Climate Program Manager Update

Office of Sustainability

October 24, 2018

- IPCC 1.5 Summary for Policy Makers
- Community Climate Plan Revision Update
- 2019 Meeting Schedule

ipcc

INTERGOVERNMENTAL PANEL ON climate change

GLOBAL WARMING OF 1.5 °C

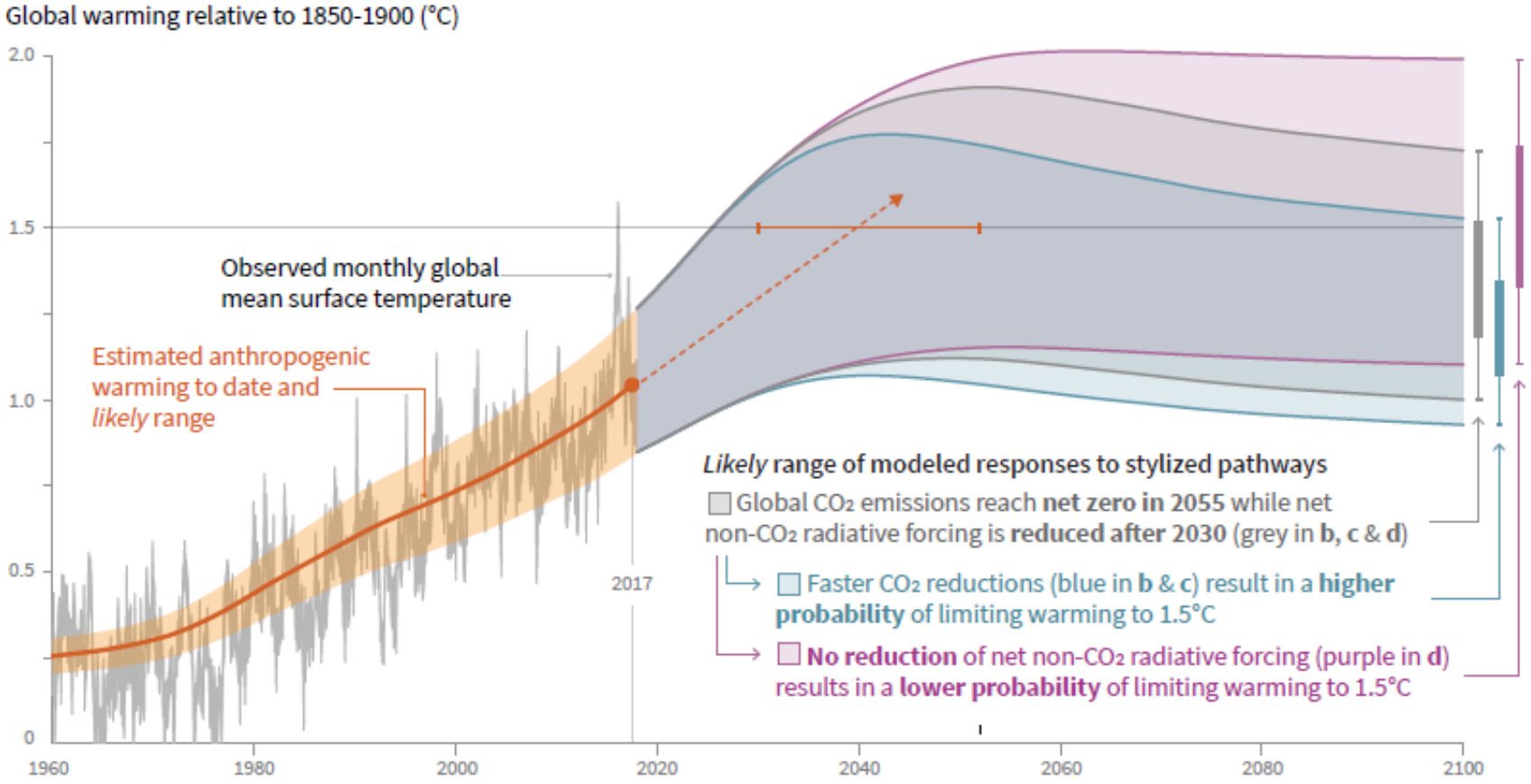
Summary for Policymakers

- A1. Human activities are **estimated to have caused approximately 1.0°C of global warming[5] above pre-industrial levels**, with a *likely* range of 0.8°C to 1.2°C. Global warming is *likely* to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (*high confidence*)

