

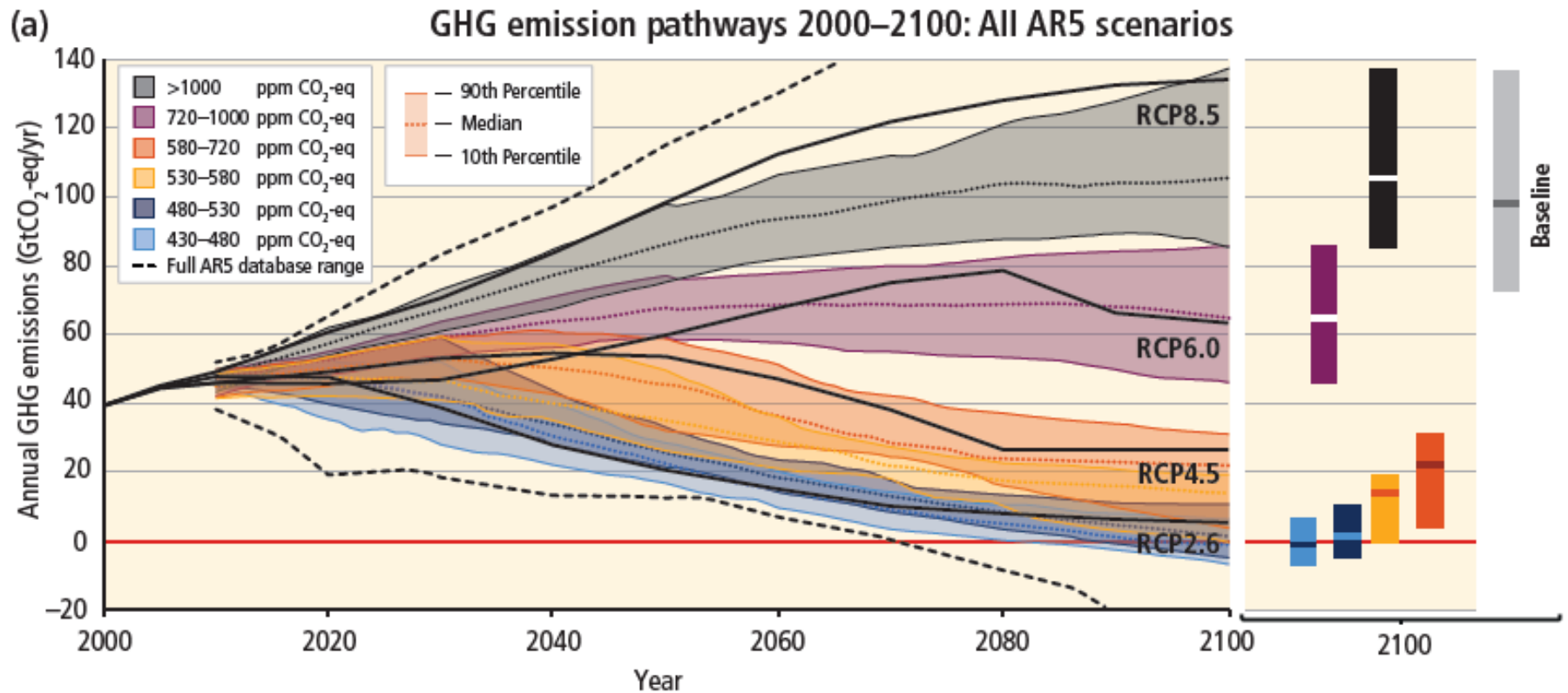
Écart entre les besoins et les perspectives en matière de réduction d'émissions

15 novembre 2016, réunion des Shifters, Clément Bultheel



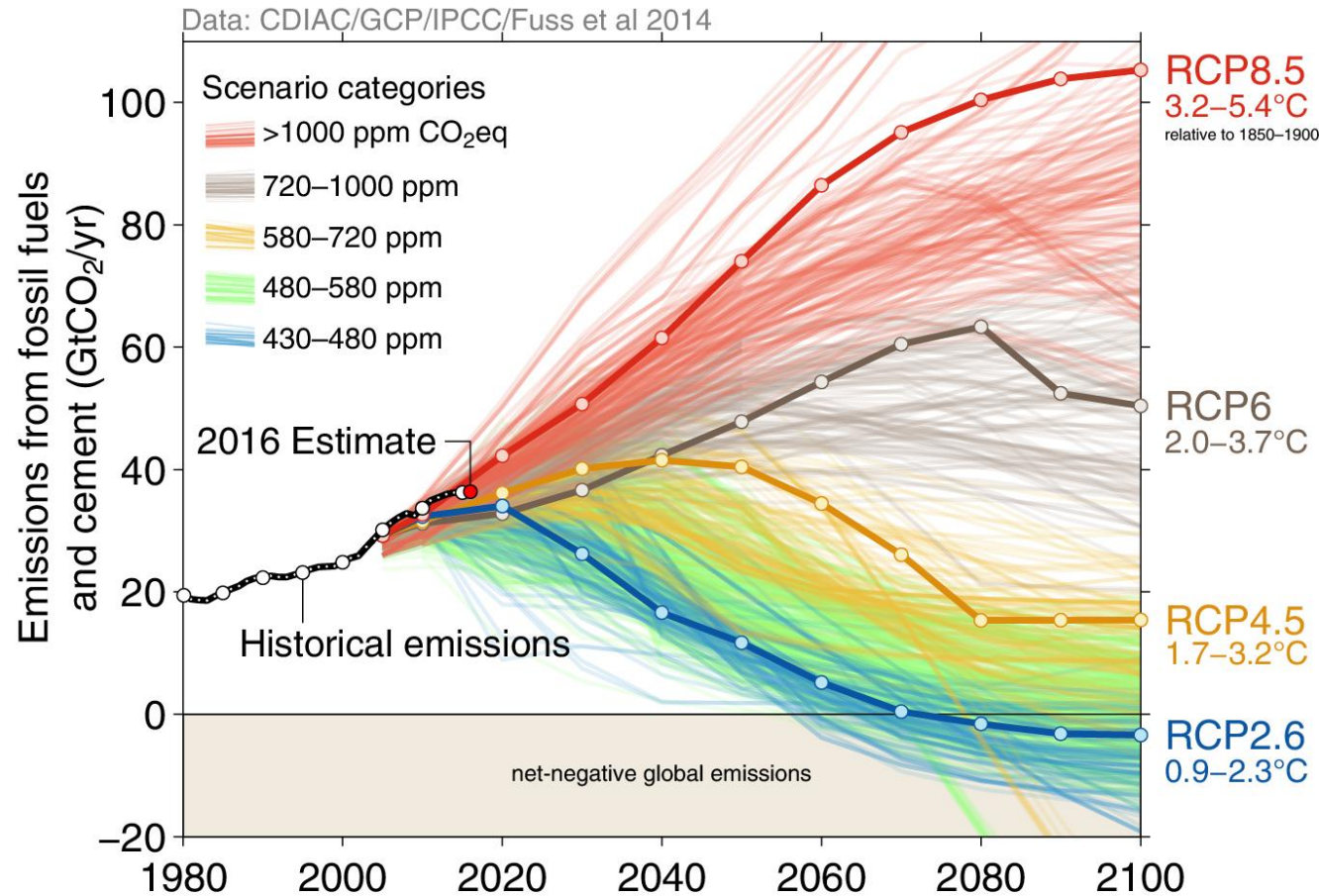
www.theshiftproject.org

Scénarios climatiques: de la gestion des probabilités par approximation



Source: IPCC (2014), AR5, WG1

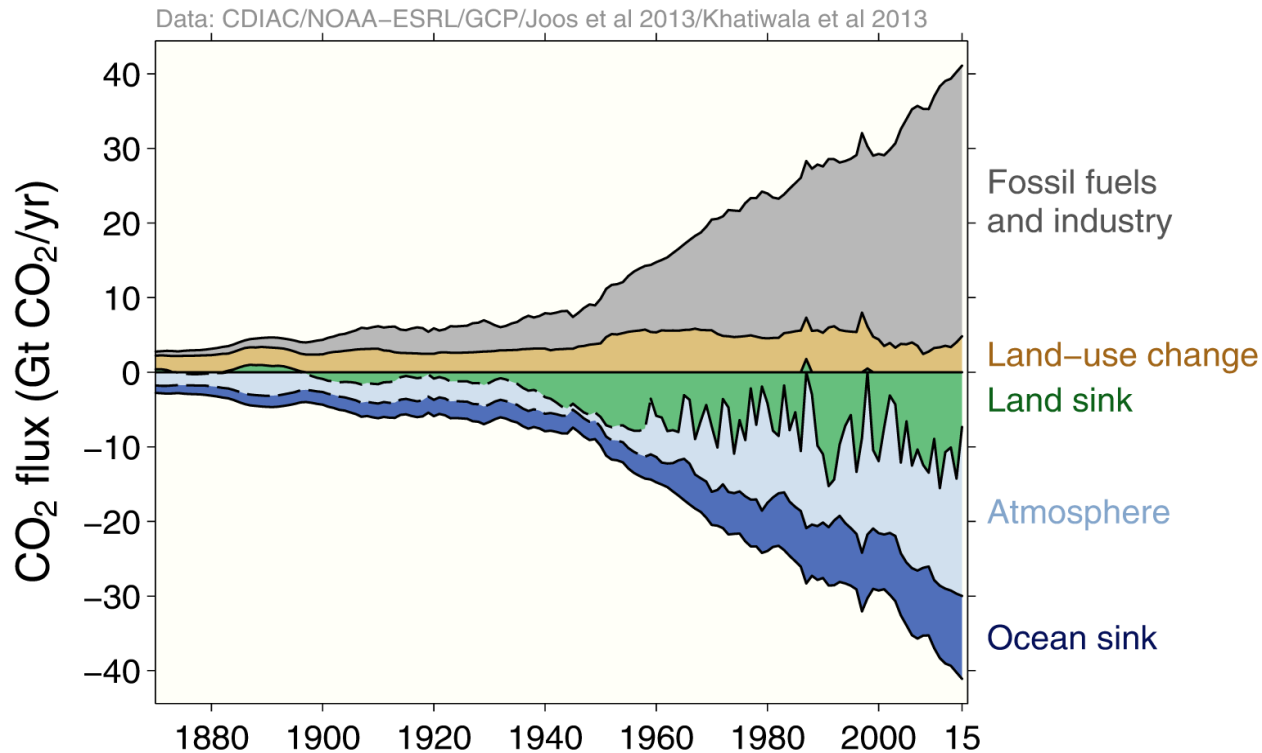
Observed emissions and emissions scenarios



The IPCC Fifth Assessment Report assessed about 1200 scenarios with detailed climate modelling on four Representative Concentration Pathways (RCPs).

