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Energy, Climate Change & Environment: 2016 Insights

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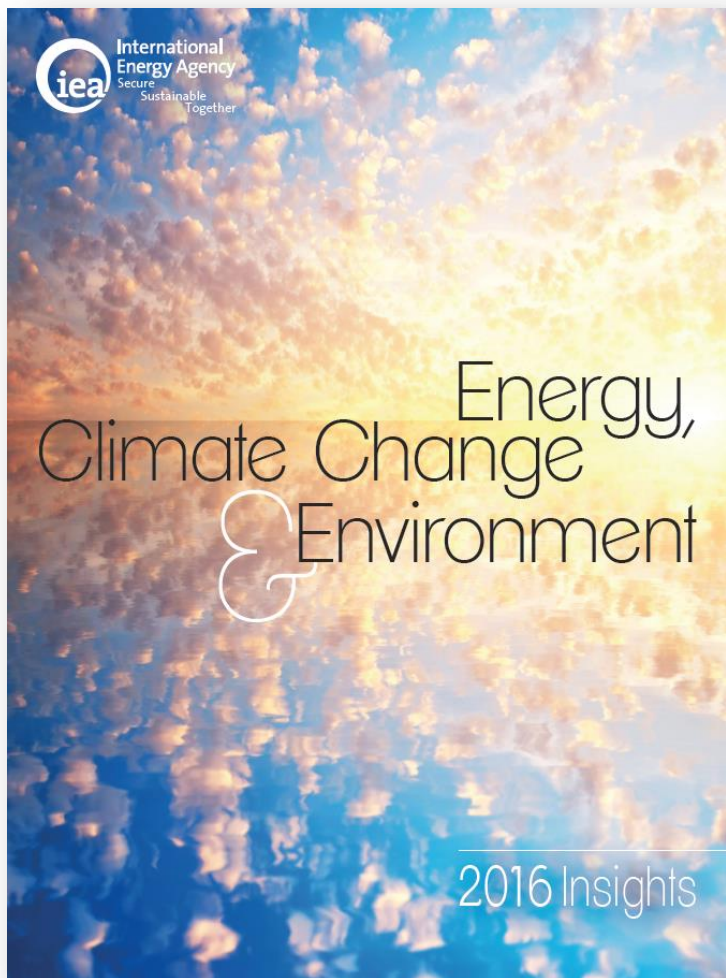
**The IEA supports governments around
the world in their clean energy transition**

through real-world SOLUTIONS

backed by ANALYSIS

built on DATA

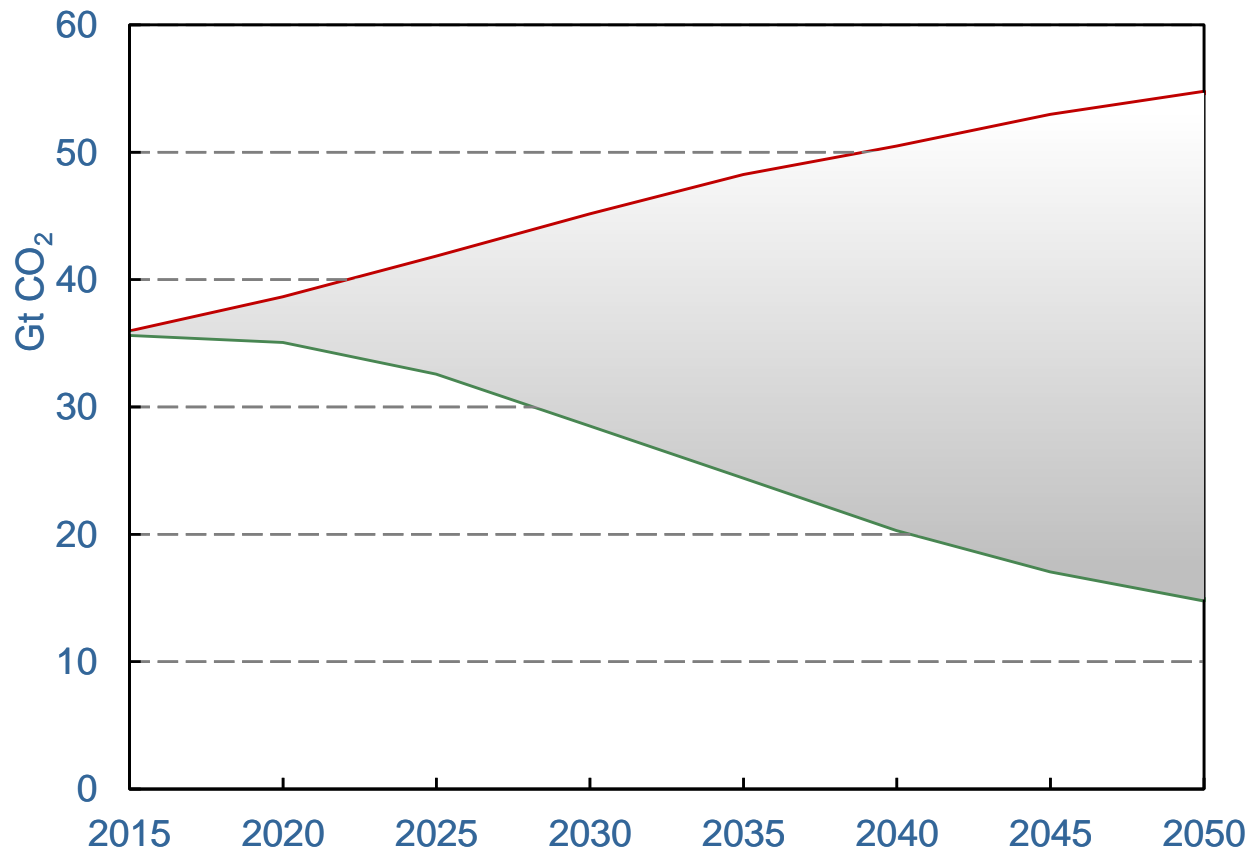
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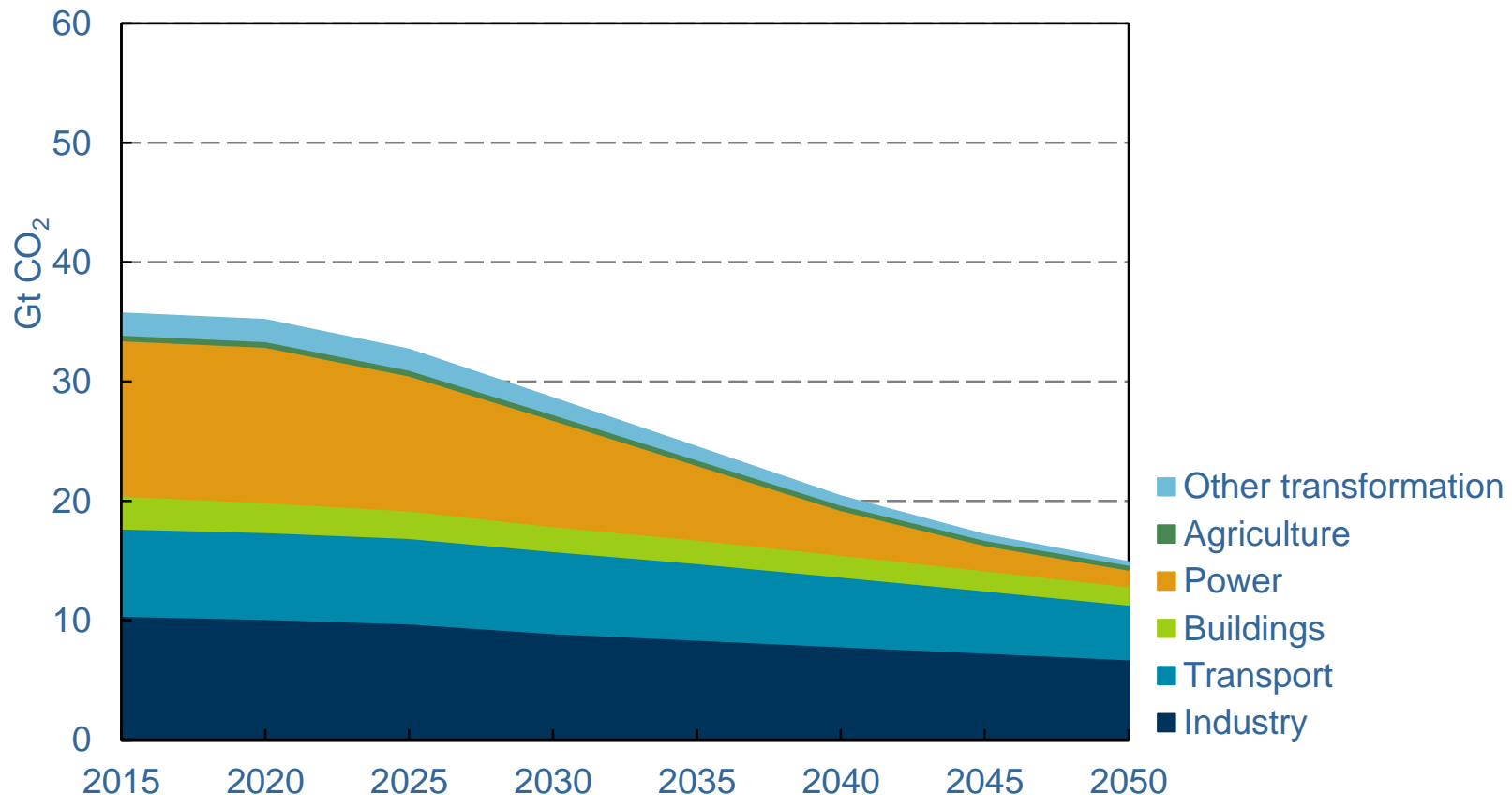
Staying well below 2°C degrees: How Paris has changed the energy challenge