- A.2. Warming from anthropogenic emissions from the pre-industrial period to the present **will persist for centuries to millennia and will continue to cause further long-term changes in the climate system**, such as sea level rise, with associated impacts (high confidence), but these emissions alone are unlikely to cause global warming of 1.5°C (medium confidence)

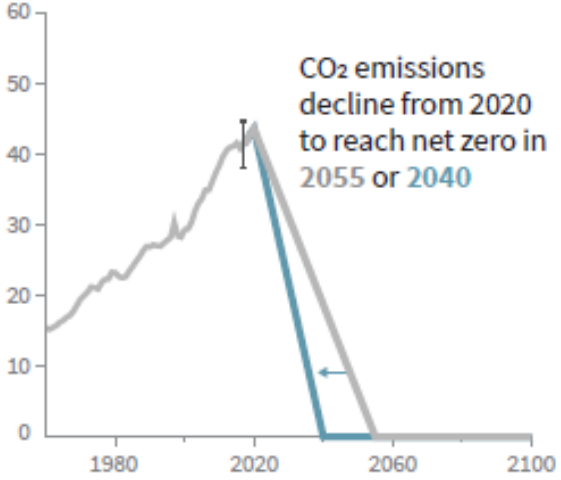
- A3. Climate-related **risks for natural and human systems are higher for global warming of 1.5°C than at present**, but lower than at 2°C (high confidence). These risks depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options (high confidence)

a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways



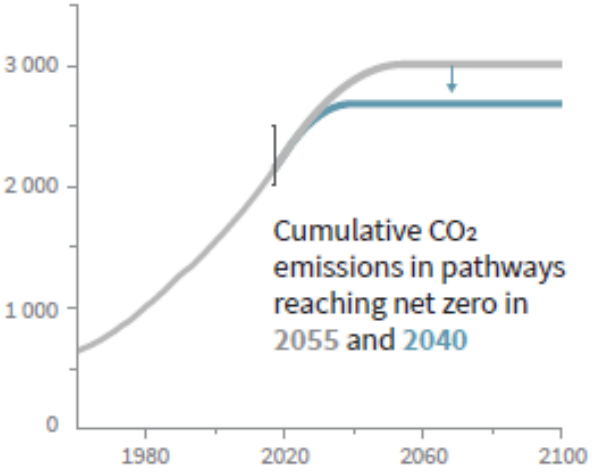
b) Stylized net global CO_2 emission pathways

Billion tonnes CO_2 per year ($GtCO_2$/yr)



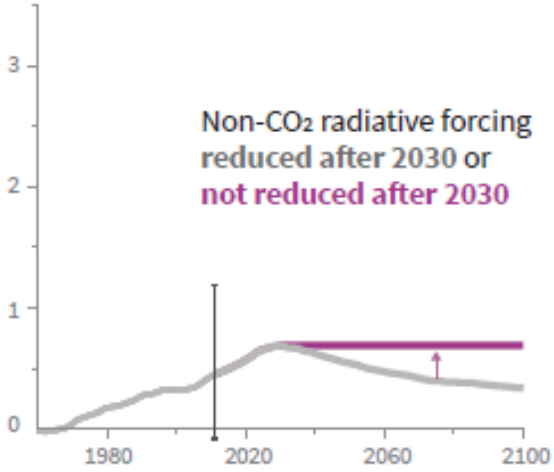
c) Cumulative net CO_2 emissions

Billion tonnes CO_2 ($GtCO_2$)



d) Non-CO_2 radiative forcing pathways

Watts per square metre (W/m^2)



Faster immediate CO_2 emission reductions limit cumulative CO_2 emissions shown in panel (c).

Maximum temperature rise is determined by cumulative net CO_2 emissions and net non-CO_2 radiative forcing due to methane, nitrous oxide, aerosols and other anthropogenic forcing agents.

- B1. Climate models project **robust differences in regional climate characteristics between present-day and global warming of 1.5°C, and between 1.5°C and 2°C**. These differences include increases in: mean temperature in most land and ocean regions (*high confidence*), hot extremes in most inhabited regions (*high confidence*), heavy precipitation in several regions (*medium confidence*), and the probability of drought and precipitation deficits in some regions (*medium confidence*).

