

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 Cyfoeth Naturiol Cymru (Saesneg yn unig)	Response from Natural Resources Wales
SEFW 24	SEFW 24

Written Submission by Natural Resources Wales

This document sets out the response from Natural Resources Wales on the consultation by the National Assembly for Wales' Environment and Sustainability Committee to inform their inquiry into 'A Smarter Energy Future for Wales?'

The role and Purpose of Natural Resources Wales

Our comments are provided in the context of our purpose to ensure that the environment and natural resources of Wales are sustainably maintained, sustainably enhanced, and sustainably used.

Natural Resources Wales has a wide range of roles in securing 'A Smarter Energy Future for Wales' – as an advisor, regulator and land owner and manager. These include;

- Our statutory duty in relation to permitting a wide range of energy facilities. The details of this permitting role vary according to the particular types of facility in question – ranging from nuclear power stations to small-scale hydropower schemes.
- We are a statutory consultee in the Nationally Significant Infrastructure Planning process and in relation to development management applications, which includes commenting on master plans where these are produced.
- We have a statutory duty in relation to designated sites, which includes assessment of activities that might have an impact on those sites.
- We can provide advice and guidance to business before any formal applications for planning consent or operating permits.
- We also provide impartial advice and evidence to the Welsh Government and UK Government within an overall energy policy and planning framework
- As an environmental regulator, in order to minimise environmental impacts and prevent harm to human health, we regulate many of the environmental impacts which can result from energy generation, transmission and consumption.
- NRW is the competent authority for three carbon trading schemes; the CRC Energy Efficiency Scheme, the EU Emissions Trading System (EU ETS) and the Energy Savings Opportunity Schemes (ESOS).
- We own land in various parts of Wales where energy development may take place. We also manage the Welsh Government Woodland Estate (WGWE) where we encourage renewable energy production such as windfarms, hydropower, solar and biomass.

Main points

Natural Resources Wales acknowledges that Wales has a considerable resource potential in relation to low carbon energy generation including tidal and marine energy, hydro, solar and onshore and offshore wind. Promoting renewable and low carbon generation opportunities can

help contribute towards green growth in Wales creating jobs, contributing to energy security and to the reduction of carbon emissions.

We are committed to work strategically with developers and decision makers to help identify opportunities to enable the right development in the right locations.

In the context of meeting Wales's commitments to contribute to the prevention of global average temperatures rising more than 2° Celsius and the need to enhance energy security in Wales, Natural Resources Wales believes that energy policy in Wales needs to;

- Provide strong leadership on demand management, renewable/low carbon generation and storage.
- Incentivise developments through targets and funding.
- Consider the revision of existing strategies to enable a 40% emission reduction by 2020.
- Encompass goals and strategies for the short term (to 2020), mid-term (to 2030) and long term (to 2050) involving a continuous reduction in fossil fuel use, while recognising its contribution to energy security for Wales.
- Recognise different approaches are needed in Wales for large projects which deliver 'big hits' in climate change and energy security issues and smaller projects which help with issues necessary to help secure the support of civil society such as energy efficiency and behaviour change.
- Integrate investment in renewable energy infrastructure with investment in future grid provision at a national Wales scale and, locally, with distributed energy generation and heat systems, including smart grids.

We expand on these points below in response to the specific questions asked in the consultation.

1. The energy mix

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

We believe that to decarbonise our energy system at pace we must ensure the right frameworks and incentives are in place. We have in place in Wales a national collaborative approach to support infrastructure investment, a policy and legal framework that allows us to manage our resources in a joined up way, a planning system focused on providing positive planning to enable the right development in the right place and the establishment of Natural Resources Wales as a single point of contact for environmental regulation and advice.

Specifically the Climate Change Strategy published by Welsh Government in 2010 sets out measures to achieve annual emission reductions of 3% pa within sectors with devolved competence from 2011 onwards. This has been strengthened by the Environment (Wales) Bill, which will put in place statutory climate change target and carbon budgeting to help drive further action on climate change, with the aim for at least 80% target reduction by 2050. In 2012 and 2013 the annual emission reduction targets have been met but with current policies it is anticipated that it will not be possible to meet the associated Welsh Government target to reduce overall Welsh emissions by 40% by 2020. We therefore recommend that in Wales we regularly undertake a stock take of policy and strategies to help meet the 40% emission reduction by 2020 and to ensure that Renewable and Energy Efficiency targets help deliver their part.

