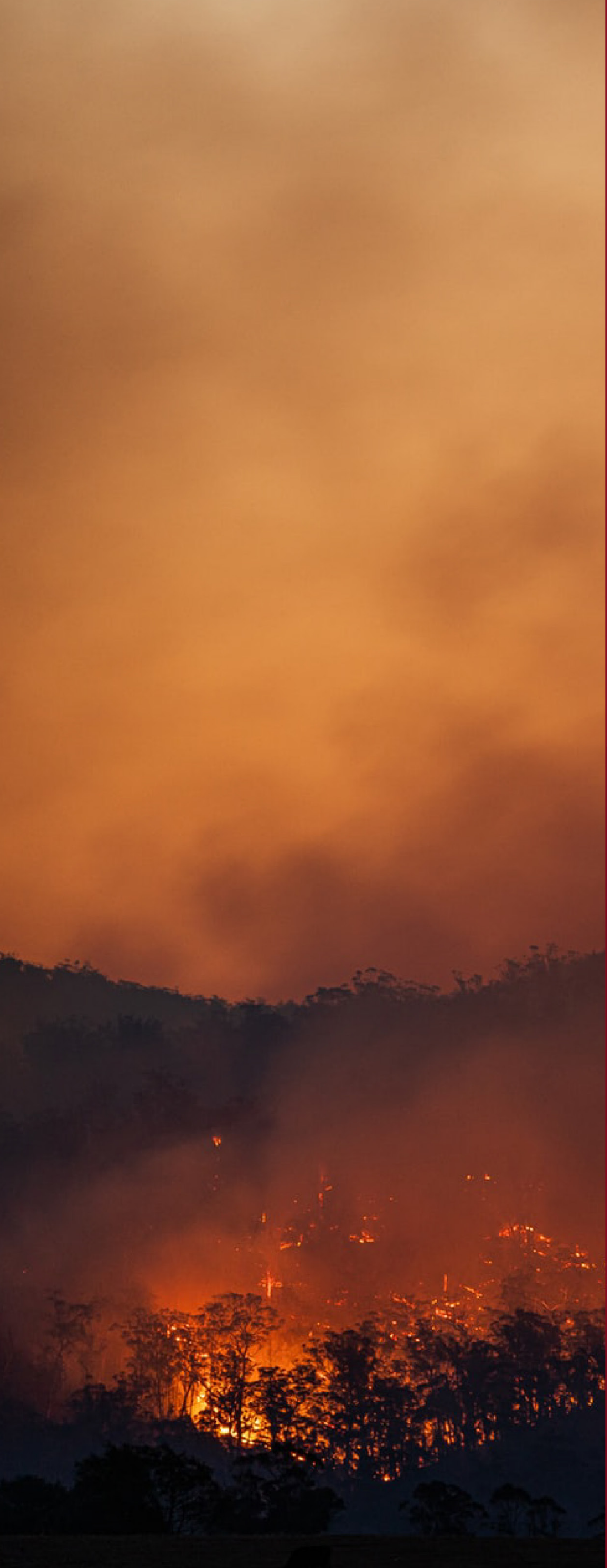

JUST ATONEMENT INC.

IPCC Sixth
Assessment Report

Summary of Changes Comparing AR6 and SR1.5

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At a glance:

- Remaining Carbon Budget: In order to stay under 1.5°C global warming with a 50% likelihood, a carbon budget of 500 $GtCO_2$ is left. At a likelihood of 66%, a budget of 400 $GtCO_2$ is left. Currently, the world is using 42 ± 3 $GtCO_2$[01] per year.
- Exceeding 1.5°C of Total Warming: All scenarios in AR6 indicate that 1.5°C of warming will be exceeded by the early 2030s.
- SSPs: The only Shared Socioeconomic Pathway that promises to limit global warming to under 1.5°C is SSP1. Under this pathway, global civilization shifts its focus to sustainability, replacing economic growth as the dominant civilizational paradigm with economic systems focused on overall well-being, including investments in health and education.
- Cuts in Carbon Emissions: In order to reach climate targets, CO_2 emissions need to be cut rapidly and net-zero[02] achieved no later than 2050.
- SLCFs: Success in cutting emissions of Short-Lived Climate Forcers (such as methane) will decide about 0.8°C of temperature increase.
- CDR: Carbon Dioxide Removal processes are a decisive factor in reaching the climate targets and must be developed and implemented at scale in order to keep warming from going over 1.5°C. Nonetheless, they still need to be invented and potential side effects are feared.
- Irreversible Changes: Regardless of future emissions cuts, several climate impacts to oceans and ice sheets, among other things, are irreversible.
- Climate Dangers: If mitigation efforts do not speed up, extreme weather events will occur with high frequency and endanger the lives of all species on the planet.

01 IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)] at C.1.3 (hereafter: "IPCC, SPM, SR1.5").

02 Net-zero emissions mean a "condition in which anthropogenic carbon dioxide (CO_2) emissions are balanced by anthropogenic CO_2 removals over a specified period." IPCC, 2021: Summary for Policymakers, In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change at D.1.1 (hereafter: "IPCC, SPM, AR6").

How much carbon budget is left?

After the release of the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6), several news outlets reported[03] that AR6 had reduced the world's window to stay within 1.5°C by as much as ten years (as compared to the 2018 Special Report (SR1.5) released by the IPCC). However, a comparison of the models used by both AR6 and SR 1.5 refutes this misconception.

According to SR1.5, the remaining carbon budget was 580 $GtCO_2$ to keep emissions under 1.5°C of warming, with a 50% probability. For a 66% probability, the remaining carbon budget was 420 $GtCO_2$.[04] However, SR1.5 noted that these calculations were qualified: "Remaining budgets applicable to 2100 would be approximately 100 $GtCO_2$ lower than this to account for permafrost thawing and potential methane release from wetlands in the future, and more thereafter."[05]

AR6 accounts for these additional factors in calculating the remaining carbon budget. According to the latest scientific findings, the remaining carbon budget amounts to 500 $GtCO_2$ to reach the climate target with a 50% probability. With a 66% probability, the amount is 400 $GtCO_2$.[06] While the amounts are indeed lower than 2018, another two years of ~40 $GtCO_2$[07] emissions per year have also passed. The carbon budgets are thus roughly consistent with each other.

As just noted, SR1.5 also estimates that the budget would be "100 $GtCO_2$" lower if permafrost thawing and methane release were considered, but AR6 does not reflect this. The reason for this is new scientific findings,[08] which have led to an upward revision of the total carbon budget.

03 For example, The Times published a day prior to the formal release of AR6 this information, perhaps based on leaked parts of AR6. Ben Spencer, "Rise Of 1.5°C Likely To Be Reached 10 Years Earlier," The Times, Aug. 8, 2021, https://www.thetimes.co.uk/article/rise-of-1-5c-likely-to-be-reached-ten-years-early-l99rx5cmm.
04 IPCC, SPM, SR1.5, C.1.3.
05 IPCC, 2018: "Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty," Ch. 2, Executive Summary (hereafter: "IPCC, F[ull]R[eport], SR1.5").
06 IPCC, SPM, AR6, D.1.2, Fig. SPM.2.
07 IPCC, SPM, SR1.5, C.1.3.
08 SR1.5 used a 0.97°C warming estimate between 1850-1900 and 2006-2015. This estimate already included corrections for the incomplete global coverage of observations and the different ways in which global surface temperature can be estimated. The AR6, based on a full reassessment of all available data, assesses 0.94°C of global surface temperature increase for the same period. In isolation, this update results in central estimates being about 65 GtCO2 larger in AR6 than in SR15. For the 33% and 67% estimates that's about 110 and 50 GtCO2 higher, respectively.
Joeri Rogelji, "A deep dive into the IPCC's updated carbon budget numbers," RealClimate, Aug. 12, 2021, https://www.realclimate.org/index.php/archives/2021/08/a-deep-dive-into-the-ipccs-updated-carbon-budget-numbers/.

