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The IPCC Special Report on Global Warming of 1.5°C

"Humans are at the centre of global climate change: their actions cause anthropogenic climate change, and social change is key to effectively respond to climate change" (Chapter 4.4.3)

The IPCC Special Report on Global Warming of 1.5C (SR 1.5C) collates the latest scientific findings on the impact to humans and eco-systems of a global mean surface temperature (GMST) rise of 1.5C, differences between 1.5C and 2C, and pathways to stabilize GMST at 1.5C, above pre-industrial levels.

The aim of this report is to better understand the Paris Agreement commitment to pursue efforts to limit temperature increase to 1.5C above pre-industrial levels – if this was possible and if it would result in significant reductions of suffering to humans and eco-systems compared to a 2C temperature rise limit.

Without urgent greenhouse gas (GHG) emission reductions, current greenhouse gas (GHG) emission levels would result in an approximate +4C rise by 2100.

This report is in two parts:

- **Part One** is our Quaker UN Office coverage of SR 1.5C conclusions. It is based on the draft Summary Report for Policy Makers, **but as this document is being negotiated as we write, points below must be considered as a QUNO summary, and not as direct SR1.5C quotes.**
- **Part Two** highlights points in the full Report (some 700 pages long) which consider behavior changes, consumption and related policy actions. **While unlikely to change, these quotes remain a draft and may be subject to copy editing before the final draft. They cannot yet be stated as final quotes. The FINAL REPORT should be adopted and online by 8 October.**

Part One

1. Human activities have caused approximately 1.0°C of global warming.

2. Many regions in the world are experiencing warming that is greater than the GMST, including two to three times higher in many Arctic regions.

3. Weather extremes may be associated with every additional 0.5°C of warming.

4. It remains possible to hold GMST at 1.5C; if all emissions caused by humans were suddenly reduced to zero, built in warming would be less than 0.5°C

5. Climate-related impacts on people and nature is higher at 1.5°C than today, yet even higher at 2°C.

6. Limiting global warming to 1.5°C compared to 2°C would make it easier to achieve many aspects of sustainable development, with greater potential to eradicate poverty and reduce inequalities.

7. The consideration of ethics and equity can help minimize adverse effects and maximize benefits associated with efforts to limit global warming to 1.5°C.

8. Strong governance, institutions, policy, technology innovation, finance, changes in human behavior and lifestyles are important for a chance to hold GMST to 1.5°C.

9. Limiting global warming to 1.5°C compared to 2°C would lessen the chance of increases in heavy precipitation events in several northern hemisphere high-latitude and high elevation regions. Compared to 2°C global warming, less land would be affected by flood hazards and the probability of droughts would be lower in some regions, including the Mediterranean and southern Africa.

10. By 2100, global mean sea level rise would be around 0.1 metre lower with global warming of 1.5°C compared to 2°C. Sea level will continue to rise well beyond 2100.

11. Marine ice sheet instability in Antarctica and/or irreversible loss of the Greenland ice sheet could result in multi-metre rise in sea level over hundreds to thousands of years. There is *medium confidence* that the threshold for such instabilities could lie around 1.5 to 2°C.

12. On land, risks of climate-induced impacts on biodiversity and ecosystems, including species loss and extinction, are lower with 1.5°C of global warming than 2°C.

13. Impacts associated with other biodiversity-related risks such as forest fires, and the spread of invasive species, are also reduced at 1.5°C compared to 2°C of global warming.

14. Limiting global warming to 1.5°C rather than 2°C could also prevent the thawing over centuries of an estimated 2 million km2 of the existing permafrost area.

15. Limiting global warming to 1.5°C compared to 2°C is expected to reduce increases in ocean temperature as well as associated increases in ocean acidity and decreases in ocean oxygen levels.

16. With 2°C global warming, at least one sea ice-free Arctic summer is projected per decade. This likelihood is reduced to one per century with 1.5°C of global warming.

17. Global fishery models, for example, project a decrease in global annual catch for marine fisheries of more than 3 million tonnes for 2°C of global warming versus a loss of 1.5 million tonnes for 1.5°C of global warming.

18. Climate-related risks to health, livelihoods, food and water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.

19. Poverty and disadvantage are expected to increase in some populations as global warming increases; limiting global warming to 1.5°C, compared with 2°C, could reduce the number of people susceptible to poverty.

20. Lower risks are projected at 1.5°C than at 2°C for heat-related morbidity and mortality and for ozone-related mortality if emissions needed for ozone formation remain high.

21. Limiting warming to 1.5°C, compared with 2°C , is projected to result in smaller net reductions in many cereal crops, and in the CO2 dependent, nutritional quality of rice and wheat.

