CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

Prepared by the CCAC Scientific Advisory Panel (SAP)

SAP COMMENTS AND RECOMMENDATIONS FOR IPCC AR6 SECOND ORDER DRAFT

SAP Comment on the Lack of Short-Term Climate Metrics in AR6 SOD

Chapter 7, Table 7.15 and Table 7.A.3 leave out metrics with timescales shorter than 50 years as does all the accompanying text. The SAP recommends that such metrics should be included (e.g. GWP20, GTP10/20) as metrics are used not only for analysis of consistency with long-term temperature targets, which is the usage the SOD implicitly seems to be referring to in its discussion of metrics for SLCFs and long-lived gases, but also for life-cycle analyses, for carbon-equivalent footprints of nations/companies/etc., for analysis of the rate of change in the near-term (which is also part of agreements under the UNFCCC), and by policy-makers who have developed near-term climate mitigation plans such as Norway and the US State of California.

Including climate metrics with timescales shorter than 50 years would be consistent with climate metrics reported in the AR5 and AR4 Working Group I reports. AR5 Table 8.A.1 includes GWP values at 20, 50, and 100-year time horizons for GWP and GTP. AR4 Table 2.14 reports GWP of greenhouse gases at 20, 100 and 500 year time horizons.

The WG1 authors do not provide a rationale for removing the short-term metrics, only indirectly discussing the benefits of comparing a step-change in short-lived forcing with a pulse change of long-lived gases. There would be enormous implications, policy and financial, of switching to a metric such as CGTP that would enormously increase the value of SLCF removals in the short-term but eliminate their value in the long term, thereby radically changing financial incentives. These could be discussed in WGIII, but WGI should not simply eliminate the prior short-term metrics without consideration of the implications.

For more information about which climate metrics are most appropriate for SLCPs please see the conclusions from the SAP Expert Workshop on Metrics and Inventory Development.

SAP Comment on Handling of the Interlinkage Between LLGHGs and SLCFs

There are a number of examples in the SOD where the authors address the links between LLGHGs and SLCFs and the implications for the climate under different scenarios. In general, the SOD addresses these links from the perspective that SLCF mitigation is secondary or a co-benefit of strict CO_2 measures. Within this frame SLCF-specific mitigation becomes less important because it is assumed to be largely addressed through a focus on CO_2. Generally, not noted in the analysis are linkages in the opposite direction, namely near-term mitigation of SLCFs resulting in reductions of CO_2. There is also little recognition of the possibility that CO_2 mitigation measures might be deployed precisely because of the benefit for SLCF mitigation.

Table of WG1 Chapters containing SLCP Topics

Note – the purpose of this table is to help reviewers quickly identify those chapters and sections on which to focus

Thematic focus	**Main Chapters**
Aerosols	6, 11, 8, 9, 7, 2, 10, 4, 12, Atlas.5
SLCP	1; 6
SLCF	4; 2; 1; 6; 7
Air Pollution	12; 4; 1; 6; 6.5.3.4
Black carbon	12.4.6.6; 10; 9; 8; 4; 2; 6
Assessing links between SLCFs and CO2	6; 6.5.3.4;
HFC/Kigali	6; 6.5.3.3

Chapter In-Line Comments

Note – The below table is a non-exhaustive list of in-line comments and suggestions from SAP members. These are meant to help reviewers identify come key areas in the SOD to review and comment.

Chapter	From pg	From line	To pg	To line	Comments	References
7	115	52		54	The following statement requires more explanation: "It is clear that the traditional emission metric, GWP(100), gives the wrong sign of the contribution of SLCFs, including methane, to warming when emissions are declining, and this is a general property of pulse metrics." This indicates that it gives the wrong sign in the sense of the impact of changes from one year to the next but not of the absolute impact of a given years' emissions.	
7	115	44		46	"Limiting on-going temperature increase at any level requires net zero CO2 emissions, and while stabilising, reducing or eliminating short-lived forcing agents can play a secondary role, the main requirement for stabilisation of temperature is to limit cumulative emissions of CO2." This is rather subjective in the sense that net zero CO2 is critical to temperature stabilization, but if SLCFs were increasing you still wouldn't have stabilization even with net zero CO2.	
7	206	43		44	The 2018 Ozone Assessment reports that the radiative forcing from HFCs totaled 0.030 W/m2 in 2016 (see Chapter 2)	WMO (World Meteorological Organization), *Scientific Assessment of Ozone Depletion: 2018*, Global Ozone Research and Monitoring Project – Report No. 58, 588 pp., Geneva, Switzerland, 2018.
7	206	42		44	It is probably not necessary to mention HFCs will be controlled under the Kigali Amendment in this section, but if it remains then it is worth noting that the Montreal Protocol manages production and consumption *not* emissions of controlled gases. Since the climate treaty is concerned with managing emissions of climate forcers, noting that the MP is managing HFC without describing it's	