There are important differences in the way that SR1.5 and AR6 estimate the year (or range of years) in which the 1.5°C threshold will be crossed. According to SR1.5, "Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (high confidence)."[09] In a corresponding graph, the mean value (2041) of this 23 year range was then used as the presumed date at which the climate will have warmed by 1.5°C compared to the pre-industrial era.[10] SR1.5 notes that the lower bound of the range, 2030, is supported by multiple lines of evidence, whereas years later in the future had fewer lines of evidence.[11] Nonetheless, SR1.5 uses the mean year of 2041, which is arguably inaccurate since it does not reflect the fact that many more models tilted towards 2030 rather than 2052.[12] In Chapter 2 of the full text version of SR1.5, 37 scenarios were analyzed taking into account the history of greenhouse gas emissions, the importance of aerosols, and other factors. The year range 2033-2036 finally emerged as an average of these multiple scenarios and the most probable point in time when 1.5°C of climate heating will be exceeded.[13]

A different type of scenario-based approach was used in AR6. Five "Shared Socioeconomic Pathways'' (SSP) scenarios with different levels of carbon emissions (very low to very high) were simulated. AR6 then looked for a probable period of 20 years in which 1.5°C of warming will be exceeded. This 20-year date range accounts for the fact that global temperatures go up and down (in fact, there have already been months in which the global temperature has been greater than 1.5°C above pre-industrial averages[14]). In order to observe a meaningful change in climate, a temperature increase must occur on average over a substantial period of time. Each of the five SSP scenarios was then used as the socioeconomic framework for determining the most probable 20-year period in which the climate will warm by 1.5°C on average. The mean values of each of these predicted 20-year periods lie somewhere in the early 2030s.[15] The only exception is the very high emissions producing scenario contained in AR6 (SSP5-8.5). It predicts a 20-year period that already commenced in 2018 and whose mean value therefore lies in the late 2020s.[16] This very high emissions scenario thus assumes rapid temperature increases in the near future which would compensate for the last three years, which are known not to have been 1.5°C above the pre-industrial average.

09 IPCC, SPM, SR1.5, A.1.
10 Ibid., Fig. SPM.1, Panel a).
11 IPCC, FR, SR1.5, Ch. 1, p. 66.
12 Malte Meinshausen, "We are not reaching 1.5°C earlier than previously thought," RealClimate, Aug. 9, 2021, https://www.realclimate.org/index.php/archives/2021/08/we-are-not-reaching-1-5oc-earlier-than-previously-thought/.
13 IPCC, FR, SR1.5, Supplementary Material, p. 27, https://www.ipcc.ch/site/assets/uploads/sites/2/2018/12/2SM_V19_for_web.pdf.
14 For example, at the peak of the 2015-16 El Niño event.
15 IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change" (hereafter: "IPCC, F[ull]R[eport], AR6"), Ch. 4, Tbl. 4.5, p. 38.
16 Ibid.

To summarize, both SR1.5 and AR6 give the early 2030s as the most likely time by which the world will have heated 1.5°C over pre-industrial averages. This is true even for the very low emissions scenario in AR6. If CO_2 emissions remain the same,[17] the amount of remaining carbon budget as provided in AR6 suggests that the planet will cross the "warming red line" of 1.5°C global temperature increase on or around 2033. Thus, reducing emissions is imperative at this time. In the very high scenario, 1.5°C of warming will be reached by the end of this decade.

WHAT CAN WE LEARN FROM THE SHARED SOCIOECONOMIC PATHWAYS (SSPS)?

