Climate Action Program

General Context & Introduction to Climate Policy

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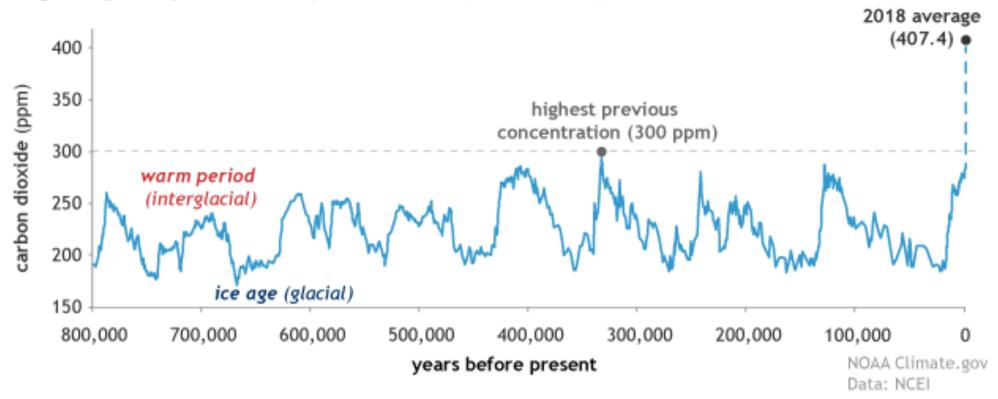
Outline

- 1. Intro: Global context
- 2. Routes for climate action
- 3. Major Organizations/Institutions involved in climate policies/actions
- 4. Major Climate Policy Deals

Global context

Rising airborne fraction of carbon dioxide (CO₂) is one of the most impressive changes of the Anthroposphere

CO₂ during ice ages and warm periods for the past 800,000 years



Changes over the lifetime of the Y generation (my case):

1982 : 339.95 ppm 2018 : 407.40 ppm

 \Rightarrow ~+20% in 36 years

2021 : about +50% increase

Key date & Historical Figures

1957: Geophysical year

- > First measurement of atmospheric CO2 @Mona Loa
- > First CO2 measurement in Antarctic ice core

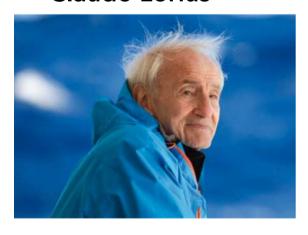
Roger Revelle



Charles Keeling



Claude Lorius



- This year (1957), atmospheric CO2 was 320 ppm
- > Today it is greater than 410 ppm

What was said at the time?

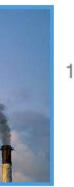




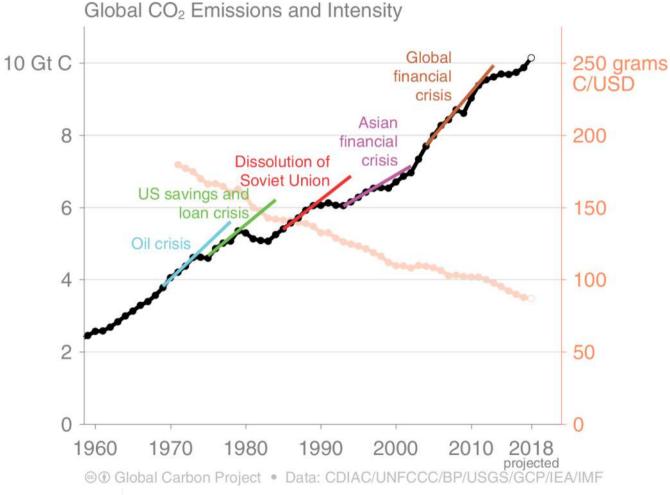
GLOBAL CARBON Variations in anthropogenic CO₂ emissions

The source of CO₂ are tightly linked to the economic growth (including global financial crisis)

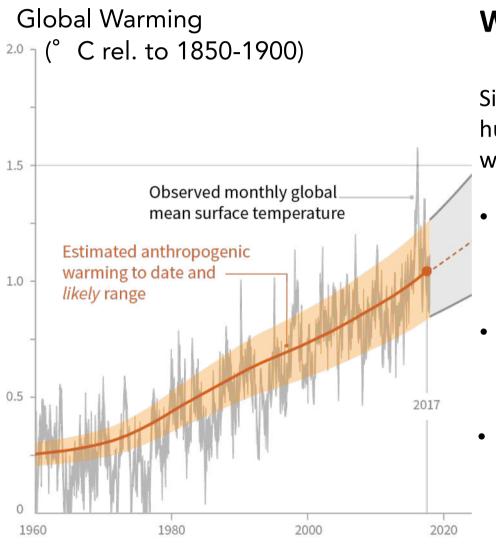








Rising airborne fraction of carbon dioxide (CO₂) drives the current warming trend and deeply alters our environment

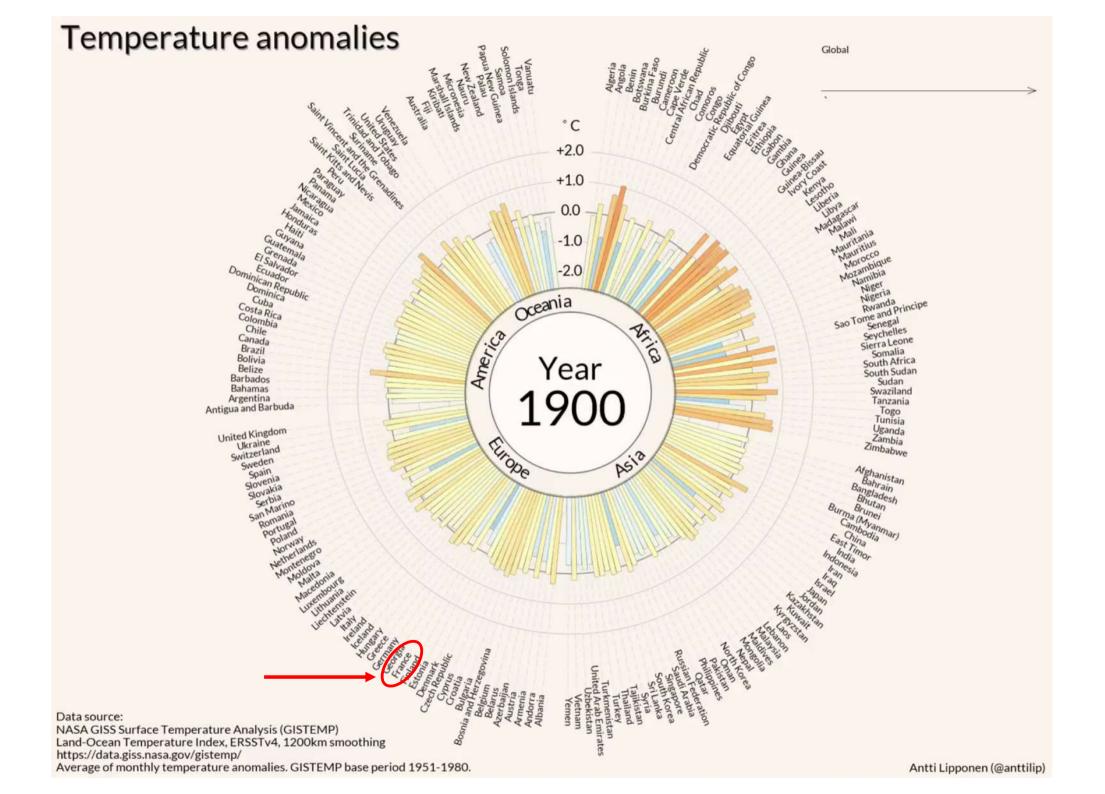


Where are we?

