

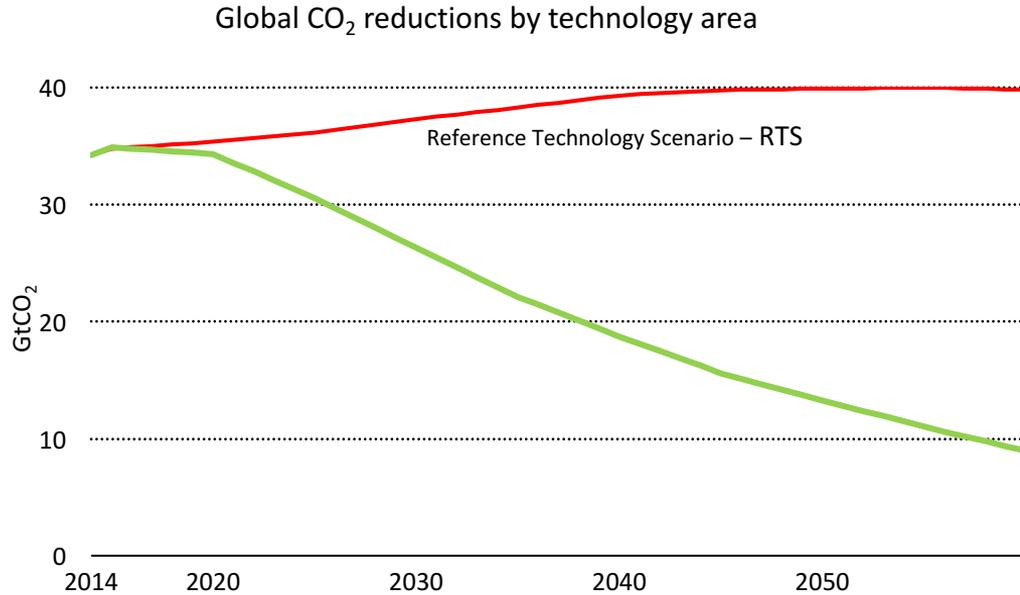


Steering transport toward sustainability – A “beyond 2 degrees” trajectory for transport

