



GLOBAL
CCS
INSTITUTE



Update: Global status of CCS

CSLF Policy Group - 2016

Alex Zapantis, General Manager-Asia Pacific, Global CCS Institute
October 2016



Large-scale CCS projects by region or country

	Early planning	Advanced planning	Construction	Operation	Total
North America	1	1	5	10	17
China	4	4	-	-	8
Europe	3	1	-	2	6
Gulf Cooperation Council	-	-	1	1	2
Rest of World*	4	-	1	2	7
Total	12	6	7	15	40

* Includes projects in Algeria, Australia, Brazil and Korea.

North America dominates projects in operation and under construction, China has the most projects in planning



By the end of 2017, CCS Projects will Store 40Mt CO₂pa

	Early planning	Advanced planning	Construction	Operation	Total

These 22 projects have the capacity to store 40Mt of CO₂ each year. This is approximately equivalent to the emissions abatement from:

- 22GW of solar PV (if displacing coal)
- total installed solar PV capacity of France, the United Kingdom and Spain in 2015.

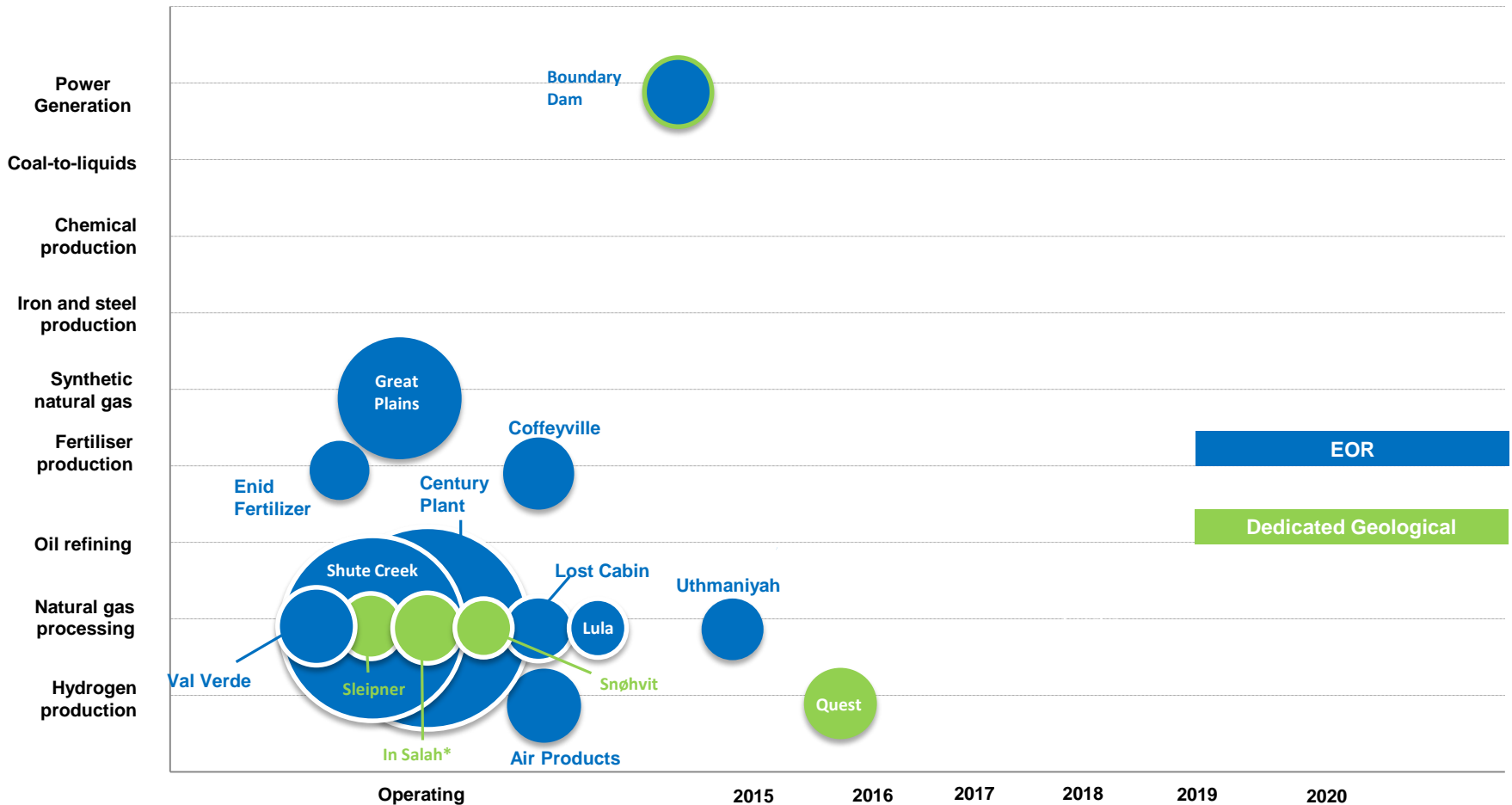
Total	12	6	7	15	40
--------------	-----------	----------	----------	-----------	-----------


