Energy Technology Perspectives for the Iron and Steel Industry

COP22 Side Event: How to get to a low carbon future: Solutions for the global steel industry

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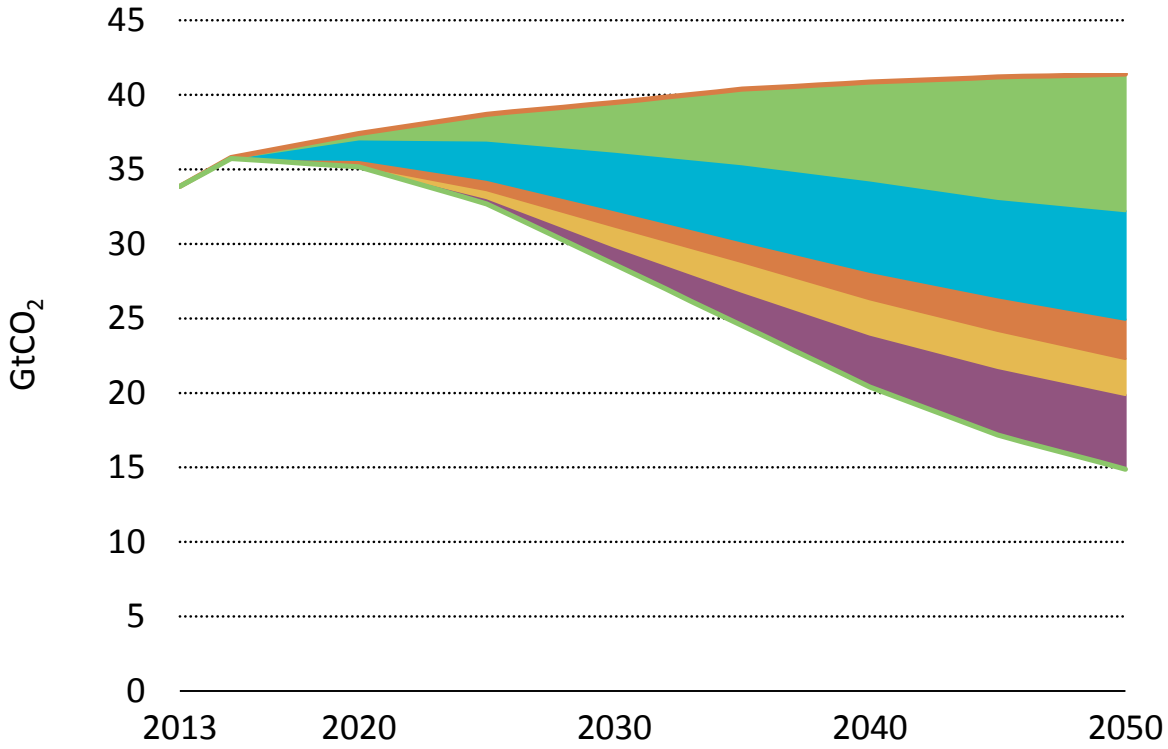
Sizing the scale of the challenge…
… and its solutions

Contribution of technology area to global cumulative CO_2 reductions



The industrial sector accounts for 23% of cumulative CO_2 reductions

The carbon intensity of the global economy can be cut by two-thirds through a diversified energy technology mix

