Why We Need Carbon Dioxide Capture and Storage (CCS)

Tim Dixon, IEAGHG

10th November 2016

Green Zone Event

COP-22, Marrakech

IPCC Fifth Assessment Report
Synthesis Report

2nd November 2014
Copenhagen

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Key Messages

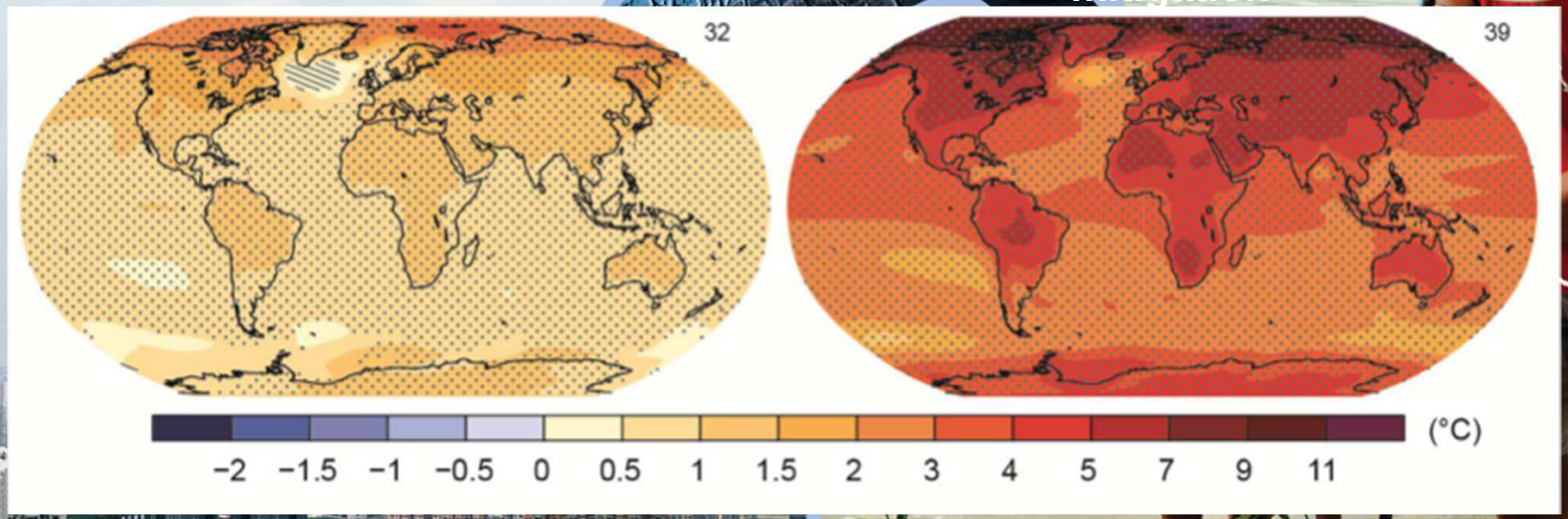
- Human influence on the climate system is clear
- The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts
- We have the means to limit climate change and build a more prosperous, sustainable future