Paris Agreement: “Holding the increase in the global average temperature to **well below 2°C** above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels...”



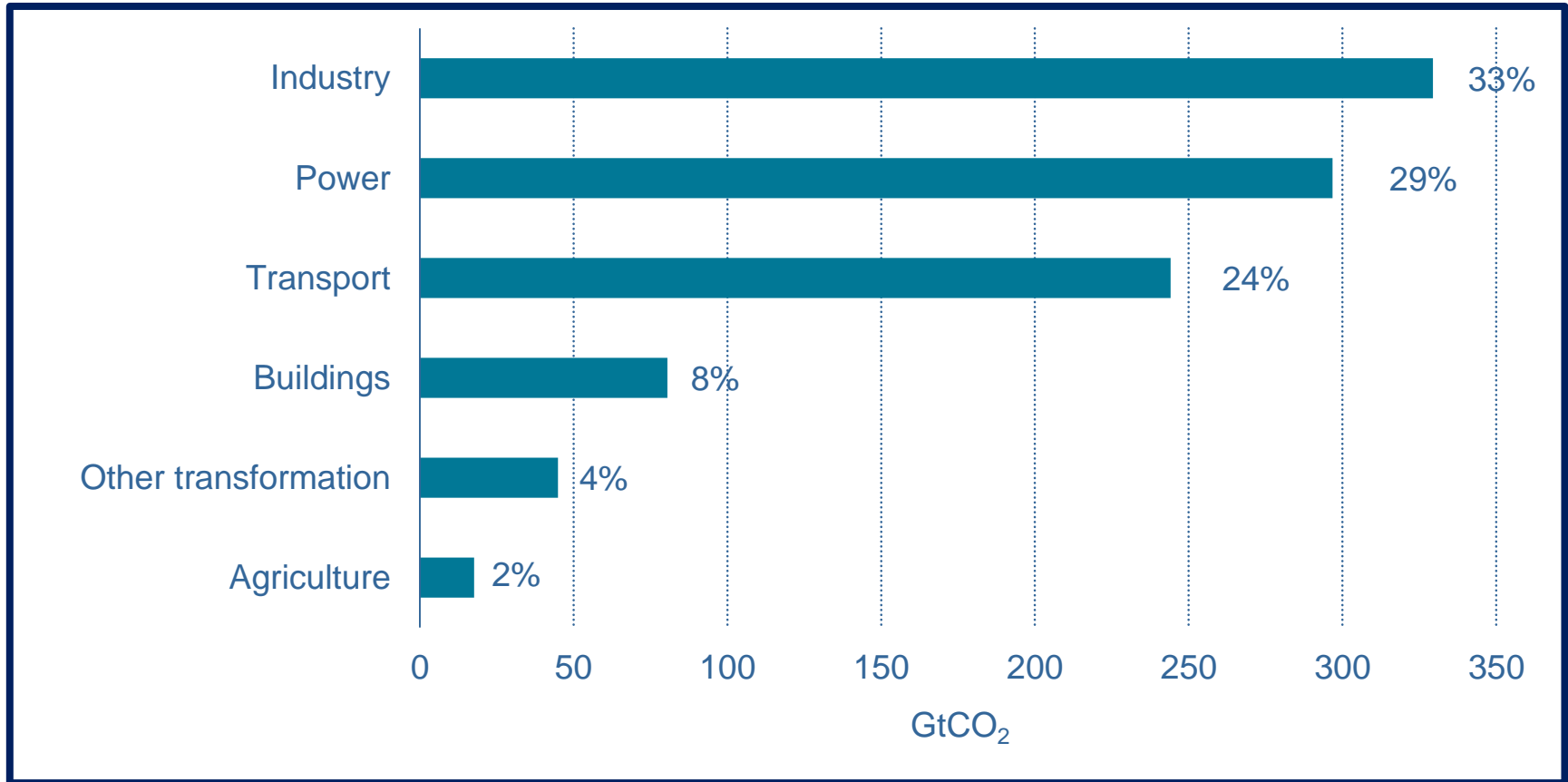
Staying well below 2°C degrees: How Paris has changed the energy challenge

Paris Agreement: “Holding the increase in the global average temperature to **well below 2°C** above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels...”



