Possible IPCC inputs into the global stocktake - the sixth assessment cycle and beyond ("what" and "when")

United Nations Framework Convention on Climate Change

The physical science basis and the global stocktake

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Best scientific knowledge relevant for the global stocktake
Possible contributions of IPCC WGI

Dashboard : current state of the climate system

Diagnosis : human influence on the climate system

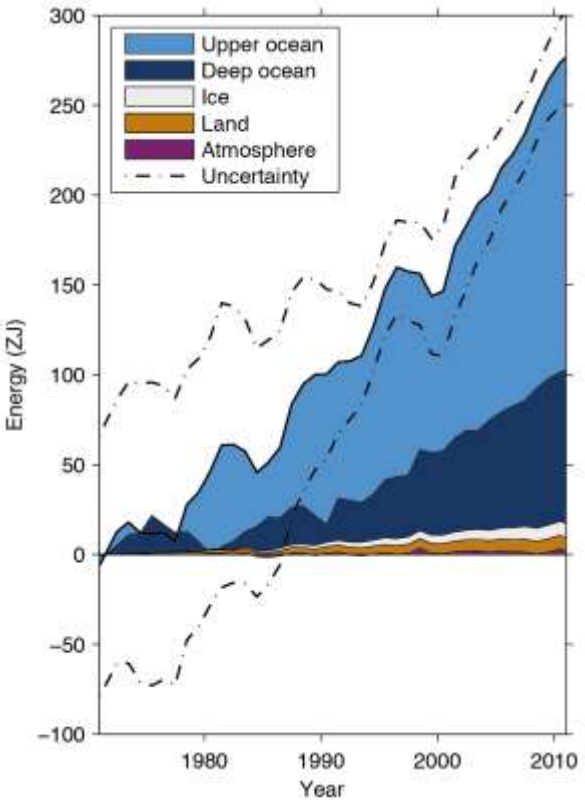
Prognosis : pathways and climate projections

Examples from the AR5 and recent updates available for assessment in the AR6 cycle (WMO, NOAA, GCP…)

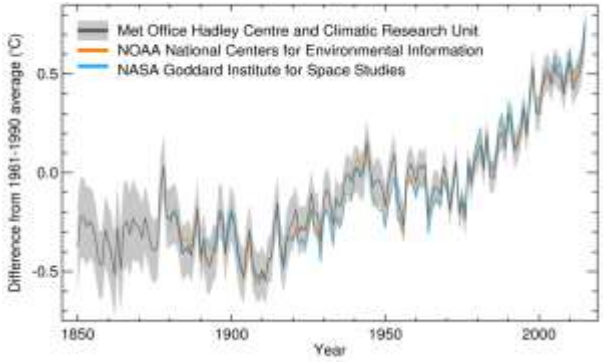
Dashboard : current state of the climate system

Key indicators

Energy in the climate system (AR5)

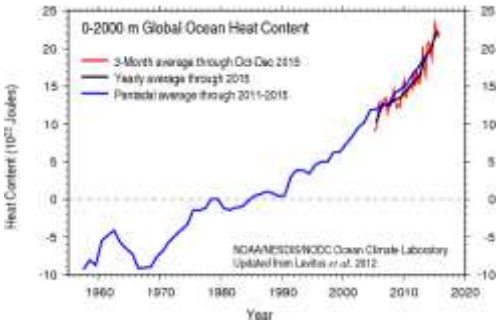


Surface temperature (WMO update)

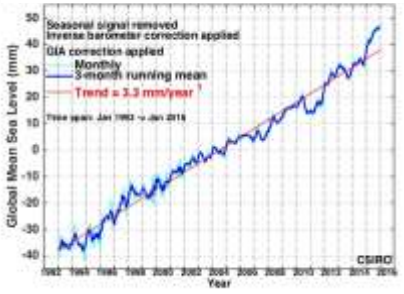


Long-term target

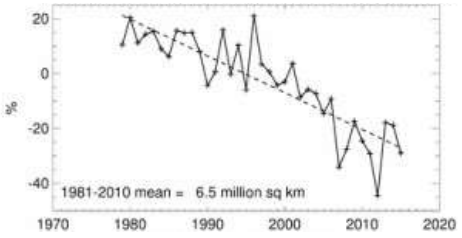
Ocean heat content (NOAA)