** Includes projects in Algeria, Australia, Brazil and Korea.*

CCS is making a real contribution to emissions abatement now.



Large Scale CCS Projects in Operation



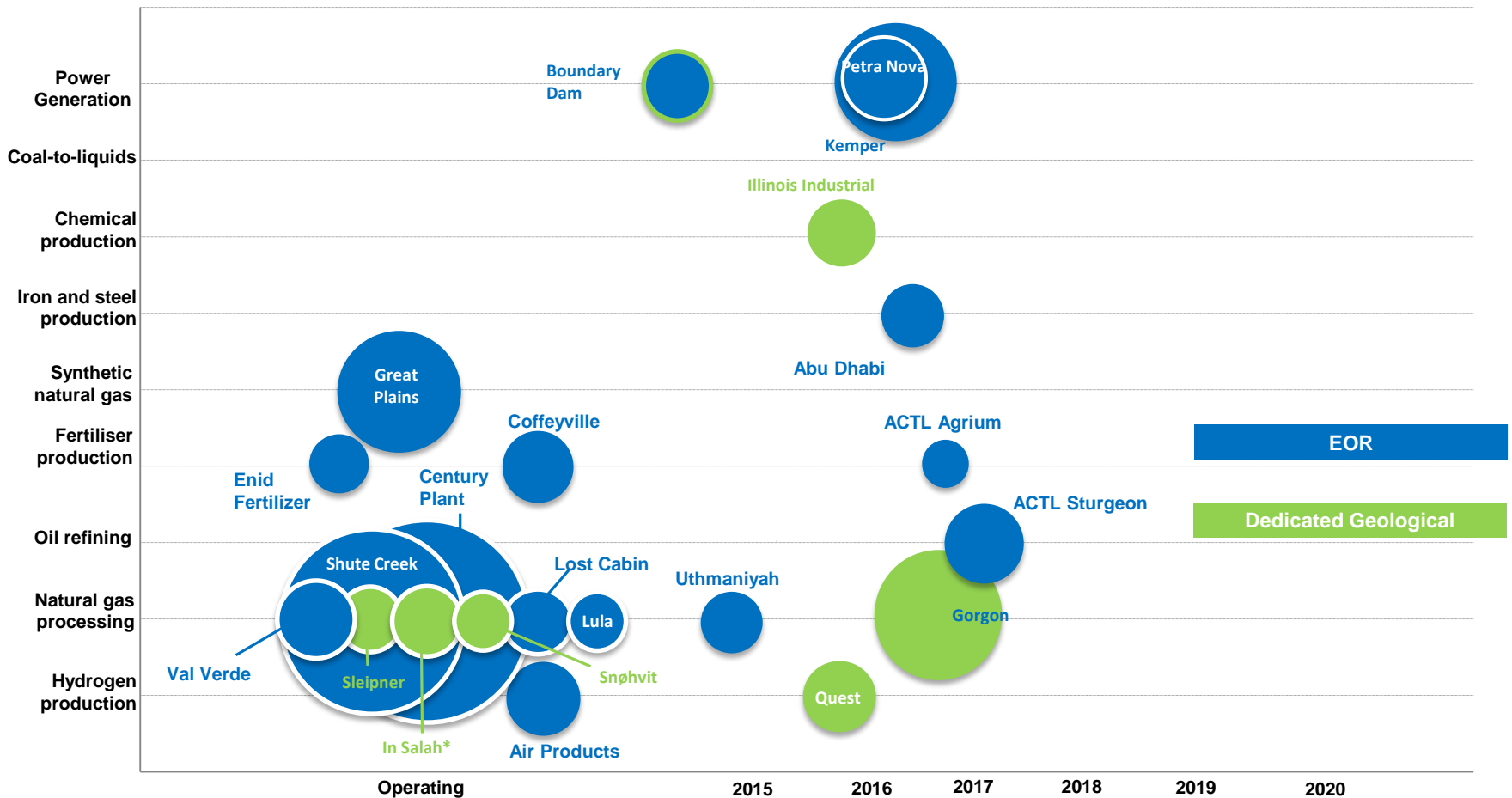
 = 1Mtpa of CO₂ (areas of circle are proportional to capacity)


