

# Agenda – Environment and Sustainability Committee

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Meeting Venue:	For further information contact:
<b>Committee Room 3 – Senedd</b>	<b>Alun Davidson</b>
Meeting date: Wednesday, 4	Committee Clerk
November 2015	0300 200 6565
Meeting time: 09.00	<a href="mailto:SeneddEnv@Assembly.Wales">SeneddEnv@Assembly.Wales</a>

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## 1 Introductions, apologies and substitutions

## 2 Motion under Standing Order 17.42 to resolve to exclude the public from the meeting for Items 3, 5 and 8

## 3 Consideration of Draft Wales Bill

(09:00 – 09:30)

(Pages 1 – 28)

E&S(4)-30-15 Paper 1

E&S(4)-30-15 Paper 1.1

## 4 Inquiry into 'A Smarter Energy Future for Wales?'

(09.30-10.30)

(Pages 29 – 54)

Craig Anderson, Chief Executive Officer, Warm Wales

Gill Kelleher, SPECIFIC, Innovation Knowledge Centre, Swansea University

Shea Jones, Policy Officer, Community Housing Cymru

Steve Curry, Community Regeneration Manager, Valleys to Coast

E&S(4)-30-15 Paper 2

## 5 Discussion of evidence (in camera)

(10.30-10.45)



## **6 Inquiry into 'A Smarter Energy Future for Wales?'**

(10.45–11.30)

(Pages 55 – 57)

Mark Harris, Planning and Policy Advisor Wales, Homebuilders Federation

E&S(4)–30–15 Paper 3

## **7 Inquiry into 'A Smarter Energy Future for Wales?'**

(11.30–12.30)

(Pages 58 – 71)

Professor Gareth Wyn Jones, Honorary Professor, School of Environment, Natural Resources and Geography, Bangor University

Dr Caroline Kuzemko, Research Fellow, College of Life and Environmental Sciences, University of Exeter

E&S(4)–30–15 Paper 4

E&S(4)–30–15 Paper 5

## **8 Discussion of evidence (in camera)**

(12.30–12.45)

# Agenda Item 3

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Alun Ffred Jones AM  
Chair  
Environment & Sustainability Committee  
National Assembly for Wales  
Cardiff Bay  
Cardiff

23<sup>rd</sup> October 2015

Dear Alun Ffred

**DRAFT WALES BILL**

I am writing in response to your letter of 9 October requesting a paper on the Welsh Government's position on the draft Bill.

We are in discussion with the Presiding Officer about how to take forward arrangements for providing evidence to Committees. Until this has been clarified I am not in a position to provide written evidence ahead of the Committee's meeting on 4 November.

I will write to you again once the position is clearer.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Carwyn Jones', written in a cursive style.

**CARWYN JONES**



Alun Ffred Jones AM  
Chair  
Environment & Sustainability Committee  
National Assembly for Wales  
Cardiff Bay  
Cardiff

30<sup>th</sup> October 2015

Dear Alun Ffred

**DRAFT WALES BILL**

I am writing in response to your letter of 9<sup>th</sup> October requesting a paper setting out the Welsh Government's views to assist in your Committee's consideration of the Draft Wales Bill. I also refer to my letter of 23 October on this matter.

I can now confirm that a paper will be provided to your Committee but unfortunately it will not be possible to meet the timescales set out in your letter. I expect the paper to be available on or after 10 November.

Yours sincerely

**CARWYN JONES**

# Agenda Item 4

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Cynulliad Cenedlaethol Cymru Pwyllgor Amgylchedd a Chynaliadwyedd	National Assembly for Wales Environment and Sustainability Committee
Dyfodol Ynni Craffach i Gymru?	A Smarter Energy Future for Wales?
Ymateb gan Grŵp Cartrefi Cymunedol Cymru (Saesneg yn unig)	Response from Community Housing Cymru Group
SEFW 16	SEFW 16



Cynulliad  
Cenedlaethol  
Cymru

National  
Assembly for  
Wales

## **CHC response to the National Assembly for Wales' Environment and Sustainability Committee inquiry into a "smarter energy future for Wales"**

