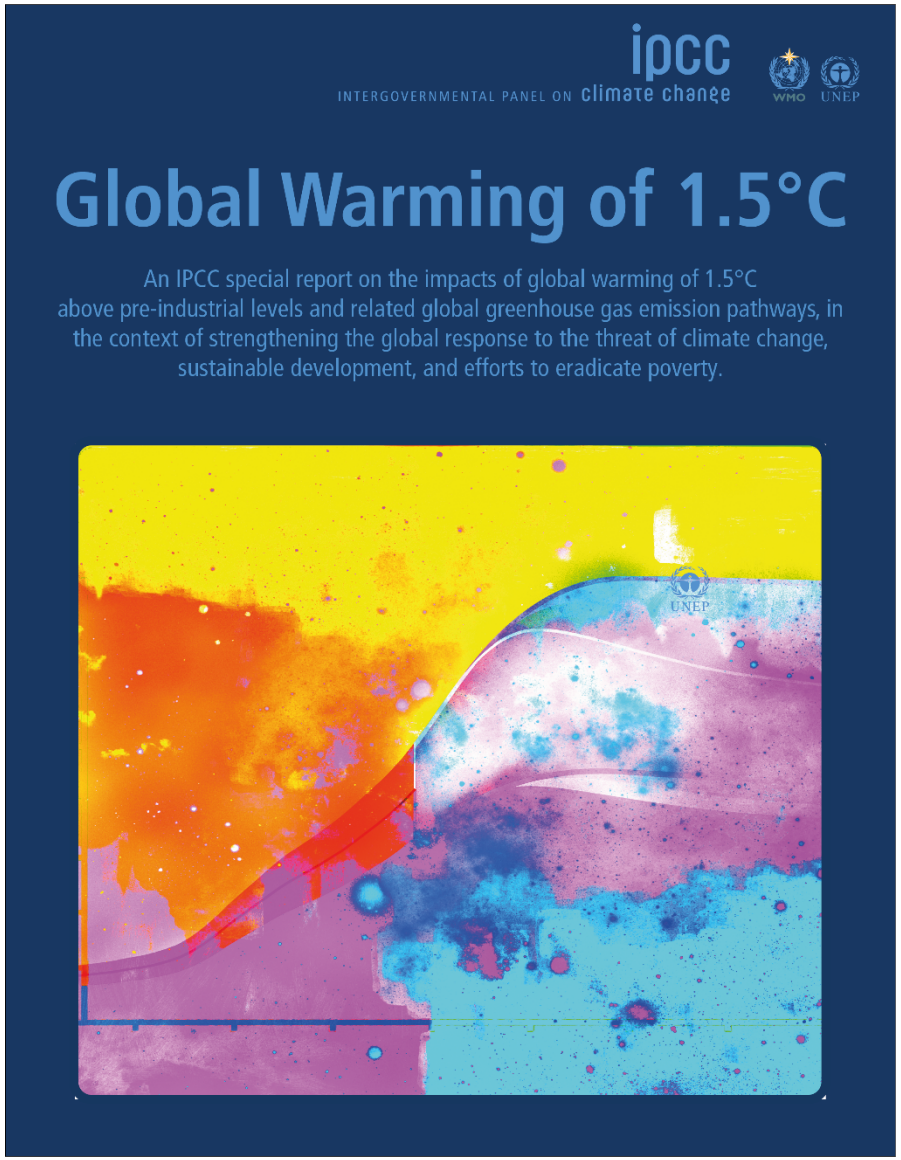


Point sur les connaissances actuelles:

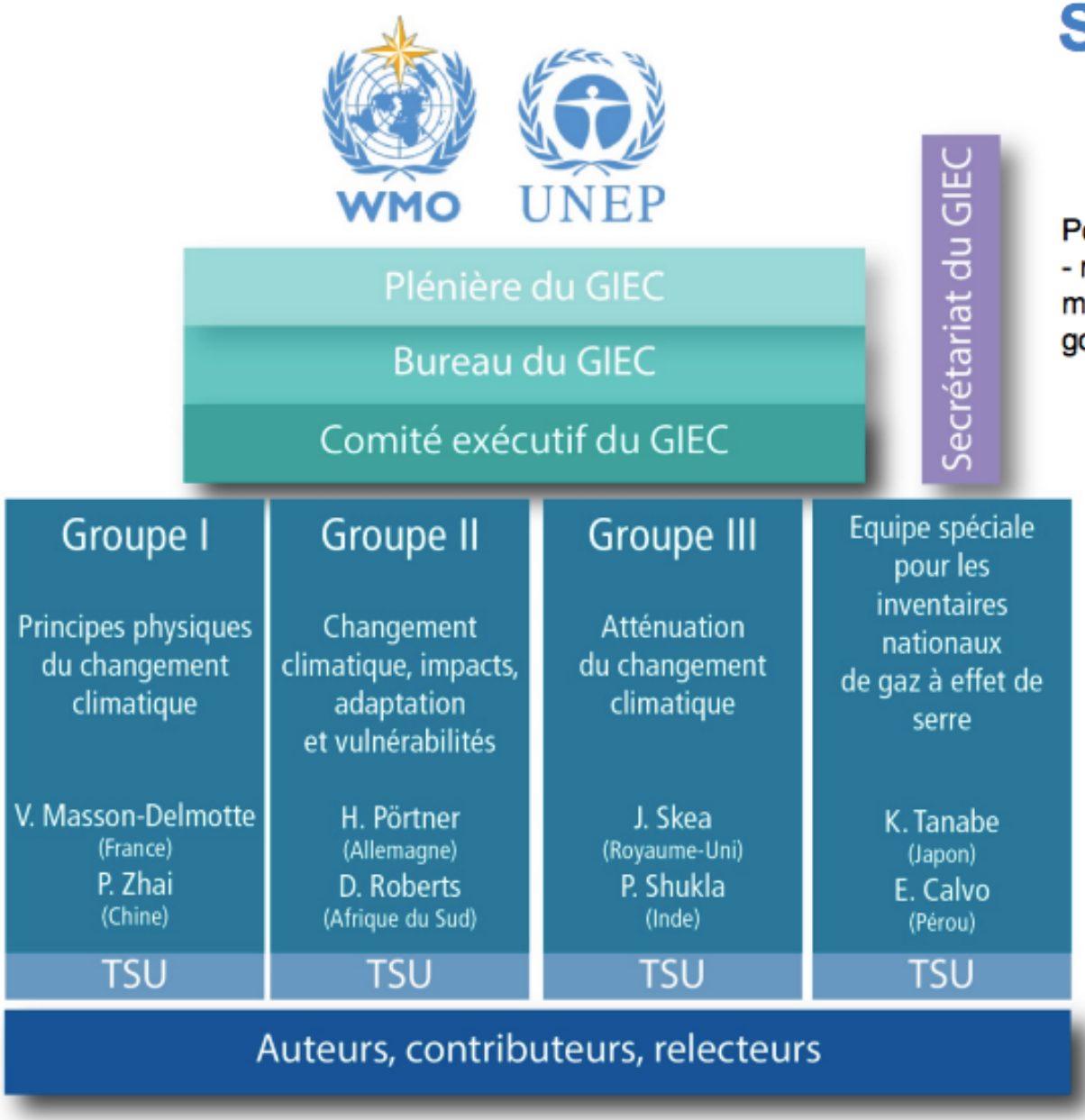
Quelles sont les conclusions du Rapport Spécial du GIEC sur 1.5°C de réchauffement planétaire

Roland Séférian

Centre National de Recherches Météorologiques (Météo-France/CNRS), Toulouse, France
roland.seferian@meteo.fr

Structure du GIEC

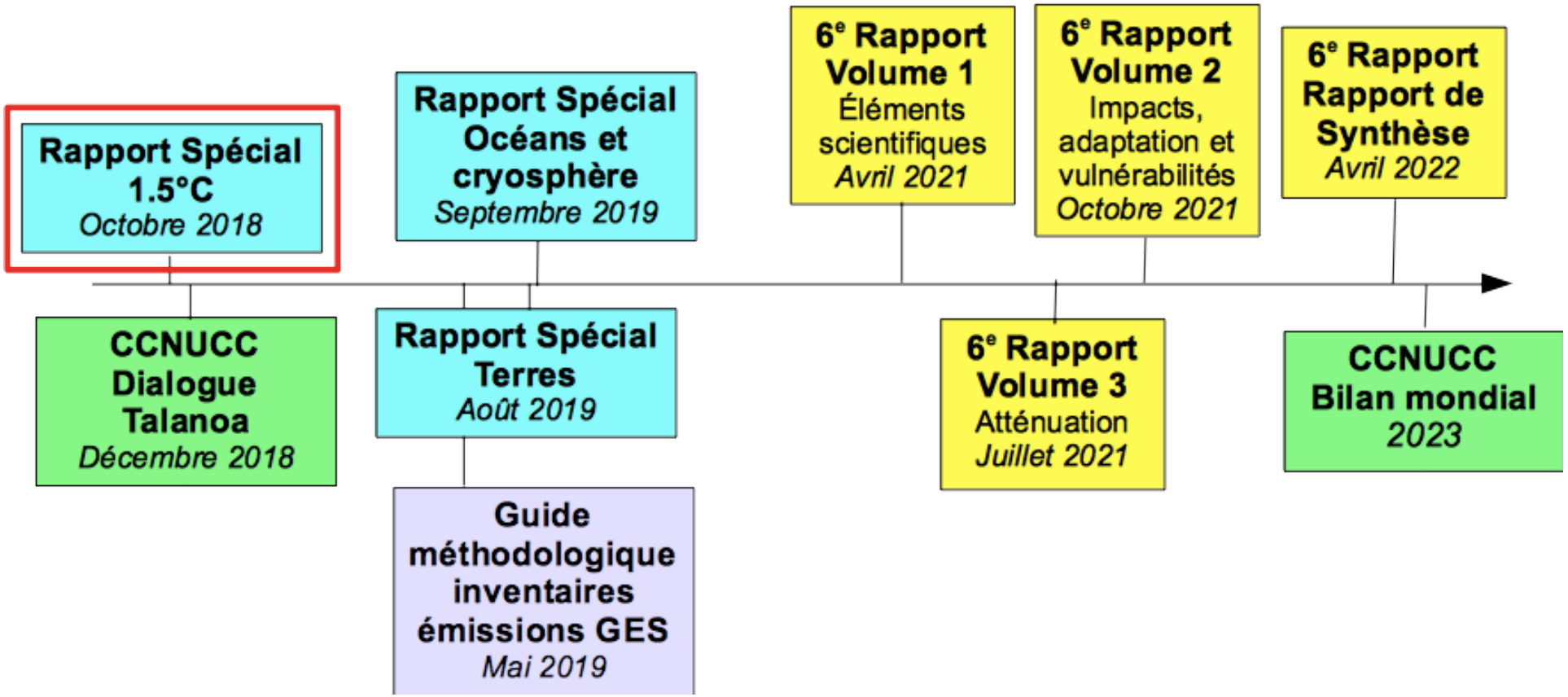
Structure



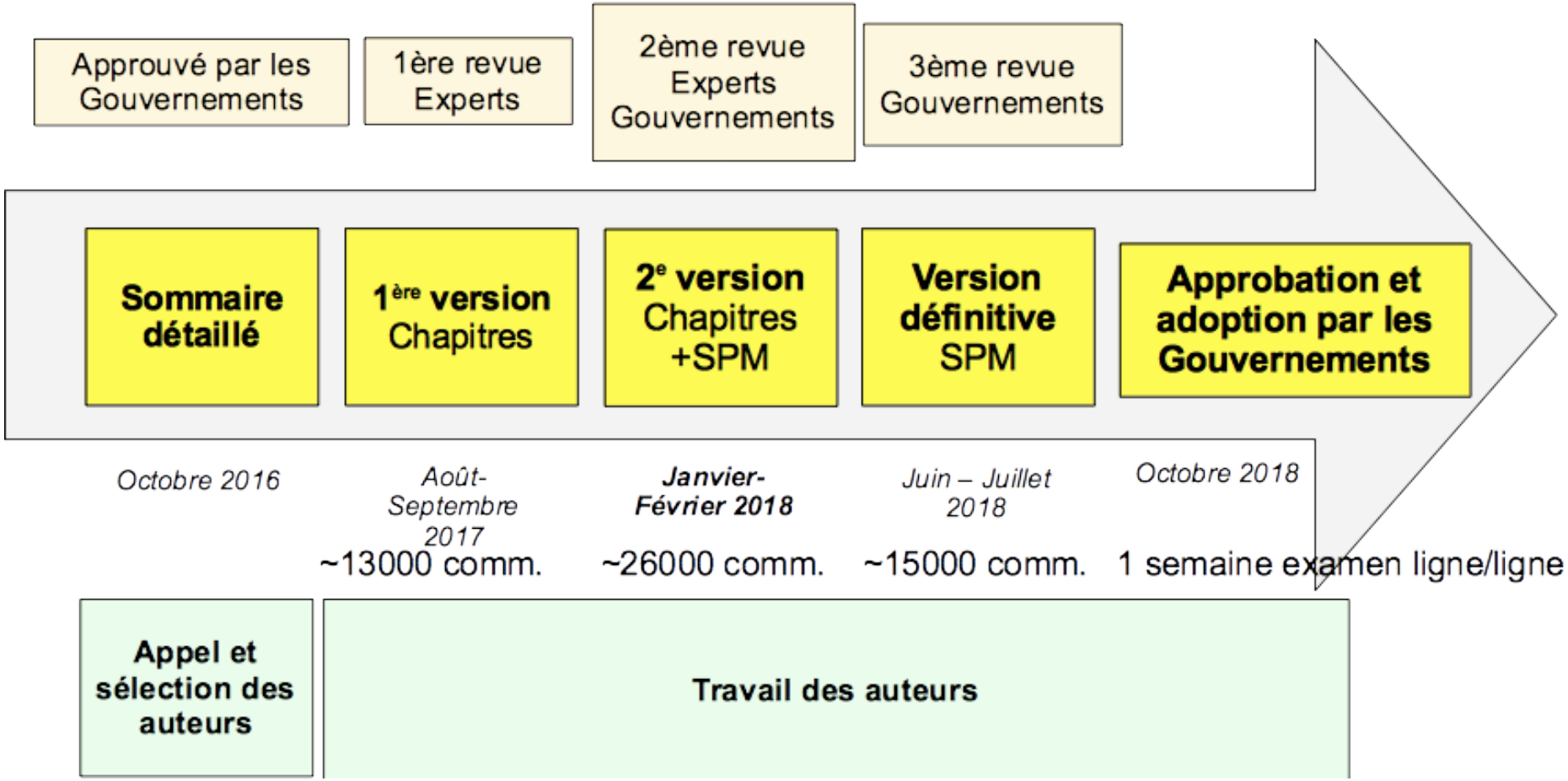
Points focaux nationaux:
- **rep**résentants des États **mem**bres pour les questions de **gouv**ernance et de budget