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

The Choices We Make Will Create Different Outcomes

With substantial mitigation

Without additional mitigation

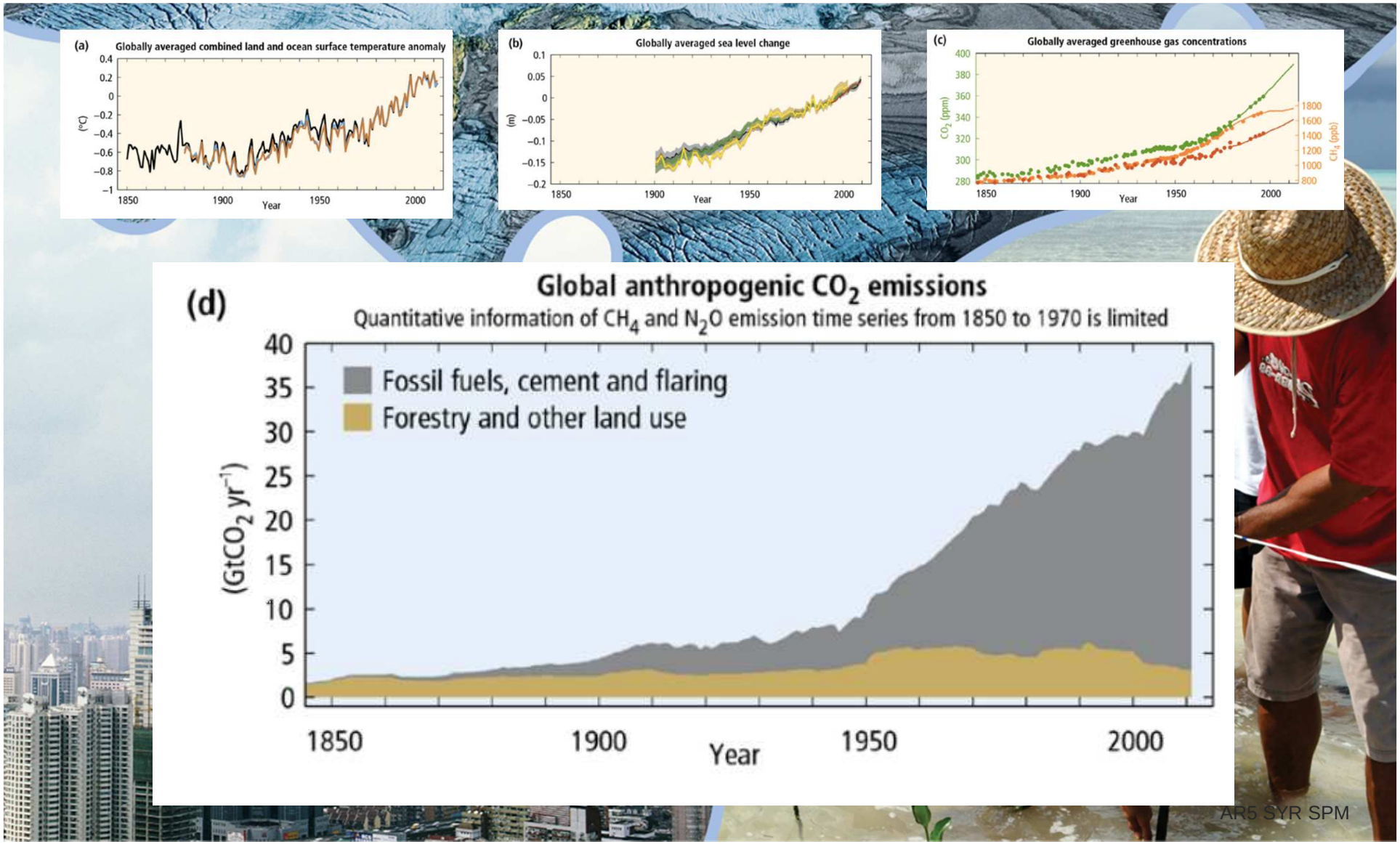


Change in average surface temperature (1986–2005 to 2081–2100)