Source: [Fuss et al 2014](#); [CDIAC](#); [IIASA AR5 Scenario Database](#); [Global Carbon Budget 2016](#)

Carbon sources & Global carbon budget

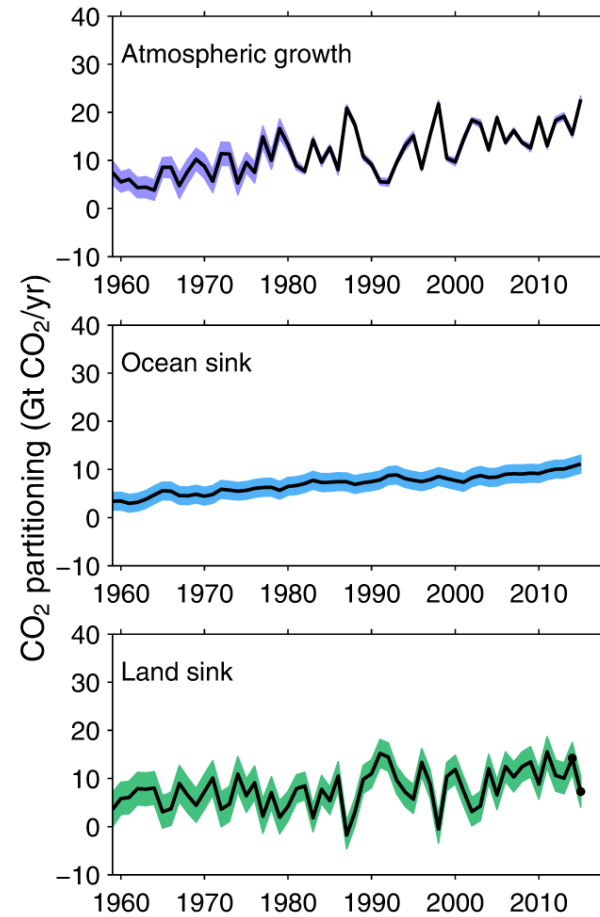
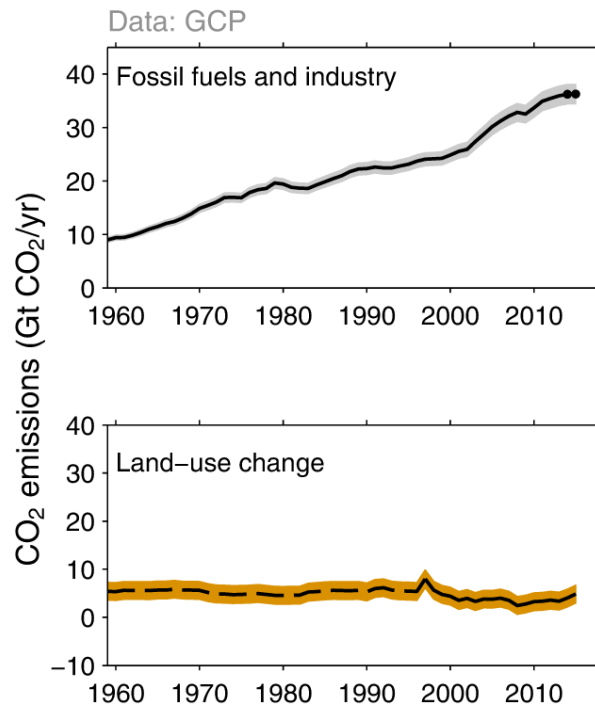


The carbon sources from fossil fuels, industry, and land use change emissions are balanced by the atmosphere and carbon sinks on land and in the ocean.

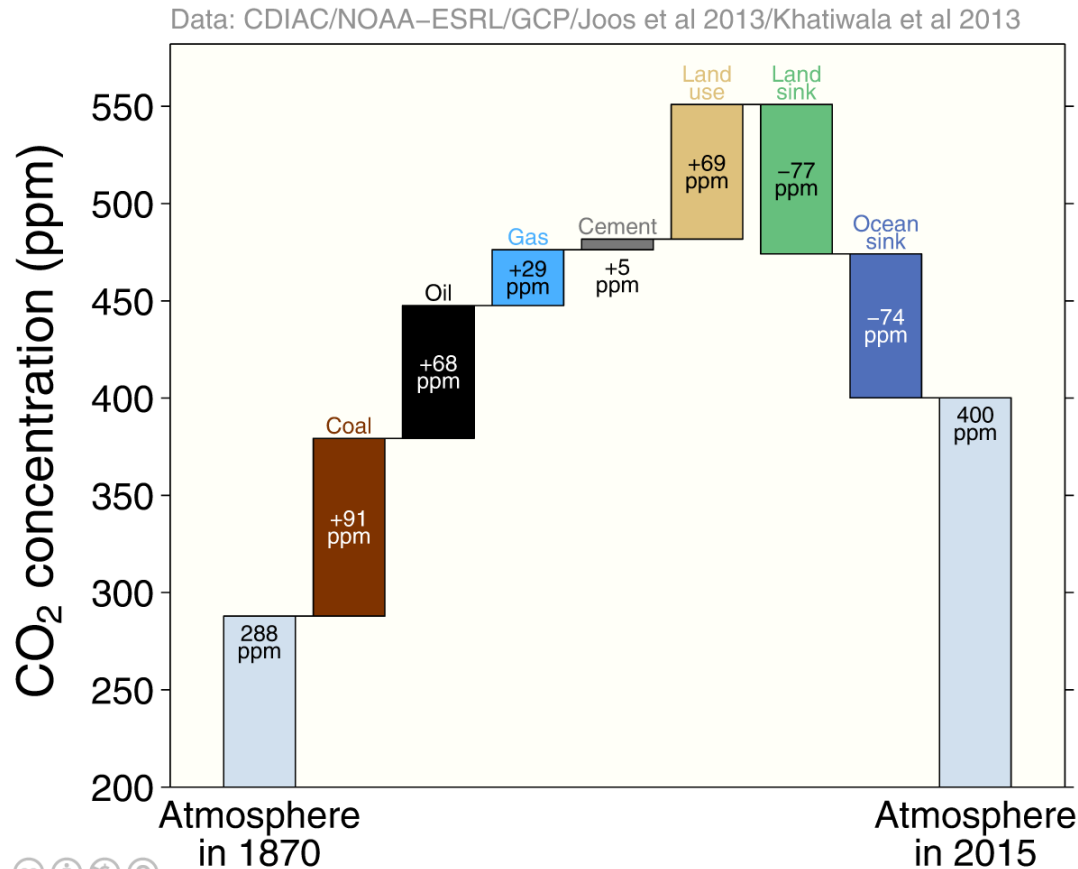
The sinks have continued to grow with increasing emissions, but climate change will affect carbon cycle processes in a way that will exacerbate the increase of CO₂ in the atmosphere.

Source: [CDIAC](#); [NOAA-ESRL](#); [Houghton et al 2012](#); [Giglio et al 2013](#); [Joos et al 2013](#); [Khatriwala et al 2013](#); [Le Quéré et al 2016](#); [Global Carbon Budget 2016](#)

Changes in the budget over time



Global carbon budget: the cumulative contributions to the global carbon budget from 1870

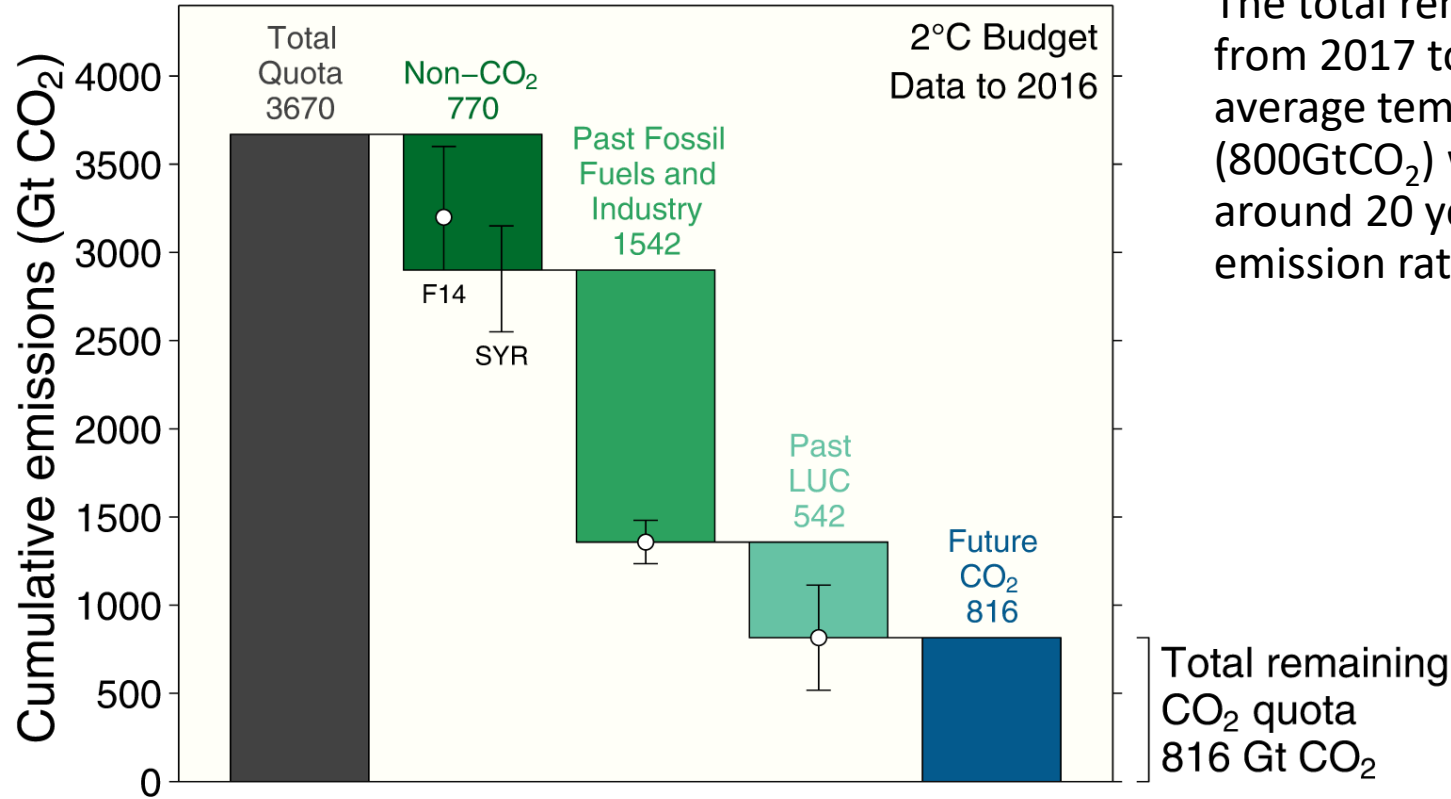


Source: [CDIAC](#); [NOAA-ESRL](#); [Houghton et al 2012](#); [Giglio et al 2013](#); [Joos et al 2013](#); [Khatriwala et al 2013](#); [Le Quéré et al 2016](#); [Global Carbon Budget 2016](#)