* Injection currently suspended ** Storage options under evaluation

15 Large Scale CCS Projects in Operation: ~28Mtpa CO₂



Large Scale CCS Projects in Operation + projects under construction



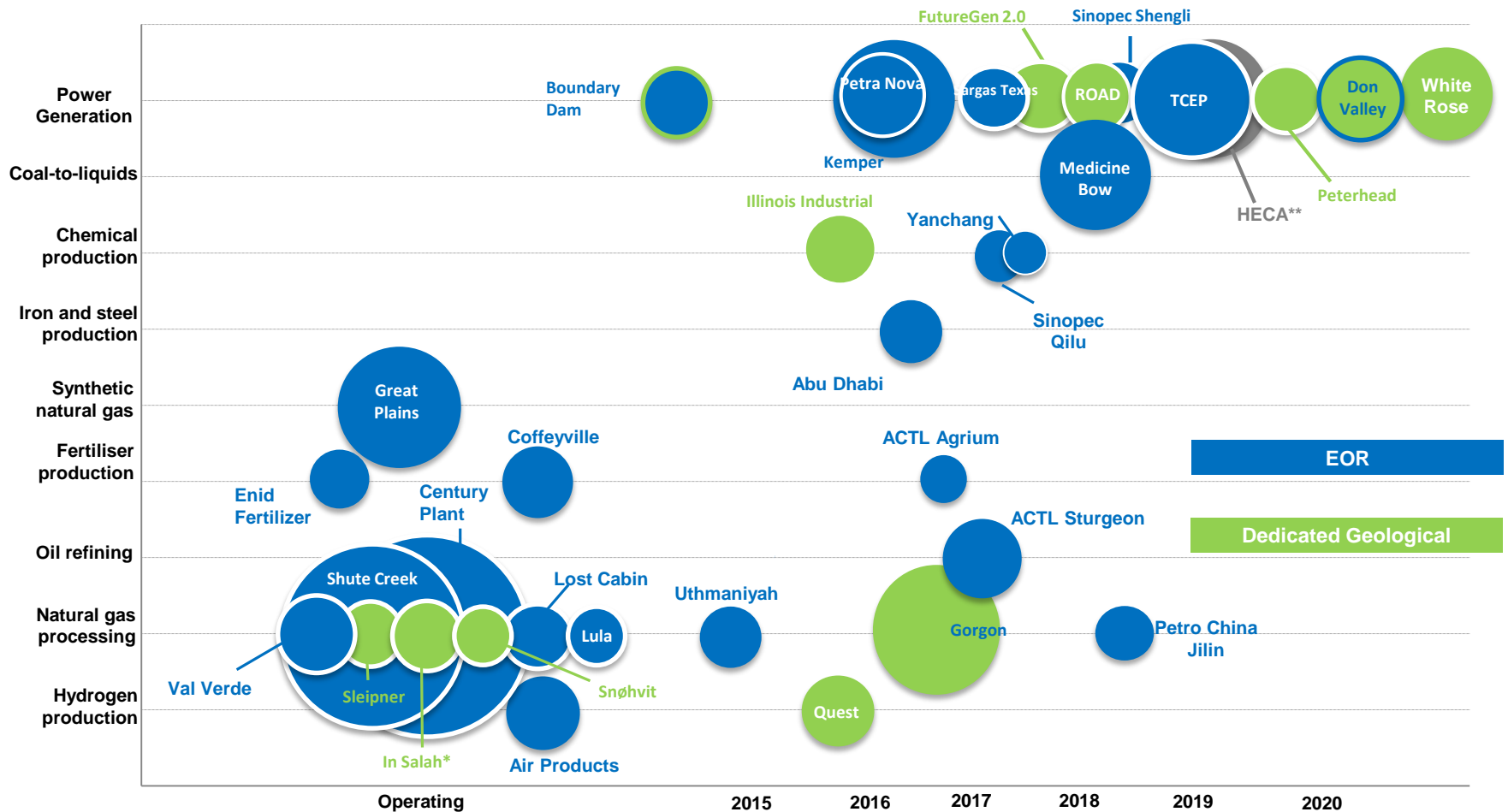
 = 1Mtpa of CO₂ (areas of circle are proportional to capacity)