In this context it would be beneficial for Wales to have short, medium and long term energy and climate change targets supported by clear strategies and roadmaps. This would provide an opportunity to regularly review and revise the strategies in place as and when required in the short term whilst working towards the achievement of the long term goal. We understand that this is an

approach developed in Denmark¹ where currently 34% of electricity consumption is wind generated. Short term and long term goals would also provide the opportunity for Wales to plan based on the increased devolved powers with Welsh Government gaining consenting powers for onshore and offshore energy developments up to 350MW. In this context, the new National Development Framework under the Planning (Wales) Act 2015, a review of Planning Policy Wales and the spatial TANs together with the emerging Wales National Marine Plan could help provide new areas suitable for the large scale energy generation that is much needed for energy transition in Wales.

This needs to be supported with a set of scenarios providing clear information to all involved to make informed decisions. Welsh Government has captured elements of this through their recent Green Growth Wales; Local Energy which outlines action plans for the next 12 months to achieve their vision of helping communities and businesses using locally generated electricity and heat from a range of renewable installation, to supply local demand and to minimise our dependence on central generation.

It should be recognised, however, that the current economy is dependent on fossil fuel and that there will be a need to manage a transition to low carbon energy to avoid enormous consequences. In our view short term strategies should help address issues like loss of revenue (loss of tax from fossil fuel) , transition on existing infrastructure (building & transport), development of skills (to support any target we set for renewable energy), and economy.

In addition to the policy and legislative framework the finance element is key in moving Wales towards a low carbon economy. For instance, our discussions with wave and tidal energy developers, have highlighted the availability of finance for initial technology development as one of the greatest difficulties affecting the deployment of offshore renewables (offshore wind, wave and tidal stream, tidal range). The ability to secure income from energy generation tariffs over the long term is also less certain since the Contracts for Difference (CfDs) arrangements replaced the relative predictability of Renewable Obligations Certificates (ROCs).

1.2. 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?

While we are not in a position to comment on the mixture of distributed generation sources that best meets Wales's renewable energy needs, we seek to advise and to find the most balanced solution to help develop the right technology in the right place. We aim to be involved in the early stages of projects to support a solutions based approach to the development of distributed energy generation to help optimise benefit for Wales.

NRW has a key role to help facilitate onshore wind development and grid connection on the Welsh Government Woodland Estate (WGWE). This will also help demonstrate how a distributed generation system would operate together with its potential benefits. We are currently working with Renewable UK Cymru to develop the Energy Park concept in Wales. This approach aims to optimise the renewable energy opportunities on the WGWE. We are looking to manage such areas profitably by integrating development of wind, solar and hydro power, biogas units, heat pumps, anaerobic digesters and other emerging renewable technologies. The concept is founded on encouraging developers to provide the investment in grid infrastructure to an area and other projects to be invited in.

We also recognise that the significant marine energy resource around the coast of Wales (wave, tidal stream and tidal range) has the potential to contribute significantly to the mix of renewable energy needs. We recommend that a strategic assessment for tidal range is undertaken to

¹ http://www.ens.dk/sites/ens.dk/files/policy/danish-climate-energy-policy/our_future_energy.pdf

understand the overall implications and how best to deploy multiple projects across Wales. For wave and tidal stream, the successful (and sustainable) development of the two demonstration zones, in Ynys Mon and Pembrokeshire, is crucial and we believe this should be a focus of effort from government, regulators, and advisors in the short to medium term.

2. The grid

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

In our experience, from a marine energy perspective, grid appears to be less of a constraint to renewable energy development in Wales than elsewhere in the UK. For example, although there appears to be significant activity in Scotland, this has largely been non-grid connected or very small scale demo projects. Larger consented projects or those with Crown Estate seabed leases (e.g. in the Pentland Firth) have not resolved grid issues and so timetables for deployment are yet to be determined. Whilst access to the grid distribution network remains an issue in Wales, our view is that the solutions are likely to have a lower cost than in Scotland, which will have implications for the pace and scale of development we could see.