Carbon quota for a 66% chance to keep below 2°C



Data: IPCC/CDIAC/GCP/Peters et al. 2015



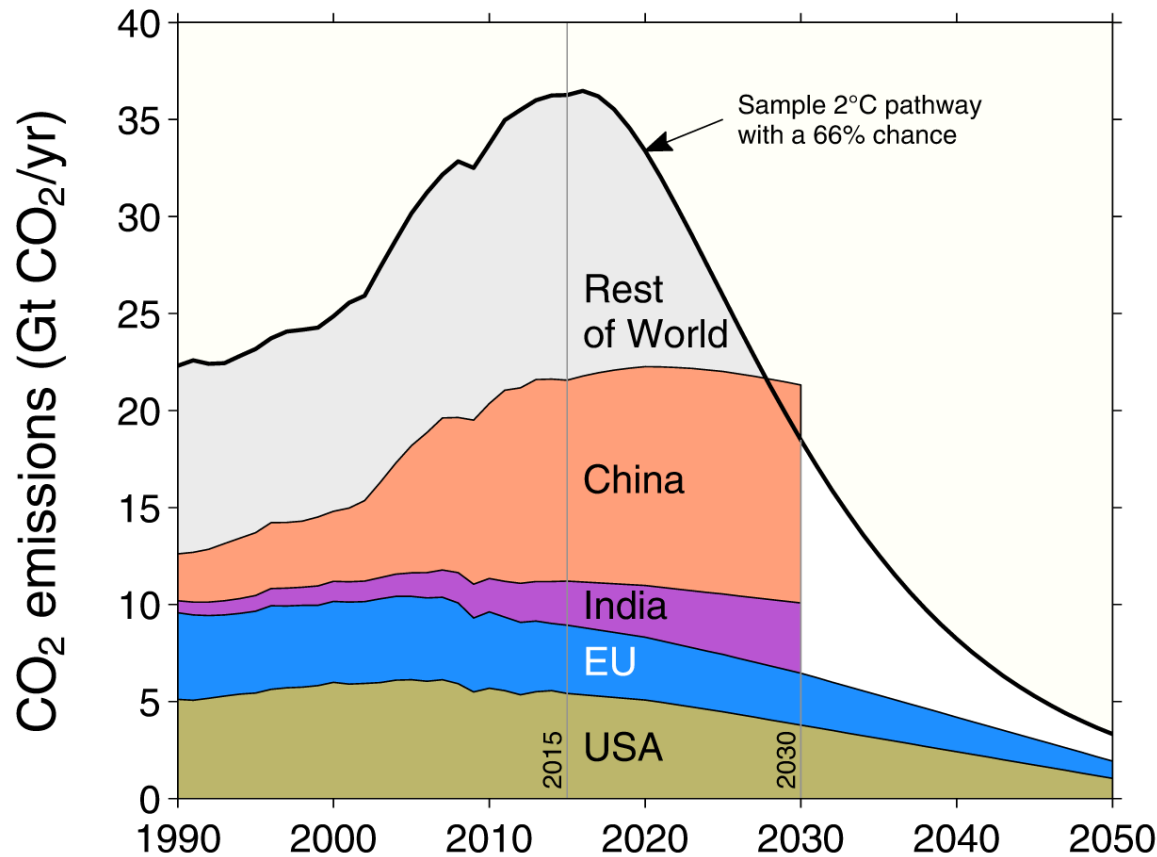
The total remaining emissions from 2017 to keep global average temperature below 2°C (800GtCO₂) will be used in around 20 years at current emission rates.

Grey: Total CO₂-only quota for 2°C with 66% chance. Green: Removed from CO₂ only quota. Blue: Remaining CO₂ quota.

The remaining quotas are indicative and vary depending on definition and methodology.

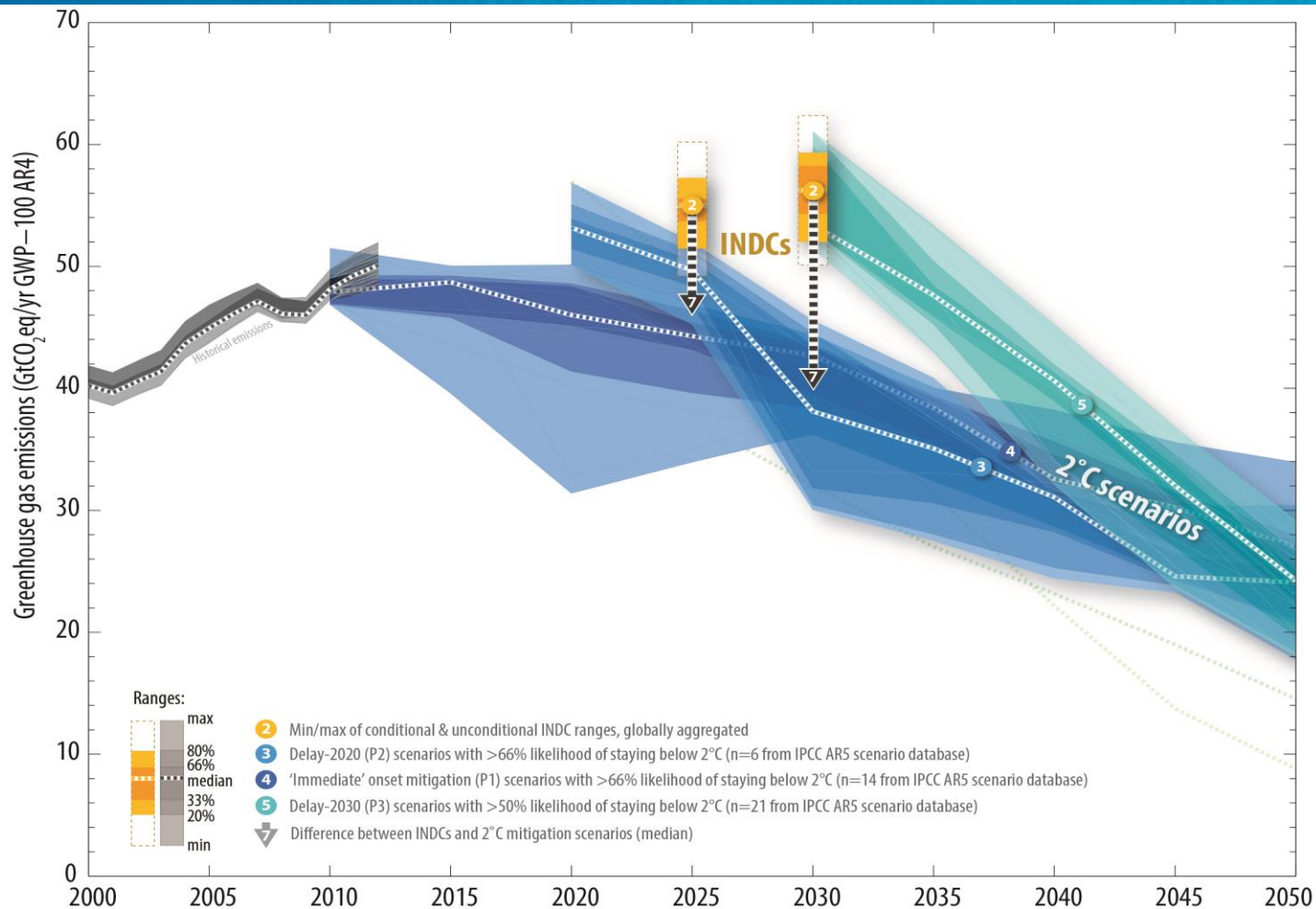
Source: [Peters et al 2015](#); [Global Carbon Budget 2016](#)

The emission pledges (INDCs) of the top-4 emitters



The emission pledges from the US, EU, China, and India leave no room for other countries to emit in a 2°C emission budget (66% chance).

1^{ères} approximations sur les INDC: marges & probabilités



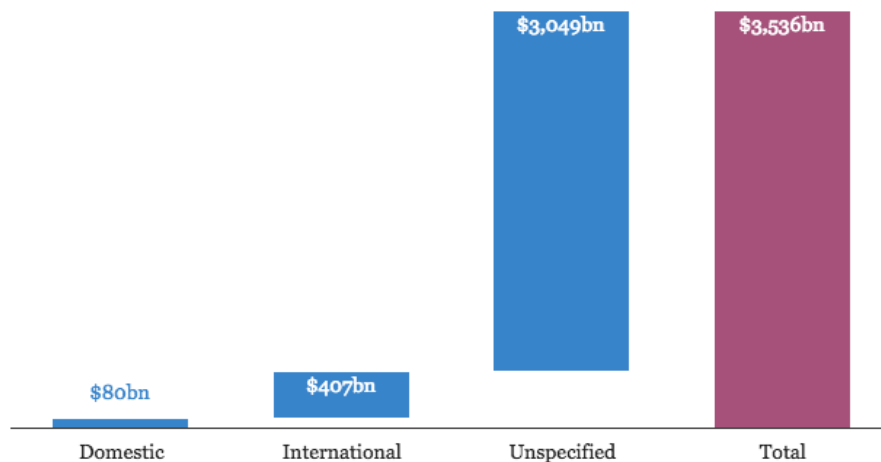
Source: UNFCCC (2016), Updated synthesis report on the aggregate effect of INDCs – published 2 May 2016

2^{ème} approximations: hétérogénéité et conditionnalité des INDC



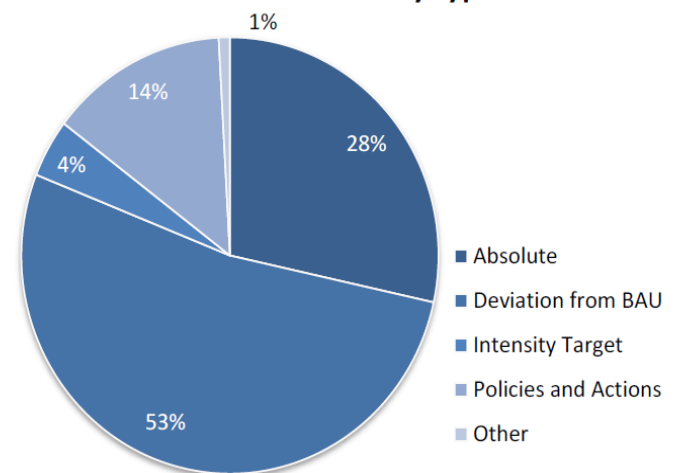
Most of the iNDC (almost all developing countries) are **conditional to international support of finance, technology transfer, and capacity-building**. The implementation of these conditional targets will depend on the ambition of the Paris agreement's mechanisms (finance, technology, market, etc.).