Getting well below 2°C means tackling the emissions that remain in the 2DS

Cumulative CO₂ emissions over 2015-2050 under the 2DS

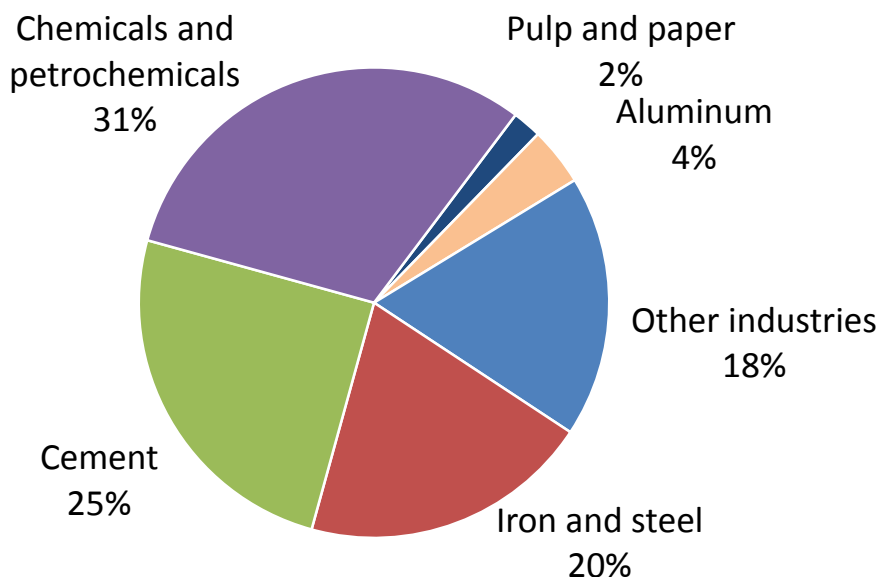


Industry, power and transport sectors dominate

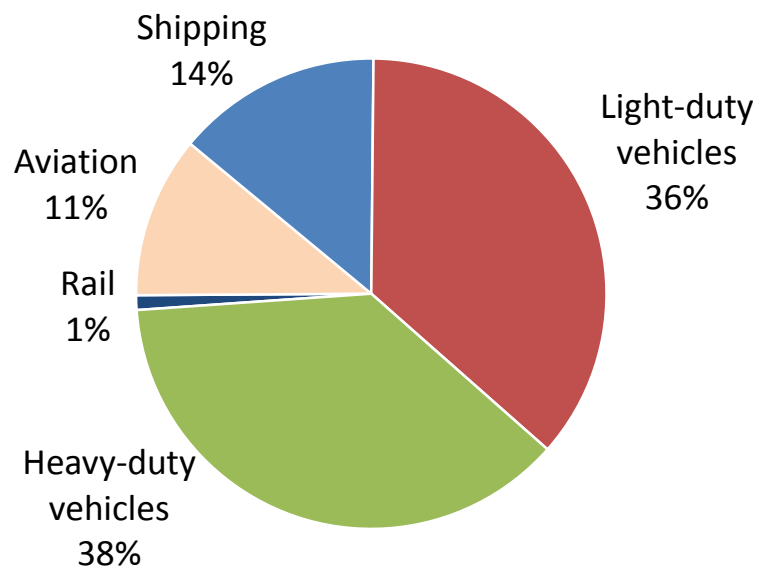
Emissions in 2050:

Sub-sector breakdown of industry and transport

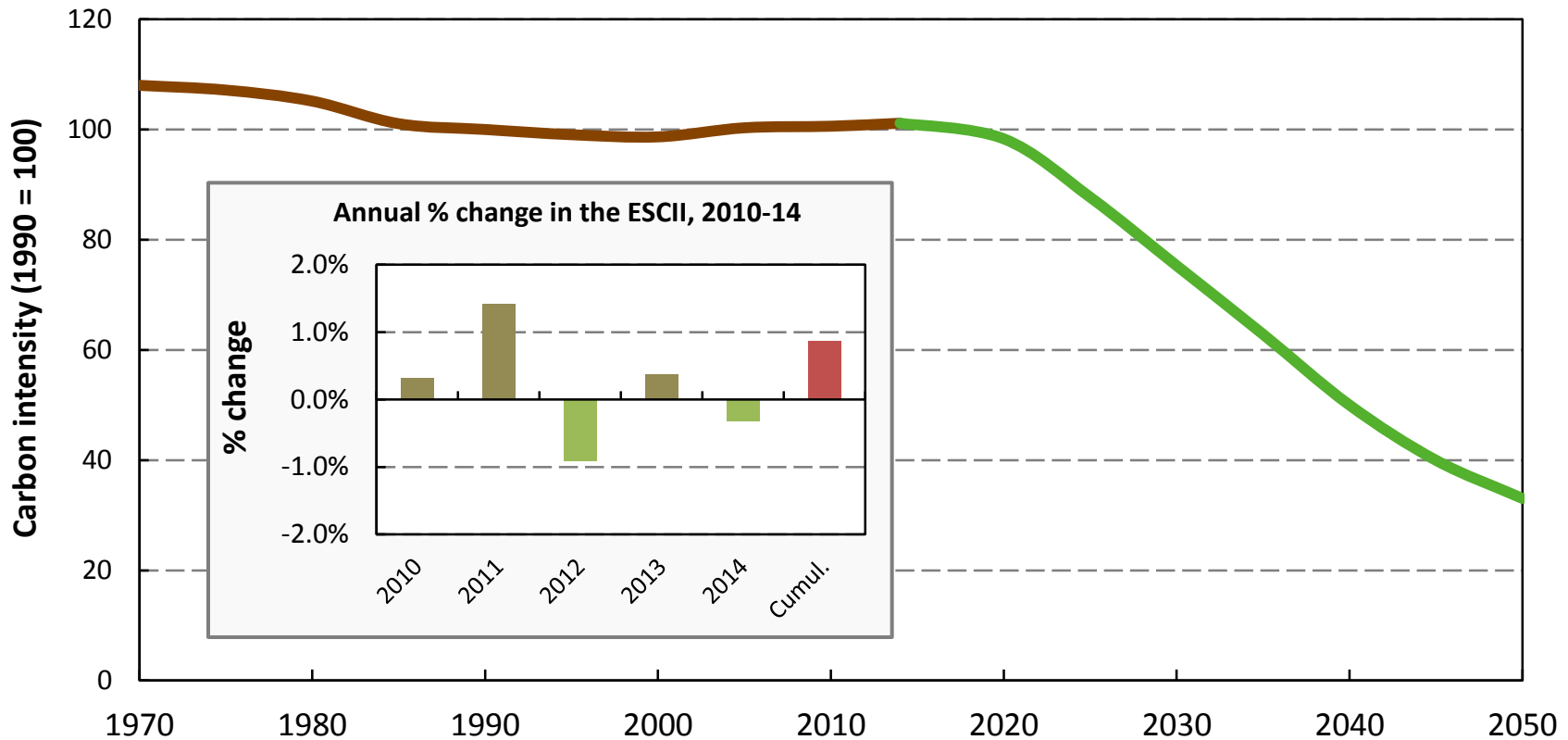
Industry
6 721 Mt



Transport
6 300 Mt



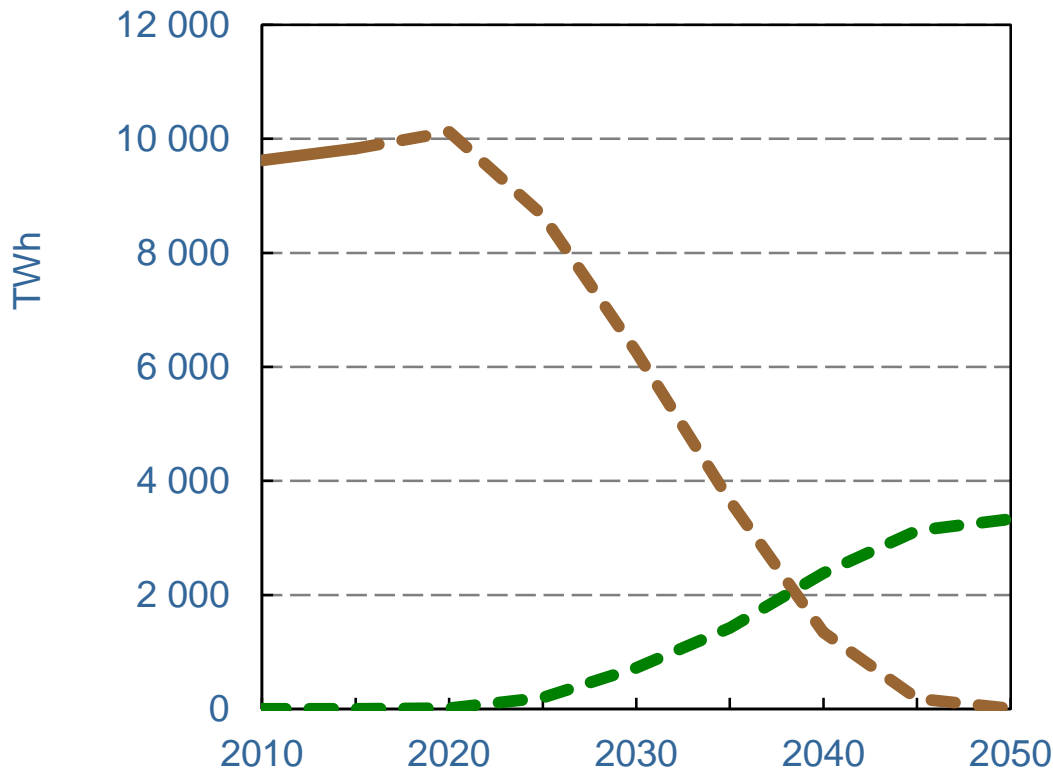
How are we doing in reducing the carbon intensity of our energy system?



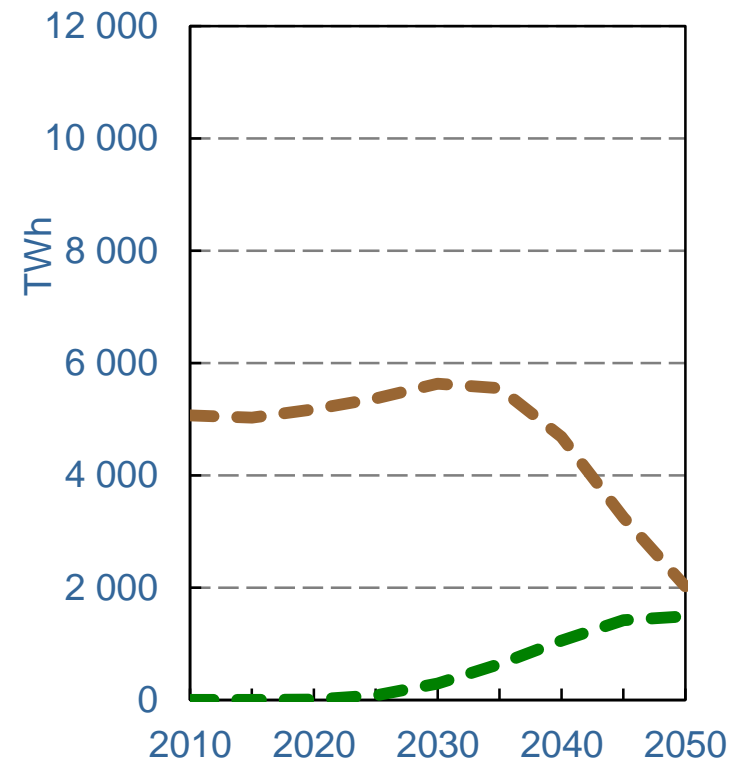
As of 2014, the world's energy supply was 1.1% more carbon intensive than it was in 1990

Reducing emissions from incumbent fossil fuel facilities: a critical element of low-carbon scenarios