- B2. By 2100, global mean **sea level rise is projected to be around 0.1 meter lower with global warming of 1.5°C compared to 2°C** (*medium confidence*). Sea level will continue to rise well beyond 2100 (*high confidence*), and the magnitude and rate of this rise depends on future emission pathways. A slower rate of sea level rise enables greater opportunities for adaptation in the human and ecological systems of small islands, low-lying coastal areas and deltas (*medium confidence*).

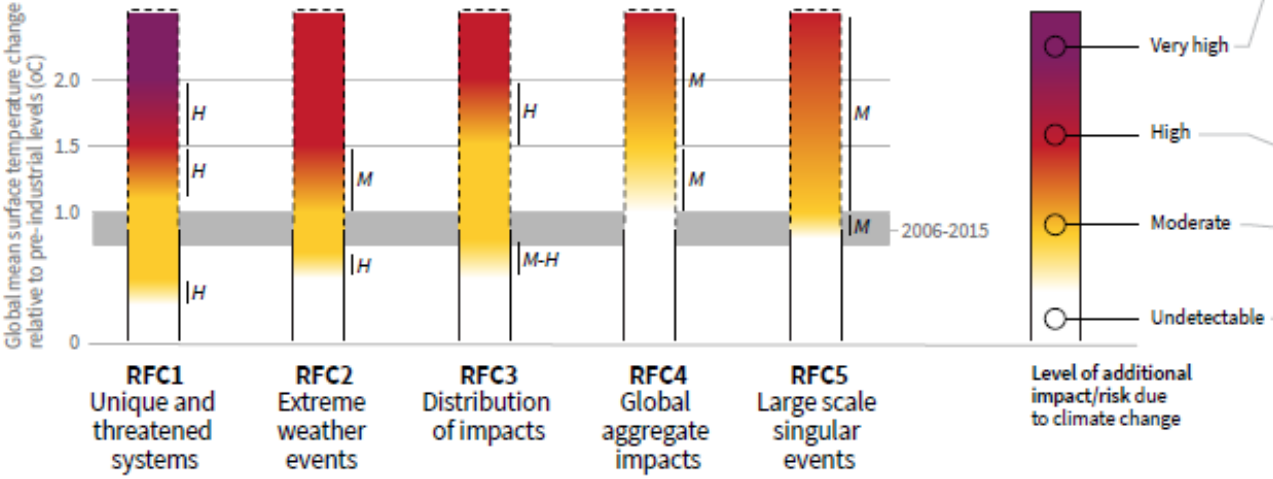
- B3. On land, impacts on biodiversity and ecosystems, including species loss and extinction, are projected to be lower at 1.5°C of global warming compared to 2°C. **Limiting global warming to 1.5°C compared to 2°C is projected to lower the impacts on terrestrial, freshwater, and coastal ecosystems and to retain more of their services to humans** (*high confidence*).

- B4. Limiting global warming to 1.5°C compared to 2ºC is projected to reduce increases in ocean temperature as well as associated increases in ocean acidity and decreases in ocean oxygen levels (*high confidence*). Consequently, **limiting global warming to 1.5°C is projected to reduce risks to marine biodiversity, fisheries, and ecosystems, and their functions and services to humans**, as illustrated by recent changes to Arctic sea ice and warm water coral reef ecosystems (*high confidence*).

- **B5. Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.**

Five Reasons For Concern (RFCs) illustrate the impacts and risks of different levels of global warming for people, economies and ecosystems across sectors and regions.

Impacts and risks associated with the Reasons for Concern (RFCs)



