Carbon Capture and Storage (CCS): Achievements and Opportunities for Developing Country Involvement

Tim Dixon, IEAGHG

1st December 2015

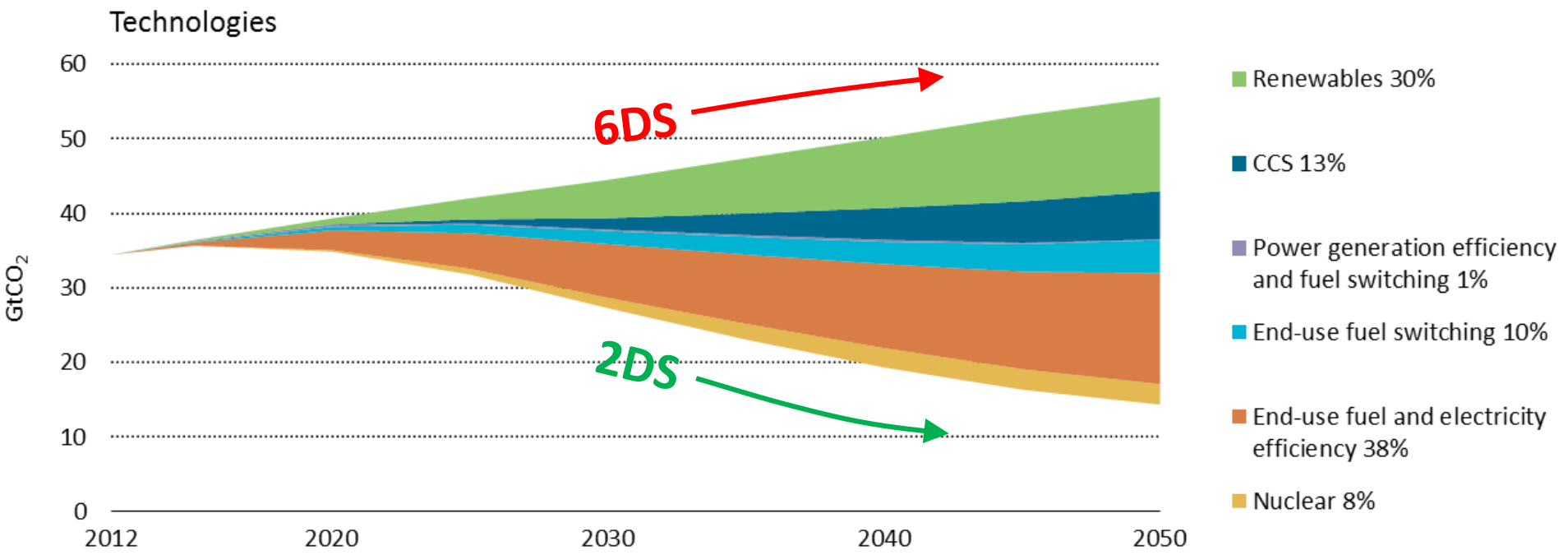
UNFCCC Side Event

COP-21, Paris

Carbon Capture & Storage Association

A portfolio of technologies is required to get from here to there

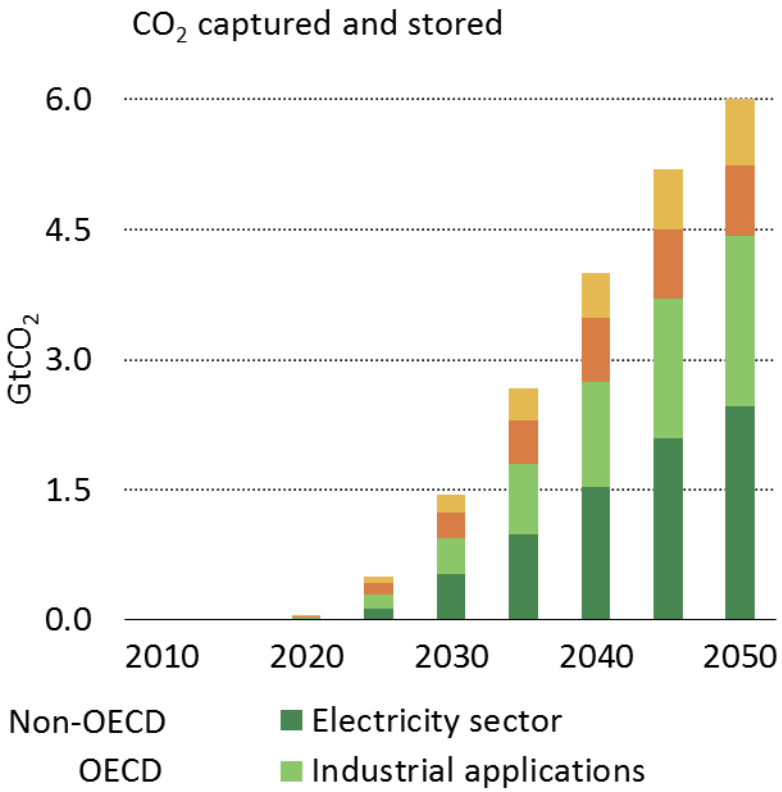
ETP 2015