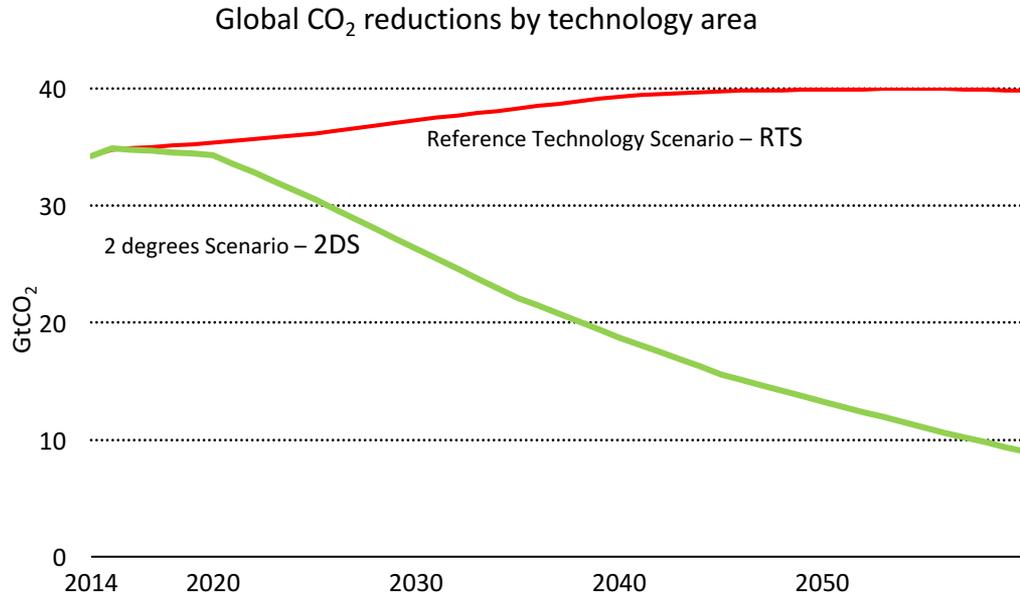
Jacob Teter, IEA

ITEM3, 26 October 2017

Technology area contribution to global cumulative CO₂ reductions

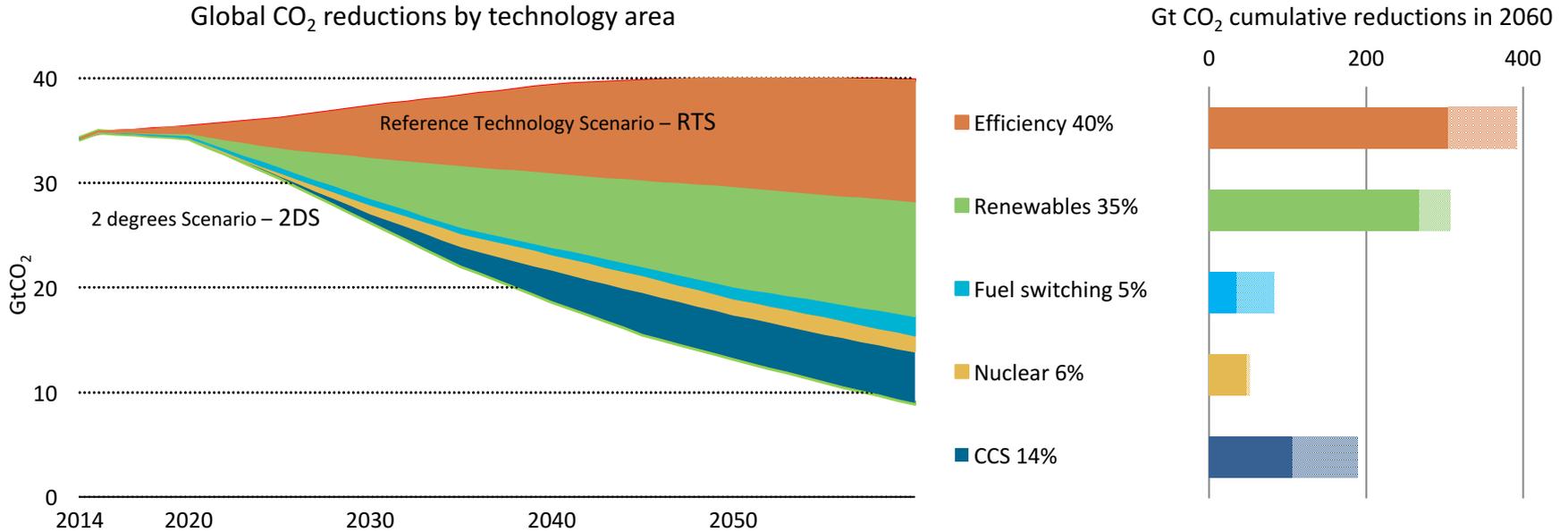


Technology area contribution to global cumulative CO₂ reductions

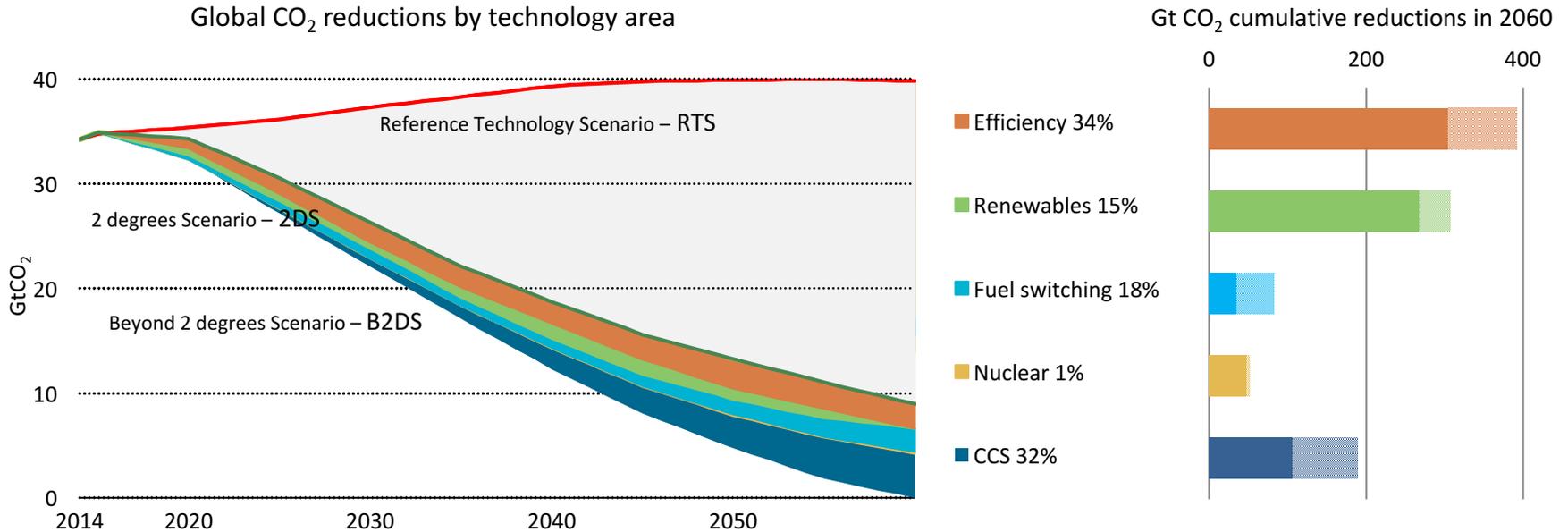


How far can technology take us?

Technology area contribution to global cumulative CO₂ reductions



Technology area contribution to global cumulative CO₂ reductions



