Public Consultation on the Department of the Environment, Climate and Communications Research and Innovation Strategy

Rediscovery Centre response

1.What gaps do you see in the Department's current research and innovation activities? How should we address those gaps in the Department Research and innovation Strategy?

One of the challenges in delivering climate and circular economy research and innovation is the very broad scope of activities that impact this area. This necessitates a significant degree of coordination as well as recognition of the overlap and interrelationships between sectors.

For example, sectors that are highly emitting and could be directly impacted by circular economy measures in Ireland include agriculture, construction and transport. Emissions relating to food production can be mitigated through food loss and waste prevention. A reduction in demand for construction products through adaptive reuse, building materials exchanges and other sustainable building strategies would not only cut GHG emissions associated with material extraction and manufacturing (e.g. a sector responsible for 7.5% of Ireland's emissions in 2021[1]) but also transport (e.g. a sector linked to 17.7% of Ireland's emissions in 2021).

Global emissions are also impacted by local circular actions, as many of our consumer goods are imported and the emissions associated with material extraction, manufacturing and transport are incurred elsewhere. This also underlines the importance of connecting and collaborating on local and global research and innovation.

A mechanism to coordinate, connect and leverage research and innovation in different sectors and disciplines (see also below) would be useful in addressing this gap.

2. What actions can the department take to identify future trends in the areas under our remit?

Consult with sectoral experts on research priorities. The EPA compiles the annual EPA research call based on input from Departments and Agencies - a similar mechanism for this

[1] See Circular Gap report here.

and other research calls, that also includes wider expert stakeholder feedback, would enable future trends to be incorporated.

In addition to identifying future trends, DECC should also consider shaping such trends. Policy is a key lever in improving the viability of circular economy activity, through for example:

- Developing secondary product and material markets and improving accessibility and availability of such products and materials to businesses
- Enabling circular business models to become economically viable
- Implementing regulations that demand certain environmental standards

For example, strong and sensible transposition of the EU's ecodesign directive for sustainable products will help to create an equal playing field for companies seeking to work with secondary materials as an input.

3. Are there specific thematic areas relevant to the Department's remit which you would like to see more research and innovation activity in? How can this be achieved?

The increase in funding for research and innovation in the circular economy in recent years is very welcome. Circular Economy research and innovation covers a vast array of sectors and themes from global supply chains to business models, marketing, behaviour change and technology. Significantly more research and innovation is required to understand how to overcome barriers and realise the economic social and logistical transformation required, with particular focus on engaged research and innovation to pilot and implement concrete measures that support circularity.

Research and innovation will also be required to support and enable new targets proposed under the National Waste Management Plan for a Circular Economy and roadmaps and targets due to be developed under the next Circular Economy Strategy to be realised. In particular,

- Coordinated research into behaviour change and awareness best practice. The Rediscovery Centre is undergoing a digital transformation through European LIFE funding, building on behavioural insight research to enhance communications and public engagement on the circular economy. This research, in addition to the EPA behavioural insights work, has proven critical in developing an understanding of circular behaviour trends and potential levers.

Building on this work, the Centre is undertaking a feasibility study with the DECC into the potential role and value of a Centre of Excellence for communications and behaviour change in the circular economy. Such a Centre would support research and innovation in the circular economy through signposting, supporting, proposing future trends and identifying best international practice in awareness, citizen engagement and behaviour change research.

- research into the investment and funding requirements to develop key infrastructure and systems to make circular practices more accessible, affordable and viable will be necessary. This again highlights the cross-sectoral and cross-disciplinary nature of the Circular Economy and the required level of collaboration between disciplines e.g. accounting, business models, supply chain, logistics, retail and marketing all play a role here.

- Construction and demolition waste is by far the largest waste stream in Ireland, yet a relatively small portion of this material is recycled. The EPA is aware of this challenge and is in the process of establishing End Of Waste criteria for such materials so that the use of secondary construction materials may be increased. However, this process needs continued monitoring and evaluation in order to ensure that the quality of secondary materials made available through such processes are of high and durable quality, and to build and maintain industry confidence.

4. Have you views on the impact of disruptive technologies such as AI, Quantum and 6G as part of the digital transformation agenda and the implications of these technologies for the Department?

Digital technologies have significant potential to support the Circular transition, enabling a better understanding of behaviour, business models and supply chains through tagging and tracking real time data on products, services and materials and facilitating communication.

However, the digital transition is not without impacts and these must be recognised. The carbon footprint of our gadgets, the internet and the systems supporting them account for about 3.7% of global greenhouse emissions, according to some estimates. These emissions are predicted to double by 2025.