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

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

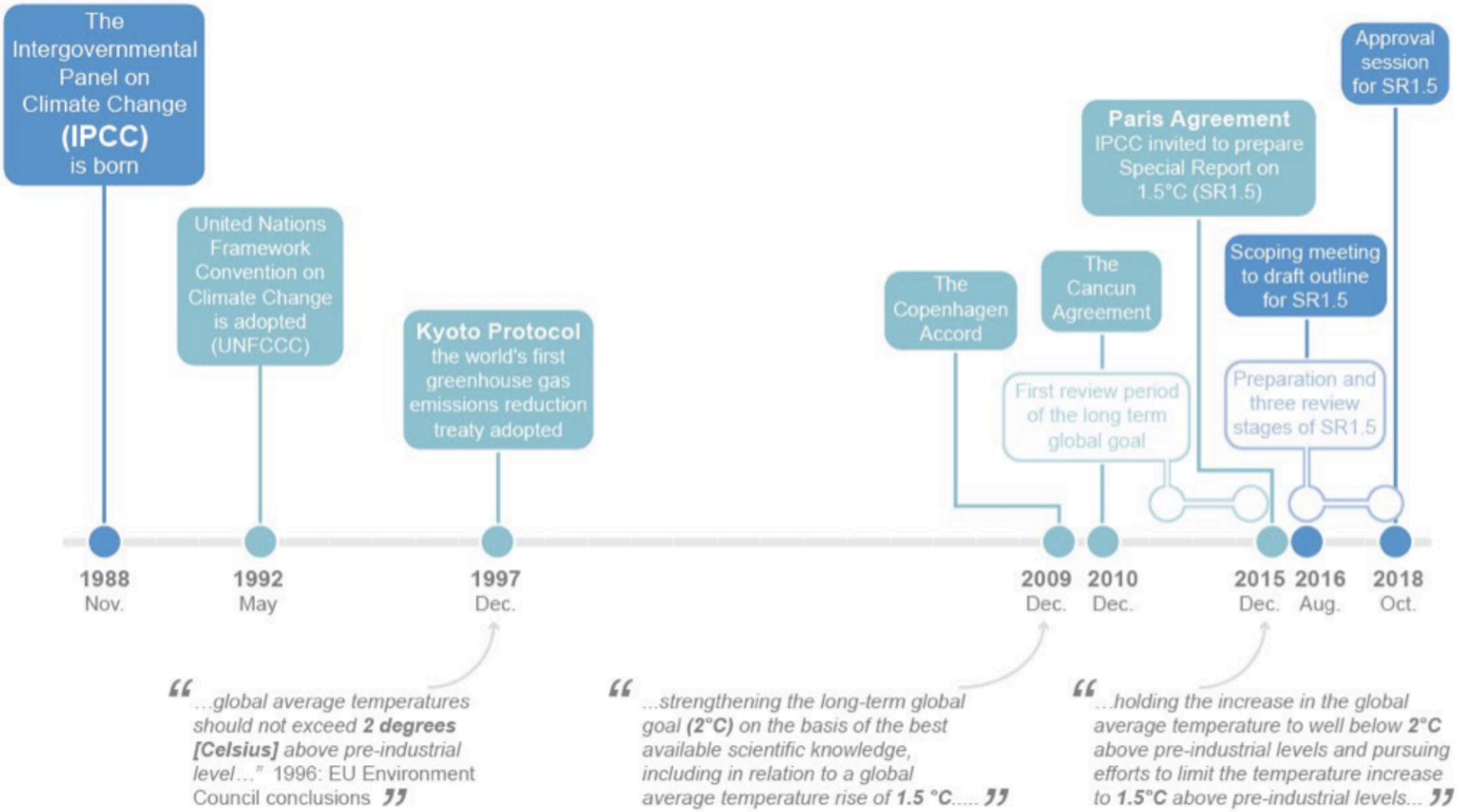


Importance du processus de revue

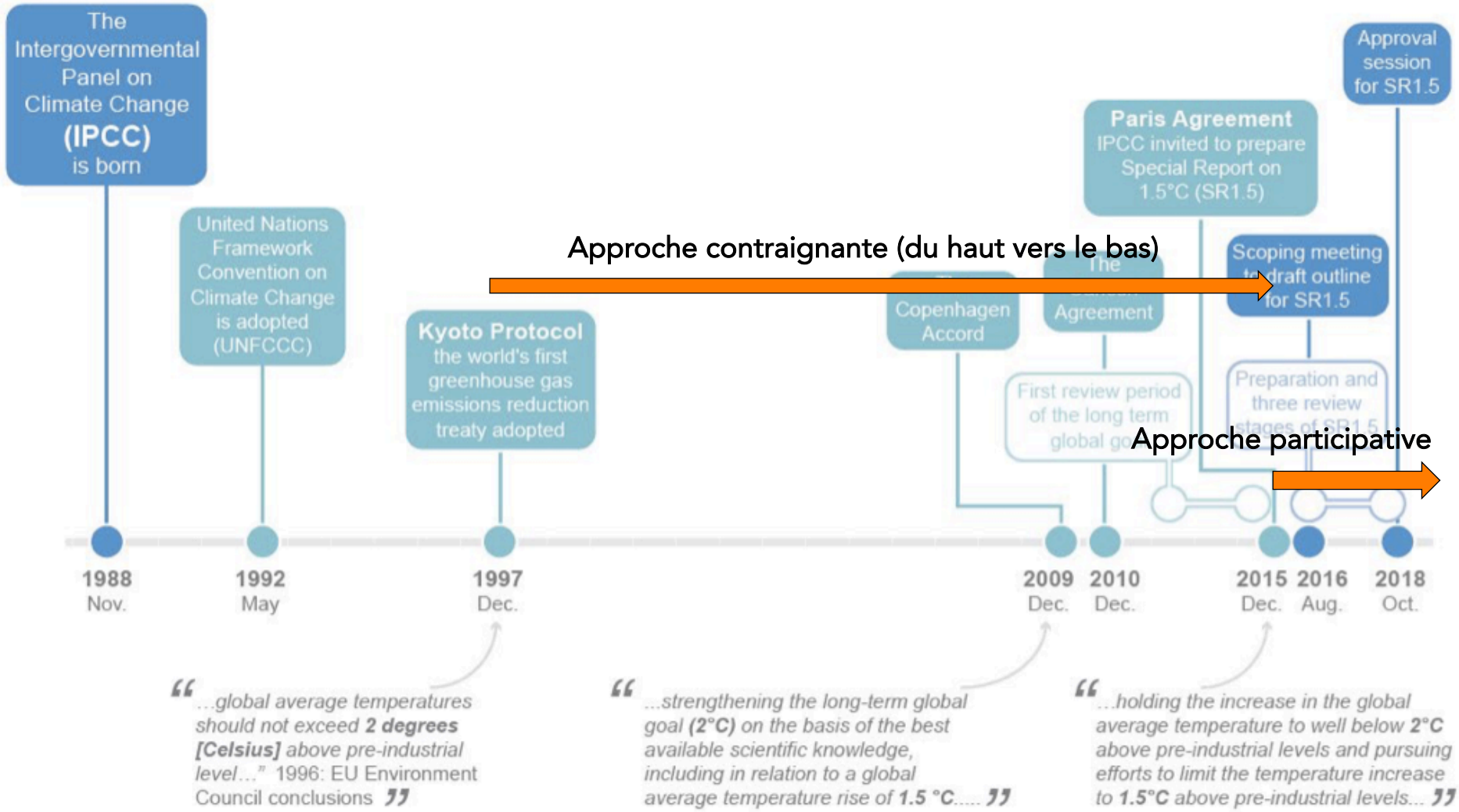


Comprendre l’origine du rapport spécial 1.5°C

Origine du rapport



Origine du rapport = point de vue des négociations internationales sur le climat



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

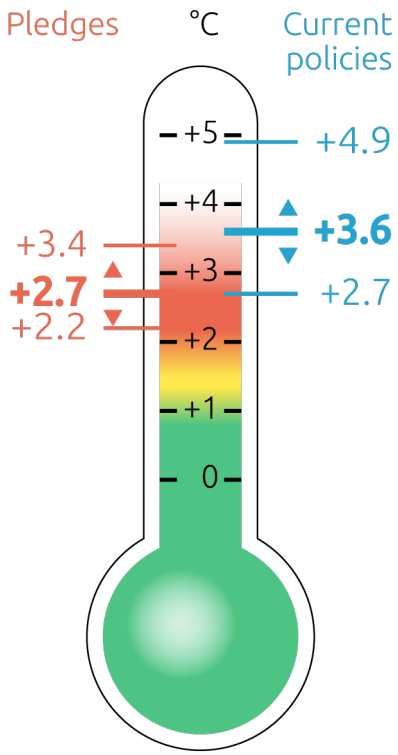
- reduce the GHG emissions per unit of GDP (**carbon intensity**) by 60-65% from the **2025** level
- increase non-fossil energy by 20%
- increase forest stock by 4.5 Mm3 from the 2005 level

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

Exemple de projections



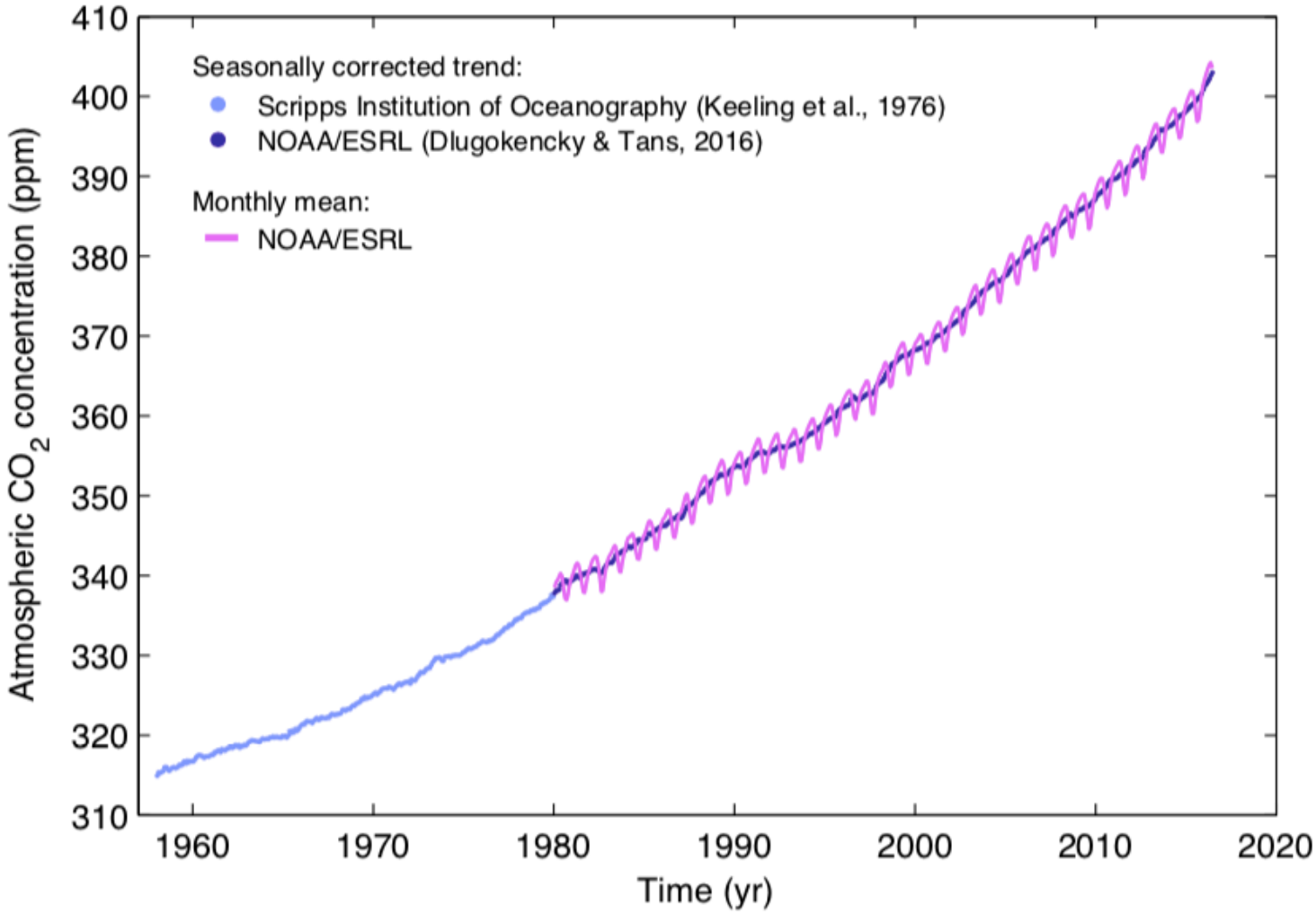
Climate Action Tracker
(PIK+NGOs)

Climate Interactive
(MIT+NGOs)

Contexte climatique

Traceur emblématique du changement climatique: le CO_2

Preindustrial (1850)= 283 ppm **+43%** Aujourd'hui (2018)= 405 ppm



Le Quéré et al., 2018

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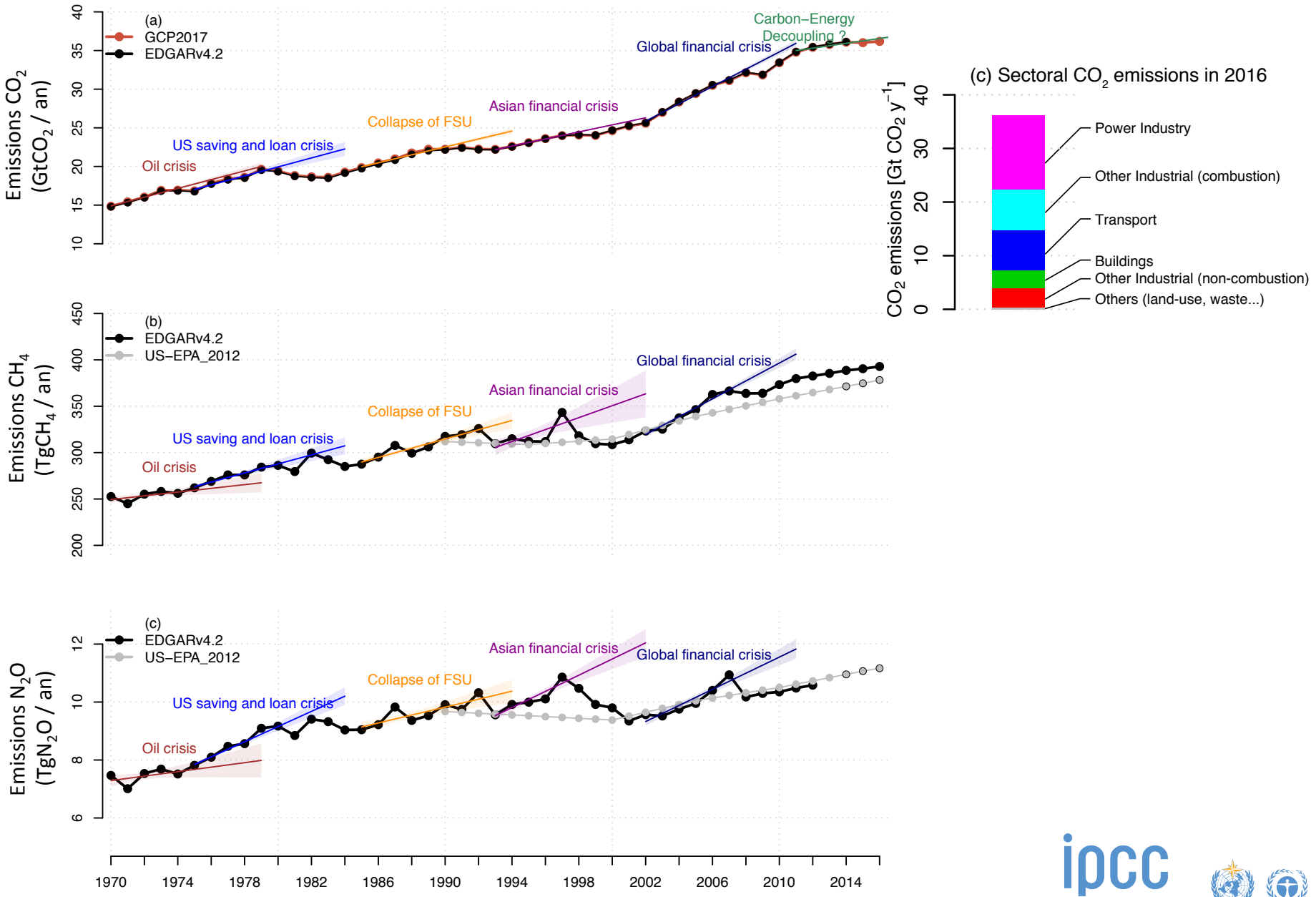
Emissions de gaz à effet de serre