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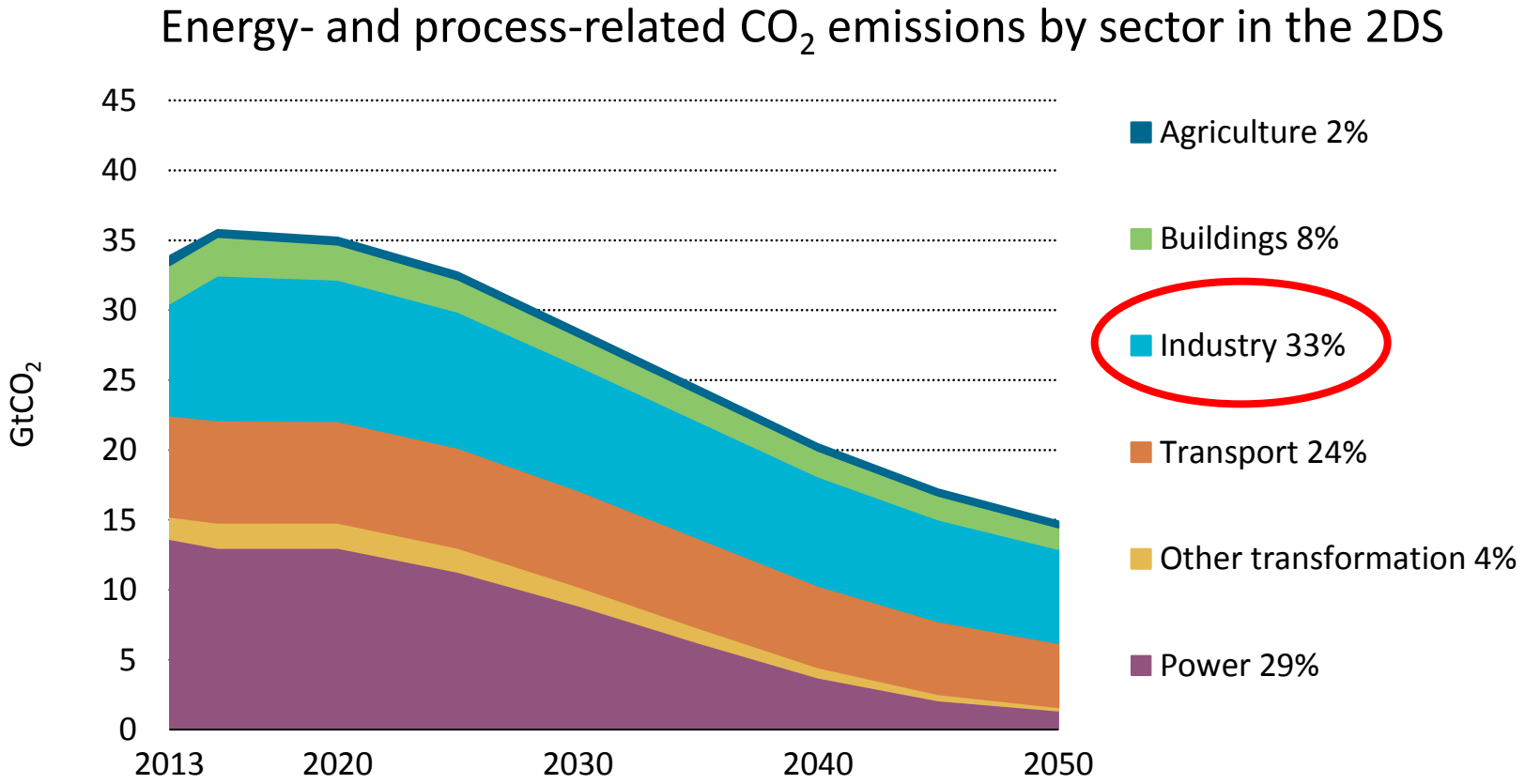
But the challenge increases to get from 2 degrees to "well below" 2 degrees



Industry and transport account for 75% of the remaining emissions in the 2DS in 2050.

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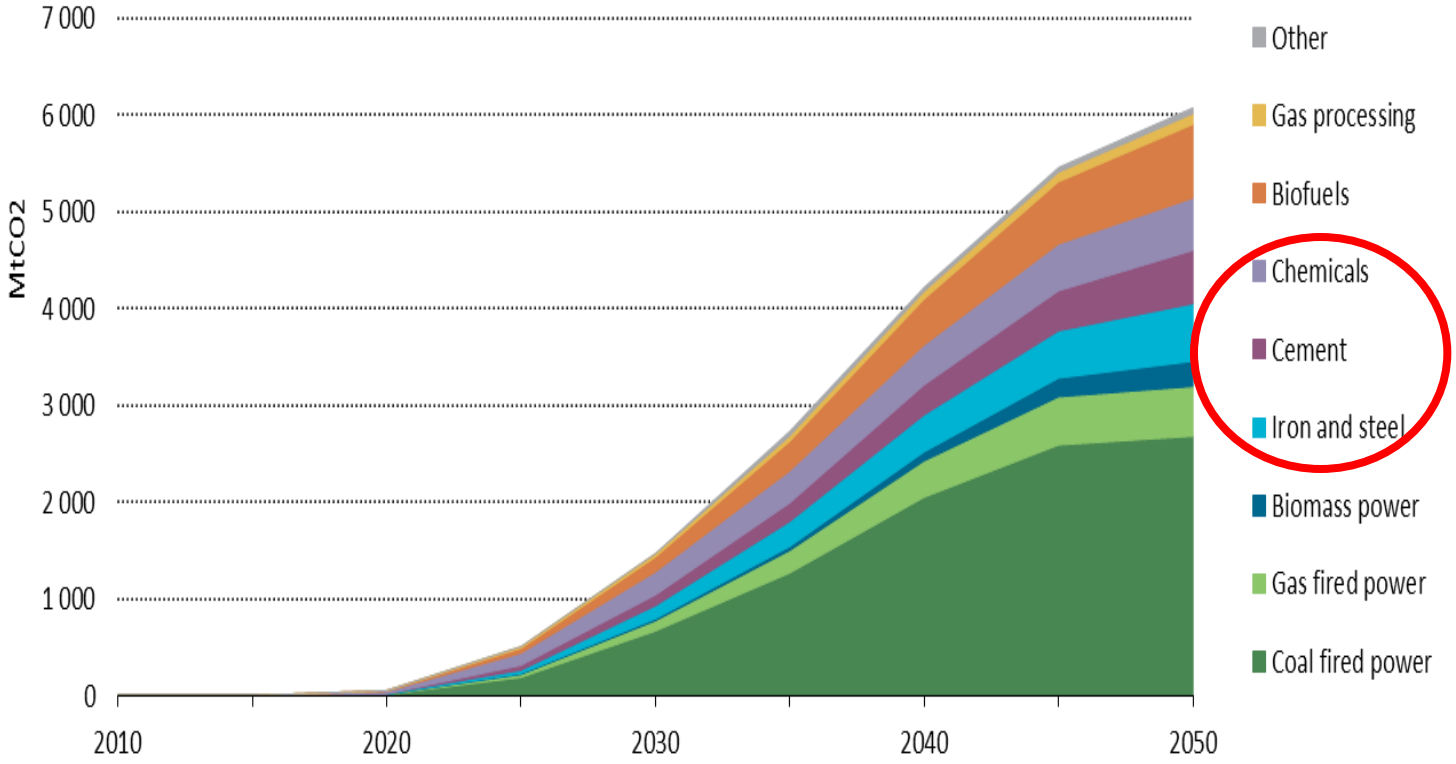
How important is industrial CCS?