### **The energy mix**

#### **How can we decarbonise our energy system at a sufficient pace to achieve the necessary reductions in emissions?**

1. Welsh Government in 2010 committed to two greenhouse gas reduction targets- To reduce emissions within all areas of devolved competence by 3% each year from 2011 to 2020 and to reduce all Welsh emissions by 40% by 2020. CHC understands that progress towards the 40% residential target requires a reduction in non-electricity based emissions from households, so achieving this target requires further energy efficiency measures to reduce heating demand, plus significant uptake of renewable heating technologies to reduce the carbon-intensity of heating. Given what is required, achieving a 40% emission reduction in the residential sector by 2020 will be extremely challenging. Our analysis indicates that around 2.2 million additional energy efficiency measure installations will be required between now and 2020 for the target to be met; this is almost 3 times the number of installations made from 2007 to 2014. Significantly greater investment will therefore be required for a reduction in source emissions to be achieved. Estimates in a Bevan report on poverty states that it will take 78 years for Nest to reach each and every home suffering from fuel poverty in Wales.<sup>1</sup>
2. We also need to reduce carbon emissions by shifting to renewable energy generation. Schemes such as the Feed-in Tariff scheme have big potential for reducing carbon emissions and cuts to the tariff have had big impacts on community's ability to install renewable energies. The key objective in the first instance should be to increase the uptake and public acceptance of renewable technologies in the early days and social landlords have an important part to play in achieving this objective. Social landlords can and should play a vital role in the roll out and eventual mainstreaming of renewable technologies.
3. Appropriate incentives and subsidies would enable RSLs to install renewable technologies into their properties and in communities at a faster rate available in order to help reduce fuel poverty. We strongly suggest that attractive incentives exist for social housing providers in order to support the social housing business model and stop schemes becoming regressive in their application. Incentives should form an important part of the process and this could include financial incentives as well as other incentives. Regulatory drivers should include the need

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<sup>1</sup> <http://www.bevanfoundation.org/publications/rethinking-poverty/>



for financial incentives and disincentives introduced by Government (including forms of subsidy), stronger enforcement, council tax reductions, etc.

4. We must also focus on the reduction of energy use at the point of use through behaviour change (whilst Welsh Government does not have control over electricity generation, their actions can have significant influence on electricity consumption by end-users).

**What mixture of distributed generation resources best meets Wales' renewable energy needs in respect to the supply of a) electricity, b) gas, and c) heat?**

5. There is potential for making more use of certain technologies such as biomass, combined heat and power, district heating and cooling. We need to consider good practice from other countries including Denmark's experience of district heating, with Denmark being one of the most successful nations in spreading low carbon heat networks. One of CHCs members, for example, is installing a new Biomass energy centre to complement existing gas fired gas boilers. One of our members is also exploring the potential for a district heating energy service company, although this is not an area that the RSL sector have a lot of experience in installing.
6. CHC's members have been mostly active in installing solar photovoltaics and renewable heat technologies (mostly solar thermal, heat pumps which do have further potential). Experience of installing solar PV has generally been positive and solar PV is increasingly becoming economically competitive. Although there has been positive feedback following the installation of renewable heat technologies, it can be accepted that renewable heat technologies are generally less well known and there are more hassle factors associated with their installation, which increases the barriers to installation. There are barriers to design, installation, operation and maintenance of renewable heating systems in particular. RSLs are still assessing the effectiveness, running costs and tenant satisfaction from installations. What is evident from projects is that householder education is an important factor to improve both the acceptance and operation of renewable heating systems.
7. The sector hasn't got much experience in installing hydro, although some RSLs have been involved in working with other partners to install Hydro. Although it has been stated that natural flow hydro and thence for small hydro will not itself likely lead to regionally significant employment or carbon-mitigation impacts, a report shows that small hydro developments can have significant local socio-economic impacts, often in challenged communities and places.<sup>2</sup> Wales should harvest its abundant rainfall and prioritise this as there are thousands of untapped streams

<sup>2</sup> [http://regenwales.org/resource\\_85\\_The-Economic-and-Social-Impact-of-Small-and-Community-Hydro-inWales](http://regenwales.org/resource_85_The-Economic-and-Social-Impact-of-Small-and-Community-Hydro-inWales)

pouring off hillsides across Wales and the potential for micro hydro is almost limitless.