Global mean sea level (CSIRO)



September Arctic sea ice extent (NSIDC)



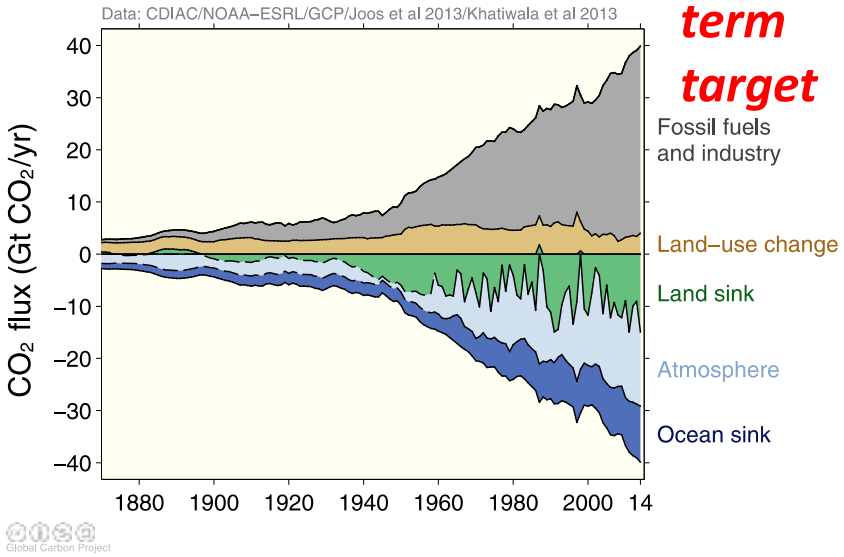
Dashboard : current state of the climate system

What is relevant for the global stocktake?

- Reference periods (pre-industrial)?
- Water cycle?
- Data related to impacts, vulnerability and adaptation ?
  e.g. mass loss from glaciers and ice sheets
  Regional climate
  Extreme events
- Large-scale ocean dynamics?
  e.g. strength of the Atlantic Meridional Overturning Circulation
  Modes of variability (e.g. El Niño)

Dashboard : current state of the climate system

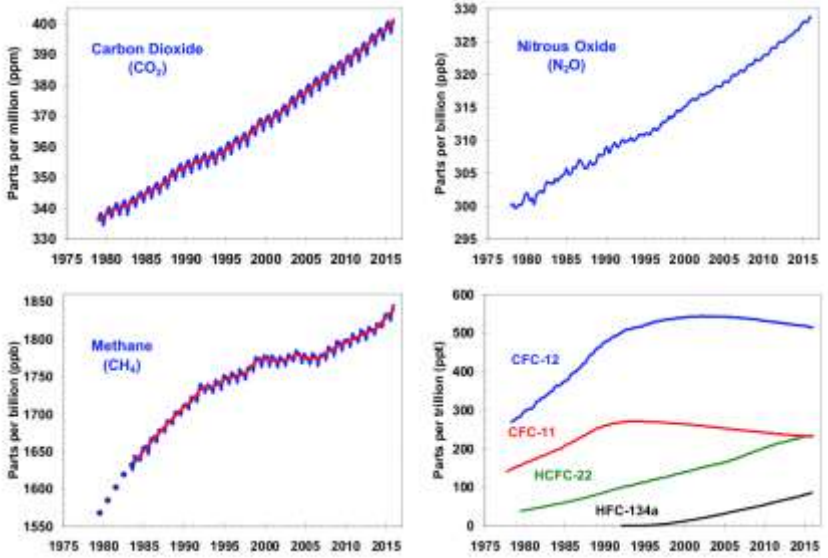
Global carbon cycle (GCP)



