

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?
Ymateb gan RenewableUK Cymru (Saesneg yn unig)	Response from RenewableUK Cymru
SEFW 03	SEFW 03



Cynulliad
Cenedlaethol
Cymru

National
Assembly for
Wales

A smarter energy future for Wales

A response to the consultation by the Environment and Sustainability Committee, prepared by David Clubb

About RenewableUK Cymru

1. RenewableUK Cymru is the trade body for all forms of energy in Wales except fossil fuel and nuclear. Our remit includes all renewables, energy storage, smart grids and green buildings
2. Our vision is of a sustainable Wales which makes full use of its renewable energy resource, and our mission is to maximise the benefits to Wales of that resource
3. We are involved in the 'smart energy' sector through our management of the Smart Energy Wales event¹ as well as the management of various social media platforms to share information about the topic and participation in collaboration to support 'real life' projects

The energy mix

How can we decarbonise our energy system at a sufficient pace to achieve the necessary reductions in emissions (to contribute to the prevention of global average temperature rise)?

4. Wales' contribution to global carbon emissions is evidently modest; however, the per-capita contribution is very high – some 40% higher than the global average which is itself unsustainable for long-term environmental sustainability

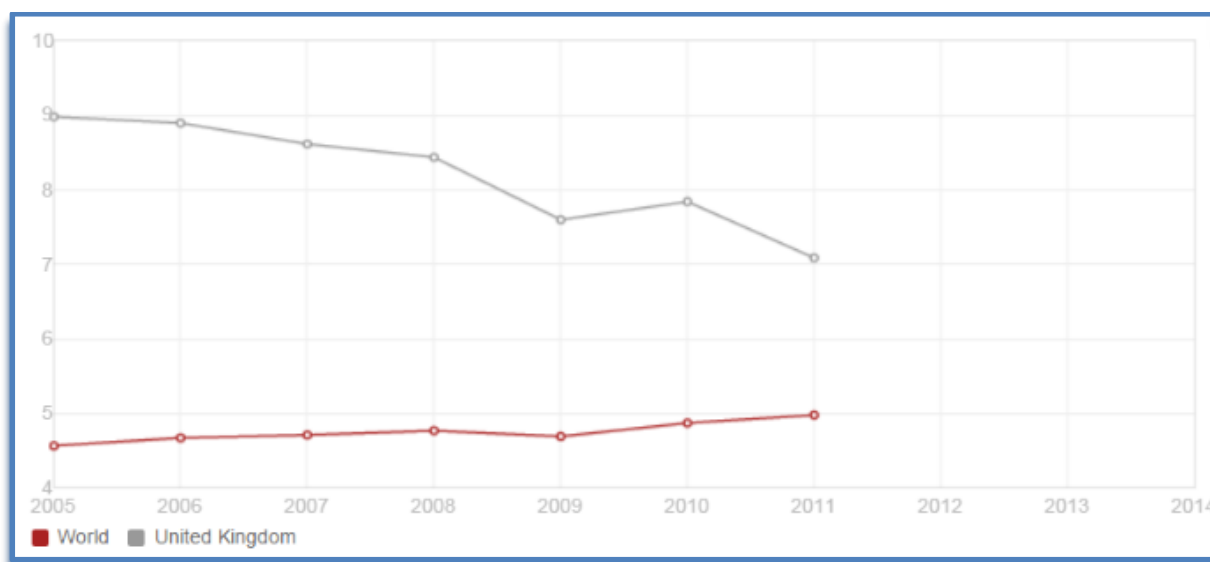


Figure 1: Per capita emissions of Carbon Dioxide (metric tonnes). Source: World Bank²

5. Wales' emissions have fallen in Wales by only 12% since 1990, compared with 30% across the UK³

¹ To be held on 16th September 2015 www.smartenergy.wales

² <http://data.worldbank.org/indicator/EN.ATM.CO2E.PC/countries/1W-GB?display=default>

³ [The Climate Change Commission](#)

6. The pace of decarbonisation needs to be considerably greater than historic trends in order to meet our moral obligation to contribute globally, as well as our legal obligation in forthcoming legislation via the Environment Bill⁴ and our contribution to the UK's carbon budget⁵ (particularly the 4th carbon budget)