* Injection currently suspended ** Storage options under evaluation

7 more projects expected to commence operation in 2016/17: ~40Mtpa CO₂



Large Scale CCS Projects in Operation + projects under construction and in planning



 = 1Mtpa of CO₂ (areas of circle are proportional to capacity)

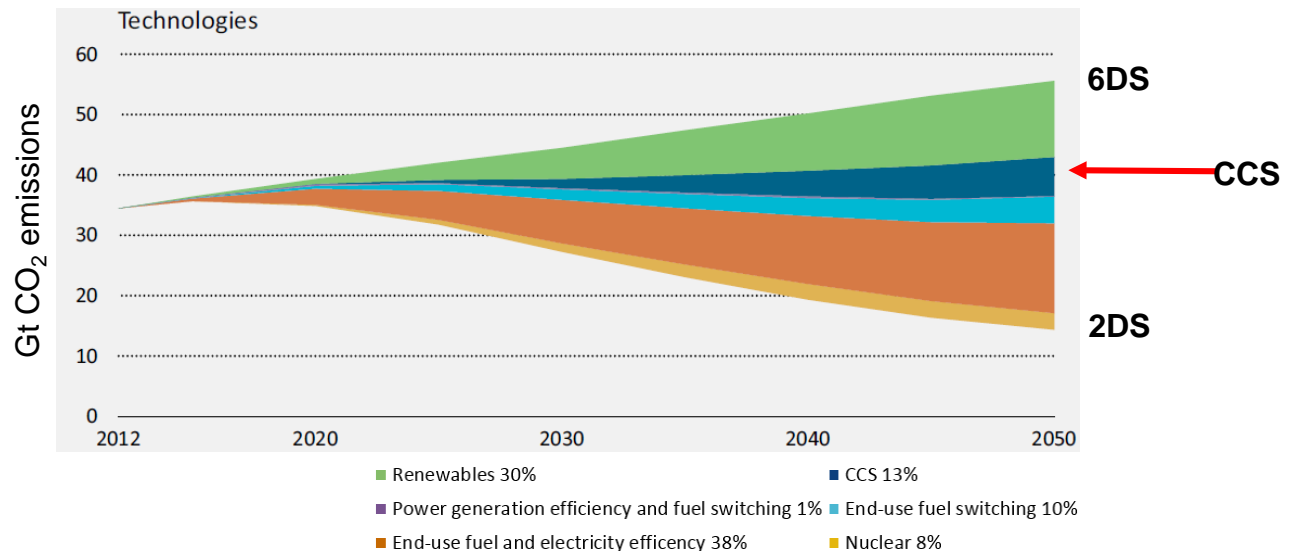
* Injection currently suspended ** Storage options under evaluation

Looking forwards, more power projects are in the pipeline than industrial projects.



