

Written evidence submitted by Greenpeace UK (CGE0022)

1. Thank you for the opportunity to submit evidence to this inquiry. It is a timely moment to consider this issue.
2. The recent report by IPCC Special Report on 1.5°C warming says that tackling climate change is even more urgent than we have previously thought because. A global average temperature rise of 2°C is now understood to be much more dangerous than believed in 2015 when the Paris deal was signed. To meet the lower target, global CO2 emissions will need to be halved by 2030 in order to avoid dependence on as-yet-speculative technologies for CO2 removal.
3. UK Government has quite correctly asked the Climate Change Committee to advise on when and how UK should move to 'net zero' greenhouse gas emissions, a move that Greenpeace publicly welcomed. However climate change must not be seen as a '2050 problem' but a '2030 problem' because failure to deliver meaningful and substantial cuts in greenhouse gas emissions by that date forecloses the possibility of keeping the climate away from risky thresholds. This means, for example, by 2030, oil and gas use will need to decline rapidly: a pathway that does not rely on CO2 removal technologies would see oil declining globally by 37 % below 2010 levels by 2030 and gas by 13%¹. This means that no further oil development is necessary because expected decline rates in reserves will essentially match decline rates required for climate safety². This means for the UK that further North Sea oil development is incompatible with 1.5°C and should be stopped immediately. In turn that should mean an end to research, technology development and tax breaks for deployment for fossil fuel extraction technology.
4. The committee has asked for views on relative importance of, and priorities for new technology in 4 sectors:
 - 'Improving Our Homes';
 - 'Accelerating the Shift to Low Carbon Transport';
 - 'Delivering Clean, Smart, Flexible Power'; and
 - 'Enhancing the Benefits and Value of Our Natural Resources'.
5. However there are issues that goes beyond specific technologies and apply to all sectors. Two are highlighted here. First - most UK carbon emission reduction has happened in the power sector whilst having little impact on most peoples' day to day lives. That phase is coming to an end as transport, heat, and deep decarbonisation of the power sector will likely impinge on peoples' lives in a much more intimate way. Tackling climate change will not be a technological revolution alone, but a social and political process as well. Alongside all new technology there needs to be other innovation work designed to assess and support

¹ https://storage.googleapis.com/planet4-international-stateless/2018/10/4ebf8640-ipcc-sr15-key-takeaways-greenpeace.pdf?utm_campaign=climate-change&utm_source=greenpeace.org&utm_medium=post&utm_term=yes&custom=apac

² https://twitter.com/Peters_Glen/status/1055378982617649152

how people interact with new technologies and the concerns, difficulties or legitimate misgivings that people have about the changes required. We believe that all innovation and technology development needs to have that, to a greater or lesser extent, as an element of the RD&D process.

6. Second, the sectors of power, heat and transport cannot be considered separate from one another given the likely close interdependence of all the sectors on (low carbon) energy vectors of electricity and hydrogen. The precise role of hydrogen is less clear than that of power but it is likely that both will be important. Scale of deployment of each will impact the other e.g. hydrogen deployment for heating will reduce the need for power distribution network upgrades. We also believe that low cost power will provide the backbone for hydrogen production. Indeed this has already begun with the planned 100MW power to hydrogen plant in Germany expected to use wind power as the main source³. The interconnections between their uses will need constant monitoring and evaluation as new technologies develop and are deployed.
7. Bearing in mind the need to deliver demonstrable impact by 2030 we suggest the technology priorities in the committee's identified sectors should be as follows:
 - a) 'Improving Our Homes'
 - Energy efficiency **deployment**, with a short term focus on technology/innovation cost-cutting on solid wall insulation
 - Large-scale pilots **trials** on the supply of low carbon heat looking at the technological & network implications of uses of heat pumps, hybrid heat pumps, district heating, and hydrogen/decarbonised power in whole areas rather than individual properties
 - **Research and experimentation** in political processes allowing decision making for small areas on the preferred low-carbon heating technology
 - b) 'Accelerating the Shift to Low Carbon Transport'
 - **Deployment** of electric charging infrastructure, informed by research on how charging behaviour of early adopters evolves to ensure cost-effective locations for public chargepoints
 - **Development** of tools to manage network impacts of large scale uptake of electric cars and other vehicles
 - **Technology development** for electrification and/or zero-carbon gas power for large vehicles such as HGVs, tractors, off-road construction equipment
 - c) 'Delivering Clean, Smart, Flexible Power'
 - **deployment** of low cost renewables. As identified by the Climate Change Committee this will be quicker and cheaper than nuclear plants. Given that technology costs decrease with scale up of global deployment, UK should do this most cost-effectively by being cogniscent of global technology trends which are emphasising wind (onshore and offshore) and solar
 - **research and development** support for early stage grid flexibility technologies

³ <https://renewablesnow.com/news/tennet-gas-grid-partners-aim-to-build-100-mw-power-to-gas-plant-in-germany-630396/>

- **barrier removal** for close to market grid flex technology
 - **research and development** for newer power storage technologies, particularly for storage at low cost for periods of more than a week
 - **research** into revamping the electricity market for clean power and its wider role in overall energy system, as it is now clear that the existing market may not be fully fit for purpose for very high penetration of variable renewables. This is already an active field and ideas have been developed by BNEF⁴ and UCL⁵.
 - We see no useful role in spending RD&D money on new nuclear given its intractable risks of proliferation and waste. And remembering that the climate issue is now very much a '2030 problem', the Committee should note that the contribution of new nuclear tech by 2030 will be negligible.
- d) 'Enhancing the Benefits and Value of Our Natural Resources'
- We are sceptical of deployment of bioenergy in its current forms, other than in the form of genuine waste arisings
 - Instead, **research and development** support for synthetic gases such as those supported at LanzaTech⁶ for aviation, using industrial waste gases would be valuable
 - The consequence of a 'net zero' target for UK will be that we will need to sequester of carbon through land use changes. Much of this is **deployment** in for example, restoring peatland, re-forestation where what needs to be done is well understood.
 - However there is a need for **research** to develop better understanding of the relationship between agricultural practices so that evidence policy support can be developed, specifically on
 - soil carbon increases
 - N2O emissions
 - methane emissions.

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⁴ <https://data.bloomberglp.com/bnef/sites/14/2017/05/Liebreich-Six-Design-Principles-for-the-Power-Markets-of-the-Future.pdf>

⁵ https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett/files/uk_industrial_electricity_prices_-_competitiveness_in_a_low_carbon_world.pdf

⁶ <http://www.lanzatech.com/lanzatech-virgin-atlantic-secure-uk-government-grant-develop-world-first-waste-carbon-jet-fuel-project-uk/>