



## **IEAGHG Information Paper 2015-08; the Case for a Low Carbon Energy Transition in the UK**

The Energy Technologies Institute (ETI)<sup>1</sup> in the UK has recently published a report that looks at the two potential scenarios showing how the UK can transition to a low carbon energy system.

The report considers how the UK can implement an affordable 35 year transition to a low carbon energy system by 2050. In their analysis the ETI have looked at 2 different scenarios which they call 'Clockwork' and 'Patchwork'.

### **The Clockwork Scenario**

'Clockwork' shows what could happen if well-coordinated, long term investments allow new energy infrastructure to be installed in a carefully planned and ordered manner. There would be a regular build of new nuclear, CCS plants and renewables, ensuring a steady decarbonisation of the power sector and through national-level planning enabling the deployment of large-scale district heating networks, resulting in the local gas distribution network retiring incrementally from 2040 onwards.

Due to a strong role for emissions offsetting, the transportation system remains in the earlier stages of a transition, and people and companies continue to buy and use vehicles in a similar way to today, albeit with regulation and innovation continuing to improve their efficiency.

### **The Patchwork Scenario**

In the 'Patchwork' scenario, central government takes less of a leading role so an informal network of distinct energy strategies develops at a regional level. Society becomes more actively engaged in decarbonisation, partly by choice and partly in response to higher costs. Popular attention is paid to other social and environmental values, influencing decision-making.

There is a more limited role for emissions offsetting requiring increased extensive decarbonisation in parallel across all sectors, including transport. Cities and regions compete for central support to meet energy needs which is tailored to local preferences and resources.

Over time, central government begins to integrate the patchwork of networks to provide national solutions.

The scenarios were developed using ESME, the ETI's Energy System Modelling Environment, an internationally peer-reviewed national energy system design and planning tool which examines the effects on heat, power, transport and the infrastructure that links them.

Information on the two scenarios including the report, a video and an infographic can be found at [www.eti.co.uk/options-choices-actions-uk-scenarios-for-a-low-carbon-energy-system](http://www.eti.co.uk/options-choices-actions-uk-scenarios-for-a-low-carbon-energy-system)

Last month the ETI published an insight report; "Targets, technologies, infrastructure and investments – preparing the UK for the energy transition", which concluded that the UK can implement an affordable transition to a low carbon energy system over the next 35 years by developing,

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<sup>1</sup> The ETI is a public-private partnership between global energy and engineering companies and the UK Government. Its role is to act as a conduit between academia, industry and the government to accelerate the development of low carbon technologies. ETI aims to bring together engineering projects that develop affordable, secure and sustainable technologies to help the UK address its long term emissions reductions targets as well as delivering nearer term benefits. They also make targeted commercial investments in nine technology programmes across heat, power, transport and the infrastructure that links them. See <http://www.eti.co.uk/about-us/>



commercialising and integrating technologies and solutions that are already known, but underdeveloped.

It also warned that decisions taken in the next decade are critical in preparing for the transition and crucial decisions must be made about the design of the UK future energy system by 2025 to avoid wasting investment and ensure the 2050 targets remain achievable.

The Transitions Insight Report can be found at <http://www.eti.co.uk/development-insight/>

One of the key aspects behind this scenario work is the ETI believes the UK must develop what it calls a 'basket of the most promising supply and demand technology options'. This it believes will help to limit what it says are the 'inevitable implementation risks'.

Key technology priorities for the UK are considered to be: CCS, bioenergy (BECCS), new nuclear, offshore wind, gaseous systems, increased efficiency of vehicles and efficiency/heat provisions for buildings.

CCS and BECCS are seen as particularly key technologies, which is refreshing to hear. These are considered to be the most cost effective systems in areas where decarbonisation is the easiest (power and industry rather than transport and buildings), thus alleviating pressure in the more difficult sectors.

The ETI report states that high levels of intermittent renewable power can be accommodated, but at costs. This, they say, requires a systems level approach covering storage technologies, heat, hydrogen and natural gas, in addition to electricity.

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