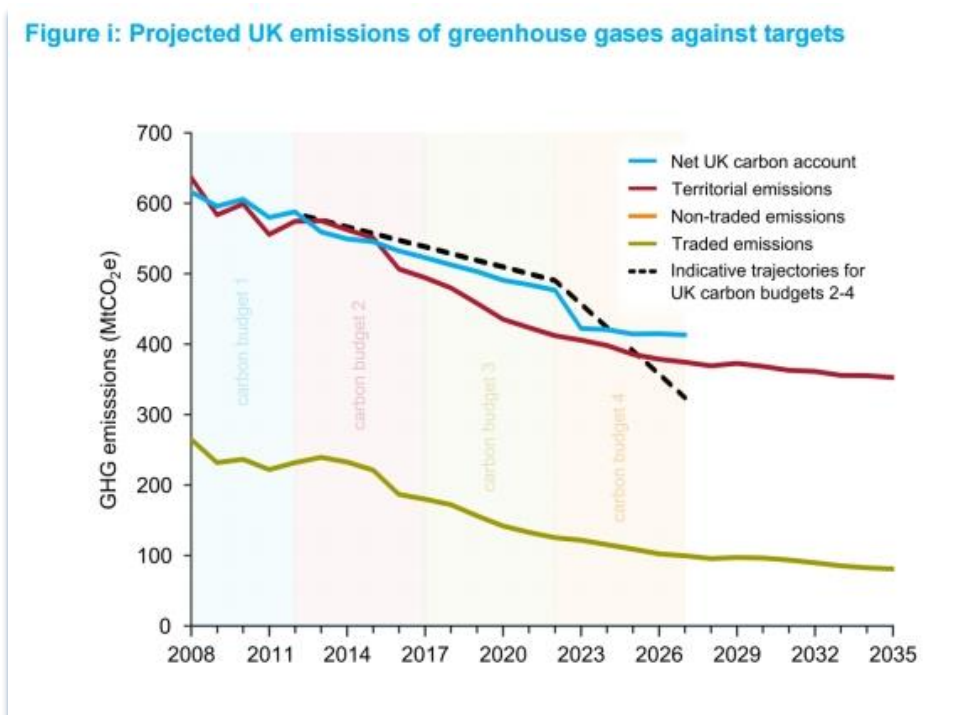


Figure 2: The UK is projected to miss the 4th GHG budget by a huge margin (DECC)

7. The supply of electricity makes up 36% of the UK's CO₂ emissions, and is the single largest component of the GHG emission mix⁶. Transport and the residential sector make up the next two largest components. Energy use therefore utterly dominates the GHG emission mix (64% of the total)
8. Of these components, the simplest and cheapest methods of decarbonisation are
 - a. Reduction of energy use at the point of use through behaviour change, energy efficiency, modal shift and change of infrastructure
 - b. Reduction of carbon emissions for provision of electricity and heat by shifting to renewable generation

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?

9. My research in 2014 demonstrated that the likely dominant renewable electricity generation by 2050 would come from onshore wind, offshore wind and solar photovoltaics⁷. This research has been rapidly dated due to the difficulties of the three major renewable electricity sectors in dealing with current UK Government policy,

⁴ A target of an [80% reduction in GHG emissions by 2050](#) is proposed

⁵ [Projected UK emissions of greenhouse gases against targets](#)

⁶ Provisional 2014 figures [from DECC](#)

⁷ Unpublished but available from <http://tiny.cc/walesenergyroutemap>

although it is likely that onshore wind and solar electricity will be the biggest growth areas of a greatly depleted sector over the next five years

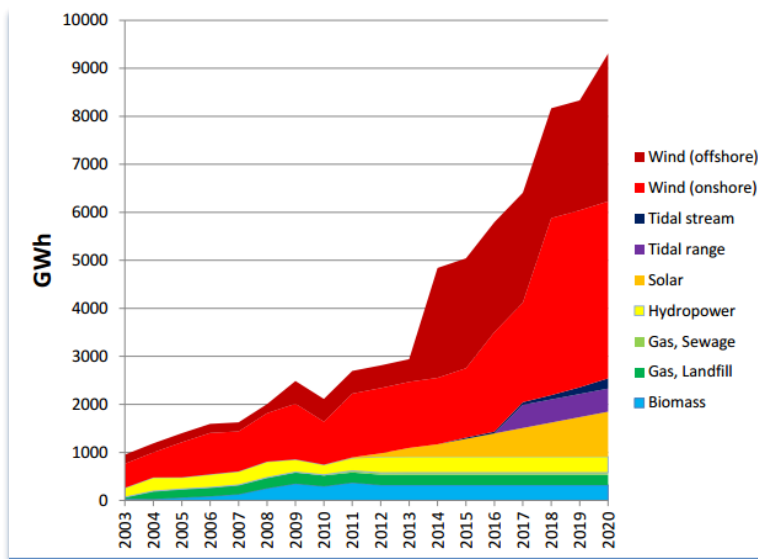


Figure 3: Potential for renewable energy in Wales (2014 research)

- The same research indicated that the strongest growth in renewable heat to 2020 would come from 'commercial' (larger scale) biomass, but with heat pumps and domestic biomass also making significant contributions. I believe that this underestimates the potential for solar thermal to make an impact, because this technology could be incorporated easily into each new-build (domestic and commercial) via building regulations for a low cost. A good example of this policy is the solar ordinance in Spain, although other good examples include Portugal, Ireland and Israel⁸