**Financial needs expressed by developing countries
Parties in their iNDC for the 2015-2030 period**



Source: Carbon Brief, October 2015

Share of INDCs by type

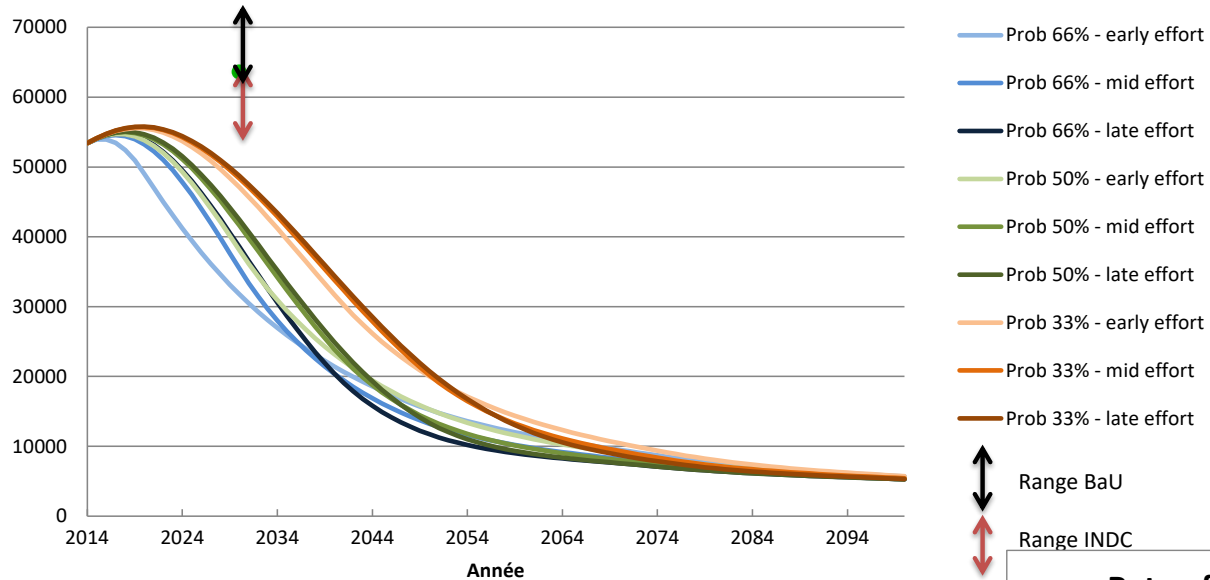


Source: WRI, October 2015

A glance on INDCs with carbon budget by probability level (1)



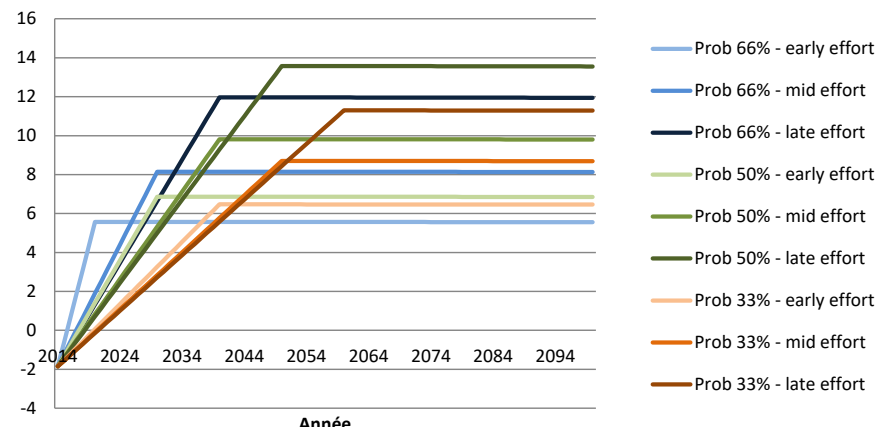
Worldwide GHG emissions (MtCO₂e)



Trajectory **WITHOUT** negative emissions by probability level to reach the 2°C target, and rate of worldwide emissions reduction to reach each scenario.

Source: Olivier Boucher (LMD, CNRS) H el ene Benveniste (IPSL, CNRS) members of GICN, October 2015

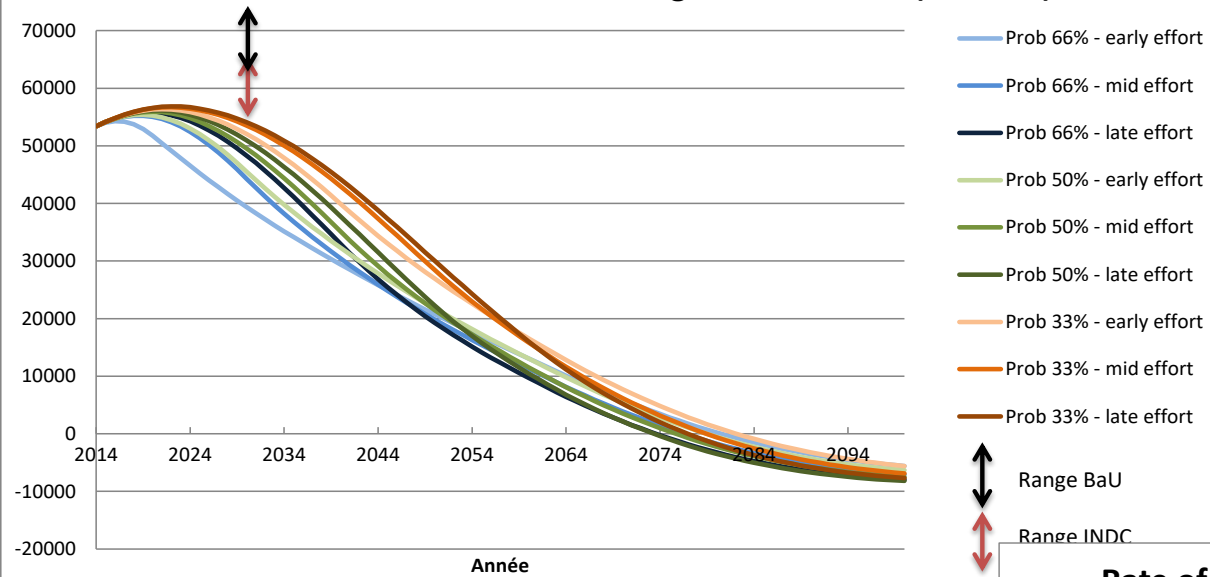
Rate of worldwide emission reduction (% per year)



A glance on INDCs with carbon budget by probability level (2)



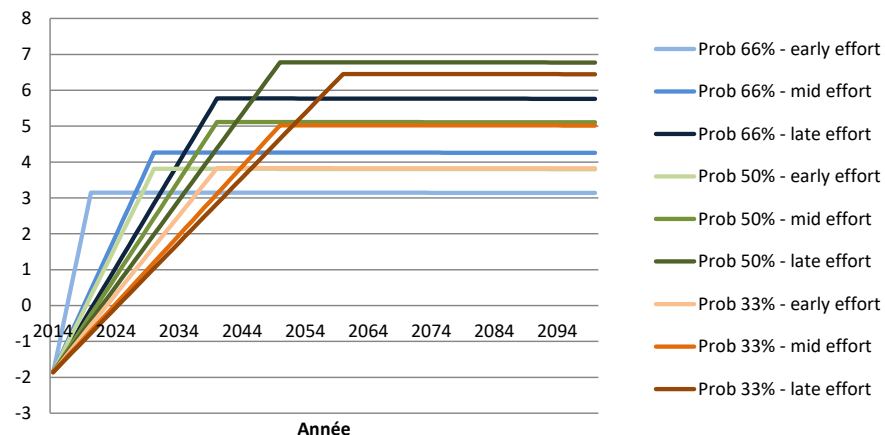
Worldwide GHG emissions with negative emissions (MtCO₂e)



Trajectory **WITH negative emissions** by probability level to reach the 2°C target, and rate of worldwide emissions reduction to reach each scenario.

Source: Olivier Boucher (LMD, CNRS) H el ene Benveniste (IPSL, CNRS) members of GICN, October 2015

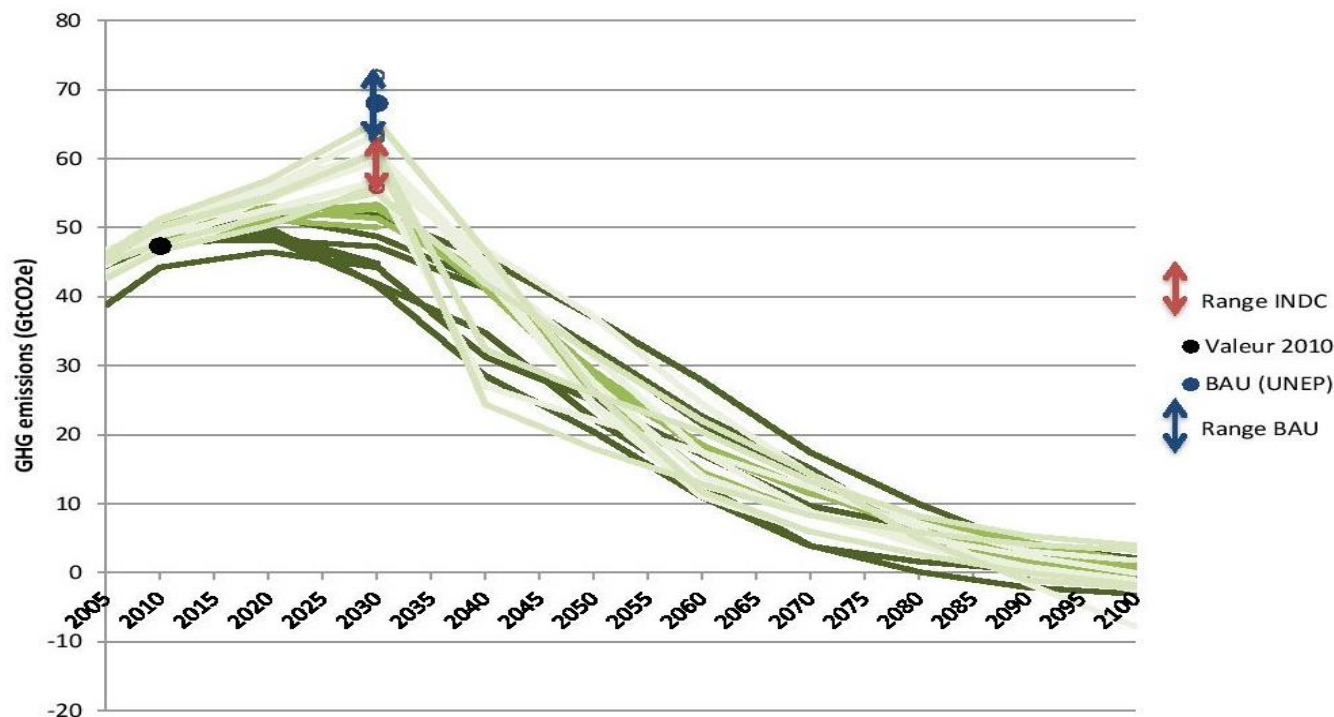
Rate of worldwide emission reduction (% per year)



