

Senedd Cymru
Pwyllgor yr Economi, Masnach a Materion Gwledig
Economi Gwyrdd
GE28
Ymateb gan: Royal Society of Chemistry

Welsh Parliament
Economy, Trade, and Rural Affairs Committee
Green Economy
GE28
Evidence from: Royal Society of Chemistry



Royal Society of Chemistry response to the Senedd Economy, Trade and Rural Affairs Committee inquiry into the Green Economy, 7 March 2024

1. About the Royal Society of Chemistry

1.1 With about 50,000 members in 120 countries and a knowledge business that spans the globe, the Royal Society of Chemistry (RSC) is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world. Our members include those working in large multinational companies and small to medium enterprises, researchers and students in universities, teachers, and regulators.

1.2 We believe the chemical sciences can be, and must be, at the heart of the green economy, with chemical scientists already leading key advances in tackling the climate emergency, driving sustainability, and embedding the circular economy. Whilst elements of the necessary interventions remain reserved there are significant areas devolved to the Welsh Government where action can be taken.

1.3 We welcome the opportunity to respond to this consultation. If you have any questions or would like us to elaborate further, please contact Niall Sommerville, Public Affairs Manager, via



2. R&D and the economic impact of the chemical sciences

2.1 The chemical sciences are vital in achieving green economic growth. The UK's chemistry-using workforce contributes around £83 billion per year to the UK economy, with a significant amount of this activity happening in Wales.¹ Recent research by the RSC shows that green skills account for one in five skills mentioned in chemistry job postings, compared to 2.5% in the wider UK labour market², highlighting how central the green economy is to the chemical sciences and vice versa.

2.2 The Welsh Government needs to be ambitious in its approach to R&D as this will underpin large sections of the green economy. Wales currently lags behind other parts of the UK in terms of investment in R&D, both in terms of securing UK wide investment and in terms of that delivered directly or indirectly by the Welsh Government³. A step change is needed and the Welsh Government should return quality related core research investment in Wales to a comparable level with the rest of the UK. Over the last decade the approach to funding has seen Wales fall behind the rest of the UK in underpinning research investment, undermining its ability to deliver its full potential. The Welsh Government should embed research and innovation investment in its approach to supporting the development of the green economy and creating resilience to respond to future emergencies such the Covid 19 pandemic.

2.3 R&D-driven chemistry SMEs are working towards disruptive breakthrough technologies in sectors such as green energy, advanced materials, and medical treatments. Well-directed investment in our

¹ Royal Society of Chemistry, Chemistry's Contribution: Workforce trends and economic impact, September 2020. See <https://www.rsc.org/contentassets/8122a7694dd14a4f9779cec4e9dbb0a6/workforce-full-report>

² Royal Society of Chemistry, The Future Chemistry Workforce and Educational Pathways, December 2023 <https://www.rsc.org/globalassets/22-new-perspectives/discovery/future-workforce-and-educational-pathways-interim-report/chemistry-future-workforce-and-education-pathways-data-report.pdf>

³ ONS, Gross domestic expenditure on research and development, UK: 2019, released 4 August 2021. See <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datasets/ukgrossdomesticexpenditureonresearchanddevelopmentregionaltables>

“deep tech” ecosystem could deliver economic returns across Wales and is an area the Welsh Government should consider for future investment to unlock the potential in this sector⁴.

3. Circular economy and Critical Raw Materials

3.1 The shift to green technologies and net zero presents a significant economic opportunity for Wales and the UK but will also lead to a dramatic rise in demand for Critical Raw Materials (CRMs), putting substantial pressure on the supply side. Moving to a circular economy for CRMs in which these materials are recovered from e-waste and end-of-life batteries will increase their supply security, cut waste, and reduce the environmental impacts of mining and refining virgin materials⁵.

3.2 Collaboration is key to building an integrated circular economy that covers CRMs as well as carbon-intensive materials such as steel and cement. Chemistry will underpin this by driving innovation in design for material recovery; green and urban mining; and optimisation of end-of-life approaches. The Welsh Government should drive the transition to a sustainable circular economy of materials in partnership with relevant stakeholders including industry and the UK Government.

