# GW4 Accelerating to Net Zero Stakeholder Workshop Summary

## Background Information

The GW4 Alliance brings together four of the most research-intensive universities in the UK: Bath, Bristol, Cardiff and Exeter, across a geography that offers unique research and innovation opportunities. Committed to responding to the climate crisis, the ***GW4 Alliance will harness our research excellence, regional assets and world-class facilities to place our region and the UK at the forefront of global efforts to reach net zero***. Such efforts demand that our ambitions are shaped in partnership.

At a workshop held on 11th May 2021, we brought together a range of stakeholders (industry, local authorities, national governments, funders and other regional organisations) across the themes of energy, transport, land use and food, to help us better understand the challenges our region faces and discuss how our research and unique capabilities can help to create innovative, world-leading whole system solutions. Our aim was to identify opportunities to work together and ***co-create a regional transformational programme*** to prepare the region to be the UK's Net Zero Laboratory, to accelerate green recovery from COVID-19, locating social justice at the centre of this transformation.

Our whole systems approach, which recognises the full economic and social impacts of any changes on all sectors, will enable us to take a holistic approach to net zero innovation by routinely embedding dynamics such as policy implementation, societal changes and behaviours, digital innovation and transformation, environmental and economic factors and cross sector knowledge translation alongside any technological developments.

***GW4 will reach further; support fast and efficient net zero innovation and implementation, deliver fairer social transitions, by working with our partners, for the benefit of the UK.***

***We would like to thank all those who joined us*** at this initial workshop and look forward to progressing these exciting conversations and ideas together.

## Executive Summary

There is no doubt that the **GW4 Alliance is uniquely placed** to address the net zero challenge, combining the synergistic climate and decarbonisation research excellence of our four institutions. Working with the established industrial regional excellence in aerospace, tidal and nuclear energy and climate we are ideally placed to rapidly implement this research and innovation. The South-West and South Wales **region** provides an ideal testbed for net zero, with strong multi sector buy-in, opportunities for exploration and test of socially equitable transition to net zero, in both urban, city, rural and marine settings. Our geography covers two national governments, a combined authority, two health systems, includes areas with among the highest and lowest deprivation rates in the UK, making it ideal for levelling up within a net zero context. This is critical in order to understand why different solutions work more effectively in some settings compared to others.

The stakeholder workshop confirmed that our research strengths and innovation can respond to the challenges different sectors and our region face in achieving net zero. A wide range of ideas were discussed, and we will now begin a process to explore those that can draw on our whole systems approach with stakeholders engaged in the development and delivery to produce a roadmap for GW4 Net Zero.

Initial ideas include:

- A net zero summit to galvanise action across the GW4 region and develop a shared vision and action plan.

- Centralised coordination of net zero related activities to enhance communication and engagement across the region, and strengthen policy, advocacy and social justice.
- Scope the creation of net zero research hubs that encapsulate the range of interconnected sectors, **behaviours and decisions**, for sustainable transformation. Sectors of particular interest which build on the foundational strengths of the region include:
    - Clean aviation –potentially leading to the world's first Institute for Clean Aviation Growth.
    - Sustainable mobility including multi sector zero emissions and autonomous vehicles, beyond road cars to include rail, maritime, construction, and other sectors – with a focus on reflecting societal appetite and capacity for change, as well as technological and economic implications and the influence of regulatory and policy change.
    - Smart land use focusing on sustainable agriculture and food systems – necessarily linked to consumer choice, but also agricultural transport and equipment.
    - New energy challenges and solutions – recognising changes in energy use such as working from home and Covid-19. Understanding how hydrogen, nuclear and off-shore wind energy can be integrated into a new net zero world.
- Creation of a regional observatory focused on data, digital infrastructure, and sector performance against net zero targets.
- Building the role of skills through a regional and scalable approach, for example up-skilling public sector workers on low carbon from a single project to regional rollout.

The solutions to achieve Net Zero are complex, spanning the entire spectrum of society and the economy from individual consumer choices; decisions on how organisations are able to invest and adapt; through to the ways in which policy and regulation influences all these things.

Further, the importance of **language and terminology** surrounding net zero cannot be underestimated. The language that we use needs to be clear and inclusive. Related to this are the challenges of timescale. We must act urgently to meet the ambitions of 2030, which may need the implementation of existing, potentially less efficient technologies. We will recognise where swift transition can be supported by more effective and sustainable innovation, to enable longer term, more efficient solutions can be adapted to over time. In developing a regional programme of work, we cannot ignore the difficult decisions that will need to be made when prioritising limited resources to support **innovation and transformative change**.