As we increasingly rely on digitalisation, the requirement for upgraded or new hardware and software drives increased consumption of electrical and electronic equipment as well as data. In addition to IT, devices, communications and related equipment, technologies such

as the Internet of Things (IoT), sensors and actuators have a shorter lifespan which leads to increased waste in the environment.

Electrical and electronic waste is the fastest growing waste stream globally with 53 million tonnes produced annually. In Ireland in 2022, 19.5 million units of WEEE were collected for recycling meaning the embodied carbon and value of these items was destroyed.

In addition, the increased use and storage of data involves increased energy consumption. According to the CSO, the percentage of metered electricity consumed by data centres rose from 5% in 2015 to 14% in 2021. This highlights the significant energy demand related to the storage and use of data.

Through the LIFE funded DIRECT project referred to above, the Rediscovery Centre is developing a low-carbon website that will act as a gold standard in Ireland. This will illustrate how measures can be taken to mitigate some of the energy consumption associated with data through web design. The website is expected to go live in mid September.

Overall, any move to support or engage with disruptive technology must therefore take into account the balance between the climate or circular benefits this may bring with the carbon footprint of the consumption of associated hardware, software and data.

5. How can the Department better communicate its research and innovation needs?

The Minister for Further and Higher Education, Research, Innovation and Science recently launched a public consultation to inform the development and co-creation of a National Framework for Engagement between policy practitioners and the higher education research sector. The consultation will seek to collate and understand the existing practices by which researchers engage with policy practitioners in providing evidence for public policy development.

This process of consultation, engagement and establishment of a framework would support the wider communication of needs, sourcing of evidence to support policy development and identification of trends. It would be recommended that such a framework extends beyond higher education researchers to other research bodies (such as the Rediscovery Centre, Circuleire, etc), networks and practitioners in the circular economy.

6. How can the Department work more effectively to source evidence from the national research and innovation community to support its work in policy development, policy implementation, and the uptake of new technologies?

In addition to the above, thematic open calls for research aligned with policy requirements can provide valuable opportunities for the R&I community to develop evidence and pilot

projects that inform and guide policy development and implementation. Some examples of open calls supporting circular economy R&I include Green Enterprise, Circular Economy Innovation Grant Scheme, EPA research calls and SFI societal challenges.

Providing the R&I community with the opportunity to input into the development of these calls (e.g. emerging themes of interest) would also be welcome, as per the response to question 2.

In addition, we recommend the development of a conference or event to provide a forum for discussion and dissemination between government and researchers. This may build on the EPA annual Circular Economy conference, which is currently a one day event which limits the number of speakers having the opportunity to present research.

7. How can the Department engage more effectively with all stakeholders in the national research and innovation system? If you are responding on behalf of an organisation, please state how the Department could more effectively engage with your organisation.

As highlighted above, the Rediscovery Centre is undertaking a feasibility study into developing a Centre of Excellence for communications and public engagement. This feasibility study builds on previous public engagement work carried out by the centre and on the identified need in the *Whole of Government Circular Economy Strategy* (WGCES) to support the development of a national circular economy online platform, and for an overarching national circular economy 'brand' for Ireland. As stated in the WGCES, the national online platform will go beyond communicating about waste to provide an authoritative source of information about what the circular economy is and how the transition is taking place in Ireland, identifying key actors, ongoing initiatives at the local, regional, and national levels and areas of likely future progress.

This platform could also support the Department in engaging stakeholders in the national research and innovation system, through facilitating the signposting of research on the circular economy and helping to facilitate increased collaboration. The Rediscovery Centre is working closely with the Department on the design of this platform through the feasibility study.

8. Should the Department seek to grow its capacity to carry out in-house research? If yes, how can this be achieved?

We suggest that the more efficient use of resources may be for the department to continue funding research that is being conducted by institutions like universities and research

institutes which already have the requisite experience, personnel and internal frameworks in place.

9. Are there examples internationally of Government strategies on research and innovation in climate, communications / digital, circular economy, cyber security, energy or environment that we should examine? If so, can you provide details?

The UK National Interdisciplinary Circular Economy Research (NICER) programme was a major research programme encompassing 34 universities and 200 industry partners aiming to catalyse the UK's shift to a circular economy.

The programme is now coming to an end and it is therefore an opportune moment to reflect on the success and effectiveness of this as a case study. Importantly, the programme involved one coordinating hub and five national research centres all of which supported interdisciplinary research, innovation and impact, an example of cross disciplinary and coordinated research as referred to above.

10. Are there any other matters you wish to raise in relation to the development of the research and innovation strategy?

(None)