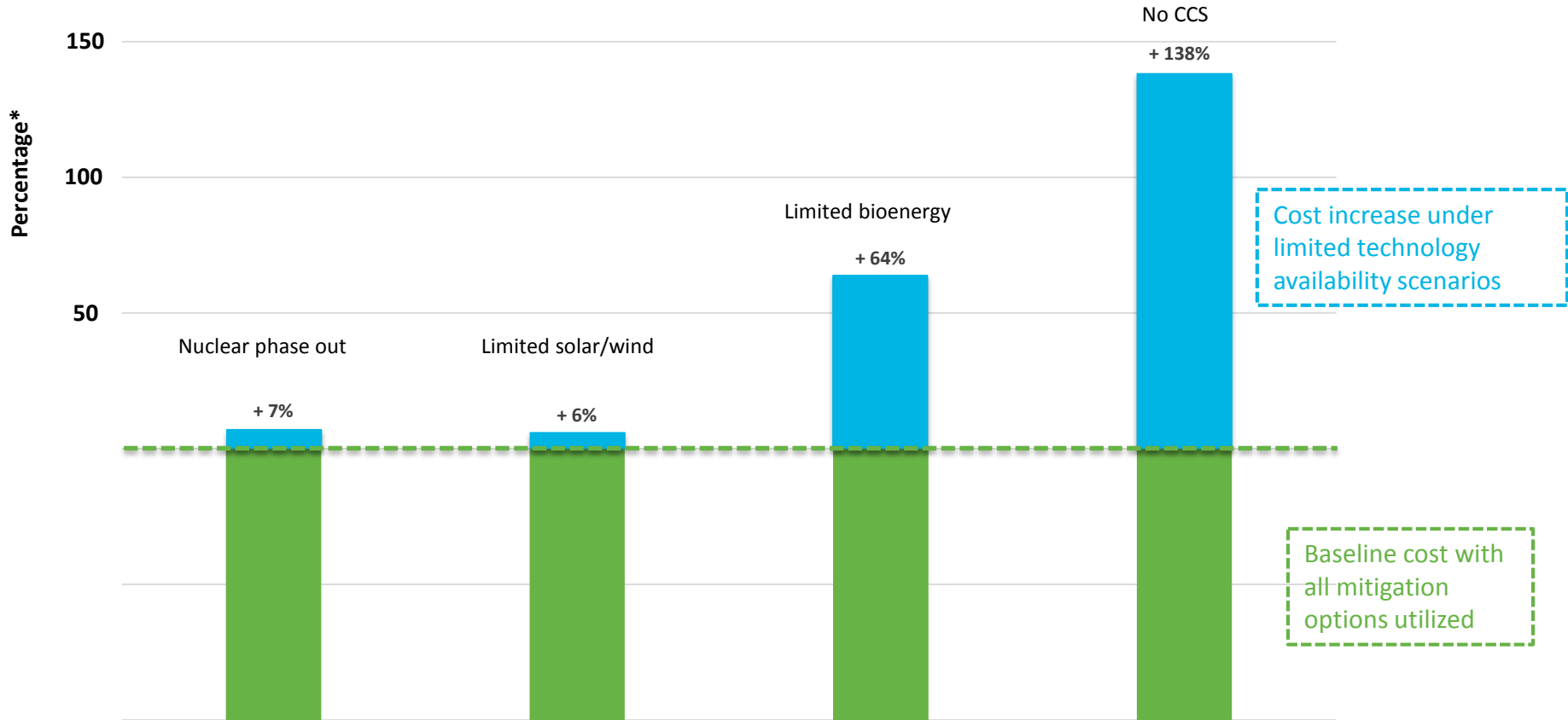
CoP21 – The need for CCS will become more visible

- CoP21 was a significant step forwards:
 - 195 countries agreed a higher level of ambition; limiting global warming to 1.5 - 2 degrees Celcius
 - Established bottom-up architecture for emission reduction targets allowing nations to determine their national contributions
 - Established a process of regular (5 yearly) reviews of national emission reduction targets and an expectation that targets will become more stringent





Mitigation costs more than double in scenarios with limited availability of CCS



*Percentage increase in total discounted mitigation costs (2015-2100) relative to default technology assumptions – median estimate

Source: IPCC Fifth Assessment Synthesis Report, Summary for Policymakers, November 2014.



