatt of electricity per year, and save a million tonnes of carbon – equivalent to the entire emissions of the National Health Service.

The technology is increasingly recognised as viable on both sides of the Atlantic, and when Lord Oxburgh, former chairman of Shell, agreed to chair the new company, it seemed that they were heading for success.

But turning the idea into reality has been quite a struggle. The national grid is designed for large-scale electricity generation, not small-scale, distributed power like geo-pressure, so it was clear that it would be difficult to compete against centralised gas- or coal-fired generation. Geo-pressure had never been harnessed before in the UK, and the venture was seen as too risky for investment banks to fund. So Mercer tried to get R&D support from the government's technology programme – but was told geo-pressure wouldn't be eligible as it had already been used abroad, and so was classified as an 'existing technology'.

2OC then tried to get geo-pressure officially recognised as a source of renewable energy under the government's Renewables Obligation. (This requires electricity suppliers to source a growing proportion of their power from renewable sources, and so would help guarantee 2OC a market.) In 2006, it won a legal battle with electricity regulator Ofgem which secured that recognition – only to discover that government officials at the new the Department for Business, Enterprise and Regulatory Reform (BERR) are now trying to write geo-pressure out again. The reason? As one official told the *Daily Telegraph*, the law "was not written with this technology in mind". The implication? Innovations will only be supported if they have been anticipated by civil servants with an uncanny ability to predict the future.

So here's a situation where an entrepreneur brings forward an innovation offering significant carbon savings, helping the UK to meet its CO<sub>2</sub> reduction targets – and gets absolutely no encouragement from government. This is surprising, given that innovation is a central aim of the new Brown government; it even has a seat in the Cabinet, occupied by John Denham, secretary of state for innovation, universities and skills. On the surface, the government supports low-carbon innovation. But for those on the front line, it doesn't often feel that way.

A new report, published by Demos and NESTA, profiles eight green innovators who are offering new, 'disruptive' solutions to the low-carbon challenge. Rather than making incremental innovations, such as more efficient car engines or streamlined logistics, they're coming up with whole new business models which can fundamentally transform the way we tackle climate change. Government should be falling over itself to support businesses like these. So what should it do to give them an easier ride?

## 1 Don't be blinded by technology

Innovation is often seen as a simile for the invention of new technologies. But some of the most significant low-carbon innovations are not about sparkly new gizmos, but new services or business models instead. So policies to promote technology, as such, will not help them. Take Barnsley Council. Its new Digital Media Centre [see below], a flagship building and symbol of the area's regeneration, is heated by one of the oldest technologies known to humans: burning wood. The Media Centre is part of a much larger biomass project: social housing, libraries and the town hall are also heated using waste wood from nearby parks and managed woodlands. It's a model which has huge potential for the UK, given its ample resource of waste wood from tree thinnings and forestry management.

Barnsley's biomass scheme is certainly innovative. But innovation discourse tends to focus on patents and gadgets, not new ways of doing things. So we need to widen our view of innovation.



Wood-fired powerhouse gets Barnsley's message out

## 2 Think about the users

As influential MIT professor Eric von Hippel points out, innovation is not a one-way pipeline from R&D lab to the consumer. The snowboarder who finds a new way of attaching straps to improve performance is as important as the product designer sitting in head office. In open-source software, users work together to create and perfect applications. End users play a vital – and growing – role in driving innovation. In a heavily regulated market such as energy, though, user-centred innovation is virtually impossible. Energy systems tend to treat the user as a passive consumer, not an active participant. If you have solar panels, you've made the shift from being a consumer to a producer of electricity. But you'll have problems connecting – and selling – to the electricity distribution system, as network operators are not incentivised to connect small-scale power.

Despite this regulatory stifling, growing awareness of climate change is encouraging innovators who involve individuals in both energy generation and carbon reduction. GREENhomes, for example, gets people involved in energy saving at home through offering a 'concierge service', auditing homes and arranging for all the necessary work to be done – making an often intimidatingly complex task for the concerned householder relatively simple. Baywind, in Cumbria, is the UK's first community-owned wind farm, powering 1,300

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Hot rocks rock Iceland



homes and ploughing profits back into local energy saving. (Construction has just started on the latest community wind farm, Westmill – see p44.)