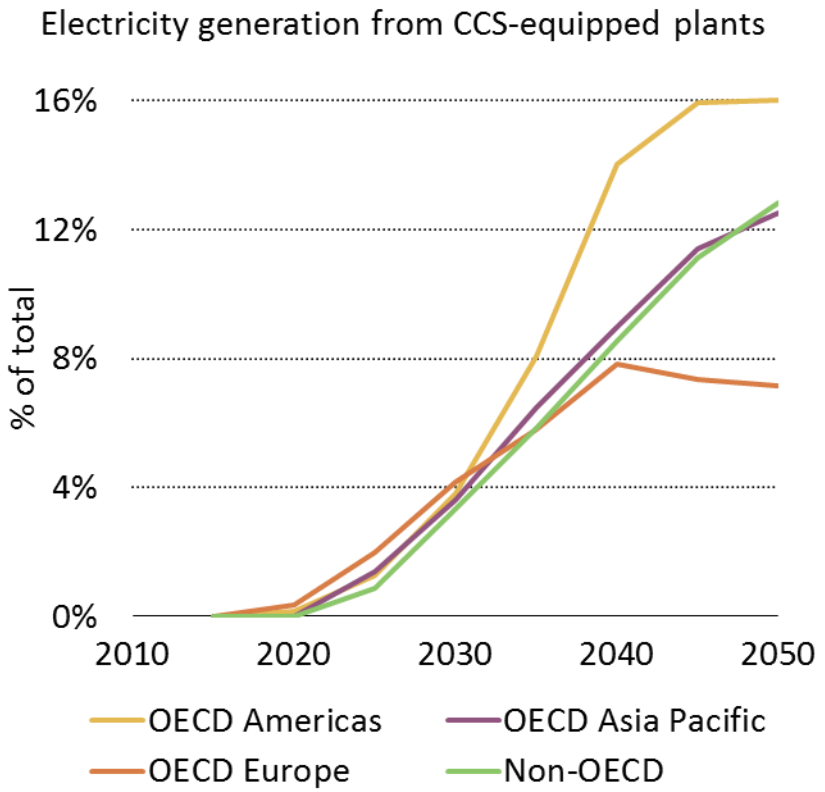


Percentages represent cumulative contributions to emissions reduction relative to 6DS

CCS takes off after 2025 in the 2DS

ETP 2015





CCS is important in both electricity and industry; over two-thirds of total CO_2 captured and stored is in non-OECD countries

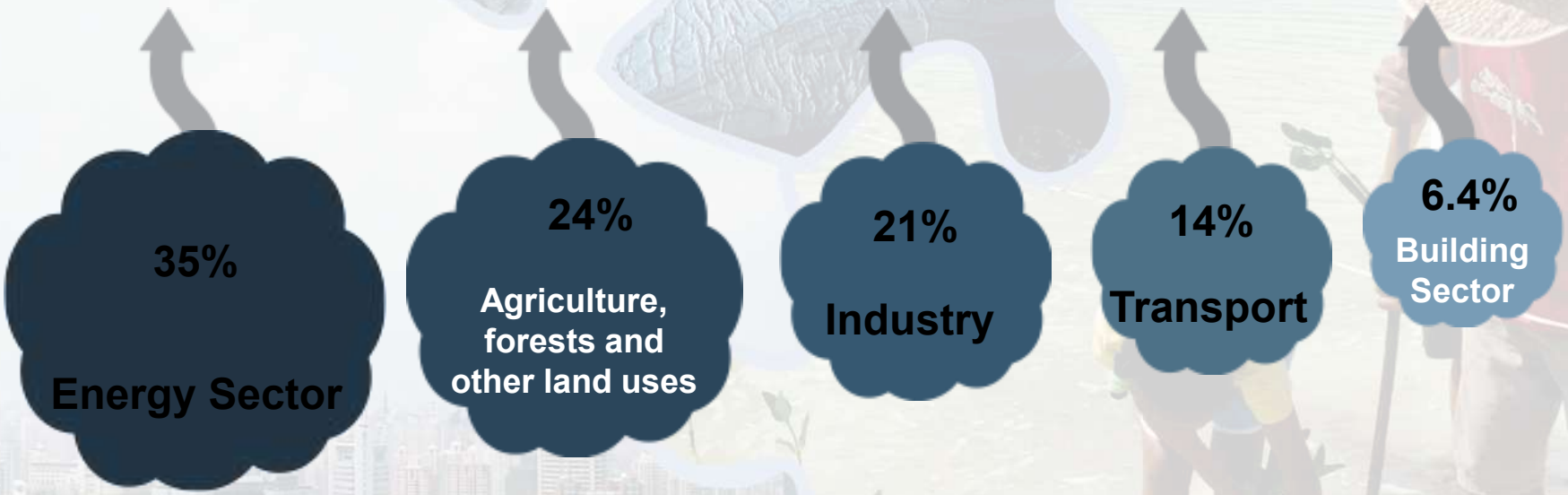
IPCC Fifth Assessment Report
Synthesis Report

