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Energy Agency

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Role of bioenergy and transport biofuels in energy and climate scenarios

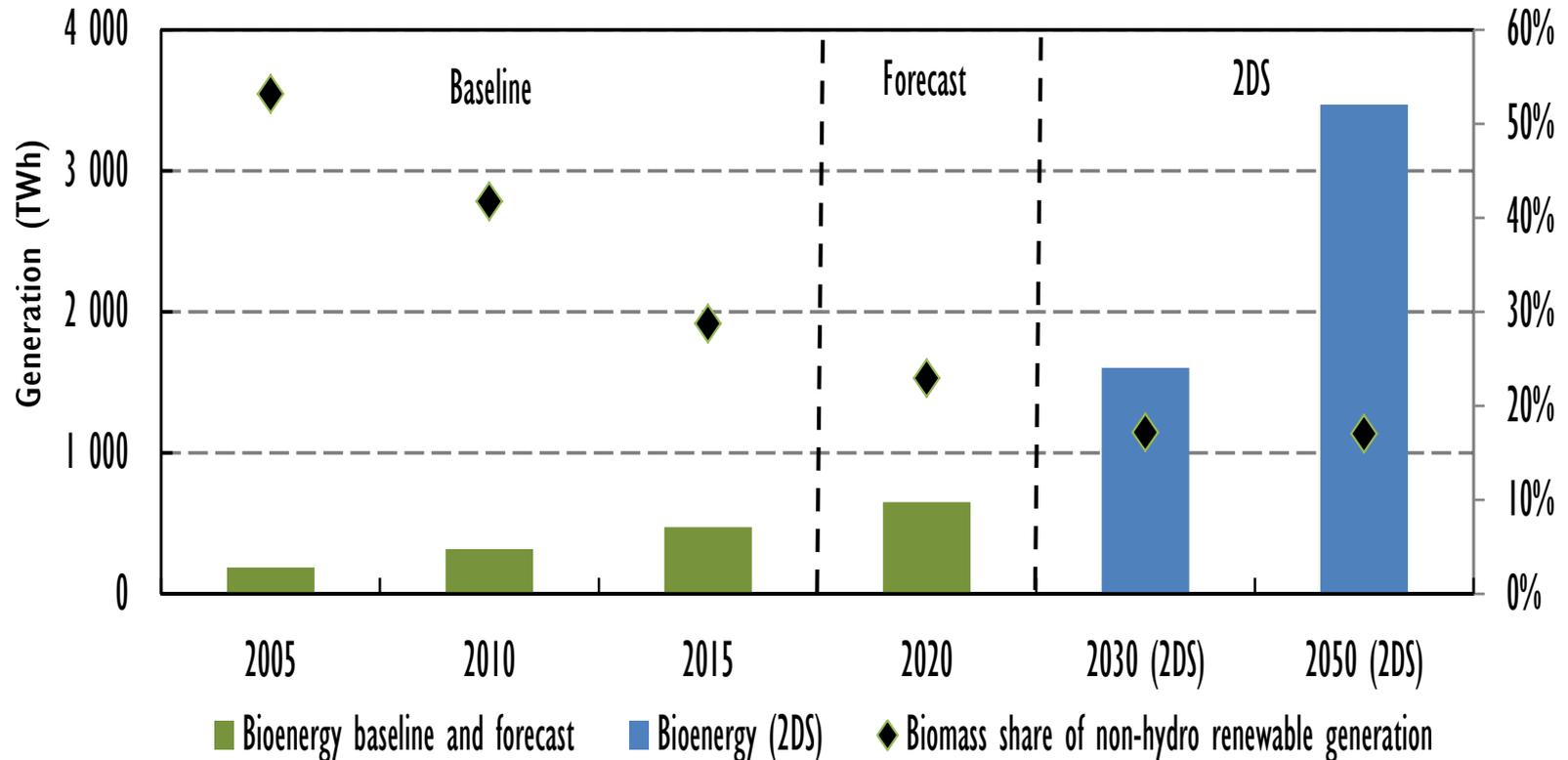
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*Biofuture Platform All-Member Meeting,
IRENA Headquarters - Abu Dhabi, 19 January 2017*