Sources of CO_2 emissions captured in the 2DS



Chemicals, iron and steel, and cement account for 28% of cumulative CO_2 emissions captured in the 2DS

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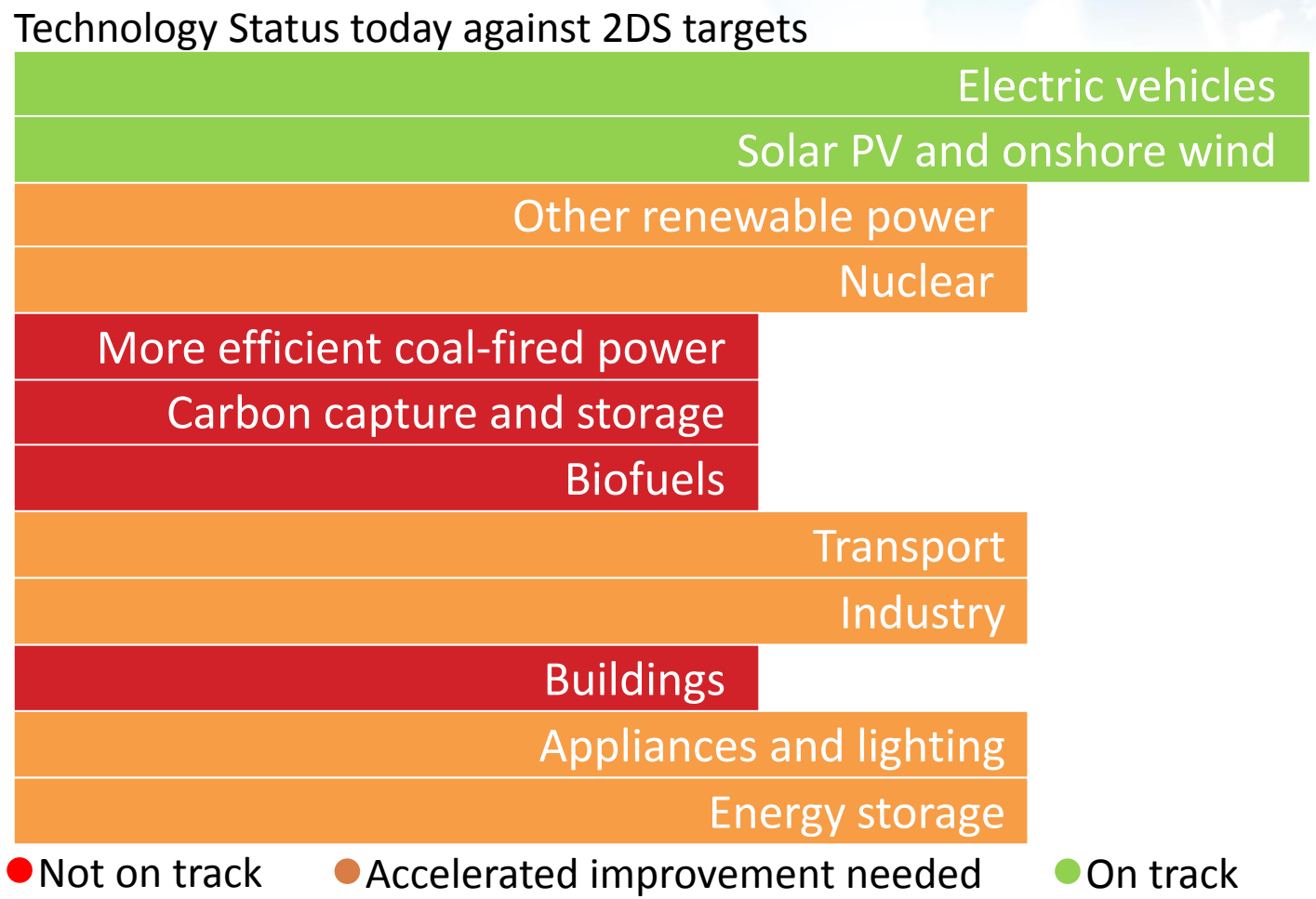
Tracking Clean Energy Progress



Clean energy deployment falls short of the 2DS opportunity but recent progress in certain technologies is promising