## **The grid**

### **How does the grid distribution network in Wales enable or restrict the development of a new smarter energy system?**

8. The grid and distribution network in Wales has significantly affected the ability of projects (particularly small and medium sized) to connect to the grid. The lack of availability of the grid and the cost of new connections is a barrier to development. CHCs members have found the capacity of the national grid to be a barrier in the past with regards to installing renewable energy systems. How we address this needs to be considered further by OFGEM, the Distribution Network Operators, Government and other partners.
9. The privatised grid in much of rural Wales is owned by Western Power Distribution (WPD) and as the grid is full for the foreseeable future in many parts of Wales, it can be very expensive to upgrade the grid and connect even small scale schemes. Due to the high levels of embedded generation currently connected, or seeking connection to the distribution networks, there are areas in south Wales where significant reinforcement work is required.
10. Following the UK Government's decision to launch a consultation on electricity distribution costs in the north of Scotland, CHC feels that the same could be considered for North Wales which has the second highest regional energy costs. However, CHC would go a step further and argue that we need a major overhaul in this area and big investments in infrastructure are needed to create a flat national rate.
11. Smarter strategies appear most cost-effective, with modelling showing that a smart grid strategy of using innovative smart solutions in conjunction with conventional reinforcement options appears to be more cost effective than using conventional solutions alone.

### **What changes might be needed in terms of ownership, regulation, operation and investment**

12. CHC recently welcomed OFGEM's consultation into Non-traditional Business Models<sup>3</sup>, which acknowledged an increase in enquiries about new ways to interact with the energy market with many proposals seeking new and non-traditional business models.

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<sup>3</sup> <https://www.ofgem.gov.uk/publications-and-updates/non-traditional-business-models-supportingtransformative-change-energy-market>

13. The consultation notes a range of issues, including that Wales has experienced an increase in the development of localised generation as technology, systems and processes are developed. This has resulted in an upward pressure on the networks. The shift to “local” has also promoted the question of how to capture the ownership of such interests to help retain benefits in Wales. These discussions form part of a longer-term engagement in this area to help understand drivers, consumer benefits and risks. As part of developing Smart Living, there should be proactive discussions on types of models that could be beneficial for organisations and communities in Wales to consider. Planning needs to account for more recognition of benefits and social ownership and we need active promotion of social ownership in communities.
14. CHC is currently active in helping our members secure energy supply for RSL tenants via local energy production through renewable energy systems. CHC wants to address the market failure impacting on low income households and impact fuel poverty directly through price. The feed-in tariff schemes work very well where they have been installed, but there is a lot more to be done now around enabling communities to generate their own power and thereby have a greater control over future fuel usage and costs. CHC would like to see the ability for more direct local supply and, for example, a generator (e.g. ESCO) being able to sell directly to a customer at a good price.
15. There is a significant and growing appetite amongst our members to intervene directly in the market and therefore CHC is looking to set up a partnership to weigh up options for setting up an energy supply company. A good example is the “Our Power” model in Scotland<sup>4</sup>, which is a new independent energy supply company and the first in the UK to operate on a non-profit distributing basis. In the future, Our Power hopes to develop renewable energy projects as part of its business for the benefit of local communities.

## **Storage**

### **How can energy storage mechanisms be used to overcome barriers to increasing the use of renewable energy?**

16. Energy storage not only has the potential to provide back-up power in case of power cuts, but storage can also help electricity grids run at average rather than peak load, therefore reducing the chances of power cuts in the first place. Energy storage can also be used to obviate the need to upgrade or install new grid capacity. Puerto Rico, for example, has set a 30% storage requirement for any new renewable capacity. Storage is also proving invaluable for isolated communities that have no access to the national grid, with “islanders in particular enjoying continuous power without the need for additional diesel generation”.

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<sup>4</sup> <http://news.scotland.gov.uk/News/Power-to-the-people-1b3b.aspx>

17. Renewables, together with energy storage, open the possibility of communities and individuals becoming energy self-sufficient. CHCs members do not have a lot of experience in assessing energy storage mechanisms, but CHC understands that the costs today are prohibitively high for mass adoption, but there are already residential energy storage solutions on the market and costs will come down. Support from Government and others would be essential in driving the use of energy storage mechanisms into the market due to initial costs and significant commercial risk.
18. It could also lead to a point where demand from the grid is much reduced. This raises important questions about who will pay for grid maintenance - initially at least only the wealthy may be able to afford renewables and storage, leaving those who can't afford them to pick up the bill. Therefore, if Wales did decide to pursue energy storage options, this must be taken into account in helping to enable low income households to get access to new technologies so that they aren't disproportionately affected.
19. There are an increasing number of energy services companies able to provide everything their customers need to generate and store their own energy. The ultimate beneficiaries could be consumers. Large-scale generation and national grids are not going to disappear overnight, if ever, but CHC would like to see individuals and communities having the power to choose their own energy futures.
20. The huge problems in grid capacity across large areas of Wales (most notably mid and west Wales but also across all of Wales) could be considered as a great opportunity to incentivise innovation in the smart grid and storage sectors, particularly if Government funding and structural funds are used to financially support projects which demonstrate a diminishing need for upgraded or new infrastructure. We need to consider the potential for energy storage, smart grids and other technological advances. CHC understands that locally installed energy storage could, in principle, be able to connect islands of generators and users without the need for "wider" grid connection.