Pushing energy technology to achieve carbon neutrality by 2060 could meet the mid-point of the range of ambitions expressed in Paris.

Transport accounts for 28% of global final energy demand and 23% of global carbon dioxide (CO₂) emissions from fuel combustion. In 2014, the transport sector consumed 65% of global oil final energy demand.

Decarbonising the sector requires:

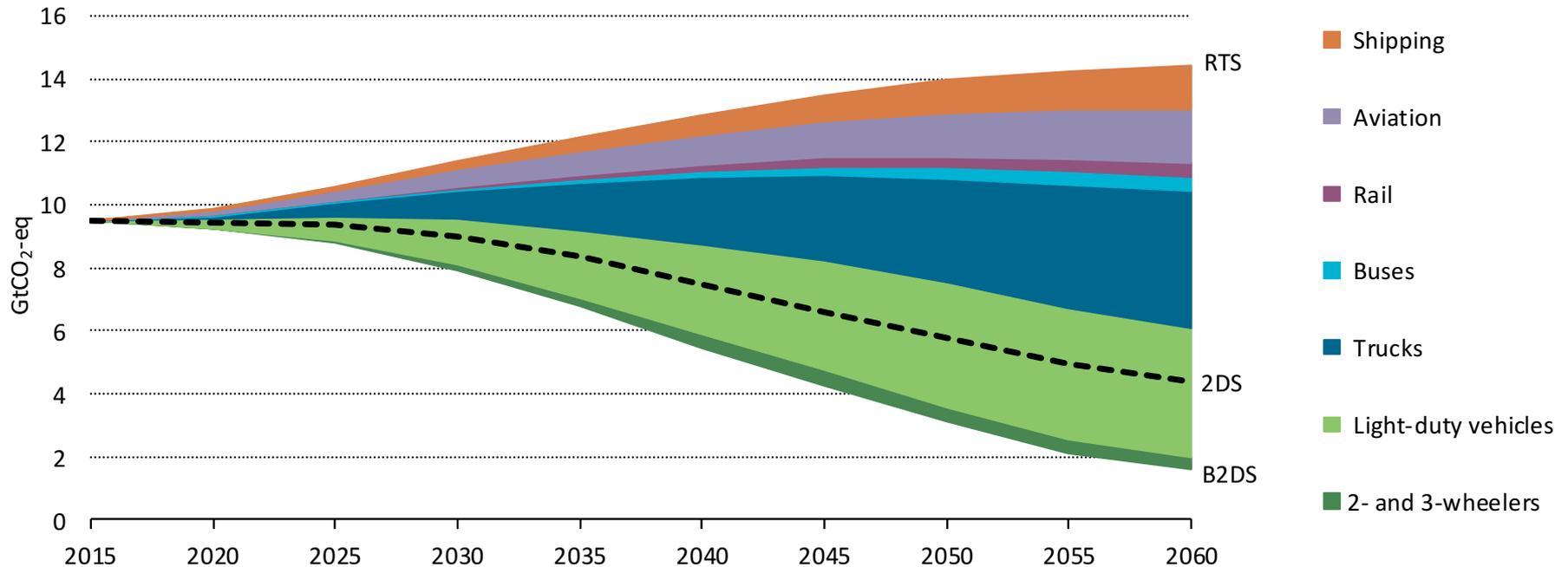
- changing the nature and the structure of transport demand,
- major improvements in efficiency,
- and rapid transitions in the energy mix used to move people and goods.