Coal

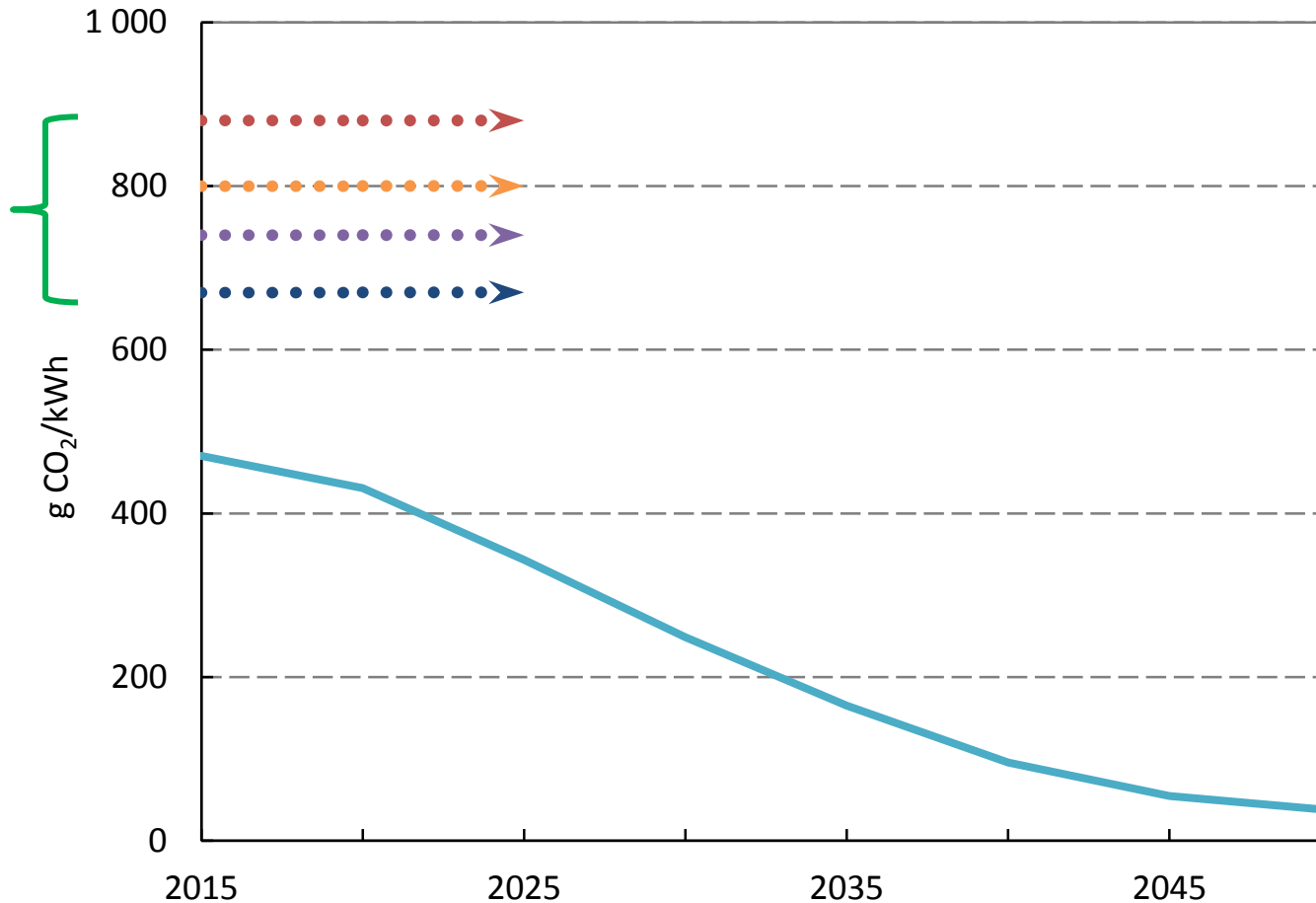


Gas

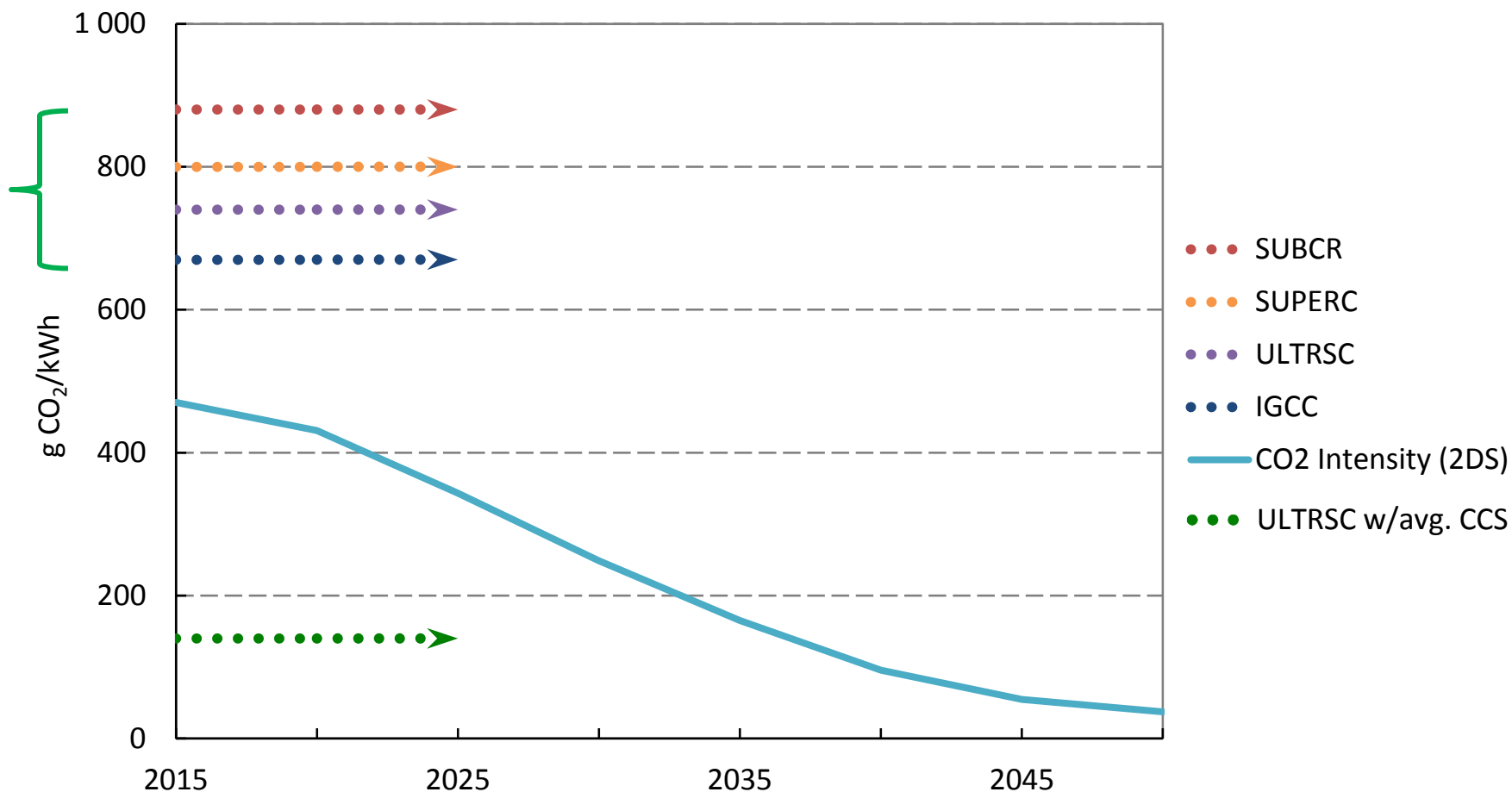


Addressing coal and gas plant emissions will be important to reduce global emissions

Role of innovation: 'High efficient-low emissions'?



Role of innovation: 'High efficient-low emissions'?

