

Cynulliad Cenedlaethol Cymru Pwyllgor Amgylchedd a Chynaliadwyedd	National Assembly for Wales Environment and Sustainability Committee
Dyfodol Ynni Craffach i Gymru?	Smarter energy future for Wales?
Gwybodaeth ychwanegol a ddaeth i law yn ystod yr ymchwiliad	Additional information received during the inquiry
University of Exeter (Saesneg yn unig)	University of Exeter



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National Assembly for Wales: Environment and Sustainability Working Group Consultation: A Smarter Energy Future for Wales?

Response by the Energy Policy Group, University of Exeter

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Thank you very much for the opportunity to respond to this exciting consultation on a smarter energy future for Wales. We are very encouraged by the Welsh Assembly's emphasis on community and/or local energy when considering how to progress sustainably.

The responses below are partly based on research undertaken over the past 3 years by the 'Innovation and Governance for a Sustainable, Secure and Affordable Economy' (IGov) research project.ⁱ As part of this project the research group has undertaken extensive research on governing for sustainable energy system change in Germany, Denmark and the UK.

Question 1: *What is the overall vision for a smarter energy future for Wales? Is it simply about reducing carbon, or is it also about economic regeneration for local communities, and/or tackling fuel poverty?*

Response:

Any future, 'smart' energy system should be sustainable in environmental, security and affordability terms, thereby making it politically acceptable. Whilst one element of a sustainable energy system is clearly that it should be low carbon, a too narrow focus on carbon comes with the risk of alienating people, in particular vulnerable energy consumers, and allowing for other kinds of environmental damage to ensue from energy production and use. Indeed, vulnerable energy consumers should be a priority during processes of system change – for example by taking them off expensive pre-payment tariffs, improving price competition, through active demand management,ⁱⁱ and/or through better welfare support for heating.

One of the lessons that can be taken from the German energy transition so far is that sustainable energy system change should not only not alienate people, but should actively include as many as possible. This is because there is far greater buy-in to sustainable system change when local populations are involved in, and can benefit from, changes made.ⁱⁱⁱ As such, actively engaging consumers should be a strategy from the outset rather than a positive side-effect of a smart strategy.^{iv}

In order to support a broad assessment of the economic and social benefits and of the costs of low carbon development the Welsh Government may wish to consider preparing an economic assessment of the 'green economy'. Several UK cities (such as Leeds, Sheffield and Manchester) have prepared similar studies which outline economic evidence of the impact of acting now on the low carbon economy. These studies have generally been termed 'mini-Stern' reports, after Sir Nicholas Stern's influential report on the economics of climate change, and as well as identifying the direct local economic benefits of action on climate change, identify benefits in terms of increasing resilience to climate change impacts and avoiding energy cost increases.

Question 2: *How can we achieve the right mix of distributed generation resources for the supply of electricity, gas and heat? Should there be specific targets?*

Response:

We note that distributed generation can have positive implications in addition to including local populations in the process of sustainable system change. As detailed in a recent report for the Department of Energy and Climate Change distributed generation can also have the effect of improving energy savings, partly through fewer losses over transmission and distribution systems.^v

Targets are useful for clearly setting a direction for change and giving clarity to potential investors, and in this sense targets for efficiency, renewables and potentially distributed generation are to be encouraged. Given its high carbon properties it might also be worth considering setting targets for phasing out, in particular, coal.

However, as various analyses of international climate targets highlight, targets make little impact on practice change in energy systems without strategies, policies and regulations designed specifically to meet targets. Turning again to Germany, performance against medium and long-term emissions, renewables, energy efficiency and demand reduction targets is monitored regularly and policies adjusted if it appears likely that targets will be missed. This also requires that policymakers are knowledgeable and that policies can be flexible.

Question 3: *How much low carbon renewable energy can come from dispersed sources within Wales and how much will still be required from large commercial initiatives or imported?*

No Response, except to say that maintaining gas and electricity interconnections will be important for flexibility and security and that the degree to which the Welsh energy system becomes dispersed will depend upon political will and strategic planning.^{vi}

Question 4: *Is there a need for comprehensive survey patterns of energy consumption and of Wales' renewable energy potential?*

Response:

It would appear that, in order to answer question 3 above, a survey of Wales's renewable energy potential would be a useful asset – not least to give indications of where different technologies (wind and solar in particular) would be best sited for maximum efficiency. Whilst it is important, when siting local generation, to understand local consumption patterns these may be altered somewhat through demand management policies and technologies (such as insulation, smart meters, time-of-use tariffs).

As such any survey should seek to not only carry out a top-down assessment of technical renewable energy potential but to also work with local areas to integrate assessment of electricity generation, heat generation, waste heat, energy efficiency and demand response potential. Variations in consumption, housing stock, locality and socioeconomic status will impact upon both the effectiveness and rates of renewable uptake. For example, distributed heat deployment may particularly benefit those communities not currently served by the main gas grid.^{vii}

Question 5: *Do energy transition processes that rely heavily on the views of existing organisations risk being shaped by the short-term interests of those organisations?*

Response:

A recent IGov paper argues that some existing energy organisations have tended to prioritise short-term (profit and or shareholder) interests over sustainability and that their ability to influence policymaking in the UK has been considerable for structural reasons.^{viii} This has provided some barriers to sustainable energy system change, in particular in terms of making market conditions for new, more innovative market entrants difficult.