The Grid

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

- The grid and distribution network in Wales severely curtails the ability of projects, particularly small and medium sized, to connect to the grid. This issue is very well described by Chris Blake in his open letter about the problems connecting a small hydro project in mid Wales⁹
- The huge problems in grid capacity across large areas of mid and west Wales could be considered as an opportunity to incentivise innovation in the smart grid and storage sectors, particularly if structural funds are used to financially support projects which demonstrate a diminishing need for upgraded or new infrastructure
- These ideas are currently being worked on by Jane Forshaw of Local Partnerships, and there are strong synergies with the Energy Park concept which is being developed jointly by RenewableUK Cymru and Natural Resources Wales¹⁰

⁸ See [European Solar Thermal Industry Federation information](#)

⁹ "[The grid that wasn't there – a dispatch from the front line of renewable energy](#)"

¹⁰ An early draft of the concept video can be seen at tiny.cc/EnergyParkVideo

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

14. We do not have sufficient expertise to be able to comment on this issue in depth; however the current regulatory system is overly biased in favour of limiting cost rises, and against pro-actively allowing speculative development of grid in order to allow likely connection for future (renewable) energy development

Storage

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

15. Energy storage is the other side of the renewable energy 'coin'. There are no implications for overall system stability, security or operation for low levels of renewable energy penetration. For variable generation of up to 34% of electricity generation – compatible with the UK's targets for 2020 – additional interconnectors of 9GW and storage of 4GW is sufficient¹¹
16. Energy storage can also be used to obviate the need to upgrade or install new grid capacity. Locally installed energy storage could – in principle – be able to connect islands of generators and users without the need for 'wider' grid connection. However these projects entail significant commercial risk, and would almost certainly need to be underpinned by public sector support
17. Heat storage would remove barriers to adoption of some renewable heat generation, particularly solar thermal, but seasonal heat storage has huge technical challenges of which some are currently being addressed by research programmes such as SPECIFIC¹²

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

18. We have insufficient knowledge of this area to make a 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)?

19. Building regulations are the primary tool for determining the energy efficiency of new and existing building stock. RenewableUK Cymru laments the huge missed opportunity presented by the decision to improve the energy efficiency of new homes by only 8% in 2013
20. We call for a huge increase in energy efficiency requirements for new-build (domestic and commercial properties) in order to support the skill base of our construction sector, and to prepare our construction companies for the forthcoming requirement for all new buildings to be 'close to zero carbon' by 2020¹³

¹¹ ["Technical benefits of energy storage and electricity interconnections in future GB power systems"](#)

¹² www.specific.eu.com

¹³ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF>

21. Zero carbon buildings would also be more affordable, as they are cost the same, or very nearly the same, as 'business as usual' properties,¹⁴ and pay back far more than the additional construction cost through reduced energy bills over their lifetime

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)

22. If new build housing had much higher energy efficiency standards, the lifetime energy use would be drastically reduced. This would reduce greenhouse gas emissions, fuel bills, fuel poverty and would increase the skill requirement for the construction sector in Wales
23. Social impacts would include reduced mortality and morbidity due to improved temperatures and reduced exposure to indoor pollutants¹⁵
24. Economic impacts would include:
- a. Cost savings to the NHS through reduced mortality and morbidity; economic value of this is estimated at £2.46bn over the next 50 years, or £49m per year¹⁶
 - b. Whole-life savings to residents of £19,500 per household over 25 years of occupancy¹⁷
 - c. Improved business opportunities to Wales-based companies involved in the engineering or construction sector improving their skill base and the export potential for goods and services

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?

25. Enabling communities to have a say in the generation of their own energy is undoubtedly a step in the right direction. However, current UK government policy acts strongly against the preferred direction of the public. It is strongly pro-fracking and pro-nuclear – neither of which can be implemented or strongly engaged with by the local communities - and anti-renewable energy, in direct contravention of the preference of the general public¹⁸. This dissonance is unhelpful in maintaining a collaborative, engaged dialogue with citizens, communities and businesses, and Welsh Government has the opportunity to counter this with strong policy and political statements supporting renewable energy and new 'smart' ways of engaging with all forms of energy.

¹⁴ See ["Designers create the 'impossible' zero-carbon house"](#)

¹⁵ See ["Health effects of home energy efficiency interventions in England: a modelling study"](#)

¹⁶ Assumes value of QALY of £25,000; number of increased households by 2036 as [190,000](#); population increase of 438,900; 2241 QALYs per 10,000 persons over a 50-year follow-up

¹⁷ Assuming average energy use for a three-bedroom semi-detached house [using 2013 building regulations](#)

¹⁸ ["Plummeting support for fracking and nuclear"](#), RenewableUK Cymru website, 4th August 2015