Transport Models as Climate Policy Evaluation Tools

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International Energy Agency

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IEA supports the low-carbon transition

www.iea.org

IEA: the global energy authority

- Part of the OECD family
- Founded in 1974 to co-ordinate a response to oil supply disruptions
- 2015: IEA Modernisation grounded on three main pillars
  - global energy security
  - energy cooperation and global dialogue
  - promoting an environmentally sustainable energy future

- Build on a decade of analysis on what we need to do to keep temperature increase below 2°C
- Now developing analysis on faster and deeper energy-sector decarbonisation

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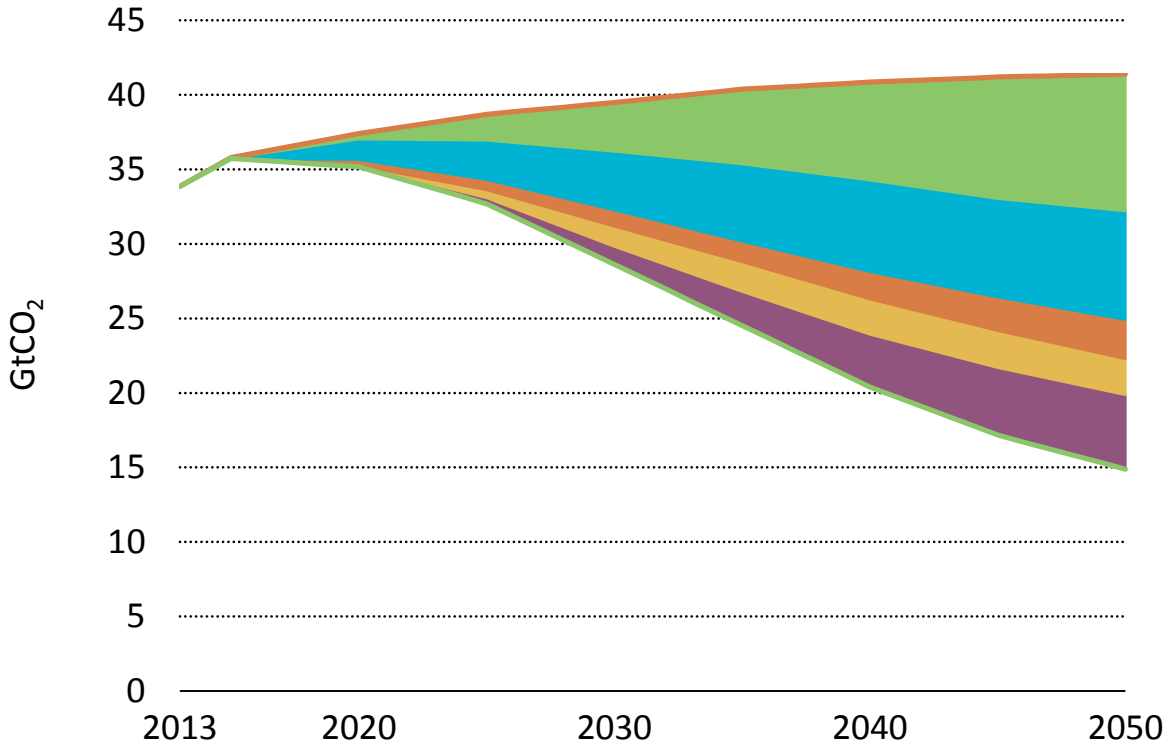
Sizing the scale of the challenge…
… and its solutions

Contribution of technology area to global cumulative CO_2 reductions



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

ETP 2016

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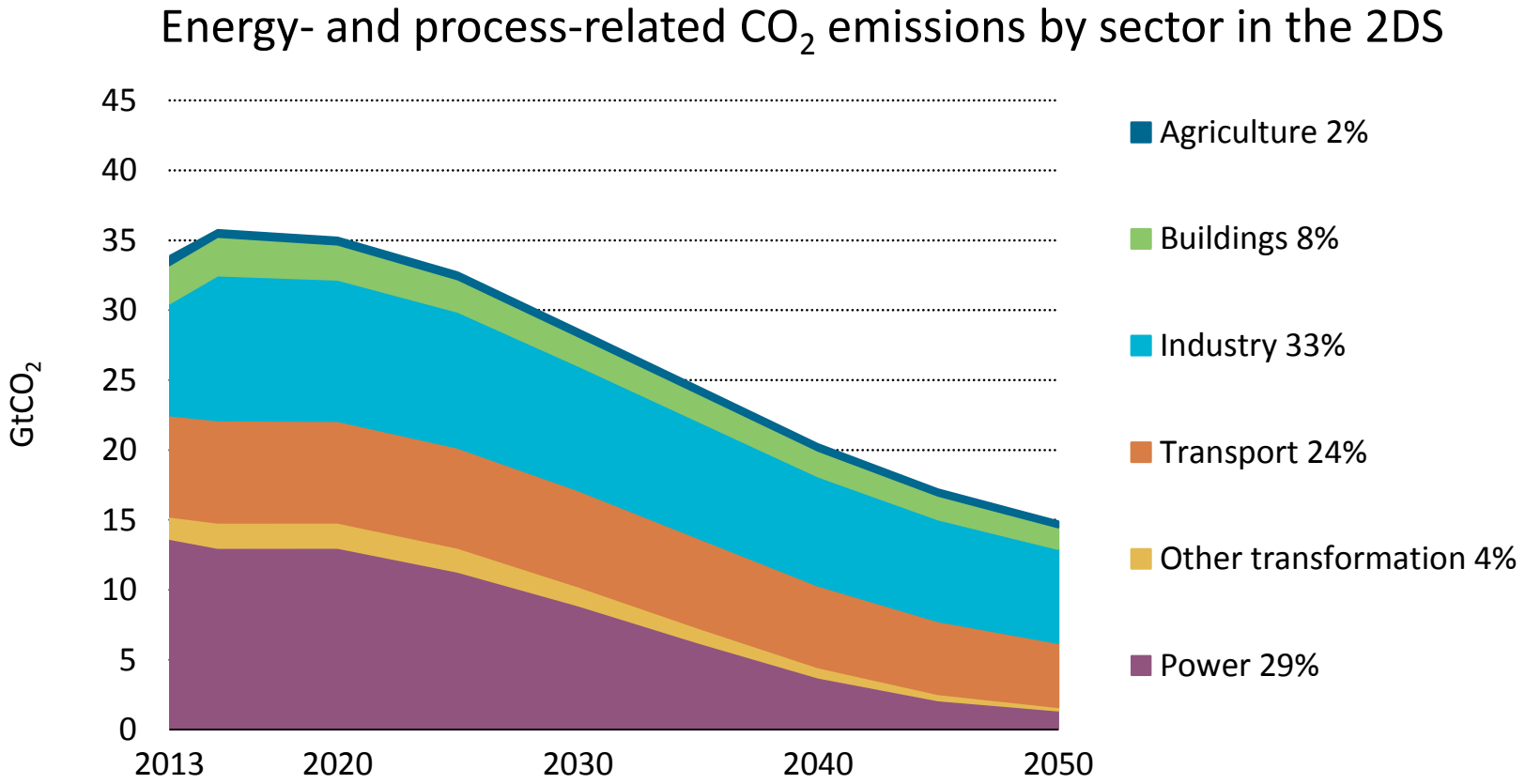
But the challenge increases to get from 2 degrees to "well below" 2 degrees