AR6 presents five different scenarios of how the climate system could evolve by the year 2100. These scenarios are called "Shared Socioeconomic Pathways" (SSPs). As the name suggests, this new framework uses a combination of climate model projections, socioeconomic conditions, and assumptions about climate policies. This interplay of multiple factors is a novelty in the calculation of climate models and is applied for the first time in AR6,[18] and they replace the four Representative Concentration Pathways (RCPs) used in SR1.5.

As just a few examples of how these interrelationships work, an increasing population also means increased energy demand. Good education, on the other hand, gives hope for technical progress. And when forests are cut down, important carbon sinks disappear.

In the five scenarios presented in AR6, the abbreviation SSP is supplemented by a combination of numbers (e.g. SSP1-1.9 or SSP5-8.5). These numbers indicate firstly, which specific SSP was applied (1-5). The hyphen is then followed by the stratospheric adjusted Radiative Forcing (RF) expected for 2100 in that specific scenario. In simple terms, RF describes the change in the Earth's energy balance due to changes in the effect of radiation from space (and, particularly, radiation from the Sun[19]) and is measured in W/m^2 (watts per square meter). The term radiative forcing or climate forcing was introduced by the IPCC to describe the influence of external factors (including anthropogenic

17 42 ± 3 $GtCO_2$ per year. IPCC, SPM, SR1.5, C.1.3.

18 Brian C. O'Neill, et al., "'A new scenario framework for climate change research: the concept of shared socioeconomic pathways," SpringerNature, DOI 10.1007/s10584-013-0905-2, https://link.springer.com/article/10.1007/s10584-013-0905-2.

19 IPCC, 2014: "Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," Ch. 8, 8.4, p. 688 ff. (hereafter: "IPCC, F(ull)R(eport), AR5").

factors[20]) on the Earth's radiative balance or climate system in the context of climate studies.[21] The conversion of RF into concrete temperature increase in °C is considered problematic. The Earth's temperature is constantly lagging behind the physical forces that are acting on it. In fact, one of the largest uncertainties in climate models is the relationship between global mean temperature and RF—what scientists call the "climate sensitivity parameter."[22] However, advances in science since SR1.5 have minimized this uncertainty, and more reliable predictions can now be made based on projected RF.[23]

In addition to these new findings and innovations, AR6 also considers the effect of aerosols, which have a cooling effect on climate, masking some of the RFs.[24]

What needs to be done to meet the targets set by the Paris Agreement?

SSP2-4.5 is the scenario most likely to represent a continuation of the status quo and the current speed of mitigation efforts.[25] For this scenario, AR6 predicts an increase in global temperatures of 1.5°C in the near term (2021-2040), 2.0°C in the mid term (2041-2060) and 2.7°C in the long term (2081-2100).[26]

The only scenario presented that actually achieves the climate targets set in the Paris Agreement is the SSP1-1.9 scenario. The SSP1-1.9 scenario predicts a global temperature increase in the near term of 1.5°C, a limited overshoot of 1.6°C in the mid term and a reduction to 1.4°C in the long term.[27] In order to reach this target, CO_2 emissions have to be drastically reduced by 2030 (SR1.5 projects a decline of 45% from 2010 levels;[28] AR6 does not give exact figures for 2030). By 2050, CO_2 emissions and GHG emissions must be at net-zero. To reverse the limited overshoot (1.6°C) in the mid term, net negative CO_2 emissions need to increase by about 2060[29] and thereafter in the following years. Net negative CO_2 emissions are reached when anthropogenic removals of CO_2 exceed anthropogenic emissions.[30]

20 IPCC, FR, AR5, 8.3, p. 675 ff.
21 Malte Meinshausen, et al., "The shared socio-economic pathway (SSP) greenhouse gas concentration and their extensions to 2500," 2020, doi.org/10.5194/gmd-13-3571-2020.
22 Bildungsserver, "Strahlungsantrieb," n.d., https://wiki.bildungsserver.de/klimawandel/index.php/Strahlungsantrieb.
23 IPCC, SPM, AR6, A.4.
24 Ibid., Fig. SPM.2, Panel c).
25 IPCC, FR, Ch. 1, p. 110, ll. 16 ff.
26 IPCC, SPM, AR6, B.1.1, SPM.1.
27 Ibid., B.1.1, SPM.1.
28 IPCC, SPM, SR1.5, C.1.
29 IPCC, SPM, AR6, B. Box SPM.1.4.
30 Ibid., Box SPM.1.