Decarbonising long-distance transport modes – in particular aviation, heavy-duty road transport (i.e. trucking and buses) and shipping – is most challenging.

- **Fuel taxes** that reflect life-cycle GHG emissions intensities
- **Regulatory measures**, including in particular fuel economy standards
- **Economic instruments**, such as differentiated taxes on vehicle purchase
- Policies to transition to **ultra-low and zero-emission technologies**
- **Local policies**
- Public funding to support **research, development, demonstration** and deployment of crucial decarbonisation technologies and infrastructure.
- As low carbon energy carriers take hold, the taxation of transport needs to shift towards **road pricing**

Ambitious policy action is needed across all transport modes

Well-to-wheel greenhouse gas emission reductions by mode 2015-2060

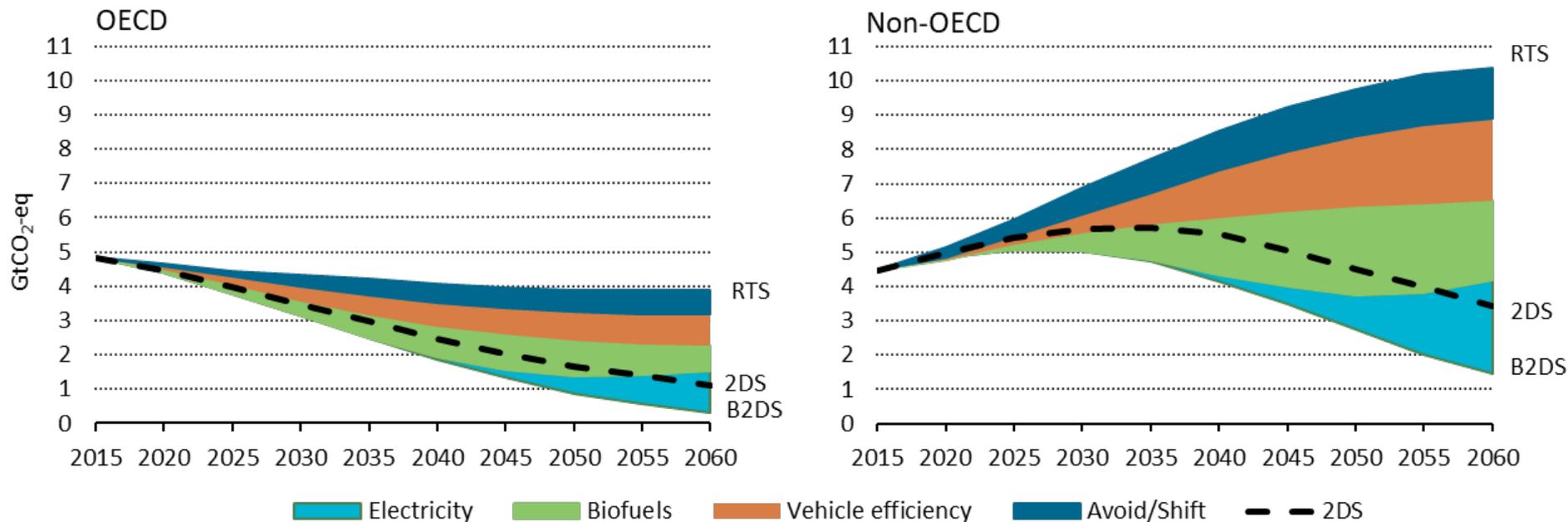


WTW GHG emissions from transport are 89% lower in 2060 than in 2015 in the B2DS, while in the 2DS they decline by 54% over the same period. All modes contribute to decarbonisation.