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

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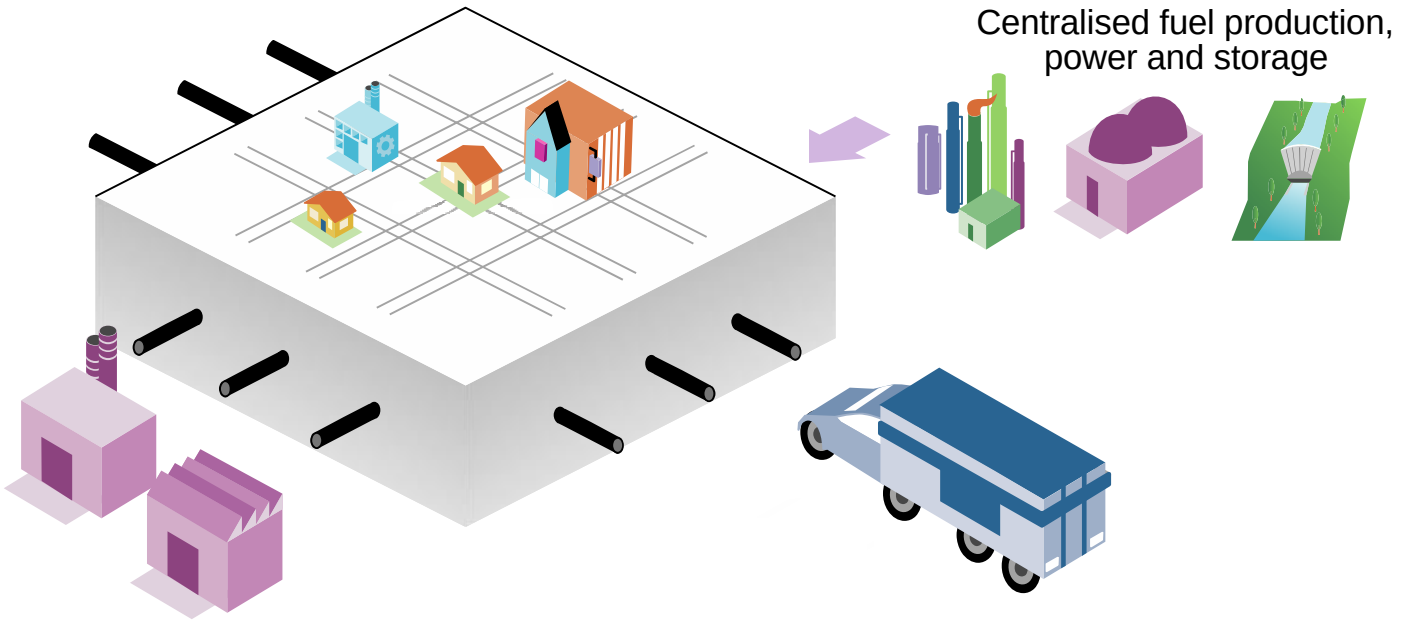
Systems thinking and integration



Today's energy system paradigm is based on a unidirectional energy delivery philosophy

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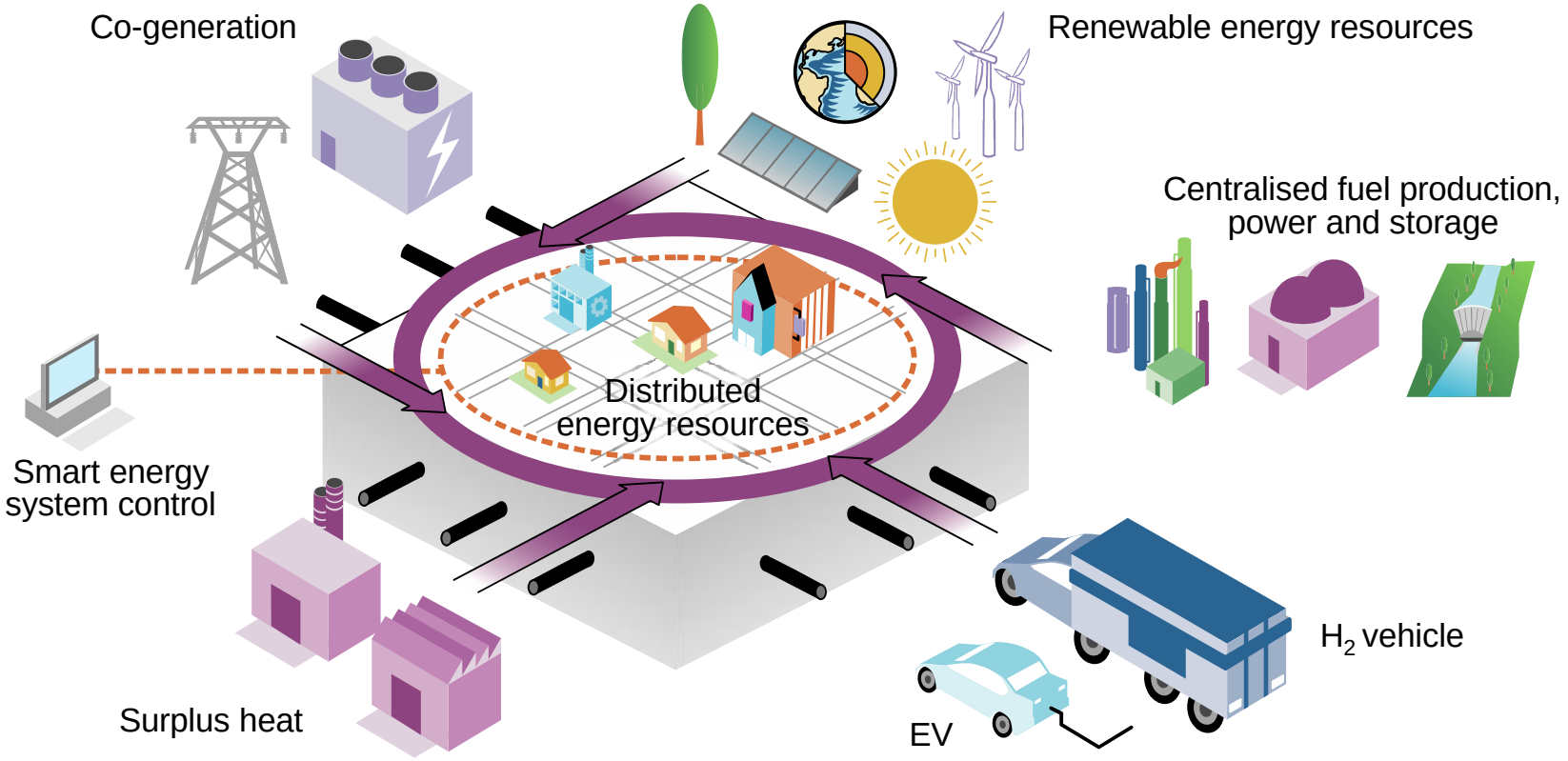
Systems thinking and integration



A sustainable energy system is a smarter, multidirectional and integrated system that requires long-term planning for services delivery

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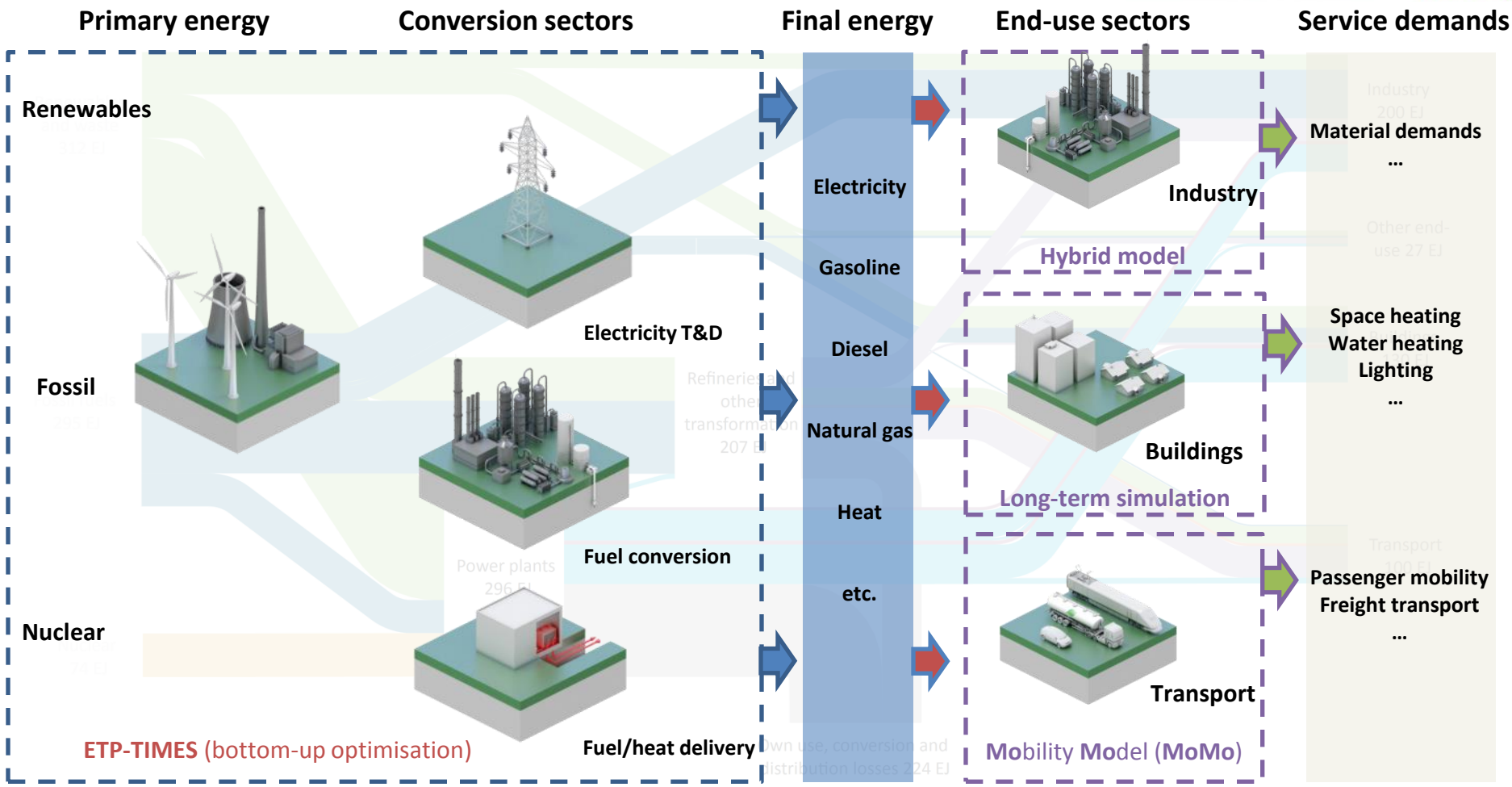
ETP modelling framework



