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Climate Change, Environment and Infrastructure Committee
Blaenoriaethau ar gyfer y Chweched Senedd / Priorities for the Sixth Senedd
PR33
Ymateb gan Prifysgol Bangor / Evidence from Bangor University

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Thank you for the opportunity to respond to the letter signed by both the Minister and Deputy Minister for Climate Change, setting out their priorities for the next 12-18 months (dated 30 July 2021).

Whilst we thought the letter was insightful, we were somewhat disappointed and surprised not to see the Agriculture sector mentioned once. While the letter does specify that its content relates to the portfolio of the Minister for Climate Change, it also clearly advocates "developing a holistic view of the decarbonisation that needs to take place across Wales" and states "we need to make sure that the approach to tackling climate change is Wales-wide" and that a key aim is to promote outstanding examples of collective action to tackle climate change. However, the failure to acknowledge the key role of all of the important land uses in Wales does not fit with these statements. This may be a consequence of the sectoral requirements of accounting for and reporting greenhouse gas (GHG) emission in national inventories, but it may also appear to be a consequence of the existence of two Welsh Government departments, with separate Ministers for Rural Affairs and for Climate Change. Whilst there may be collective thinking about tackling climate change between both departments, not highlighting this linkage in the published prioritised list of actions letter does not portray joined-up thinking in the Welsh Government. Given the considerable changes to agri-policy and the development of the Sustainable Farming Scheme, and the significant implications this could have for the prioritised actions, the requirement for this is greater than ever. The crucial need for a co-ordinated approach across land use sectors as a pre-requisite for effective action to mitigate climate change has long been recognised by experts in the field.

The importance of Agriculture and its land base in enabling Wales to meet the net zero challenge is palpable. Most recent GHG inventory submission (for the year 2019) shows that GHG emissions from Wales' Agriculture sector represent 13.7% of the total annual national emissions. Importantly, the Land Use, LandUse Change and Forestry (LULCF) component also represents a small but important sink for GHGs that can be exploited. Hence, Agriculture and its land base are key in achieving the ambitious target of net zero by 2050.

Decarbonisation in Agriculture is being tackled via improved efficiencies of production (increasing productivity and reducing emissions), increasing carbon storage on farms, and coupling bioenergy to carbon capture, utilisation and storage (Hyland et al. 2016, CIEL 2020). However, current technologies alone will not sufficiently decarbonise the sector: new innovations and a step change in agricultural production systems are needed to further reduce emissions beyond the levels that currently known mitigation strategies will deliver (CIEL 2020, Jones et al. 2014ab).

Agriculture and its land base is also key in the delivery of many of the priorities outlined, e.g. Energy production, Tree planting, Nature and biodiversity, Circular Economy and Environment. Brief examples of its importance for each of these are summarised below – the purpose of which is not to elaborate in detail, but to highlight the relevance of Agriculture and its land base in enabling the Ministers to meet their specified priorities.

Energy:
Agricultural land provides opportunities for energy generation via multiple means, e.g., hydro (including micro-hydro) (Gallagher et al. 2015), solar, wind, and via anaerobic digestion. Its landscape means that Wales is well-placed to capitalise on such systems, and many Welsh farmers have embraced the opportunities to diversify their income streams through investing in renewable energy generation. The recent slowing down of the renewable sector in Wales highlighted in the Ministers' letter could be reversed, should the right incentives again be made available.

Agriculture can also, of course, provide land for tree planting, and other means of woodland expansion, to help grow the proportion of Wales' heat demands that are met through biomass (helping to decarbonise one of the Ministers' other priorities, Housing).

Lastly, on-farm generation of renewable energy can make a significant contribution in meeting the Ministers' target on the proportion of energy that is locally owned, as opposed to very large schemes that are typically owned by international companies and where much of the wealth generated is thus taken out of Wales (Haf et al. 2018).

Tree planting:
As no doubt highlighted during the Deputy Minister's recent 'deep dive' exercise, aspirations for afforestation will only be met if landowners, the majority of which are farmers, choose to adopt the incentives offered to them. Deep concerns have recently been expressed that models of afforestation that exclude the farming community may undermine rural communities and generate significant conflict. The significant challenge of how to integrate woodland expansion targets with a socio-economically viable farming sector is a serious issue for Wales that deserves considerable Ministerial attention. Farmers' decisions will be based on the trade-offs of afforestation and how it affects the viability of their business. Practical factors, such as whether they have the necessary time and skills to manage the woodland will also be considered, and significant work is required from the Welsh Government to determine how appropriate support can be put in place to address such challenges. However, done appropriately, tree planting can bring a host of benefits to farming systems (Hardaker et al. 2021, Kendall et al. 2021, Pritchard et al. 2021, Rayment et al. 2017). There will be a real need for the Welsh Government to liaise closely across the farming, forestry, wood products and conservation sectors, and broker co-operation between them, so that these potential benefits are realised.

