

Mining energy efficiency – the strategic opportunity

This is a slightly edited version of a submission to DECC that accompanied my response to consultation on solid and gaseous biomass generation in November 2012

Energy efficiency is a great value approach to cutting emissions and increasing energy security. Some efficiency measures pay for themselves in a matter of months or a few years, others take longer. But even when the payback times are relatively long, they are still better value both in energy supply and decarbonisation terms than much genuinely low carbon generation, never mind so-called low carbon energy like much bioenergy, which actually increases emissions in the near term.

This is recognised by DECC. At the Ecobuild event in spring 2012, DECC's Charles Phillips explained the rationale for subsidising solid wall insulation: "Measures like solid wall insulation are not individually cost-effective, but highly socially cost-effective. They enable us to mine carbon savings as a nation, and can be cheaper compared to sources such as tidal and nuclear."

Support and subsidy directed into biomass generation is, in a spending-limited world, support and subsidy that could alternatively be directed to energy efficiency. It is therefore to be welcomed that DECC are at least now looking at what energy efficiency can deliver.

What would be fantastic would be if energy efficiency could also be looked at in terms of its carbon abatement potential, and if it could compete on a level playing field with both low carbon renewables and indeed with bioenergy generation, in terms of the energy security and decarbonisation offered.

Reducing overall energy use even increases the proportion of renewable supply, if it is fossil fuel capacity that is retired or not built, to meet the reduction in demand.

Electrical efficiency in particular gives high returns on investment in many cases. Ah, I hear you cry, then the market will take care of it! Well, no, it doesn't, as we can see looking around us.

Low awareness, plus the cost and availability of finance for even quite high-yielding energy efficiency measures are among the obstacles to 'the market' delivering a 'rational' set of measures everywhere they would be applicable. But a well designed incentive and financing system, such as has been successfully adopted in numerous American states (see below), certainly could yield tremendous, lasting dividends.

The national approach to investment in these complementary aspects of energy security and decarbonisation has up until now, been contradictory. No-one says individuals have to borrow privately at commercial interest rates, to buy their share of a nuclear power station, the way they are having to borrow to finance Green Deals. Yet 'mining carbon savings' is 'mining carbon savings' wherever they come from – so why not finance all carbon savings on the same basis? Couldn't our whole energy strategy be looked at in terms of the most socially cost-effective investments?

As the UK Energy Research Council put it in their response to the original Green Deal/ECO consultation: "There is no reference in the consultation document to the consistency of the proposals with ongoing [electricity] market reform proposals (EMR).

"...The proposal inherent in the [Green Deal] consultation to end all subsidies for demand side measures other than solid wall insulation seems to be seriously out of line with the EMR proposal to introduce subsidies for all low carbon electricity supply technologies (regardless of technical maturity).¹

"The ... lack of any subsidy, even for very cost effective measures on the demand side, coupled with the expectation of increasing electrification of heating, will raise electricity demand and therefore require **much higher supply side subsidies and costs than would be needed with stronger support for energy efficiency.**" [KdeS emphasis] . In other words, if you don't subsidise cheap electrical efficiency measures, you will end up paying through the nose for expensive renewables we could otherwise have managed without.

Richard Hipkiss, chair of the energy Services and Technology Association writing in a recent Energy Institute periodical ('Tackling the flaw at the core of UK energy policy, Energy World, October 2012) also points out the imbalance between support for new energy supply and reductions in demand, and suggests demand reduction would alter the scale of the challenge of developing new infrastructure, and the difficulties of insulating ourselves from volatile international fossil fuel markets. "'An overall reduction in demand of about 20% [appears to be] achievable and cost-effective...and reducing the national energy bill by one fifth makes the cost of new supply networks that much lower as well"

Others propose it would be possible to go further. The argument is developed in detail in the AECB report *Less is More* (see <http://aecb.net/news/2012/02/less-is-more-energy-security-after-oil-lim-from-the-aecb/>). It has also been made by the Green Alliance², the Association for the Conservation of Energy³ and others.