ETP model finds cost-effective investment and operation of energy technologies to meet energy demands from now to 2050

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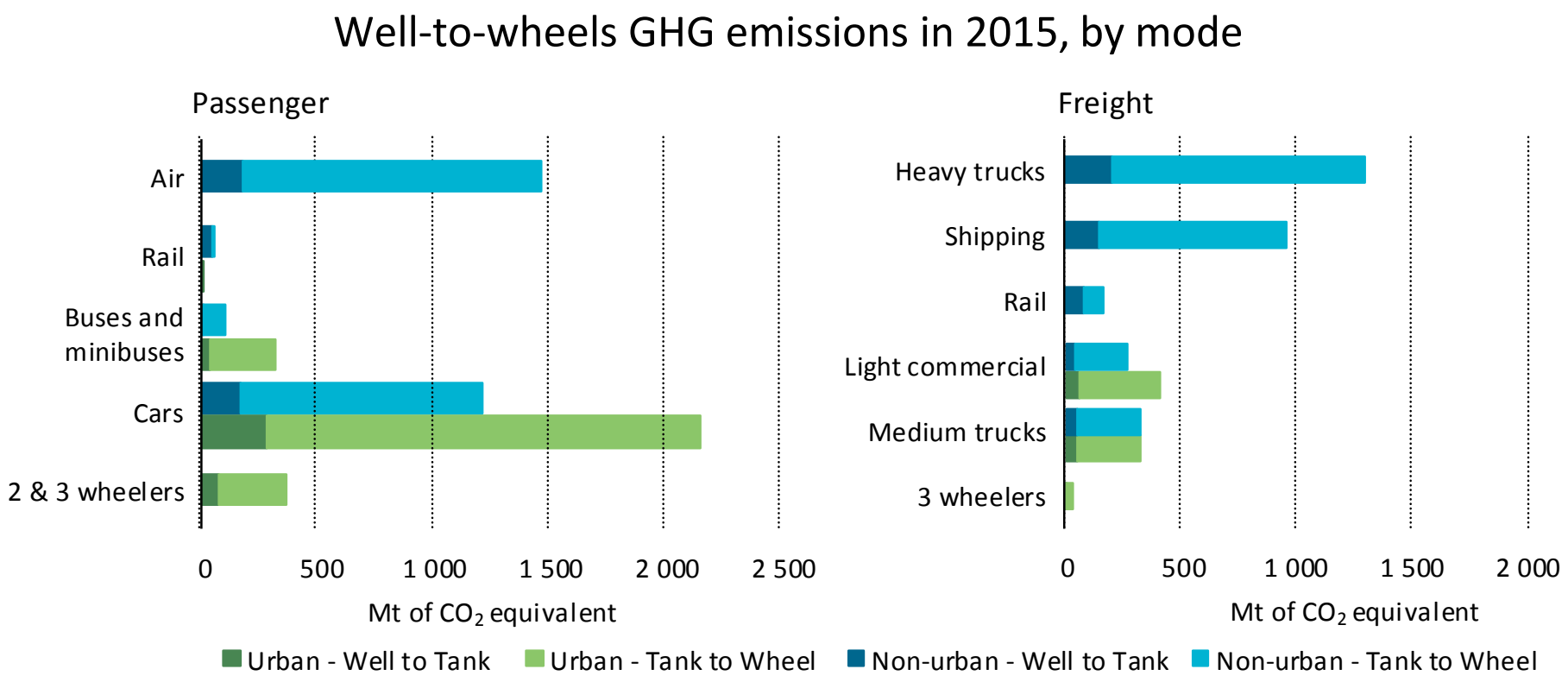
Understanding transport impacts: Mode matters



Transport is the least diversified energy demand sector

Solutions need to be adapted transportation modes

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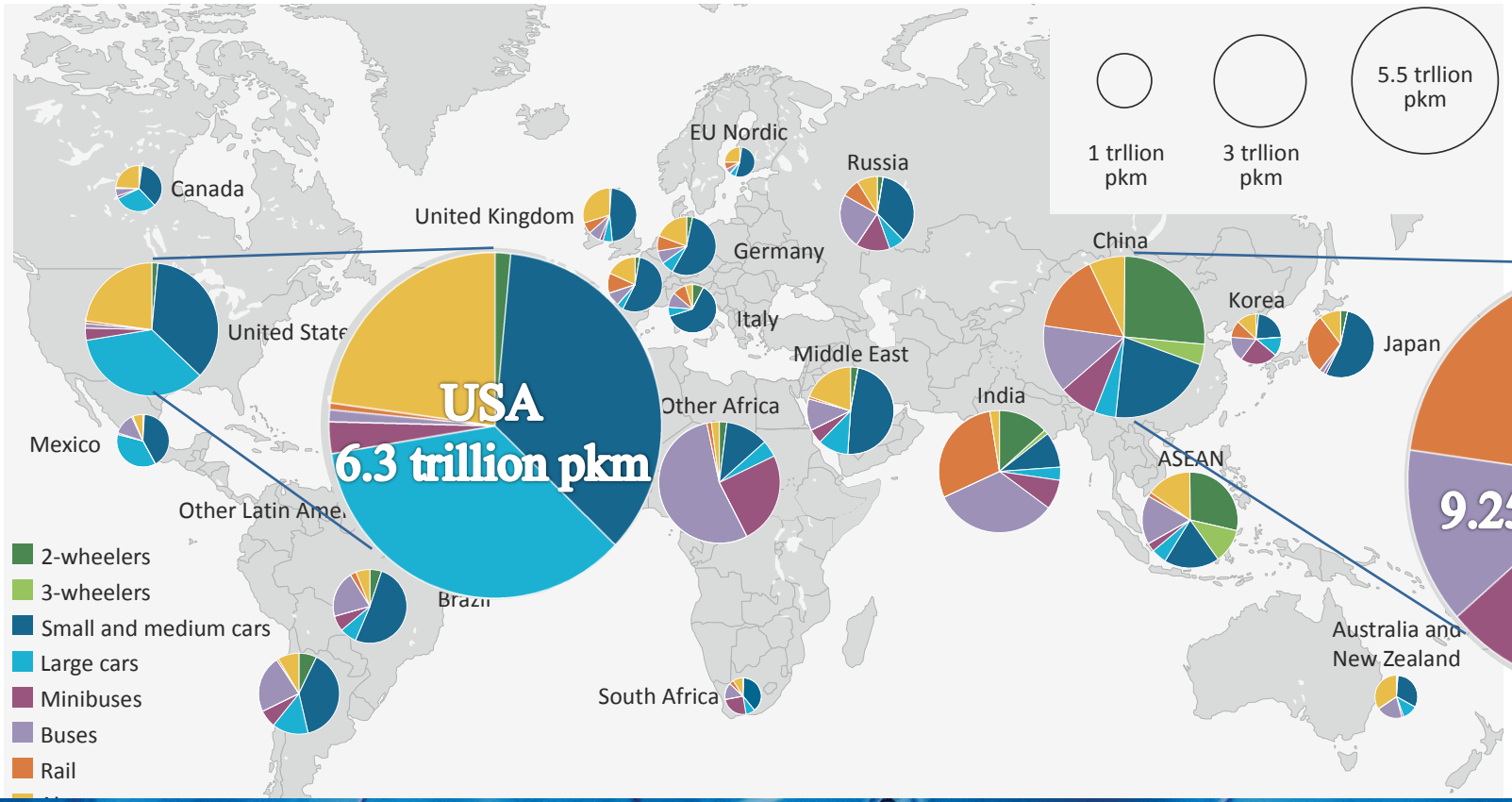
Passenger transport activity: Mode matters

