

National Infrastructure Commission call for evidence

Written submission by Green Alliance, January 2016



Green Alliance welcomes the National Infrastructure Commission's call for evidence. In particular, we believe that new initiatives can help to ensure the UK realises the potential of electricity efficiency to reduce emissions cost effectively and to underpin a secure power system.

We furthermore welcome the recent acknowledgement by the Commission's interim chair, Lord Adonis, of the importance of public dialogue, when he pledged to "ensure that the Commission places the needs and views of the UK public at the heart of a long-term strategy and responds to the clear demand for a more strategic two-way conversation."ⁱ Bearing this in mind, we note that there does not appear to be any meaningful attempt to engage the public in this first set of activities by the Commission.

We question the scope of Part 4 of the call for evidence: the energy section focuses entirely on the objective of security of supply, with no mention of carbon constraints or environmental impacts. To achieve the UK's legislated carbon budgets and to ensure the UK plays its part in global efforts to tackle climate change, carbon considerations must be at the heart of all major infrastructure plans. Any new infrastructure that is built to last will have to facilitate a very low carbon economy.

Electricity interconnection and storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

Our work on electricity efficiency savings – negawatts – demonstrates that very substantial cost and carbon savings can be achieved by adopting tried and tested policies used in Texas, California and New England to incentivise the use of energy saving products and systems instead of constructing new power stations. If the government were to adopt these policies, it could reduce the cost of decarbonisation by more than £2 billion by 2025, and keep the UK on the least cost pathway to meeting its carbon budgets.

A key priority for the government should be to allow low cost demand reduction and response to compete with higher cost power stations in the electricity market. Yet current market biases create a perverse effect: the UK pays to keep polluting coal-fired power stations in operation, via the capacity market, and then pays again for low carbon technology to displace them, via contracts for difference for low carbon power. Previous approaches to incentivising electricity efficiency have failed to deliver significant results, primarily because they don't allow the demand side to compete with the supply side.

Meanwhile, the most effective existing approach, the European Ecodesign mechanism, has been slow to deliver electricity savings because it only applies to new products, so its uptake

is necessarily limited by the natural replacement rate of products in the market.ⁱⁱ In the US, incentives to purchase energy efficient appliances have been used alongside product efficiency standards to good effect.ⁱⁱⁱ

Obligations like CERT and CESP have had significant effects because they featured targets and penalties, and gave flexibility to suppliers about how precisely to find savings. However, suppliers have been very slow to reorient their business models towards delivering energy services, because they are unable to profit from their obligations. The result has been good delivery of measures, but limited innovation and competition. Our view is that a feed-in tariff, supporting efficiency aggregators to offer energy services, would overcome this weakness.

Enabling efficiency aggregators to seek out electricity savings from other companies would help to address the well known behavioural barriers that companies face, including the fact that “efficiency improvements are competing for management attention with other potential investments that also have powerful business cases, often in groups looking to allocate investment between different countries as well as different priorities. Energy costs make up less than five per cent of overheads for three quarters of companies; something more than price is needed to bring energy to the attention of those business leaders.”^{iv}

Permanent electricity demand reduction (EDR) measures are available at £30 per MWh, and can compete with new power stations, which cost a minimum of £76 per MWh.^v But EDR measures are only currently procured via the EDR pilot, which is very small and can only incentivise a tiny fraction of the UK’s technical potential for negawatts. The government’s conservative estimate is that almost 39 TWh, around ten per cent of the country’s total electricity demand, could be reduced by 2030.^{vi}

The first mechanism we recommend, therefore, is a **negawatts feed-in tariff**, to be paid on the basis of avoided energy consumption, with recipients competing in an auction to deliver energy savings in homes and businesses at lowest cost. It would keep the UK on the least cost, long term decarbonisation trajectory by reducing electricity demand by 6.4 GW by 2030, equivalent to the capacity of eight 800 MW combined cycle gas turbine (CCGT) power stations. We calculate that the ensuing investment in electricity demand reduction alone could yield net savings to British consumers of £2.4 billion by 2025.