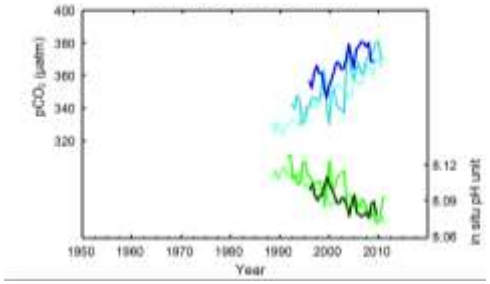
Long-term target

Key indicators

Atmosphere greenhouse gas concentration (NOAA)



Ocean CO_2 and pH (AR5)



Regional land surface aspects?

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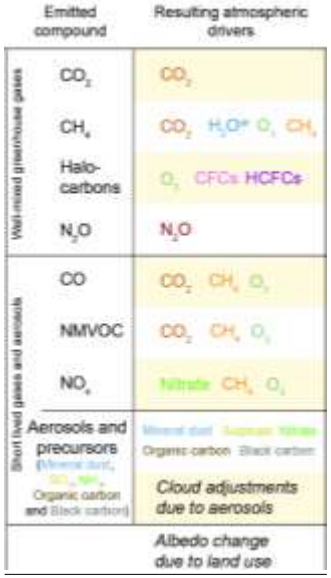
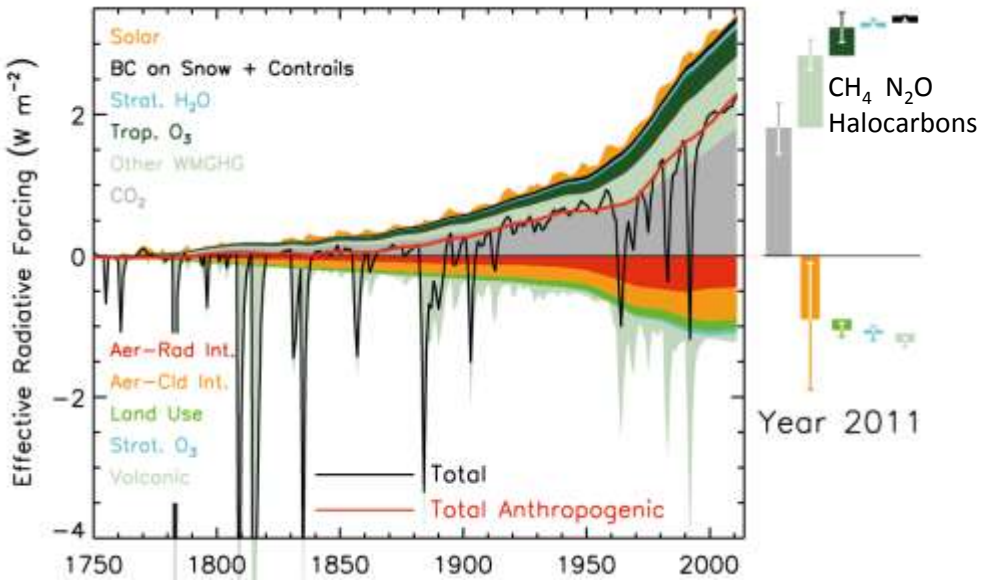
Diagnosis : human influence on the climate system