National passenger transport activity (pkm) in 2015, by mode



While activity is almost 50% higher in China than in the US…

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Passenger transport energy use: Mode matters

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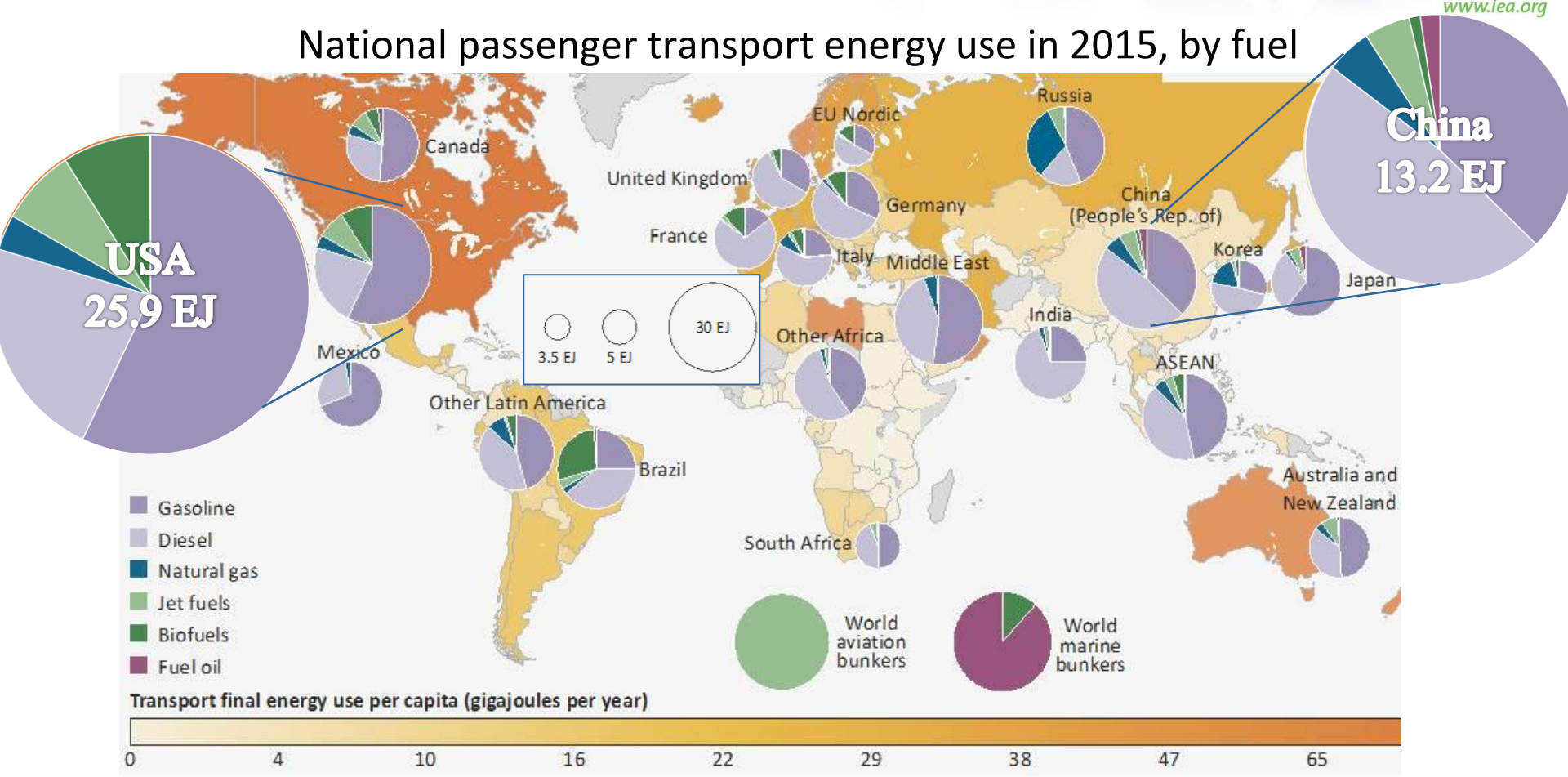
National passenger transport energy use in 2015, by fuel



While China's activity is almost 50% higher than in the US…

Its total energy use is only a bit more than half that of the US

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Need to decouple activity & emissions

Avoid/shift, vehicle efficiency, low carbon fuels

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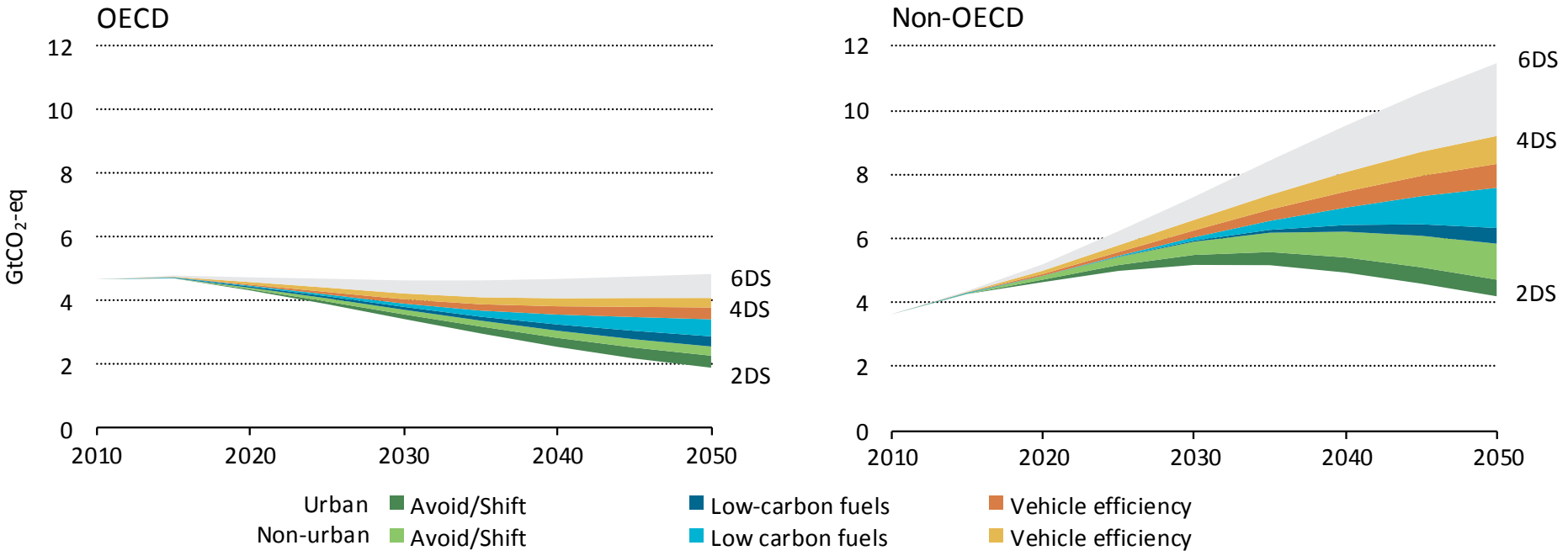
GHG Emissions in the 2DS, 4DS, and 6DS – 2010 to 2050



OECD transport emissions have peaked, while Non-OECD transport emissions can be brought back to current levels in 2050