Major challenges remain in determining the relative effectiveness of different tree planting options for climate change mitigation (Ford et al. 2021), and the trade-off with other targets such as biodiversity (Forster et al. 2021, Hardaker et al. 2020). These were not resolved during the Deputy Minister's deep dive, and require further urgent attention to ensure that the measures referred to in the letter (such as the creation of 30 new woodlands) are actually designed effectively to meet the Government's Net Zero targets.

Nature and biodiversity:
Agriculture is the overwhelmingly dominant land use sector in Wales, and is key to redressing some of the losses seen to Wales' natural capital. The new Sustainable Farming Scheme aims to protect and enhance our environment (air, water, soil and biodiversity) by rewarding farmers to manage their land in a way that delivers such public goods in a way that the market does not. It is not clear how the Welsh Government's Nature Action Recovery Plan (NRAP) will link to the Sustainable Farming Scheme (and *vice versa).* We anticipate that there are considerable ongoing discussions to harmonise both schemes, however we would have expected the Ministers' letter to have acknowledged the importance of this. Similarly, efficiently combining land use measures targeting net zero with nature and biodiversity remains a major challenge, which we would have expected to be acknowledged.

Circular economy:
Anaerobic digestion (AD) is a technology that can reduce GHG emissions from stored livestock manures, but is also important for improving the circular transfer of nutrients and organic matter from our food wastes to land where future food is produced. This avoids landfill of organic matter, and reduces the quantity of inorganic fertiliser that needs to be produced and used in crop and livestock production), with considerable benefits for achieving net zero targets. Pertinent incentives and the relaxing of some non-financial barriers (e.g. appropriate / targeted relaxation of planning requirements) could help grow the AD sector in Wales. Our work has shown that crop-fed AD systems can have considerable environmental impacts (Styles et al. 2015ab, 2016); introduced measures should therefore be targeted at non crop-fed AD systems to avoid unintended consequences.

Similarly, the targeted use of biosolids (treated sewage sludge) on agricultural land in Wales recycles nutrients and organic matter from the food-supply chain. It is important that measures aimed at reducing potential negative environmental impacts from the use of manures and slurries do not stifle the potential for Wales to capitalise on the use of biosolids and the environmental and economic benefits that can bring.

Again, we would have hoped to see greater evidence of joined-up thinking between the different sections of the Ministers' level; including, for instance the crucial need to integrate circular economy thinking with housing policy, so that building design, material sourcing and construction maximise the re-use of materials with high embodied carbon, and the contribution made by Welsh-grown wood products towards net zero targets (Forster et al. 2021).

Environment:
Air: The Clean Air Act will have a major impact on how livestock farmers in Wales manage manures to reduce ammonia emissions. This will likely result in major infrastructure requirements (e.g. modification to livestock housing, covers for manure stores, alternative equipment for spreading manures). Again, the complexity of assessing trade-offs between different environmental targets needs to be carefully considered by the Welsh Government, as

the costs associated with reducing ammonia emissions will limit opportunities to invest further in tackling and adapting to climate change. However, mitigating ammonia emissions also results in a reduction in indirect N_2O losses – so this will contribute to the net zero target.

Water: The whole-territory Nitrate Vulnerable Zone for Wales will also have a major impact on many farm businesses, again requiring major infrastructure of manure storage. However, a reduction in nitrate leaching will also contribute to the net zero carbon target, as nitrate is an indirect source of N_2O. It is also important that the Ministers' strategy is holistic and integrated; a clear example (not mentioned in their letter) is the potential for tree planting to contribute to reducing flooding risk. However, the evidence base for this strategy is complex (Cooper et al. 2021) and requires significant additional work.

As mentioned previously, the purpose of the above is merely to highlight the relevance of the agricultural sector to your list of priorities, the need for a more integrated strategy, and thereby the need for different divisions and Ministers in Welsh Government to liaise closely to ensure joined-up thinking and collaborative working to achieve desired outcomes.

Please do not hesitate to contact us should you wish to discuss any of the points further.

Yr eiddoch yn gywir / Yours sincerely,

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