Cross Party Group on Science & Technology

Tuesday 7 September 2021, 18:00-20:00

Zoom

Climate Change Mitigating Technologies: Minutes

1. Attendance & apologies

In attendance:

MSPs: Clare Adamson, SNP (Convenor); Brian Whittle, Conservatives; Finlay Carson, Conservatives.

Non-MSPs: Zoe Shipton; Alastair MacGregor; Albert King; Alison McLure; Alistair Taylor; Allan Colquhoun; Bill Sloan; Clare Reid; Cristina Clopot; Daria Tuhtar; David Cole-Hamilton; Derek Stewart; Derek Young; Florence Bullough; Gavin Gibson; Kathleen Hill; Kitty Meeks; Laura Alexandra Smith; Mark Dames; Tim Hurst; Niall Sommerville; Simon Andrews; Stuart Farmer; Susan Burr; Sylvia McKay; William Duncan; William Hardie; Marc Strathie; Andrew Mackenzie; Stuart Fancey; Maria McPhillips; Alfie Gaffney

Apologies:

Fred Young, Katherine Duncan.

It was noted that in-line with Covid-19 regulations, the group is quorate, and able to progress with the re-establishment of the CPG.

Thanks were given to Liam MacArthur MSP, Scottish Liberal Democrats, and Ian Gray, Scottish Labour for their support of the CPG.

2. Re-establishing CPG (need to register CPG by 31 October)

- **Election of Convener**

- Clare Adamson MSP was nominated to continue as Convener by Alfie Gaffney (RSE), with the nomination seconded by Brian Whittle MSP.

- **Election of Deputy Convener**
- Brian Whittle MSP was nominated to serve as Deputy Convenor by Alfie Gaffney (RSE), with the nomination seconded by Clare Adamson MSP.

- **Election of Secretariat**
- Alfie Gaffney, on behalf of RSE, was nominated to serve as Secretariat by Clare Adamson MSP, with the nomination seconded by Alison McLure (IOP).

- It was noted that the CPG is pursuing more MSP members, and would be grateful for any suggestions to increase involvement.

- **Proposal to broaden remit to encompass social sciences**

    - Members were in-principle receptive to the proposal that the remit & membership of the CPG be extended to include the social sciences, noting that it would be advantageous for the group to consider cross-cutting issues, such as climate change, and include a wide(r) range of perspectives in debates.
    - It was noted that broadening the remit of the CPG would not add any further burden to the secretariat.
    - Feedback from members on the proposal to extend coverage of CPG to include social sciences should be submitted to the secretariat.
    - The inclusion of the social sciences and potential re-naming of the CPG will be included as agenda items at the next CPG meeting.

3. Six short presentations on a range of climate change mitigation technologies

A copy of each set of slides has been circulated alongside the meeting minutes. For further information on the presentations, please contact the Secretariat.

Simon Andrews, Fraunhofer UK presenting on *Wind Farms*

- Simon's presentation discussed: wind LIDAR (used to measure complex seascape/wind profiles, maximise efficiency gains, power cable sensing and monitor cable conditions) and photonic tools (lights, lasers, optical systems; exploring the role of automated asset management, use of photonics in agriculture, e.g., to minimise energy use and maximize growth; and hydrogen detection over large areas, e.g., Sellafield warehouse to determine repairment requirements). Simon highlighted the enabling role of photonic technologies in the efficient introduction and long-term sustainability of net-zero technologies.

Tim Hurst, Wave Energy Scotland presenting on *Wave Energy*

- Tim's presentation discussed: the basics of wave energy, the importance of a mix of low-carbon technologies; global deployments of wave, tidal stream and floating offshore wind technologies; WES's Scottish Government-backed programme which is culminating in the demonstrations of two technologies (Wave Device Programme w/Mocean Energy and a large Scottish supply chain; Wave Device Programme w/AWS); how to bridge the gap to commercialisation (e.g. by developing the Scottish supply chain and harnessing alternative markets, such as oil and gas).