### **Ownership**

**To investigate the desirability and feasibility of greater public and community ownership of generation, transmission and distribution infrastructure and the implications of such a change.**

21. Please see our answer above to the question "What changes might be needed in terms of ownership, regulation, operation and investment?" We have insufficient knowledge of this area to make a full response.

## **Energy efficiency and demand reduction**

### **How can the planning system and building regulations be used to improve the energy efficiency of houses (both new build and existing stock)?**

22. Improving the energy efficiency of homes is one of the key levers to tackling fuel poverty. Energy efficiency lies at the heart of discussions about energy. A home which is highly energy efficient can provide the occupants of those buildings with a more comfortable experience, lower fuel bills, enable reductions in carbon emissions and help ensure increases in energy security for individuals, businesses and communities. Wales has responsibility for setting energy efficiency requirements for new buildings. The integration of renewable energy technologies when feasible into the built environment offers clear benefits and an additional improvement in the skills and expertise of the workforce operating in the sector in Wales. The Welsh Government needs to increase its support for the smart energy sector and commission an assessment of potential impact of the smart grid and storage sectors.

### **What would the environmental, social and economic impacts be if Wales set higher energy efficiency standards for new build housing? (e.g. Passivhaus or Energy Plus)**

23. CHC is committed to its members delivering economic, social and environmental benefits through the building of new homes. In assessing the environmental, social and economic impacts of Wales setting higher energy efficiency standards for new build housing, there are several to take into account. In making the argument for increasing standards, increases in the energy efficiency requirements for new-build could support the skill base of our construction sector ready for the forthcoming requirement for all new buildings to be “close to zero carbon” by 2020. Zero carbon buildings can also mean reduced energy bills for tenants, lifetime energy use would be drastically reduced (reducing greenhouse gas emissions, fuel bills, fuel poverty), improvements in people’s health and this would result in economic cost savings to the NHS and whole-life savings for tenants. A project that is of particular interest to our members and the health service at the moment is the Boiler Prescription service which is being delivered by Gento.<sup>5</sup>

24. In making the argument against, or in making the argument in regards to how much and how quickly standards are increased, our members report that development costs have increased in recent times with ever improving standards as there are many different tiers of design criteria that our members are required to meet for new build properties. As well as the mandatory Building Regulations and Code Level 3 applicable to all new build dwellings, affordable homes also have to be compliant with DQR (Development Quality Requirements), WHQS

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<sup>5</sup> <http://www.gentoo-group.com/news/gentoo-group-launch-boiler-on-prescription-pilot/>

(Welsh Housing Quality Standards) and Lifetime Homes. Although this additional level of design results in consistency in design and standards across the affordable homes sector, it should also be noted that this comes at an extra over development cost. The review of Part L under the building regulations and the intention for the requirement to install automatic fire suppression systems in all new residential dwellings from spring 2014, as outlined in the domestic fire safety measure, will add to that cost and they are coming at a time when there are a lot of difficulties in the sector including viability challenges and technical challenges to be looked at.

25. It is important that these changes are balanced against the backdrop of the current financial situation, cuts in social housing grant and increasing housing demand. The viability of development schemes is challenged with increasing standards and less rental income/grant. Furthermore, there is considerable financial pressure on the sector at a time when there are significant cuts to the welfare system which are considerably impacting the income of RSLs. With the cuts to welfare reform, there will be a greater need for more efficient properties in terms of accommodation which could have a larger footprint and associated build cost but may be necessary in order to meet housing need. Our members have commented that rising standards will drive developers including RSL's away from build.