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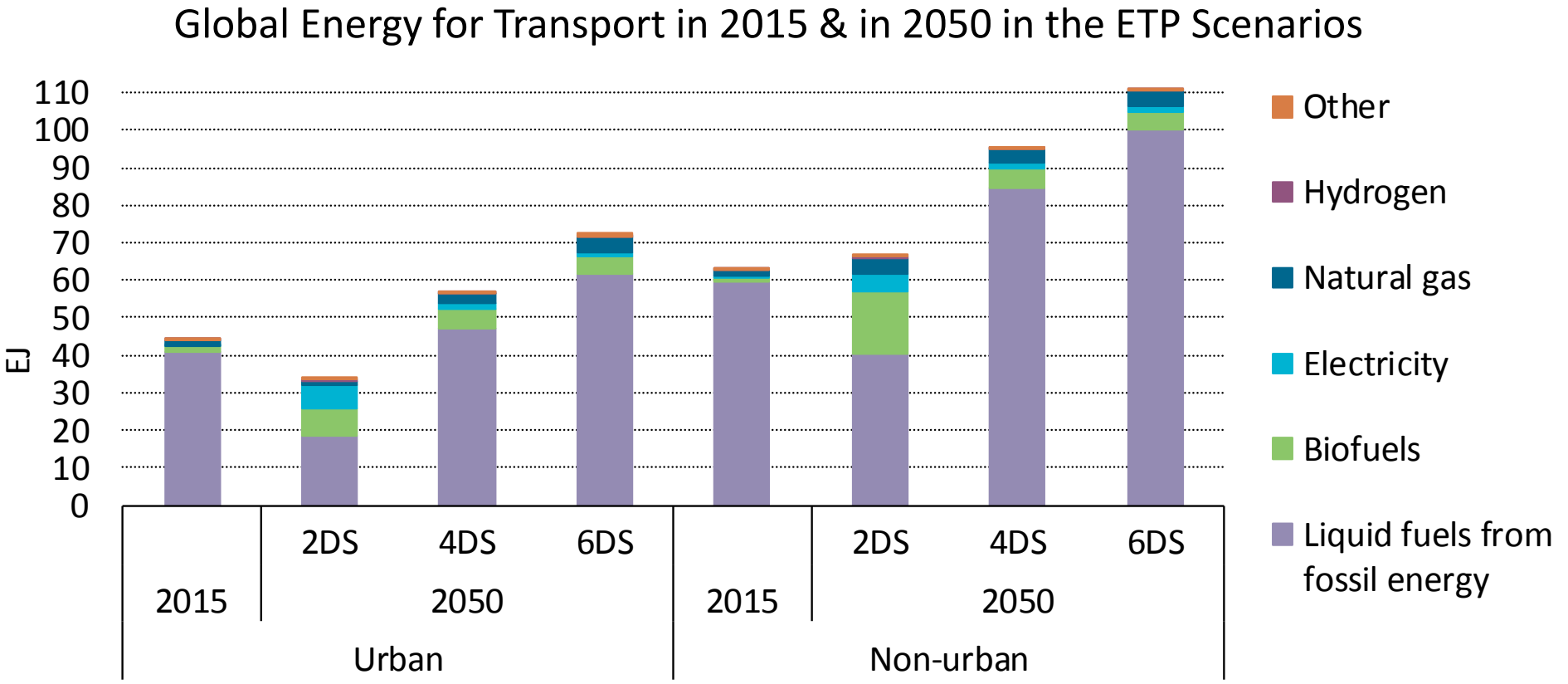
Transport energy demand projections

Policy and technology have great potential



2DS sees a net global decline in transport energy demand, but not in all regions

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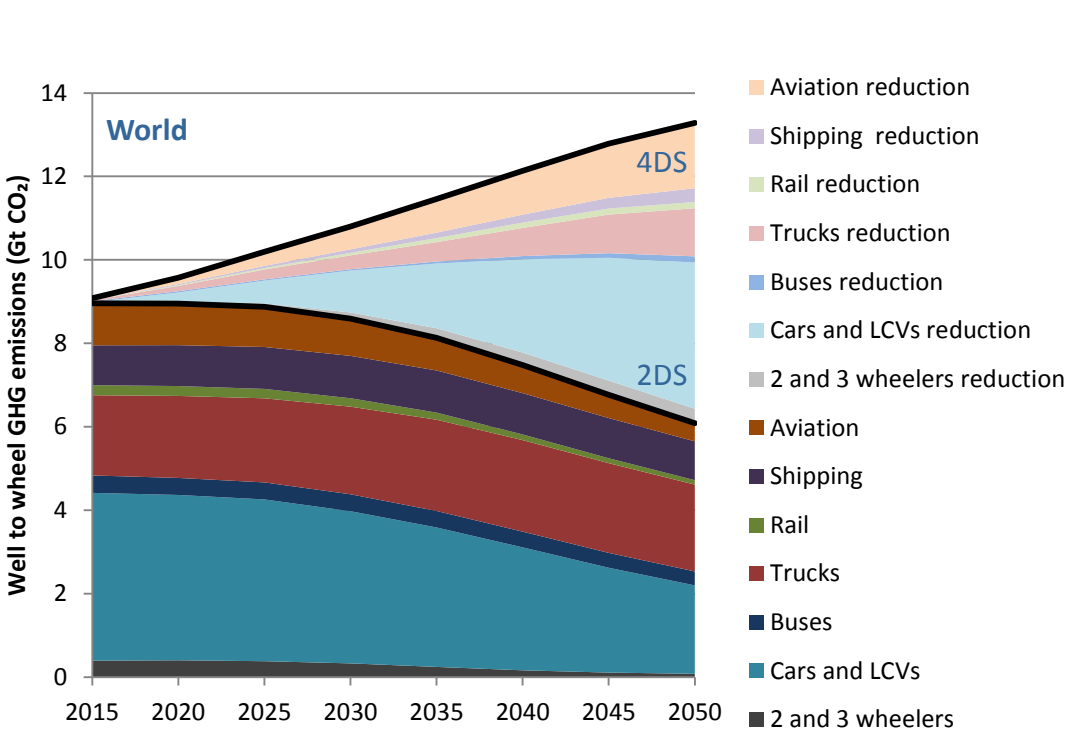
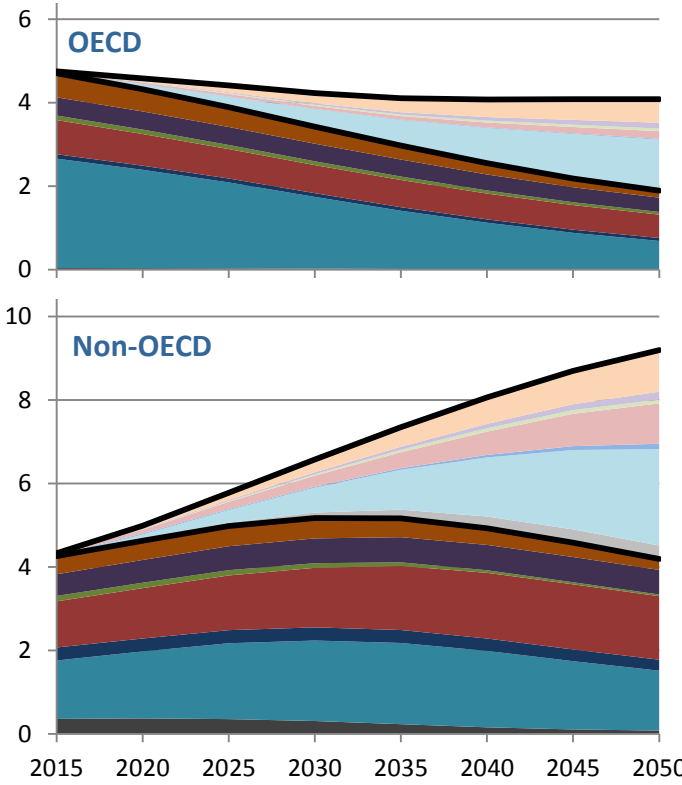
GHG emission projections

Current ETP scenarios - Transport





Moving below 2DS reductions in transport will require action in all transport modes

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IEA 2DS level of ambitions – How can we move beyond?

