

Energy Technologies Institute (ETI) response to Labour Party's Green Paper "Powering Britain: One Nation Labour's plans to reset the energy market"

Organisation Details

1. The Energy Technologies Institute (ETI) was established by the last Labour Government as a public-private partnership between global energy and engineering firms (BP, Caterpillar, E.ON, EDF Energy, Rolls-Royce, Shell) and the UK Government. Hitachi also sponsor ETI's work on Smart Systems and Heat.
2. Our mission is to accelerate the development, demonstration and eventual commercial deployment of a focused portfolio of energy technologies which will increase energy efficiency, reduce greenhouse gas emissions and help achieve energy and climate change goals.
3. We carry out three key activities:
 - modelling and strategic analysis of the UK energy system to identify the key challenges and potential solutions to meeting the UK's 2020 and 2050 targets at the lowest cost to the UK,
 - investing in major engineering and technology demonstration projects to de-risk and build capability both technology and supply-chain solutions for subsequent commercial investors
 - enabling effective third party commercialisation of project outcomes.
4. The ETI has developed an internationally peer reviewed national energy system design tool (known as 'ESME' - Energy System Modelling Environment), to underpin our strategic techno-economic analysis of the UK energy system. ESME models choices across power, heat, transport and infrastructure sectors and is informed by evidence drawn from our private sector members, our technical projects and a range of expert advisers. As such it provides a key source of evidence and insights on the UK's low carbon transformation and has been used by both DECC and Committee on Climate Change to inform policy and strategy reviews.
5. ESME and a £211m portfolio of innovation and supply-chain projects enables the ETI to deliver evidence-based insights on how to deliver affordable, secure and low-carbon energy for Britain in the decades ahead, including:
 - identifying credible, lowest-cost pathways to secure low-carbon energy in future
 - identifying and understanding the key strategic technology challenges that need to be overcome

- supporting policy makers as they consider how best to enable major future investment in transforming the UK energy system.
6. The ETI also contributes insights and expertise to support a range of technology strategy and policy groups, including the cost reduction task forces on both offshore wind and carbon capture and storage (CCS), the recently created CCS development forum, the low carbon innovation co-ordination group (LCICG) and a wide range of research advisory groups. ETI, in partnership with the Ecofin Foundation, has pioneered the creation of a CCS commercial development group to help address the challenges in commercialising carbon capture and storage in the UK.
 7. In the last five years, the ETI has announced projects worth £211m across nine technology programme areas. The technology project portfolio to 2017 totals over £400m of investment with four key aims to reduce the costs of generating energy, demand reduction, increasing investor confidence and increasing public acceptance and engagement. We work with over 120 large corporates, SMEs and academic groups to deliver these projects.

ETI's perspective on UK energy challenges

8. In responding to the Labour Party's Green Paper "Powering Britain: One Nation Labour's plans to reset the energy market" we will concentrate on the strategic issues which relate to the insights emerging from the ETI's work over the past 5 years. We believe that our experience and insights mean that we are well-placed to inform thinking on the broad shape of the energy transformation that Britain's energy market needs to deliver.
9. We welcome the focus in 'Powering Britain' on the challenges of delivering affordable low-carbon energy, and we understand the attention placed on current issues around the operation of energy markets and regulatory arrangements. However, our institutional focus is on the longer term structural transformation of our energy system (to 2030 and then 2050) and the technical challenges we will need to address to deliver secure and affordable low carbon energy in the decades ahead. Energy policy has become increasingly complex and controversial, so it is important to maintain focus on the long-term challenges.
10. Our analysis suggests that the UK can develop a secure and low carbon national energy system at an affordable cost provided that the right strategic decisions are taken in future. In broad terms our analysis shows that we can meet our 2050 carbon targets at an annual cost of around 1% of GDP by 2050 (compared against a scenario without carbon targets). So, while we can expect upward pressures on the cost of energy reflecting world markets, ageing infrastructure and rising demands, the extra cost burden of meeting carbon targets can be contained by making the right investments. This will clearly be important in meeting the challenge of climate change in a socially acceptable way. If we fail to take the right strategic decisions then the cost of decarbonising our energy could easily double – placing a bigger

burden on consumers and businesses, raising social and political challenges and undermining UK economic competitiveness.