Trajectoire de décarbonation: encore le flou artistique à ce stade



IPCC 2°C scenarios and INDC



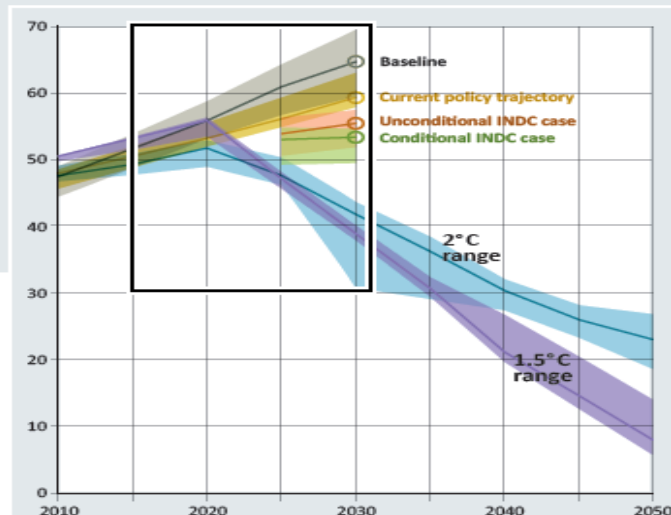
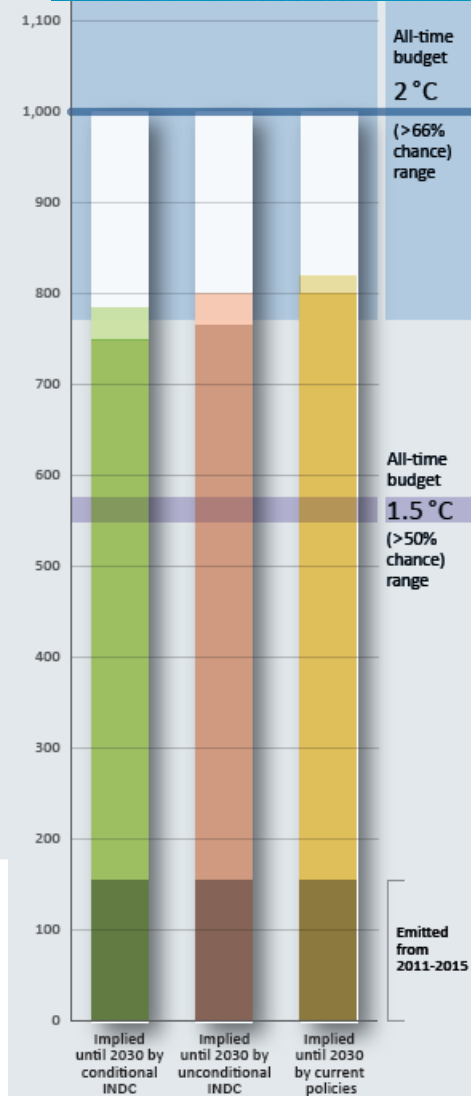
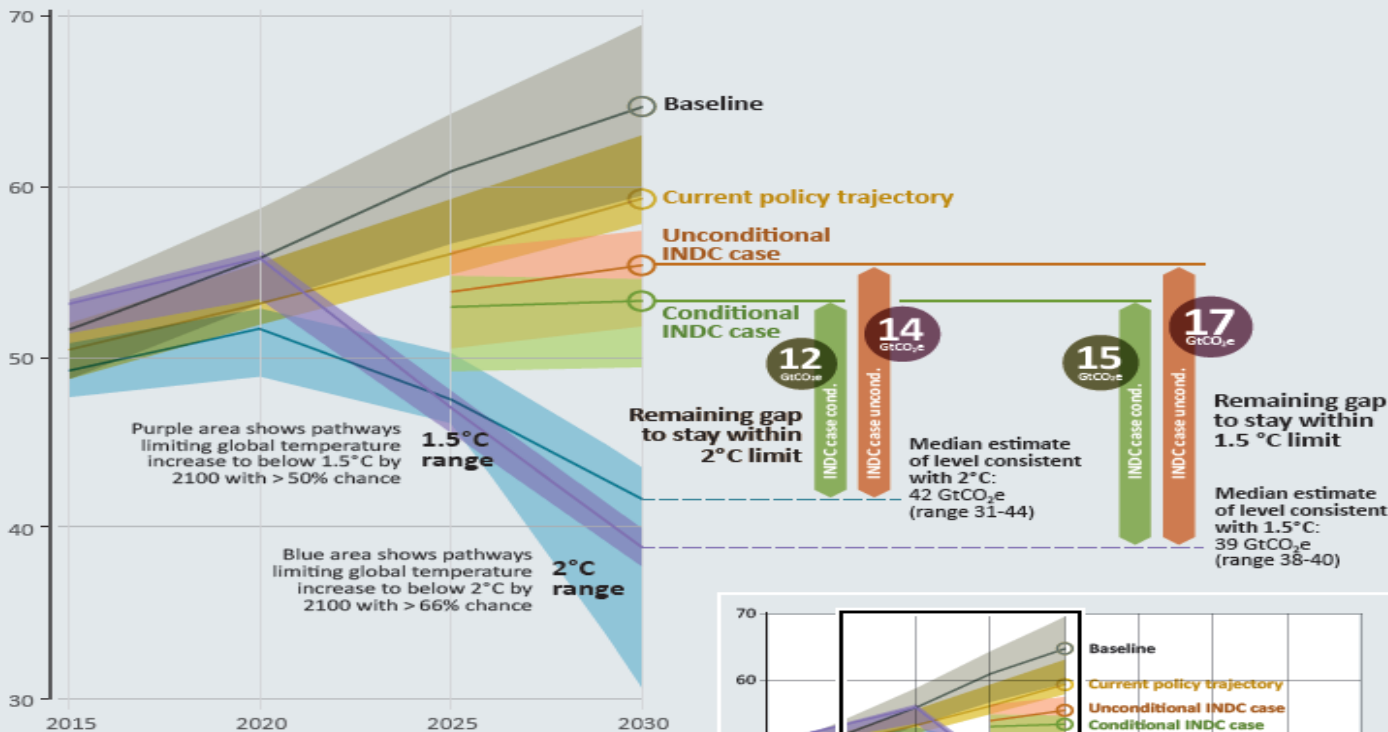
The emission pledges to the Paris Agreement avoid the worst effects of climate change (4-5°C).

Most studies suggest the pledges give a likely temperature increase of about 3°C in 2100.

But we actually don't know...

Source: Olivier Boucher (LMD, CNRS) H el ene Benveniste (IPSL, CNRS) members of GICN, October 2015

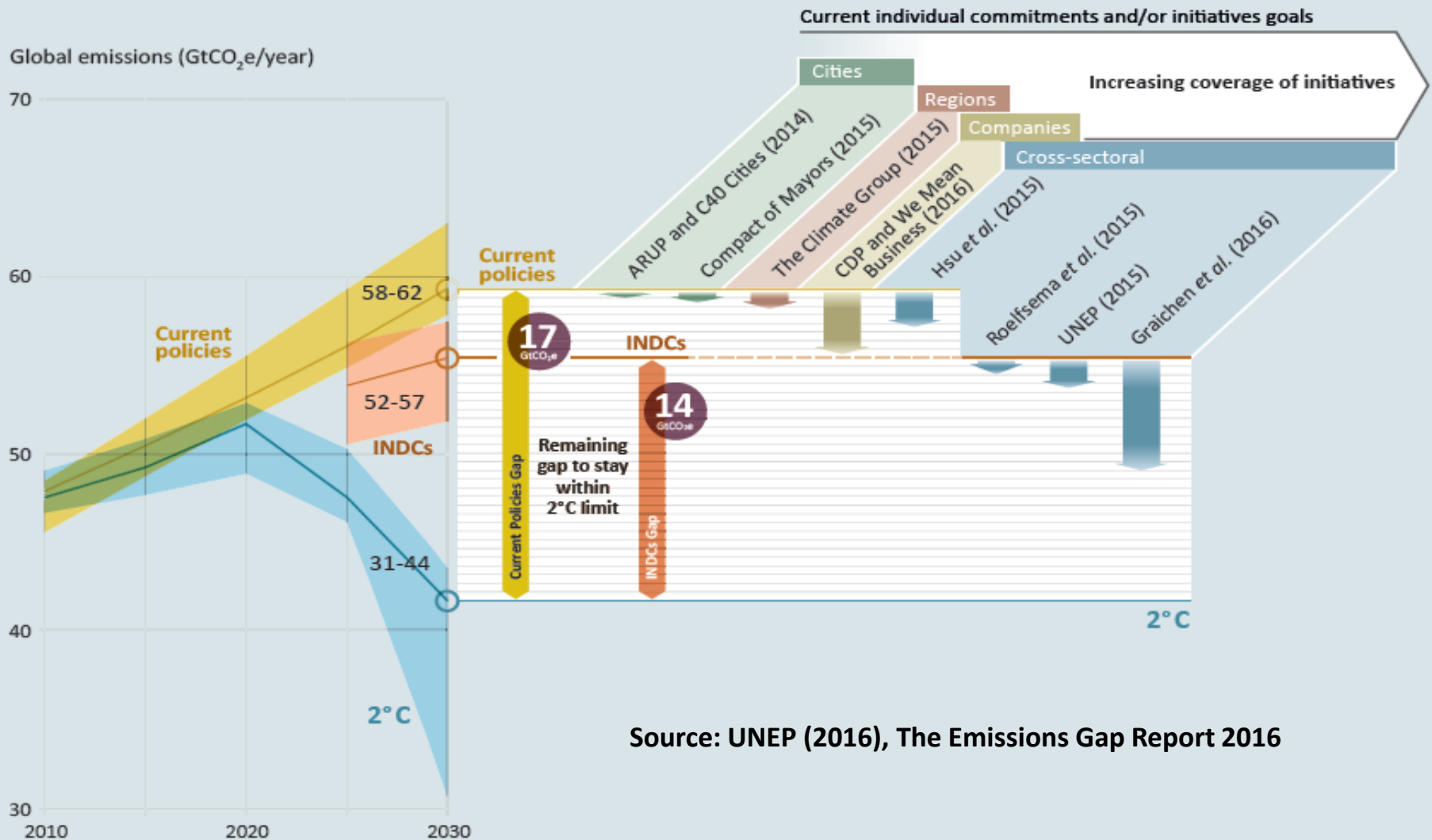
L'UNEP Emissions Gap Report: le véritable indicateur politico-économique



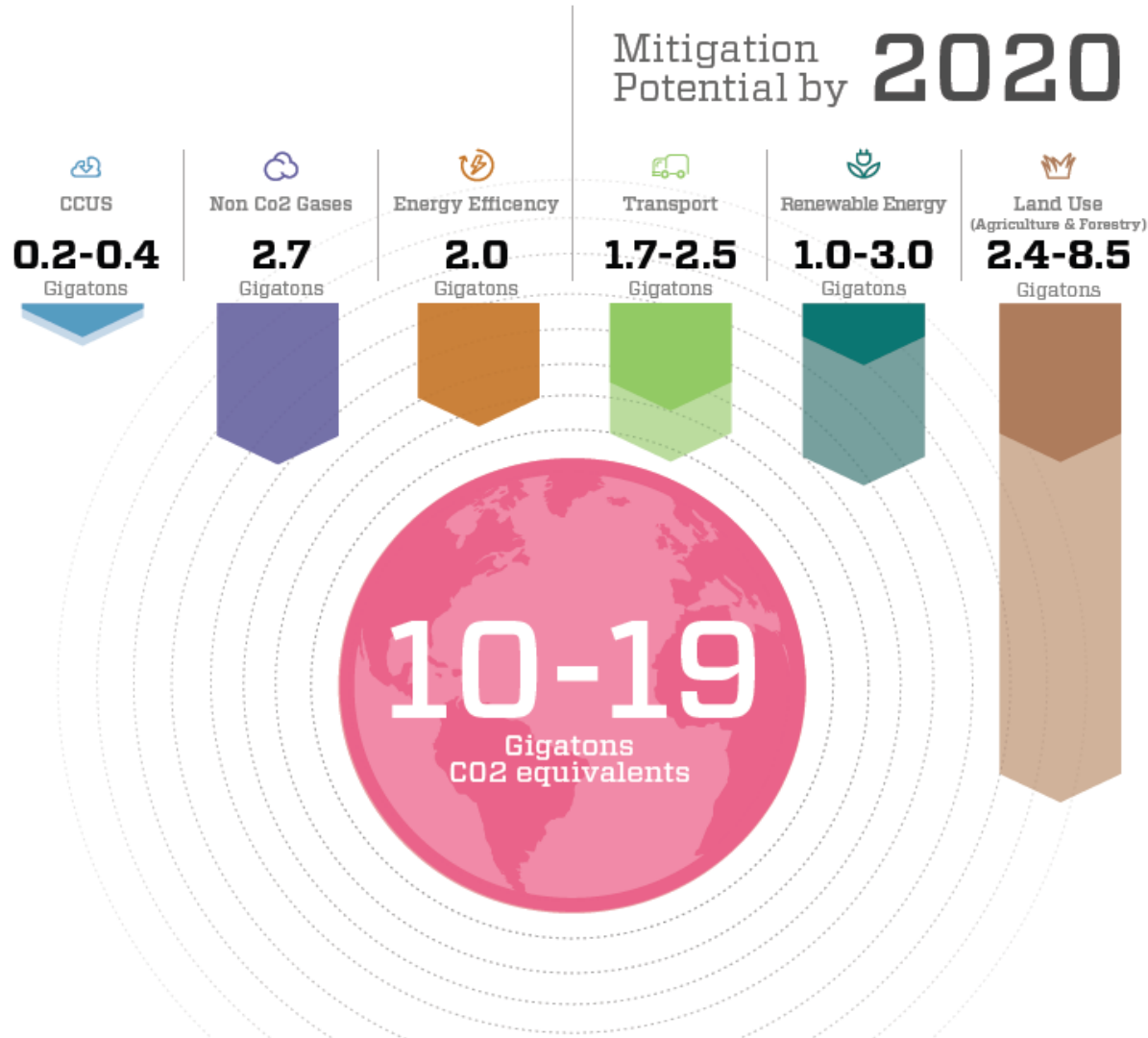
Sources: The 20th–80th-percentile ranges are shown for the baseline and the 2°C and 1.5°C scenarios. For current-policy and INDC scenarios, the minimum–maximum and 10th–90th-percentile range across all assessed studies are given, respectively.