Since the industrial area, human-activity and human-induced emissions has caused a global warming of 1.1° C

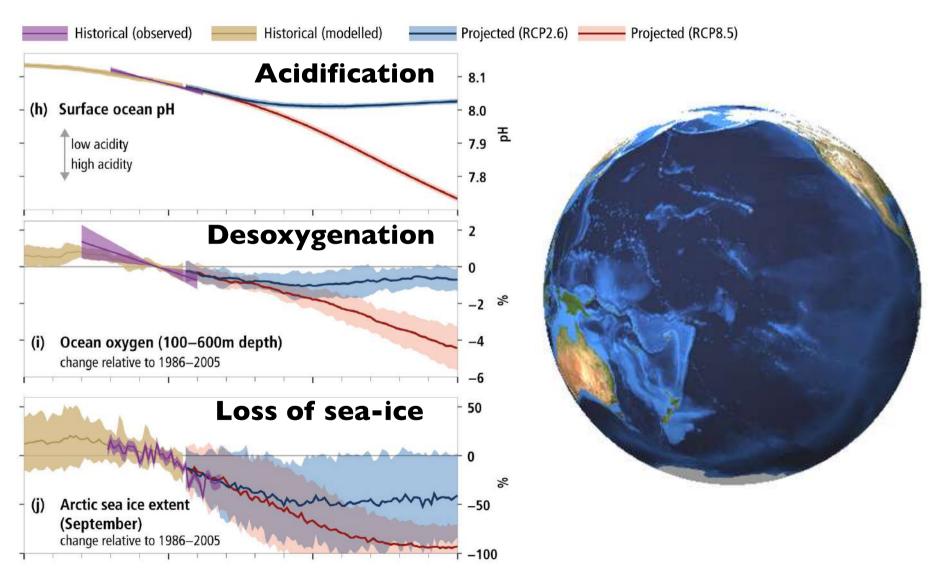
- With the current pace of global warming,
 1,5° C will be reached between 2030 et
 2052
- Past emissions do not bring use above
 1,5° C
- We can observe the impacts of climate change in multiple domains

IPCC SR15 (2018), IPCC AR6 WGI (2021)



Rising airborne fraction of carbon dioxide (CO₂) drives the current warming trend and deeply alters our environment

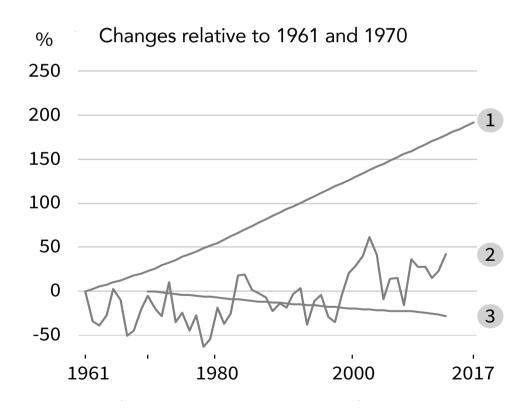
over Ocean



Rising airborne fraction of carbon dioxide (CO₂) drives the current warming trend and deeply alters our environment

over Land

- 1 Population in areas experiencing desertification
- 2 Dryland areas in drought annually
- 3 Inland wetland extent

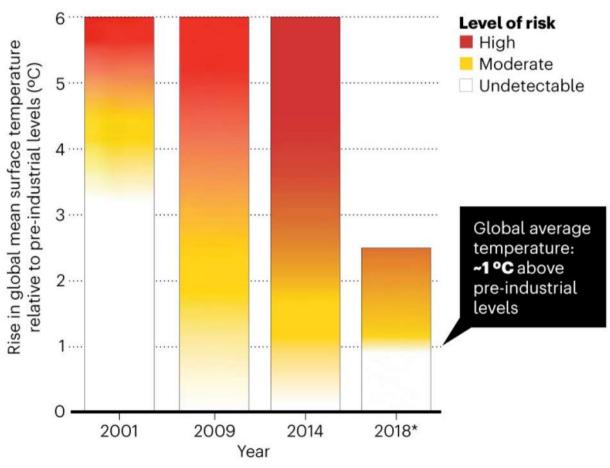




... leading to abrupt or irreversible changes in the Earth system

TOO CLOSE FOR COMFORT

Abrupt and irreversible changes in the climate system have become a higher risk at lower global average temperature rise. This has been suggested for large events such as the partial disintegration of the Antarctic ice sheet.



^{*}The 2018 IPCC Special Report: Global Warming of 1.5 °C focuses on the temperature range up to 2.5 °C.

©nature



[Credit: Yoda Adaman | Unsplash]

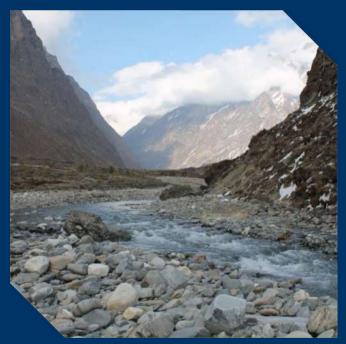
66

It is indisputable that human activities are causing climate change









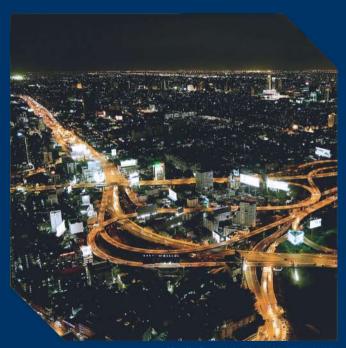


There's no going back from some changes in the climate system. However, some changes could be slowed and others could be stopped by limiting warming.









[Credit: Peter John Maridable | Unsplash]



Unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5° C will be beyond reach.