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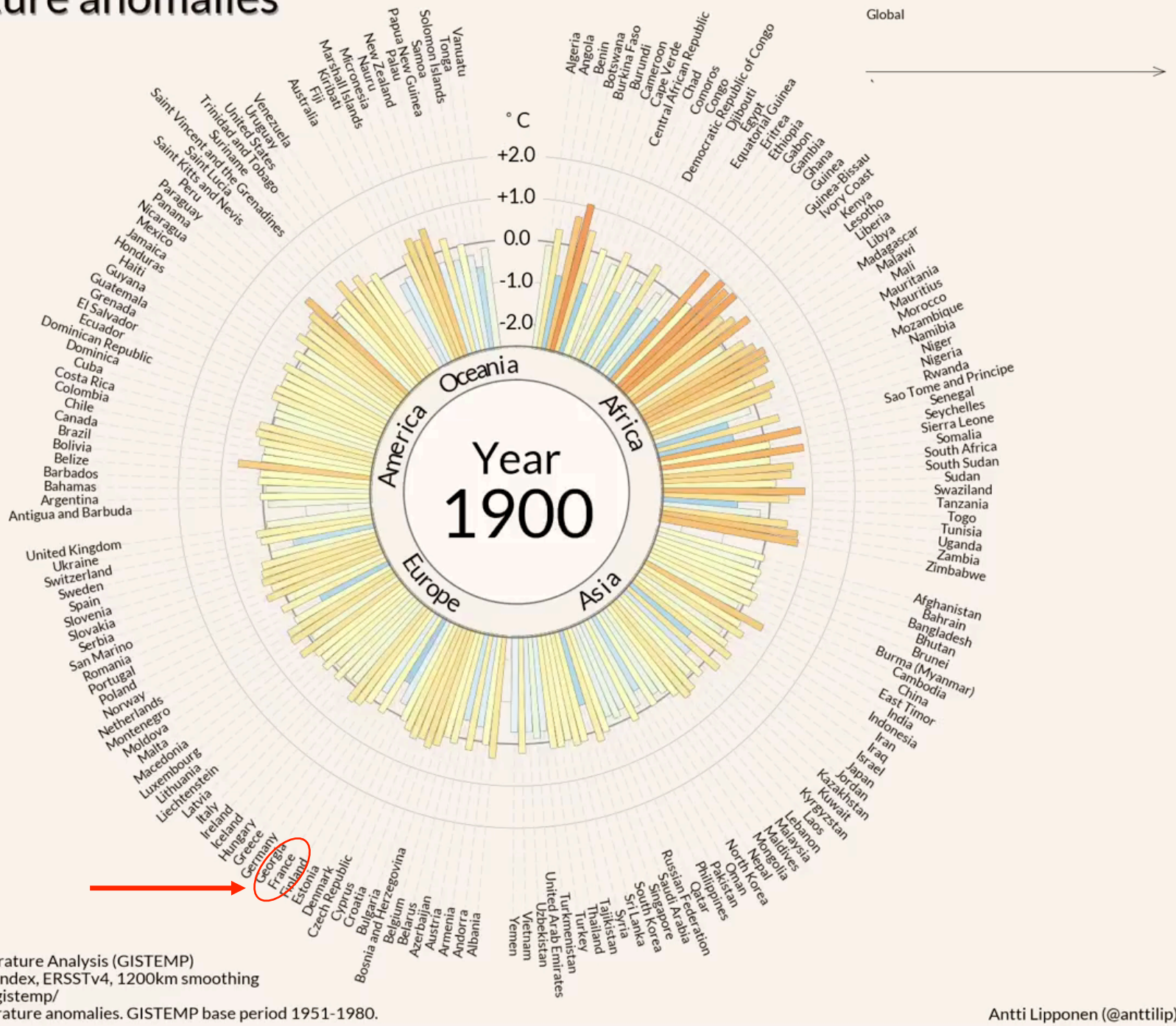
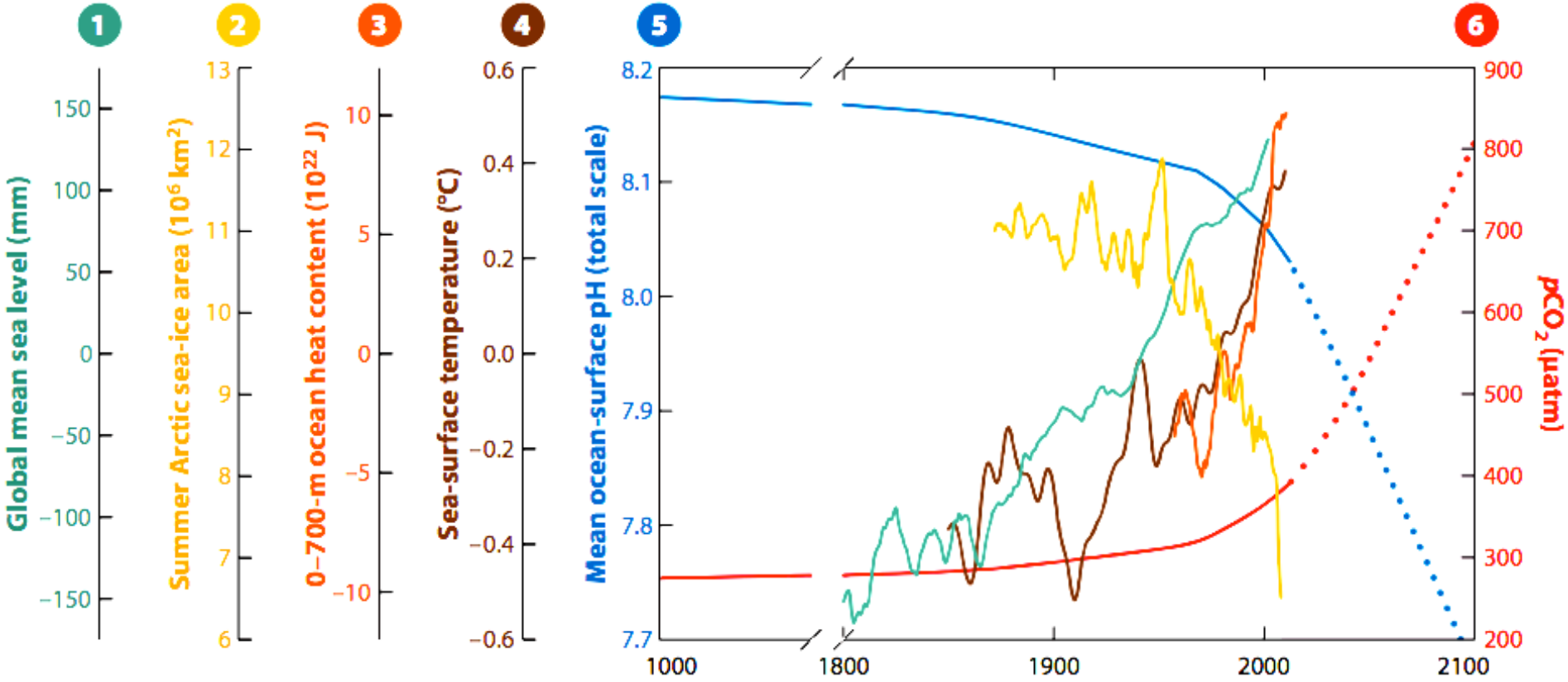
Temperature anomalies



Data source:
NASA GISS Surface Temperature Analysis (GISTEMP)
Land-Ocean Temperature Index, ERSSTv4, 1200km smoothing
https://data.giss.nasa.gov/gistemp/
Average of monthly temperature anomalies. GISTEMP base period 1951-1980.

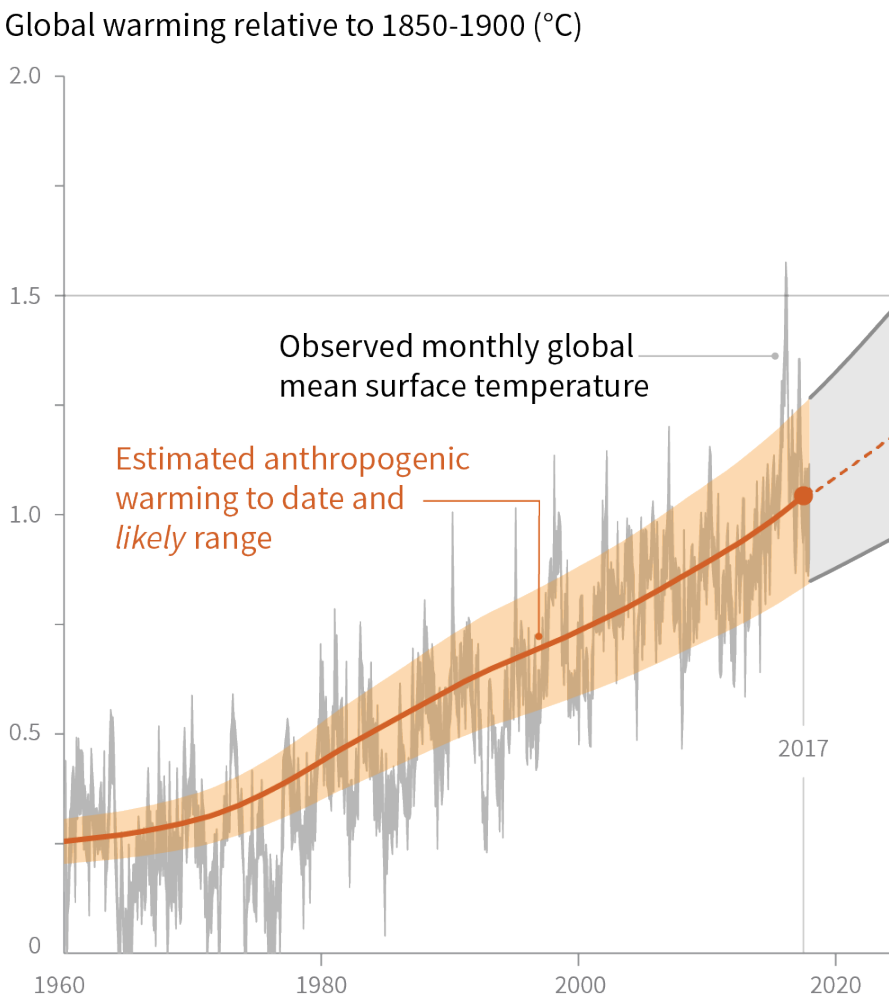
Antti Lipponen (@anttilip)

Un cortège d'impacts sur l'océan et les écosystèmes marins



Doney et al. 2012

Comprendre 1.5°C de réchauffement global



Où en sommes-nous aujourd'hui?

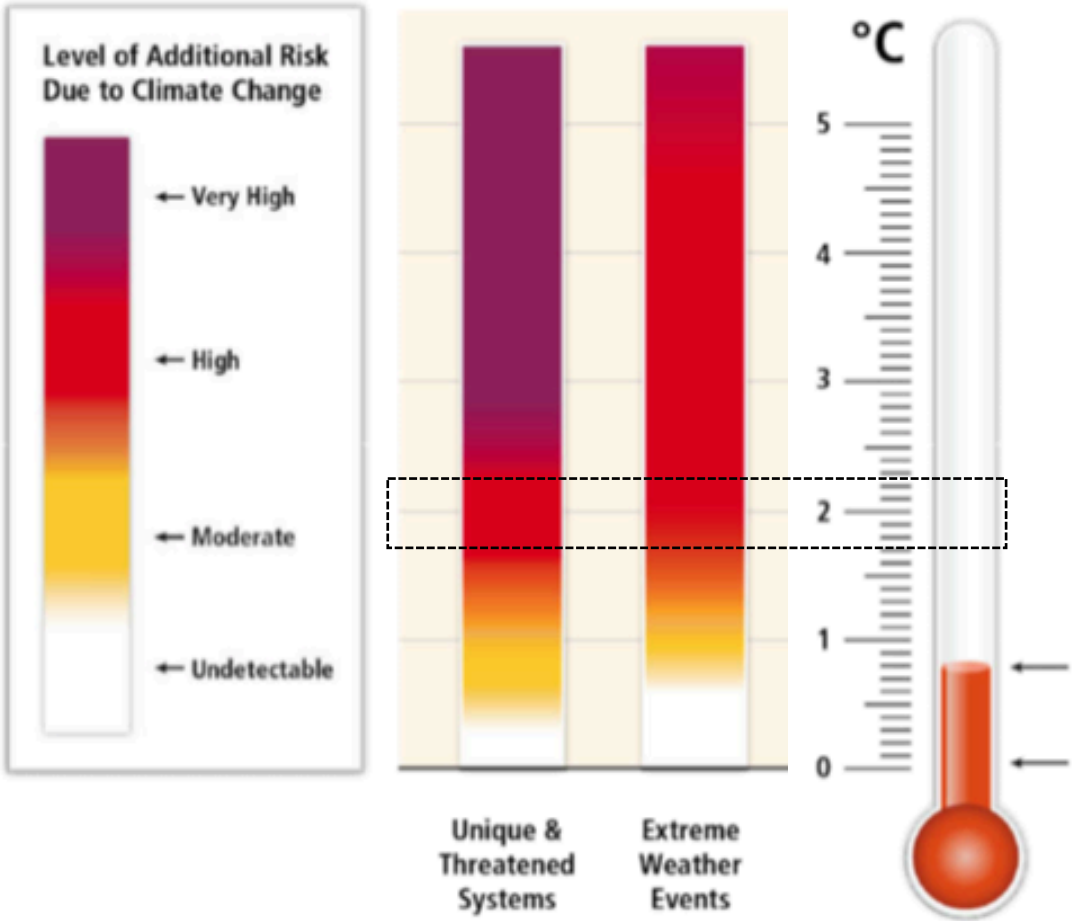
Depuis la période pré-industrielle, les activités humaines ont provoqué un réchauffement global d'environ 1°C

- Des effets déjà visibles
- Au rythme actuel, 1,5°C serait atteint entre 2030 et 2052
- Les émissions passées ne conduisent pas inéluctablement jusqu'à 1,5°C