Professor Derek Stewart, James Hutton Institute presenting on *Vertical Farming*

- Derek's presentation discussed: vertical farming as a route to climate positive food. The presentation covered the increasing probability of extreme weather events and their impact on the spread of harvests, quality of yields, and GHG emissions; the role of the Advanced Plant Growth Centre in developing vertical farming solutions; the importance of co-locating different disciplines to facilitate innovation, developing edible 'green batteries' as solutions which can be marketed abroad, the importance of peri-urban conditions to increasing the yield of nutritionally-high produce and saving money via import substitution. Solar farms, wind power, re-purposing mining shafts via heat exchangers, and anaerobic digesters were highlighted as climate positive vertical farming options in Scotland.

Professor Zoe Shipton FRSE, University of Strathclyde presenting on *The Role of the Subsurface in Reaching Net Zero*

- Zoe's presentation discussed: the range of sub-surface applications that can contribute to achieving net-zero, including hydropower, hydrocarbons, carbon capture & storage (via industry expansion), longer duration seasonal storage (solar power, wind energy, and compressed air energy storage), and geothermal energy (e.g., United Downs project hitting a source of lithium to heat homes, potential to do the same in the Cairngorms/Aberdeen via hot granites generating geothermal energy). The importance of Scotland's ex-mining infrastructure was highlighted as a source of geothermal energy; touching on the HotScot project as a means of drawing from the Scottish Industrial Revolution, re-purposing an environmental hazard as a resource via warm minewater driving heat pumps (providing a consistent heat source, which increases efficiency, is available at scale, and is distributed across the central belt, co-located with areas of heat demand and energy poverty).
- For further information on Carbon Capture Storage in Scotland, please see here: https://theacornproject.uk/about/.

Professor Bill Sloan FRSE, Glasgow University presenting on *Water Treatment Technologies*

- Bill's presentation discussed: the roots of the urban water cycle; the importance of the Loch Katrine supply stream, the introduction of the Trunk sewer system into Glasgow; the establishment of (unsustainable) centralised water treatment and wastewater treatment centres; the energy intensive nature of Scottish Water's activity; the need to fuel technologies via green energy sources; the negative impacts on rural communities; biological treatment as a low-energy solution; installing enhanced biological wastewater treatment solutions on Scottish islands; the challenges posed by Scotland's rural demographic.

Clare Reid, SCDI presenting on *Climate Tech – Innovation Critical* Report

- Clare's presentation discussed: the role of digital technologies and their applications which support/enable climate action; Scotland's growing climate tech ecosystem; three case studies were highlighted: Integrated Environmental Solutions (build digital twins to help building owners to design/re-furbish buildings to minimise their carbon footprints, Space Intelligence (applying Machine Learning to satellite data to help farmers manage their land use more sustainability), IntelliDigest (reducing food waste via sustainable packaging). The fast-growing tech sector, enterprise and skills agencies, world class universities/colleges, community of angel investors and thriving fintech sector (as a potential climate tech cluster). The presentation also stressed the importance of embedding carbon and digital literacy across early years, education and training, the need to increase diversity in the sector, and encourage open data sharing and investment in enabling infrastructure, e.g., 5G.

4. Discussion session

Following the presentations from the speakers, a discussion session was held. Issues around the following topics were discussed: sustainable electricity production, grid capacity, battery storage and lifecycle; rare earth element mining; establishing a circular economy; co-producing heat and lithium from granite; reducing storage requirements; the design of consumer goods to encourage de-commissioning over disposal; pests and pathogens in vertical farming; shifting employment patterns in the farming sector; pH farming and producing genetically modified tobacco to produce vaccines, increase pharmaceutical security via low cost solutions; re-using industrial brownfield sites; the importance of embedding innovative solutions early in the design stage; public engagement with the climate crisis.

The following links were also shared:

- European Chemical Society European Parliament Workshop on Lithium (1st December 2021): https://www.euchems.eu/lithium-element-webinar/.

- A new periodic table which highlights how much of each element there is, and how much time we have left for each one if we carry on as we are in the linear economy: https://www.euchems.eu/euchems-periodic-table/

- The following IOP article was shared: https://iopscience.iop.org/article/10.1088/1748-9326/ab8589/pdf

5. Dates and themes for future meetings

A date for the next meeting of the CPG will be set following re-registration of the group.

It was noted that the next CPG meeting could be themed around aspects of the recently published Programme for Government which relate to Science and Technology

Please send any further recommendations on future themes to the Secretariat.

6. AOB

There was no additional business discussed.