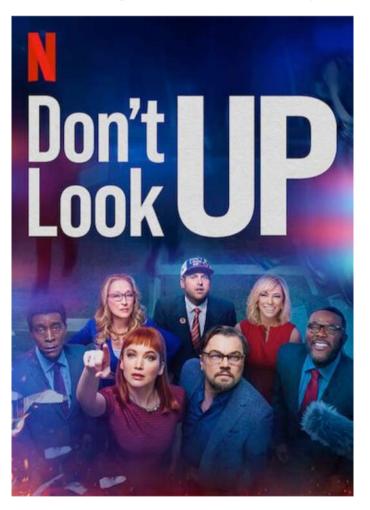


Let's summarize the problem

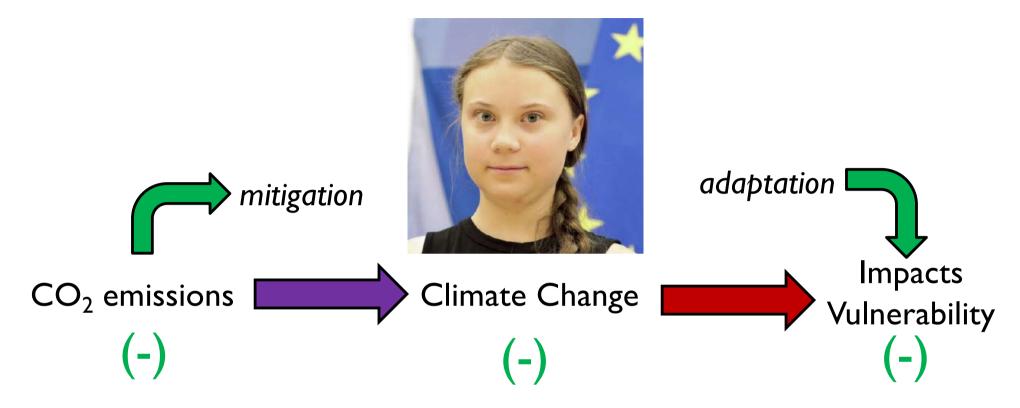


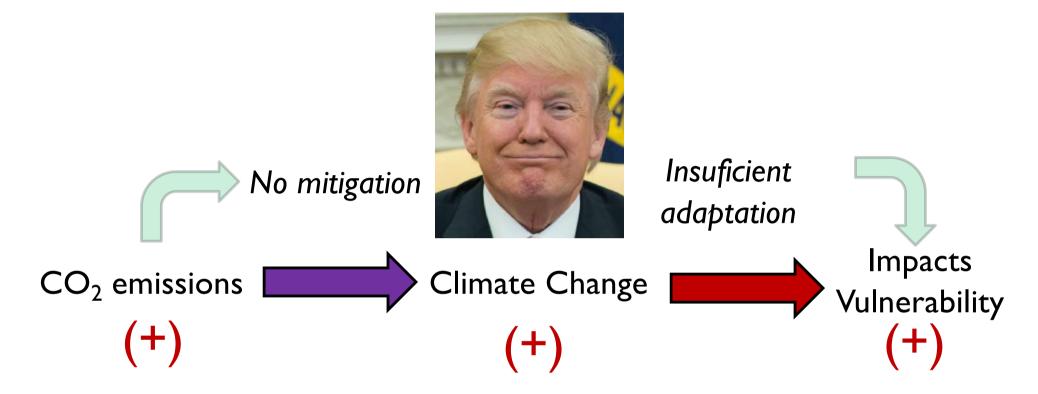
Routes for climate action

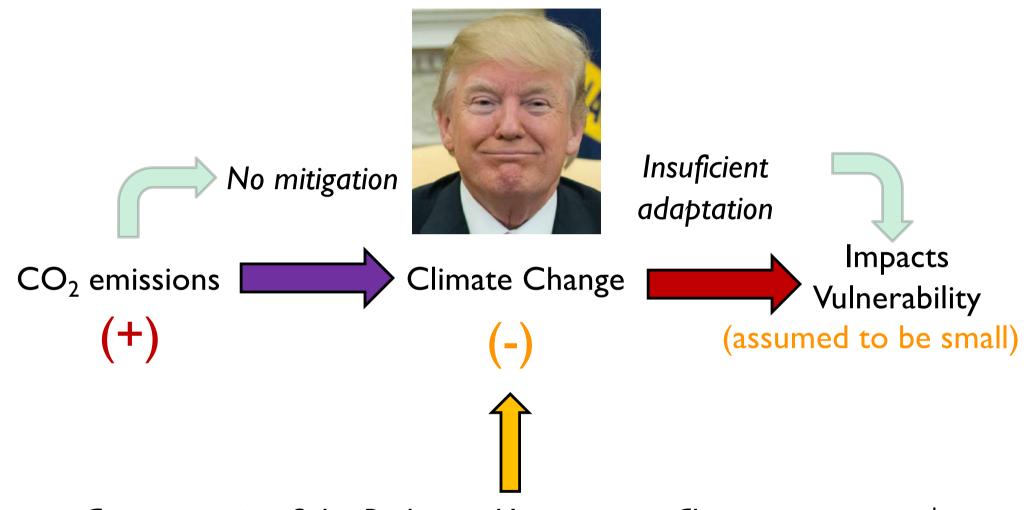
an introduction to mitigation: look up or don't look up?











Geoengineering, Solar Radiation Management, Climate intervention*

NASEM 2021: Reflecting Sunlight: Recommendations for Solar Geoengineering Research and Research Governance National reports: https://france-science.com/rapport-dambassade-interventions-sur-le-climat-etat-des-lieux-des-initiatives-aux-etats-unis/

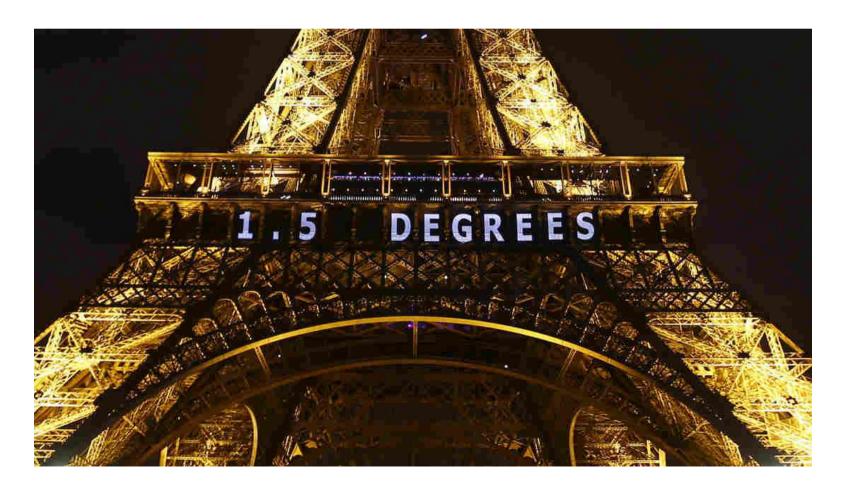
Open letter for a non-use agreement : https://www.solargeoeng.org

Mitigation (of climate change)

A human intervention to reduce emissions or enhance the sinks of greenhouse gases.

Questions:

- \Rightarrow Scale of mitigation ?
- ⇒ What kind of mitigation can be put in place?



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- \Rightarrow What kind of mitigation can be put in place ?

Mitigation measures

In climate *policy*, mitigation measures are technologies, processes or practices that contribute to *mitigation*, for example, renewable energy (RE) technologies, waste minimization processes and public transport commuting practices. See also *Mitigation option*, and *Policies* (for climate change mitigation and adaptation).

Mitigation behaviour

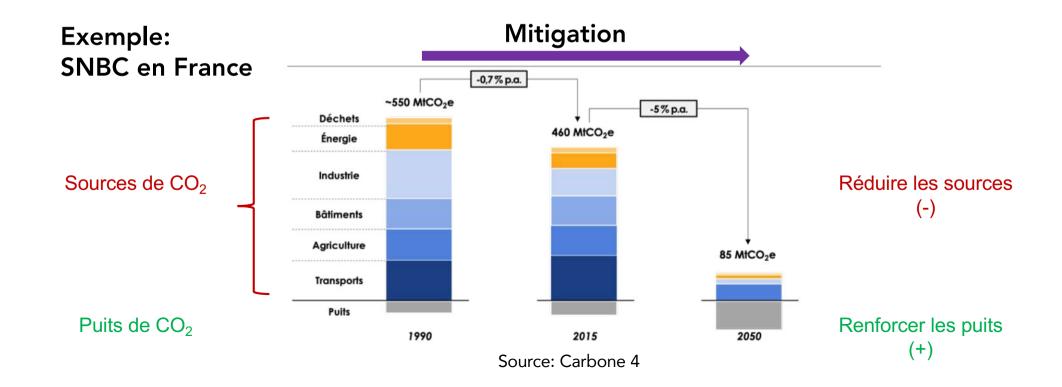
Human actions that directly or indirectly influence mitigation.

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thermique, changement de chaudière,

remplacement d'un véhicule à essence

ou diesel par un véhicule électrique)

compléteraient la réduction de 20 %.

L'engagement individuel permettrait

de l'empreinte carbone moyenne

N.B.: Au-delà de leur potentiel rôle pédagogique, les « petits gestes du quotidien » (faire le tri, éteindre la lumière...) n'ont pas d'impact significatif

sur l'empreinte carbone moyenne des individus.

Un engagement individuel « modéré »,

20 % (tous types d'action confondus).

plus réaliste, permettrait d'atteindre une baisse de l'empreinte carbone d'environ

Mais ces estimations se fondent sur

Une réduction qui correspond à 1/4 de l'effort nécessaire pour faire passer l'empreinte carbone

de 11 à 2 tonnes de CO2 équivalent par an.

un engagement personnel «héroïque»!

de près de 45%.

-20%

-45%

-20%

Mitigation behaviour Human actions that directly or indirectly influence mitigation.



Sur les 80 % de baisse nécessaires, 60 % donc en principe d'engendrer une baisse ne pourront être réalisables que grâce à une impulsion politique et collective.

-60%



Décarbonation du système agricole

Décarbonation des services publics

Décarbonation de l'énergie résiduelle

consommée (chaleur, gaz, électricité)

- Décarbonation du fret

Pour que l'empreinte carbone des Français diminue, les entreprises et l'État doivent donc aussi se transformer en profondeur.