Measures are needed across the developed and developing world



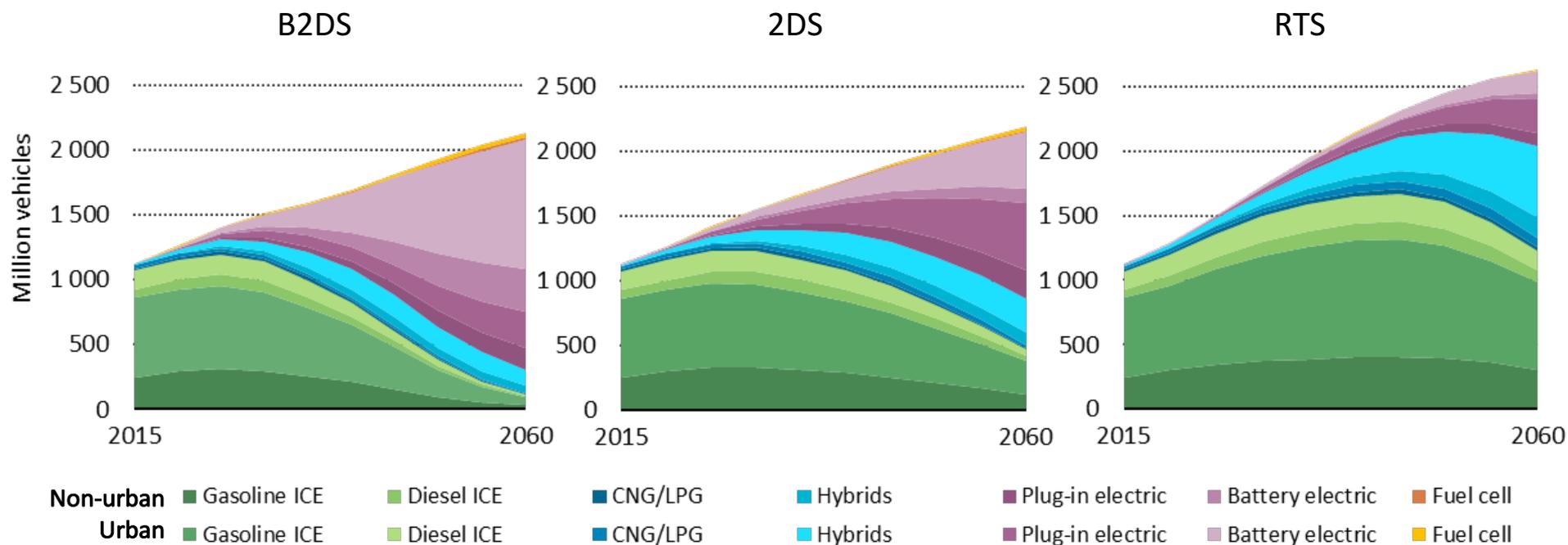
Well-to-wheel greenhouse gas emissions in OECD and non-OECD countries by scenario, 2015-2060



Achieving the B2DS target requires OECD countries to reduce WTW GHG emissions by 90% and non-OECD countries by 66% from 2015 levels by 2060.