If regulation is reformed, and energy provision is further decentralised, a more wholesale shift toward such user-centred innovations could swiftly follow.

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### 3 Let the outsiders into the system

Like 2OC, many innovations flounder because they don't fit the system. Dynamic Demand is a case in point. Its control technology could be fitted to appliances like fridges and air conditioners, allowing them to communicate with the national grid, and turn themselves off briefly when there is a surge in demand for power. If enough appliances were fitted with this technology, the overall effect would be to smooth out demand and reduce the need for extra power generation.

But although it could cut costs and carbon, it currently has no way into the market. In theory, the technology could earn money from the services it provides to power system operators, since it would be saving them money. In practice, though, the system simply isn't set up for power suppliers to make appropriate payments, whether to people who've installed the technology, or to Dynamic Demand in return for doing so in consumers' homes and offices.

The way that the electricity market functions, and is regulated, prevents new entrants like Dynamic Demand from offering a profitable service. They are locked out of the system, because they offer a new solution that wasn't available when the regulations were developed.

### 4 Look beyond energy

Innovation rarely comes from expected places. So we should expect low-carbon solutions to emerge from all parts of the economy – not just the established 'energy' or 'environment' sectors, both of which can be hidebound by traditional ways of thinking. The 'disrupters' we studied included a leadership coach, a design student, a building services manager and a hill farmer. Environmentalists alone won't save the world. And real progress can be made when a series of innovations link together, setting off a chain reaction. We need to think of innovation 'tipping points', and create policy that supports them.

### 5 Sing from the same hymnsheet

Talking to our disrupters convinced us that there is real potential for innovative approaches to carbon reduction. But it also became clear that innovators are struggling to gain a foothold. We need to find a way to link up the government's climate change objectives with a broader system of policies to support low-carbon innovation.

So how do we do it? The government has agreed, through the Climate Bill, to mandatory emissions reductions. There should be an equally clear goal of providing a stable and supportive environment for low-carbon innovation. The Dutch government promotes a model of 'transition management', working with stakeholders to agree a long-term goal of achieving a sustainable energy supply within 50 years. This sounds straightforward, but is complex in practice. For a start, it would mean much more active management of energy markets – which challenges the policy status quo.

Then we need to find new ways of talking to and learning from low-carbon entrepreneurs. Government has no obvious channels of communication with disruptive companies. Trade associations like the CBI tend to represent the interests of incumbents, and often lobby against policy measures that could support new entrants. Trade bodies for the environmental sector are relatively narrow in focus. Government could be far more proactive in seeking out and listening to fledgling businesses, through participating in the many entrepreneur networks and meet-ups, for example; or through talking to existing recipients of government funding to get their views on wider strategic issues. So it's encouraging to report that, as this article goes to press, the BERR has announced that it will fund research into the carbon-savings potential of dynamic demand and its ability to integrate renewables into the grid network, and will draw up plans for a dynamic demand standard and incentive system.

Where innovation is locked out of current systems, government could create space for experimentation in low-carbon innovation zones. Local and regional decision-makers could pledge carbon cuts, and set a framework to achieve them. In return, they could be given greater autonomy and scope for regulatory experimentation, and a larger share of funding, to find ways to involve local households, communities, businesses and the public sector in carbon reduction. In effect, this would be a sort of low-carbon devolution, creating the right conditions for radical change.

Deep carbon cuts will not be possible unless we rethink the way we do things. *The Disrupters* offers us a glimpse of a future that we can still seize: carbon-constrained, certainly, but with no restrictions on innovation. With the right support, these environmental entrepreneurs will lead us to it. ☺

*The Disrupters: Lessons for low-carbon innovation from the new wave of environmental pioneers* is available from [www.nesta.org.uk](http://www.nesta.org.uk). Its launch coincided with that of NESTA's Environment Challenge, the newest strand in its Innovation Challenges programme, which aims to stimulate innovation in response to social needs. NESTA is developing a £1 million prize fund to inspire more innovative approaches to carbon reduction among community and third sector organisations. Full details will be announced at the end of October.

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