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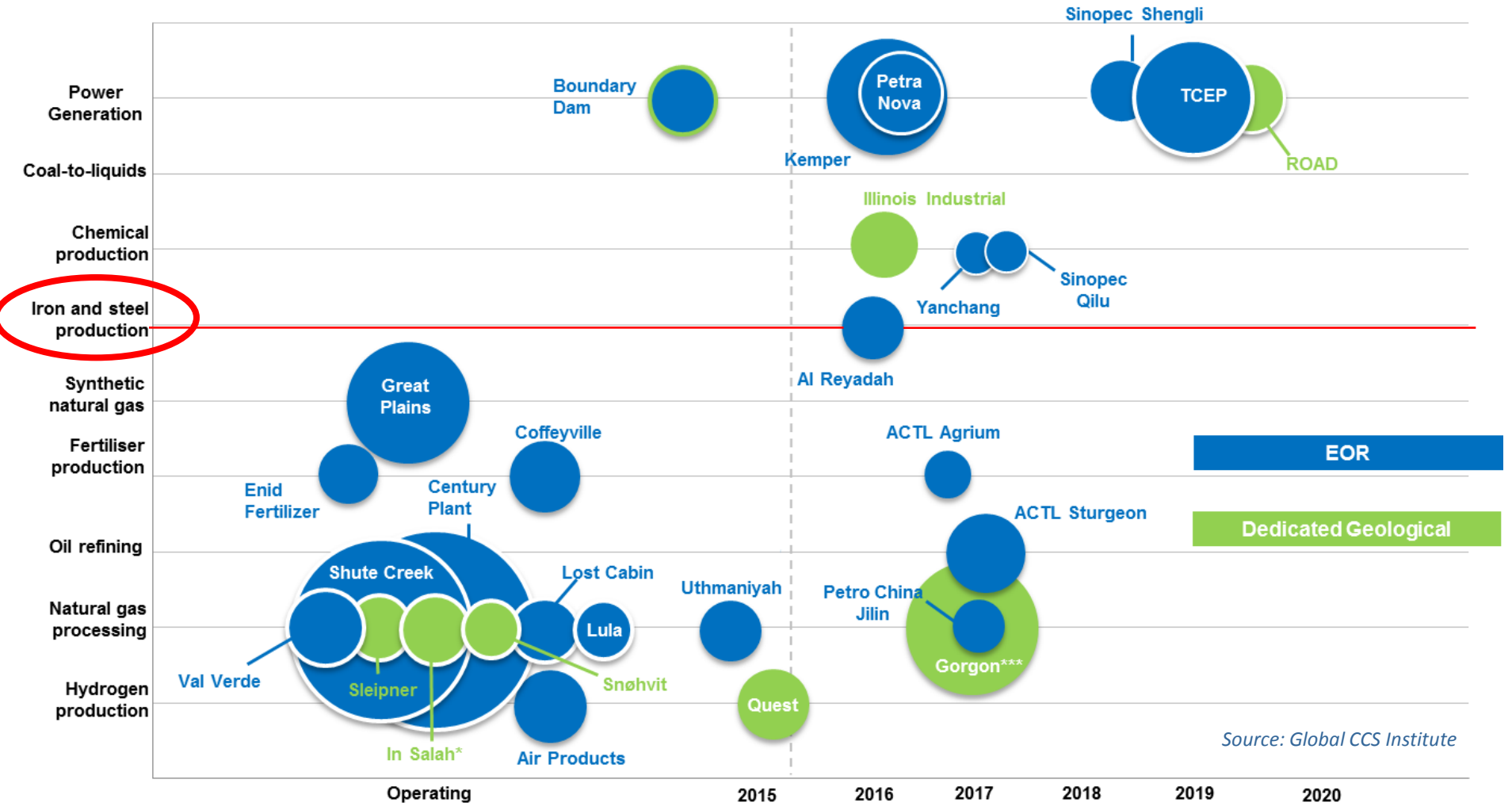
Progress with iron and steel CO_2 capture

Actual and expected operations dates for projects in operation, construction, and advanced planning