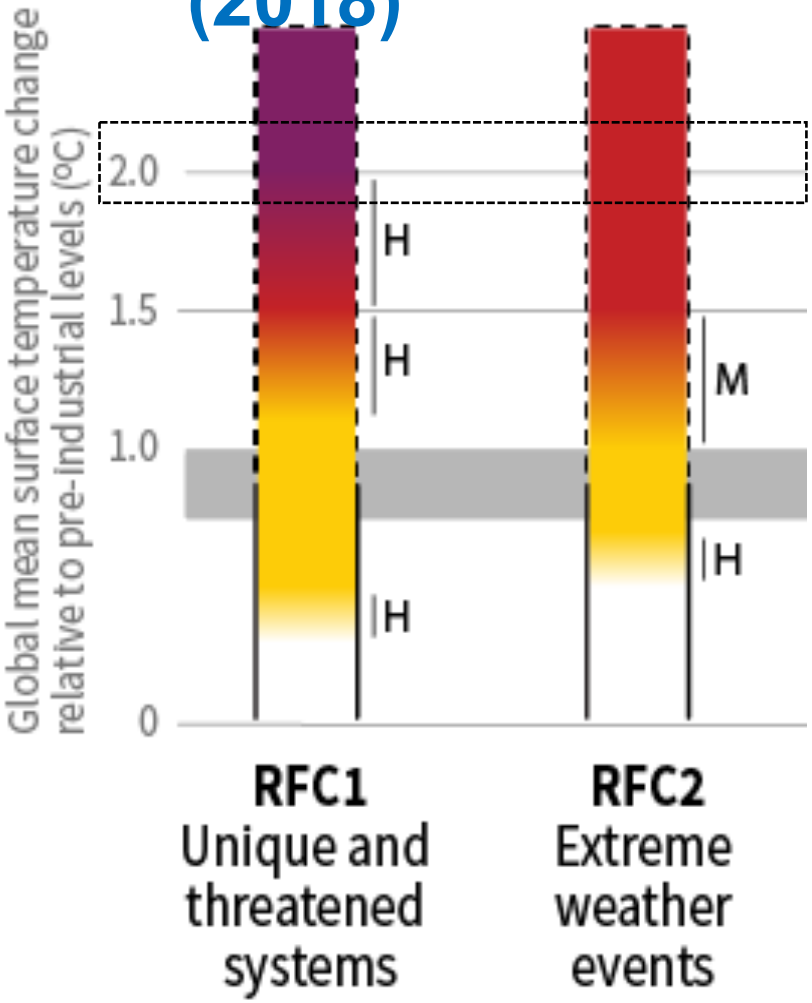
Projections du changement climatique, impacts potentiels et risques associés

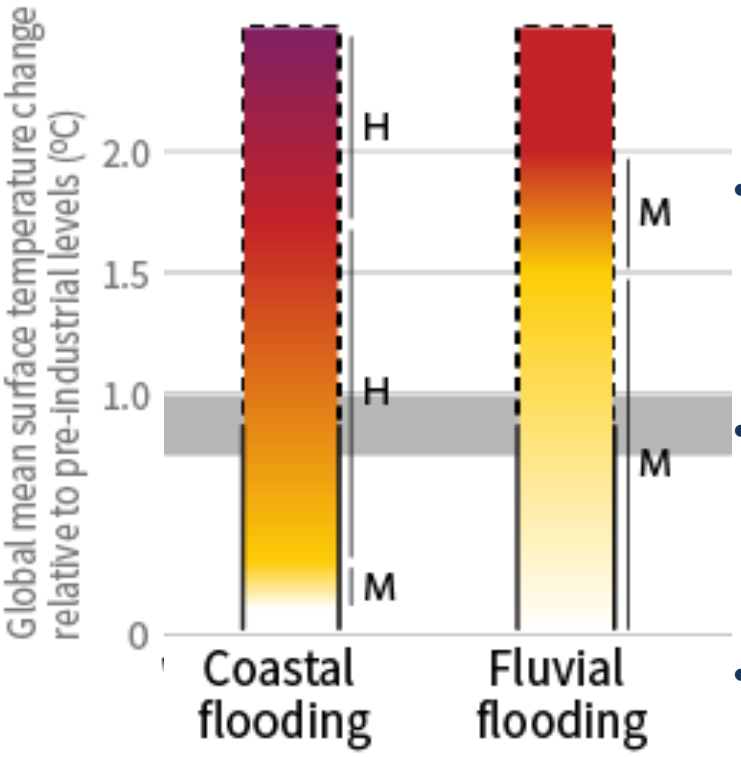
Les risques du changement climatique ont été revus à la hausse

IPCC AR5 (2013,2014)



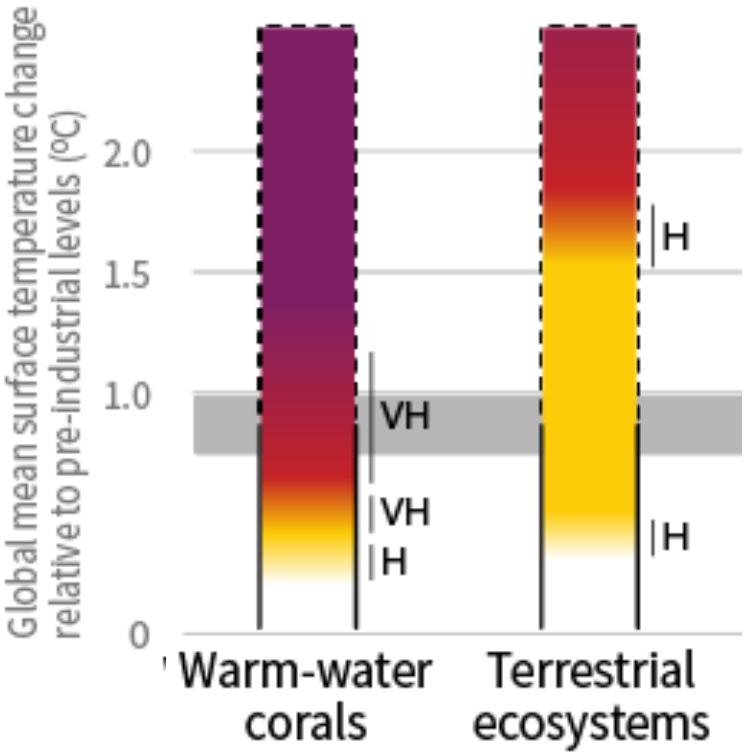
IPCC SR15 (2018)





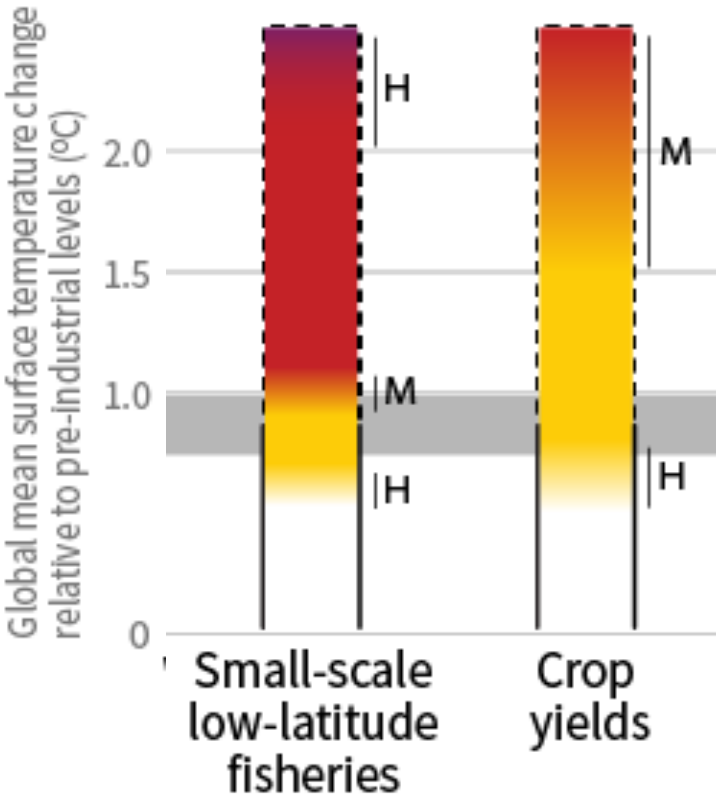
Quels risques évités pour 1,5°C par rapport à 2°C de réchauffement?

- Des évènements extrêmes moins intensifiés, en particulier les vagues de chaleur, les pluies torrentielles et le risque de sécheresse
- D'ici à 2100, une différence de 10 cm de montée du niveau moyen des mers, qui continuera à augmenter
- 10 millions de personnes en moins exposées aux risques liés à la montée du niveau des mers



Quels risques évités pour 1,5°C par rapport à 2°C de réchauffement?

- Un risque moins élevé de pertes de biodiversité et de dégradation d'écosystèmes



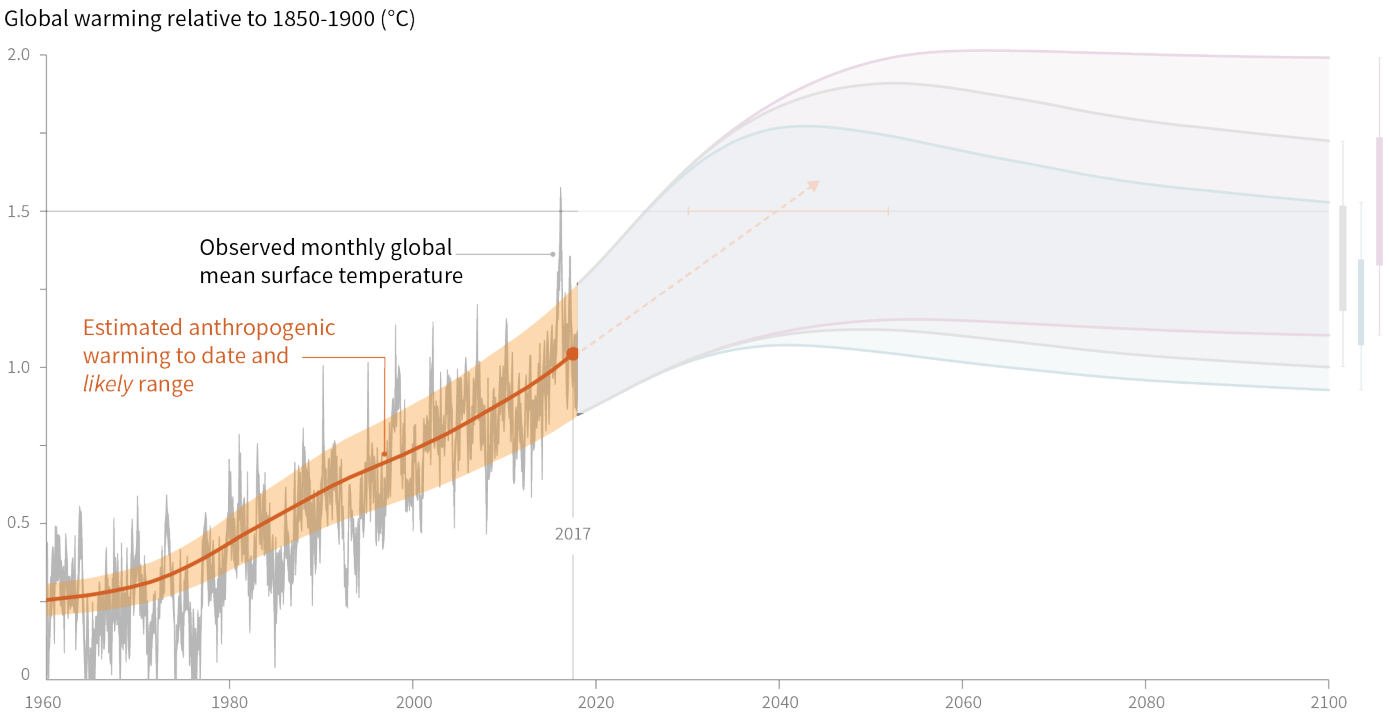
Quels risques évités pour 1,5°C par rapport à 2°C de réchauffement?

- Des risques moins élevés pour les pêcheries
- Des chutes de rendement moins importantes pour le maïs, le blé et le riz et un risque d'insécurité alimentaire moins élevé
- Diminue de moitié la fraction de la population mondiale exposée au risque de pénurie d'eau
- Jusqu'à plusieurs centaines de millions de personnes en moins à la fois exposées aux risques climatiques et susceptibles de basculer dans la pauvreté

Trajectoires d’émissions et transitions de systèmes compatibles avec 1,5°C de réchauffement global

Nos ambitions de réduire les émissions de gaz à effet de serre conditionnent nos chances de limiter le réchauffement global en deçà de 1.5°C

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



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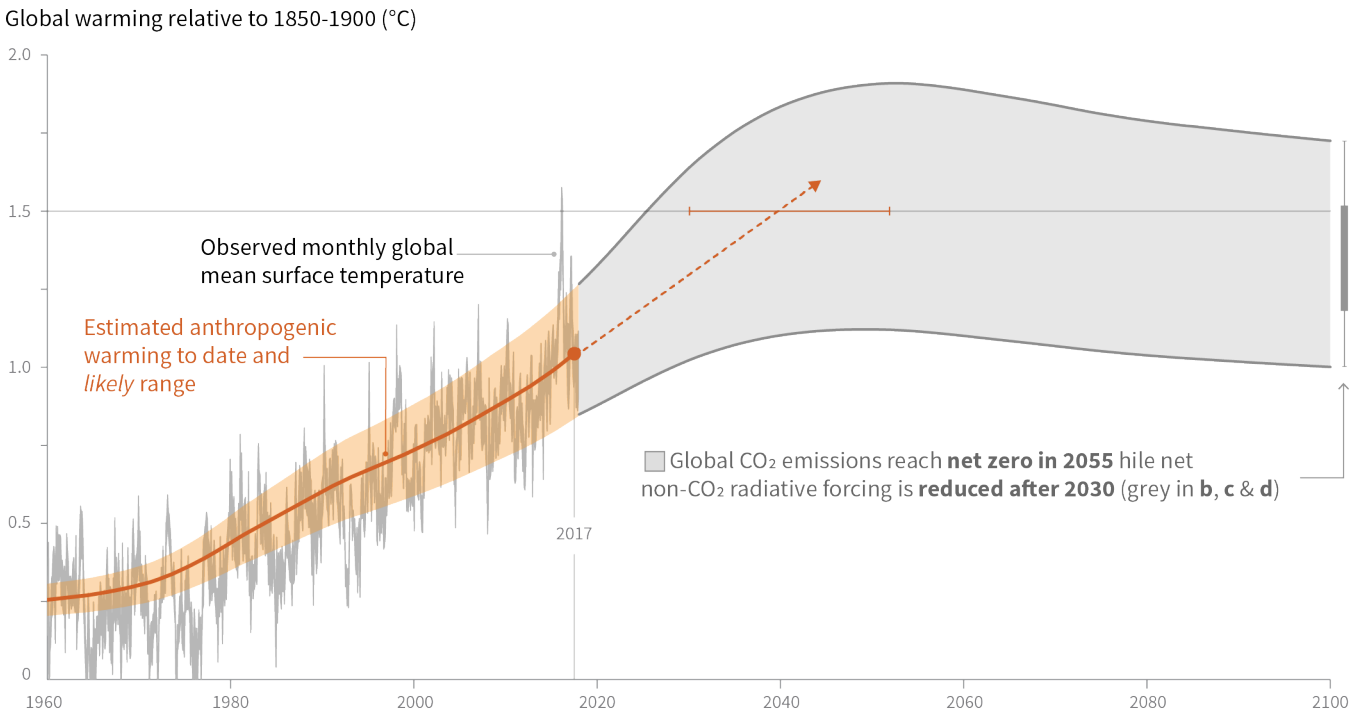
Nos ambitions de réduire les émissions de gaz à effet de serre conditionnent nos chances de limiter le réchauffement global en deçà de 1.5°C