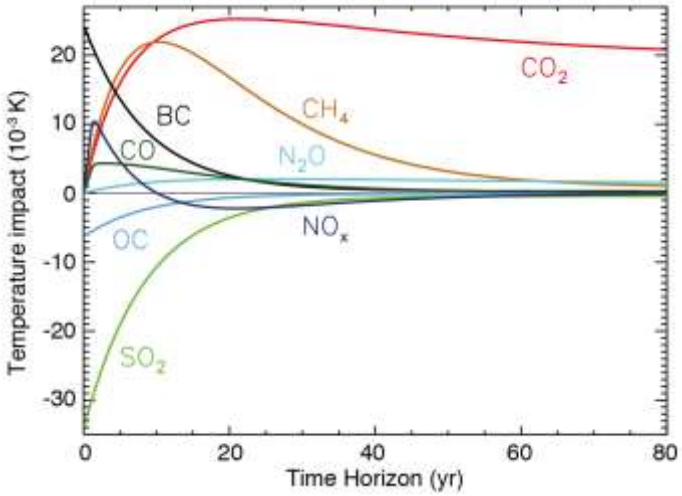


Radiative forcing per driver (AR5)



Importance of assessing emissions of compounds and their impacts

Will the global stocktake include attribution of observed changes (e.g. global / regional temperature, sea level…) to drivers (GHG, aerosols, land use…)?



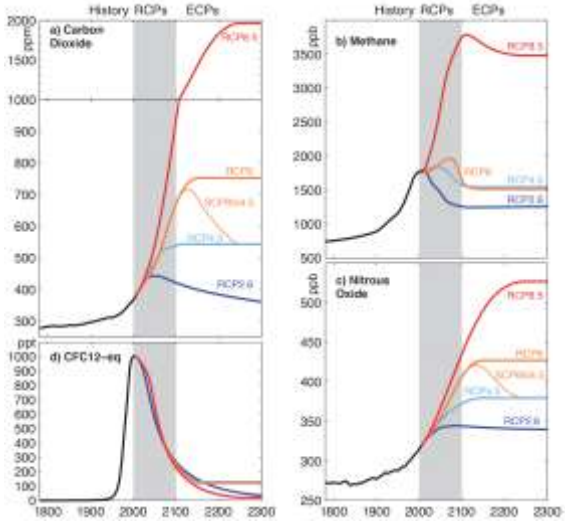
Prognosis : pathways and climate projections

What is relevant for the global stocktake?

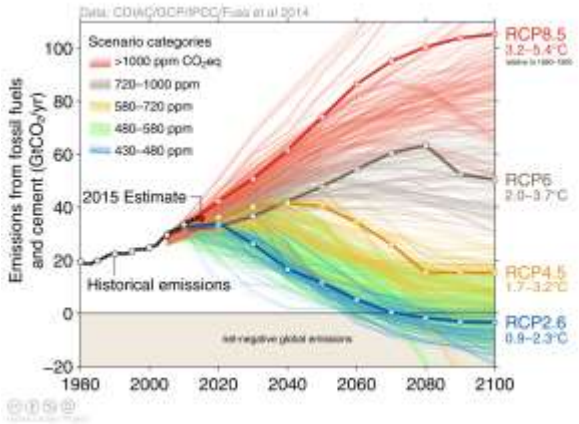
- Emissions and radiative impacts of each driver (not CO_2-eq only), albedo of land use change
- Climate sensitivity
- Ocean and land carbon sinks

(potential reversal for low emission scenarios)

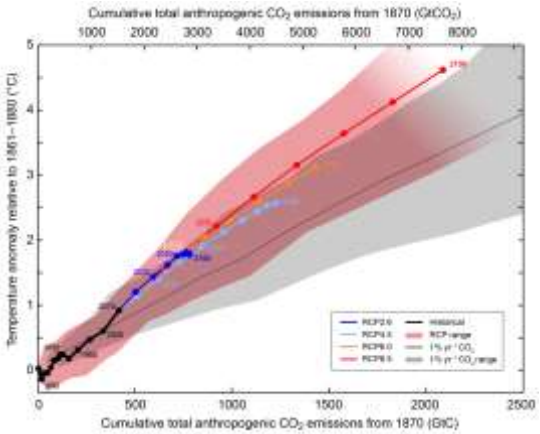
Concentration pathways (AR5)