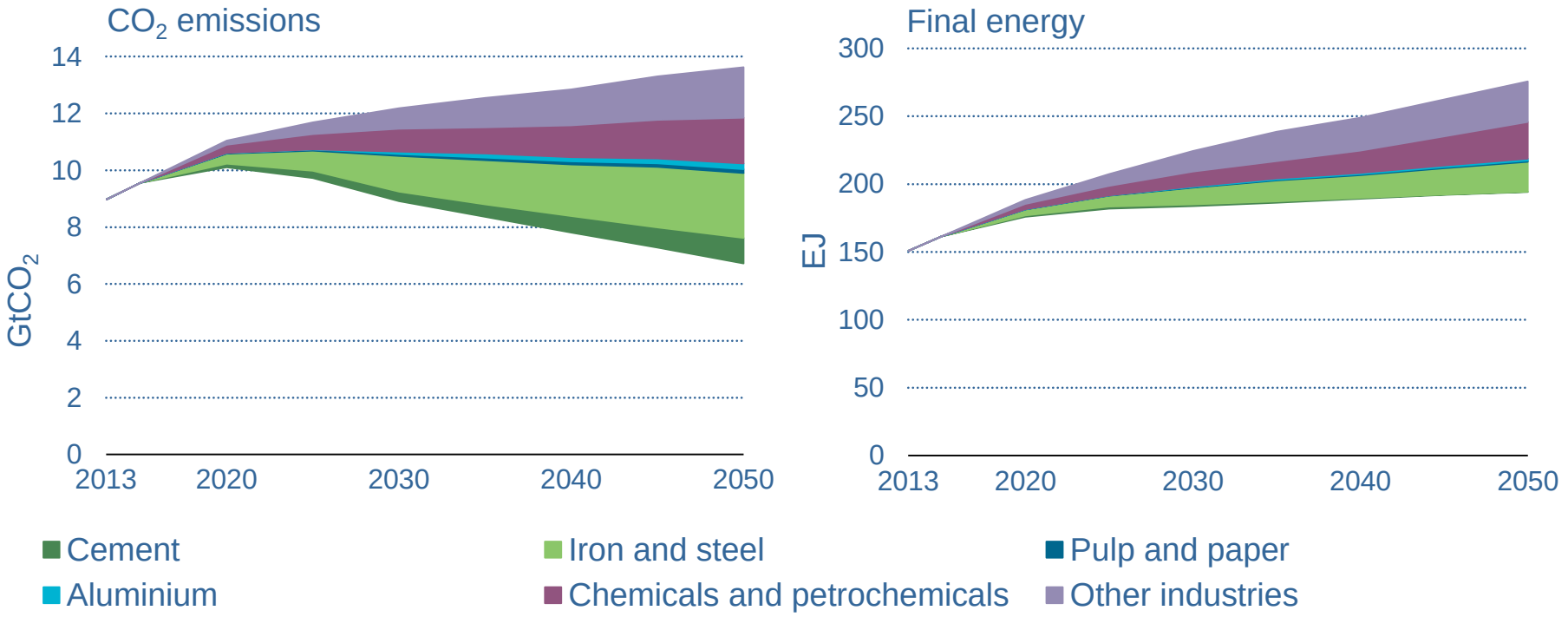
= 1Mtpa of CO_2 (areas of circle are proportional to capacity)

* Injection currently suspended ** Storage options under evaluation

*** Institute estimate

The path forward for industry?

Direct industrial CO2 emissions and final energy reductions in the 2DS compared with the 6DS



Large reductions in direct CO_2 emissions are possible, but energy use and emissions must be decoupled

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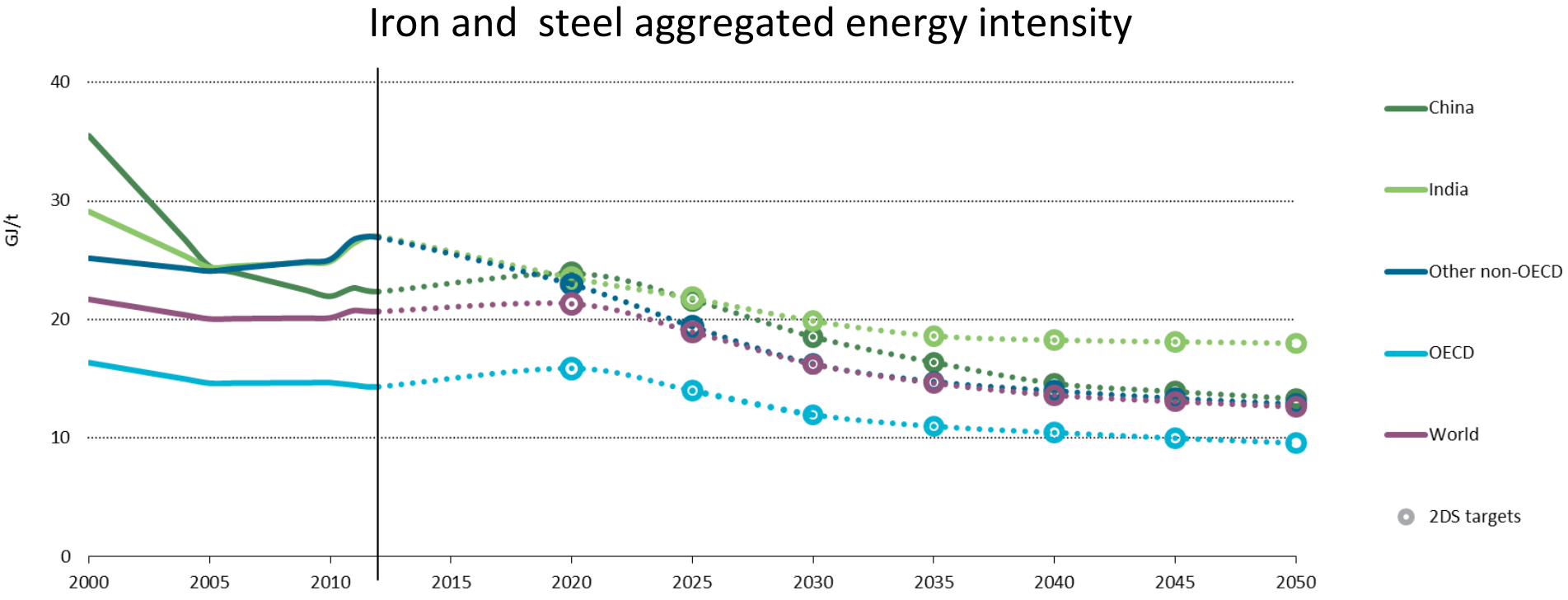
While continued efficiency gains are needed …



Note: Aggregate energy intensity includes final energy consumption in blast furnaces and coke ovens, as well as the portion of fuel consumption related to thermal energy generation of captive utilities for internal use.
Source: Derived from IEA Energy Balances.