3.3 Whilst elements of creating a circular economy for CRMs remain reserved, there are significant opportunities within the devolved competence of the Welsh Government or that can be done in cross-government collaboration to deliver greener solutions for Wales. Examples of this are: investment in developing improved recycling infrastructure, promoting the waste hierarchy, and world leading research into sustainable materials.

i) Incentivise ‘reduce and re-use’: Strategies to tackle waste should follow the ‘waste hierarchy’, with measures that focus on reducing and re-using before discarding and eventually recycling. The Welsh Government should work with industry to introduce convenient product take-back schemes for waste electronics that guarantee secure data wiping, as well as a deposit return schemes for plastics.

ii) Invest in R&I that ensures we can recycle our waste: If everyone started recycling their household electronics today, there isn’t the available large-scale infrastructure to extract the rare elements. The Welsh Government should work in partnership with academia, industry and consumers to explore scientific solutions. Alongside this, investment must be made available to research the chemistry of materials to develop more sustainable plastics, and to find large-scale methods of recycling materials and recovering rare elements.

3.4 All sectors of the economy need to take action to reach ‘net zero’, including the so-called “hard to abate” sectors of metals manufacturing, minerals and chemical processing that operate in Wales. Interventions which incentivise scientific advances, support the workforce to innovate and deliver clean business operations are essential to delivering a productive economy, sustainable society and growing back greener.

3.5 The creation of a Minister for Climate Change and the embedding of climate change and net zero across Welsh Government departments is to be welcomed and demonstrates the cross departmental working needed to tackle these challenges and develop a green economy. Cross governmental

⁴ Royal Society of Chemistry, Igniting Innovation: The case for supporting UK deep tech Chemistry, 2021 <https://www.rsc.org/globalassets/22-new-perspectives/discovery/igniting-innovation/igniting-innovation-report.pdf>

⁵ Royal Society of Chemistry, No time left to waste for government - we need a circular economy for materials now, 2024 <https://www.rsc.org/news-events/opinions/2024/feb/un-global-resource-outlook-2024-circular-economy/>

working with the UK Government and the other devolved administrations will be crucial in ensuring Wales reaches its potential in delivering a green economy.

4. Skills and a brilliant science education

4.1 Chemistry using professionals play an important role in key Welsh industries, many of which will need to make significant technological and skills changes to meet the needs of a green economy. Welsh Government should work with its counterparts to ensure the monitoring required to inform a place-based understanding of sector capacity and skills exists to deliver place-based strategies to support green growth in Wales. As part of this there is a need to prioritise knowledge and skills retention within the Welsh economy to support ambitions for a research and innovation system, skilled workforce, and green economy which reaches its potential.

4.2 If we want to maximise the economic opportunities of a green economy it is necessary for us to ensure we have a science literate society, not just in terms of developing the STEM work force to deliver a green economy but to understand why the green economy is important, including the societal challenges we face due to the climate emergency. This requires a broad general science education and a focus on science and STEM more generally within the school curriculum. The RSC has raised several concerns regarding the proposed changes to GCSE science qualifications in Wales⁶, including directly with the Minister for Education and Welsh Language, we would welcome the opportunity to share these concerns directly with the committee. If we do not get the reform to qualifications and curriculum right just now, we will not create the requisite STEM workforce for the future, undermining the efforts of industry and others to deliver a green economy in Wales.

4.3 Further to this, measures are needed to ensure we have clear routes into further study in science, alongside apprenticeships and other routes into industry. Over recent years there have been growing concerns about the future science teaching workforce in Wales and we would welcome further measures to address these concerns, encouraging more people into teacher training and supporting them into employment in Wales. Delivering a comprehensive, well supported science education sits well within the remit of the Welsh Government and is vital to the future green economy.

4.4 We look forward to following the work of the committee in this area and would welcome the opportunity to discuss further the ways in which the chemical sciences can help drive the green economy in Wales.

⁶ Royal Society of Chemistry, Wales GCSE science changes: 'a missed opportunity', June 2023
<https://www.rsc.org/news-events/articles/2023/jun/gcses-wales/>