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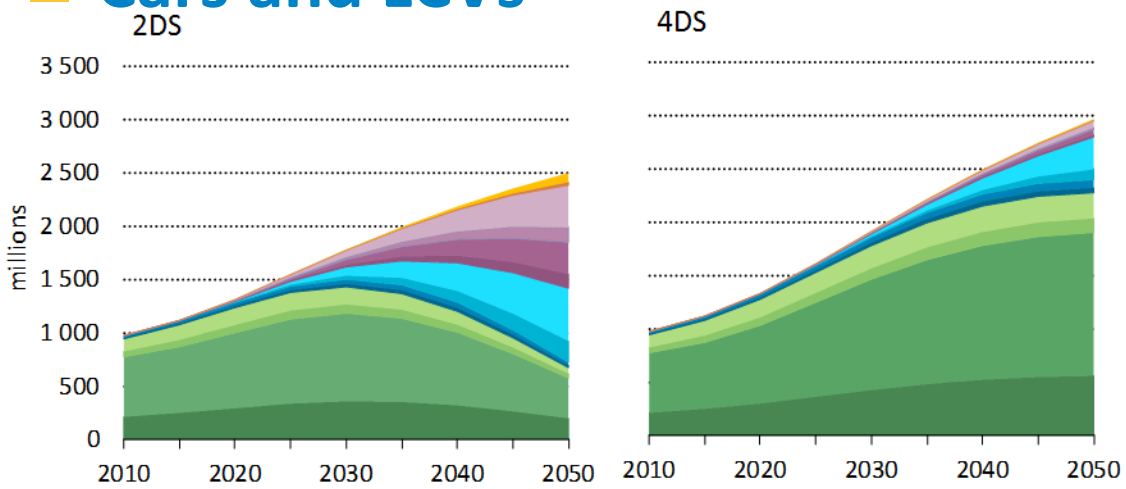
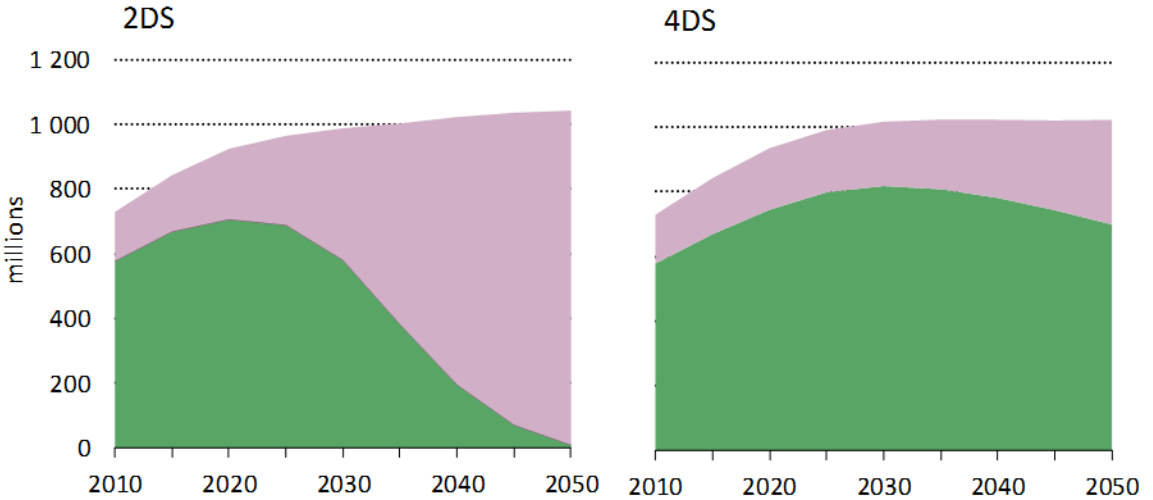
Cars and LCVs



2050 4DS-2DS emission cuts over 4DS baseline: **62%**

MEDIUM-HIGH

2-3 Wheelers



2050 4DS-2DS emission cuts over 4DS baseline: **82%**

HIGH

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IEA 2DS level of ambitions – How can we move beyond?

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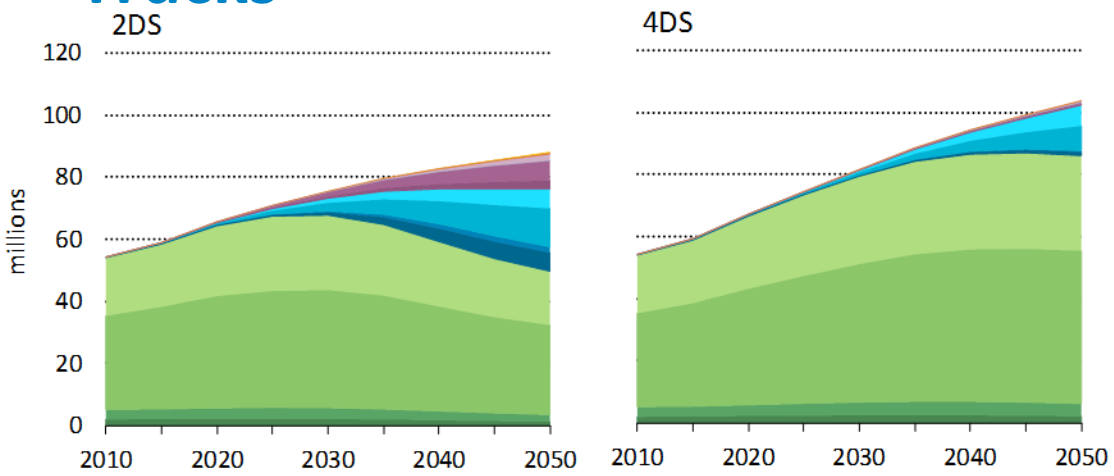
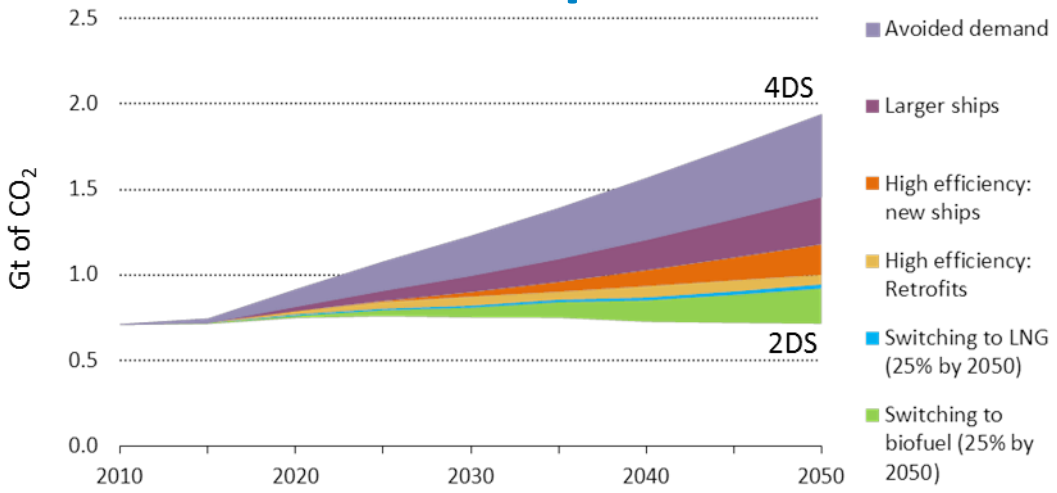
Trucks



2050 4DS-2DS emission cuts over 4DS baseline: **36%**

LOW

Maritime transport



Preliminary results of updated projections (higher 4DS, stabilization in 2DS)

2050 4DS-2DS emission cuts over 4DS baseline: **63%**

MEDIUM-HIGH

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IEA 2DS level of ambitions – How can we move beyond?

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Aviation

ATAG AIR TRANSPORT ACTION GROUP

"the only global industry-wide body to bring together all aviation industry players so that they can speak with one voice"

Stabilise

From 2020, net carbon emissions from aviation will be capped through carbon neutral growth.

50%

By 2050, net aviation carbon emissions will be half of what they were in 2005.

Source: http://www.atag.org/facts-and-figures.html

IEA 2DS reflects ATAG goals without taking into account of any offset

2050 4DS-2DS emission cuts over 4DS baseline: **78%**

HIGH

Cross-cutting Technologies

- Biofuels
- Hydrogen

Non-Technology Options

- Modal Shifts
- Urban Design/Logistics

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IEA 2DS level of ambitions – How can we move beyond?

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Implementing actions

Scope	Policy category	Impact		
		Avoid/Shift	Vehicle efficiency	Low carbon fuels
Local	Pricing (congestion charges, tolls parking fees)		Possible	
	Regulatory (access & parking restrictions, low emission zones)		Possible	Minor
	Public transport investments		Possible	
	Compact city			
National	Fuel taxation			Possible
	Fuel economy regulations			Possible
	Vehicle taxation, feebates	Possible		Possible
	Low carbon fuel standards			
	Alternative fuel mandates			
	RD&D support			

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Sustainable Transport Systems analysis: the IEA Mobility Model and ETP

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- Foundation of transport-related analysis in the IEA
- Projections to 2050+, 29 global regions (including most of G20), all transportation modes except pipelines
- Assess urban and non-urban activity, energy use, emissions (GHG, pollutants), infrastructure and materials demand
- Shared with OECD Directorates (TAD), ITF
- Developed in the framework of a partnership with major industrial and governmental stakeholders, some academic institutions and NGOs (MoMo partnership)

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Sustainable Transport Systems analysis: the IEA Mobility Model and ETP