A significant task within one generation

Global Status of CCS

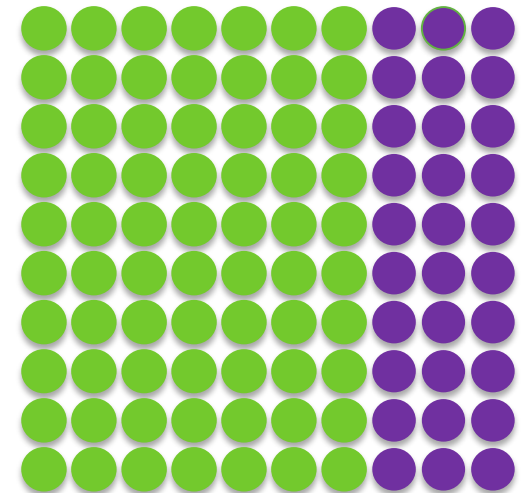
40 large-scale CCS projects - combined capture capacity of approximately 71 Mtpa*:

- 22 projects in operation or construction (**40 Mtpa**)
- 6 projects in advanced planning (6 Mtpa)
- 12 projects in earlier stages of planning (25 Mtpa)

40 Mtpa



~4,000 Mtpa of CO₂ captured by CCS by 2040 (IEA 450 Scenario)**



● Non-OECD ● OECD

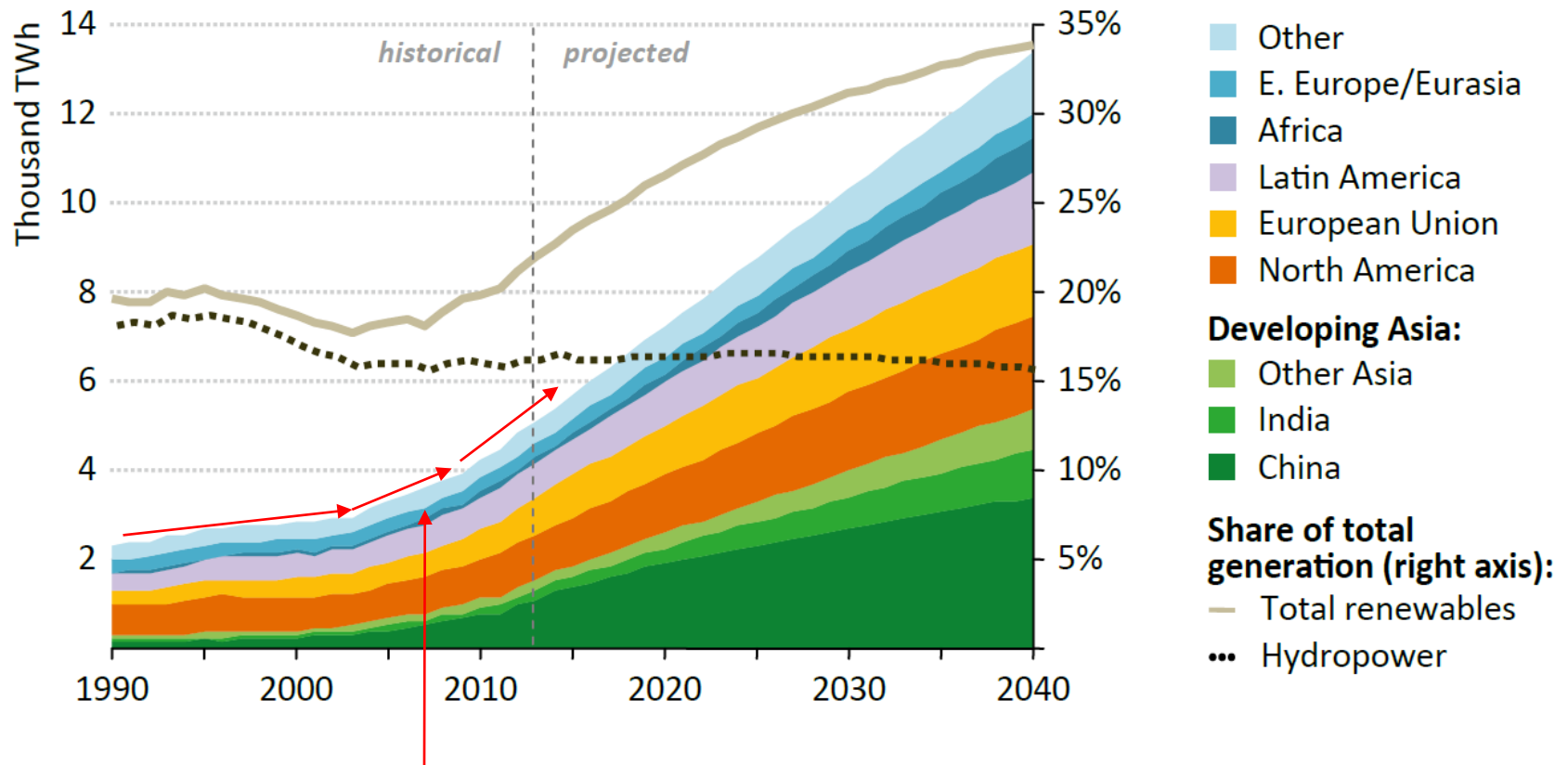
*Mtpa = million tonnes per annum

**Source: IEA, Energy Technology Perspectives (2016).



Renewables – a fantastic success story! What can we learn?