In 'Less is More', author David Olivier points out: "Unlike oil, the potential of energy efficiency cannot be exploited with one grand technological intervention. Energy efficiency consists of a wide range of technologies, and delivering substantial savings involves investment in many different areas at a more local level. This makes the task more complex, seen from "the centre".

"But unlike exploitation of the oilfield, the benefits are permanent and widely-distributed. We have to look all across the energy supply chain and focus on the fine details of energy consumption, including those 'beyond the meter', where the energy efficiency resource is concentrated."

Capital can be cheaper than 7.5%?

As David Olivier and the UKERC both point out, big utility companies (and governments and local authorities for that matter) have access to much cheaper borrowing than individual customers. While the energy companies take advantage of this borrowing power to finance infrastructure investments, similar cheap borrowing to upgrade the efficiency of the national estate has, hitherto, been ruled out. It is hard to see this as rational.

¹ http://www.ukerc.ac.uk/support/tiki-index.php?page=Bulletin_green_deal&highlight=green%20deal

² (http://www.green-alliance.org.uk/grea_p.aspx?id=6082)

³ (http://www.ukace.org/index.php?option=com_content&task=view&id=632&Itemid=26)

David Olivier describes the introduction of so-called 'least cost planning' as an obligation on energy companies in the United States. This involves changing the way energy companies are licensed to operate, putting an obligation on them to help their customers save energy, and ensuring they have incentives to invest in cost-effective energy efficiency before more expensive new generation. But this is not done in the "add on" way that, for example, the Green Deal ECO has been set up (and which does not incentivise the companies with anything other than the threat of fines).

Olivier believes that the post-1999 UK gas and electricity regulatory model "is antithetical to profitable investment in energy efficiency, because the companies lack the correct incentives. So the model will need a total overhaul."

"The first most important move in all the US states, including California, which induced investor owned utilities to invest in energy efficiency, was to decouple their profits from their sales. This step ensures that, in principle, regulated utilities do not lose money from diversifying into energy efficiency," Olivier writes.

"But if a regulator then goes further than "decoupling", and allows utilities to keep some of the net profit from selling their customers negawatts, not megawatts - so-called "*shared savings*" - one can expect rapid investment. This happened in California at the peak of least-cost planning, in the early 1990s, when the rules were changed to allow shareholders to keep 15% of the net profits. The pressure towards energy efficiency became overwhelming, because more investment in negawatts now led directly to higher profits for shareholders."

The Californian Public Utilities Commission recently summarised the progress of this policy:

"[The] investor-owned utilities recently reported the results of their 2009 efficiency programs, which show a 10 percent increase in annual savings from a record-breaking 2006-08 program cycle, providing an estimated reduction in CO2 emissions of more than 1.5 million tonnes for that year alone. ...Energy efficiency continued to be the cheapest resource available, costing less than half as much [2.5 p per kWh] as supply-side alternatives."

US lawyer and energy expert Ralph Cavanagh recently suggested that the US's Pacific Gas and Electric Company had saved the equivalent of 15,000 megawatts of new generation through its efforts to help customers become more energy efficient. The savings had saved 'many new power plants' from needing to be built.⁴

Once again, the home energy efficiency department in DECC recognises this, accepting that at the moment, the energy companies don't have that crucial incentive to help their customers save energy. DECC's Charles Phillips recently told a meeting about the Green Deal that DECC does not expect energy companies to be the main drivers of the Green Deal for this very reason: "selling less energy is really not such a big incentive for them," he pointed out.⁵

Ralph Cavanagh believes that it should be for power companies to mobilise this sort of investment: "A worldwide search is on for affordable low-carbon energy solutions, but looks

⁴ <http://www.pgecurrents.com/2011/10/27/earley-proud-to-inherit-pge%E2%80%99s-environmental-leadership-legacy/>