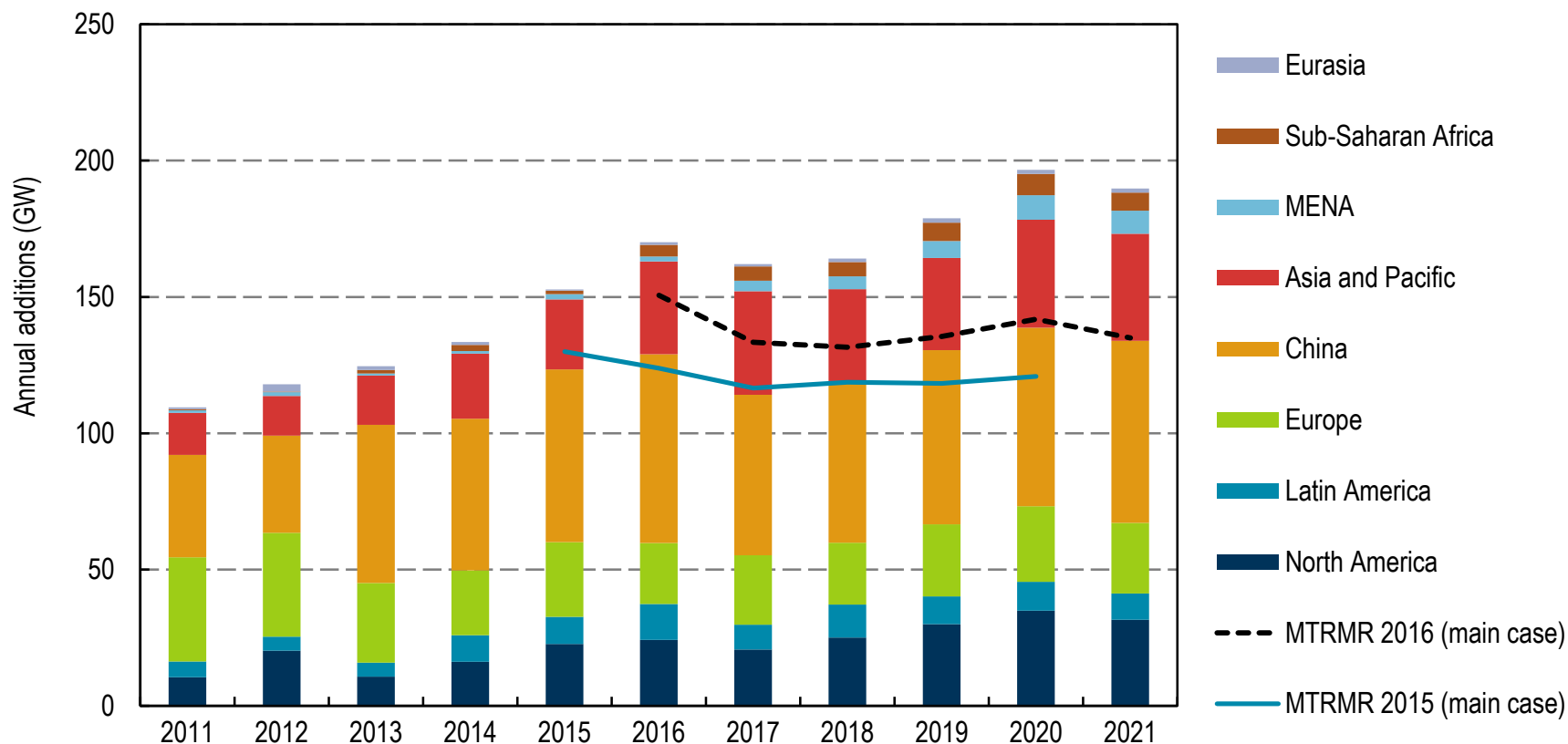


Need CCS to make coal 'low-carbon'

Role of moderate carbon prices

- Real-world carbon price expectations (USD 15/tCO₂ – 40/tCO₂ in 2030) are significantly lower than those consistent with 2°C scenarios (USD 100/tCO₂ in 2030)
- “Moderate” carbon prices still help:
 - support dispatch of low-carbon generation options
 - reduce need for subsidies for low-carbon investment
 - favor retirement of the most carbon-intensive plants
- Well integrated packages of policies are needed – not carbon pricing alone (auctions, EE policies, etc.)

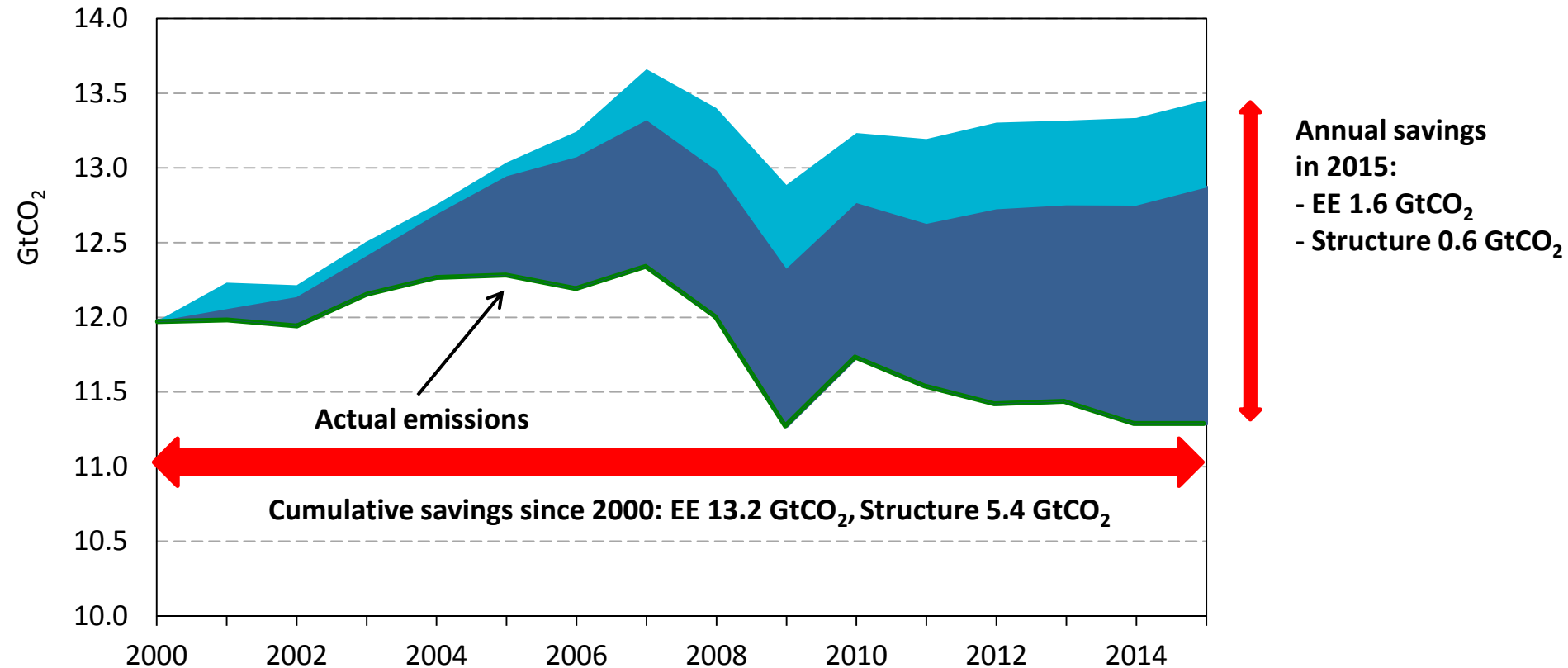
Renewables post-COP21



COP21 INDCs generated momentum for renewables development and deployment worldwide