On land, however, the limited capacity in the north and south and the lack of significant transmission networks in mid Wales is a significant constraint to development. In order to realise any large scale renewable energy potential in Wales, strategic improvement, planning and investment in the network linked to opportunities is needed. This will reduce one of the main constraints to development and encourage a greater range of renewable energy projects.

It is also important to recognise for long term purposes, in order to maximise renewable energy, we need smart and sophisticated overall grid management which must be supplemented with the financing element on how the grid would be managed. We see value in running a smart grid pilot project such as the Smart City Kalundborg in Denmark², a three year project which represented an innovative approach to deepening the connection between smart grids and smart cities. The project also reflected the uptake and innovation in demand side management and provided a pathway for transition.

2.2. What changes might be needed in terms of ownership, regulation, operation and investment?

At the community and local level in order to encourage more use of localised renewable energy, ownership and uptake of energy efficiency there needs to be;

- More financial support and incentives. For instance, priority to grid access for any renewable generated with a fixed return rate for duration of time. This should be supplemented with subsidies for installing renewable energy technology.
- Communications strategies to help reach the public on their own terms with a strong focus on information and advice.
- A simplified, streamlined and transparent planning and regulation process.

At the national level we feel that there is a need to;

- Better integrate the strategic planning of energy generation with the strategic provision of grid and other distribution networks tailored to the strategic needs of Wales.
- Continue to simplify and streamline the planning and regulation process with public support and acceptance as new evidence and information arise.

² <http://ses.jrc.ec.europa.eu/smart-city-kalundborg>

- Continue to develop a coordinated approach between policy makers, industry, community, regulators, and advisors based on a 'no prejudice' approach in the initial planning stages. This would ensure that the full range of expertise is deployed to secure the right development in the right place.

3. Storage

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

In our view energy storage is technologically and economically viable and has great potential to enable the transition to secure, low carbon energy systems.

From the operational view energy storage could take place at many different scales. On the bigger scale pumped storage schemes like the Dinorwig power station in North Wales play a key role from an energy security perspective.

On a smaller scale, which could be coupled with energy efficiency methods, shifting energy demand by using smart appliances, batteries and heat storage have valuable roles to play. The use of electric cars that could be charged overnight at times of excess generations and charging stations in strategic locations which still allow the long car journeys is also a good solution. As transport still accounts for around 38% of the UK energy consumption (2014 figures)³, addressing storage issues (coupled with sustainable transport measures) for this sector would be beneficial for energy transformation.

There is also great potential for demand management measures to help balance supply and demand. In this context we welcome the launch of Resource Efficient Wales in October 2014 as a single point of advice on energy, waste and water resources.

In essence, demand management could help avoid the need to scale overall power generation capacity according to peaks, which may be relatively short in duration. In this context it would be useful to explore the role of an 'energy hierarchy', driven by carbon intensity and resource use, to provide an effective framework to guide energy policy and decision making. The Scottish Government has, for example, made reference to such a hierarchy in its 'Energy Efficiency Action Plan'⁴. The Scottish Environmental Protection Agency (SEPA) was also explicit in their Energy Position Statement⁵ on how an energy hierarchy offers an effective framework to guide energy policy and decision making.

4. Ownership

4.1. 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

Although there are a number of studies in the UK on the public perception of renewable energy / low carbon technology and engaging the public with the whole energy system⁶, we think there is value in conducting a Wales specific study. This may help provide a more precise picture of the public's attitudes and opinion on different types of technology and location.

³ <https://www.gov.uk/government/collections/energy-flow-charts>

⁴ Conserve and Save: The Energy Efficiency Action Plan for Scotland, Oct 2010

⁵ SEPA's Energy Position Statement

⁶ UKERC, Transforming the UK Energy System: Public Values, Attitudes and Acceptability

- Renewable Energy and the Public: From NIMBY to Participation, Devine-Wright, P. 2011

- Public Perceptions of Renewable Energy Technologies, Challenging the notion of Widespread Support, Demski, C. 2011

It is likely elements of this could have been captured and collated in the recent 'Wales We Want' study. The simple fact that the report⁷ found that climate change was considered the single most critical issue facing future generation, highlights the urgency for energy transformation and the need for the public to be involved in these decisions.