Source: étude Carbone 4 (Juin 2019) - www.carbone4.com



Major Organizations/Institutions involved in climate policies/actions

Some key institutions involved in climate action

United Nations Environment Program (UNEP, PNUE)

- depends directly upon UN
- coordinating United Nations activities in the field of the environment
- Support/assist countries in the implementation of environmental policies
- Generates reports (UNEP gap report)

World Meteorological Organization (WMO, OMM)

- Depends directly upon UN but it is an non-governmental institution
- Provide standards and recommendations to facilitate the consideration of meteorological, climatic and hydrological factors in all human activities
- Ultimate goal is the preservation of people and property, transport (especially air transport), agriculture, water resource assessment, dissemination of information through the media.

Some key institutions involved in climate action

United Nations Framework Convention on Climate Change (UNFCCC, CCNUCC)

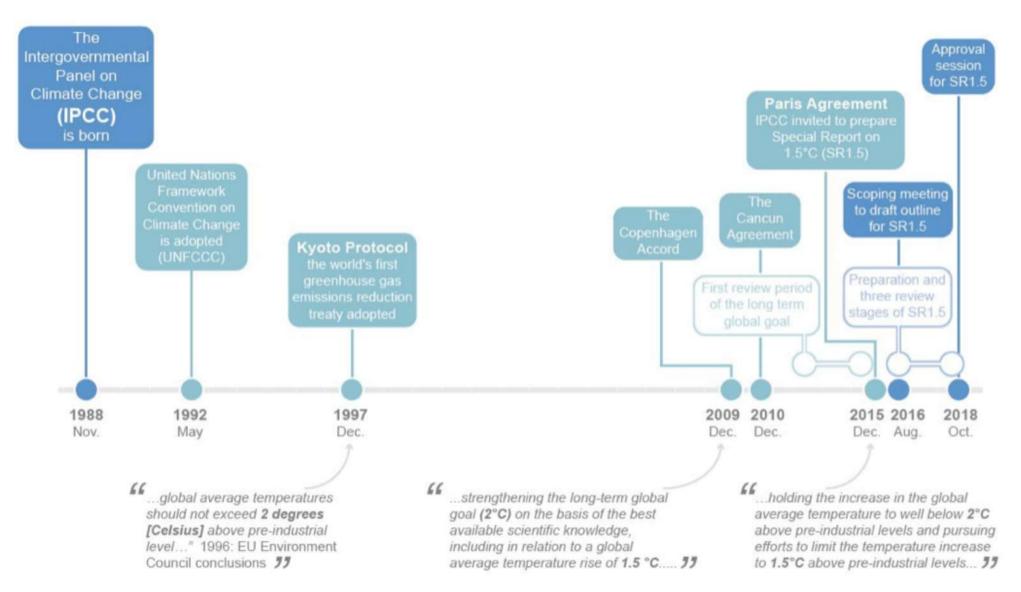
- Free-standing entity
- ultimate objective is the 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic human-induced interference with the climate system
- Its supreme body is the Conference of the Parties (COP)

Intergovernmental Panel on Climate Change (IPCC, GIEC)

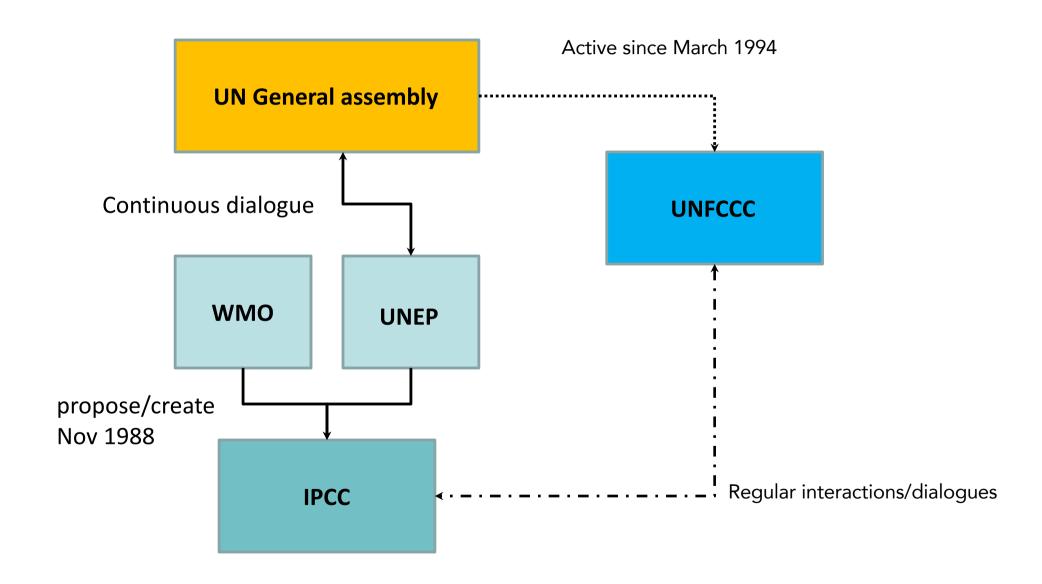
- Provides objective and scientific information on the understanding, the impacts and the risk of human-induced climate change and the possible response options (e.g., mitigation)
- Produces reports that contribute to the work of the UNFCCC.

⇒ Question: Which was created first?

Climate policies in timeframe



Institutional framework for Climate Action (1)



How IPCC works?







Plénière du GIEC

Bureau du GIEC

Comité exécutif du GIEC

Secrétariat du GIEC

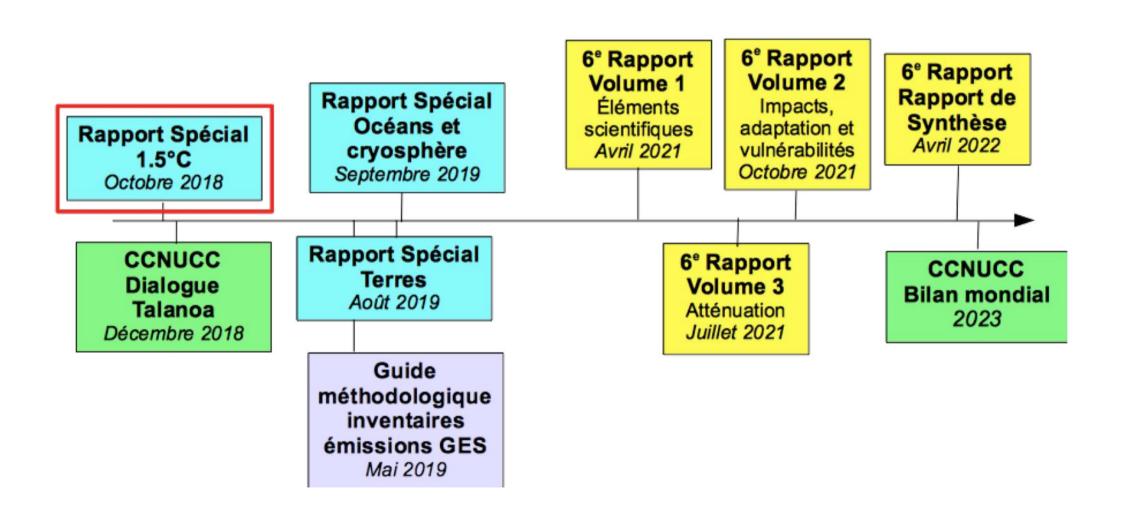
Points focaux nationaux:
- représentants des États
membres pour les questions de
gouvernance et de budget

Groupe I Principes physiques	Groupe II Changement	Groupe III Atténuation	Equipe spéciale pour les inventaires nationaux
du changement climatique	climatique, impacts, adaptation et vulnérabilités	du changement climatique	de gaz à effet de serre
V. Masson-Delmotte (France)	H. Pörtner (Allemagne)	J. Skea (Royaume-Uni)	K. Tanabe (Japon)
P. Zhai	D. Roberts	P. Shukla	E. Calvo
(Chine)	(Afrique du Sud)	(Inde)	(Pérou)
TSU	TSU	TSU	TSU