We are immeasurably grateful to the range of stakeholders who were able to join us recently as we began to shape a transformational programme of work together. Following on from this first step towards a regional programme of transformation, GW4 Ambassadors will begin to develop cross-cutting programmes of work in the areas that show greatest potential in terms of collaborative opportunity and transformational potential to create the most effective transitions. Traditional academic approaches to research and development must evolve to enable the rapid changes required for a fair and beneficial transition to net zero. We will work across our institutions and extend our reach across the region, across sectors in the economy and society, in development of a proposition for an accelerated net zero, going further, moving faster and together, and creating fairer transitions as we do so.

***Prof. Chris Smith***
***Chair of the GW4 Academic Ambassadors group***

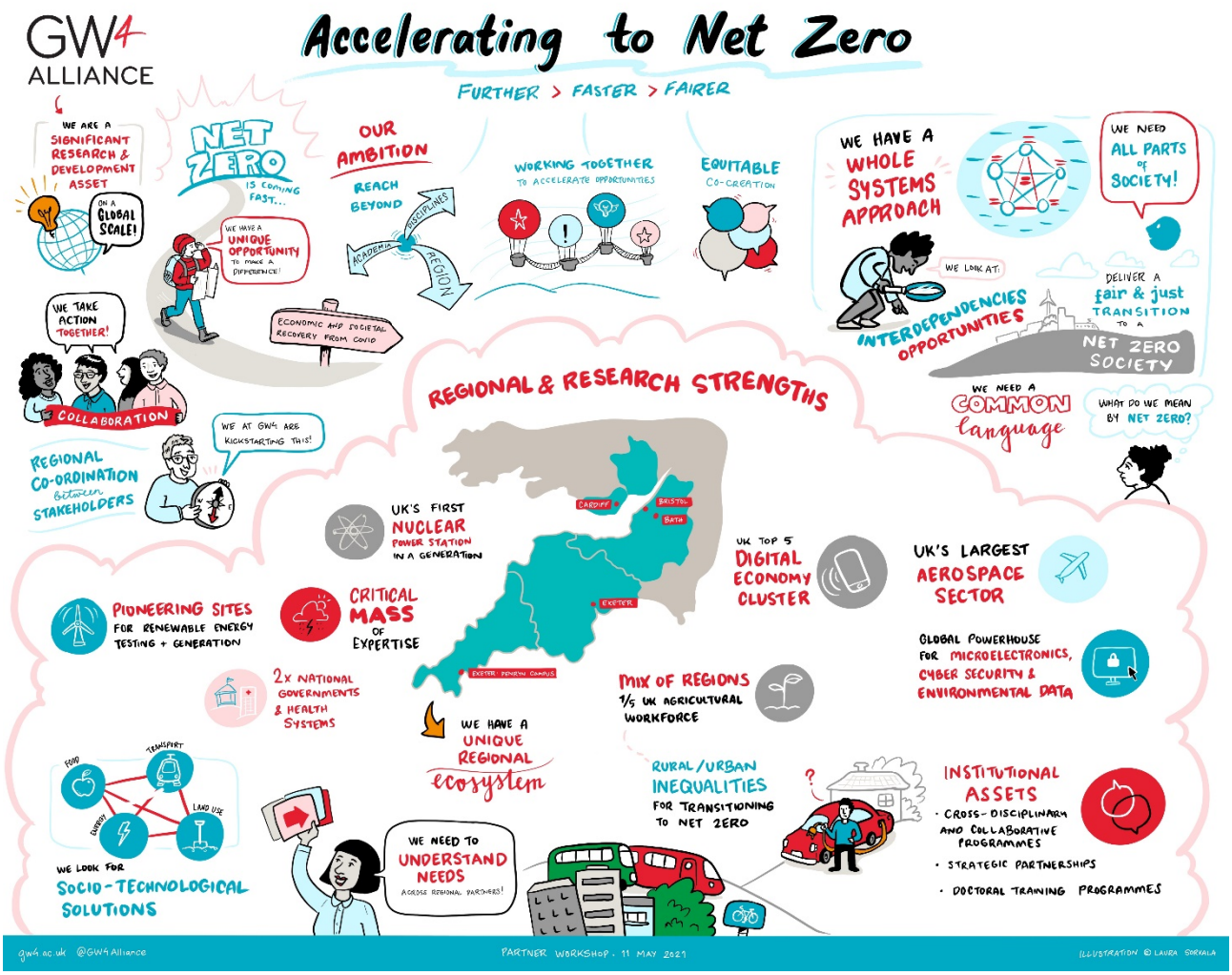
## 1. Introduction

1.1. This report sets out the discussions GW4 Academic Ambassadors had with a range of stakeholders from across the region of GW4 universities in a workshop held on 21 May 2021. The workshop focussed discussions on three areas of academic strength of our universities: **Energy, Transport and Land use and Food.** The report draws out some of the over-arching messages that were felt to be relevant to all groups, as well as reporting on the discussions that were specific to the topics.