Energy efficiency continues to deliver, but is limited by current technology and scrap availability

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… expanding spatial boundaries may achieve greater energy savings …

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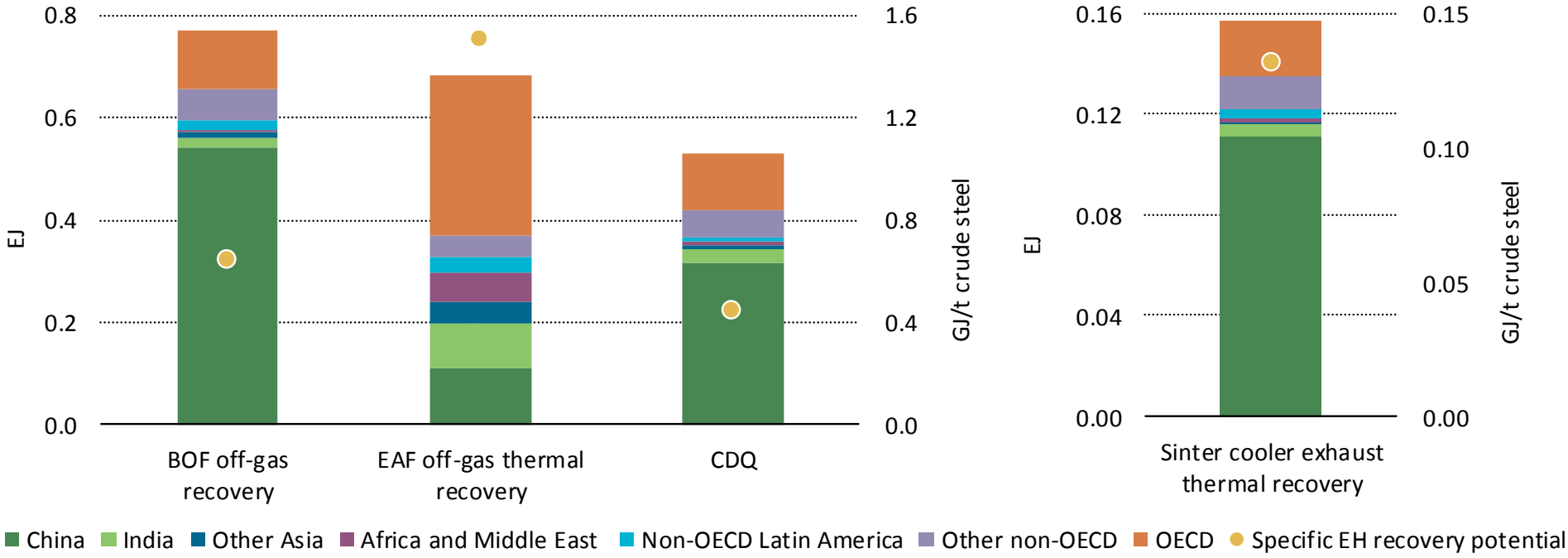
Global excess heat recovery technical potential – Iron and steel



NOTE: Only medium and high temperature IEH sources (>100 degC) and commercial recovery technologies included.
SOURCE: Energy Technology Perspectives 2016

Globally, 6% of the final energy use in iron and steel making could be technically recovered