Source: UNEP (2016), The Emissions Gap Report 2016

N'oublions pas les acteurs non-étatiques !



Sectoral pre-2020 climate action: technologies are here !

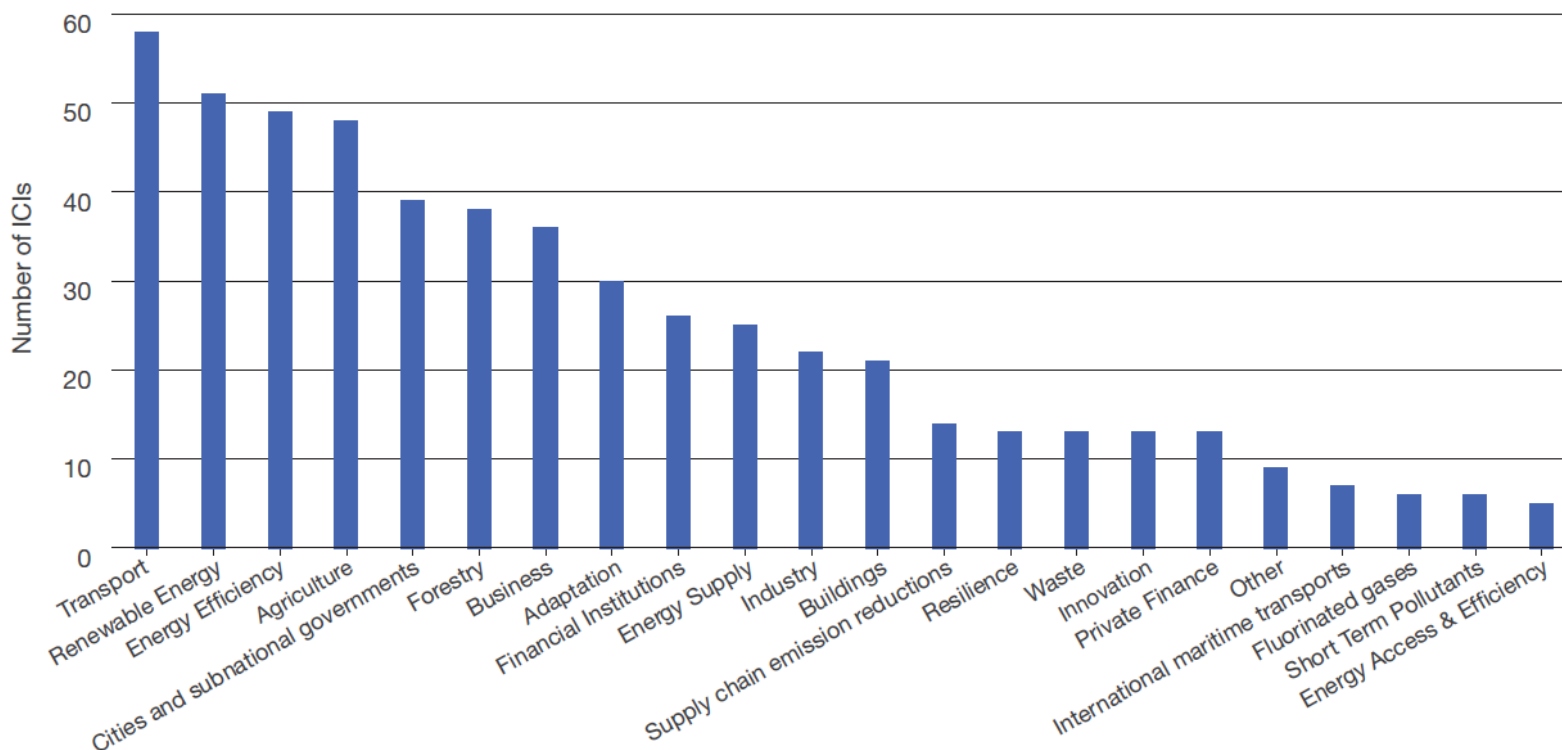


Source: UNFCCC (2015),

ICIs: plenty of, pending for a rigorous monitoring system



FIGURE N°1 – INTERNATIONAL COOPERATIVE INITIATIVES (ICIs) BY THEME*

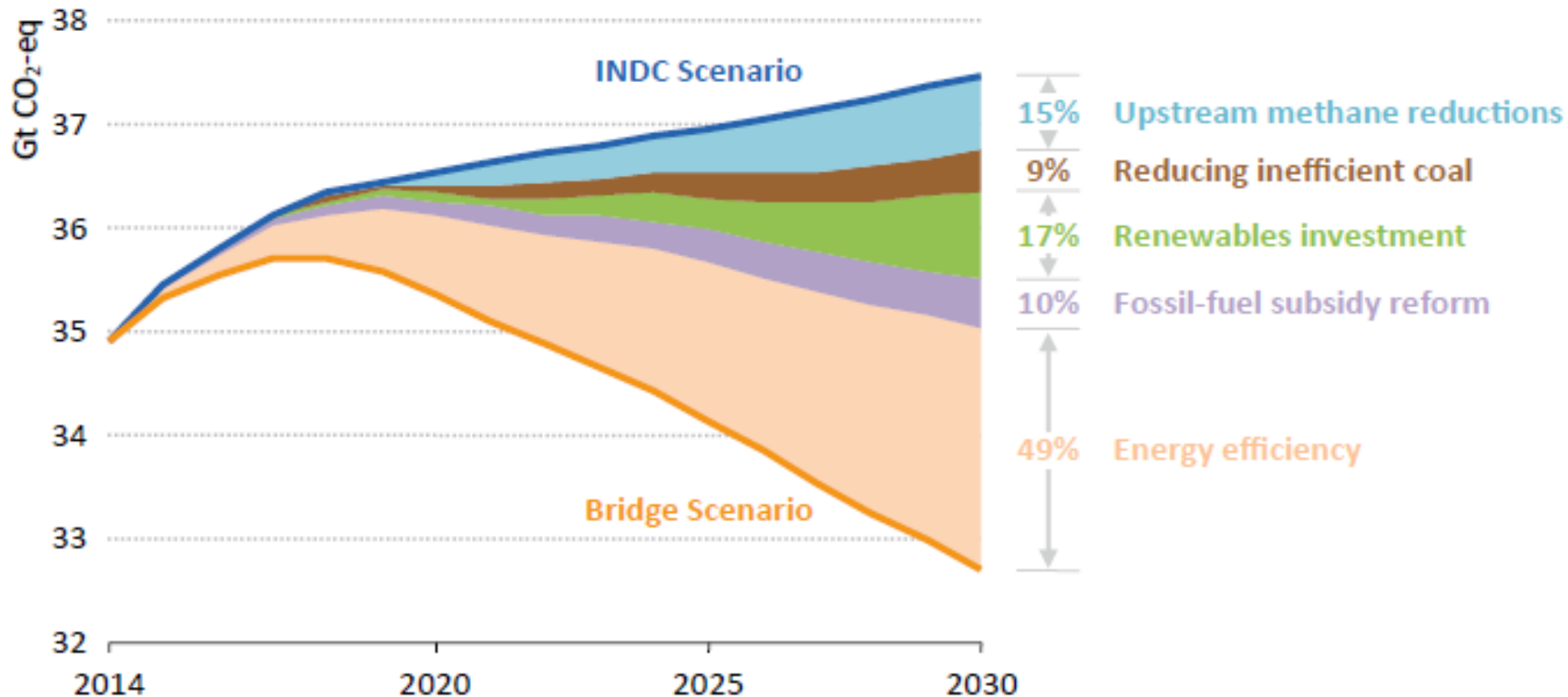


* Some of the 231 ICIs referenced in the platform regroup multiple themes.

Source: I4CE according to data from the Climate initiatives platform, October 2016

