

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
Prifysgol Caerdydd (Saesneg yn unig)	Cardiff University



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National
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Wales


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Dear Madam/Sir,

Please find below my submission to the National Assembly for Wales Environment and Sustainability Committee inquiry into A Smarter Energy Future for Wales. This follows on from the advice I offered at the invited stakeholder event on 18th June 2015. I thought it might be helpful to provide a written note of the points I made.

Yours faithfully,



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1. I am delighted that the National Assembly for Wales Environment and Sustainability Committee are pursuing the issue of energy transition. I see it as a positive signal that the tentative moves underway towards devolving limited energy decision-making powers to Wales are triggering serious interest in how Welsh institutions can play a more active role in steering us towards a low carbon future. Grasping this steering role may well require a sea change in the approach and assumptions that surround energy in Wales:
 - from seeing energy investment primarily as a source of inward investment, to be welcomed for its job creation benefits, to viewing these investments as part of an energy system, with connected social, economic and environmental implications;
 - to recognise that achieving an effective and fair energy transition requires more than considering how powers may be passed to the Welsh Government, but how powers to steer energy development are distributed across a variety of actors at different scales
2. These themes inform my main points, which I have organised below under each of the question themes. Although I offer no specific evidence on it, I would also like to emphasise that critical to the Inquiry's decarbonisation objectives is significant progress on reduced energy consumption. This is central to Germany's Energiewende.

The energy mix

3. I note that the inquiry questions lead with issues of energy mix, and ask about the mixture of distributed generation resources that best meets Wales' renewable energy needs in respect to the supply of electricity, gas and heat. I do hope, however, that the committee sees the issues of technology, networks, demand management, ownership and communities as more

fundamentally connected, rather believing that technical feasibility is the dominant, driving concern, for a number of reasons:

4. As analysts of future energy transitions have noted, there are – in technical terms – multiple possible pathways towards decarbonised energy futures. Some pathways, (the traditional ‘bulk power pathway’), might place greatest emphasis on Wales becoming a site for large numbers of industrial-scale renewable energy plants, equivalent in their output to match energy consumption in Wales, thus enabling Wales to achieve one interpretation of what it means to be a ‘100% Renewable Energy Region. Alternative pathways allow a greater role for smaller-scale, ‘distributed’ sources of generation, and closer integration between the provision of electricity, heat, storage, demand side management and transport.¹ So, technology alone does not wholly determine future energy pathways; instead, choices should be more widely based on their environmental, social and economic qualities.
5. Moreover, different pathways have radically different implications for the appropriate distribution of powers. The ‘bulk power pathway’ tends to inform arguments that all is needed from the Welsh Government is to take steps to adjust planning processes to expedite the delivery of major infrastructure projects. Wales is still, in effect, at the ‘end of the pipe’ in governance terms. Other pathways, based more heavily on distributed energy technologies, may require the Welsh Government to acquire the powers to more effectively encourage and coordinate multiple energy flows within Wales. This may entail both the more assertive use of existing powers (e.g. for building energy efficiency) but also more double devolution – enabling actors at city region, local government and community level to take a more active role.

The grid and ownership issues

6. One of the major factors in the UK that has disincentivised the emergence of major new independent actors is the market structure of the grid and distribution network and how this distributes rewards between different companies. It has certainly often been remarked that current arrangements work against new, intermittent sources of energy like wind, solar and tidal/marine sources.
7. Research in Denmark offers ways of thinking about solutions that are highly germane to the Committee’s considerations, in that Denmark is investigating how to move from its present position in which 25% of electricity is supplied from wind to a position where 100% of energy for electricity and heating comes from renewables by 2050. The research of Dr Frede Hvelplund in Aalborg University proposes that the key ingredient is the development of ‘intermittency infrastructure’, whereby renewable electricity supplies are linked to storage, to heat provision (district heating, heat pumps), including (in future) facilities for charging electric cars. This infrastructure helps improve the security of supply aspects of renewable energy intermittency but also reduces costs, by making effective use of periods of ‘surplus’ generation.²
8. A key part of Hvelplund’s argument is that management and operation of this intermittency infrastructure is best achieved by decentralised organisations, such as municipalities. This is because they would operate at a scale that can link and coordinate multiple, fluctuating, small-scale suppliers and sources of demand, and do so with lower transactions cost than other ownership forms. Others examine the case for Municipally-Owned Energy Service Companies performing this role (see footnote 1).