1.2. The discussion explored a range of issues that represented both the **regional challenges** as well as individual **organisational priorities.** The session also encouraged discussion on the **opportunities** that we could take advantage of together, and also considered some of the **outcomes** that we might hope to achieve through a collaborative and transformational programme.

1.3. Much of the discussion, despite being thematically grouped, overlapped significantly. The report first sets out the overarching views that resonate across all areas, followed by a summary of the more thematic conversations. We are enthused to recognise that these also hold great potential for developing a proposition that considers these issues as part of a whole systems solution.

**Illustration 1: Why GW4?**



## 2. Overarching views across themes

**Whole systems approach**

2.1 Organisations, businesses and communities **need to work together in a systems-based approach** to deliver net zero.

2.2 The three themes identified do not need to be thought about as a pipeline of activity, they are congruent and coherent, working together achieve harmonious goals. We need to work on all three themes and the relationships across them if we want to develop a systems-based approach. For example, sustainable transport uses energy and also requires an infrastructure fit for purpose.

**Importance of Language**

2.3 There needs to be a consistency of the language, terms and understanding around net zero. Are we talking about offsets? Does it include scope 3? Whilst a challenging prospect, can we create a joined-up understanding across the region of our ambitions, that recognises that we may all be moving towards net zero in different ways. For example, are we only talking about carbon? As a measurable concept, carbon is a safe start, but we need to recognise that reducing emissions and green recovery is much wider than this and more complex.

**Social and political change**

2.4 In order to achieve a roadmap to net zero, society will need to adapt to new behaviours, social norms and technologies. Solutions will need to be accessible across society and fair and just in their implementation.

2.5 Government needs to **offer incentives to change**. Regulation and policy changes will make a big difference and drive change.

2.6 Research on **public attitudes and behaviours** is relevant to all sectors and regions, but R&D programmes need to deliver clear, useful outcomes for businesses and the economy.

2.7 Protected ecological, heritage and cultural sites have an enormous audience, and the challenge they anticipate facing is countering negative perceptions of any changes they chose to make in response to net zero ambitions. However, it is felt the changes would be viewed positively as people associate closely with the places they visit and the heritage, culture and society they have.

2.8 UKRI is developing a programme in Net Zero as part of its Spending Review submission in 2021.

**Targets and Data**

2.9 Reaching net zero by 2030 may not be achievable, but we need to **aim for ambitious targets** so we make progress and actions don't get delayed or pushed down the road.

2.10 Declaring a climate emergency on its own is not enough, we need actions that are appropriate for the scale of the situation. Currently many organisations are aiming for 'business as usual' in a post-pandemic era but we need radical change to address the situation.

2.11 Need to consider the people of the region, who have differing needs and requirements. Could we **use data better to understand the diversity and extremes of rural / urban /marine/ deprived areas and what this means for net zero**? Including data use for monitoring and evaluation of interventions.

**Skills and Capacity**

2.12 Political aspirations do not currently align with the available skills and resources (including funding) needed to operationally deliver against net zero – there is a **need to focus on the level of capacity and skills needed 10-20 years** down the line.

2.13 We need to **upskill people now to create the capacity to deliver these solutions**. Do we have the skills and solutions to drive this training? (e.g. the workforce with the skills needed to install the number of heat pumps necessary, if public demand increases).

**Post COVID-19**

2.14 Opportunities to build back better and greener post COVID

2.15 We **need to understand how COVID-19 has affected energy use** and what this means for future demand and supply. For example, with more people working from home, rather than in the office. Also explore the broader impacts on transport and commuting – will people embrace public transport or new sustainable mobility options if commuting less often and if work is more distributed in regional hubs not just centralised locations.