According to SSP1-1.9, reducing warming to under 1.5°C is possible if societies switch to more sustainable practices, and in particular, shift their civilizational focus from economic growth to overall well-being. In addition, investments in education and health must go up and inequality must fall.[31] As noted immediately above and discussed in further detail below, anthropogenic removal of CO_2 will also require the development and implementation of new technologies that can remove CO_2 at scale.

From these interlinkages, AR6 observes that achieving the climate goals cannot be limited to reducing CO_2 emissions, even if those reductions are aggressive. Rather, it requires holistic approaches that engage ordinary citizens as well as economic and political elites. Even in a "best case" scenario like SSP1-1.9, the world experiences extreme weather events with greater regularity. But the worst impacts of climate change can be avoided, and in the process, the world can shift its collective effort from economic growth to sustainability, well-being, and maintaining and preserving a habitable planet.

What types of CDR processes are identified?

As mentioned in the previous section, carbon dioxide removal (CDR) processes play an important role in tackling the climate crisis. In fact, AR6 identifies CDR processes as fundamental to achieving climate goals.[32] AR6 lists "additional afforestation, reforestation, soil carbon management, biochar, direct air capture and carbon capture and storage (DACCS), and bioenergy with carbon capture and storage"[33] as CDR possibilities. However, this list is by no means exhaustive. This is because CDR methods are still in their infancy, and the technologies that so far exist are, at best, economically unviable prototypes.

31 Andrea Januta, "Explainer: The U.N. climate report's five futures - decoded," REUTERS, Aug. 9, 2021, https://www.reuters.com/business/environment/un-climate-reports-five-futures-decoded-2021-08-09/.
32 IPCC, SPM, AR6, D.1.4.
33 IPCC, FR, AR6, Ch. 1, p. 114.

AR6 notes that achieving the best case scenario, SSP1-1.9, requires reliance on technologies that, for the most part, have not been invented yet.[34] Concerns about the feasibility of CDR processes are also generally reflected throughout AR6. In fact, AR6 cites to studies which "conclude that it is implausible that any CDR technique can be implemented at scale that is needed by 2050,"[35] which would effectively mean that it is scientifically impossible to achieve net-zero by 2050.

AR6 also confirms that "CDR methods can have potentially wide-ranging effects on biogeochemical cycles and climate, which can either weaken or strengthen the potential of these methods to remove CO_2 and reduce warming, and can also influence water availability and quality, food production and biodiversity (high confidence)."[36] In view of these unknown potential side effects, every ton of CO_2 that is prevented from entering the atmosphere through mitigation efforts lessens the dependence on CDR processes that still need to be invented, and which will bring unknown (some foreseeable and some unforeseeable) side effects.

WHAT ARE SHORT-LIVED CLIMATE FORCERS?

For the first time in an IPCC report, AR6 devotes an entire chapter to short-lived climate forcers (SLCF). Although this topic is given little space in the Summary for Policymakers, it is an important inclusion. This is because SLCFs can rapidly and significantly affect temperature changes.