### **Communities- making the case for change**

**How can communities, businesses and industry contribute to transforming the way that Wales thinks about energy? Does the answer to this challenge lie in enabling communities to take greater responsibility for meeting their future energy needs?**

26. Taking into account the energy hierarchy, energy reduction should be considered firstly before considering energy efficiency. Undoubtedly the first and best option is to use less energy, to be less profligate. With less waste, the adoption of modern technologies, better insulation, regulation and planning, we can save over 35% of our total energy bill and Wales could reduce its internal consumption from ~100 TWh to below 65TWh.<sup>6</sup> Useful figures can be seen within this article in the footnote<sup>7</sup>. Therefore a priority should be to increase energy efficiency and reduce our total national energy use without increasing imported embedded energy.

27. In England, 100% of business rates from new energy projects are retained by local authorities and we believe Wales should emulate this approach as the retention of local business rates from renewable energy projects would help link projects with the communities in which they are based, and support the "fairness"

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<sup>6</sup> <http://www.clickonwales.org/2015/07/the-energy-conundrum/>

<sup>7</sup> <http://www.clickonwales.org/2015/07/re-energising-wales-2/>

principle of supporting the local authorities which play host to more developments.

28. Wales must reconfigure and re-engineer its energy supplies to a “zero carbon”, minimal greenhouse gas (GHG) emission format. Energy is essential to the Welsh economy and though we are traditionally an exporter of electricity, we are likely to become a net importer from 2016. We face many unique challenges, as well as opportunities, in terms of developing our energy resources in a way that is compatible with our obligations to future generations and greenhouse gas emission targets

**If you require any further information on the content of this submission, please contact Shea Jones at XXXXXXXXXXXXXXXXXXXX We are willing to provide oral evidence to the Committee if required.**

## Response from Homebuilder Federation Wales

### National Assembly for Wales' Environment and Sustainability Committee inquiry into 'A Smarter Energy Future for Wales'.

#### **1. How can we achieve reductions in energy demand and to what extent is this linked to local community engagement?**

As new housebuilders we already consider we are playing our part in this process as the modern home build today is far more efficient than those built previously.

*A recent HBF report concluded that, on average, new homes built in England and Wales today are 65% more energy efficient than a Victorian house of the same style. Further new homes currently built in the UK are roughly 50% cheaper to run per year than the equivalent Victorian house. That could mean an annual saving of £440 for a 1-bed ground floor flat, and £1,410 for a 4-bed detached house.*

However new homes still make up a small percentage of the total housing stock, for this reason a continued drive to improve the energy efficiency of the existing stock should take place.

A lot of energy is used by the users in the home (not heating or light) and through transport and would not be stopped by physical changes to the dwelling. These require culture change, information, and better understanding of how energy is used. Areas like improved public transport, legislation around efficiency of electrical goods and better education all need to be considered.

The main service providers also use a large amount of energy providing energy to its users, investment in update infrastructure, for water, gas and electricity could help save significant amounts of energy.

We are not sure that local community engagement can help with a lot of these issues other than possibly education. However there is an opportunity for it to support small scale local production of energy from renewable resources such as wind or hydro power.

#### **2. What are the social and economic impacts of increases in building energy efficiency standards?**

If household energy bills are reduced as a result of using less energy, then this will give people more money to spend. Although a small improvement in energy efficiency in current new build is likely to have a small impact on how much money would be saved.



The new technology required to achieve this goal could lead to new companies and associated jobs created, but to counter this jobs may be lost which relate to the old technology.

The drive to be more energy efficient also needs to be balanced against other factors which can have an impact on people's health such as daylighting and ventilation regimes. The overheating of over insulated houses had already been established as an issue.

**3. What scale of housing refurbishment programme is needed and how could this realistically be managed/funded?**

The private house building industry is not in a position to comment on this .

**4. What are the skills/training implications of a large-scale energy efficiency programme?**

One of the issues in recent years and has been the lack of a long term Government commitment to renewables, without this why would companies invest in the training needed to support the industry.

If the programme of work involves physical building work to properties then there is potential for a shortage of skilled labour as this has already been felt for some time by the private house builders.

**5. What are the real barriers to building low cost, energy smart homes given that they can be built as cheaply as 'normal' homes and then can make money by generating surplus energy?**

Firstly we are not aware of the evidence base to back up the statement 'given that they can be built as cheaply as 'normal' homes'.

Secondly we are not aware of what is the accepted definition of a 'normal house' as there are a wide variety of building techniques available.

