

IPCC ISSUES SPECIAL REPORT ON IMPACTS OF GLOBAL WARMING OF 1.5 DEGREES CELSIUS

Earlier this month and after almost three years of efforts, the Intergovernmental Panel on Climate Change (“IPCC”) issued a special report on the impacts of global warming of 1.5 degrees Celsius (2.7 degrees Fahrenheit) above pre-industrial levels (“2018 Special Report”).

The primary drivers for this 2018 Special Report were the Paris Agreement (ratified by 181 member countries) and its goal of limiting global warming to “well below” 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels, coupled with mounting scientific evidence that such a two degree average temperature increase contemplated by the Agreement presents potentially catastrophic consequences for the earth, its inhabitants and ecosystems. Accordingly, the 2018 Special Report sought to determine whether limiting the global temperature increase to 1.5 versus 2 degrees Celsius would provide a significant benefit, by reducing the adverse consequences predicted by otherwise adhering to the Paris Agreement’s goal of “well below” 2 degrees.

What’s the big deal in half a temperature degree either way some may ask? Quite a lot, according to the 2018 Special Report prepared by approximately ninety-one authors and review editors from 40 countries, citing more than 6,000 scientific references and weighing in at over 1,000 pages.

Because the numbers are so small (1.5 versus 2 degrees Celsius), many people may dismiss the difference as inconsequential, since there is simply no good documented historical precedent to draw upon. However, a comparison to the last ice age provides some context on the impact of a few degrees in temperature swing. The difference in global average surface temperature between the depths of the last ice age and today is believed to be around 4 to 7 degrees Celsius. By comparison, many climate models predict global average temperature increases of 3-4 degrees if the current trajectory goes unchanged - - a climate shift not that unlike the last ice age and today.

Yet the 2018 Special Report details numerous climate change impacts that could be avoided or significantly mitigated by limiting global warming to 1.5 degrees Celsius - - a threshold its states the world will reach sometime between 2030 and 2052, if current trends continue. It is important to recognize that the world has already surpassed one degree Celsius of warming, as carbon emissions have ballooned since the 1850s.

A little background. The IPCC was established in 1988 by the World Meteorological Organization (“WMO”) and the United Nations Environmental Programme. The IPCC is made up of representatives from 195 member states from around the world. It does not conduct research, but rather assesses available climate change information based on published sources, with a priority to those that are peer reviewed. IPCC has prepared five assessment reports regarding the state of climate change knowledge, with the sixth expected in 2022. In addition, it

has prepared several publications and special reports. In 2007, the IPCC won a Nobel Peace Prize along with former President Al Gore.

The IPCC 2018 Special Report stresses that limiting global warming to 1.5 degrees Celsius would require “rapid and far-reaching” changes in all aspects of society including: land, energy, industry, buildings, transport, and cities. This would also entail reducing “global net human-caused” emissions of carbon dioxide (CO₂) by 45 percent from 2010 levels by 2030 and reaching “net zero” levels around 2050. While Jim Skea, Co-Chair of the IPCC Working Group III, recognizes that limiting global warming to 1.5 degrees Celsius is “possible within the laws of chemistry and physics” he is mindful that “doing so would require unprecedented changes.” Indeed, Debra Roberts, Co-Chair of IPCC Working Group II emphasizes that the “next few years are probably the most important in our history.”

Some of the climate change impacts that could be avoided or significantly mitigated by limiting global warming to 1.5 degrees Celsius discussed in the 2018 Special Report include the following:

- By 2100 global sea level rise would be 10 centimeters lower with global warming of 1.5 degrees Celsius compared with 2 degrees Celsius, placing 10 million fewer people at related-risk.
- The likelihood of an Arctic Ocean free of sea ice in summer would be once per century with global warming of 1.5 degrees Celsius compared with at least once per decade with 2 degrees Celsius.
- Coral reefs would decline by 70-90 percent with global warming of 1.5 degrees Celsius, whereas virtually all would be lost with 2 degrees Celsius.
- Of 105,000 species studied, 6% of insects, 8% of plants and 4% of vertebrates are projected to lose over half of their “climatically determined geographic range” for global warming of 1.5 degrees Celsius, compared with 18% of insects, 16% of plants and 8% on invertebrates for global warming of 2 degrees Celsius.
- The percent of global population exposed to extreme heat at least once every five years is reduced to 14% for global warming of 1.5 degrees Celsius, compared to 37% for global warming of 2 degrees Celsius.
- Depending on future socioeconomic conditions, limiting global warming to 1.5 degrees Celsius, compared to 2 degrees Celsius, may reduce the proportion of the world population exposed to climate change induced increase in water stress by up to 50%, although there is considerable variability between regions.

To assist in limiting a global warming increase to 1.5 degrees Celsius, the IPCC 2018 Special Report proposes, *inter alia*, imposition of a carbon tax many orders of magnitude above those currently in use or being considered. More specifically, the 2018 Special Report suggests raising the cost of a ton of carbon possibly as high as \$5,000 by 2030, with the possible need to further increase to \$27,000 per ton by 2100. By comparison, at present, the average price of carbon across 42 major economies is \$8.00 per ton.

The IPCC 2018 Special Report will likely take center stage this December, at the Katowice Climate Change Conference in Poland, when governments review the Paris Agreement.

The 2018 Special Report is the first in a series of Special Reports to be produced in the IPCC's Sixth Assessment cycle. In 2019, the IPCC will be releasing Special Reports on the "Ocean and Cryosphere in a Changing Climate" and "Climate Change and Land".