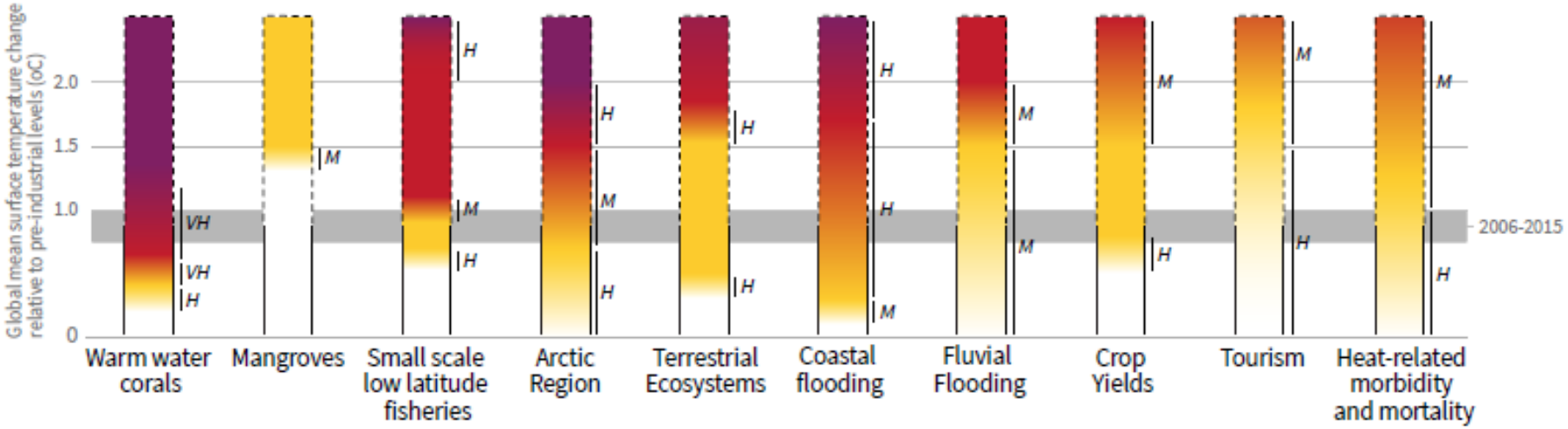
Purple indicates very high risks of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.

Red indicates severe and widespread impacts/risks.

Yellow indicates that impacts/risks are detectable and attributable to climate change with at least medium confidence.

White indicates that no impacts are detectable and attributable to climate change.