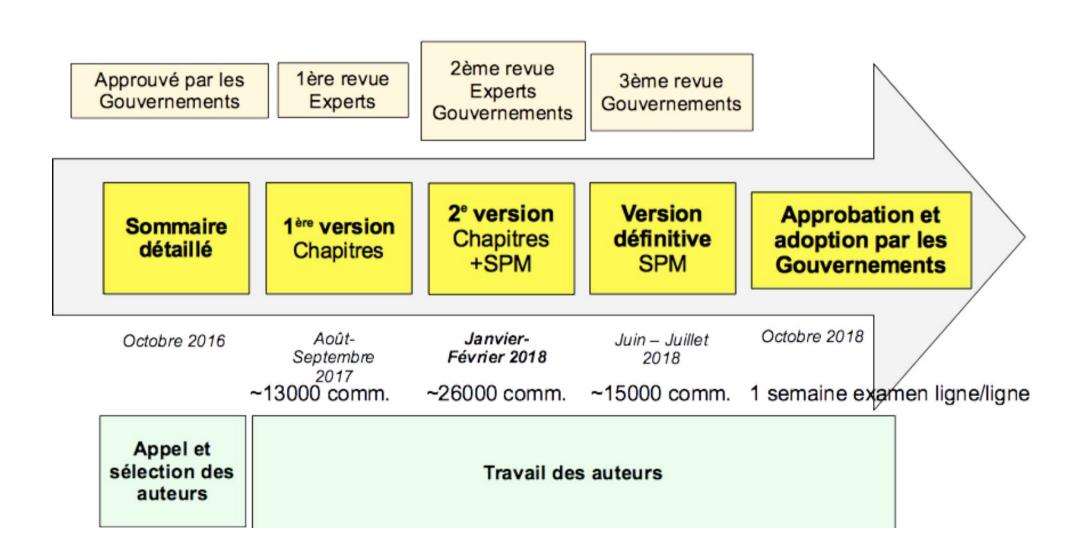
- Élaboration des rapports
- Réunions d'experts et réunions d'auteurs

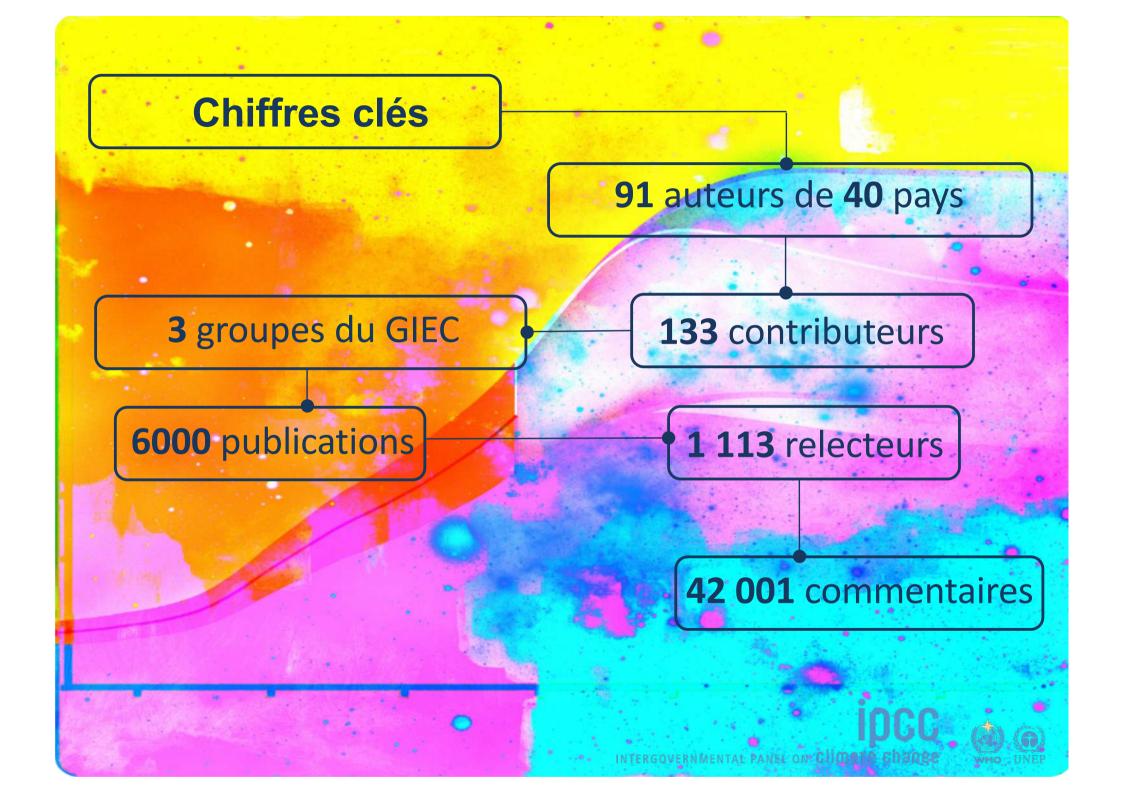
Auteurs, contributeurs, relecteurs

Le calendrier du 6° cycle du GIEC et ses liens avec la CCNUCC



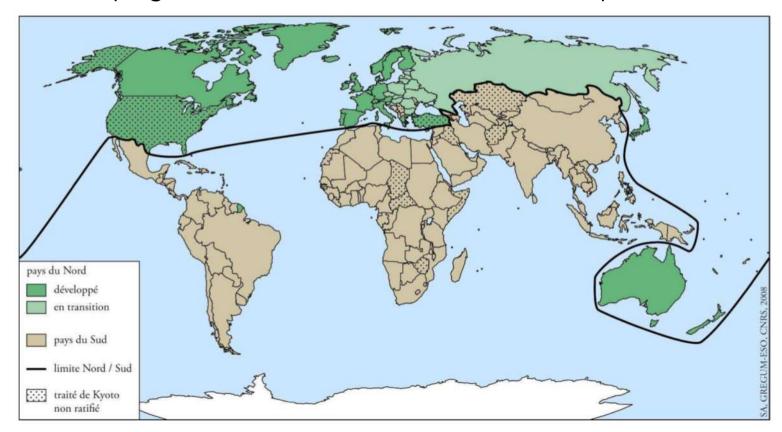
Importance du processus de revue



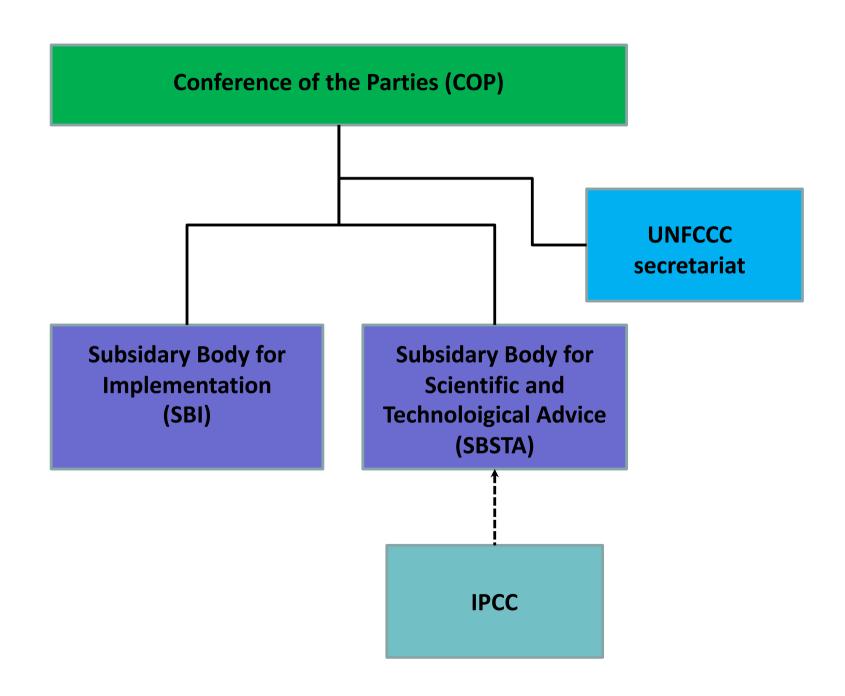


How the COP works?

