CO_2 storage is an essential part of meeting the Paris Agreement targets

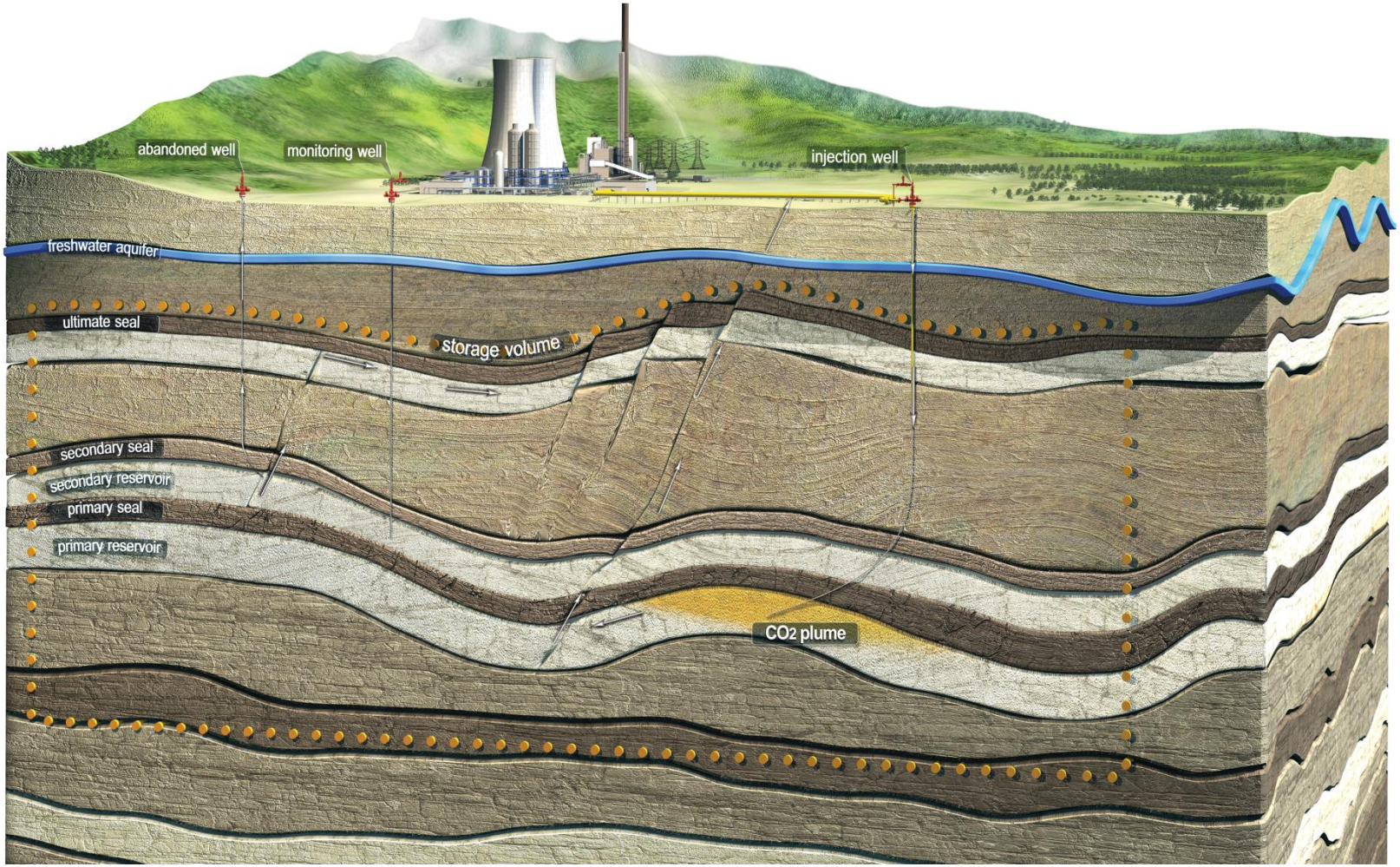
Tim Dixon, IEAGHG

8th November 2017

Energies2050 Side Event

COP-23, Fiji in Bonn

What is CCS?