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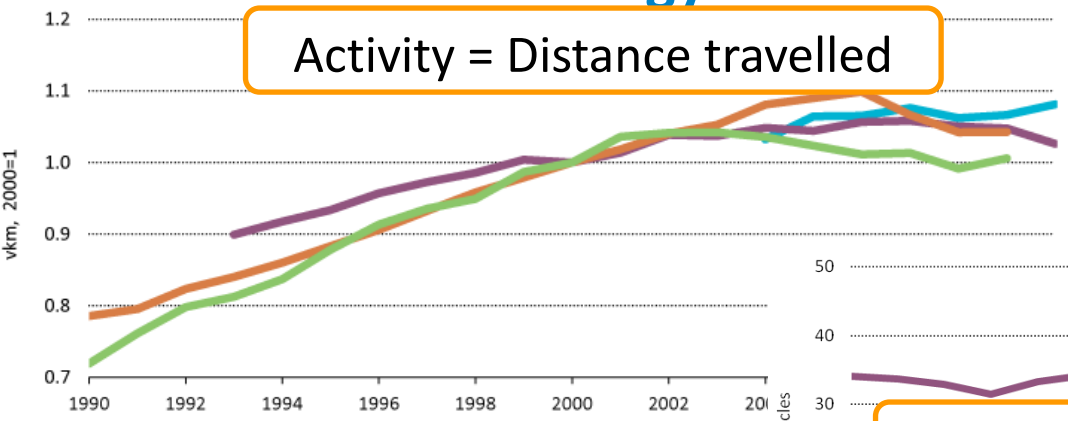
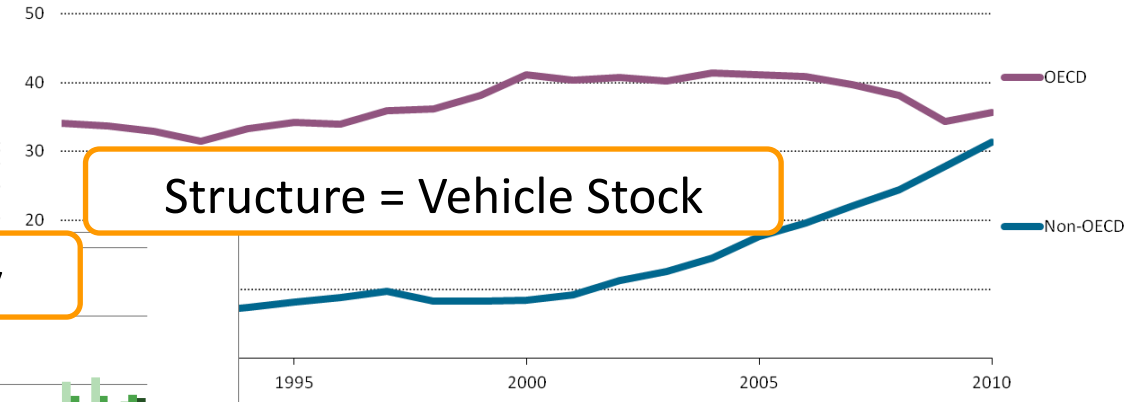
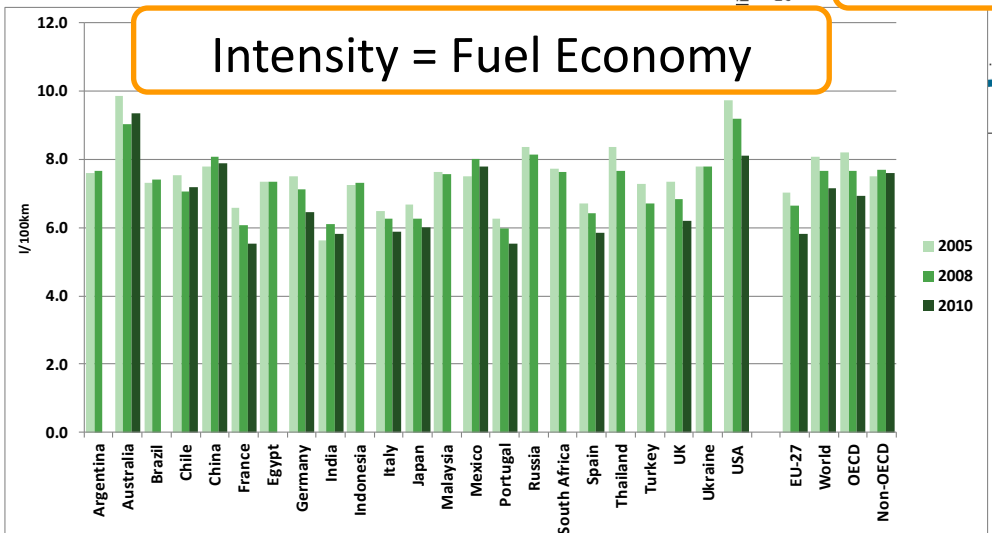
- **ETP uses ASIF (activity–structure–intensity–fuel) methodology**







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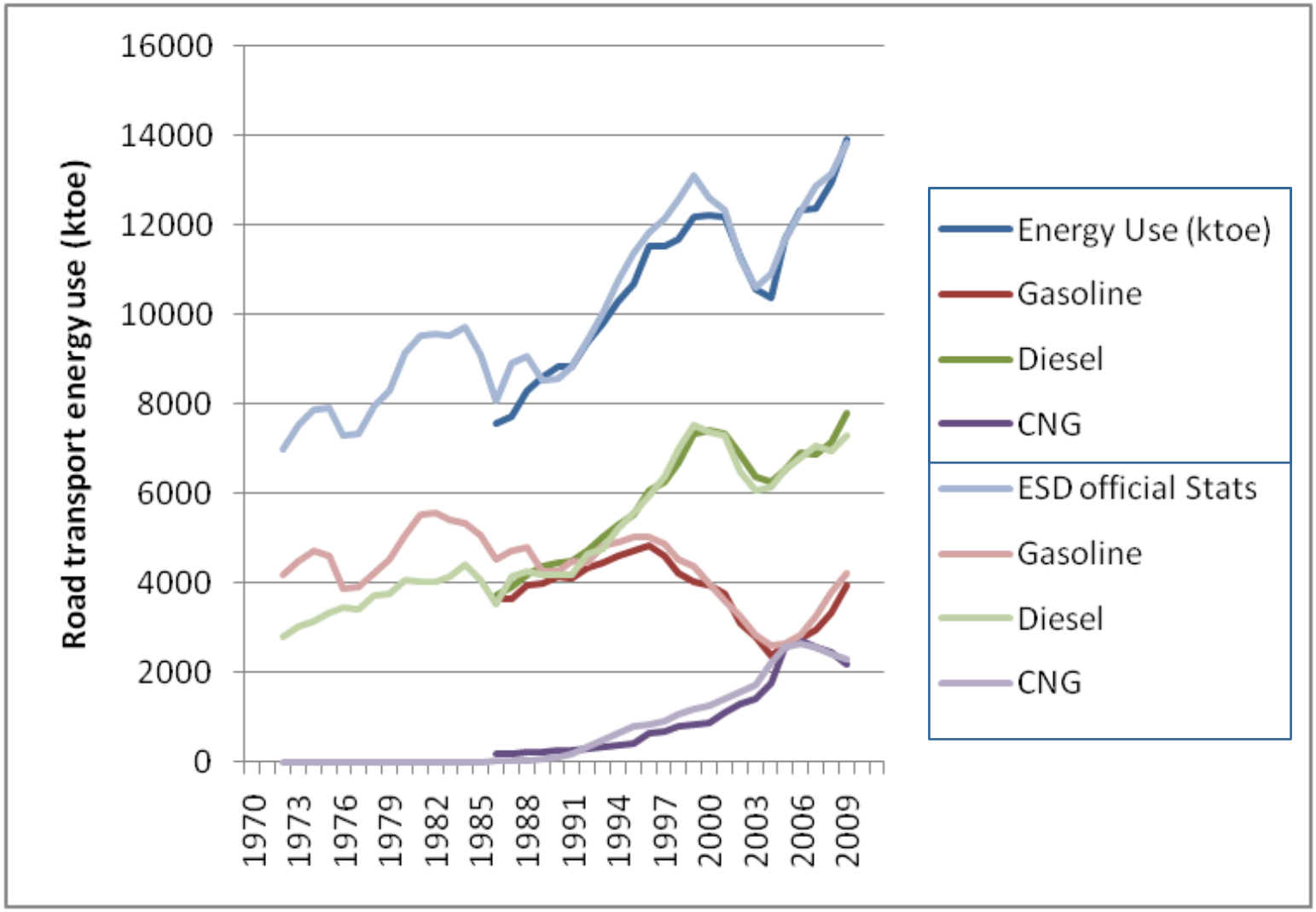
IEA data coverage and transparency – Understanding energy use patterns

