

## Achieving a low carbon pathway to 2030 for Wales

### Context / Background

Climate change is one of the biggest global challenges threatening Wales' prosperity because it will have an impact on all of our lives. Wales is required by law to reduce its carbon emissions by at least 80% in 2050<sup>1</sup>. This requires a step change to how we live and work and is not a standalone policy area. The global decarbonisation trajectory has been set, creating clarity and certainty to drive investment. This creates enormous economic opportunity for Wales<sup>2</sup>. Everyone needs to act and accelerate a shift to Low Carbon Buildings and Transportation.

### Our Approach

In the face of significant challenges for the construction, energy and transport sectors, the approach of SPECIFIC and the new Active Building Centre, is to link up these areas through the provision of "Active Buildings" which use building integrated solar energy and storage technologies to provide useful heat, power and transport at the point of use. This approach allows a flexible, smart infrastructure approach to be taken, where groups of buildings and vehicles can exchange energy to support balancing of the wider electrical system. This approach has significant benefits in terms of potential for economic growth as well as enabling a transition to localised, low carbon energy system, that are less reliant on large centralised power generators.

### Critical challenges need to be addressed

- Cost of energy, consumer protection and security of supply whilst delivering clean smart flexible power.
- Decarbonising heat in buildings and most industrial processes by at least 80% by 2050.<sup>1</sup>
- To open the energy market for flexible energy to benefit domestic and commercial scale end users.
- Reducing carbon emissions and localised pollution associated with transportation.

### ➤ ➤ ➤ Priority Actions: ➤ ➤ ➤

#### 1. Ensure that all new publicly funded buildings in Wales are "Active Buildings"<sup>3</sup> as defined by a Publicly Available Specification (PAS)

The technology to create energy positive buildings is available and is effective. When designed correctly, the minimal additional cost of such an approach is quickly recovered through energy savings and additional revenues. The public sector in Wales should consider adoption of Active Buildings, in turn supporting capacity building for associated jobs and skills. The use of a PAS effectively means that Active Buildings become available through an "open source" approach. The Active Building Centre will test business models and de-risk scale up across regions and introducing fiscal policy reforms to incentivize action<sup>4</sup>. Here the Welsh Government has the opportunity to provide leadership in the context of the Low Carbon Pathway for 2030, by considering options from the early 2020s onwards. This approach could also be applied to all new build housing, public and private.

<sup>1</sup> Environment (Wales) Act 2016

<sup>2</sup> The IEA estimates 13.5 trillion dollars of public and private investment in the global energy sector alone will be required between 2015 – 2030 if the Paris agreement are to meet their national targets

<sup>3</sup> A working definition of Active Buildings has been provided by the Industrial Strategy Challenge Fund: "a building which integrates solar generation and storage technologies for both electricity and heat within its construction, rather than being heated by gas, and which is controlled by an intelligent system to optimise energy management and comfort for inhabitants. Active Buildings aim to be net energy generators, and have the potential to utilise the surplus energy to trade" energy with the grid, surrounding buildings and electric vehicles."

<sup>4</sup> Under the Wales Act, the Assembly and Welsh ministers have increased capital borrowing powers as well as tax powers to create a tax system that is simpler and fairer to support jobs and growth

## 2. Prioritise innovation for the decarbonisation of heat

In Wales we have an emerging critical mass of innovation on heat, whether it be SPECIFIC's Active Buildings, the Freedom project with hybrid heat-pump and gas heating systems, or localised heat networks in Bridgend. SPECIFIC's research and development work on Inter-seasonal Heat Storage has great potential for using peak summer time solar generation or waste heat from industry. SPECIFIC, the Active Building Centre and our numerous partners provide many opportunities for further collaboration which could be exploited by sector specific interventions such as SBRI competitions.

## 3. Public Sector Leadership to enable energy resilient communities - flexible regions for low carbon heat, power and transport

Welsh Government should use its devolved powers, access to capital and innovation expertise (as demonstrated by SPECIFIC and others) to establish greater collaboration with relevant bodies (UK government, Ofgem and others) to address critical market failures and challenges to accelerate a shift to low carbon buildings and transport. A regional approach to energy communities which deploy new flexible energy markets based in Wales, or part of Wales such as a District Network Operator area, should be developed to encourage the use of buildings and transport which enable flexibility around heat, power and transport and to test technical integration and consumer responses. Scope includes: novel business models for housing and commercial buildings; grid-tied batteries; building integrated batteries; vehicle to grid (V2G) and vehicle to building (V2B) electric vehicles; flexible heating systems and heat storage; and many other approaches. There is much emerging commercial activity in these areas, and this approach will ensure that economic and environmental effects benefit Wales, as well as informing future energy strategy.

## 4. Welsh Government should broaden its definition of Electric Vehicles to include e-bicycles and e-mopeds, and invest in infrastructure

Smaller electric vehicles have the potential to integrate well with Active Buildings and open up cost effective mobility options. Sales of electric bicycles have become the main growth area for the bike industry, and non-electric cycle rental schemes are popular in Cardiff and Swansea (with Swansea's Santander Cycles having won a crowdfunded national competition to secure the investment). Electric bicycles and mopeds open up these activities to a much wider proportion of the population, while still securing many of the benefits of "Active Travel". Welsh Government should view electric vehicles, smart flexible infrastructure, and active travel in a more holistic manner. Investment in these areas should be encouraged through trialing pooled electric vehicles (cars and bikes) for social housing and office buildings. Associated investment in infrastructure is also required.

### Benefits

- Demonstrates global leadership in transforming how Wales achieves and implements a plan for decarbonisation across its sectors post Brexit; tangible outcomes for Future Generation Act.
- Best economic and regulatory outcomes for Wales by putting people, science and industry at the heart of a new clean energy policy for Wales, rewarding businesses and citizens to act.
- Addresses fuel poverty, delivers low carbon, energy positive, affordable buildings at scale. Avoids the costs of reinforcing the electricity grid, increasing energy security and demonstrates technology that could also be applied to the building retrofit market.
- Green house has targets in the context of Active Buildings allows the basis for primary energy factor calculation incorporating renewables to achieve sustainable and balanced outcomes.

### Funders



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