Source: DNV

IPCC Fifth Assessment Report
Synthesis Report

2nd November 2014
Copenhagen

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Key Messages

→ **Human influence on the climate system is clear**

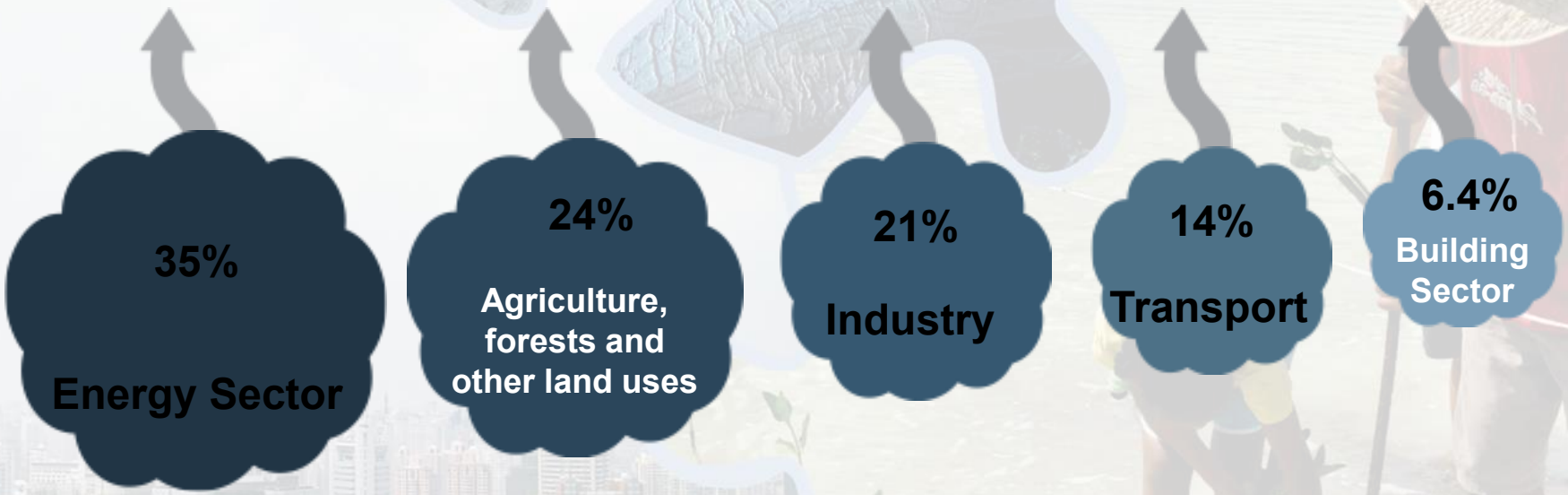
→ **The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts**

→ **We have the means to limit climate change and build a more prosperous, sustainable future**