AR5 WGI SPM

ipcc INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

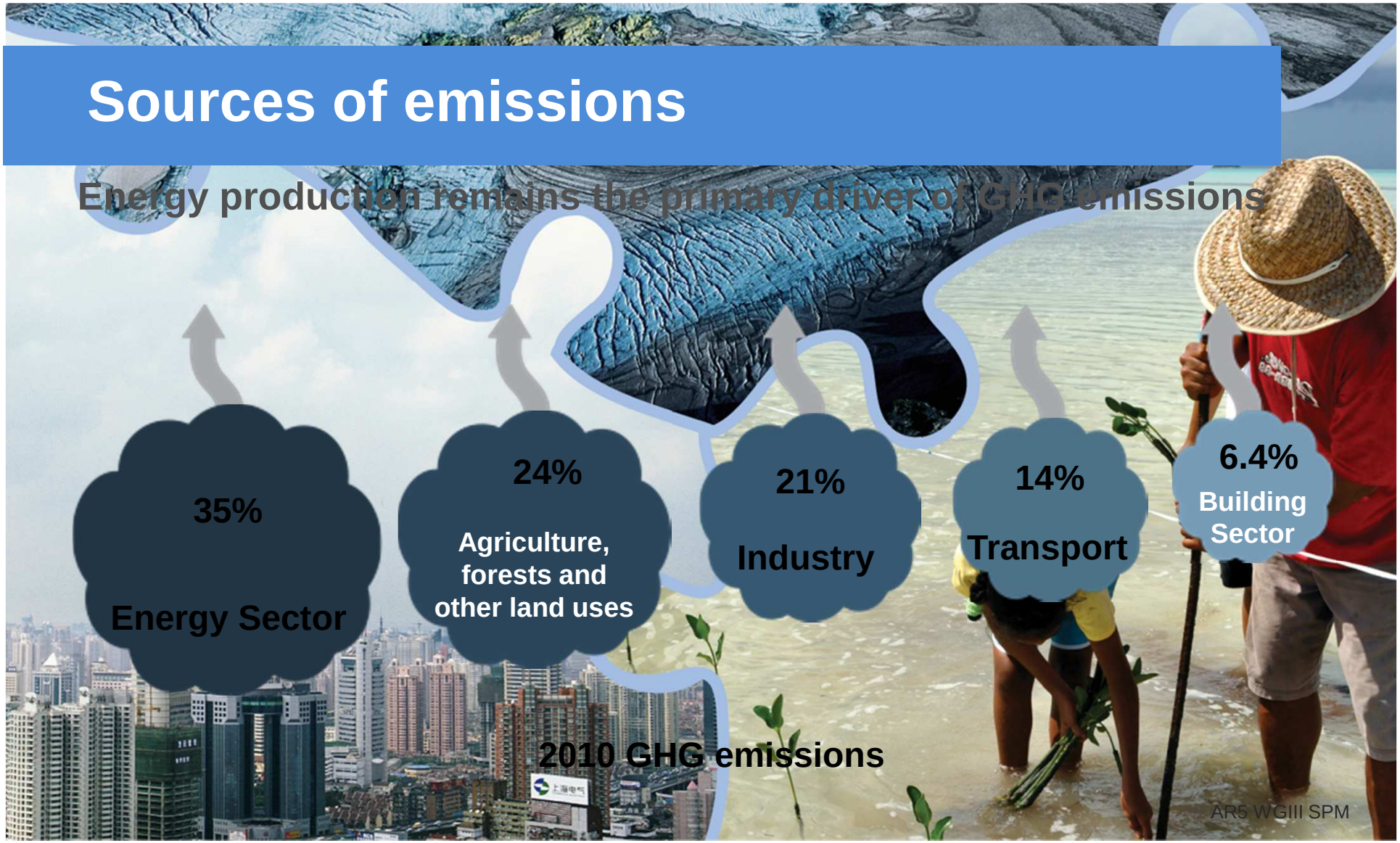


AR5 SYR SPM

INTERGOVERNMENTAL PANEL ON climate change

Sources of emissions

Energy production remains the primary driver of GHG emissions



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

IPCC AR5 – Role of different low-carbon energy technologies

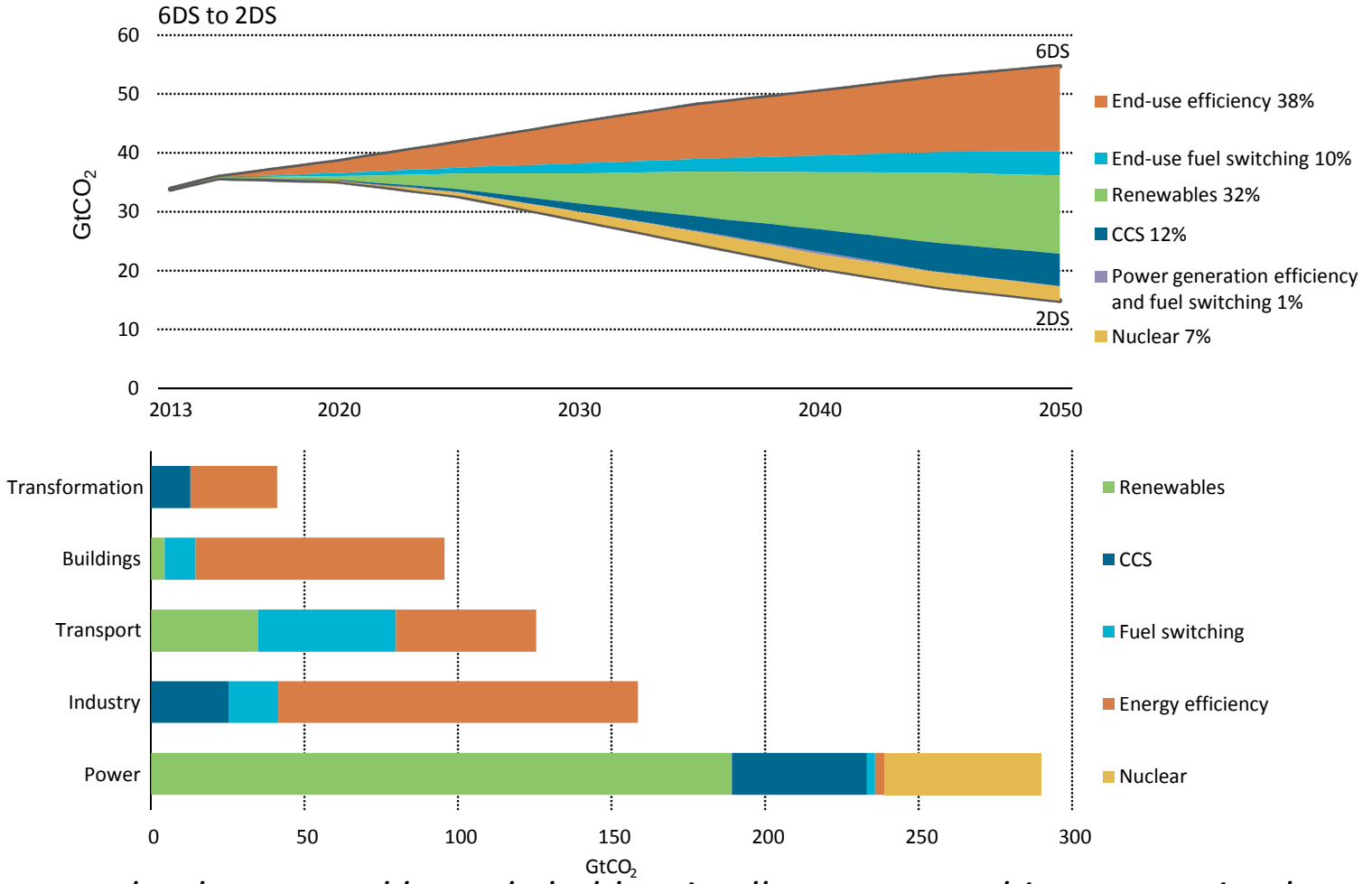
Mitigation cost increases in scenarios with limited availability of technologies [d] *[% increase in total discounted [c] mitigation costs (2015–2100) relative to default technology assumptions]*				
2100 concentrations (ppm CO_2-eq)	no CCS	nuclear phase out	limited solar/wind	limited bioenergy
450 (430 to 480)	138% (29 to 297%) 4	7% (4 to 18%) 8	6% (2 to 29%) 8	64% (44 to 78%) 8

IPCC AR5 SYR from Table 3.2 (2014)