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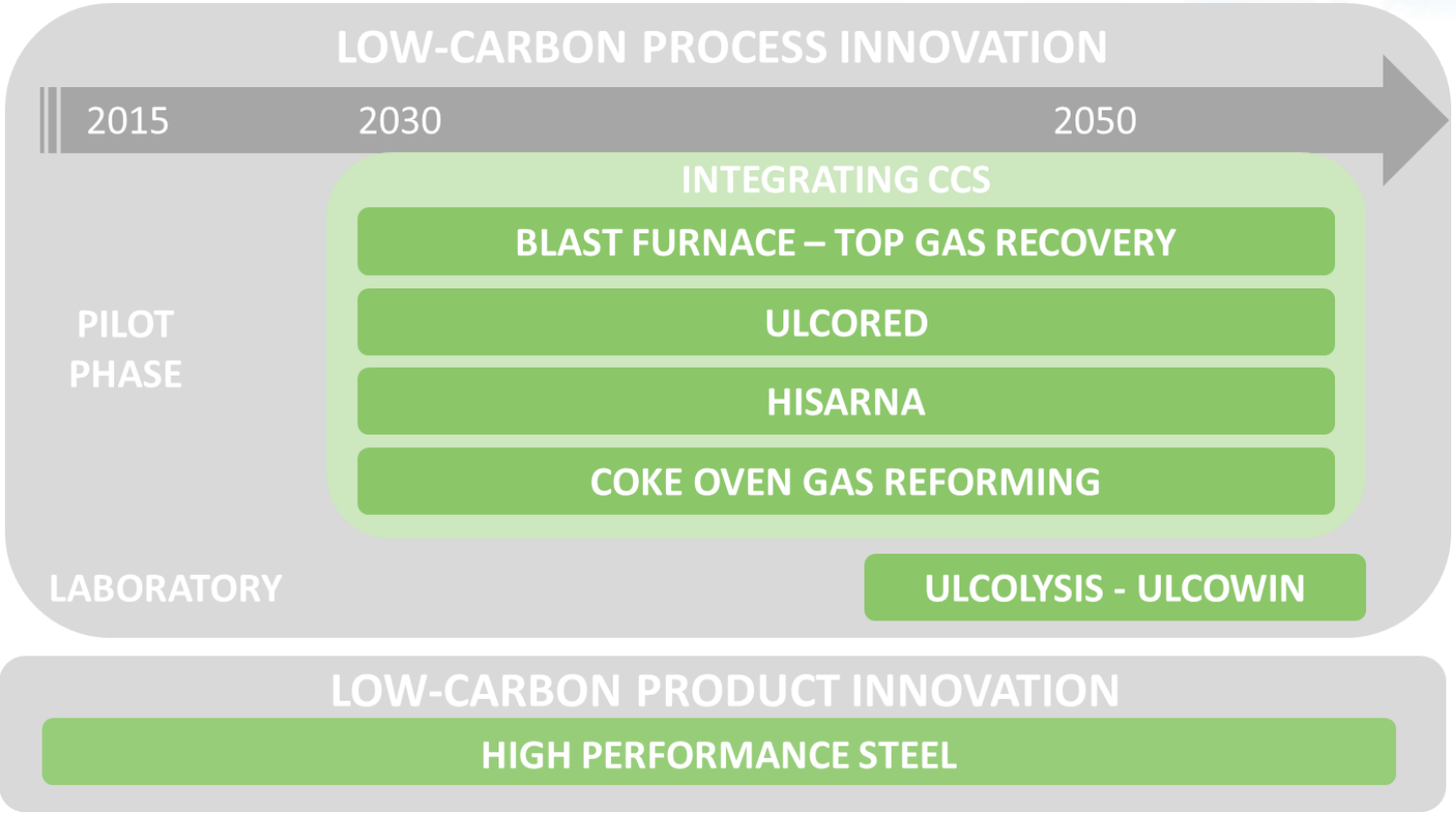
… and more innovative low-carbon technology options are needed.



Note: This slide is not intended to provide an exhaustive list. Sketch is not at scale and time milestones are just illustrative.

Low-carbon iron and steel technology RD&D is promising, but progress must be accelerated

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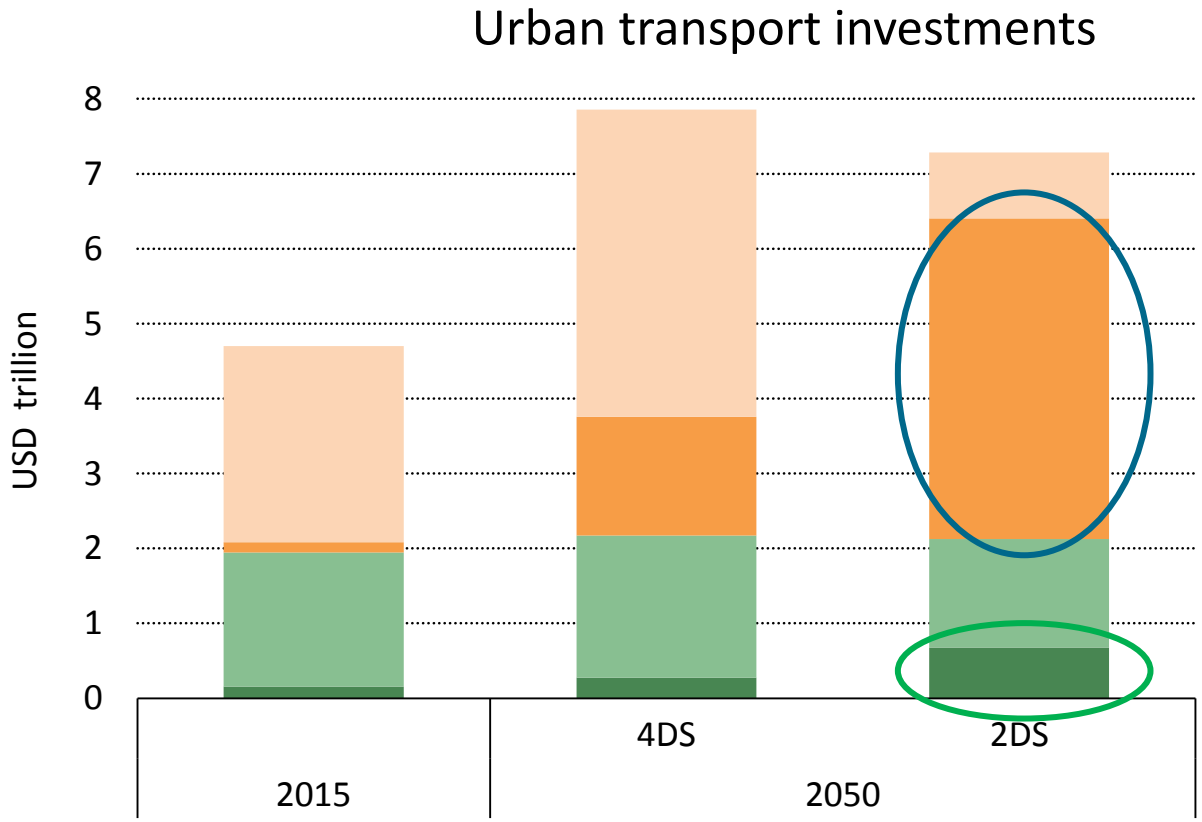
Rethinking materials demand