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

Sources of emissions

Energy production remains the primary driver of GHG emissions



2010 GHG emissions

AR5 WGIII SPM

Mitigation Measures

More efficient use of energy

Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today

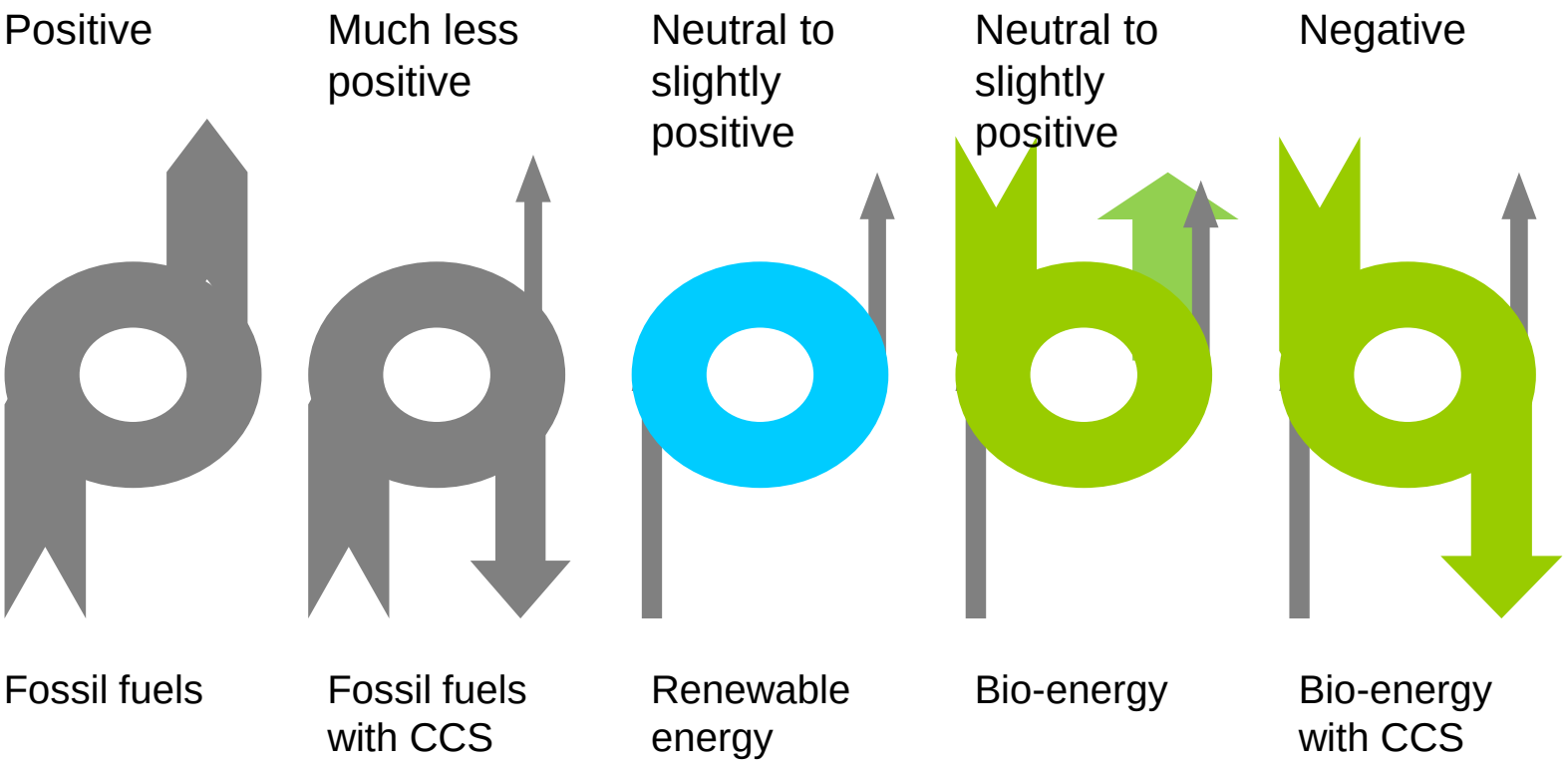
Improved carbon sinks

- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage

Lifestyle and behavioural changes

AR5 WGIII SPM

Why Biomass and CCS - the net carbon balance



IEAGHG/Koornneef 2010

IPCC AR5 – Role of different low-carbon energy technologies

Mitigation cost increases in scenarios with limited availability of technologies [d]

[% increase in total discounted [e] mitigation costs (2015–2100) relative to default technology assumptions]