22. Depending on future socioeconomic conditions, limiting global warming to 1.5°C, compared to 2°C, may reduce the proportion of the world population exposed to a climate change induced increase in water scarcity.

23. Risks to global economic growth posed by climate change-related impacts are projected to be lower at 1.5°C than at 2ºC of global warming.

24. Most adaptation needs will be lower for global warming of 1.5°C compared to 2°C.

25. In pathways with no or limited overshoot of 1.5°C, global CO2 emissions decline by at least 35% from 2010 levels by 2030, reaching net zero around 2050,[1] and involve deep reductions in emissions of methane and black carbon as well as in most cooling aerosols (35% or more by 2050 relative to 2010).

26. The current Nationally Determined Contributions (NDCs) submitted under the Paris Agreement could not limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030.

27. Challenges from delayed actions to reduce GHG emissions include the risk of cost escalation, lock-in in carbon-emitting infrastructure, stranded assets, and reduced flexibility in future response options in the medium to long-term.

28. There are 1.5°C pathways with low energy demand, low material consumption, and low GHG-intensive food consumption that have the most pronounced synergies and the lowest

[1] C1. For comparison, limiting global warming below 2°C implies CO2 emissions decline at least 20% by 2030 in most pathways and reach net zero around 2075. Pathways that limit global warming to 1.5°C and those that limit warming to 2°C involve similarly ambitious reductions in non-CO2 emissions. (*high confidence*) {2.1, 2.3, Figure SPM3a}

number of trade-offs with respect to sustainable development and the SDGs. Such pathways would reduce dependence on carbon dioxide removal (CDR).

29. The impacts of land-based CDR and other land-intensive mitigation options on Sustainable Development Goals depend on the type of options and the scale of deployment. If poorly implemented, options such as bioenergy and carbon capture storage, agriculture, forest and other land use would lead to trade-offs.

30. Redistributive policies across sectors and populations that shield the poor and vulnerable can resolve trade-offs for a range of SDGs, particularly hunger, poverty and energy access. Investment needs for such complementary policies are only a small fraction of the overall mitigation investments in 1.5°C pathways.

31. Limiting the risks from global warming of 1.5°C in the context of sustainable development and poverty eradication implies system transitions that can happen with increased adaptation and mitigation investments, policy instruments, the acceleration of technological innovation and behaviour changes.

32. The redirection of world savings towards investment in infrastructure for mitigation and adaptation could provide additional resources.

33. Pathways limiting global warming to 1.5°C with no or limited overshoot involve the redistribution of global investments in infrastructure. Average annual investment in low carbon energy technologies and energy efficiency roughly doubles while investments in fossil fuel extraction and conversion decrease by about a quarter over the next two decades.

34. Policies exist which can help secure the equity of transition, and include such examples as redirect global world savings, integrate explicit carbon pricing, and reduce fossil fuel subsidies.

35. Education, information, and community approaches, including those that are informed by Indigenous knowledge and local knowledge, can accelerate the wide scale behaviour changes consistent with adapting to and limiting global warming to 1.5°C.

36. Social justice and equity are core to climate-resilient development pathways that aim to limit global warming to 1.5°C as they address challenges and inevitable trade-offs, without making the poor and disadvantaged worse off.

37. The potential for climate-resilient development pathways differs between and within regions and nations, due to different development contexts and starting points.

38. Pathways that are consistent with *sustainable* development show less mitigation and adaptation challenges and are associated with lower mitigation costs.

39. Cooperation in governance and (gender responsive) policies, alongside innovative financing and cooperation on technology development and transfer can ensure participation, transparency, capacity building, and learning among different players.

40. International cooperation can support the implementation of 1.5°C consistent climate responses in developing countries and vulnerable regions, by enabling access to finance and technology and enhancing capacities that can complement domestic resources.

Part Two

The SR1.5C includes a collation of recent scientific research on behavior change, individual actions and policy approaches.

For the purpose of Monday's inter-faith gathering at Friends House, we offer **a few highlights** from the SR1.5C on behavior change and individual action.

Please note – quotes below remain in draft form and may be subject to copy editing or changes, until the final adoption by States.

Finally, we will add highlights on sustainable development and sustainable economic models when time permits, but are, at the time of writing, still covering the negotiation process.