From our own experience, not taking the public values and opinion into decision making has often resulted in the resistance to the energy (technology) transformation and conflicts. This was obvious in relation to micro-hydro projects⁸ in Wales which concluded that in several sites/cases without the personal passion and belief of the individual developer in each cases it was unlikely that the projects would have gone ahead.

From NRW's recent experience of dealing with hydropower and onshore oil & gas activities (and other similar activities), our key reflections are;

- People and communities are willing and capable of engaging in energy (technology) transformation if we provide early public engagement and the opportunities for different perspectives and knowledge as part of the discussion. Some elements of this are reflected in the planning and permitting process.
- The communication strategies and methods are also key in the process to ensure the public has a clear understanding of the process, roles, impacts and benefits.
- There is a need to make clear how current and proposed changes to the energy system fit in the short and long term.
- Finally, actions and decisions should be transparent and clearly communicated.

5. Energy efficiency and demand reduction

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

To a great extent we feel that the changes to the planning and regulation frameworks introduced by the Planning (Wales) Act 2014, the establishment of NRW and the emerging Environment (Wales) Bill provides a good framework to promote energy efficiency and demand reduction. The incorporation of climate change mitigation measures into the location, layout and design of development can make an effective contribution towards improving the energy efficiency of houses. As such, *Planning Policy Wales* and *Technical Advice Note 12 (TAN12): Design (2014)*, promotes such measures in the delivery of sustainable buildings. They also recognise the role that green infrastructure can make on this matter e.g. solar shading, and sustainable drainage systems. Many local planning authorities promote such measures in their Local Development Plan policies and supplementary planning guidance. The planning policy framework in Wales is therefore generally consistent in requiring development to mitigate and adapt to climate change, and thereby makes a valuable contribution towards the objective of improving the energy efficiency of houses. However, there may be scope to give further attention on how best practice measures for mitigating and adapting to climate change become the norm for new development e.g. mitigation measures such as sustainable drainage schemes and solar shading.

Future reviews of Planning Policy Wales to reflect the respective provisions of the Well Being of Future Generations (Wales) Act 2015, the Planning (Wales) Act 2015 and the Environment (Wales) Bill provide further opportunities to embed climate change adaptation and mitigation measures with the planning system.

⁷ <http://www.walesonline.co.uk/news/wales-news/article8748024.ece/BINARY/Click%20her%20to%20read%20the%20full%20The%20Wales%20We%20Want%20report>

⁸ The Economic and Social Impact of Small and Community Hydro in Wales: Report for Hydropower Stakeholder Group.

In addition we believe the public sector should take a leading and visible role in the wider drive for energy efficiency improvements across Wales. Working with the Carbon Trust we are in the early stages of working towards becoming a carbon neutral organisation that will involve a programme to reduce energy use throughout our offices and opportunities for micro-generation and carbon storage across the NRW estate.

Individual energy awareness and changing personal behaviours is one of the biggest challenges in addressing energy efficiency. The Welsh public sector is a major employer and could also provide a convenient and effective communications route through its employees to promote household and community energy efficiency. There would be value in developing energy awareness and advice programmes targeted at the residential level that can be run within public sector organisations.

The importance of working with large businesses to use energy more efficiently should be more clearly recognised. It is an area for which NRW have regulatory responsibilities. The EU Emissions Trading System, CRC Energy Efficiency Scheme and the Energy Savings Opportunity Scheme can help meet Wales's energy efficiency commitments through creation of both financial and reputation mechanisms capable of achieving significant energy efficiencies and greenhouse gas emission reductions from industrial activity and energy generation. We are responsible for the regulation of these schemes in Wales, which collectively, capture around 50% of the total Welsh greenhouse gas emissions. For example, the EU Emissions Trading System captures 20,000 tonnes of CO₂ emissions every day from both Aberthaw Power Station and Port Talbot Steelworks.