SLCFs take two forms. They can be either cooling (e.g. sulphates) or warming SLCFs (e.g. ozone). Currently, these two forms are roughly balanced, but this may change in the future. Common to all SLCFs is their short lifetime; most of them last only for hours to a few months. However, since they have high radiative efficiencies, SLCFs can have a strong effect on the climate even though they have relatively short lifetimes. Methane lasts the longest of the SLCFs, up to two decades. This is long enough for it to have a global warming effect rather than only a regional one. Reducing methane emissions therefore offers a great opportunity to achieve measurable results in slowing global

34 James Temple, "The UN climate reports pins hopes on carbon removal technologies that barely exist," MIT Technology Review, Aug. 9. 2021, https://www.technologyreview.com/2021/08/09/1031450/the-un-climate-report-pins-hopes-on-carbon-removal-technologies-that-barely-exist/.

35 IPCC, FR, AR6, Ch. 4, p. 82, ll. 6-7.

36 IPCC, SPM, AR6, D.1.4.

warming within a short period of time. The economic sectors most relevant to methane include "fossil fuel production and distribution, agriculture and waste management (high confidence)."[37] A massive reduction of methane, ozone precursors and HFCs will determine whether the climate warms by 0.8°C more or less by the end of the century.[38]

Sulphates are considered types of SLCFs that have a cooling effect on the climate. Thus, reducing sulphates will improve air quality but could lead to faster progression of global warming.

WHICH CHANGES ARE IRREVERSIBLE ALREADY?

Even in the "best case" scenario, SSP1-1.9, AR6 makes it clear that some damage from climate change is irreversible. These changes are particularly noticeable in the world's waters. For example, AR6 lists increased "global ocean temperature (very high confidence), deep ocean acidification (very high confidence) and deoxygenation (medium confidence)" as irreversible effects.[39] Even with global net-zero emissions starting in 2050, sea levels threaten to rise by up to 0.62 meters compared to 1995-2014.[40] These changes are irreversible on centennial to millennial time scales.[41] Moreover, in previous Assessment Reports it had always been stated that ice-free summers in the Arctic could still be prevented.[42] In SR1.5, this outlook changed and the scientific consensus now focused on reducing the number of ice-free summers prior to 2100.[43] AR6's conclusions are bleaker in this aspect in that it predicts at least one sea ice-free summer in the Arctic by 2050, regardless of future emissions. That there will be summers practically without Arctic sea ice is now classified as likely.[44] In addition, AR6 mentions the "[l]oss of permafrost carbon following permafrost thaw," as "irreversible at centennial timescales (high confidence)."[45]

37 IPCC, FR, AR6, Ch. 6.
38 IPCC, FR, AR6, Ch. 6, p. 16.
39 IPCC, SPM, AR6, B.5.1.
40 Ibid., B.5.3.
41 IPCC, SPM, AR6, B.5.1.
42 See, e.g., IPCC, FR, AR5, p. 74.
43 IPCC, SPM, SR1.5, B.4.1.
44 IPCC, SPM, AR6, B.2.5.
45 Ibid., B.5.2.

What is at stake if the pace of climate action does not increase significantly?

If the global community does not decide to take immediate, radical climate protection measures, true disaster scenarios present themselves. AR6 confirms that "[w]ith every additional increment of global warming, changes in extremes continue to become larger."[46] Each additional warming of the climate by 0.5°C produces clearly discernible increases in the frequency and intensity of hot extremes such as heatwaves, heavy precipitation, as well as agricultural and ecological droughts.[47] Should mitigation efforts only continue at the same pace as before (SSP2-4.5), this would have drastic consequences: "Precipitation is projected to increase over high latitudes, the equatorial Pacific and parts of the monsoon regions, but decrease over parts of the subtropics and limited areas in the tropics."[48] Also, "[i]t is very likely that rainfall variability related to the El Niño-Southern Oscillation is projected to be amplified by the second half of the 21st century."[49] These increases and decreases in precipitation translate to droughts and famine in some regions, while severe flooding is to be feared in others. In addition, if climate change mitigation continues along a "business as usual" trajectory, sea levels would be expected to rise by up to 0.76 meters compared to 1995-2014 levels by 2100.[50] This would deal a severe blow in the struggle for survival of many low-lying coastal areas and low-lying island states. In addition, the SSP2-4.5 scenario predicts that "the rates of CO_2 taken up by the land and oceans [will] decrease in the second half of the 21st century (high confidence).[51]

46 Ibid., AR6, B.2.2.
47 Ibid.
48 IPCC, SPM, AR6, B.3.1.
49 Ibid., B.3.2.
50 Ibid., B.5.3.
51 Ibid., B.4.2.

What does AR6 say about low-likelihood but high-impact events?