Impacts and risks for selected natural, managed and human systems

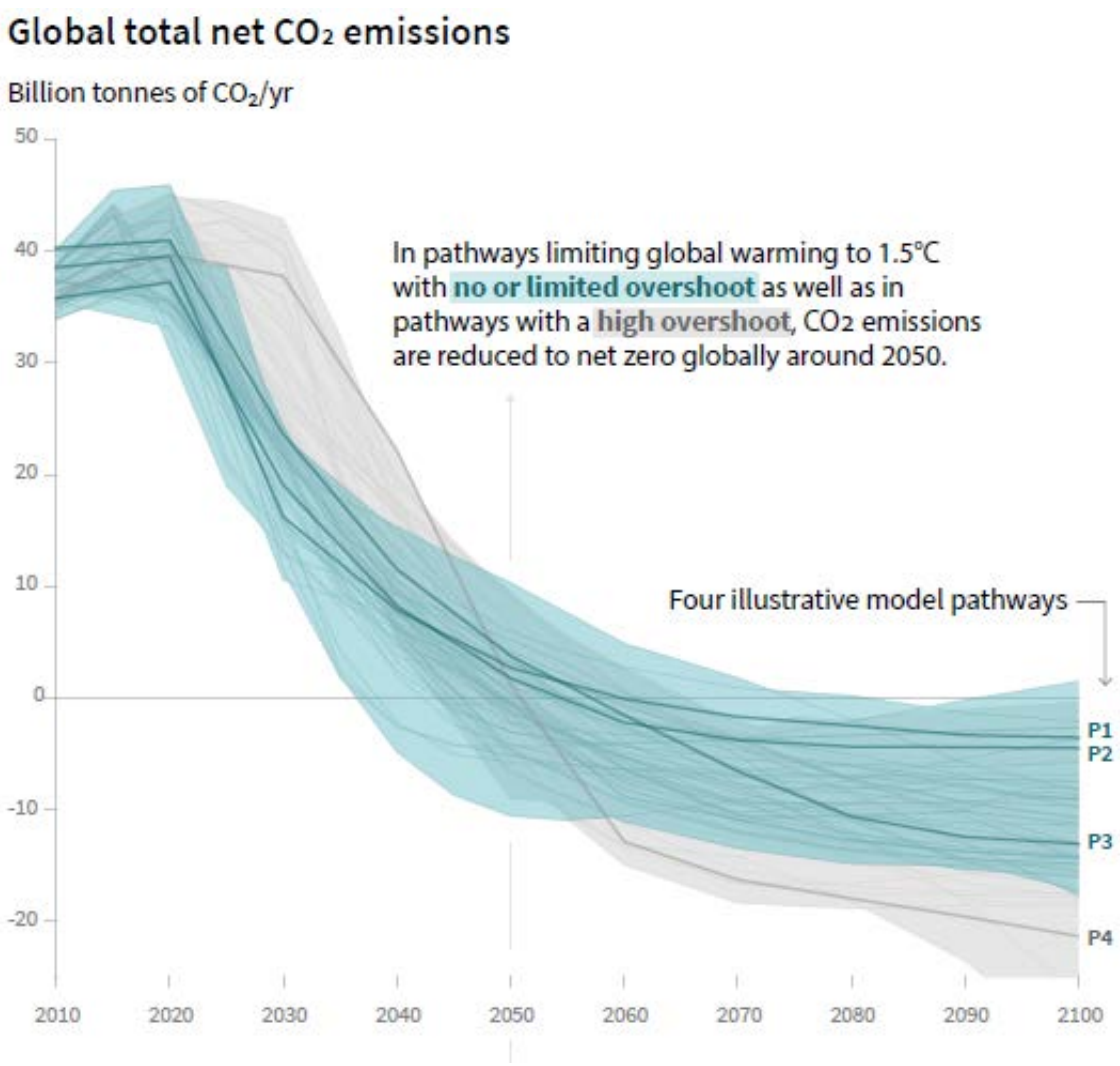


Confidence level for transition: *L*=Low, *M*=Medium, *H*=High and *VH*=Very high

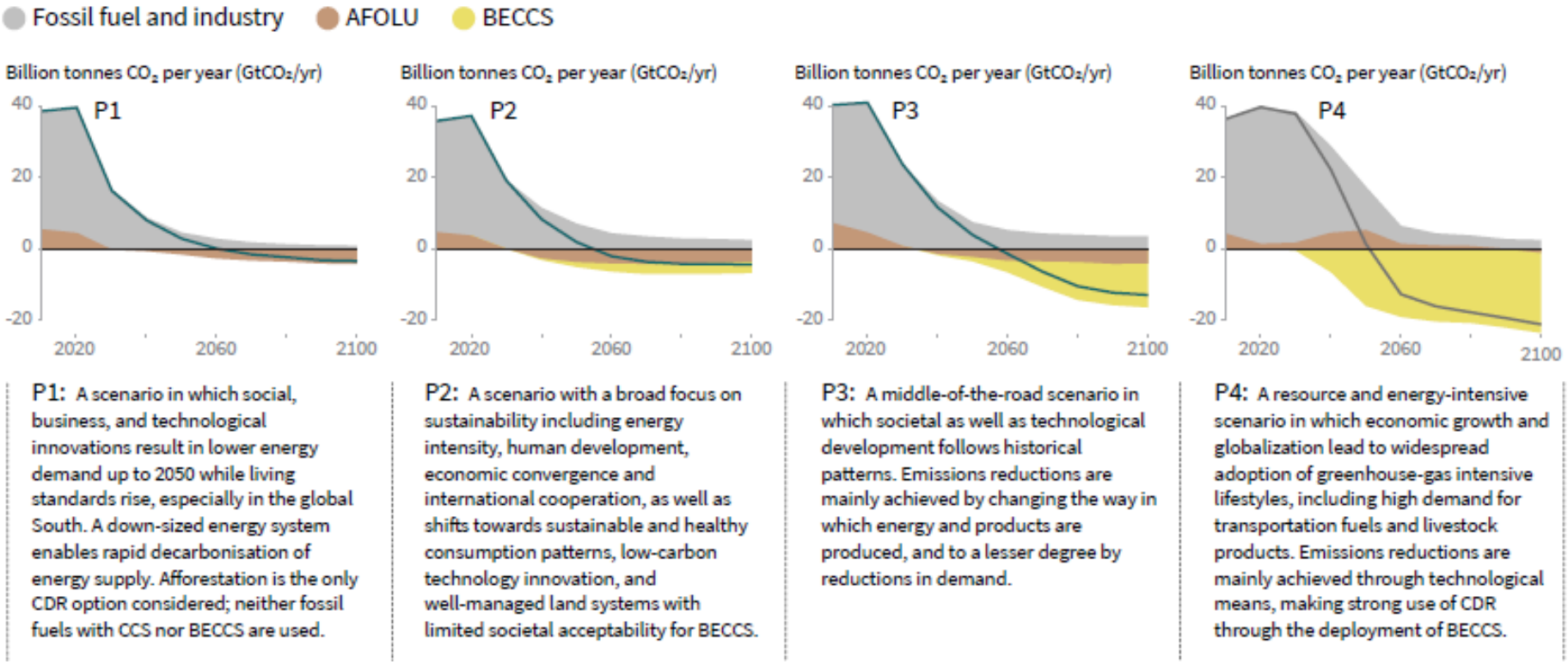
- C1. **In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO2 emissions decline by about 45% from 2010 levels by 2030 (40–60% interquartile range), reaching net zero around 2050** (2045–2055 interquartile range). For limiting global warming to below 2°C CO2 emissions are projected to decline by about 20% by 2030 in most pathways (10–30% interquartile range) and reach net zero around 2075 (2065–2080 interquartile range). Non-CO2 emissions in pathways that limit global warming to 1.5°C show deep reductions that are similar to those in pathways limiting warming to 2°C. (high confidence)