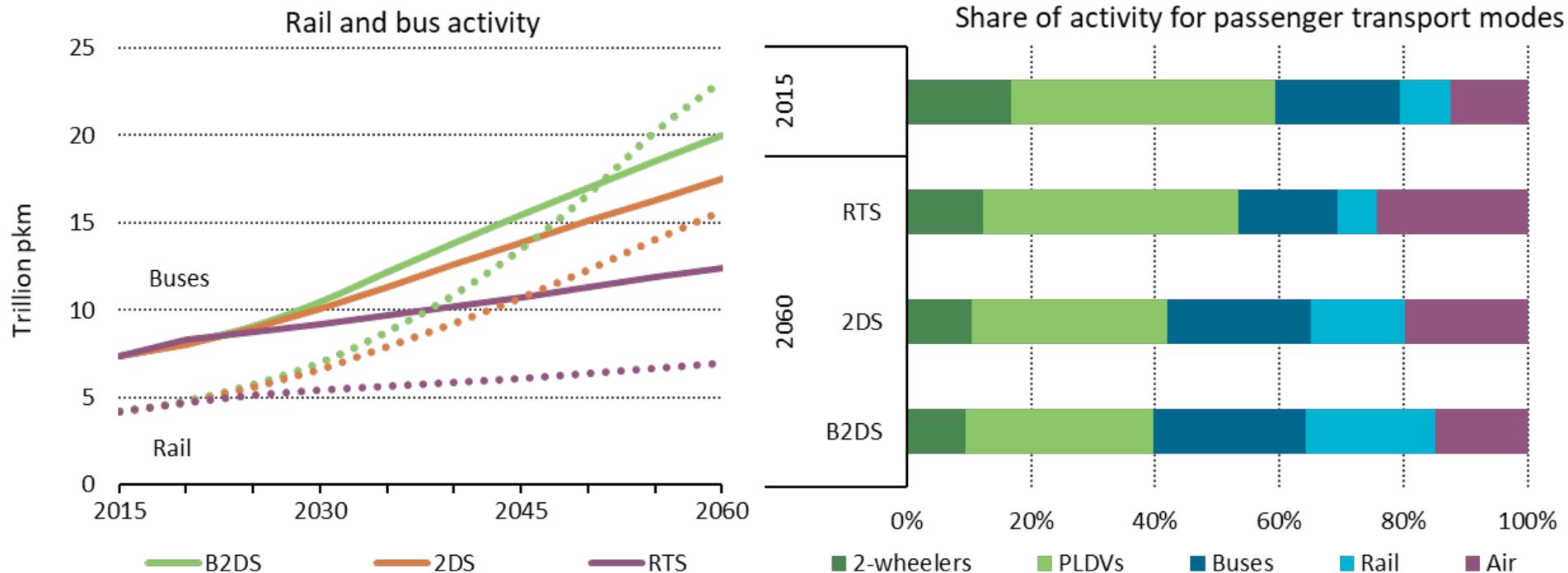
Rapid electrification of light-duty fleet drives deep decarbonisation

Global technology penetrations in the Light-Duty Vehicle (LDV) stock by scenario, 2015-2060



By 2060, the share of alternative powertrain vehicles in the global LDV stock will reach 94% in the B2DS and 77% in the 2DS.

Bus and rail activity by scenario and passenger transport activity by mode, 2015-2060