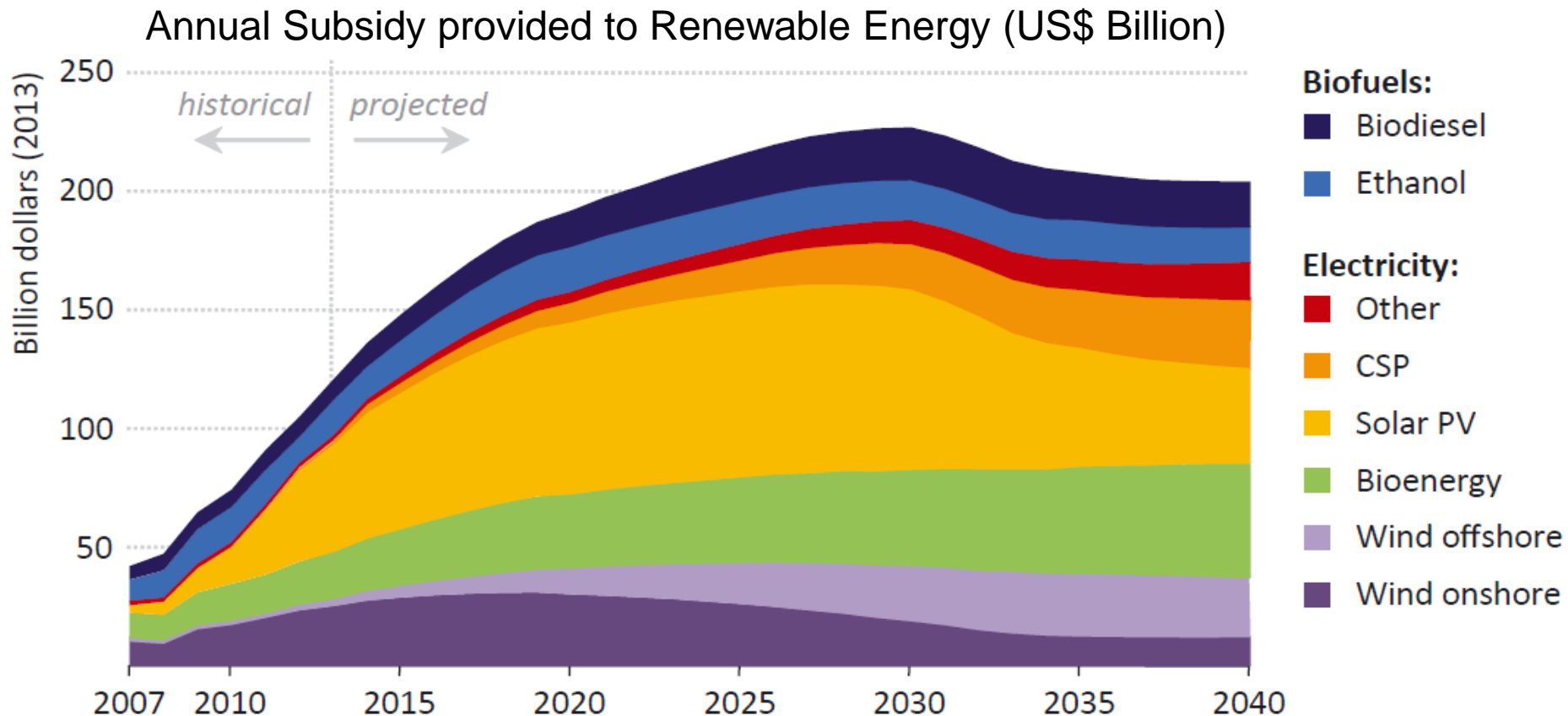
Electricity Generation from Renewable Energy