Demand-side levers

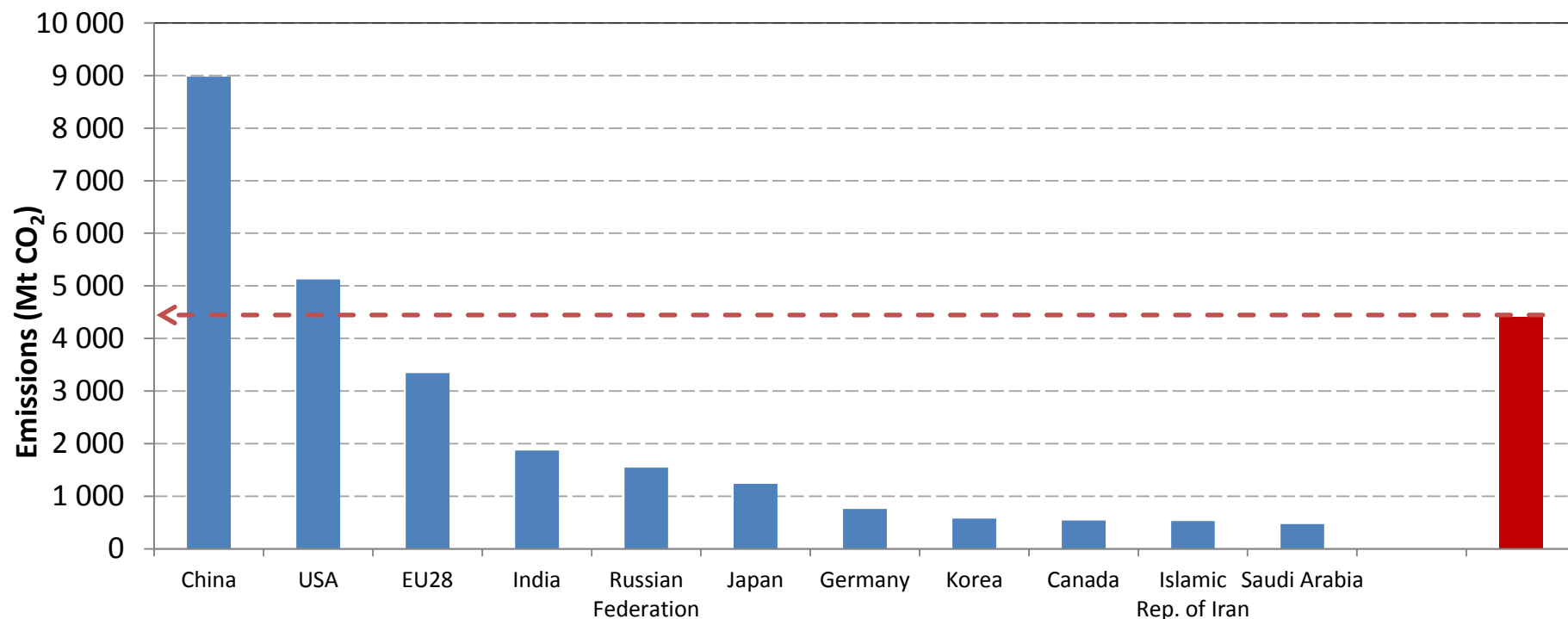
(decomposition analysis IEA member countries)



Greater use of energy efficiency, structural change, energy conservation and other demand-side levers is needed to reduce emissions

SOEs: Among 'Top 10' energy GHG emitting 'countries'

Looking beyond the 'what' and the 'how' to the 'who':
tailoring solutions to motivate state-owned enterprises



*Selected 50 SOEs would, by themselves,
constitute the third largest emitting country*

Energy sector resilience: government is a key actor

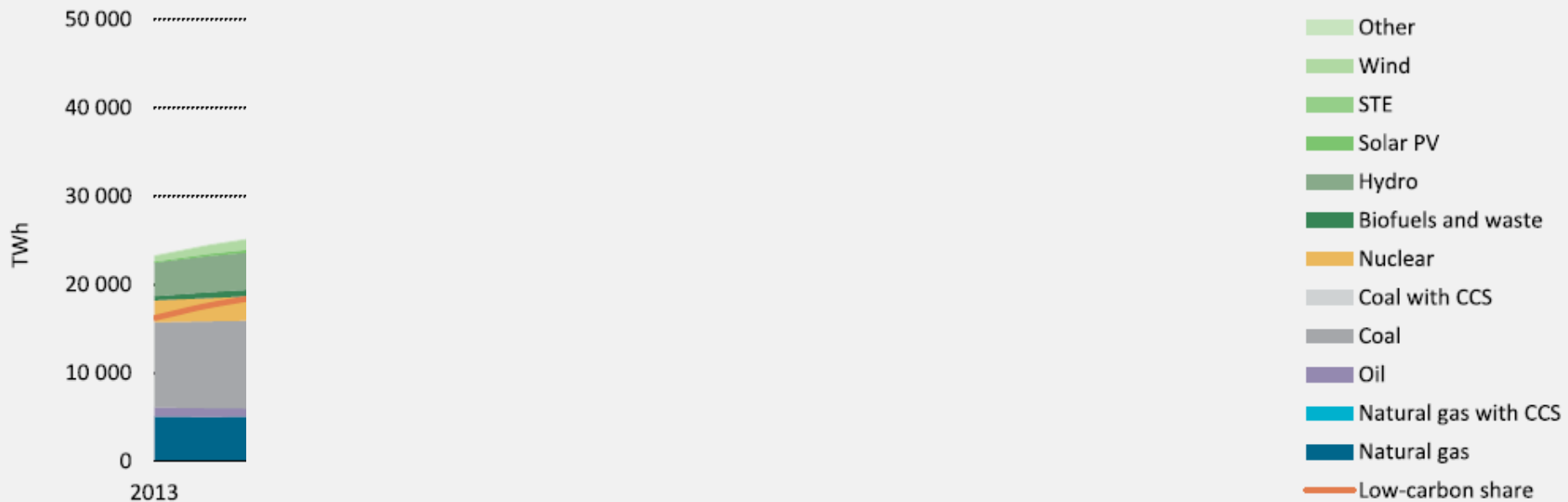
1. Create enabling frameworks/incentives to facilitate/to prompt resilience-building by business