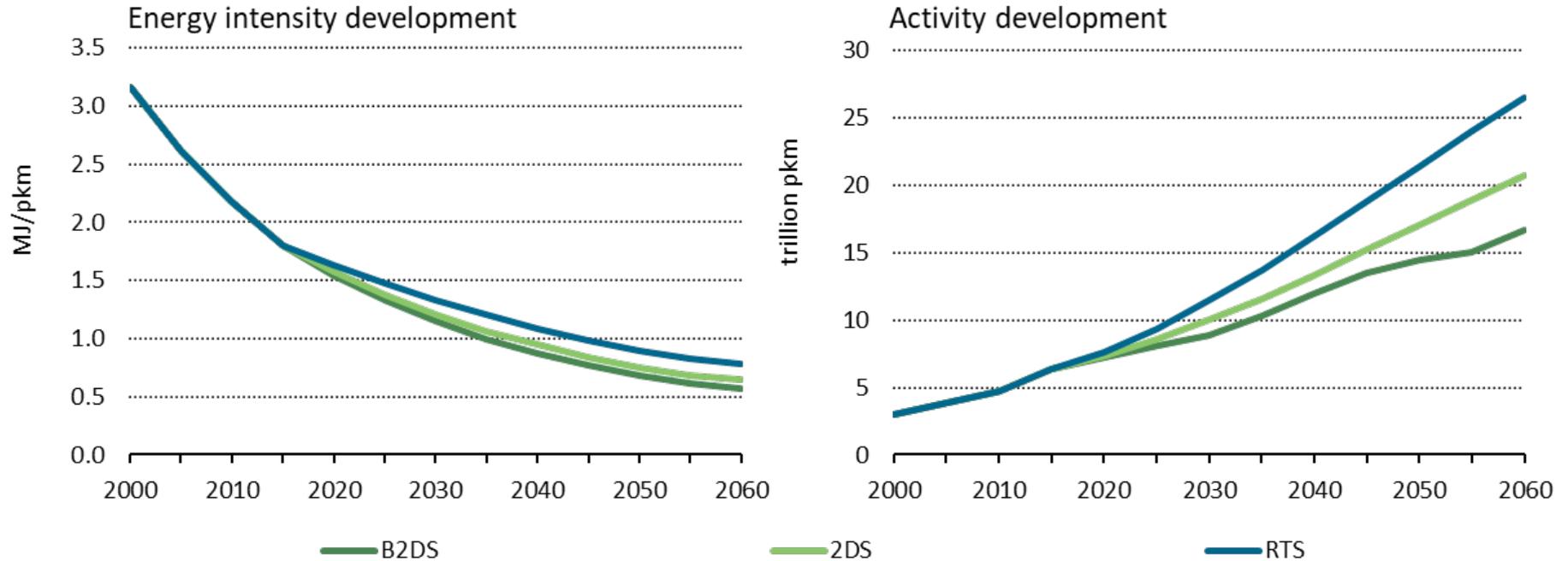


Measures to shift and to avoid passenger transport result in a 25%-27% reduction in passenger activity (passenger kilometres [pkm]) on cars by 2060, relative to the RTS

To curb aviation emissions, focus on efficiency and mode shift



Energy intensity improvements in global aviation by scenario

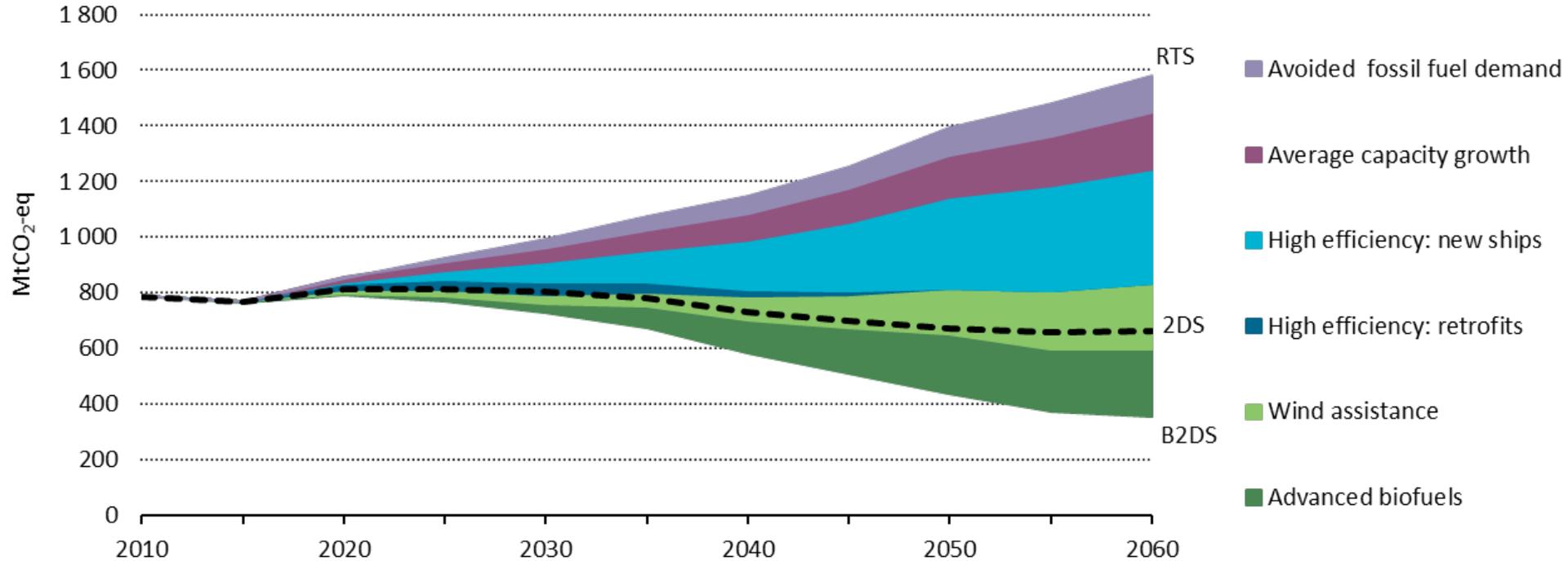


International aviation experiences strong activity growth and continuously improves fuel economy of the fleet in each scenario.