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

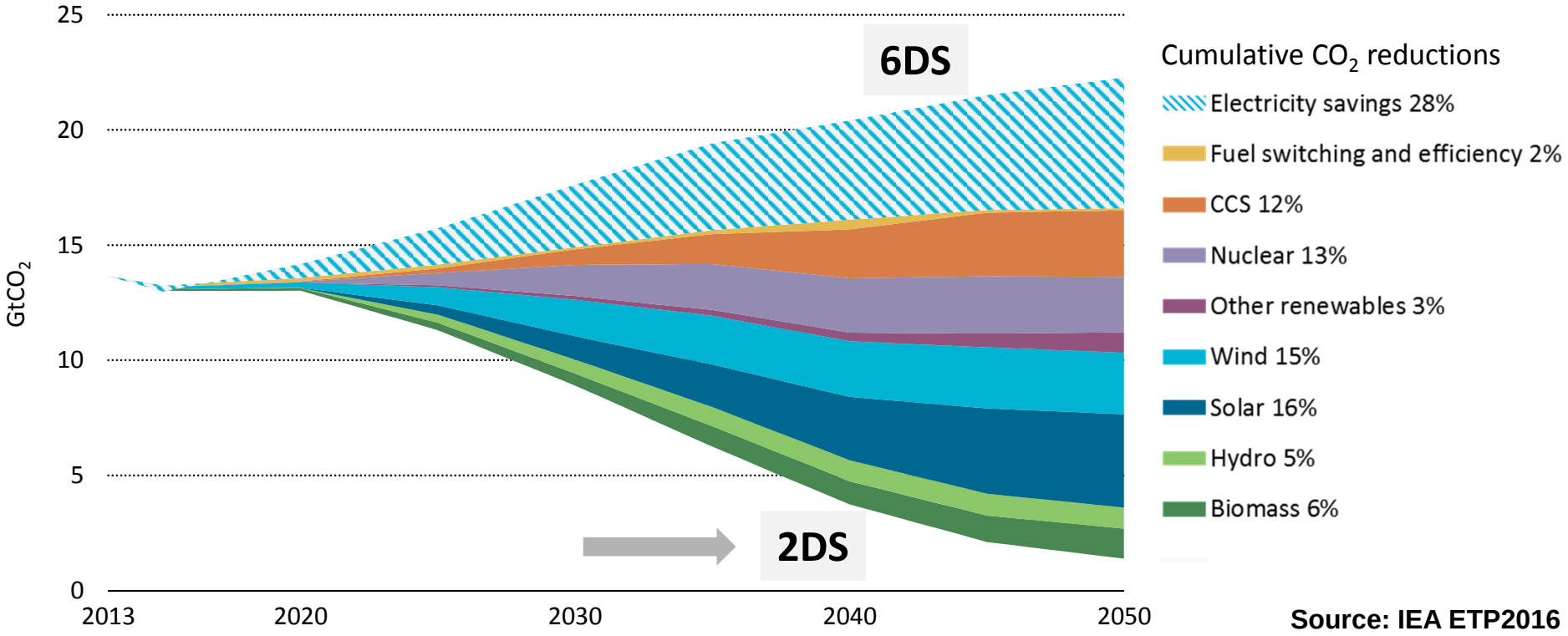
ETP 2016

Contribution of technology area and sector to global cumulative CO_2 reductions



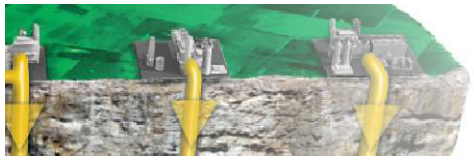
Actions need to be pursued by stakeholders in all sectors to achieve an optimal transition strategy.