In the 2DS, by 2050 one billion cars are electric vehicles while public transport travel activity more than doubles

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Technology Roadmapping:
Bringing stakeholders together

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- Goal to achieve
- Milestones to be met
- Gaps to be filled
- Actions to overcome gaps and barriers
- What and when things need to be achieved

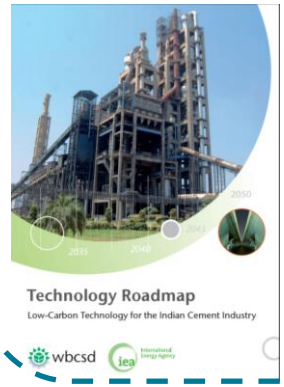
- 32 global publications, 21 different technology areas
- Re-endorsed at G7 Energy Ministerial Meeting in May 2016 (Kitakyushu)
- New Cycle for Implementation:
  - Near-term actions
  - Regional Relevance
  - Key partnerships (e.g. Finance)
  - Metrics and Tracking

Low-Carbon Technology Roadmaps

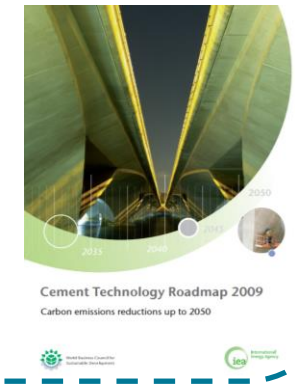
A global iron and steel industry roadmap?

CEMENT

Regional, 2013

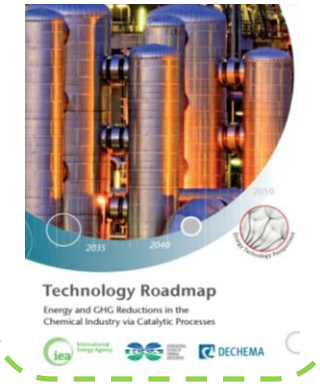


Global, 2009

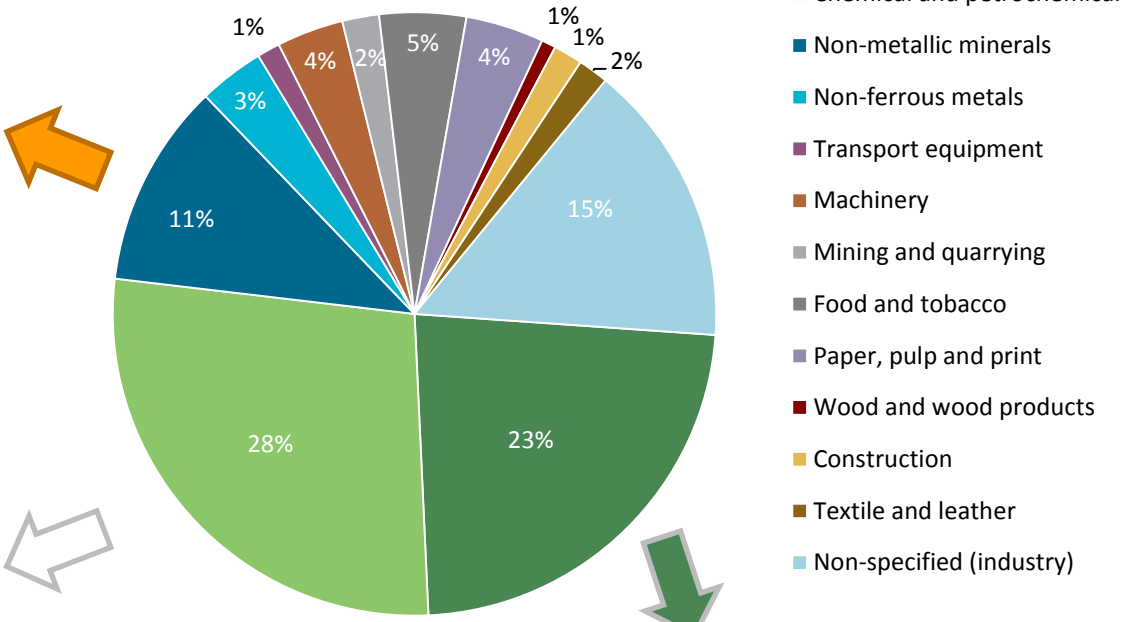


CHEMICALS

Global, 2013



Final industrial energy use , 2014 (154 EJ)



IRON & STEEL

Workshop 2Q2017?

SOURCE: IEA Energy Balance. Note: Iron & Steel includes blast furnaces and coke ovens. Chemicals & Petrochemicals includes petrochemicals feedstocks.

The IEA works around the world to support an accelerated clean energy transition that is

enabled by real-world SOLUTIONS

supported by ANALYSIS

and built on DATA