2.16 Whilst the pandemic has allowed organisations to take strides towards reducing emissions, as a result of offices and work spaces not needing to be serviced in the same way and occupancy reduced, and some individuals have made savings in relation to their travel, we need to understand how carbon budgets have been displaced. What is the systemic impact on an increase of relatively inefficient home heating or an increase in the use of cloud-based computing? Can we be proud of our strides forward if we don't understand what the impact of going back and the system impact of this approach will be? What are the technologies that provide an optimum solution for mix of home/office working?

**Technological solutions**

2.17 The **upfront cost to invest in sustainable technology** does present a barrier to smaller companies and individuals, so policies that offer financial support would be welcome. However, the understanding of what adaptation means in terms of policy making and the understanding of how policy around adaptation impacts other services e.g. healthcare, is a big challenge and a priority for the medium to long term.

2.18 We need to work on **technological solutions** and ensure these are affordable (provide reasonable return on investment and also affordable to society); in many circumstances adaption is not an option because the solutions do not exist. **Cultural shift, behaviour and regulation change** also required for these new solutions to be taken up and used by society.

2.19 Explore any existing technologies available to achieve net zero while recognising their limitations.

2.20 **Organisations need support from universities** in helping them innovate to provide solutions to problems – e.g., in battery storage and other technologies.

2.21 New technologies – easy to recognise and strongly needed but how do we regulate for them and how could we trial/ implement them for test beds and across the region?

**Regional approach**

2.22 Hold a **net zero Summit to galvanise action** across the GW4 region and develop a shared vision and action plan.

2.23 Utilise national and global events such as **COP26** to showcase our collective ambition, transformational projects and results.

2.24 **GW4 could provide a one stop service/front door** for organisations to contact and work with. GW4 needs to showcase their research strengths so organisations know who best to contact. GW4 needs to be transparent in terms of its research capabilities.

2.25 GW4 to look at published strategies of organisations across region and identify any crossover on what we are all trying to achieve - and what technologies we need**. Create an aggregated regional climate strategy**.

2.26 There is a need for a **mature, developed regional R&D plan** in order to secure government funding and support.

2.27 Just transitions are also impacted by whether the ownership of a particular aspect of the net zero agenda resides at a national or regional level. GW4 has extensive expertise on the development of regional bodies to support just transitions.

**Illustration 2: Net Zero Regional Challenges and Opportunities**


# 3 Energy

**Industry**

3.1. One of the big challenges is the **cost of energy** (electricity) only going in one direction (increasing). Companies that need to achieve net zero and decarbonise have double challenge of increasing energy costs while at same time as investment becoming more competitive.

3.2. Industry is trying to reduce cash leakage and retain funds to reinvest into new technologies, but the d**evelopment and implementation of new technologies results in more waste** arising from replaced assets. This presents a challenge in handling and processing such waste, but also an **opportunity for reuse of materials**.

3.3. Big firms use a lot of the UK's energy and society as a whole is heavily reliant on energy usage. A key challenge is **how to decarbonise the energy sector while still providing reliable and easily accessible energy sources** to society. The demand for renewables is not matched by the current supply. We need to **accelerate decarbonisation of household activities in UK whilst increasing levels of productivity**.

3.4. Further, many **companies are working to become net zero yet still need to maintain delivery of products and services**. For example, BT (who use 1% of UK's energy) is looking at changing their 30,000 vehicles to an all-electric fleet by 2030. Significant challenge is achieving this whilst maintaining good customer service. Also dependent upon the **infrastructure** being there to support these changes and transformations.

**Buildings/household**

3.5. New building projects, such as new homes, need to include energy efficient solutions as standard. For example, household heating systems such as heat pumps. This is not so much a technology issue as a social challenge. We need to encourage behavioural change and ensure affordability, desirability, and usability. Nesta is looking at how **data and behavioural science** can help to address the problem and encourage uptake of heat pumps. Can **social science and data** help the region to improve how society engages with new technologies, systems, and policies?

3.6. Retrofitting energy solutions to publicly owned housing stock is very expensive and thus can only be achieved over a long period of time. The **rental sector is a big challenge in achieving net zero housing and heating solutions**. Around 30% of households in Wales are rented – split evenly between private and social landlords. This equates to about 1/3 of population – 1 million people - in Wales living in rented accommodation.

**Context**

3.7. **Environments are not static, with lots of different factors at play, making it difficult to implement transformations and changes**. For example, there is a need to make water usage less energy intensive, but society also needs to be encouraged to use less water. We could focus on the customer journeys for a better understanding of how energy is used.