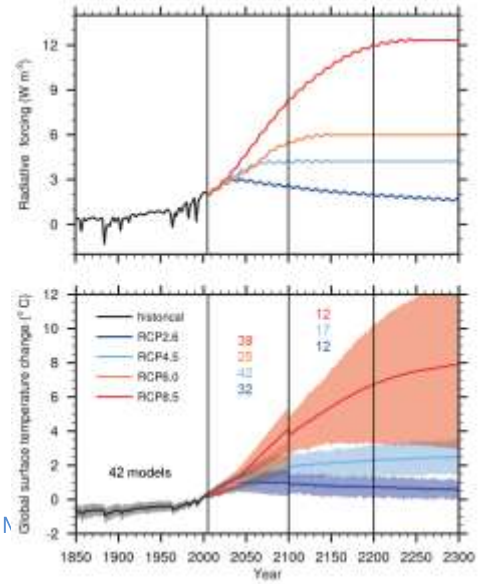
CO_2 emission pathways (GCP)



Carbon budget (AR5)



Radiative forcing and climate projection (AR5)



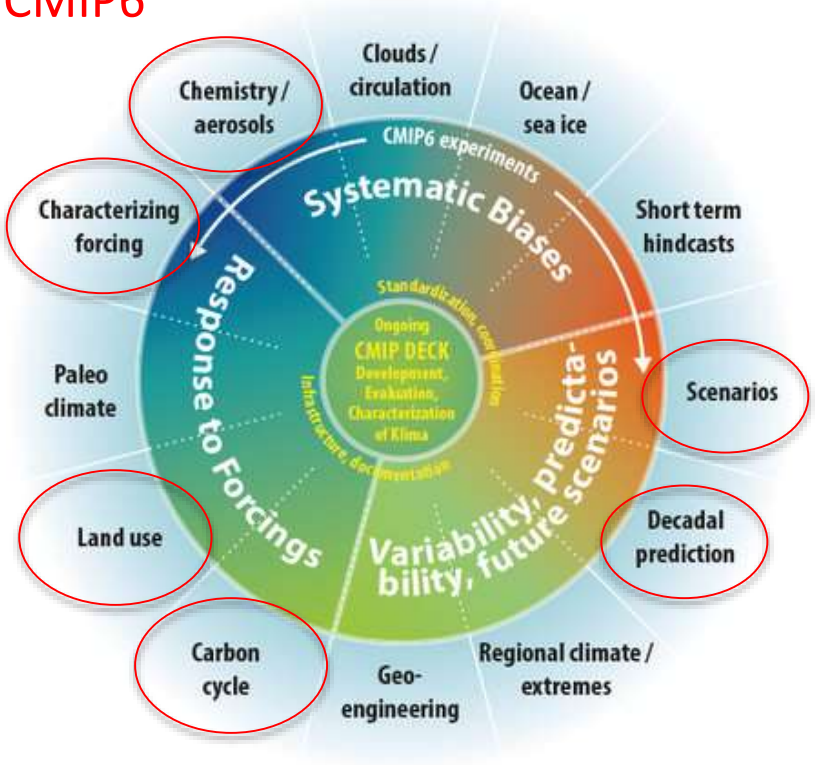
PANEL ON

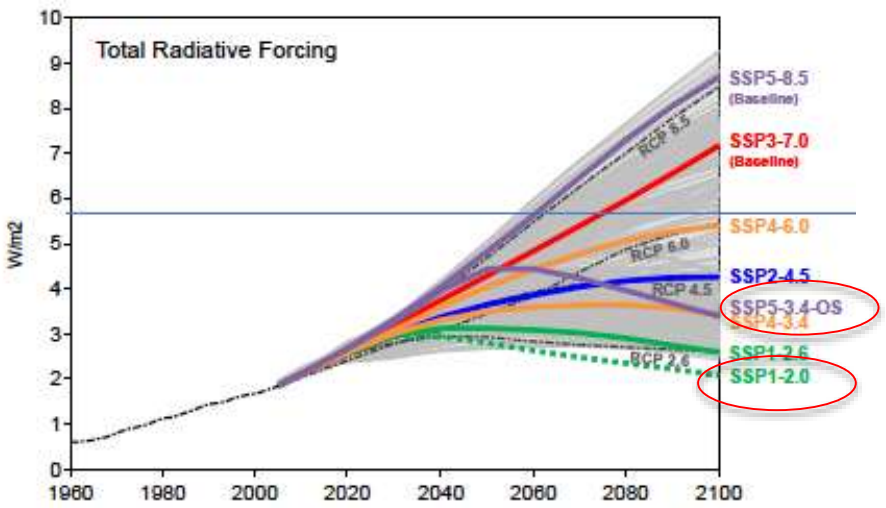
Prognosis : pathways and climate projections