Alongside EDR, demand side response (DSR), which temporarily brings down power demand at peak times, can also play an important role in ensuring that supply and demand are balanced, whilst minimising cost to consumers. Evidence presented to the Energy and Climate Change Committee suggests that, if DSR were allowed to compete on equal terms, it would save bill payers up to £359 million in the first year alone.^{vii}

The US experience proves that DSR is an effective means of keeping the lights on. In the PJM market on the east coast of the United States, a market with three times the electricity demand of the UK, 15 GW, or nine per cent of total capacity in 2015-16, will be provided by DSR. Demand response kept the lights on during the 2014 ‘polar vortex’ in the US, when old

coal-fired power stations stopped because their coal stacks had frozen solid. In New England, EDR and DSR have proved so reliable that the system operator was confident enough to avoid investing \$260 million (£156 million) in grid upgrades.

In the UK, DSR and EDR measures are generally excluded from equal participation in the capacity market. Instead, they are required to meet additionality criteria that generation does not have to meet, and are only able to access short term contracts, unlike generators who can receive 15 year contracts. In contrast, in US electricity efficiency markets, co-ordinated by PJM and ISO-NE, projects only have to prove that they will reduce peak demand: that's what the capacity payment is for. The evidence from the US is that negawatts out-compete power stations on price, when they are treated equally with generation, and can access multiple sources of funding.

Our second recommended mechanism is therefore to **open up the capacity market**, to allow competition from demand side response and energy demand reduction on an equal basis with electricity generation. This could bring forward 6 GW of additional load shifting and reduction by 2023, covering most of the coal capacity deficit created by the prime minister's pledge to phase out unabated coal.

An electricity efficiency strategy incorporating the above recommendations could address major market distortions. As it stands, the UK market is skewed strongly towards creating new sources of electricity supply to meet demand. Energy companies can only really make money by selling more energy and therefore pushing up bills unnecessarily. Because energy saving services can't compete on equal terms, only a third of one per cent of UK peak demand is currently being met by negawatts.

A well designed strategy would enable innovative companies to develop new business models that aggregate the delivery of energy efficiency measures, and compete with power stations to deliver the energy services consumers want on the most cost effective basis. Aggregators, enabled to profit from selling negawatts in a market framework, would actively seek out efficiency opportunities from households and businesses.

Our recent report, *Getting more from less: realising the potential of negawatts in the UK electricity market*, presents evidence to support the above argument and discusses the recommendations in detail. Link: www.green-alliance.org.uk/getting_more_from_less.php

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ⁱ Lord Adonis, Foreword in *Independent survey of attitudes to infrastructure in Great Britain*, December 2015 http://www.copperconsultancy.com/wp-content/uploads/2015/12/20151203_Attitudes-to-infrastructure-in-Great-Britain-2015_FINAL-PDF.pdf

ⁱⁱ Green Alliance, *Cutting Britain's Energy Bill: making the most of product efficiency standards*, 2012, available from <http://www.green-alliance.org.uk/resources/Cutting%20Britain's%20energy%20bill.pdf>

ⁱⁱⁱ Green Alliance, *Creating a market for electricity savings: paying for energy efficiency through the Energy Bill*, 2012, available from <http://www.green-alliance.org.uk/resources/Creating%20a%20Market%20for%20Electricity%20Savings.pdf>

^{iv} EEF, *The low-carbon economy – moving from stick to carrot*, 2015, available from www.eef.org.uk/resources-and-knowledge/research-and-intelligence/industry-reports/the-low-carbon-economy-moving-from-stick-to-carrot

^v The most recent study from Bloomberg New Energy Finance identified a cost of \$115/MWh for new CCGT, converted to £76/MWh, exchange rate as of 6 October 2015, www.prnewswire.com/newsreleases/wind-and-solar-boost-costcompetitiveness-versus-fossilfuels-300154606.html

^{vi} Green Alliance, *Kickstarting the negawatts market: How to make sure the electricity demand reduction pilot succeeds*, 2014, available from http://www.green-alliance.org.uk/resources/Kickstarting_negawatts.pdf

^{vii} Letter to Rt Hon Matt Hancock MP, minister of state at DECC, from Tim Yeo MP, chair of the Energy and Climate Change Committee, 9 September 2015, www.parliament.uk/documents/commons-committees/energy-andclimate-change/Matthew-Hancock-090914-DSR-Cap-Market-letter.pdf