Rapid increase in renewable electricity generation



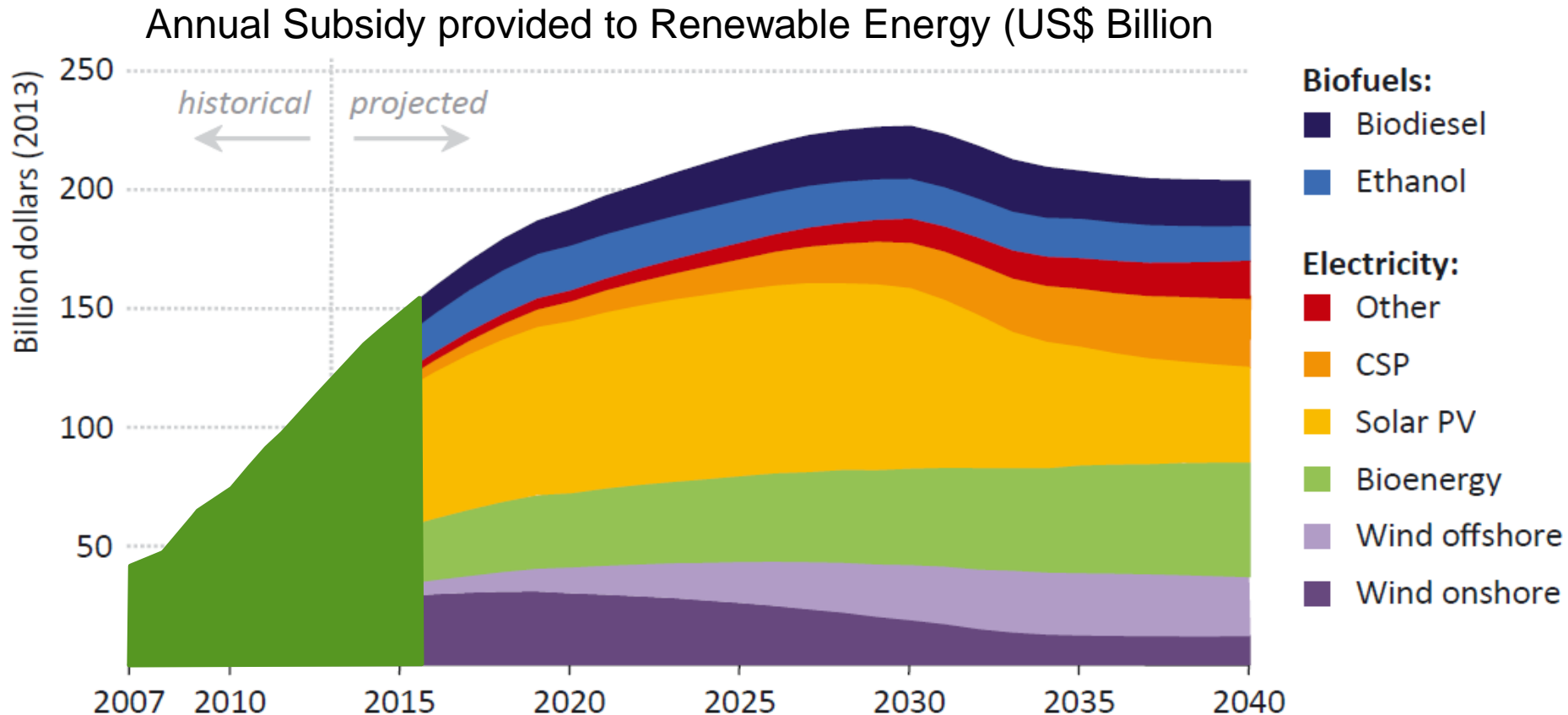
Renewables – a fantastic success story – driven by policy



Significant and sustained policy support has incentivised massive private sector investment, resulting in rapid deployment and cost reductions arising from competition between suppliers and economies of scale.



Renewables – a fantastic success story! Policy parity is required for CCS to play its part in emission reductions.



- In the period 2007 to 2016, value of global policy support for renewable energy deployment was around US\$800B.
- Total value of policy support for deployment of CCS over all time is around \$20B