It should be noted, however, that not all energy organisations are currently driven by short-term (private) interests. In this respect the landscape of energy organisations is already changing. For example, Ofgem’s recent consultation on non-traditional business models highlights the growth in non-traditional business models pursued by new energy organisations, such as some Welsh and English local authorities and companies like Ebico.^{ix} Some energy companies that do have short-term profit motives also have a longer-term sustainability and/or affordability ethos built into their business model, such as Good Energy and Ovo. Ovo, in particular, is working with local authorities to enable them to provide affordable local energy supply through versions of White Label contracts.^x

As such, it is possible to enlist the support of (certainly in advisory terms) and even to rely on existing, progressive local authorities and energy companies. Indeed, regular communication with other organisations who, like the Welsh Assembly, are driven towards achieving sustainability goals would be recommended.

Question 6: *How can we achieve a whole systems approach (joining up, reducing demand, energy efficiency, renewable generation, grid, storage, ownership, subsidy etc.)?*

Response:

Achieving a genuine whole systems approach is complex and probably unprecedented. There has been a good deal of research into this question, in particular by the UK Energy Research Council, with an emphasis on modelling and pathways but less into how policy can encompass a whole systems approach. It should be noted, however, that if a distributed energy system is planned that this does necessitate a joined up approach.

One way to learn about adopting a whole systems approach is to look at energy systems that are further down a sustainable system transition pathway, for example Germany or Denmark. In this way it is possible to draw lessons from the ways in which new technologies affect market conditions (i.e. variable generation and low wholesale prices) and how policies and regulations are having to change to adapt.^{xi}

Question 7: *How can the necessary behavioural change be achieved?*

Response:

Please refer back to the response to question 1. Behaviour change is much more likely when citizens can become involved in or benefit from system change. There are also arguments that behaviour change can be achieved through long-term local debate, information services and inclusion. This goes much further than information campaigns at moments in time but more takes the form of regular opportunities for two-way dialogue about what the issues are, how they can be addressed and how people can get involved. One example of this is the on-going campaigns that the Centre for Sustainable Energy (CSE) has been running to make residents of Bristol aware of sustainability and of how to go about becoming pro-active.^{xii}

Behaviour change may also be facilitated through the development of greater trust between energy service providers and consumers, which is currently at a low level. There is some evidence to suggest that community and local authority involvement in energy systems increases levels of public trust. Therefore, increasing the involvement of these groups in the energy system, together with growth in the number of new entrant suppliers focussed on customer service, may help to increase engagement in the energy system and promote behaviour change. This implies a need to keep barriers to entry low.

Question 8: *What can be done using existing executive/legislative powers?*

Response:

We are not experts on existing Welsh executive/legislative powers, but it might be worth mentioning that the Scottish devolution appears to have allowed for a good deal of progress in terms of energy system change (albeit there is still also a good deal of emphasis on oil and gas production). In addition, Cornwall's devolution deal includes some new powers over energy. It might be worth exploring in more detail how Scotland and Cornwall included energy in their devolution deals.

Question 9: *What is the scope for public investment/support for innovation to encourage new forms of local renewable energy?*

Response:

As well as direct support for innovation (through for example R&D funding) public bodies can also support local renewable energy innovation through directly funding infrastructure and supply operations. Such schemes (see for example Nottingham and Bristol) can be funded through various local government/public funding arrangements that tend to access capital at sub-commercial interest rates allowing projects that might otherwise not be pursued to be viable. These schemes can provide long-term revenue to public bodies and create a structure through which it is also possible to support community owned energy projects.^{xiii}

There is also a role for public bodies to explore the potential for new supply and balancing arrangements in the energy sector which would support innovation and new entrants. Both DECC and Ofgem are currently exploring the impact of regulation on energy system innovation and we would encourage the Welsh Government to engage with these debates and to ensure that Welsh interests and concerns are represented in any ensuing regulatory framework changes.

Question 10: *What are the skills/training requirements and implications to ensure a successful transition? To what extent are these skills already available in Wales?*

Response:

It is vital that skills and training keep up with Welsh sustainability ambitions – not least to ensure that the full range of available green manufacturing, building, engineering and supply chain jobs can be located in Wales. It is worth noting that in Germany, where there has been sustained support for renewable energy and energy efficiency skills over time, that some 800,000 people are now employed in servicing renewable and efficiency technologies.^{xiv}

This refers not just to training around new technologies and associated supply chains, but also to having appropriate *public knowledge* at local authority and Assembly levels. One of the downsides of having relied so much on large, private energy companies to provide energy services in the UK has been that knowledge capacity and data about how our complex energy systems work lies in the private not public sector. This has arguably made it harder for UK policymakers to stay abreast of markets, to make policy decisions and may be one reason for their reliance on large energy companies for policymaking advice.^{xv} It is notable that in other countries, like Denmark for example, all data about generation, networks and supply is publically available via the ‘DataHub’.^{xvi}

ⁱ For more information see: <http://projects.exeter.ac.uk/igov/>

ⁱⁱ See [here](#) for a discussion on the demand side

ⁱⁱⁱ On the need for energy transitions to be inclusive of broader populations see [here](#) and [here](#).

^{iv} For a discussion of the strategic need to democratize energy, see [here](#).

^v The report can be accessed [here](#).

^{vi} The impact of varying degrees of supportive policy and regulatory frameworks is analysed [here](#) with particular reference to community energy in the UK.

^{vii} See [here](#) for a discussion on the opportunities of community heat generation.

^{viii} This paper can be accessed [here](#).

^{ix} Ofgem’s report is available [online](#).

^x This is done through [Ovo Communities](#) and their own (remodelled) version of a white label contract.

^{xi} A [recent report](#) by Elmar Schuppe outlines how markets have changed and policy responses in Germany.

^{xii} Examples of these programmes can be seen [here](#).

^{xiii} For an interesting analysis of the role of public institutions in innovation see Marianna Mazzucato’s ‘The Entrepreneurial State’.

^{xiv} For reference see [here](#).

^{xv} For a paper that makes this argument in more detail see [here](#).

^{xvi} Details of the Danish model of energy governance for sustainability is [here](#).