=> Neutralité carbone en 2055 + reduction des émissions de CH_4, N_2O, CFCs

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



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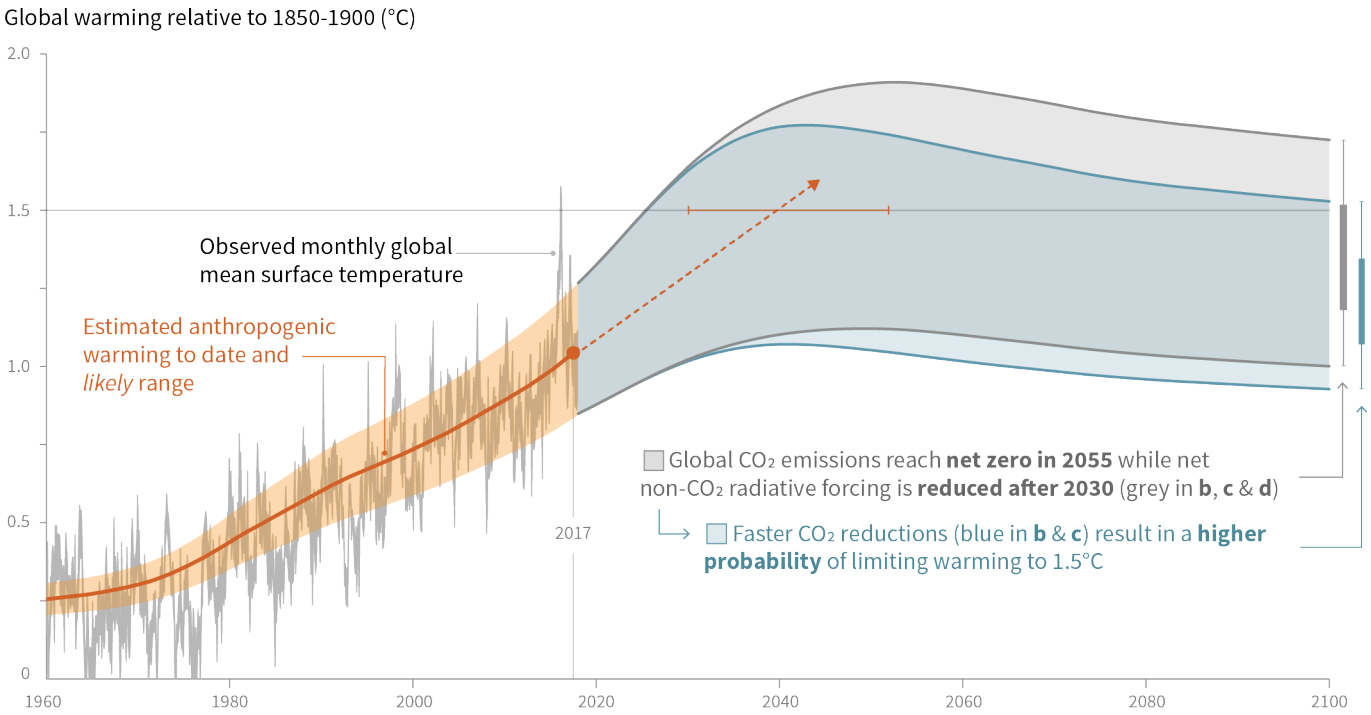
Nos ambitions de réduire les émissions de gaz à effet de serre conditionnent nos chances de limiter le réchauffement global en deçà de 1.5°C

=> Plus la neutralité carbone est atteinte tôt plus nos chances sont importantes

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



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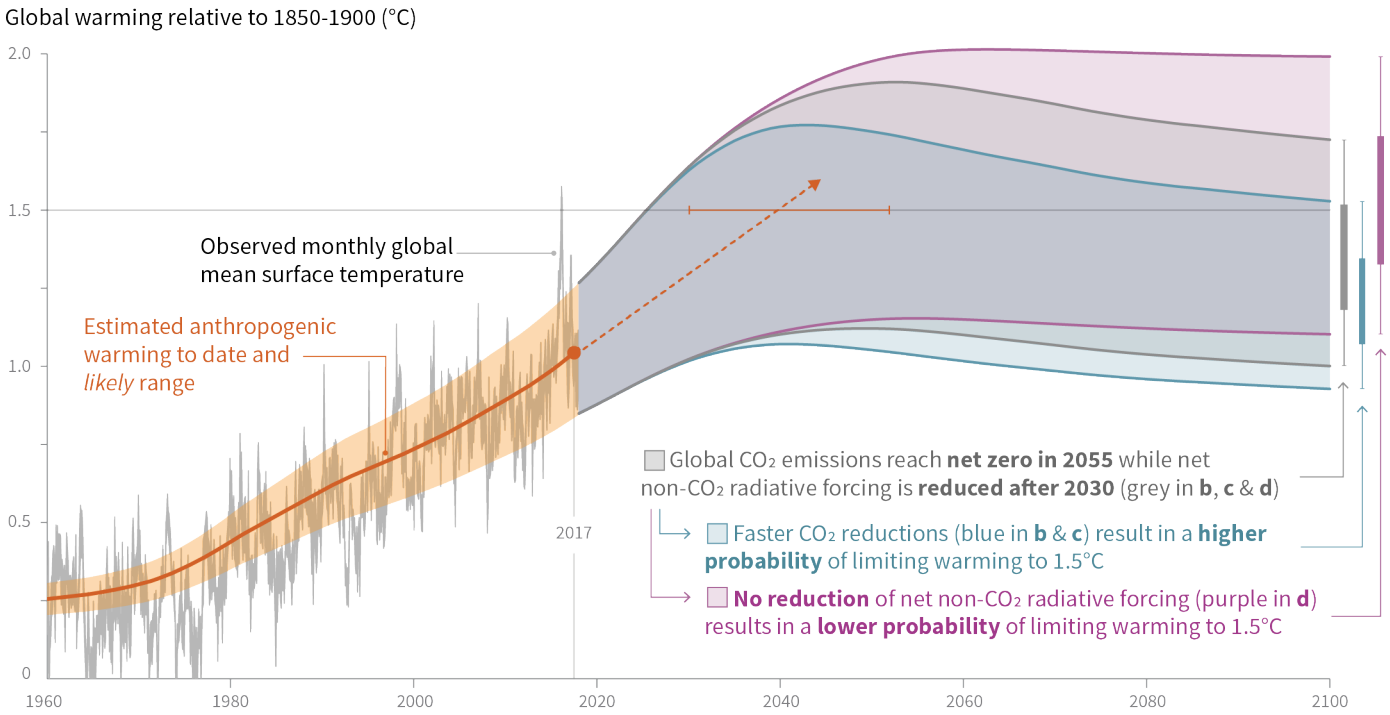
Nos ambitions de réduire les émissions de gaz à effet de serre conditionnent nos chances de limiter le réchauffement global en deçà de 1.5°C

=> Les reductions des émissions de CH_4, N_2O, CFCs sont critiques pour cet objectif

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



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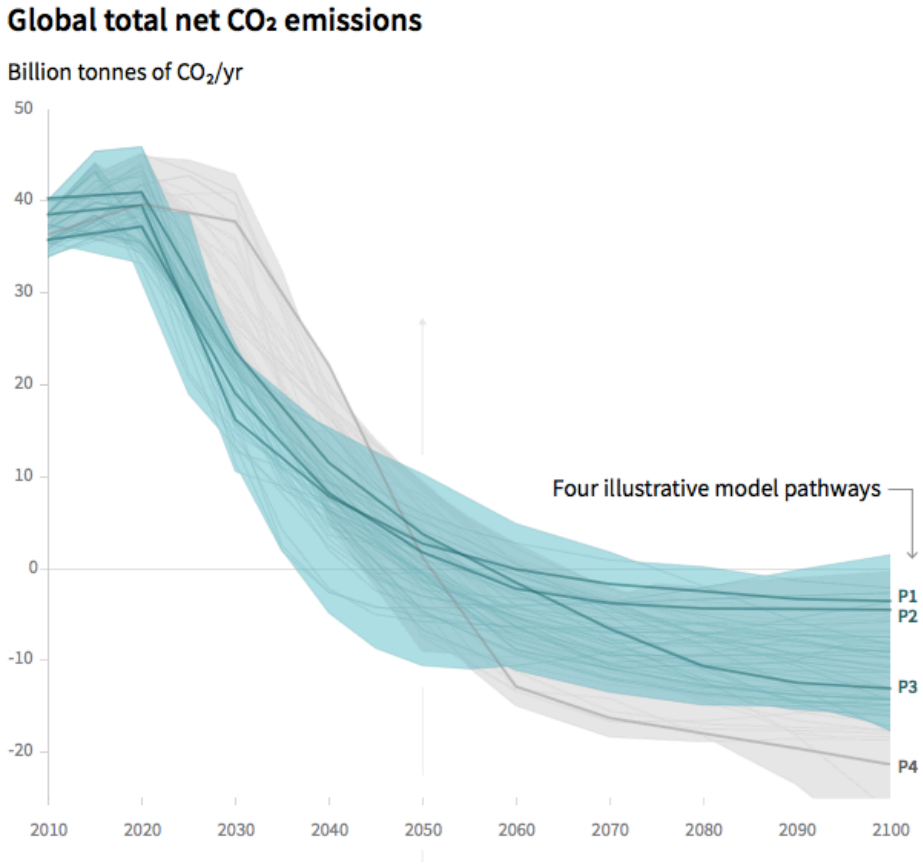
Trajectoires d'émissions de CO_2



Pour contenir le réchauffement global à 1.5°C, les émissions de CO_2 devraient diminuer de 45% en 2030 (par rapport à 2010)

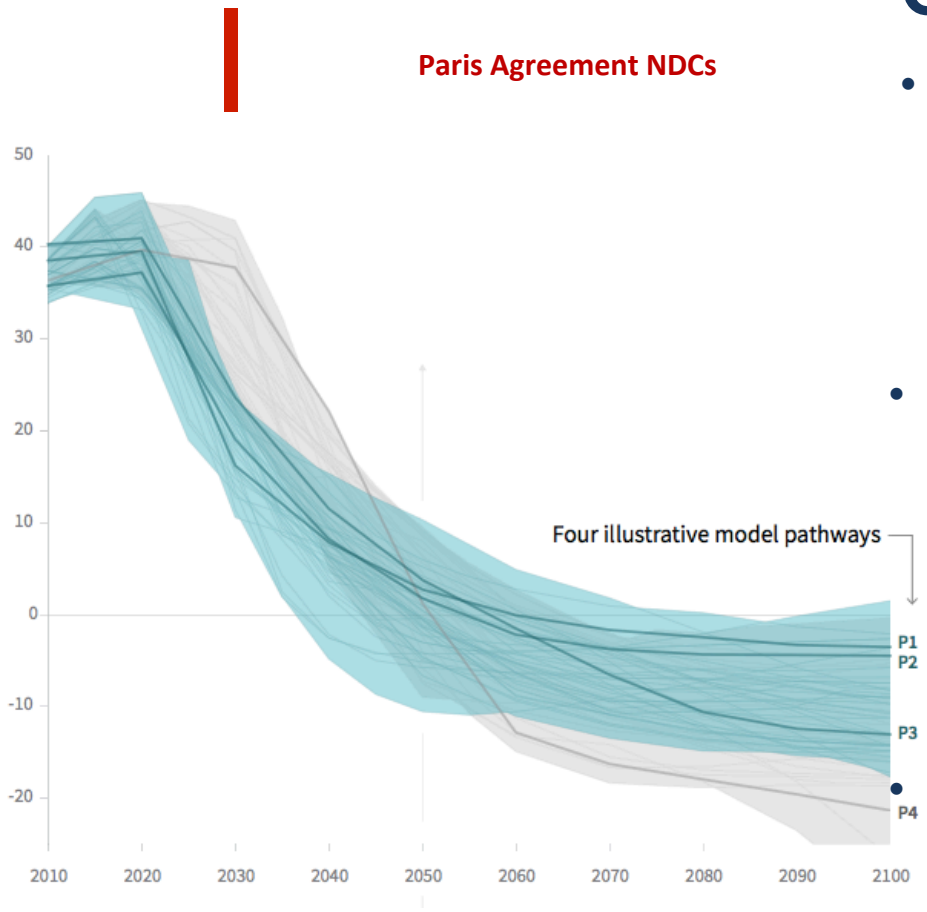
→ *Pour comparaison, 20% pour 2°C*

Pour contenir le réchauffement global à 1.5°C, les émissions de CO_2 emissions devraient atteindre le "net zéro" vers 2050

→ *Pour comparaison, 2075 pour 2°C*

Réduire les autres émissions (non CO_2) aurait des bénéfices directs et immédiats pour la santé publique

Trajectoires d'émissions de CO_2



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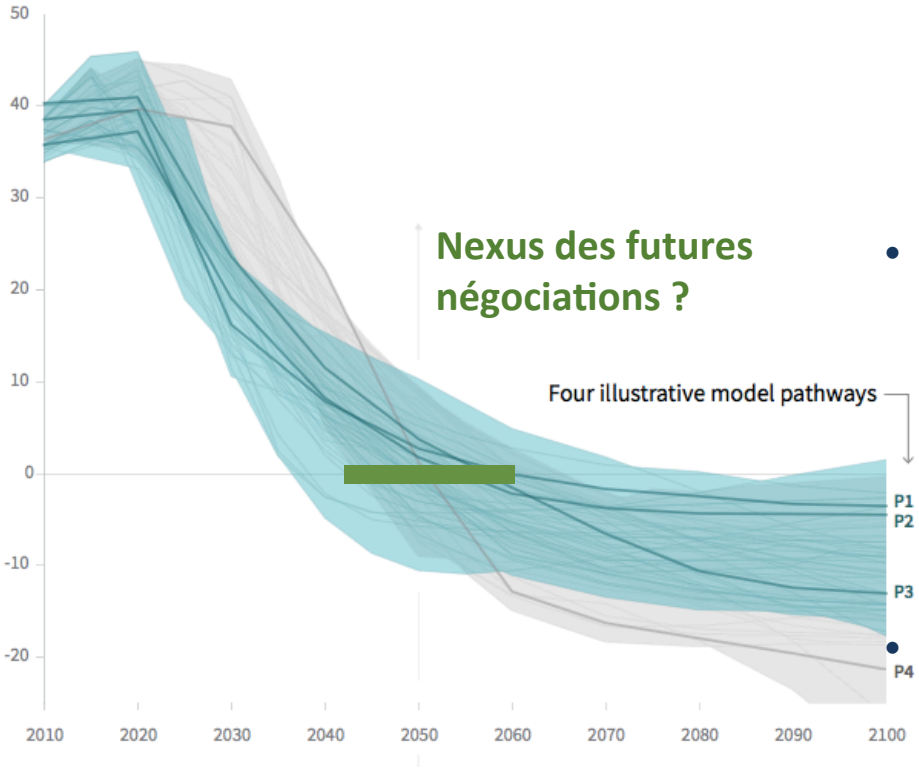
Trajectoires d'émissions de CO_2



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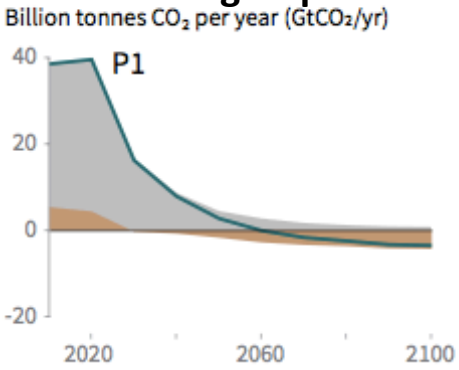
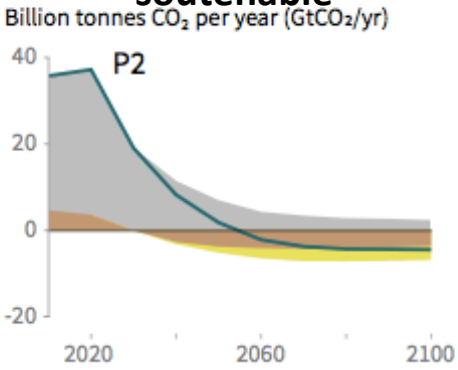
  → *Pour comparaison, 2075 pour 2°C*
- Réduire les autres émissions (non CO_2) aurait des bénéfices directs et immédiats pour la santé publique