2nd November 2014
Copenhagen

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

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

IPCC AR5 – Role of different low-carbon energy technologies

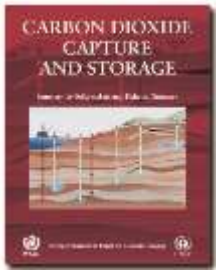
Mitigation cost increases in scenarios with limited availability of technologies [d]

[% 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%) 4	7% (4 to 18%) 8	6% (2 to 29%) 8	64% (44 to 78%) 8

IPCC AR5 SYR from Table 3.2 (2014)

CCS in UNFCCC

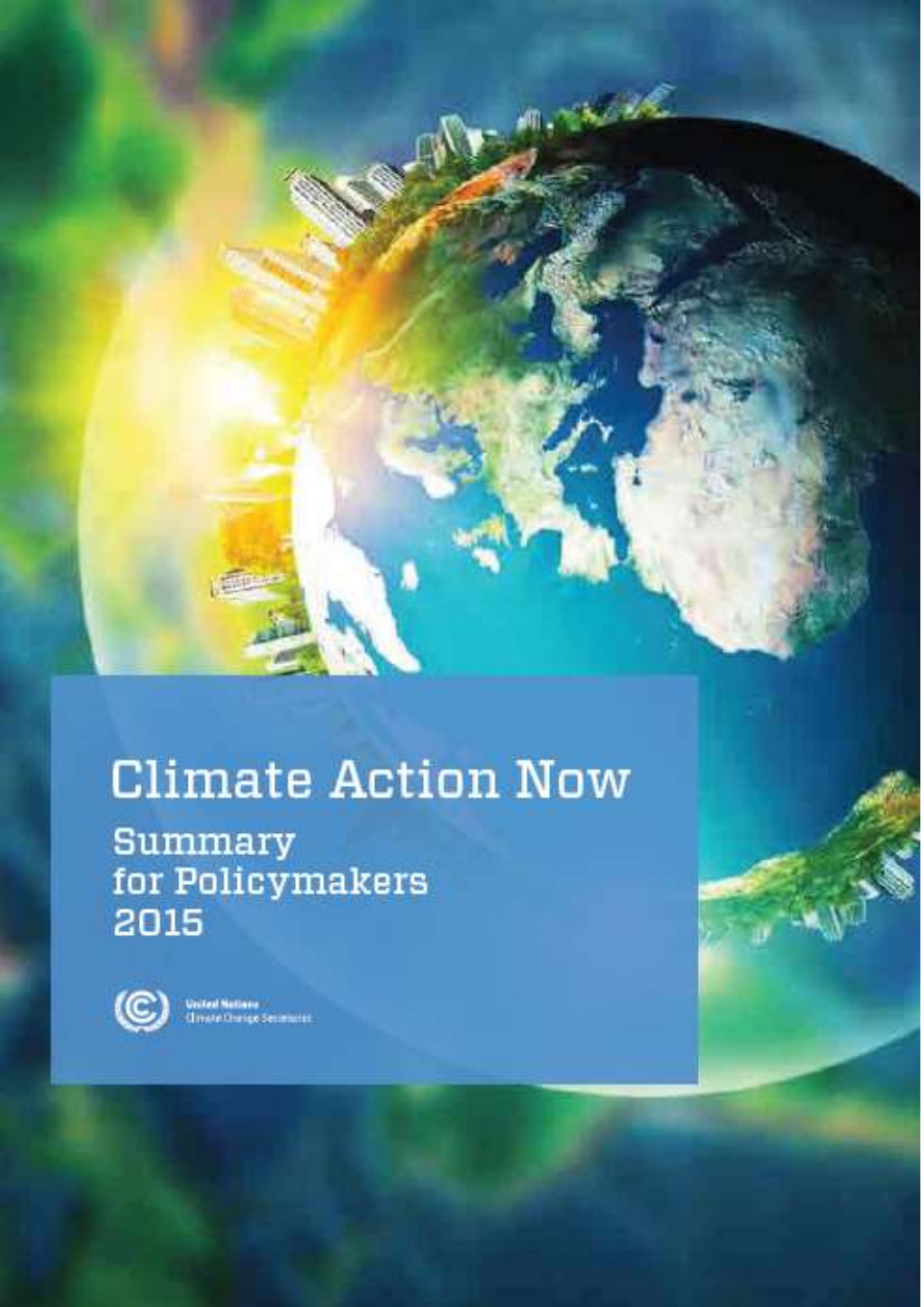


- 2005 - IPCC SR on CCS

- 2005– 2011 CCS in CDM?
- 2011 – CCS CDM Abu Dhabi workshop

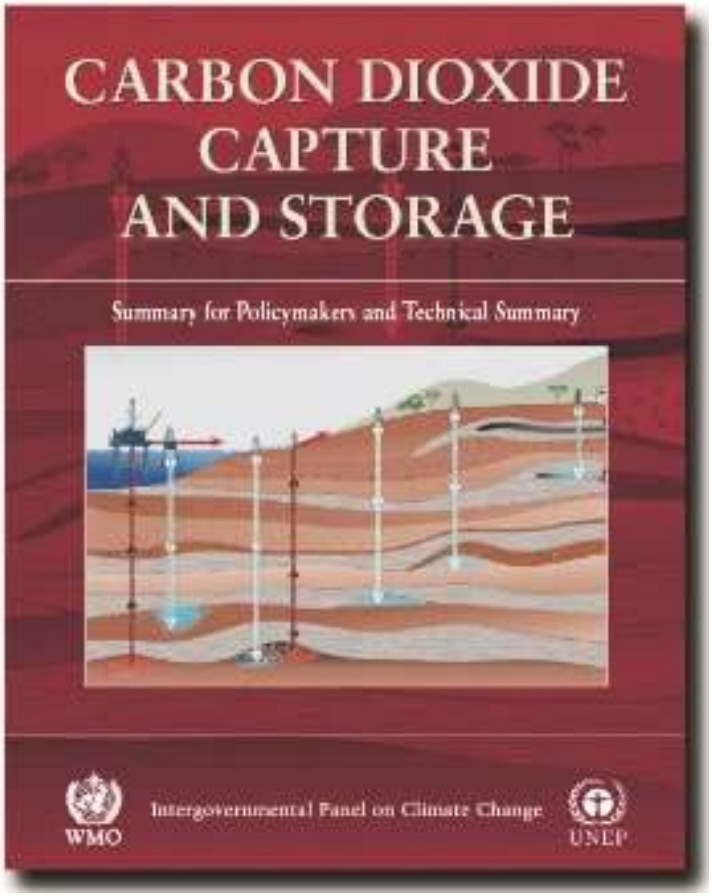
- **2011 - COP-17 CCS in CDM**
- 2014 - ADP – TEM on CCS – project focussed

- 2014 - COP-20 – CCS Projects Side Event



- **‘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

IPCC Special Report on CCS (2005)



- "Observations from engineered and natural analogues as well as models suggest that the fraction retained in appropriately selected and managed geological reservoirs is very likely to exceed 99% over 100 years and is likely to exceed 99% over 1,000 years. "
- "For well-selected, designed and managed sites the vast majority of the CO2 will gradually be immobilized by various trapping mechanisms and, in that case, could be retained for up to millions of years. Storage could become more secure over longer timescales. "

IJGGC Special Issue No. 40

- Updates IPCC SR on CCS
- 17 technical papers on CCS progress
- Take away message:

"Considerable progress made in all areas in the last ten years"

- http://www.sciencedirect.com/science/journal/17505836/40
- Papers free to download until 31st Dec 2015

CCS: Achievements and Opportunities for Developing Country Involvement

- **19 years of Offshore Operations in the North Sea Region**
  Philip Ringrose, Statoil
- **CCS Pilot Projects in the EU**
  Ton Wildenborg, CO_2GeoNet
- The Honourable Brad Wall, Premier of Saskatchewan, Canada
- **1 year of Operation and New Project Collaboration Opportunities at Boundary Dam**
  Mike Marsh, SaskPower
- **New Collaboration Opportunities in Offshore Storage**
  Katherine Romanak, University of Texas
- **Climate Technology Centre and Network**
  Jukka Uosukainen, CTCN

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