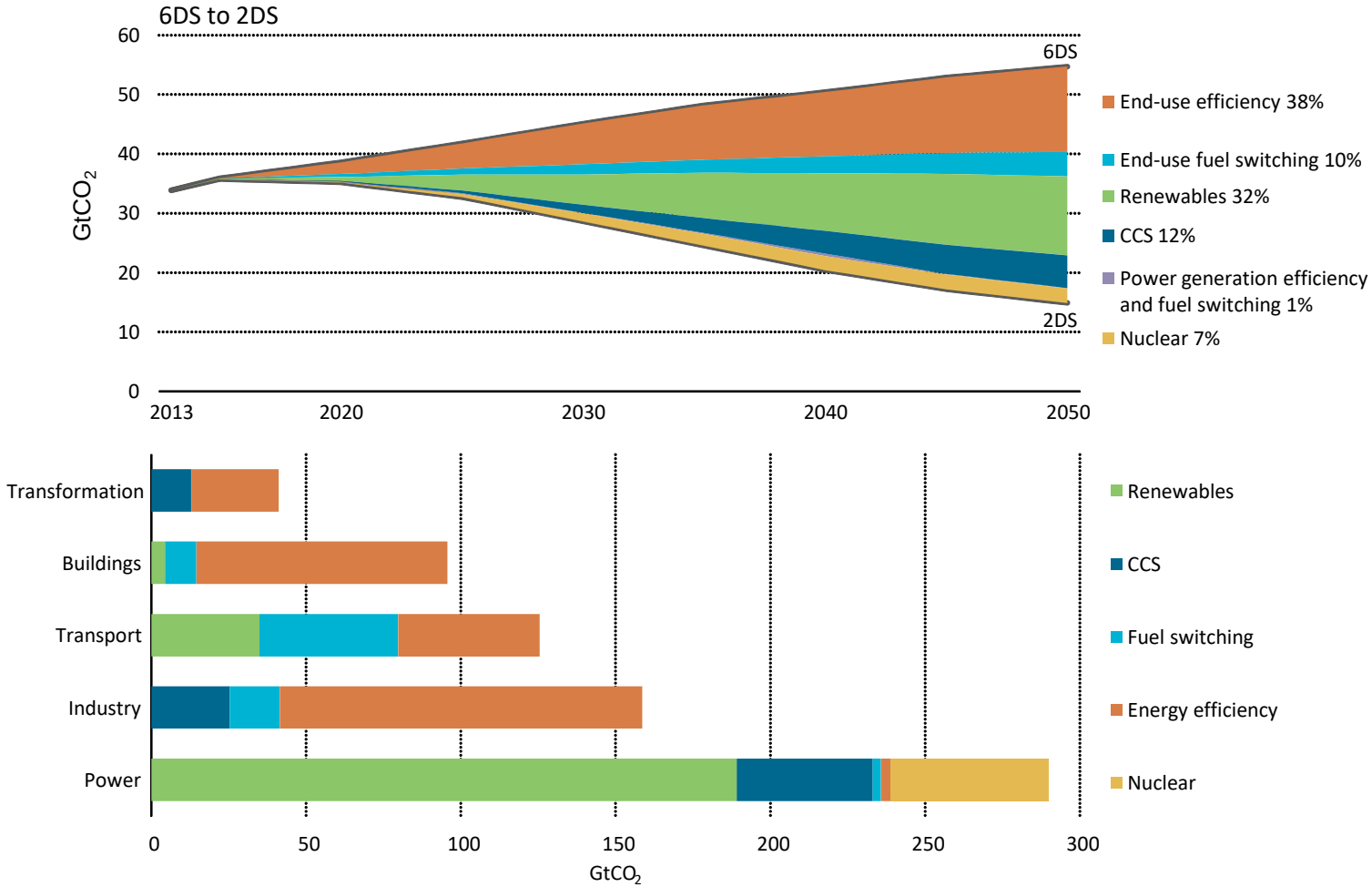
2100 concentrations (ppm CO_2-eq)	no CCS	nuclear phase out	limited solar/wind	limited bioenergy
450 (430 to 480)	138% (29 to 297%) 	7% (4 to 18%) 	6% (2 to 29%) 	64% (44 to 78%) 

IPCC AR5 SYR from Table 3.2 (2014)

The momentum from COP21 needs to be accelerated to reach 2DS ambitions

ETP 2016

Contribution of technology area and sector to global cumulative CO_2 reductions



Actions need to be pursued by stakeholders in all sectors to achieve an optimal transition strategy.

Photo Courtesy of IISD/ENB

COP-21 – Paris Agreement

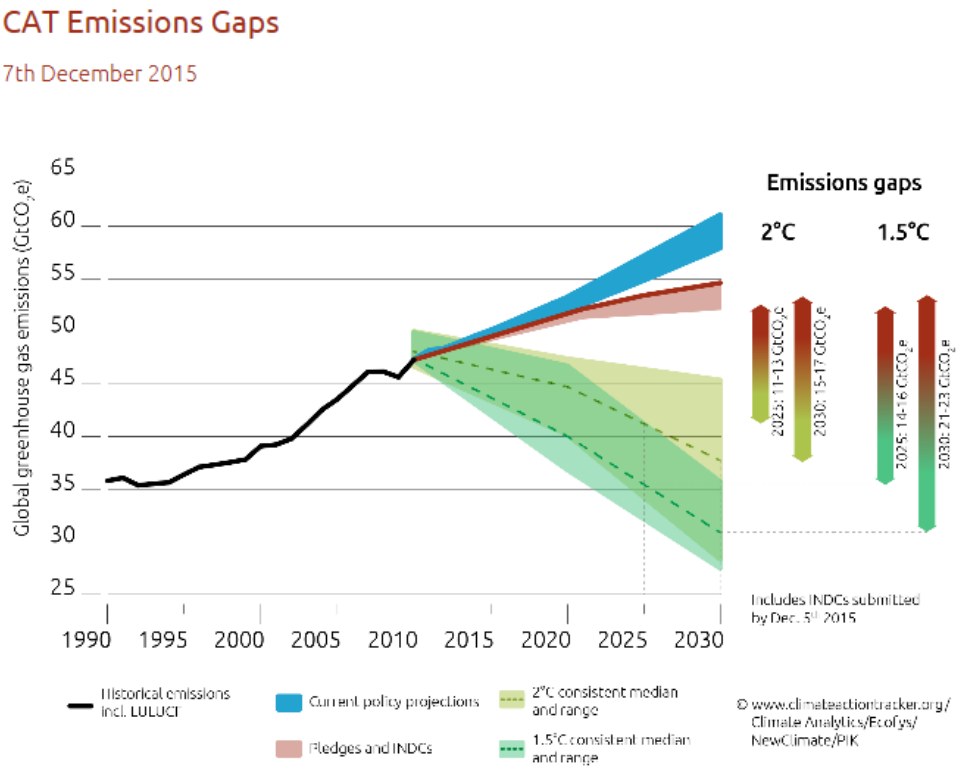
- **Article 2 – ‘Objectives’**
- Purpose of the agreement is limit warming to “well below” 2.0 C (by 2100) and pursue 1.5C
  - To be delivered by the pledges in Articles 3 and 4
- Increasing adaptation
- Ensuring finance
- Continues principle of “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”