In international shipping, a broad portfolio of measures is needed



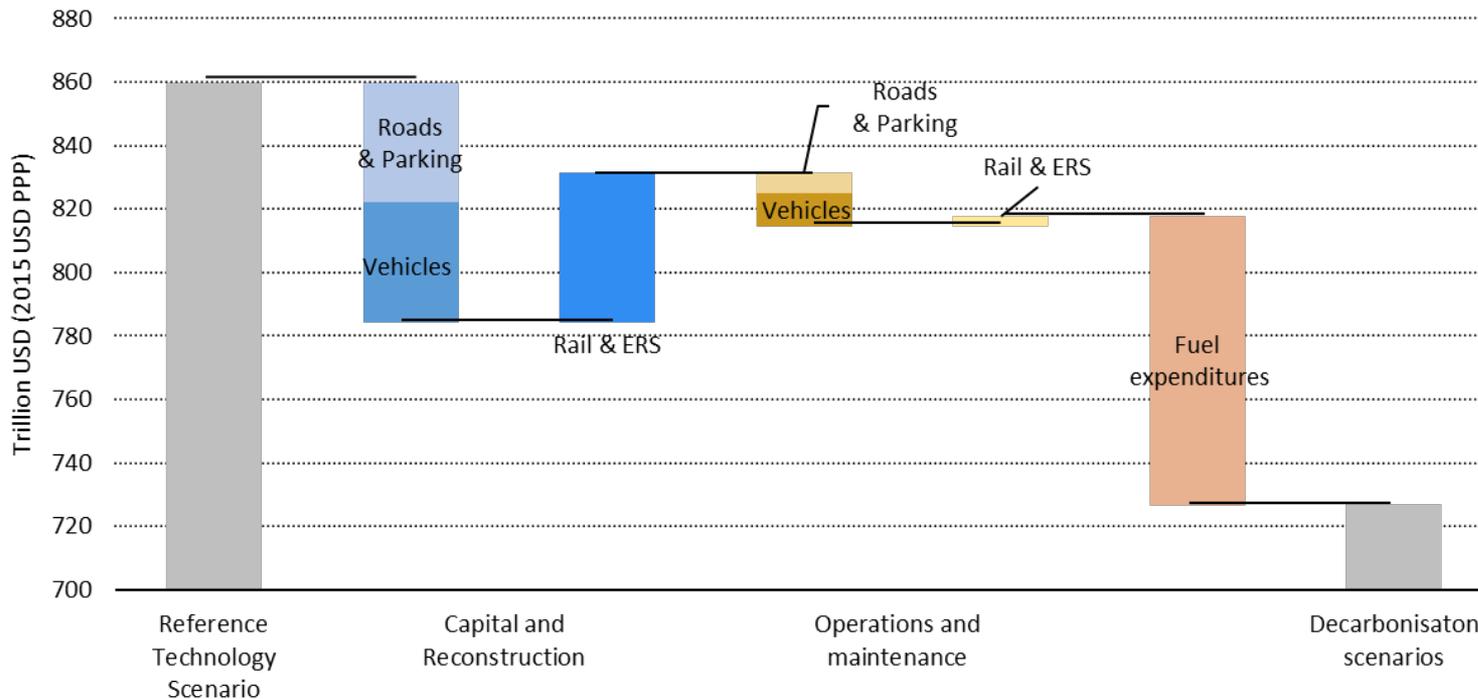
WTW GHG emissions in international shipping in the B2DS relative to RTS



The largest share of GHG abatement in shipping results from operational and technological efficiency improvement combined with wind assistance in the B2DS.

Expenditures on vehicles, infrastructure and fuels

Cumulative investment needs by scenario, 2017-2060



Decarbonising transport saves more than USD 100 trillion in the period to 2060, or about 1% of cumulative global GDP, mostly from reduced expenditures on road vehicles, roads and fuel.