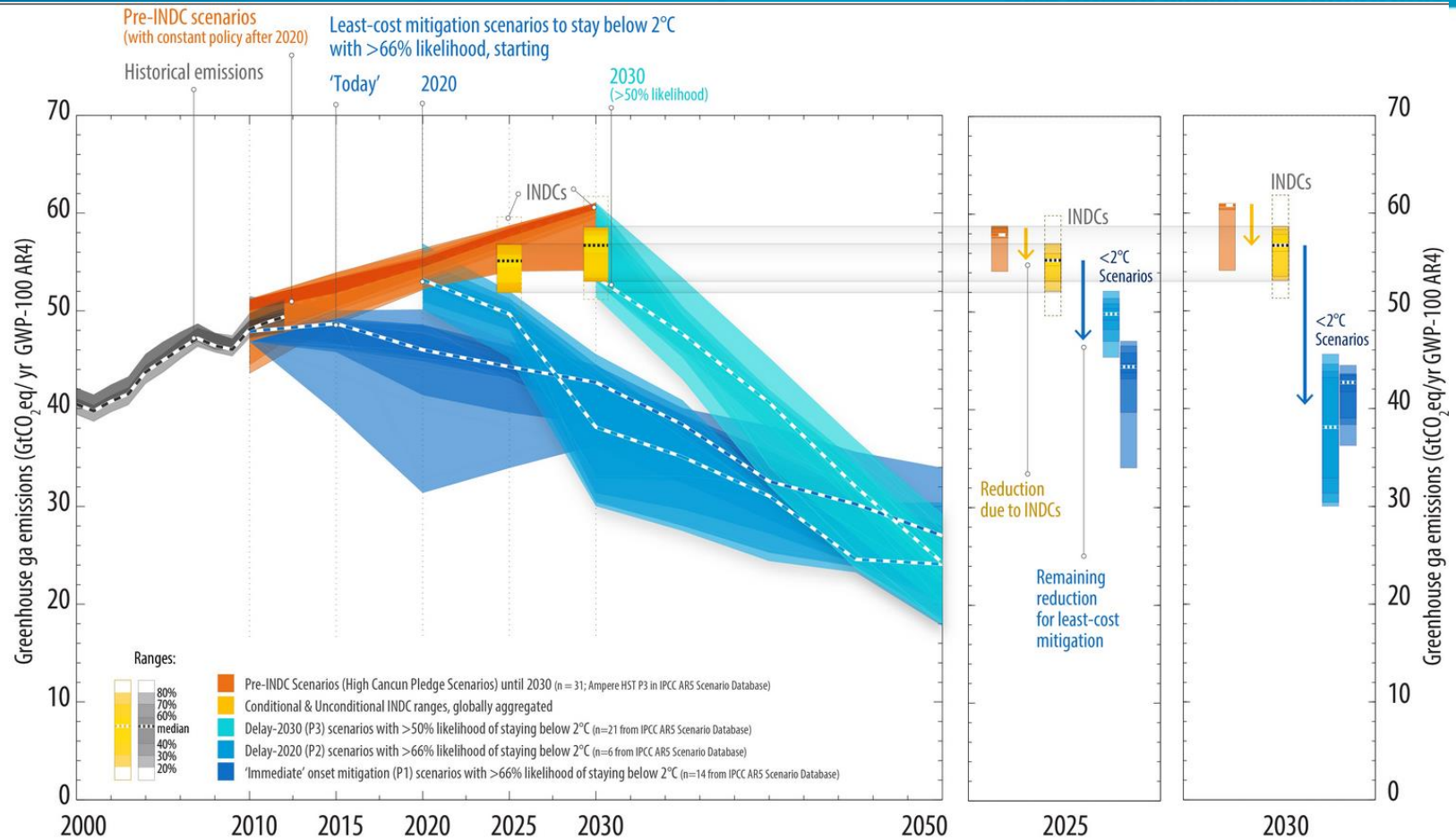
Source: Bultheel *et al.*, November 2016

Trajectoire de décarbonation: certitudes sur les actions, incertitudes sur les interdépendances



Source: IEA (2015), World Energy Outlook, Special Report on Energy & Climate

INDCs: a first check-point to assess « cost-effective » mitigation pathways



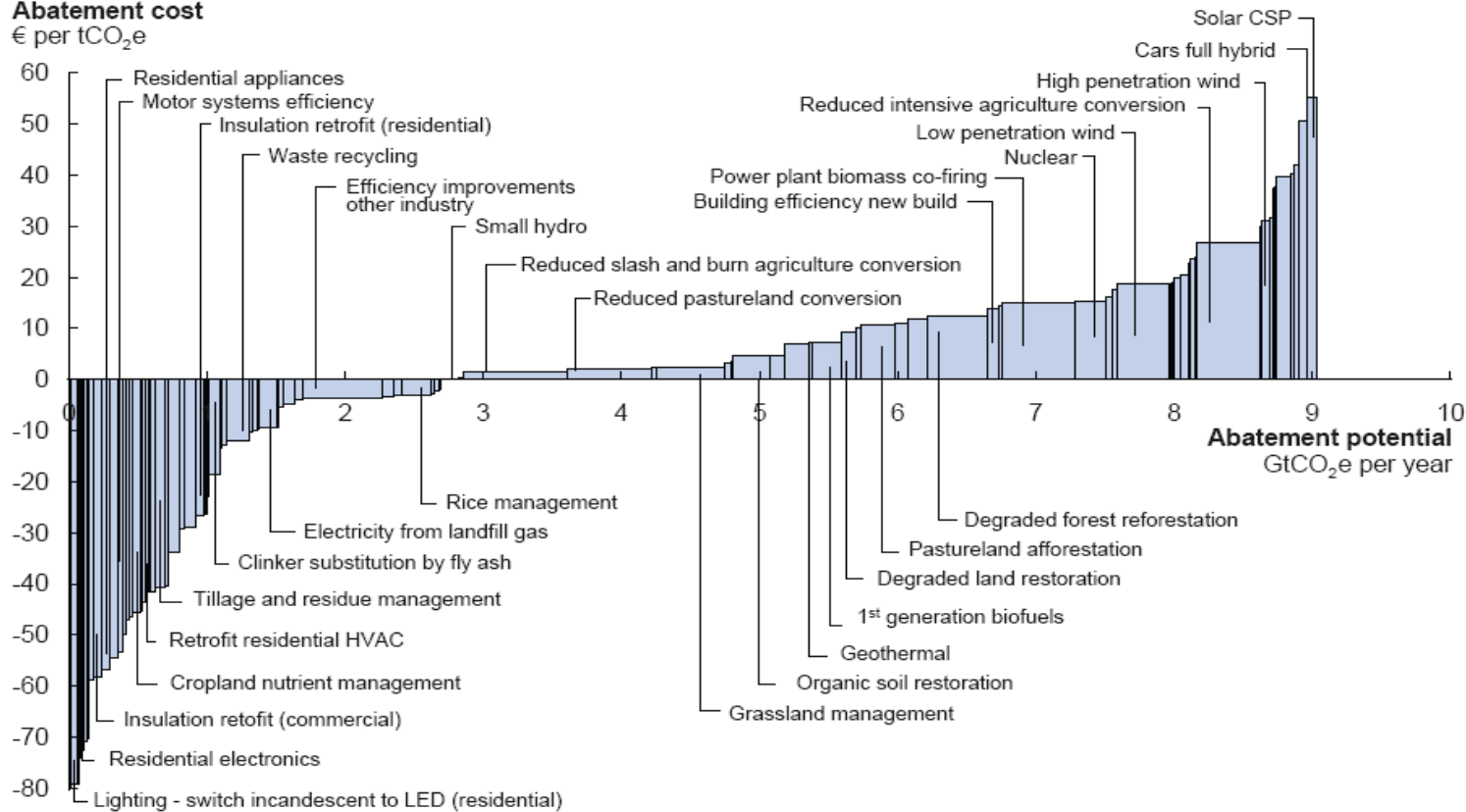
Source: UNFCCC (2016), Updated synthesis report on the aggregate effect of INDCs – published 2 May 2016

Une évolution permanente du rapport « coût-efficacité » de la décarbonation



Global GHG abatement cost curve beyond business as usual – 2015

Abatement cost
€ per tCO₂e



<- « [C'est d'la merde.](#) »

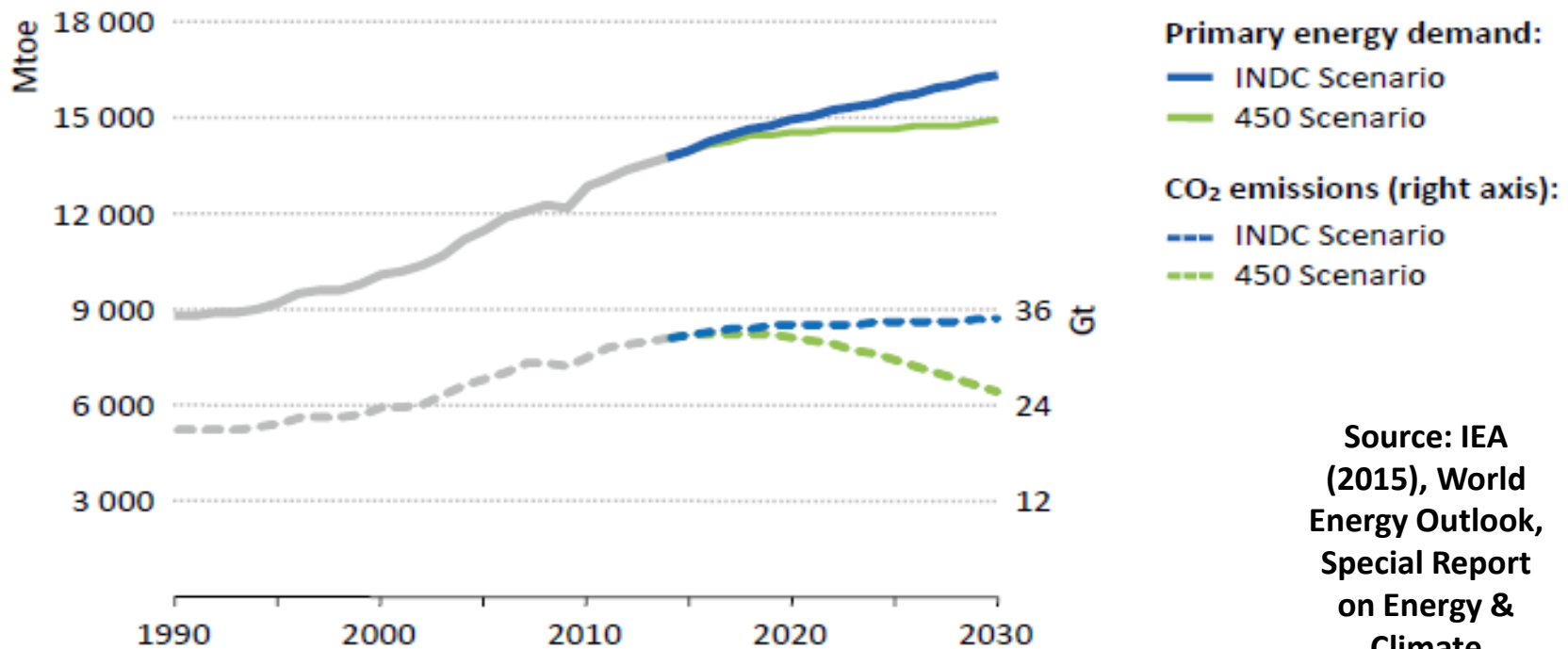
Source:
McKinsey, 2009

Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €60 per tCO₂e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.
Source: Global GHG Abatement Cost Curve v2.0

Estimer la trajectoire de décarbonation post-2030? Ah, prospection quand tu nous tiens...