Les 4 archetypes à la loupe :

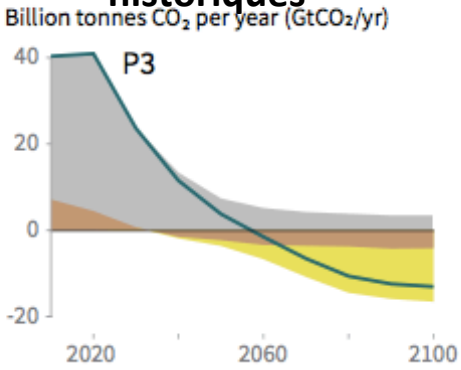
Faible demande énergétique



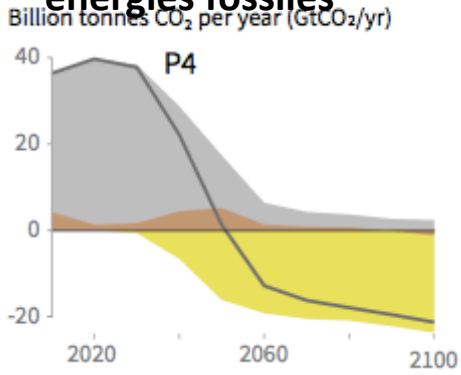
Développement soutenable



Caractéristiques historiques



Dépendance aux energies fossiles



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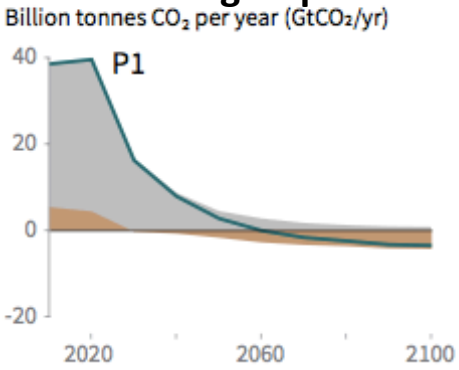
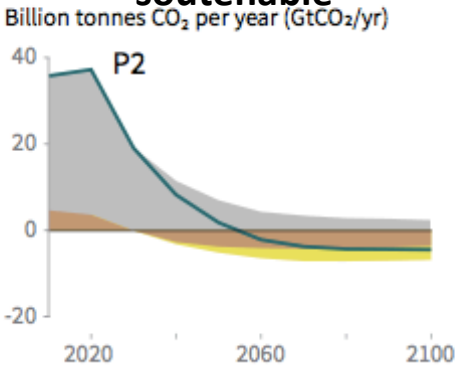
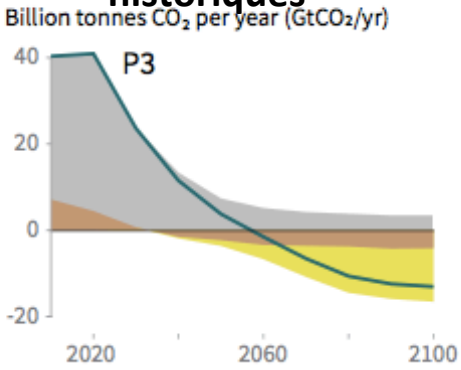
Faible demande énergétique



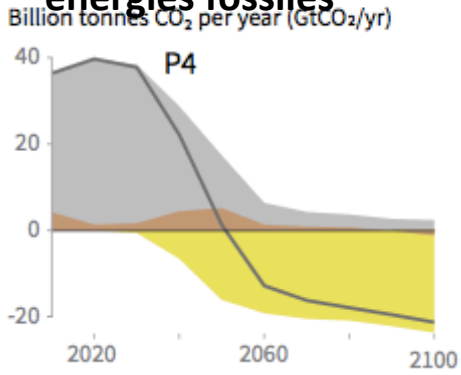
Développement soutenable

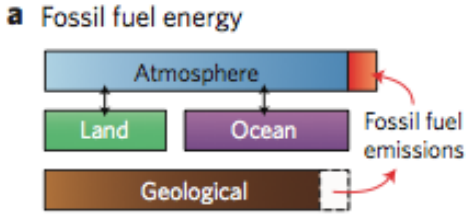


Caractéristiques historiques



Dépendance aux energies fossiles

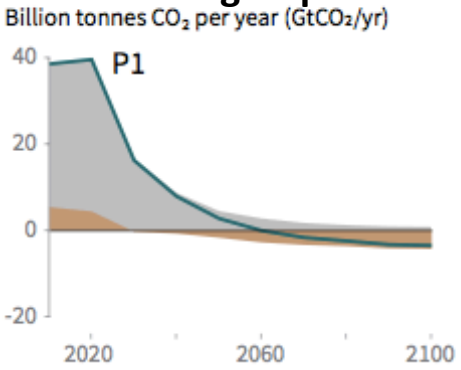




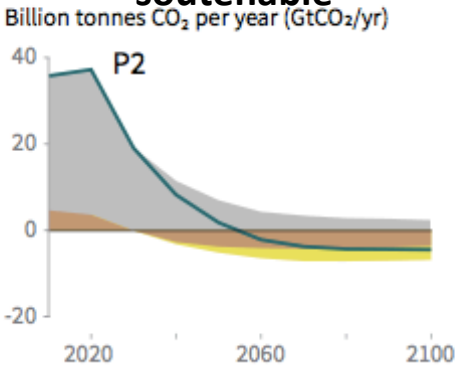
Fossil fuel and industry

Les 4 archetypes à la loupe :

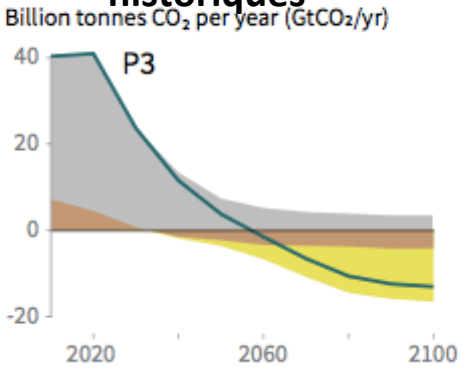
Faible demande énergétique



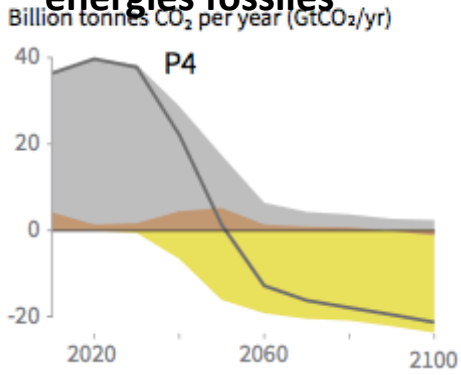
Développement soutenable

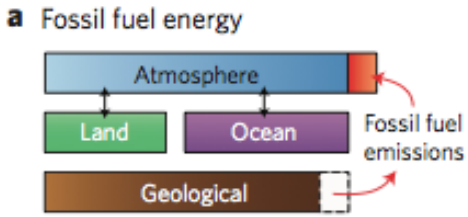


Caractéristiques historiques



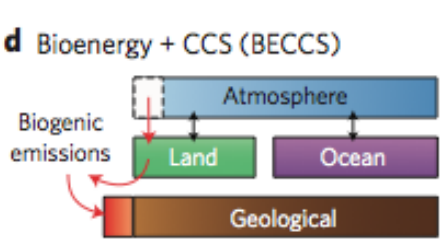
Dépendance aux energies fossiles



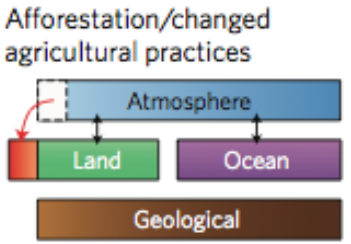


Fossil fuel and industry

BECCS



AFOLU



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Trajectoires d'émissions de gaz à effet de serre

Limiter le réchauffement planétaire à 1,5°C demanderait des changements à une échelle sans précédent

- Transitions de systèmes : énergie, agro-foresterie, villes, industrie, infrastructures
- Fortes baisses d'émissions dans tous les secteurs
- Large palette de technologies
- Changements de comportements
- Augmentation des investissements dans les options bas carbone

Définir la faisabilité

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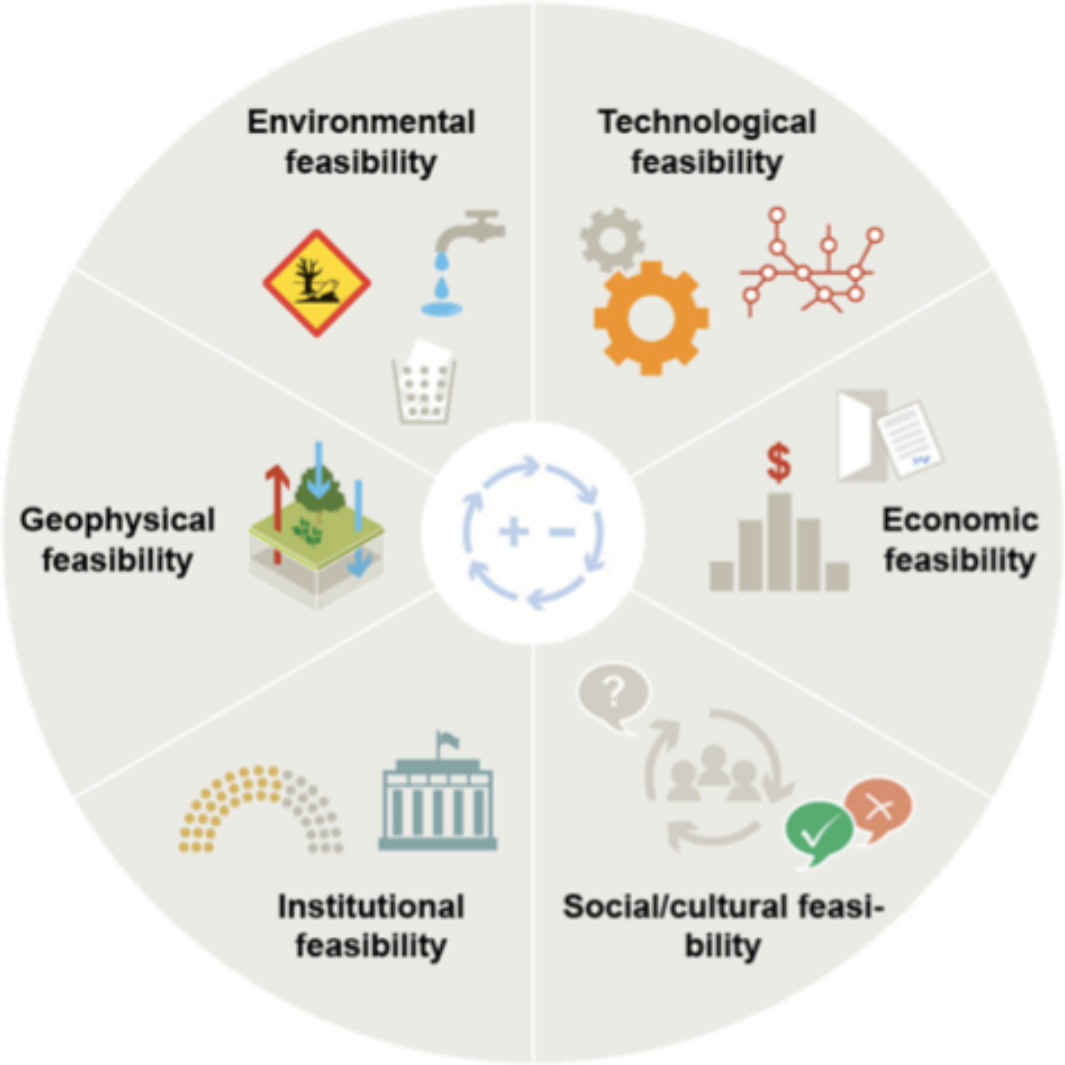
Plusieurs niveaux de faisabilité sont décrits dans le rapport SR15:



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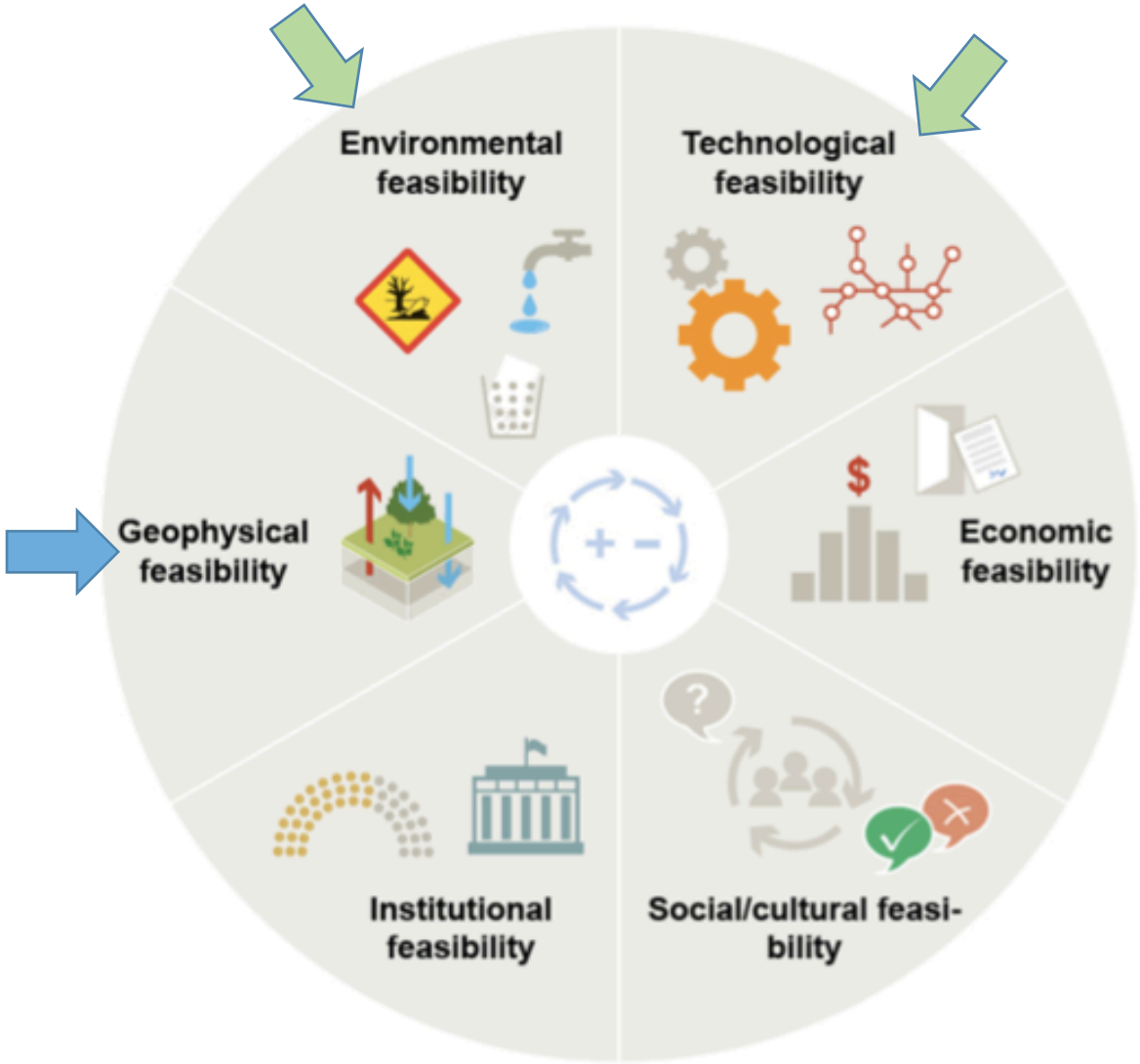