AR6 also presents the possibility of "black swan" events. The probability of any such event actually happening is low. However, if a black swan event were to become a reality, it would have a major impact on global weather phenomena. One example is the potential collapse of the Atlantic Meridional Overturning Circulation. "If such a collapse were to occur, it would very likely cause abrupt shifts in regional weather patterns and water cycle, such as a southward shift in the tropical rain belt, weakening of the African and Asian monsoons and strengthening of Southern Hemisphere monsoons, and drying in Europe."[52] Although AR6 says with high confidence that the Atlantic Meridional Overturning Circulation will weaken during the 21st century, it concludes there is only "low confidence" in determining the magnitude of such weakening.[53] The likelihood of a black swan event is increased if, contrary to current trends, humankind experiences an enormously carbon-intensive future and the resulting global temperature rises,[54] such as a doubling of current CO_2 emissions.[55] Under these circumstances, other low-likelihood, high-impact outcomes such as "strongly increased Antarctic ice sheet melt and forest dieback"[56] become more realistic.

Conclusion

The mean global temperature will likely exceed warming of 1.5°C as compared to pre-industrial times in less than 20 years. This holds true for all five scenarios in AR6, including the very low carbon emission scenario. Concurrently, the frequency of extreme weather events such as storm surges, droughts and storms will also increase.

However, AR6 concludes that the 1.5°C target is still feasible with decisive action:

- First and foremost, massive reductions in CO_2 emissions are needed, with net-zero emissions reached by the middle of the century.
- Second, carbon dioxide removal processes play an essential role. They represent an enormous

52 Ibid., C.3.4.
53 Ibid., C.3.4.
54 IPCC, SPM, AR6, C.3.2.
55 Ibid., B. Box SPM.1.1.
56 Ibid., C.3.2.

uncertainty factor in AR6's predictions, since the corresponding technology has yet to be invented. They also could have detrimental and other unknown side effects.

- Third, the reduction of methane emissions and other SLCFs could be a decisive factor. The handling of SLCFs like methane could decide a possible temperature increase of 0.8°C.

AR6 innovates in the field of climate modeling through its use of Shared Socioeconomic Pathway scenarios, which link climate change to societal development and civilizational goals. A more detailed evaluation of these links can be expected in the next part of AR6, expected in March 2022.

AR6 also largely and materially confirms the consistency of science with respect to climate change. And the certainty through the latest IPCC report is also expressed in the report's unambiguous formulations: "It is unequivocal that human influence has warmed the atmosphere, ocean and land."[57] "The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years."[58] And "[e]very ton of CO_2 emissions adds to global warming."[59] Climate science is thus more reliable than ever.

To avoid the worst consequences of climate change, AR6 gives a clear mandate: "limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions, along with strong reductions in other greenhouse gas emissions."[60] And no government can escape this mandate. The Summary for Policymakers of the AR6 was unanimously approved by representatives of all 195 IPCC member states. All governments therefore have committed themselves to the conclusions in AR6 and cannot plead ignorance. AR6 itself presents a remarkably hopeful message: "Scenarios with very low or low GHG emissions (SSP1-1.9 and SSP1-2.6) lead within years to discernible effects on greenhouse gas and aerosol concentrations, and air quality."[61]

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57 Ibid., A.1.
58 Ibid., A.2.
59 Ibid., D.1.1.
60 IPCC, SPM, AR6, D.1.
61 Ibid., D.2.

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