Our primary role is to ensure participating organisations comply with the three schemes in Wales. We take an active enforcement role to ensure high rates of compliance, and thereby increase the effectiveness of the schemes, through provision of advice, guidance and support to participating organisations.

We worked with the EU, Welsh Government, DECC, the Environment Agency and other UK regulators to transpose the Energy Efficiency Directive and the EU Emissions Trading System into domestic law, and also contributed to the development of the CRC Energy Efficiency Scheme Order 2013. Through ongoing collaboration with these bodies we will continue to take an active role in improving the effectiveness of the schemes and the supporting policy frameworks. Our contributions always aim to ensure the effectiveness and maximum coverage of the schemes in Wales.

5.2. 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)

We would welcome the setting of higher energy efficiency standards for new build housing. Wales could be leading the way in ensuring all new build are more energy efficient.

The 'Solcer' house⁹ which is located at the Cenin site in Stormydown has Passivhaus level of energy demand and has been designed to meet the social housing standard. It uses Structural Insulated Panels (SIPs) timber panel construction, manufactured off site and has an integrated heating and ventilation system.

The UK's target for all new homes to meet the Zero Carbon Standard from 2016 comes in advance of the Energy Performance of Buildings Directive (EPBD) target for all new buildings in the EU to be 'Nearly Zero-Energy Buildings' from 2020.

⁹ SOLCER <http://www.solcer.org/news-items/uks-first-smart-carbon-positive-energy-house/>

Projects like the Solcer Housing, successfully implemented has the potential to meet these targets in fact, it has the potential to take this a step beyond as it is UK's first carbon positive energy house. Simultaneously having high 'Passivhaus' standards for new buildings, and improving internal temperature control would reduce energy demand for heating by around 50%¹⁰. In addition to setting higher energy efficiency standards for new build housing there is a need for a focus on retrofitting existing homes and buildings recognising the age of the housing stock in many parts of Wales.

6. Communities - making the case for change

6.1. 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?

In our view communities, businesses and industries can contribute to transforming behaviour in the use of energy in Wales, especially through energy demand reduction and renewable generation. A study by the UK Energy Research Centre¹¹ indicates that the British public wants and expects change with regards to how energy is supplied, used and governed. It also indicates that there is clear public preferences that people should be integral to future energy pathways. The study further indicates that on the supply side this is characterised by strong commitment to renewable forms of energy production and a corresponding shift away from fossil fuels while on the demand-side it relates to the development of technology and infrastructures (e.g. public transport, demand management, electric vehicle charging points) to support changes in lifestyles, with the overall goal of improvement in energy efficiency and reduction in energy demand.

Policy and regulation can help support people and communities on energy efficiency and renewable energy such as securing priority to grid access for renewable generated energies. A good example of this is the Germany's Renewable Energy Sources Act. The Act, adopted in 2000, establishes an advanced "feed-in tariff" in Germany, enabling any company or individual who meets the technical and legal requirements to sell renewable electricity into the power grid for a guaranteed, long-term price for each kilowatt-hour sold. The Renewable Energy Sources Act is regarded as the most important and successful instrument to promote the expansion of renewable energies in the electricity sector.

This effect is prevalent in some European countries such as Denmark and Germany which has been more successful with renewable energy development which was mainly achieved through the transition driven by citizens and communities. There is also a correlation that increased ownership of renewable energy leads to increased energy efficiency thus reducing demand¹². Shifting the mind set for energy efficiency which is often seen as a burden and not as the opportunity.

Whilst enabling communities to take greater responsibility for meeting their future energy needs may bring benefits in the way energy is used and generated, our view is that policies should include effective outreach and communications strategies to help reach the public on their own terms. Better efforts should be in place to make energy programmes more accessible to citizens and communities together with a clear articulation of the multiple benefits provided by a move towards low carbon energy generation.

¹⁰ Zero Carbon Britain; Rethinking the Future, Centre of Alternate Technology.

¹¹ Transforming the UK Energy System: Public Values, Attitudes & Acceptability: Synthesis Report. UKERC July 2013.

¹² The Economic and Social Impact of Small and Community Hydro in Wales: Report for Hydropower Stakeholder Group.