11. In the following paragraphs we set out what we see as the key areas we need to get right to deliver low carbon and secure energy affordably.

12. Over the next decade it is vital for policy makers to focus on enabling and incentivising industry to develop and prove the strategic technologies that will underpin the security and affordability of a decarbonising energy system into the 2030s and 40s. Equally, because it is impossible to forecast the future, we must at the same time develop technical capabilities and technologies that give us flexibility and optionality in how we respond to future challenges. The ETI's analysis points to 6 key groups of technologies that are 'no regrets' options for our technical focus over the next 10 years:

- Carbon capture and storage – developing our national CO₂ storage resource and infrastructure, demonstrating technology at scale as well as continuing to innovate in new capture technologies
- Bioenergy – building the technology options and domestic biomass resource base (using lower quality land) to sustainably exploit this flexible and unique source of low carbon energy
- Nuclear – building supply chain capacity and investor confidence in delivering new nuclear projects efficiently and safely
- Efficiency improvements – innovative systems and smart technologies to reduce cost and improve energy efficiency in buildings and transport
- Gases – developing technologies to deliver energy services efficiently from a range of gases (natural gas, syngas and hydrogen)
- Offshore renewables – driving down costs, developing next generation technologies and building supply chain and investor confidence

13. In particular, ETI's analysis of the best available evidence shows that CCS and bioenergy are the two most valuable technology options in terms of their ability to reduce the medium and long-term cost of low carbon energy for British consumers and businesses. The ETI's analysis shows that the cost of decarbonisation roughly doubles if either CCS or bioenergy is not deployed widely in the future. Intuitively this reflects the flexibility and versatility of both of these technologies across the energy system (e.g. in industry and gasification, not just electricity). However there are major challenges to overcome in developing a supportive market and policy environment for both of these technologies, and this should be an important focus for policy makers concerned with energy affordability challenges.

14. Another key feature of our analysis of the UK energy system transition is that major decisions on infrastructure and technology choices (e.g. low carbon power or gas infrastructure, transport fuelling and vehicle choices etc) will need to be taken in the mid to late 2020s. The next decade constitutes an important period for preparation and innovation to ensure that a balanced portfolio of technology options are fully ready for scale up and roll-out in the late 2020s and 2030s, and that business models and market frameworks are fully developed, as our energy system undergoes fundamental transition. This implies the need for close focus by policy-makers on ensuring that the incentives to innovate are sufficiently strong and that technologies are pulled through to market-readiness.

ETI perspective on key themes raised in ‘Powering Britain’

Theme: Reform of energy market regulation

Retain stable independent regulation, and avoid constraining innovation in future

15. Reforming the way energy markets are regulated to ensure that consumers get a good deal is one of the themes explored in ‘Powering Britain’. Given the scale of investment required to transform the UK’s energy system it is important that any reforms retain the benefits of a stable and transparent system of independent regulation. Many current features of the UK’s model of independent regulation, including duties to focus on the interests of consumers now and in the future, should be retained. Investors also value a stable and coherent regulatory framework which delivers benefits directly to consumers by lowering the cost of capital for investment in long-lived energy infrastructure. It is also important that new approaches to regulation do not unduly constrain the scope for innovative new business models to emerge, based on quite different technologies and modes of consumer engagement.