Intended Nationally Determined Contributions (INDCs)

- 187 INDCs submitted
- 94% global emissions
- New trajectory to ~ 2.7C
- ~ 3.6C from existing policies

- **CCS in 10 INDCs**

Bahrain	**Malawi**
Canada	**Norway**
China	**Saudi Arabia**
Egypt	**South Africa**
Iran	**UAE**
	(and EU and USA)



Climate Action Tracker
http://climateactiontracker.org/global/173/CAT-Emissions-Gaps.html

UNFCCC Paris Agreement

NDCs

- 187 Nationally Determined Contributions submitted ahead of COP-21 - only 10 included CCS as a mitigation activity, although these countries covered a signification proportion of the world's emissions.
- Should be noted that these NDCs were short-term focussed in being 5 or 10 years duration and only to 2025 or 2030.

Low GHG emission development strategies

- Longer-term, the Paris Agreement invited Parties to communicate *'long term low GHG emission development strategies'* to the mid-century.
- So far, six countries have submitted these, and five of which contain CCS as a mitigation activity, particularly for industrial emissions (USA, Canada, Germany, Mexico, and France).

ETP 2017
The role of CCS in achieving global climate ambitions

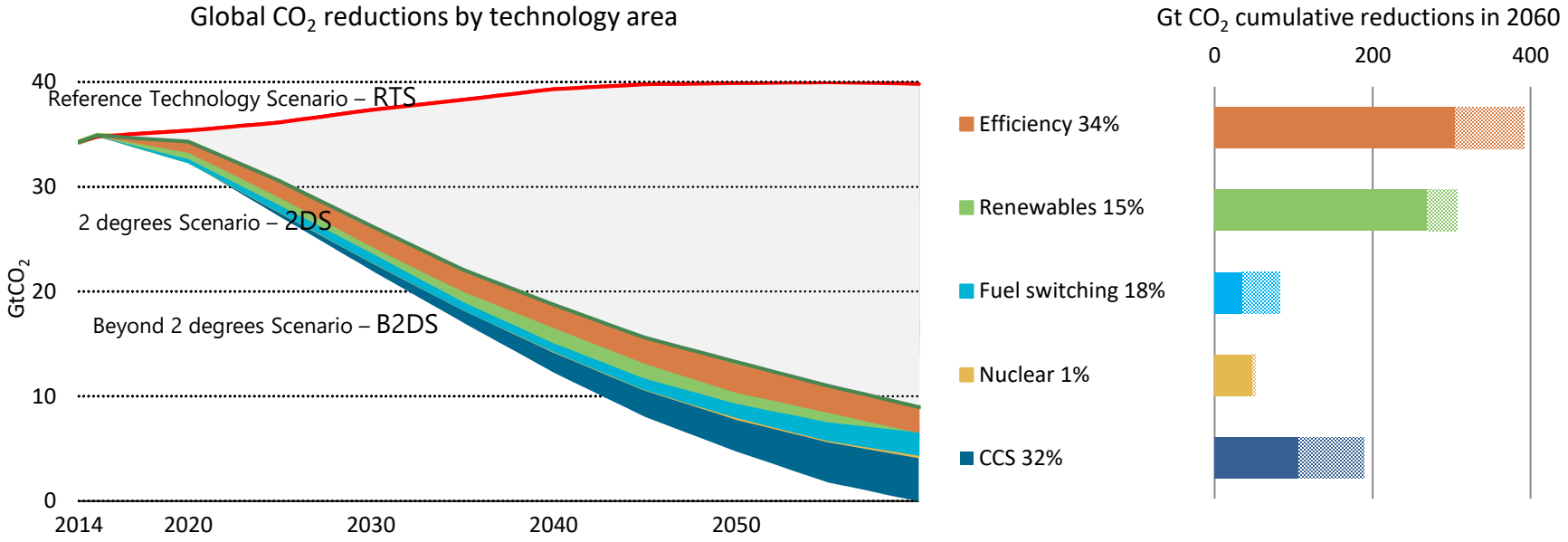
Samantha McCulloch

June 2017

IEA

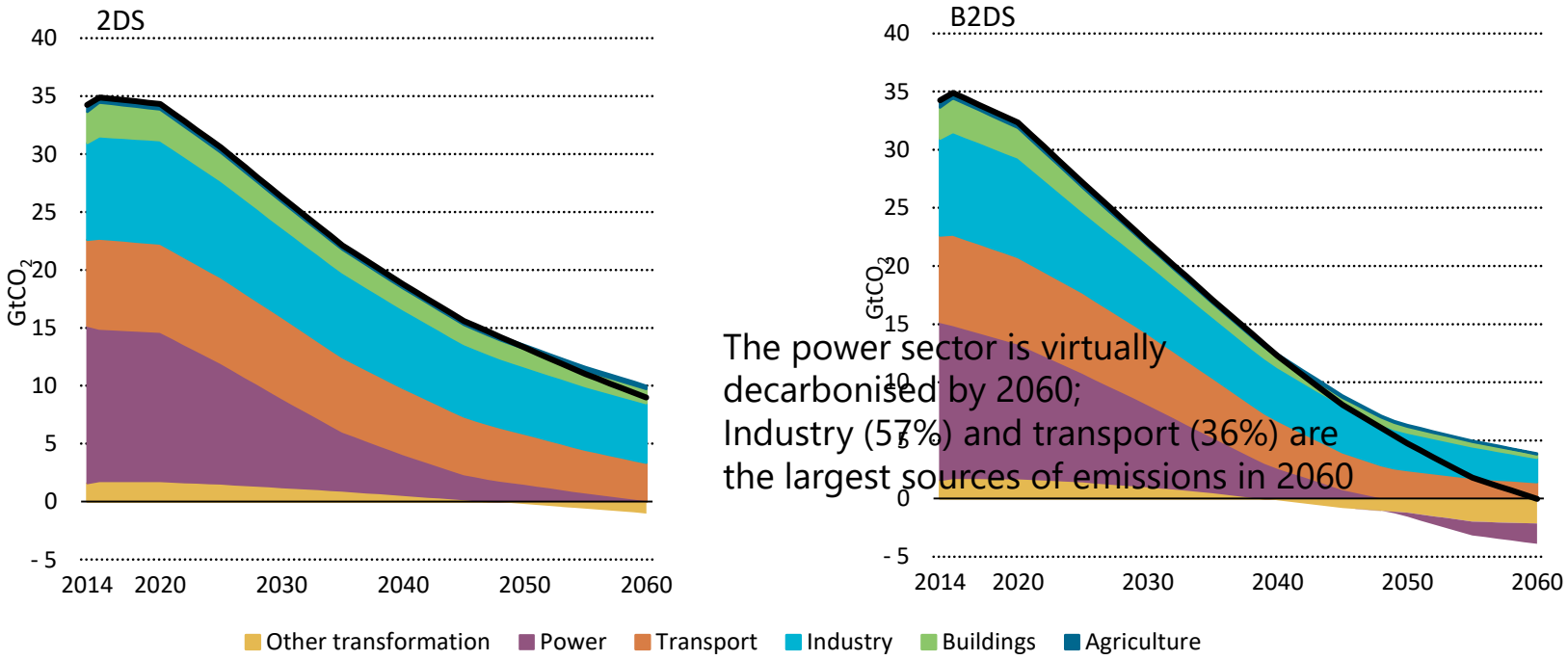
CCS plays a leading role in the energy transformation

Technology area contribution to global cumulative CO_2 reductions



Pushing energy technology to achieve carbon neutrality by 2060 could meet the mid-point of the range of ambitions expressed in Paris

Remaining CO_2 emissions in the 2DS and B2DS



The power sector is virtually decarbonised by 2060;
Industry (57%) and transport (36%) are the largest sources of emissions in 2060

The remaining CO_2 emissions in industry and power must be targeted for the B2DS
Negative emissions are necessary to achieve net-zero emissions in 2060

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