Power sector challenge



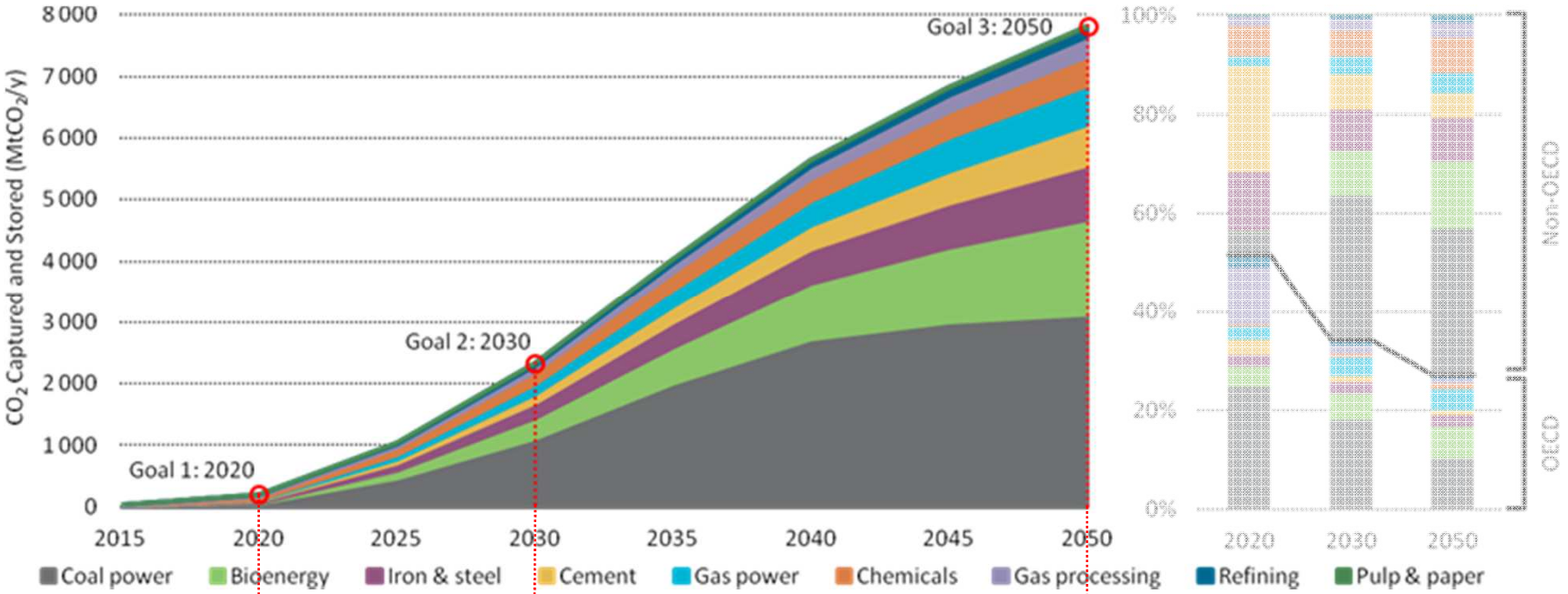
Source: IEA ETP2016

Electricity generation needs to be almost completely decarbonised in the 2DS, from a CO_2 intensity of around 530 g/kWh today to less than 40 g/kWh by 2050.