Buildings & Investment (Chapter 2 section 2.5.2) (see also conclusions, above)

- Transformation towards 1.5°C requires a major shift in investment patterns. (2.5.2.2 pp81:12 -15)
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- End use systems, e.g. heating and air conditioning are an area for both policy and individual improvement. (2.5.2.2, pp 81: 17 – 40)

Diet (Chapter 4 Section 4.3.2)

- "Increased temperatures, including 1.5°C warming, would affect the production of cereals such as wheat and rice, impacting food security" (pp22:19,20)

- "Livestock are responsible for more GHG emissions than all other food sources." (pp22:55)
    - Improvement in fodder would improve this issue. "Adaptation of livestock systems can include a suite of strategies such as using different breeds and their wild relatives to develop a genetic pool resilient to climatic shocks and longer-term temperature shifts … [and] improving fodder and feed management" (pp23:24-26)

- "Soil management that reduces the disruption of soil structure and biotic processes by minimising tillage. A recent meta-analysis showed that no-till practices work well in water-limited agroecosystems when implemented jointly with residue retention and crop rotation but may by themselves decrease yields in other situations" (pp22:36 – 38)

- "Dietary shifts could contribute one-fifth of the mitigation needed to hold warming below 2°C, with one-quarter of low-cost options" (pp22:16,17),

    - "The way food is produced, processed and transported strongly influences GHG emissions. Around one-third of the food produced on the planet is not consumed" (pp24:45,46)
    - This is an area available to individuals in terms of changes that they can make in their lives, this is a crisis of "inappropriate human consumption" (pp24:45)

- "Decreasing food wastage has high mitigation and adaptation potential and could play an important role in land transitions towards 1.5°C" (pp24:54,55)

- "There is *medium agreement* that a combination of individual-institutional behaviour… improved technologies and management … can transform food waste into products with marketable value. Institutional behaviour depends on investment and policies" (pp25: 1 -4)

- "Institutional behaviour depends on investment and policies, which if adequately addressed could enable mitigation and adaptation co-benefits, in a relatively short time." (pp25:4,5)

Behaviour and lifestyle change (Chapter 4 Section 4.4.3)

- "In the US and Europe, GHG emissions are lower when legislators have strong environmental records. Political elites affect public concern about climate change: pro-climate action statements increased concern, while anti-climate action statements and anti-environment voting reduced public concern about climate change. In the European Union, individuals worry more about climate change and engage more in climate actions in countries where political party elites are united rather than divided in their support for environmental issues." (pp74:8 – 13)

- "Knowledge of the causes and consequences of climate change and on ways to reduce GHG emissions is not always accurate, which can inhibit climate actions, even when people would be motivated to act. For example, people overestimate savings from low energy activities, and underestimate savings from high-energy activities." (pp74:38-44)

- "More knowledge on adaptation is related to higher engagement in adaptation actions in some circumstances. How adaptation is framed in the media can influence the types of options viewed as important in different contexts." (pp74:46 -49)

- "High impact events less frequently are remembered more than low impact regular events" (pp75:1,2)

- "Personal experience with climate hazards strengthens motivation to protect oneself." (pp75:3)

- "Climate actions are more strongly related to motivational factors, reflecting individuals' reasons for actions, such as values, ideology and worldviews than to knowledge" (pp75:15)

- "People are more prone to act on climate change when individual benefits of actions exceed costs. For this reason, people generally prefer adoption of energy-efficient appliances above energy consumption reductions; the latter is perceived as more costly." (pp75:33-35)

- "Further, individuals may engage in mitigation actions when they think doing so would enhance their reputation." (pp75:45,46)

- "Decisions are often not based on weighing costs and benefits, but on habit or automaticity, both of individuals and within organisations and institutions. When habits are strong, individuals are less perceptive of information, and may not consider alternatives as long as outcomes are good enough. Habits are mostly only reconsidered when the situation changed significantly. Hence, strategies that create the opportunity for reflection and encourage active decisions can break habits." (pp76: 26 -32)

- "Policy can enable and strengthen motivation to act on climate change via top-down or bottom-up approaches, through informational campaigns, regulatory measures, financial (dis)incentives, and infrastructural and technological changes." (pp77:13 -15)

- "Current mitigation policies emphasise infrastructural and technology development, regulation, financial incentives and information provision that can create conditions enabling climate action, but target only some of the many factors influencing climate actions. They fall short of their true potential if their social and psychological implications are overlooked." (pp77: 22 -25)

- "…media coverage on the UN Climate Summit slightly increased knowledge about the conference but did not enhance motivation to engage personally in climate protection." (pp78:31,32)

- "Information provision is more effective when tailored to the personal situation of individuals, demonstrating clear impacts, and resonating with individuals' core values. Tailored information prevents information overload, and people are more motivated to consider and act upon information that aligns with their core values and beliefs. Also, tailored information can remove barriers to receive and interpret information faced by vulnerable groups, such as the elderly during heat waves. Further, prompts can be effective when they serve as reminders to perform a planned action." (pp78:48- 55)

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