					specific focus could give a false impression that all aspects of HFC emissions are being addressed	
6	60	16	60	19	It is a very important argument that we should work on integrating climate and air quality policies which aim at co-beneficial solutions. It would be useful to extend this paragraph by adding further explanations that SLCPs/SLCFs are crucial to link these policies, since reducing them can have both clean air and climate benefits. It would be useful to cite UNEP (2019) (Tsinghua, CCAC and UNEP report) which explains that reducing short-lived climate pollutants can bring co-beneficial solutions in air quality, climate, health and other SDGs.	UNEP (2019): synergizing action on the environment and climate: good practice in China and around the globe. Available from: https://ccacoalition.org/en/resources/synergizing-action-environment-and-climate-good-practice-china-and-around-globe
6	77	33	77	36	Citing idealized scenarios from Collins 2013 and Samset 2018a in a section about 'effects and linkages in SLCPs under different mitigation scenarios" is problematic. The cited simulations, which found that instantaneously removing all aerosols from the atmosphere would increase global warming by 0.5-1.1C is both unrealistic and inherently unlinked to any realistic mitigation scenario. The findings in Rogelj 2014b clearly show that "a large fraction of the warming from SLCPs are co-emitted with CO2." It would be better to replace these references with Shindell & Smith (2019) which modelled the co-emissions from fossil fuel sources and found no near-term aerosol 'temperature penalty' from a more realistic phasedown of fossil fuel sources	Shindell, D. & C.J. Smith (2019) Climate and Air-Quality Benefits of a Realistic Phase-Out of Fossil Fuels, Nature 573(7774):408-411
6	77	25	79	31	This section - Compensating effects and linkages in SLCFs under different mitigation scenarios – appears to be predicated on an assumption that mitigating SLCF emissions is additional or a co-benefit of CO2 mitigation and (by implication) can never be the primary objective of a mitigation action or that reducing CO2 emission might instead be a co-benefit of SLCF action. If (as is stated in Rogelj 2014b) 'a large fraction of the warming SLCFs are co-emitted with CO2,' then by the same logic 'a large fraction of CO2 is co-emitted with warming SLCFs.'	

					It might be more useful if this section presented the overwhelming linkages between long-lived and short-lived climate forcers in such a way that did not bias or presuppose the policy objectives of the climate mitigation community.	
Chapter 4	48	4	48	6	Some of the statements made in this sentence require additional explanation and a citation. What is the scale of the 'very strong [CO2] mitigation required to have clearly detectable effect in the near-term'?	
Chapter 4	48	5		6	What does "most efficient, both in the short and longer term" mean in this context? Is it most efficient because shorter-lived climate forcers do not have the same long-term impact on the climate? Solomon et al (2013) stated that "[C]limate change that takes place due to increases in carbon dioxide concentration is largely irreversible for 1,000 years after emissions stop. Following cessation of emissions, removal of atmospheric carbon dioxide decreases radiative forcing, but is largely compensated by slower loss of heat to the ocean, so that atmospheric temperatures do not drop significantly for at least 1,000 years." Note also the text at 4-102 line 48-53. This finding would appear to indicate that mitigating CO2 emissions is not an effective or efficient way to reduce anthropogenic warming in the short-term.	Solomon S. *et al.* (2009) *Irreversible climate change due to carbon dioxide emissions*, Proc. Natl. Acad. Sci. USA 106:1704-1709, 1704
Chapter 4	48	25	48	29	The opposite can be equally true. The co-emission of CO2 from major sources of SLCFs would also mean that policies aimed at reducing SLCF emissions could implicitly capture some CO2 reductions. While it is true that some SLCF mitigation technologies would not simultaneously address co-emitted CO2 - properly designed climate policies would presumably incentivize mitigation options which achieve maximum simultaneous mitigation of all climate forcing co-pollutants. For the purposes of a WG1 report, does it matter if the necessary CO2 mitigation comes from decarbonization efforts or as a co-benefit of SLCF mitigation?	