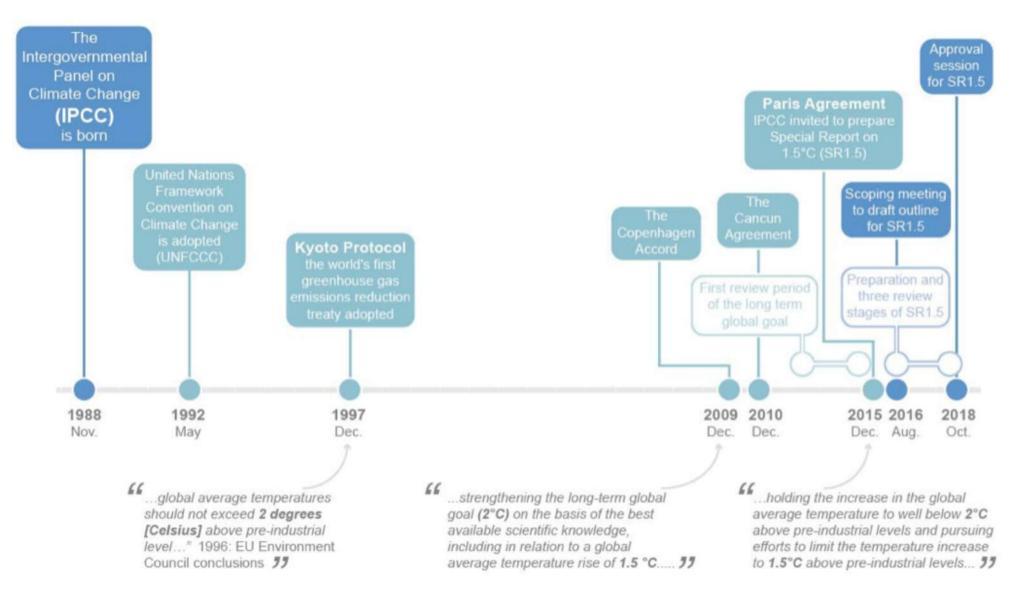
- Conference of the Parties (COP) is a conference established in accordance with Article 7 "CONFERENCE OF THE PARTIES" under UNFCCC as the supreme body of this Convention to assess in dealing with climate change.
- COP is organized annually since 1995.
- There are 42 parties listed in Annex-I parties to convention, 152 parties including
 49 latest developing countries (LDC) listed in Non Annex-I parties to convention.



Institutional framework for Climate Action (2)



Climate Action/Negociations in timeframe



Major Climate Policy Deals

Kyoto protocol (Dec 1997)= COP3

The main goal of the Kyoto Protocol is to control human-induced emissions of the main greenhouse gases (GHGs) considering national differences in GHG emissions, wealth, and capacity to make the reductions

Some of the principal concepts of the Kyoto Protocol are below:

- It establishes legally binding commitments to reduce emissions of greenhouse gases for Annex I Parties. The commitments were based on the Berlin Mandate, which was a part of UNFCCC negotiations leading up to the Protocol.
- It sets implementation requirements to prepare policies and measures for the
 reduction of greenhouse gases in their respective countries. In addition, they are
 required to increase the absorption of these gases and utilize all mechanisms
 available, such as joint implementation, the clean development mechanism and
 emissions trading, in order to be rewarded with credits that would allow more
 greenhouse gas emissions at home.
- It establishes and adaptation fund for minimizing the impacts of climate change on Developing Countries.
- It set and 'Accounting, Reporting and Review' procedure in order to ensure the integrity of the Protocol.
- It establishes a Compliance Committee to enforce compliance with the commitments under the Protocol.

Copenhagen Accord (Dec 2009)=COP15

The main goal of the Copenhagen accord is to endorses the continuation of the Kyoto protocol. It also reinforced the role of the scientific knowledge in climate negociations.

Key elements of this accord are below:

- It underlines that climate change is one of the greatest challenges of our time and emphasises a "strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities ».
- It recognizes "the scientific view that the increase in global temperature should be below 2 degrees Celsius", in a context of sustainable development to combat climate change.
- It recognizes "the critical impacts of climate change and the potential impacts of response measures on countries particularly vulnerable to its adverse effects" and stresses "the need to establish a comprehensive adaptation programme including international support"
- Recognizes that "deep cuts in global emissions are required according to science »
 (AR4) and agrees cooperation in peaking global and national greenhouse gas
 emissions "as soon as possible" and that "a low-emission development strategy is
 indispensable to sustainable development »

Copenhagen Accord (Dec 2009)=COP15

The Copenhagen accord also established several funds:

- ⇒ Agrees that developed countries would raise funds of \$30 billion from 2010–2012 of new and additional resources
- ⇒ Agrees a "goal" for the world to raise \$100 billion per year by 2020, from "a wide variety of sources", to help developing countries cut carbon emissions (mitigation).
- \Rightarrow Agrees on a new multilateral funding for adaptation with a governance structure.

The main goal of the Paris Agreement is established a novel multilateral comprehensive accord to fight climate change with a novel bottom up approach.

The objectives of this accord is established in the Article 2:

- 1. Limit Global warming well below 2° C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5° C above pre-industrial levels.
- 2. Increase the ability to adapt to the adverse impacts of climate change
- 3. Make finance flows consistent with a pathway towards low greenhouse gas emissions.

Key elements/dates:

- Adopted in Dec 2015 at COP21 by 191 over 196
- Signed in 2016
- Enter into force the 4th November 2016
- Composed with 29 Articles including goals and monitoring revision verification mechanism
- Facilitating dialogue kicked off in 2018
- Ratched mechanisms in Dec 2020
- Global stocktake planned for Dec 2023

Can be found here: https://unfccc.int/fr/processus-et-reunions/l-accord-de-paris/

Article 2

- 1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:
- (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

Science

(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

Adaptation Mitigation

(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Finance

2. This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

Key Articles: https://unfccc.int/fr/processus-et-reunions/l-accord-de-paris

Article 4

1. In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

Principle of the global mitigation

- 2. Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.
- 3. Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

Linkage with NDCs and Art. 3

Key Articles: https://unfccc.int/fr/processus-et-reunions/l-accord-de-paris/l-accord-de-paris

Article 3

As nationally determined contributions to the global response to climate change, all Parties are to undertake and communicate ambitious efforts as defined in Articles 4, 7, 9, 10, 11 and 13 with the view to achieving the purpose of this Agreement as set out in Article 2. The efforts of all Parties will represent a progression over time, while recognizing the need to support developing country Parties for the effective implementation of this Agreement.

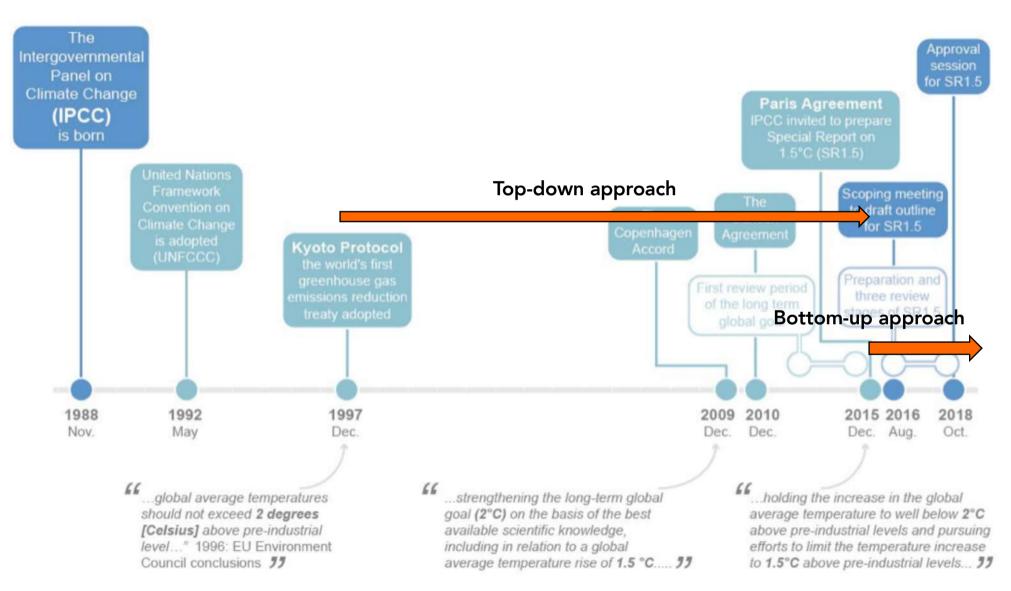
Principle Of NDCs

Article 12

Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement.