International Energy Agency

IEA vision: 120 Gt of CO_2 stored by 2050



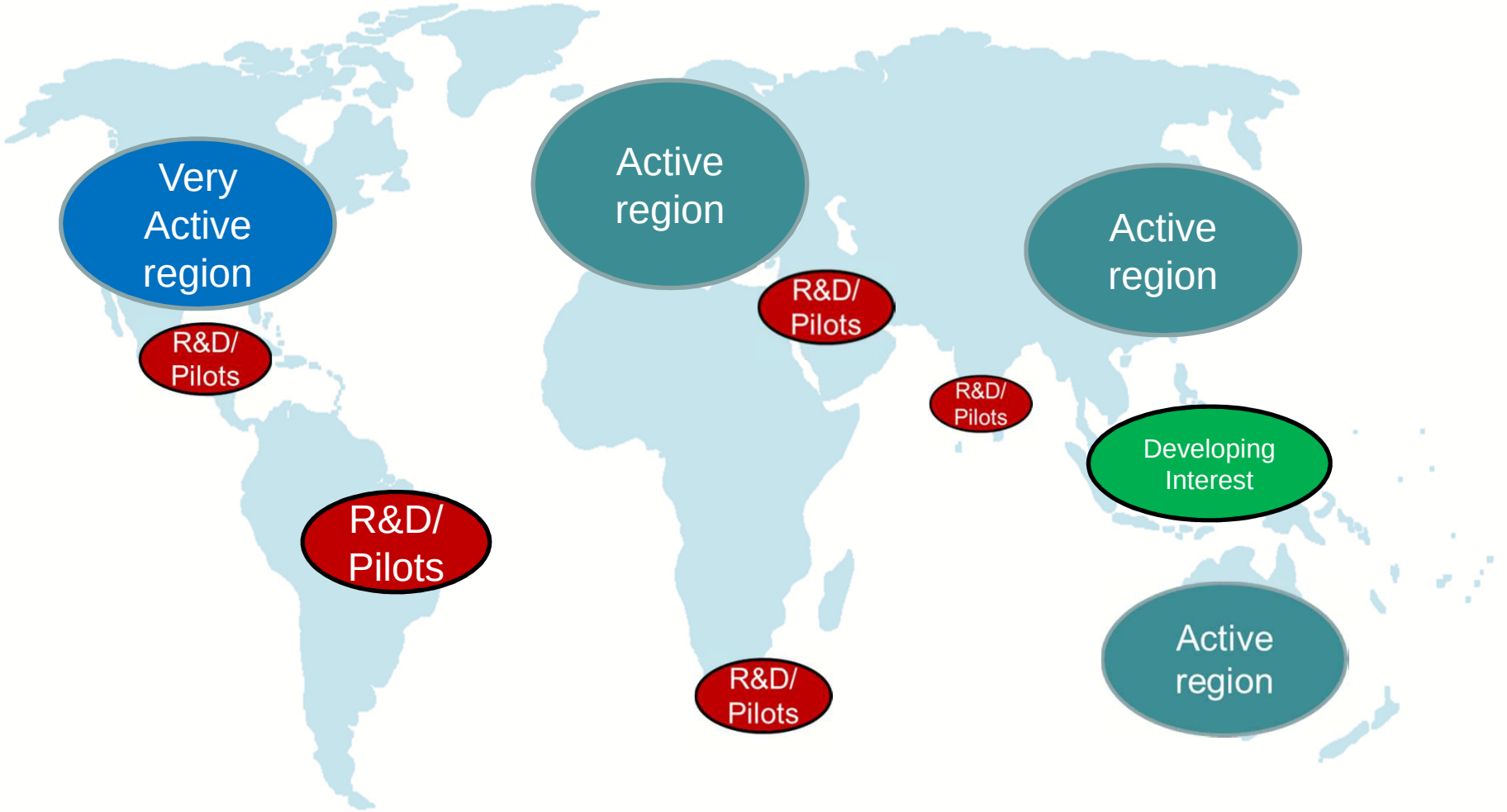
Goal 1: 2020
Over 30 large projects in operation in power and across a range of industrial processes, storing 50 $MtCO_2$ per year.

Goal 2: 2030
Over 2 $GtCO_2$ is stored per year. CCS routinely used in power and certain industrial applications.

Goal 3: 2050
Over 7 $GtCO_2$ stored per year. CCS routinely used in all applicable power and industrial applications.

- **‘Climate Action Now’ UNFCCC - 18 Nov 2015**
- High level summary of policy actions with high mitigation potential at 2020
- Builds on Technical Expert Meetings (TEMs)
- Includes CCUS as one of the six priority areas
- Significance of Boundary Dam CCUS project
- Solutions through international cooperation - IEAGHG

Global CCS Update



Why We Need Carbon Capture and Storage (CCS)

Tim Dixon, IEAGHG

10th November 2016

Green Zone Event

COP-22, Marrakech