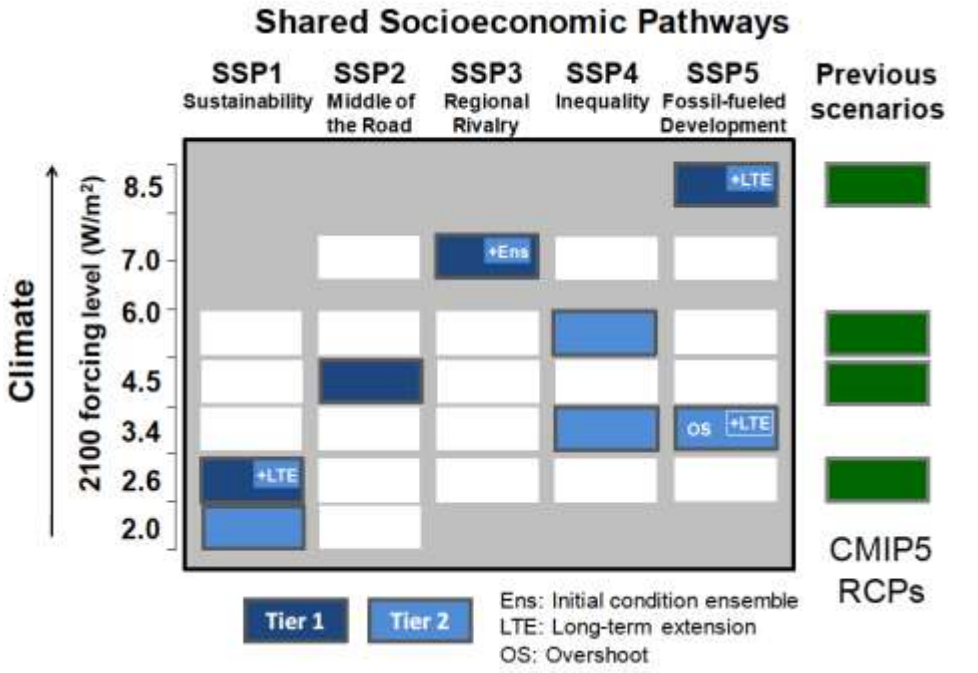
ScenarioMIP for CMIP6, O'Neil et al, GMD Discussion 2016

Shared socio-economic pathways (SSP) : new framework to facilitate integrated analysis of future climate change ipacts, vulnerability, adaptation and mitigation

CMIP6







Specific IPCC WGI issues relevant for the global stocktake

Coordination with GCOS, WCRP, Future Earth, Global Carbon Project, UNFCCC, UNEP, climate statistics for SDG13

- Special report on 1.5°C (**09/2018**)

  Pending on scoping and new peer-review publications :

  update of dashbord

  new analyses of existing CMIP5 simulations, new simulations (e.g. HappiMIP-?