Climate Education

Why Paris Agreement such a big change?



What INDCs/NDCs consists in?

Countries' NDC are available on

https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx

Questions:

 \Rightarrow Have a look at the [first or updated/revised] NDC of some countries ?

⇒ What kind of emissions reduction measures are considered?

⇒ Are they comparable between each other ?



Submissions to date: 128; Parties Represented: 156

INDCs/NDCs

Exemple de Contributions Nationales

UE28:

- at least 40% of domestic GHG emissions by 2030 compared to 1990

3206 MtCO2eq with LULUCF (-277 MtCO2eq)

Deals with 7 GHGs=CO2, CH4,N20,4 HFCs

USA:

- 26-28% of GHG emissions reduction below its 2005 level in 2025

4599-4735 MtCO2eq with LULUCF (- 420 MtCO2eq)

Deals with 7 GHGs=CO2, CH4,N20,4 HFCs

China:

- -Peak in ~2030
- reduce the GHG emissions per unit of GDP (carbon intensity) by 60-65% from the 2025 level
- increase non-fossil energy by 20%
- increase forest stock by 4.5 Mm3 from the 2005 level

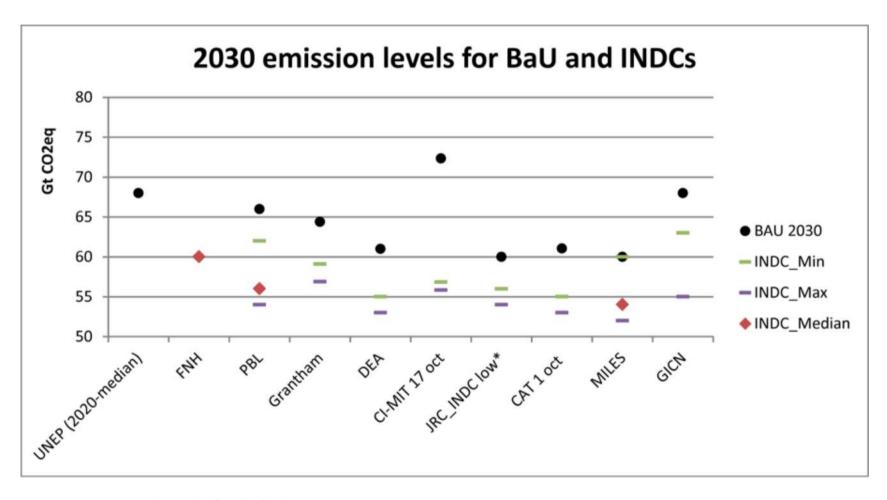
13 481 - 16 043 MtCO2 with LULUCF (-292 MtCO2eq)

Deals with 3 GHGs

More info on http://unfccc.int/focus/indc_portal/items/8766.php

Aggregating INDCs in emission is challenging

 ΔT = warming deduced from cumulative aggregated emissions

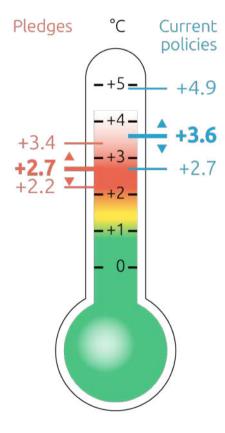


BAU = 63-72 GtCO2eq INDCs = 55-63 GtCO2eq (GICN)

Source: GICN 2015

Warming projections assumed with INDCs

Exemple de projections



Climate Action Tracker (PIK+NGOs)



Climate Interactive (MIT+NGOs)







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.



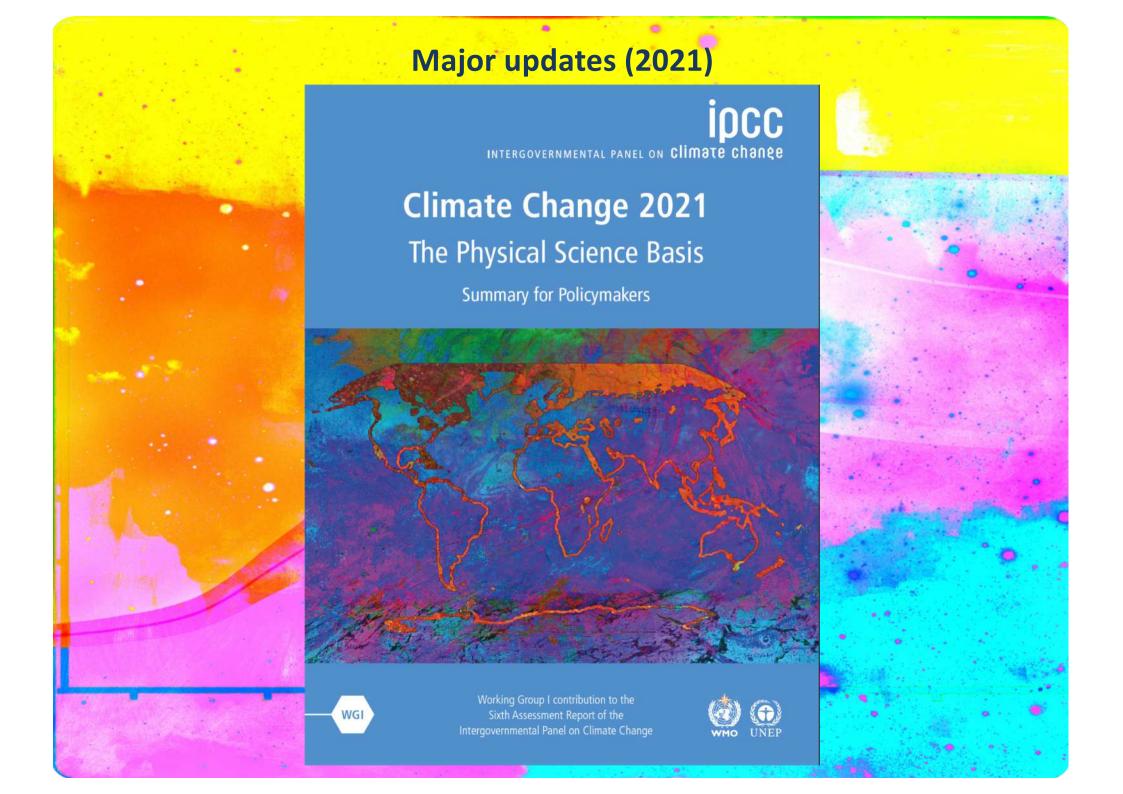
Global Warming of 1.5° C

An IPCC special report on the impacts of global warming of 1.5° C above preindustrial 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.









Glasgow Climate Pact



The main goal of the Glasgow Climate Pact is to continue work on implementing the 2015 Paris Agreement's aim of limiting global temperature increase to "well below" 2.0 ° C on pre-industrial levels, and to pursue efforts to limit temperature increases to 1.5° C.

The objectives of this pact are:

- 1. Secure global net zero by mid-century and keep 1.5 degrees within reach.
- 2. Adapt to protect communities and natural habitats to avoid loss of homes, livelihoods, and even lives.
- 3. Mobilise at least \$100bn in climate finance per year.
- 4. Finalize the Paris Rulebook and accelerating climate action.