Contrainte géophysique

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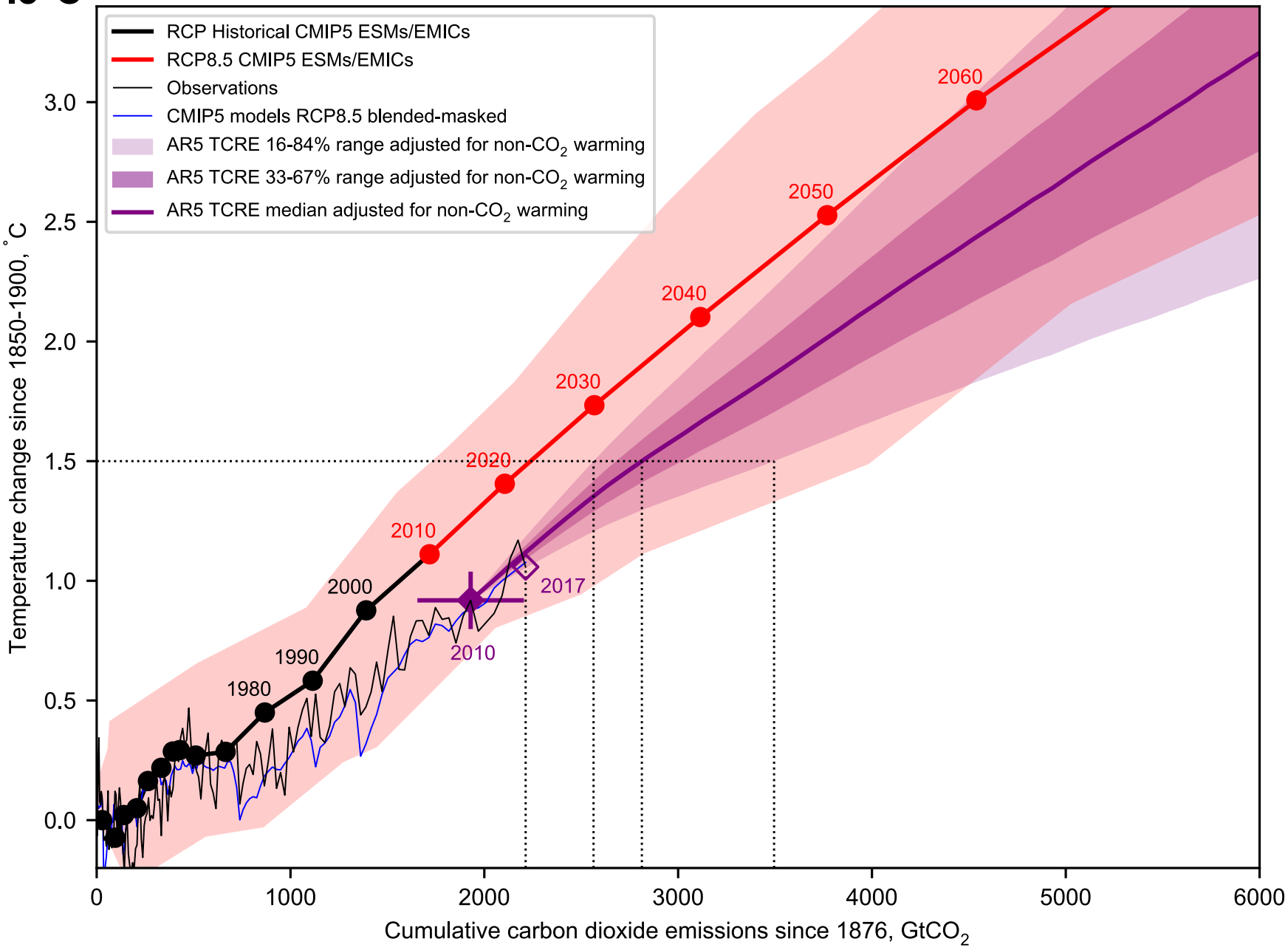
WMO UNEP

Budget carbone ou contrainte ultime pour un réchauffement global de 1.5°C



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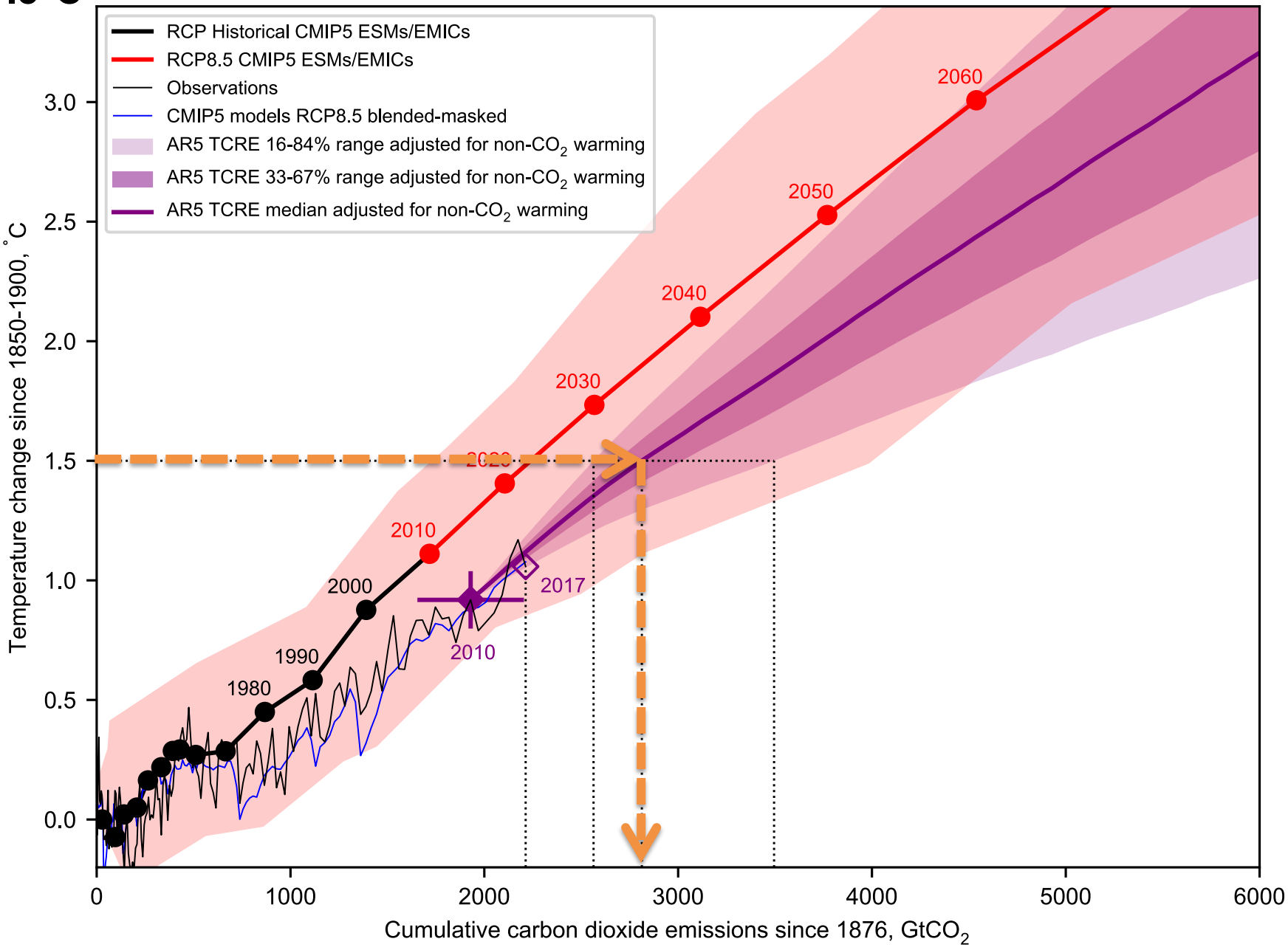

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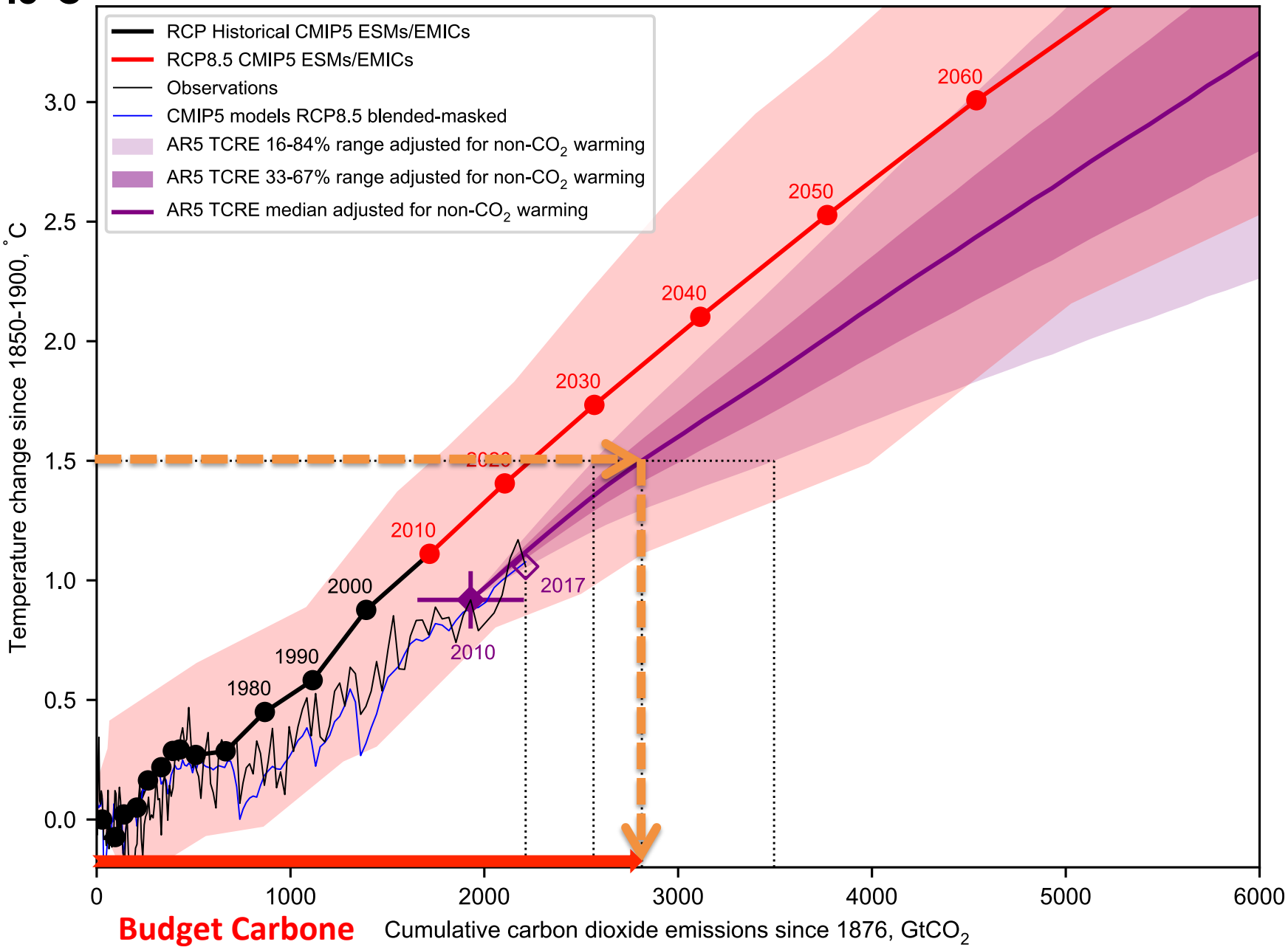

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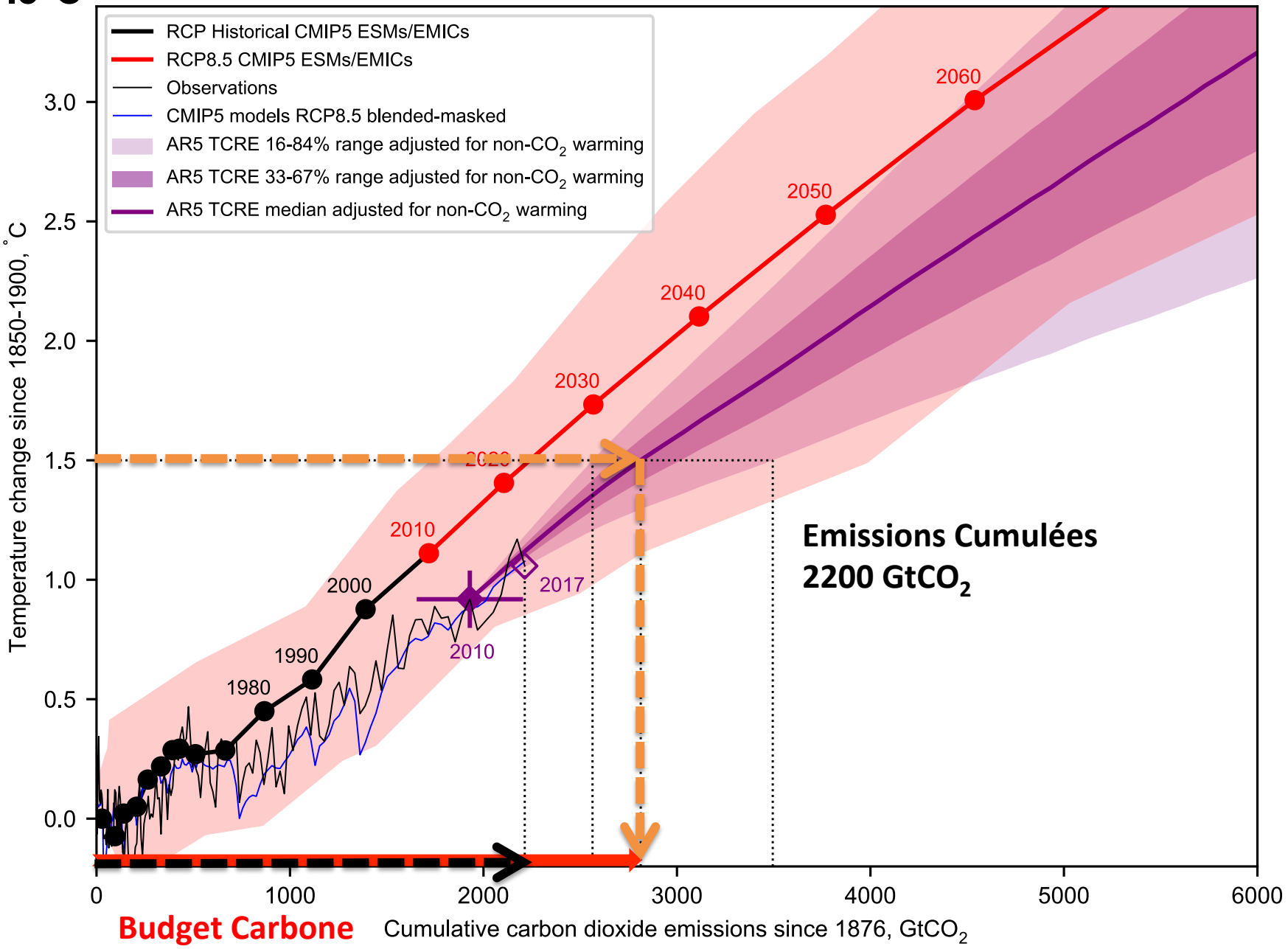