Communities - making the case for change

9. There remain important arguments for encouraging more communities to take an active role in supplying energy and managing demand, in terms of local value capture, job creation and energy security. There is thus a need to keep building on the kind of work done under Ynni'r Fro. However, the 'community energy' agenda also needs to be viewed in a different way if its contribution to wider energy transformation is to be enhanced. There is a need to look at the overall structures and incentives in current systems of energy provision, and the space they allow for such local energy initiatives. The fact that Welsh institutions have a limited role in shaping systems of market support, or grid regulation is unhelpful. Other countries have done better than the UK in, for example, structuring feed-in tariffs to assist community-owned schemes.
10. Moreover, it is likely that the scope for communities to take a lead role in energy transformations is limited by the availability of communities with the cohesion, skills and resources to take a major role in what is a complex and difficult area. Perhaps the language should widen to consider communities as just one part of a wider 'social' or 'civic' energy architecture, in which municipalities, cooperatives or other forms of local enterprises have more of a role. This would better reflect what has happened in Germany, where a diversity of enterprises is involved, not just community-led/community-owned schemes.
11. There is likely to be a positive link to issues of social and political acceptability. An Achilles Heel of the 'bulk power pathway' is social unacceptability: its reliance on major, industrial-scale infrastructure which raises questions about the environmental impacts and distribution of costs and benefits, and the side-effect of placing pressures on government to de-risk such investments by instituting planning processes that delimit the scope for challenge, further exacerbating public distrust and opposition. A more distributed energy pathway, offering an array of mechanisms for social participation, may offer publics more ways to feel that they benefit, and that they have some control, and so may be less prone to public opposition. It could raise new challenges, in the UK, in terms of cultivating public trust in local government.

How to cultivate agency for change

12. Perhaps the most challenging issue is not one explicitly addressed by the inquiry – how does one bring desirable future energy pathways into being? The problem is that energy transition processes that rely heavily on hearing the views of existing organisations inevitably risk being shaped by the short-term interests of those organisations, which creates a high degree of path dependency in future options. Given that the energy landscape in Wales (as in the rest of the UK) is dominated by major energy companies, many of whom have large investments to deliver, it is not surprising that views presented about future energy pathways tend to be dominated by the delivery of projects already somewhere in the delivery pipeline. The challenge for the Committee (and also the Welsh Government) is therefore:
 13. How to gain the insights of the categories of actors that are likely to be very important in alternative future energy pathways, especially those relying more heavily on diverse

and distributed energy activity, but which may be weakly developed at present. The evidence from Denmark and Germany is that action by communities and cooperatives *but especially by municipalities* has been crucial in driving forward the move towards more sustainable energy futures: both in taking action within their local areas, and in maintaining wider national support for supportive policies (such as feed-in tariffs). The Committee should actively encourage evidence from local government, beyond Wales, including those in England which have progressed further in energy provision, to understand how they have been able to do what they have, and what would enable them to do more.

14. How to form a reasoned view on which potentially attractive major energy investments targeted on Wales ought *not* be supported, because their presence in the energy system reinforces the status quo and is likely to divert resources from, and distort progress towards pathways that may be more sustainable in the future. This should include the actions that the Welsh Government might take to accelerate the phasing out of fossil fuels, not just fostering alternatives.
15. How to move beyond recommendations that just list potential actions, to consider seriously how these might be turned into a coordinated programme. Systems of energy provision can be highly resistant to change, and if the Committee is persuaded of the merits of pathways involving greater use of distributed provision, and greater local integration of electricity, heat and demand-side management, then thought needs to be given to how such activities can be layered onto and, over time, displace current modes of energy provision.

¹ See Realising Transition Pathways Engine Room (2015) *Distributing Power: A Transition to a Civic Energy Future*, Realising Transition Pathways Research Consortium.

² Suitable sources for this work include: Hvelplund, Frede; Möller, Bernd; Sperling, Karl (2013)

‘Local ownership, smart energy systems and better wind power economy.’ *Energy Strategy Reviews*, Vol. 1, No. 3, 03.2013, p. 164-170; and, in more simple form,

<http://www.folkecenter.dk/mediafiles/folkecenter/frede-hvelplund.pdf>.