- C2. **Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure** (including transport and buildings), and industrial systems (high confidence). These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options (medium confidence).

- C3. **All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO2 over the 21st century.** CDR would be used to compensate for residual emissions and, in most cases, achieve net negative emissions to return global warming to 1.5°C following a peak (high confidence). CDR deployment of several hundreds of GtCO2 is subject to multiple feasibility and sustainability constraints (high confidence). Significant near-term emissions reductions and measures to lower energy and land demand can limit CDR deployment to a few hundred GtCO2 without reliance on bioenergy with carbon capture and storage (BECCS) (high confidence).


Global total net CO_2 emissions
Billion tonnes of CO_2/yr
50
40
30
20
10
0
-10
-20
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
In pathways limiting global warming to 1.5°C with no or limited overshoot as well as in pathways with a high overshoot, CO_2 emissions are reduced to net zero globally around 2050.
Four illustrative model pathways
P1
P2
P3
P4

Breakdown of contributions to global net CO_2 emissions in four illustrative model pathways



P1: A scenario in which social, business, and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A down-sized energy system enables rapid decarbonisation of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

Different mitigation strategies can achieve the net emissions reductions that would be required to follow a pathway that limit global warming to 1.5°C with no or limited overshoot. All pathways use Carbon Dioxide Removal (CDR), but the amount varies across pathways, as do the relative contributions of Bioenergy with Carbon Capture and Storage (BECCS) and removals in the Agriculture, Forestry and Other Land Use (AFOLU) sector. This has implications for the emissions and several other pathway characteristics.

Questions?

Community Climate Plan

Electricity and Natural Gas

- Buildings and Integrated Efficiency
- Promote Behavior Change
- Resource Technologies

Transportation and Land Use

- Infrastructure and Service
- Land Use
- Demand Management
- Policy and Planning
- Vehicles and Fuel Efficiency
- Economic and Pricing Solutions

Materials and Waste Management

- Organics Diversion
- Purchasing
- Methane Management
- Recycle / Reduce / Reuse

Industrial Process

- Fuel Switching
- Process Optimization
- Capture and Destruction
- Local Offsets

Before we start the revision

- Staff will work on:
  - 4 year qualitative / quantitative analysis of the original 2015 plan
  - Analysis of consumption based inventory methodologies and feasibility of doing our own
  - Benchmarking of goals / plans from other Cities

Proposed Focus Areas and Organization

- Energy and Buildings
- Transportation
- Consumption
- Education
- Sequestration and Moonshots

- JSC as the steering committee
- Committee on urgency and goal setting

Target Audiences and Engagement

- Equity office and Quality of Life Commissions
- Businesses and Major Institutions – Sign Off and Recognition
- Neighborhoods and Faith Based Organizations
- All 10 Districts Represented and Participating
- Community survey to the Austin public on climate issues and awareness

Proposed Process

- Ongoing JSC Working Group
- JSC reviews and discusses at each meeting going forward
- Council and/or Manager agrees on the path forward
- Staff begins work in January 2019

2019 Meeting Schedule (4th Wednesdays)

- January 23
- February 27
- March 27
- April 24
- May 22
- June 26
- July 24
- August 28
- September 25
- October 23
- November 27
- December 25

end