To support UK industry in their efforts to electrify transport, government should:

Update the legal framework governing end-of-life vehicles and batteries to support the circular economy and harmonise legislation with our biggest markets

Build and invest in a domestic EV battery collection and recycling infrastructure

Foster the development of internationally competitive sustainable EV battery designs by promoting engagement between academic research and industry

Support the EV and battery manufacturing sector in the UK to encourage use of secondary CRMs, including to comply with the rules of origin for battery cathode materials specified in the EU-UK Trade & Cooperation Agreement

To work towards a circular economy of materials that enables decarbonisation, unlocks business opportunities for the whole of the UK and contributes to more secure raw material supply, we recommend that government:

Takes an integrated view across industry sectors and across departments to drive a circular economy strategy that minimises environmental impacts and maximises resource efficiency and recovery of both CRMs and foundation materials such as steel and concrete, putting these sectors on a sustainable and competitive trajectory

Incentivises product design for efficient and simple deconstruction, reuse and recovery, including through regulation

Supports coordination and collaboration:

- o Between different industrial sectors (e.g. steel manufacturers and businesses relying on
- o and maximise the use of high-quality secondary raw materials recovered from waste
- Between academic research and industry to foster development of more sustainable product designs and deployment of economically viable material recovery technologies

Skills needs for the net zero transition

Employees in a range of sectors, including those working in carbon-intensive industries, will need policies in place to support the reskilling and upskilling that will be required to adapt to new opportunities in the net zero transition. Hard-to-abate sectors which will need to see some of the most significant changes in operational and skills requirement are regionally clustered, largely concentrated in Scotland, Wales and the North of England, and will need to form part of the considerations for achieving equality of opportunity across the UK.

RSC research<sup>17</sup> has shown that chemistry-using professionals in these sectors are similarly concentrated, with 58% of those employed in the manufacture of basic metals located in Wales, and 63% of those in the mineral industries (including glass, ceramics and cement) based in the North-East, Yorkshire & Humber regions. The ongoing work of the Just Transition Commission<sup>18</sup> will inform the Scottish Government on a long-term path for these currently high-emissions workforces. However, other nations of the UK should recognise this issue and prepare policy responses.

Royal Society of Chemistry, 2019.

<sup>&</sup>lt;sup>18</sup> Just Transition Commission. Scottish Government.

Sustainability skills and knowledge are becoming increasingly important to the chemical sciences. The majority of respondents to our Science Horizons Researcher Survey said that their work had potential applications in one of the global challenge areas we identified, with 86% identifying applications in relation to the environment and 68% to energy<sup>19</sup>. However, practising chemists working in academia and urrent skills and knowledge and those needed for

green jobs now and in the future. 94% of those who identified a gap said it is at least moderately significant<sup>20</sup>.

In our recent research, Green Shoots: a sustainable chemistry curriculum for a sustainable planet<sup>21</sup>, teachers, pupils and practising chemists working in academia and industry told us their views on sustainability and climate change in the school chemistry curriculum. We are calling on Government to urgently prioritise updating the school chemistry curriculum so it prepares all young people to fully participate in efforts to tackle climate change and sustainability challenges and ensure young people have the skills and careers information needed to progress into green jobs in the chemical sciences and contribute to the future green economy.

Question 5: Where and in what areas of policy focus could net zero be achieved in a more economically efficient manner?

The drive towards net zero will significantly impact air quality: policymakers will need to consider this fully and take coordinated action to address both areas. The health impacts associated with air pollution have an economic cost in addition to a cost to public healthcare services. In 2020, CBI Economics reported that the UK could gain an additional 3 million working days by reducing the morbidity associated with its air quality, making a £600 million gain in reduced workplace absences<sup>22</sup>.

Climate change and air quality are linked<sup>23</sup>. Often, measures to reduce carbon emissions towards net zero a

new target or particulate matter 2.5 (PM2.5, one of the most harmful pollutants), estimated that 72% of the £135 billion total benefit resulted from greenhouse gas reduction<sup>24</sup>. However, there are also policy options to achieve net zero which could result in trade-offs with air quality, for example uncertainty of the impact of hydrogen blending in domestic gas supply<sup>25</sup>, or large scale and urban tree-planting that could increase emissions of biogenic volatile organic compounds leading to an increase in ozone and organic PM2.5 formation.<sup>26</sup> Impact on air quality should be considered in developing and implementing

likely to switch to a rival of their preferred brand if they knew the product was made in a sustainable way. Almost three quarters of people we surveyed said they believe the government should take urgent action to tackle e-waste before the situation gets any worse.

Question 29: How can we ensure that we seize the benefits from future innovation and technologies?

Public procurement can be used as a driver of innovation through the adoption of novel solutions promising transformative capabilities. The Government should create ambitious tenders designed and structured to attract innovative proposals, allowing an enhanced risk appetite to encourage innovative solutions including those from research-driven SMEs. Efforts to minimise the bureaucracy involved in submitting proposals may increase accessibility for SMEs with lower resources and/or little experience in submitting proposals to government (though due diligence remains important, as well as tracking impact). Procurement processes may also want to consider UN sustainable development goals and the SMEs working to further them.

Innovative chemical technologies will be key to solving many of the challenges associated with reaching net zero including energy generation and storage, carbon capture and storage, and reducing the impacts of farming and food supply among others. We have published research<sup>34</sup> into how government actions could support the innovation ecosystem in *Igniting Innovation*, in order to ensure that more home-grown innovative solutions are providing benefits both towards achieving net zero and for the UK economy.

In short, R&D-driven chemistry SMEs need access to the people, facilities and funding that will allow them to pursue disruptive, capital-intensive research over long and uncertain timescales. Government support plays a vital role in this ecosystem to boost early-stage companies and address market failures where venture capital and other private funding is not available, such as for chemistry companies needing to buy equipment to scale up their production. Efforts to reach net zero could be boosted by supporting relevant companies, as science and innovation will be needed to solve climate challenges. Behavioural change alone will be insufficient to meet agreed targets.

Question 30: Is there a policy idea that will help us reach net zero you think we should consider as part of the review?

As we have detailed in our responses to Q4 and Q5 government could develop policy in a number of areas to support a flourishing net zero economy, specifically:

Creation of a circular economy of materials

Updating the school chemistry curriculum to ensure young people have the skills and careers