Without going into detail the ability of a house to generate a surplus supply would appear to rely on a number of factors some of which are listed below:

Building orientation- this is critical if the sun's energy is being used (one of the cheapest and easiest forms of renewable energy), if orientation was looked to be a key factor this would be extremely restrictive on which sites could be built on the type of layout and the densities achievable, all of which are likely to restrict the number of units which could be built on a site.

Ground conditions – likely to affect the use of ground source heat collection and again could affect layouts and densities.

Design – is the design of such a house likely to be acceptable in all locations and all sites. The customer also has to be willing to buy the house.

Other planning requirements – planning is always a balance between various competing policy requirements, if energy is to become the main driver then other policy requirements would have to give.

We would finally question the benefit or incentive for individuals to generate excess energy for others particularly as the UK government are looking to reduce FIT by 86% for small scale pv.

Mark Harris  
October 2015

## Evidence from Prof Gareth Wyn Jones

### School of Environment, Natural Resources and Geography

- 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?

There is a global necessity to reduce GHG emissions and respond to the challenge of global warming. This seems arcane to many and both 'energy' and invisible 'GHG emissions' abstruse concepts. However we in Wales enjoy an array of renewable energy resources, both terrestrial and marine, which, if properly developed, could contribute to local/community economic development, mitigate health problems, improve our housing stock, tackle fuel poverty and, arguably, make us all more resilient in face of looming global crises. An additional consequence would be to fulfill our international obligations to reduce emissions [cf. the forthcoming UN Climate Change Conference in Paris].

Underpinning this is the necessity of decoupling economic growth/prosperity from both GHG emissions and increased energy use (the latter until, maybe in many decades, we have controlled pollution-free, nuclear fusion).

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

As I have outlined in my previous submissions to this Committee, it is possible to make a proximate estimation of demand based on Wales' current annual internal energy requirement of ~100TWh. A mix of technological developments e.g. EV vehicles, either electrified or H<sub>2</sub> powered railways, and better space insulation, heating and aeration and energy-efficient white goods, and much improved planning could [cf. Denmark] lead to a ~40% decrease in gross demand. However the % of this utilized as electricity would consequently increase. So to the first approximation one can assume electricity demand will double to about 40TWh per year and a residual heat demand of ~20TWh. The strategic targets over 25 years would then be: [a] a reduction in total energy demand of 40%; [b] production of at least 40TWh of renewable, very low carbon electricity with a significant but as yet unquantifiable % from local/community/dispersed sources (see below) and [c] some 20TWh of heat energy, part of which would be a product of WG policy to increase woodland cover of 400,000ha. There may well also be an export potential both for low carbon electricity and for the renewable technologies themselves.

- 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 accurate answer can be offered and obtaining a realistic answer is one of the major objectives of the putative IWA study. However the answer will also depend on [a] technological advances, [b] public perceptions and [c] financing packages for renewables and energy saving. Renewables are not impact free; each has its attendant issues e.g. small-scale hydro is resisted usually by the fishing lobby and /or by some conservation interests, on-shore wind and PVs by landscape perceptions. However I don't think people appreciate the impact of doubling electricity supply and demand will have. If a large proportion of the growing demand could be met locally so reducing the need for transport by more and more huge pylons cf. Wylfa B and Anglesey, then public reaction to energy saving and local renewable production and its economic benefits might be positive.

- Is there a need for comprehensive survey patterns of energy consumption and of Wales' renewable energy potential?

Yes.

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

Again yes. Importantly the global energy market is grossly distorted. The recent 2015 IMF report 'Counting the Cost of Energy Subsidies' estimates that fossil hydrocarbon burning is 'subsidised' to \$5.3 TRILLION per year (6.5% of global GDP) due to a mixture of direct subsidies, tax breaks (see George Osborne's views on fracking) and, dominantly, off-balance sheet externalities i.e. effects on health and global warming resulting, globally, in thousands of deaths each year. These distortions are little discussed cf the outcry about modest subsidies for renewables, but reflect huge vested interests. A move of dispersed more local energy generation clearly challenges commercial companies such as the National Grid and the DNOs. In this the emerging approach of UK government differs significantly from that of some mainland European countries and appears to focus on large centralised electricity generating plants (be they gas [fracked or imported] or nuclear or imported biomass). I refer to this as the "CEGB model" compared with the dispersed, smart grid model evolving in Denmark and parts of Germany (see also below).