⁵ Green Deal 4 Real, Good Homes Alliance, September 2012

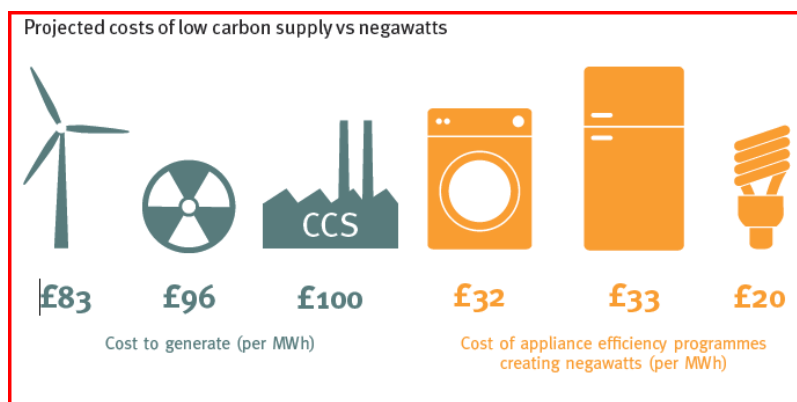
mostly in the wrong places. We need savvy and credit-worthy institutions capable of choosing among a bewildering array of resource options...

“ Wherever feasible, those institutions should be displacing other energy resources with efficiency improvements that offer equivalent or better services at lower cost. Recent candidates for this demanding role include national and local governments, venture capitalists, investment bankers, software engineers and information technologists. All can contribute, but none come close to replacing properly motivated and financially robust electric utilities.”⁶

As David Olivier explains, the interest paid all hinges on business risk “which goes right down as regulation and statutory powers go up”.

“That’s why some of the USA including its largest state, California apparently has no plan to move away from the regulatory model of the last 100 years,” he adds. According to Olivier, California tried deregulation in 1996-2003 and returned to regulation after they found it increased prices. In the UK, “water companies can borrow cheaply since they have statutory powers, giving investors confidence their money will be repaid (with interest more typical of government than corporate bonds). Energy networks can do this too.”

Matthew Spencer director of the Green Alliance, also argues that the “cheapest first” approach is already being made to work in the US, where a number of states have created a market for electricity savings or “negawatts”.



Projected costs of low carbon supply vs negawatts

from Green Alliance paper ‘Creating a Market for Electricity Savings’ <http://tinyurl.com/b6ac53k>
Courtesy of Green Alliance

“These programmes really work - they have reduced the number of new power stations that need to be built and have delayed or even prevented grid upgrades. They have saved consumers considerable amounts of money. Appliance replacements and efficiency retrofits in the US avoid electricity consumption at nearly a third of the price of new supply. **They replace an expensive megawatt of electricity which costs perhaps £100 , with an avoided megawatt, or negawatt, which only costs £30.**”^{7 8}[KdeS emphasis]

⁶ <http://newenergycities.org/competitive-electricity-reinvestment-the-energy-efficiency-imperative>

⁷ <http://www.businessgreen.com/bg/opinion/2220543/energy-switching-is-dead-long-live-the-market-in-energy-saving>

It is therefore great news that DECC intends to bring forward "the most ambitious approach to demand reduction we've ever seen in the UK" aiming to ensure "energy efficiency is comparable with building new energy generation assets".⁹

There is clearly a great deal of interest and expertise in this field in the UK. It would be crazy to trap ourselves in the old "predict and provide" ways of securing our energy and our climate future, if cheaper and more effective options were open to us; and the advice and expertise is here for the taking.

⁸ This subject is also explored at considerable length in David Olivier's report "Less is More" published on www.aecb.net

⁹ <http://www.businessgreen.com/bg/news/2227391/exclusive-minister-promises-energy-bill-to-deliver-worldleading-efficiency-drive>