3.8. The rurality of much of our region has **significant infrastructure challenges** for feeding renewable energy into the national grid. Additionally, the rural road infrastructure necessitates **investment to support electric vehicles**. We need to manage intermittency within energy demand and supply and **look at storage solutions** and need to make 'green energy' systems more resilient, e.g. water and wind energy systems.

3.9. **Self-sufficiency of renewable energy supply in our region** is a huge ambition. This would be quite a challenge to respond to, but the scale of the challenge is as yet unknown. There are **significant opportunities to utilise the natural resources of our region** for energy generation, storage (e.g. fugitive methane, deep-geothermal) and support technological development (e.g. lithium reserves for use in batteries).

3.10. Could we focus on **regional procurement in an innovative way**, collectively at scale, which would increase buying power and interest from the market in new technologies / services? There is a need to add and **build scale and pace** into the energy sector. We need to work with those who are already prepared to transition to net zero solutions to build momentum. We could **focus on quick wins** first then move onto harder, more complex challenges once we have an established and tried and tested method/approach. Building scale and pace will also need more co-ordination across industry and funding bodies.

3.11. There is clear opportunity to use **GW4 region as a test bed for new energy solutions**, as it will not be a one size fits all across the country and a test bed at the regional level is more feasible compared to a national version. As a region we can implement more rapidly and determine what works.

## 4. Transport

**Political context**

4.1. The complex **political structures and jurisdiction** in our region makes it challenging to tackle the issue of green transportation. There is still a need to improve the **UK policy framework** for low

carbon transport which is currently 'too soft' and aspirational. Maintaining accurate **regional data** on progress could be valuable, with an interest in developing a regional net zero dashboard. Regional data will help to understand local transport challenges (urban v. local) with scope to translate these to other settings nationally and internationally. The UK has a distributed set of regulatory bodies facing emissions issues in urban and rural settings, between transport sectors including road vehicles, off-highway, rail, marine and air, and between private individual, public and commercial transport.

**Societal challenges**

4.2. A key component of a transition to net zero transport is **behaviour change.** The way we think about and use personal transport needs to change in order to succeed at net zero transportation. This is critical to understand as changes in transportation systems require **community buy-in** in order to be effective. Importantly, the transition to net zero has to be **just** and **fair** to all people.

4.3. Further, we need to be sure to incorporate all transportation if we are to address sustainable mobility and production. Public transport, including buses, trains and flight as well as private use vehicles, walking, cycling and scooters need to be considered together. Matching supply and demand is a challenge and there need to be developing **markets for low carbon industries** which can address price disparities across public and personal transport options.

**Innovation and skills**

4.4. Key stakeholders in the transport sector, including public transport bodies, infrastructure owners (airports, sea ports, Highways England), major transport operators (logistics companies, airlines, rail operators, maritime operators etc), must widen their approach to emissions. They must consider the impact of associated passenger and vehicle movements such as travel to train stations or airports, and how these can be tackled as a whole integrated problem. Further, in relation to the developing zero emissions mobility sectors, there is an emerging and critical **skills gap**. Some transition in skills provision in road cars is evident, but beyond that there is almost zero provision of training, a factor hindering development in the commercial sphere. Talent pipelines in areas like cyber, led by the National Digital Exploitation Centre, could be developed and replicated for zero emissions mobility, facing the growing skills gaps in supply chains currently orientated towards internal combustion engines. GW4 universities will be critical in growing and fostering training and skills, which will derestrict economic growth and high value job creation in low carbon industries.

## 5. Land Use and Food

**Policy and governance**

5.1. **What we do and how we use land, and how we develop that land for different activities is important.** The role of coastal and marine environment and how we manage (for example) the fishing industry in order to sequestrate carbon. **The divide between land and marine** rules is artificial and needs to be considered more as environmental rules, regulation and policy rather than land or marine separately.

5.2. When considering the way we talk about net zero, we need to factor in the **quantification of contribution of land use changes to net zero goals** at a regional scale – how much can fair, inclusive and sustainable land use changes add to cumulative net zero goals including agriculture, food and biodiversity, green and blue sequestration, renewable energy and historic/cultural (protected) landscape development. We need to avoid predatory delay, knowing there is always more we 'could' do, before taking bold steps. How do we hold the tolerance of needing to do something even if we don't all completely agree what the choice is?

5.3. We need to consider the policy of management and coordination of the private and public sector in farming spaces. Policy makers are having to reconcile the tensions here. **Joined-up governance** is needed in the region including **collaborative governance** schemes.