- Special reports on ocean and cryosphere, and on land use issues (**2019?**)

  Pending on scoping and new peer-review publications

- TFI methodological report on greenhouse gas emission inventories (**2019**)

- Main assessment report of WGI (**end of 2020 – beginning of 2021**)

  Pending on scoping and new peer-review publications :

  update of dashbord and diagnosis

  new CMIP6 simulations (new SSP)

  emphasis on regional aspects

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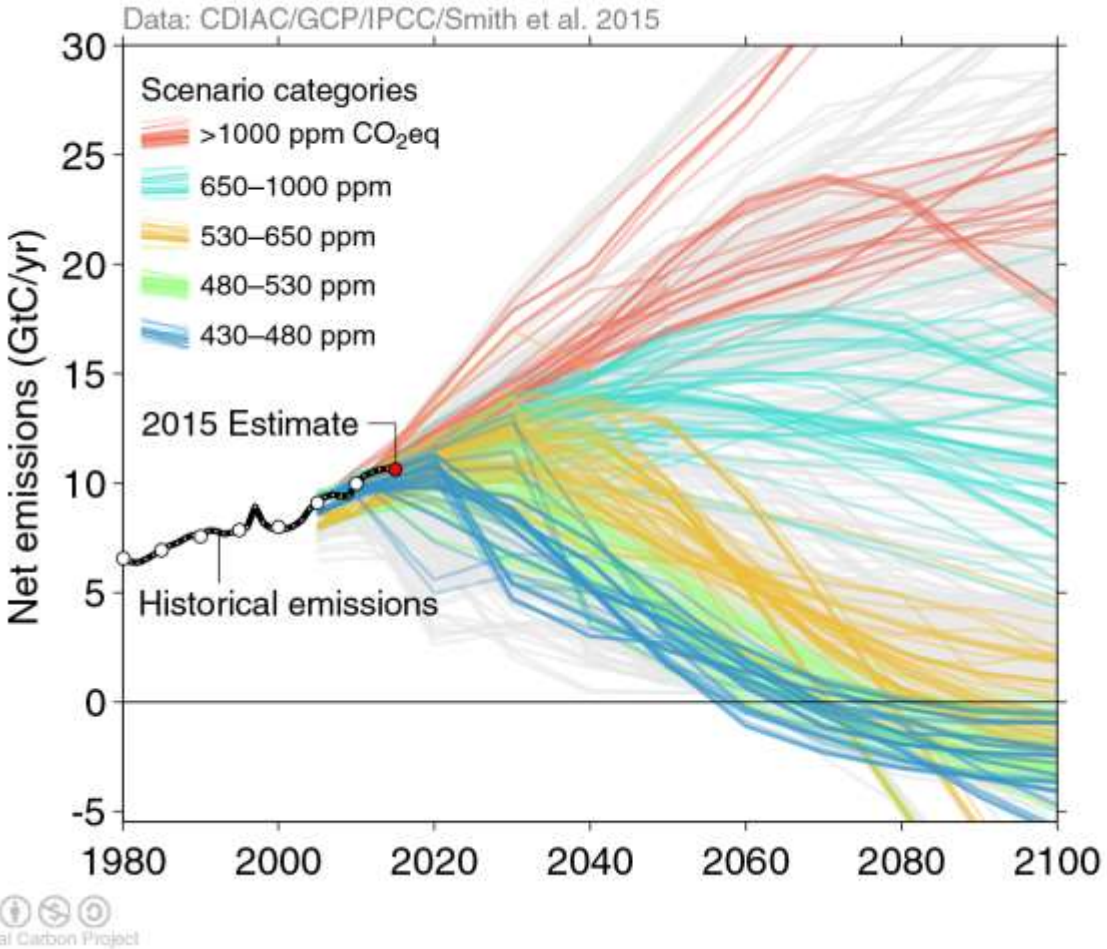
Scenarios including Negative Emission Technologies

Scenarios including Negative Emission Technologies for each scenario category (colours), net land use change fluxes are included



Scenarios with Negative Emissions Technologies from the AMPERE and LIMITS modelling comparison exercises (colours), with all other scenarios from the IPCC AR5 database shown in grey

Source: Smith et al 2015; Global Carbon Budget 2015