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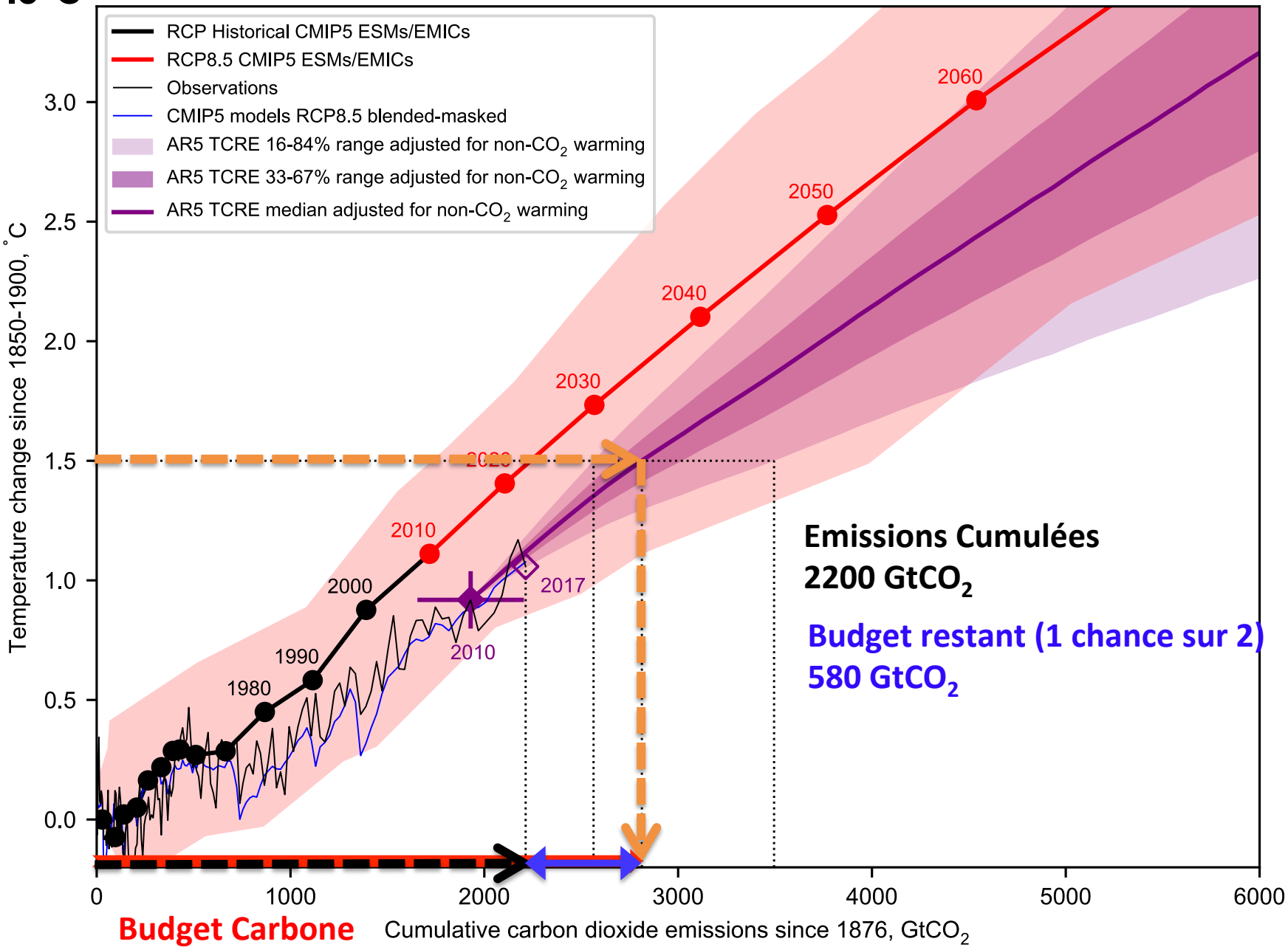
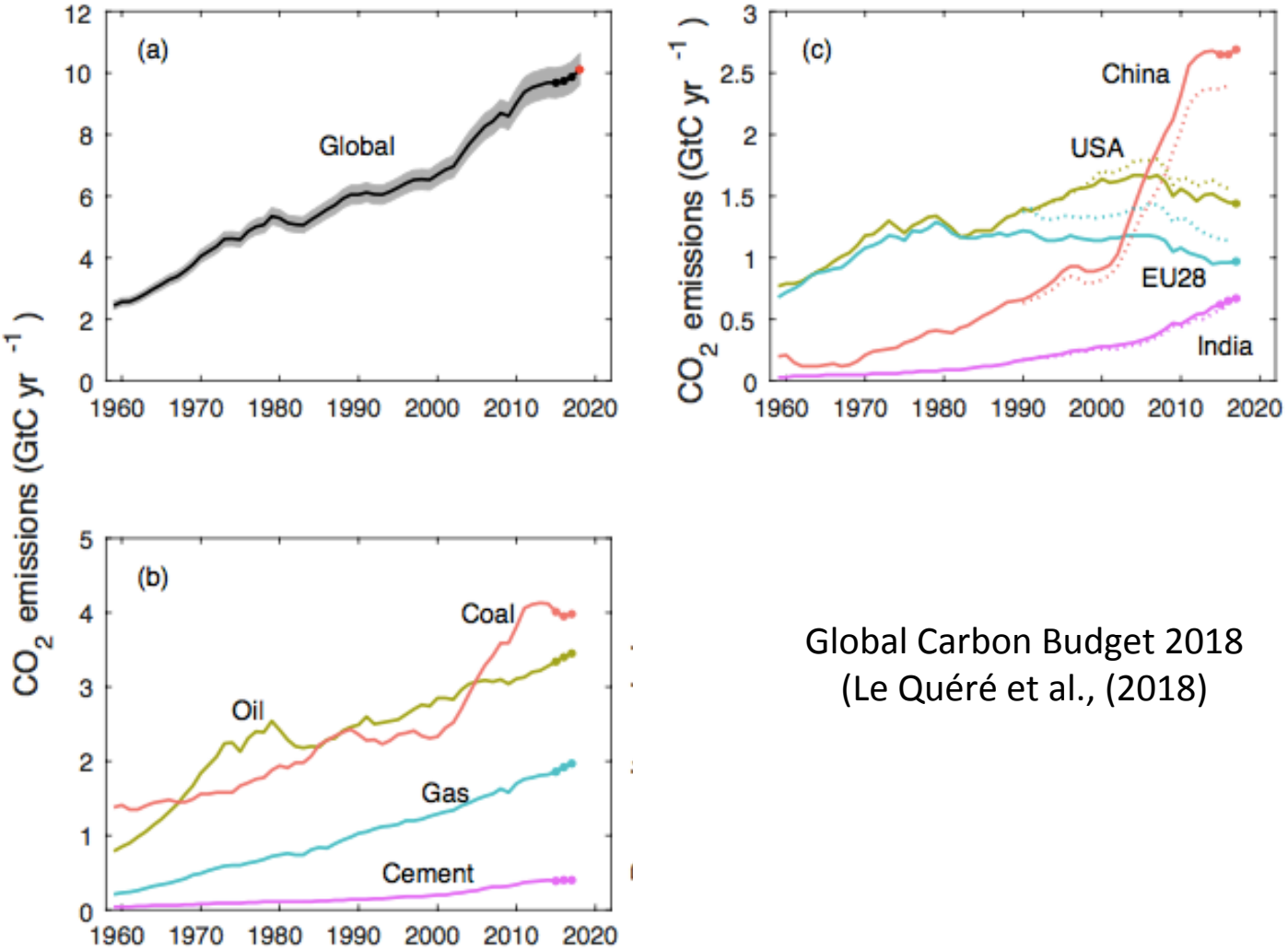


Où en sommes nous ?

Émissions de CO_2 en hausse en 2017 et 2018:



Global Carbon Budget 2018
(Le Quéré et al., (2018)

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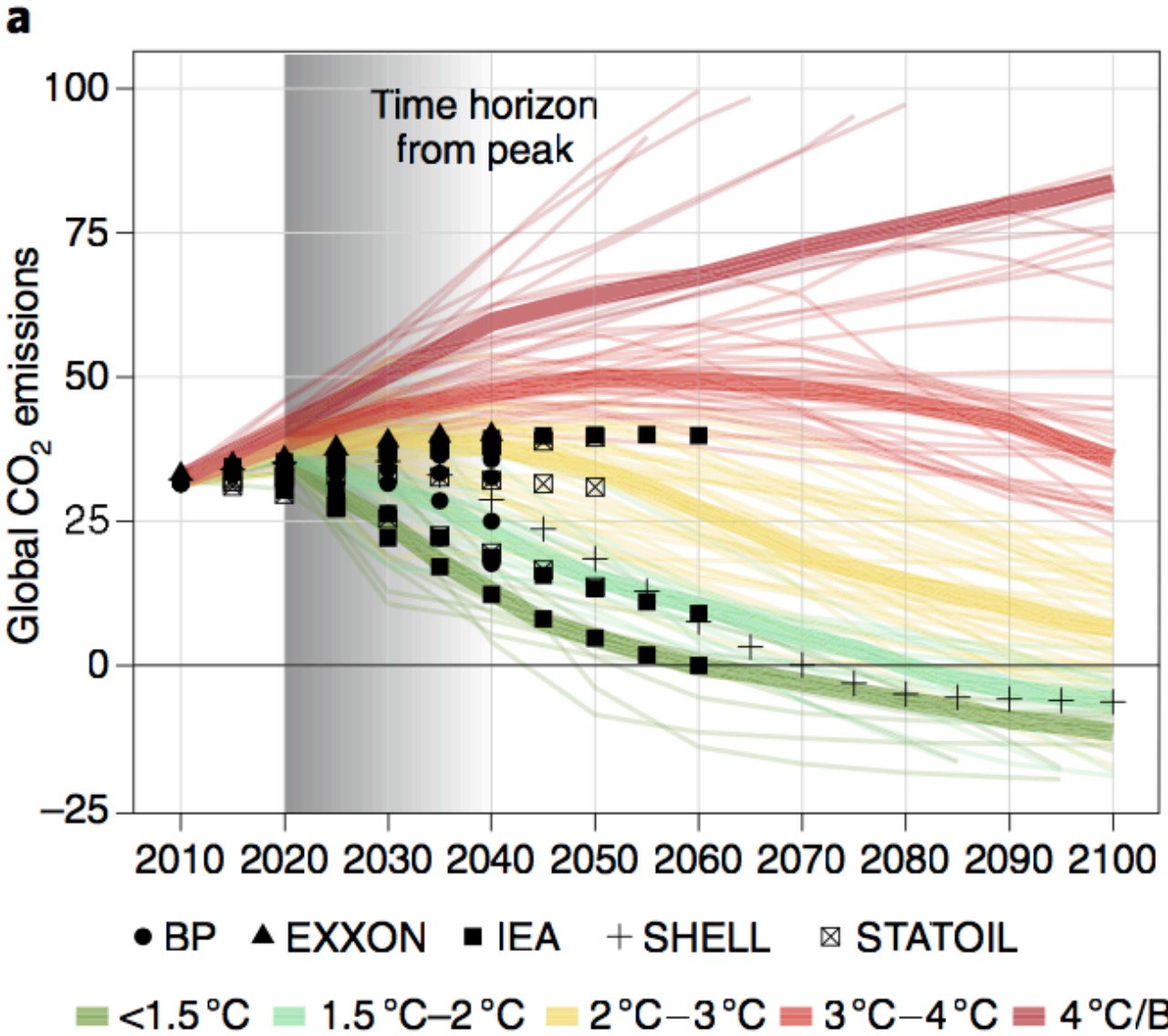
Toutefois une transition energétique est en marche:

Weber et al. (2018)



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Quelles opportunités ?

SPM3b | Characteristics of four illustrative model pathways

Global indicators	P1	P2	P3	P4	**Interquartile range**
Pathway classification	No or low overshoot	No or low overshoot	No or low overshoot	High overshoot	No or low overshoot
CO_2 emission change in 2030 (% rel to 2010)	-58	-47	-41	4	(-59,-40)
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Primary energy from coal in 2030 (% rel to 2010)	-78	-61	-75	-59	(-78, -59)
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from nuclear in 2030 (% rel to 2010)	59	83	98	106	(44,102)
↳ in 2050 (% rel to 2010)	150	98	501	468	(91,190)
from biomass in 2030 (% rel to 2010)	-11	0	36	-1	(29,80)
↳ in 2050 (% rel to 2010)	-16	49	121	418	(123,261)
from non-biomass renewables in 2030 (% rel to 2010)	430	470	315	110	(243,438)
↳ in 2050 (% rel to 2010)	832	1327	878	1137	(575,1300)
Cumulative CCS until 2100 ($GtCO_2$)	0	348	687	1218	(550, 1017)
↳ of which BECCS ($GtCO_2$)	0	151	414	1191	(364, 662)
Land area of bioenergy crops in 2050 (million hectare)	22	93	283	724	(151, 320)
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Énergie Météo-dépendante

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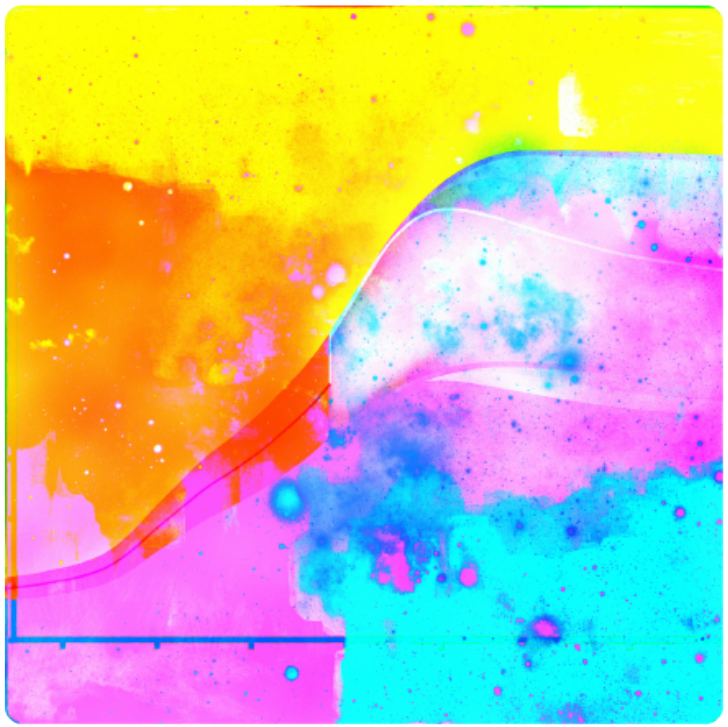

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