Figure 2.1 ▶ Global primary energy demand and related CO₂ emissions by scenario



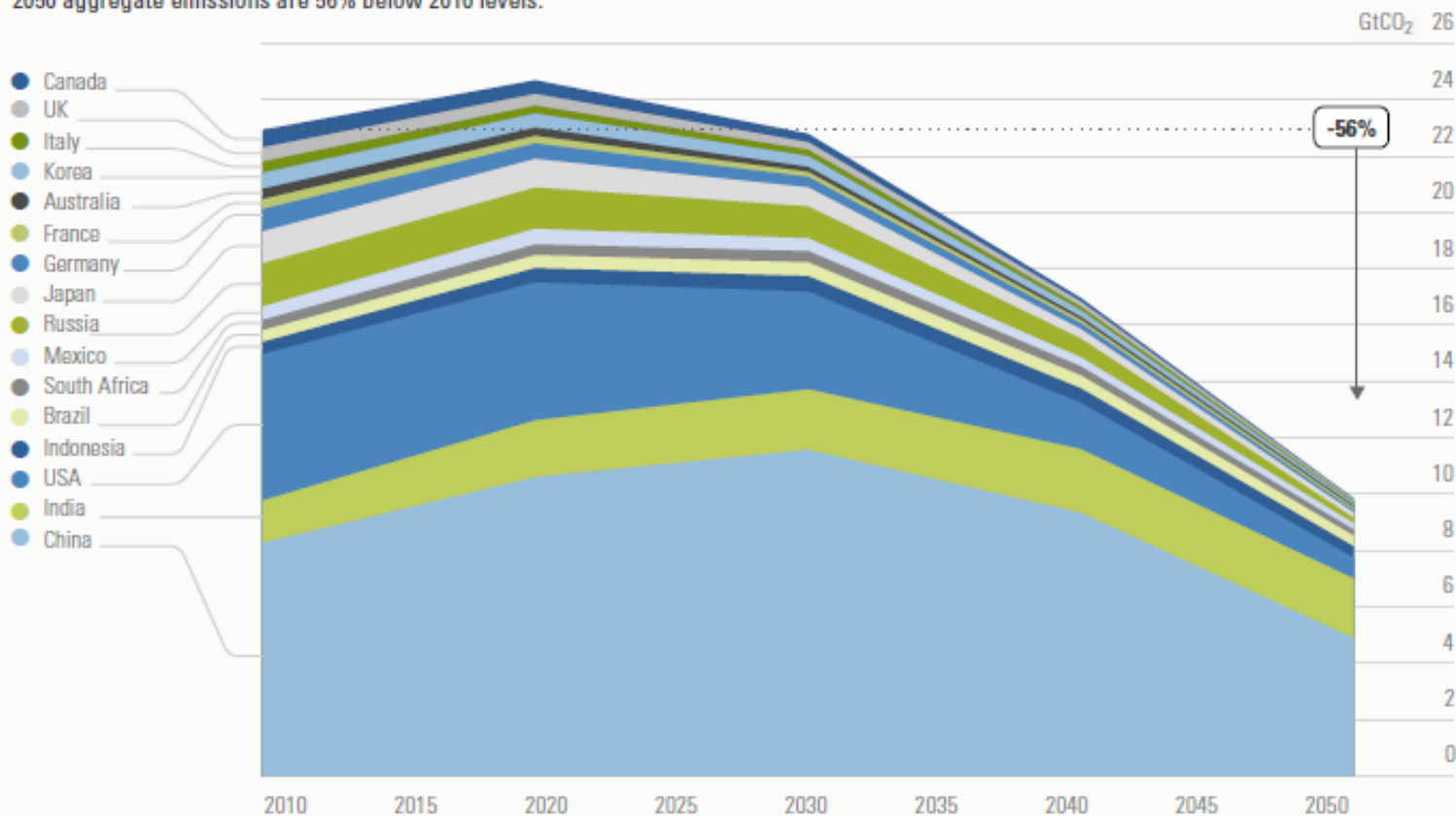
Source: IEA (2015), World Energy Outlook, Special Report on Energy & Climate

Note: Mtoe = million tonnes of oil equivalent; Gt = gigatonnes.

Seul le projet DDPP va en 2050, mais que sur l'énergie, et sur base des technologies actuelles (évolution uniq. sur le \$\$)

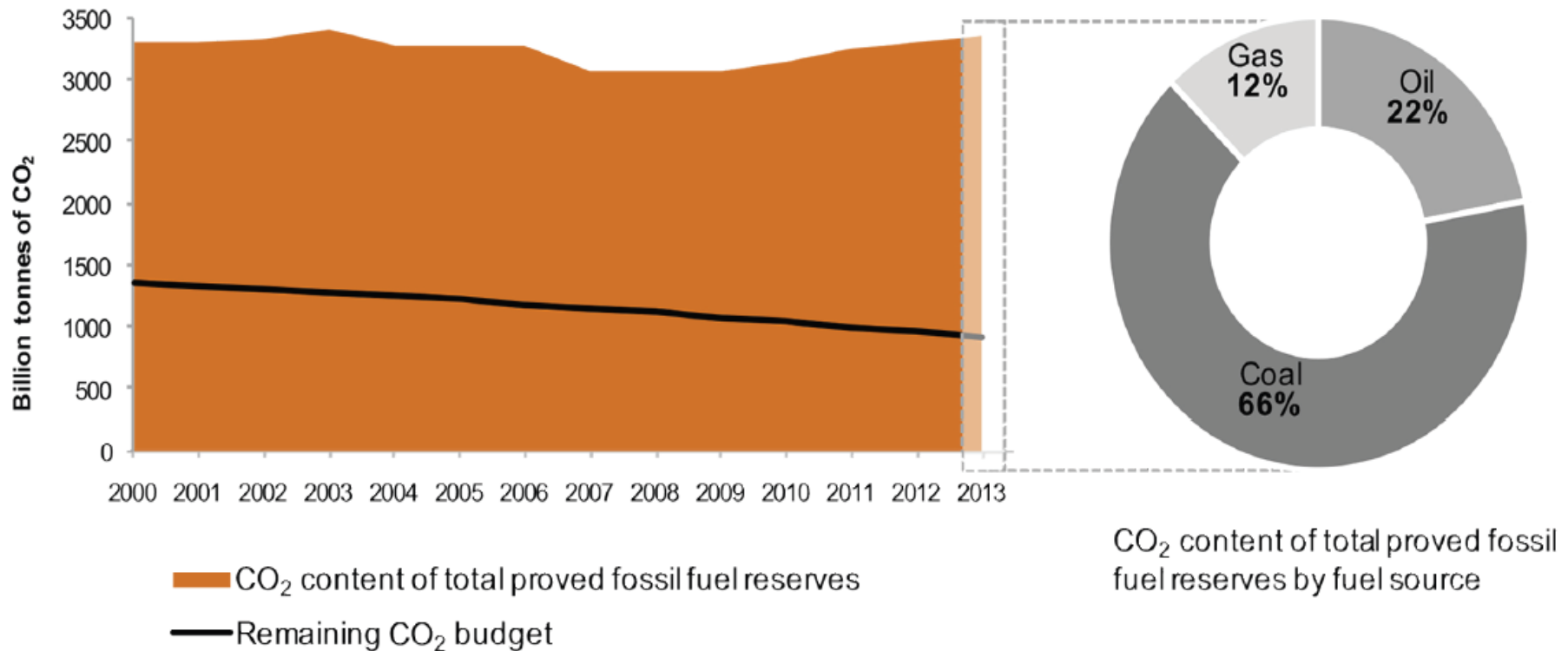


Figure 1. Emissions trajectories for energy CO₂, 2010-2050, showing most ambitious reduction scenarios for all DDPP countries. 2050 aggregate emissions are 56% below 2010 levels.



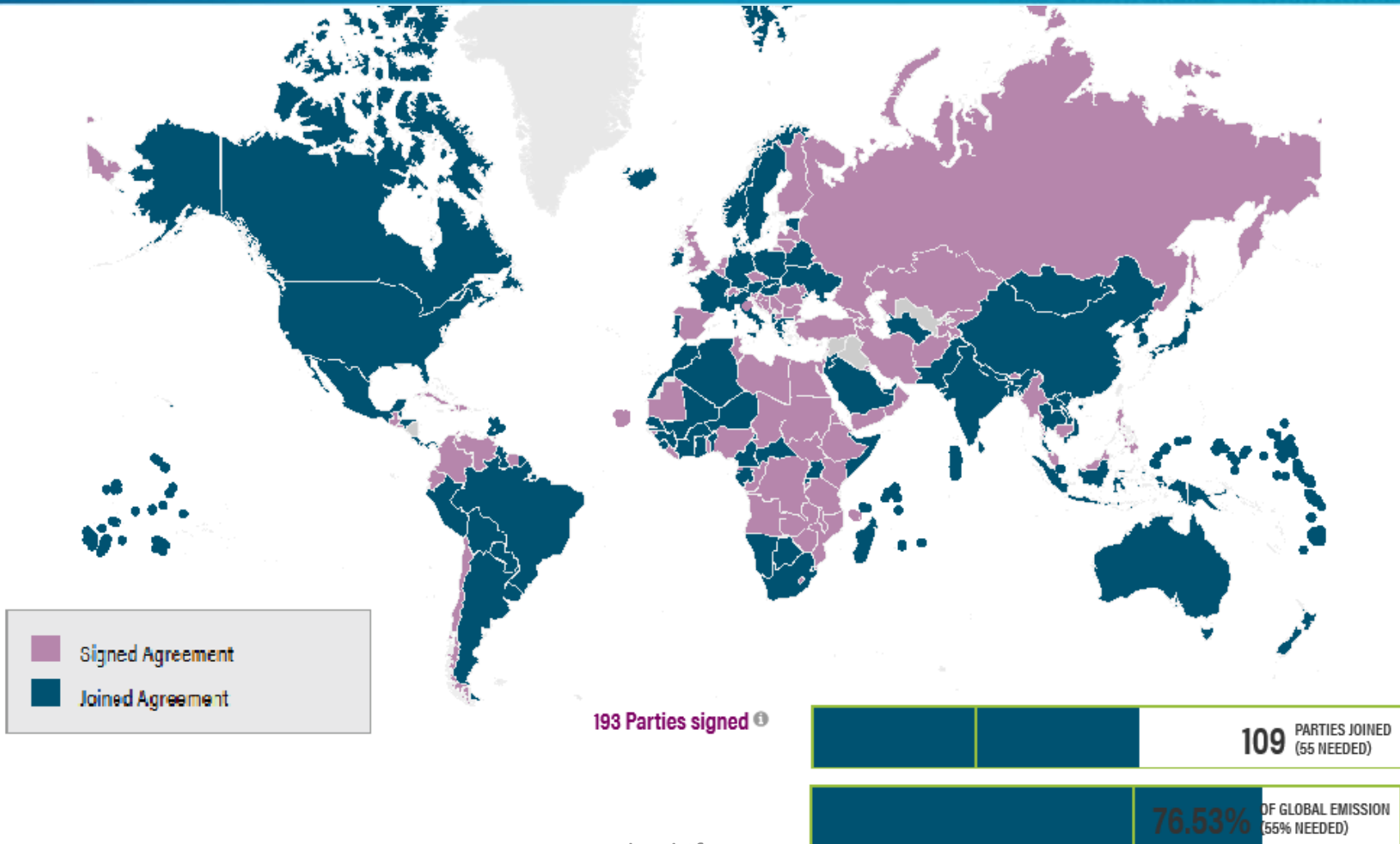
Source: Deep Decarbonization Pathway Project (2015), Pathways to Deep Decarbonization, 2015 Report

Keeping in mind the global carbon budget, at last for fossil fuels...



Carbon content of total proven fossil fuel reserves (GtCO₂) – Source: ODI, Oil Change International, novembre 2015

The Paris Agreement ratification: ¡Arriba! ¡Arriba!



NDCs: it should only progress, except with US Republicans rulling...



Ambition Mechanism in the Paris Agreement



Avec tout ce retard, que pensez ?



« Les optimistes ont bien de la chance. Les pessimistes, bien du travail. » (Comte-Sponville)

Le pessimiste est un optimiste bien informé. (Comte-Sponville)

« L'optimiste et le pessimiste ne s'opposent que sur ce qui n'est pas. » (Valéry).

« La seule différence entre un optimiste et un pessimiste, c'est que le premier est un imbécile heureux et que le second est un imbécile triste. » (Bernanos)

« Je suis pessimiste avec l'intelligence, mais optimiste par la volonté. » (Gramsci)