**Behaviour change and visibility**

5.4. Show, don't tell – People make decisions from the information they know. **In the future we could expect people to be able to more easily see the carbon footprint of their decisions** (e.g. purchases, travel, lifestyle). We could work on creating a regional programme that makes these measures more easily accessible to people or companies. This could be a **pilot for the UK**, and be rolled out (think food traffic light systems). Given the challenge of **behaviour change**, and recognition this is a space that needs greater understanding to form effective drivers, **the region could be a space to trial and test**.

5.5. Our plans will need to be visible and be communicated across the region and country to maintain momentum, vibrancy and change in this space. A better **coordination of the work** that is happening would be valuable e.g. via place-based thematic local and regional stakeholder groups. **Improving carbon literacy through skills development** and transfer is also required including for leadership in local and regional authorities and media.

5.6. Whilst technology is visible and tangible, the **cultural shift and behaviour change** that is required is significant and felt everywhere. How can we advocate and support people into shifting their personal preferences, even if they understand the impact that behaviour has? At an organisational level, we can support each other to achieve that. As a region we are of a size where we could do something that offers genuine insight into the value behaviour gap and explores drivers.

5.7. There are important links to be made on sustainable business practice in the wider sense – the workforce is an important factor in being successful in the context of reducing emissions. **Social sustainability** is as important as the carbon use.

**Opportunity**

5.8. Suggestion of the **development of Smart Land Use and Food Scheme** for the region including:

- Develop a **regional net zero lab** to trial whole systems approaches in sustainable agriculture and food systems that explore new technologies and practices, public attitudes, psychological aspects of behaviour change etc.
- Quantification of 1) decarbonisation potential of different land use practices including farming practices, and 2) sequestration potential of land and marine areas and 3) renewable energy potential of land.
- Need for promotion of biodiversity, nature-based solutions and protection of the subsurface and landscapes.
- Development of food systems based on co-creation together with the farming community and local food partnerships, food justice as well as health and nutrition aspects.
- Test of short-term packages as living labs across the region including decision where to put and how to choose them. Assessment of best scale e.g. recent success of peatland protection.
- Development and application of novel environment management schemes as well as business models and investment cases for farmers for example.

## 6. Next Steps

6.1. This workshop is just the beginning of our GW4 Accelerating to net zero initiative. We will work with our academic Ambassadors, other colleagues and external partners to progress the emerging ideas within this summary document. The ideas will contribute to a value proposition document setting out our regional vision and associated programmes of work that will deliver a regional transformational programme. We plan on sharing the document widely and discussing the content with funders and Government. We anticipate elements of this to be developed into bids as each strand is further progressed in collaboration.

*Phase 1: complete by end July*

- Prioritise emerging ideas from the workshop with our Ambassadors to agree areas we focus on as a region.
- Produce a regional proposition to deliver a regional net zero transformational programme.

*Phase 2: July onwards*

- Set up programmes to progress the agreed areas of focus, working with our Ambassadors, relevant stakeholders.
- Share our regional proposition and ambitions widely with specific discussions planned with government and funders to secure funding to deliver against our ambitions and unique potential.

## 7. Contact

7.1. For more information please visit the GW4 website: https://gw4.ac.uk/net-zero/
Email: netzero@gw4.ac.uk

**Annex 1: List of organisations represented the GW4's Accelerate to Net Zero Stakeholder Workshop**

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|---|---|---|
| Airbus UK | Devon County Council | South West Infrastructure Partnership |
| BANES council | Environment Agency | South West Water |
| Bristol Airport | Exmoor National Park | Swindon and Wiltshire LEP |
| Bristol City Council | Future Leap | Thales |
| Bristol Green Capital Partnership | Heart of the South West LEP | The Future Economy Network |
| Bristol's One City Climate Strategy | Industry Wales | Toshiba Europe |
| BT | Institution of Civil Engineers | UKRI - EPSRC |
| Business West | National Trust | UKRI - Innovate UK |
| Cardiff Capital Region (CCR) City Deal | NCCUK | UKRI - NERC |
| Cardiff University | Nesta | UKRI - Strategy Unit |
| Compound Semiconductor Centre | ONS | University of Bath |
| Connected Places Catapult | Pennon Group | University of Bristol |
| Cornwall and Isles of Scilly Local Enterprise Partnership | Plymouth Marine Laboratory | University of Exeter |
| Cornwall County Council | Regen SW | Welsh Government |
| Department for Transport | Siemens | Western Gateway |