... but much more:

2. Awareness raising and modelling
3. Service provider (e.g. climate services, data)
4. Managing “own-assets” (utilities, etc.)
5. Financing and facilitating investments
6. Inter-governmental coordination: domestic and international

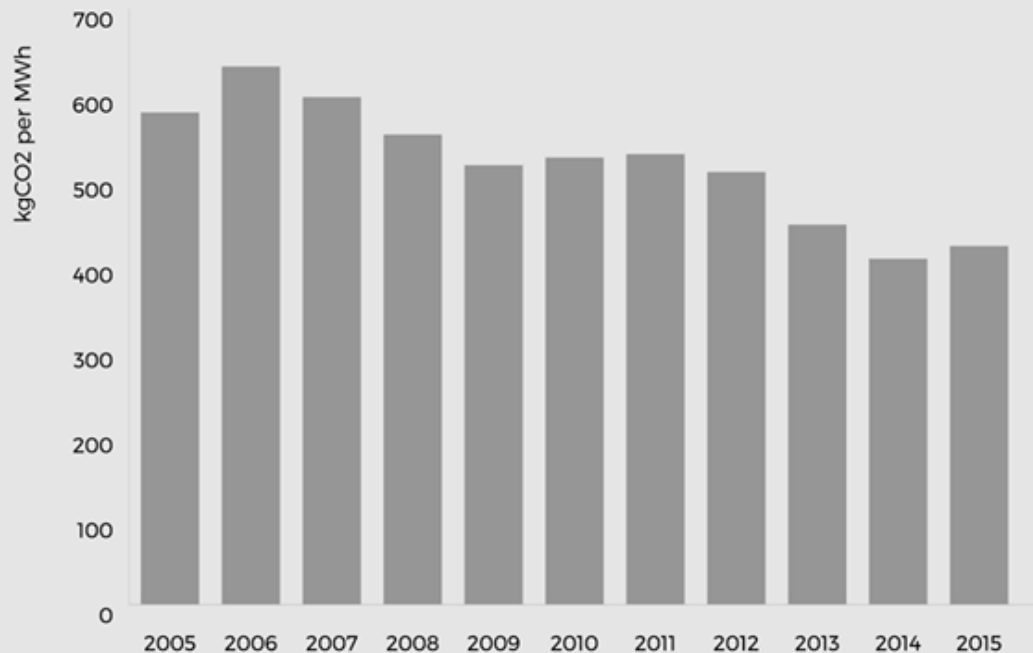
Energy resilience effort needs to adapt to energy sector of the 'future'

Global electricity generation mix in the 2DS, 2013-2050



Tracking and metrics

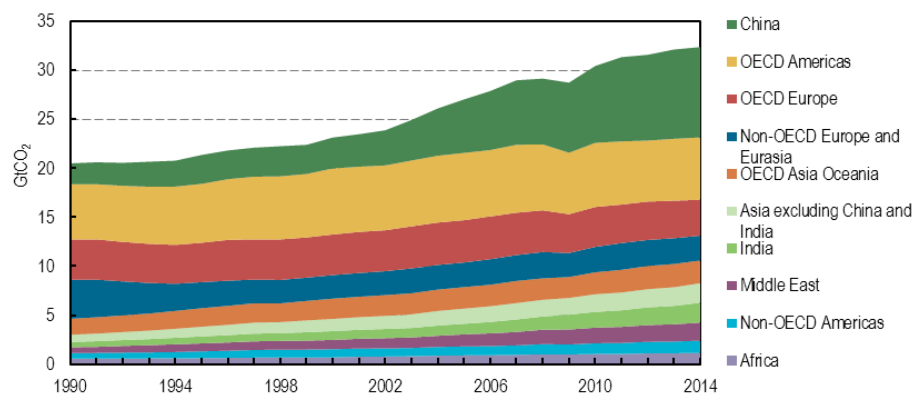
The **carbon intensity** of new power plants around the world has dropped by **27%** since 2005



Energy and emissions data

I. Interregional comparisons:

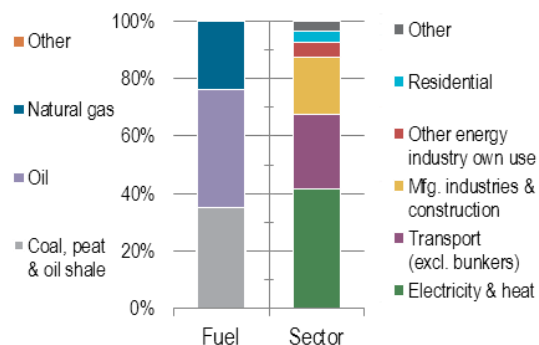
- CO_2
- $ESCII$
- $CO_2/capita$
- $TPES/GDP$



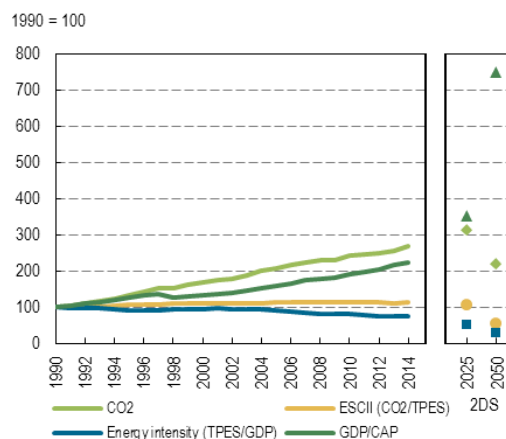
II. Regional data and indicators: three graphs

Ten global regions and world region for 1990-2014 and 2DS (2025 and 2050)

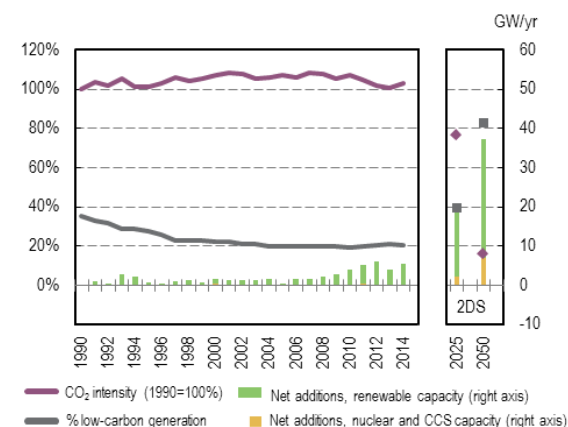
Example: Southeast Asia region



CO₂ emissions by fuel and sector, 2014



Energy sector-wide metrics



Electricity sub-sector metrics

Thank you

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