Have a look at the deal:

 $\frac{https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pd}{\underline{f}}$

Glasgow Climate Pact (Nov 2021)=COP26

Non-Paper: Presidency summary of possible elements identified by Parties for inclusion across 1/CP.26, 1/CMA.3, 1/CMP.16 without prejudice to placement

Context

- Importance of multilateralism and international cooperation, in accordance with international law
- Impacts of the COVID-19 pandemic, in particular in developing countries
- Urgency of action to keep 1.5 alive, critical decade to deliver Paris goals on mitigation, adaptation and finance
- Guided by principles and provisions of Convention, equity, common but differentiated responsibilities and respective capabilities in light of different national circumstances
- Welcome IPCC report and look forward to further IPCC reports, concern about state
 of the climate
- Need for increased ambition in light of science to address gaps across all pillars of the Paris Agreement in a balanced manner
- · Youth participation and empowerment
- · Human rights, gender, and rights of Indigenous People
- Integrity of Mother Earth in the context of sustainable development and poverty alleviation and climate justice
- Just transition
- · Outcomes of World Leaders Summit, including Glasgow breakthroughs

Adaptation

- · Vital importance of adaptation in light of increasing temperatures
- Acknowledge science, look forward to WGII, opportunity for IPCC work on adaptation
- · Acknowledge progress made through Adaptation Committee
- · Acknowledge adaptation plans and communications submitted to date
- Acknowledge the gap and need to urgently accelerate action and scale up finance to support developing countries
- · Commitment to take further action
- Importance of incorporating adaptation into planning processes, enhanced support for development of NAPs
- Submission of Adaptation Communications by COP27 in order to inform GST
- Placeholder: Global Goal on Adaptation

Adaptation Finance

- Acknowledge gap between needs and available financial resources
- Acknowledge commitments made, but highlight inadequacy of support for adaptation and urgency of scaling it up

- · Balance with mitigation finance
- Address predictability, adequacy and effectiveness

Mitigation

- Urgency of action towards Paris temperature goal of well below 2 degrees, pursuing efforts to 1.5 degrees; emphasising importance of keeping 1.5 degrees in reach
- Importance of responding to the science; refer to IPCC findings; pre-2030 action, global net zero by 2050; carbon budget
- Acknowledge updated and enhanced NDCs and long-term strategies
- · Acknowledge the gap: findings of NDC Synthesis Report, UNEP gap report
- · Highlight need for collective action and implementation
- Reaffirm nationally determined nature of contributions, and different pathways according to national circumstances
- Accelerate efforts to 2030 and align short and long-term targets through work programme/roadmap
- Parties who have not yet submitted enhanced NDCs expected to do so in 2022
- Reaffirm Article 4.3 and 4.11 of the Paris Agreement, Parties to revisit 2030 NDCs to align with temperature goal
- Updated NDC Synthesis Report at least annually
- Annual high-level roundtable on Pre-2030 ambition from COP27
- Leader level event to consider 2030 ambition ahead of Global Stocktake
- Renewed call for submission of long-term strategies that chart a just transition to net zero, to be updated regularly, captured in Secretariat synthesis report
- Opportunities to reduce non-CO2 gases
- Enhanced support and cooperation for the development and implementation of NDCs and long-term strategies

Finance, capacity building and technology transfer

- Urgently scale up finance flows to the levels needed to support developing countries in implementation
- Deep concern that the \$100bn goal has not yet been met
- Acknowledge recent finance commitments and \$100bn delivery plan
- Placeholder: SCF's Biennial Assessment report and the Needs Determination report
- Emphasise need to enhance access to finance, including through guidance to the climate funds, including eligibility/ non GDP based vulnerability metrics
- Placeholder: needs of developing countries
- Improve quality of finance; increase grant-based resources; acknowledge debt burden
- Accelerate action to make finance flows consistent with a pathway to low greenhouse gas emissions and climate resilient development
- · Placeholder: Article 2.1c
- MDBs alignment with Paris Agreement
- · Importance of public and private sources of finance

Glasgow Climate Pact (Nov 2021)=COP26

- Placeholder: deliberations on new collective quantified goal for post 2025
- Enhanced support to developing countries should include the development, transfer and deployment of technology and capacity-building

Loss and Damage

- Acknowledge the ongoing and increasing reality of Loss and Damage with rising temperatures and basis in science
- · Urgency of action
- · Need for increased and additional financial support
- · Placeholder: operationalisation of Santiago Network

Implementation

- The need to move to implementation and delivery, providing information on policies
- Welcome the start of the Global Stocktake; need to support participants
- · Placeholder: elements of the Paris Rulebook
- · Increased support for enhanced transparency framework reporting requirements
- Pre-2020 implementation
- Specific measures for emissions intensive sectors
- · Actions to transition to low-carbon economies
- · Response measures

Collaboration

- Importance of international collaboration, capacity building, technology and innovation
- · Role of non-party stakeholders
- Importance and recognition of work of High-Level Champions, Marrakech Partnership
- · Recognition and follow up to ocean dialogue
- · Recognition and follow up to land dialogue
- · Role of nature and biodiversity including forests, in adaptation and mitigation
- Placeholder: COP27 in Egypt

Around the COP26

Key pledges around the COP26:

Deforestation pledges: « ... work collectively to halt and reverse forest loss and land degradation by 2030 »

Global methane pledge: the pledge asks countries to cut their <u>methane emissions</u> by 30% over 2020-30 and move towards using the "best available inventory methodologies" to quantify emissions.

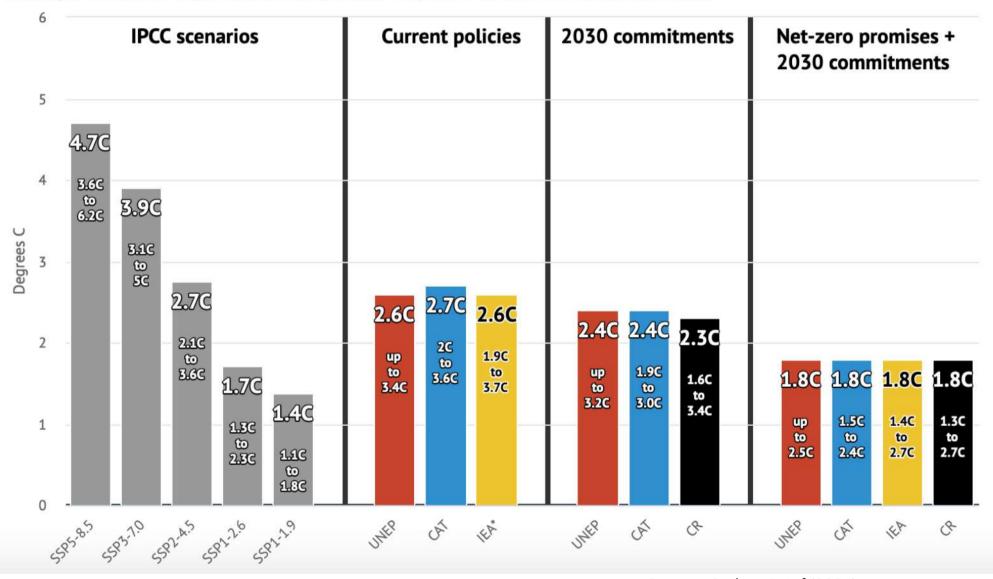
Coal phase-out pledges: the UK has secured a 190-strong coalition of countries and organisations at COP26, with countries such as Poland, Vietnam, Egypt, Chile and Morocco announcing commitments to phase out coal power."

Fossil fuel financing: the signatories will "end new direct public support for the international unabated fossil fuel energy sector by the end of 2022, except in limited and clearly defined circumstances that are consistent with a 1.5C warming limit and the goals of the Paris Agreement".

Glasgow breakthroughs: a commitment to work together internationally this decade to accelerate the development and deployment of the clean technologies and sustainable solutions needed to meet our Paris Agreement goals, ensuring they are affordable and accessible for all

Do COP26 pledges keep global warming below 2° C?

Warming in 2100 relative to preindustrial. 50th percentile temperature outcomes and uncertainties shown.



Source: Carbon Brief (2021)