Theme: Delivering value for money on policy costs

Enable the most strategically valuable technologies, simplify and consolidate policy incentives where possible, and design energy policies that reinforce complementary policy objectives and/or broader economic growth

16. ‘Powering Britain’ is also rightly concerned with ensuring that policy interventions into energy markets, which ultimately flow through to consumers’ bills, deliver value for money. Stimulating and enabling the development of the most strategically valuable energy technologies for the UK’s low carbon future is central to the delivery of value for money for UK consumers. Significant policy intervention and support will be required to incentivise and enable the efficient deployment of the six priority technology groupings we have identified. Clearly there are limits to the overall resources available, so it is important that policy-makers prioritise resources in a balanced way, taking account of the potential value of technologies. Understanding value from an energy ‘system-wide’ perspective (as opposed to individual sectors such as electricity or heat) is essential to target public resources and intervention efficiently.

17. UK energy policy has also become increasingly complex in recent years and in the long run a process of consolidation and simplification in policy instruments could lower policy costs. Delivering clearer, more coherent incentives for carbon reduction and reducing instability in the policy environment could lower the cost of capital and help to stimulate innovation in the areas which offer best value in terms of energy security and reduction of emissions. A clearer economy-wide carbon price signal would help to support long term investment in delivering new technologies and infrastructure. A decarbonisation target for the power sector could be part of this, but focus would also need to be placed on ensuring consistent economic signals to drive investment in decarbonisation beyond the power sector.
18. Finally, value for money in policy costs can be enhanced by designing energy policies that also deliver complementary benefits (e.g. delivering social or health benefits through energy efficiency investments), or which otherwise help to support broader productivity and economic growth. Examples include supporting bioenergy industries which could stimulate greater productivity from agricultural land, reviewing how economic incentives on motorists could incentivise both decarbonisation and efficient use of road infrastructure and aligning urban and regional renewal with major energy infrastructure upgrades.

Theme: Enabling consumers to engage with the market

Avoid constraining the scope for innovative consumer offerings and learn lessons about consumer behaviour as new service offerings emerge

19. We support the emphasis in ‘Powering Britain’ on enabling consumers to engage with the energy market. New low carbon energy technologies will need to meet consumers’ needs for comfort, light, power and mobility if they are to be widely adopted. Given that we are likely to see significant change in technology and service offerings to consumers as we transition to a low carbon economy, it will be important to ensure that new regulatory requirements do not constrain future innovation. There is a risk that a focus on standardising and simplifying tariff offerings could constrain the development of innovative new business models which could better deliver consumers’ needs and promote decarbonisation.
20. The ETI’s £100m Smart Systems and Heat programme will build understanding and will demonstrate optimal combinations of new technologies to deliver low carbon energy, and particularly heat solutions, for consumers and small commercial premises. The programme will demonstrate these solutions at scale, building capability and understanding of how to meet mass market consumer needs. A key part of this major ETI programme is exploring new business models and deepening our understanding of consumer behaviour and needs.

Theme: The Green Investment Bank

Enhance the role of the GIB in enabling low carbon technology

21. ETI has worked closely with the Green Investment Bank, sharing our analysis and insights on the key technology challenges and how these play into financial considerations. We welcome the role of the GIB as a dedicated financial institution addressing key access to finance issues for low carbon technologies. Our work in many ways is complementary to the role of GIB in demonstrating and derisking new technologies, which may then go forwards for financing through the GIB and broader financial markets.
22. We would welcome a broadening of GIB's remit to enable finance for some higher risk and earlier development stage projects. This would be a key step in further reducing the potential financing gaps for SMEs and corporates as they seek to transition technology from development and demonstration (ETI's areas of support) through full-scale pre-commercial prototypes to commercial applications (open market investments) – the perennial problem of 'bridging the valley of death'.

Theme: Long-term security of supply

Ensure that policy is informed by a national system-wide perspective and sound evidence

23. Clearly long term security of supply lies at the heart of our objectives for the energy sector. It is for policy-makers to decide on the best institutional and market arrangements to deliver this. ETI's capability to carry out energy-system wide analysis of credible alternative pathways to deliver secure and affordable low carbon energy is a significant national resource. This capacity is available to guide policy-makers and key market players, and we believe that the 'system-wide' perspective that it embodies is vitally important in informing our approach to delivering national energy objectives.

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