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

[a] We need urgently a comprehensive study such as that proposed by the IWA (see attachment). [b] We need the political vision and will. [c] We need well thought-out policies in all fields and long term funding programmes which enjoy cross party support and amount to a Welsh 25-year programme. I would emphasise that energy use and policy permeates all aspects of government and our lives (see Y Faner Newydd article)



- How can the necessary behavioural change be achieved?

Paradoxically we need to appeal to self interest and to concerns for the welfare of our children and grandchildren and give people the hope for more productive, fulfilling lives. We need to show that it is not all gloom and doom and there exist alternative ways which reduce the risk to us as individuals and as families and to mankind globally. I would argue that the prospect of dispersed renewable energy has the potential to achieve this while stimulating energy awareness and saving. Consideration should be given to media games and television programmes on energy saving and generation e.g. TV competitions for the best energy saving community (rural and urban), original innovative schemes leading to BAFT Wales-type glitzy annual events!!

- What can be done using existing executive/legislative powers?

Much can be done with the very limited powers of the National Assembly as individual schemes will have low capacity within WG competence. Planning, transport and land use are largely WG matters but the 'retained powers' model with Wales receiving the status of Scotland would allow a much more comprehensive and coherent approach.

- What is the scope for public investment/support for innovation to encourage new forms of local renewable energy?

Finance is vital. Much of UK government policy appears predicted on attracting foreign capital investment and consequential ownership at very favourable rates to the investor e.g. Hinkley C Nuclear Power Station.

Any community/local schemes must find funding despite the distorted energy economy i.e. a serious difficulty is that the current price of hydro carbon energy by excluding the externalities is creating a false market (see IMF). WG could have a critical role in this. Lord Stern and others advocate a carbon tax of >£50 per tonne but this can only be implemented on an EU or global scale. I suggest that this Committee seeks advice from financial experts and seeks comparative data from other countries and regions. At stake is an economic and social development model which seeks to empower local enterprises, be they individually or community owned, to develop endogenously as opposed to a model creating a long-term dependence on foreign investment and capital. Wales has experienced the latter and its withdrawal when circumstances change. Currently money is historically cheap.

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

Greater skills appear required (outside a few companies) in grid management, in how to set up municipal grids, in smart grids and electricity storage technologies e.g. new batteries and in marine source technologies - tide flow and tidal barrages. There are also opportunities in small scale AD and in creating financial packages. There is also a lack of real expertise in insulation of existing buildings



in an area of high rainfall and humidity and many stone-built and solid brick wall dwellings. Cavity wall insulation is not appropriate in much of Wales but is sold without constraint.



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

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### **Response by the Energy Policy Group, University of Exeter**

**Dr Caroline Kuzemko, Jessica Britton, Iain Soutar and Dr Bridget Woodman**

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.<sup>i</sup> 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.

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**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,<sup>ii</sup> 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.<sup>iii</sup> As such, actively engaging consumers should be a strategy from the outset rather than a positive side-effect of a smart strategy.<sup>iv</sup>

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.<sup>v</sup>

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.<sup>vi</sup>

**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.<sup>vii</sup>



**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.<sup>viii</sup> 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.<sup>ix</sup> 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.<sup>x</sup>

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.<sup>xi</sup>

**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.<sup>xii</sup>

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.<sup>xiii</sup>

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.<sup>xiv</sup>

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.<sup>xv</sup> It is notable that in other countries, like Denmark for example, all data about generation, networks and supply is publically available via the ‘DataHub’.<sup>xvi</sup>

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

<sup>ii</sup> See [here](#) for a discussion on the demand side

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

<sup>iv</sup> For a discussion of the strategic need to democratize energy, see [here](#).

<sup>v</sup> The report can be accessed [here](#).

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

<sup>vii</sup> See [here](#) for a discussion on the opportunities of community heat generation.

<sup>viii</sup> This paper can be accessed [here](#).

<sup>ix</sup> Ofgem’s report is available [online](#).

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

<sup>xi</sup> A [recent report](#) by Elmar Schuppe outlines how markets have changed and policy responses in Germany.

<sup>xii</sup> Examples of these programmes can be seen [here](#).

<sup>xiii</sup> For an interesting analysis of the role of public institutions in innovation see Marianna Mazzucato’s ‘The Entrepreneurial State’.

<sup>xiv</sup> For reference see [here](#).

<sup>xv</sup> For a paper that makes this argument in more detail see [here](#).

<sup>xvi</sup> Details of the Danish model of energy governance for sustainability is [here](#).