- Fuel use in Argentina



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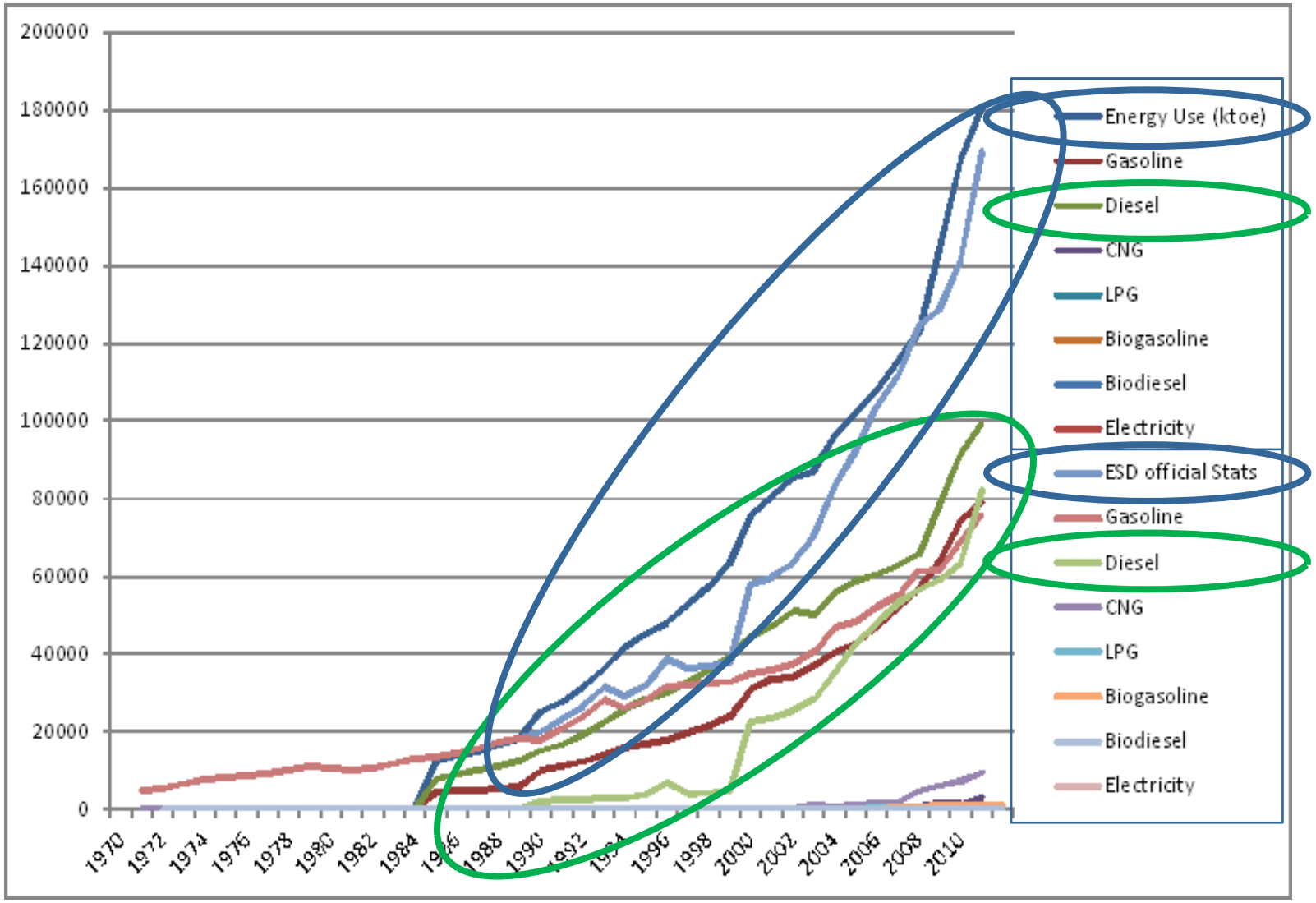
IEA data coverage and transparency – Understanding energy use patterns

- Fuel use in China



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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

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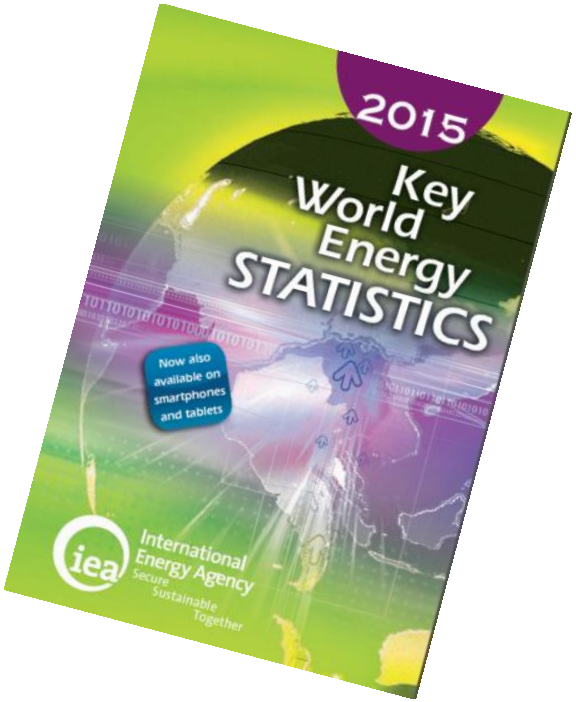
Thank you

Explore the data behind *ETP*

www.iea.org/etp



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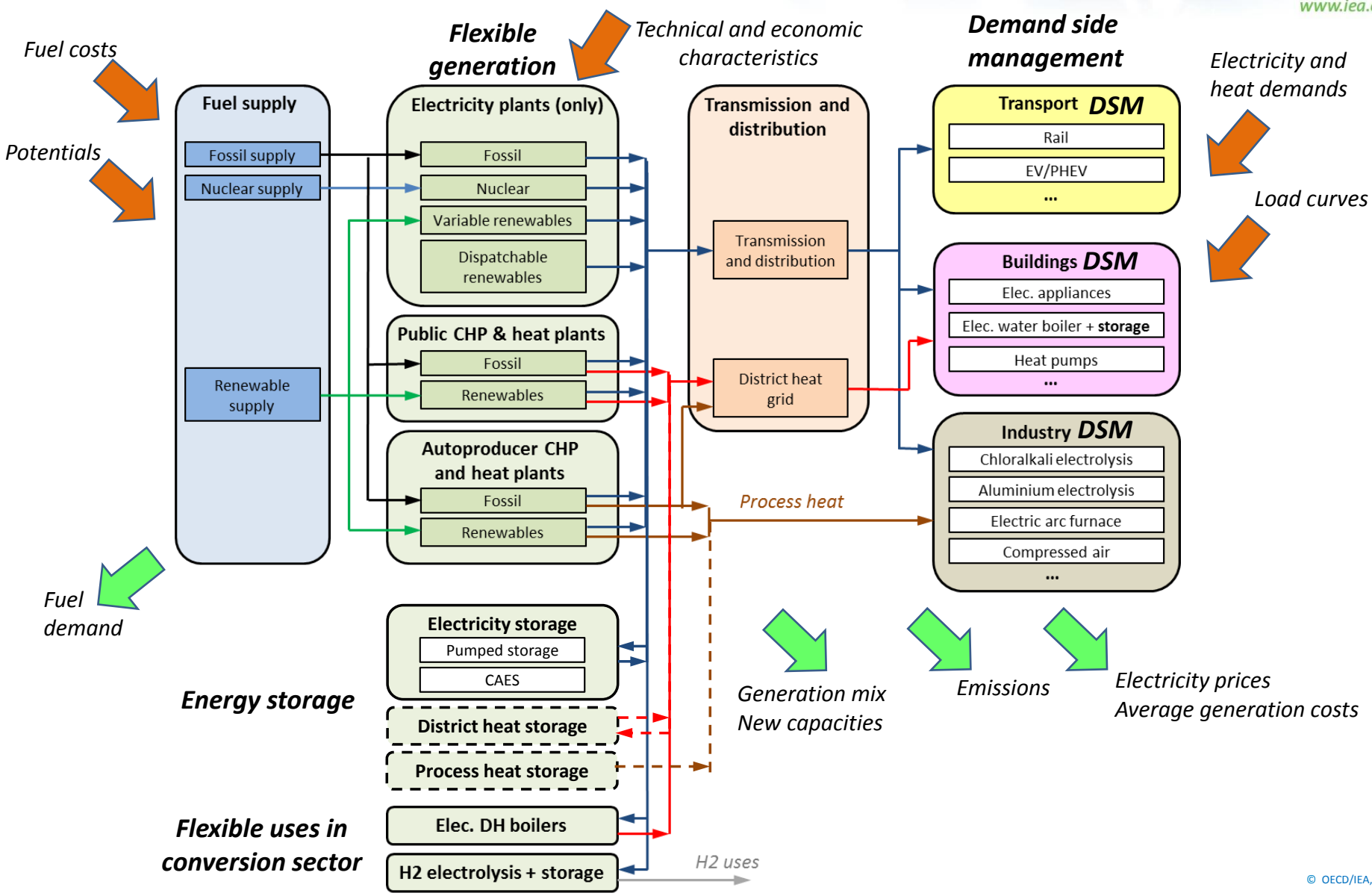
Looking at interactions between energy technologies



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