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Biomass forms part of a portfolio of renewable options for the power sector

Global power generation from bioenergy

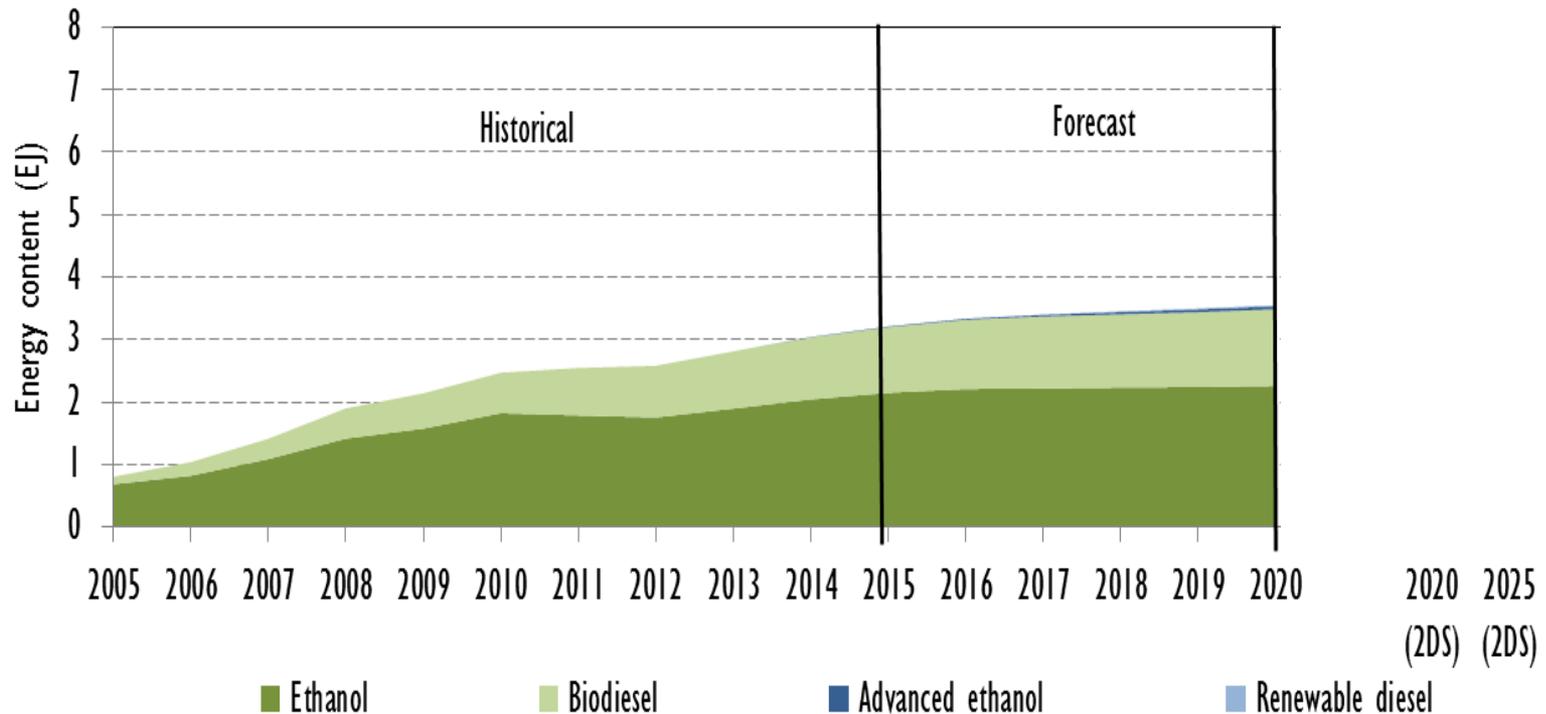


Biomass electricity generation needs to more than triple over 2015-30 to keep on track with 2DS needs. However, its share of non-hydro generation is on a downward trend due to faster growth of onshore wind and solar PV.

Accelerated growth is required to meet climate change objectives for transport biofuels



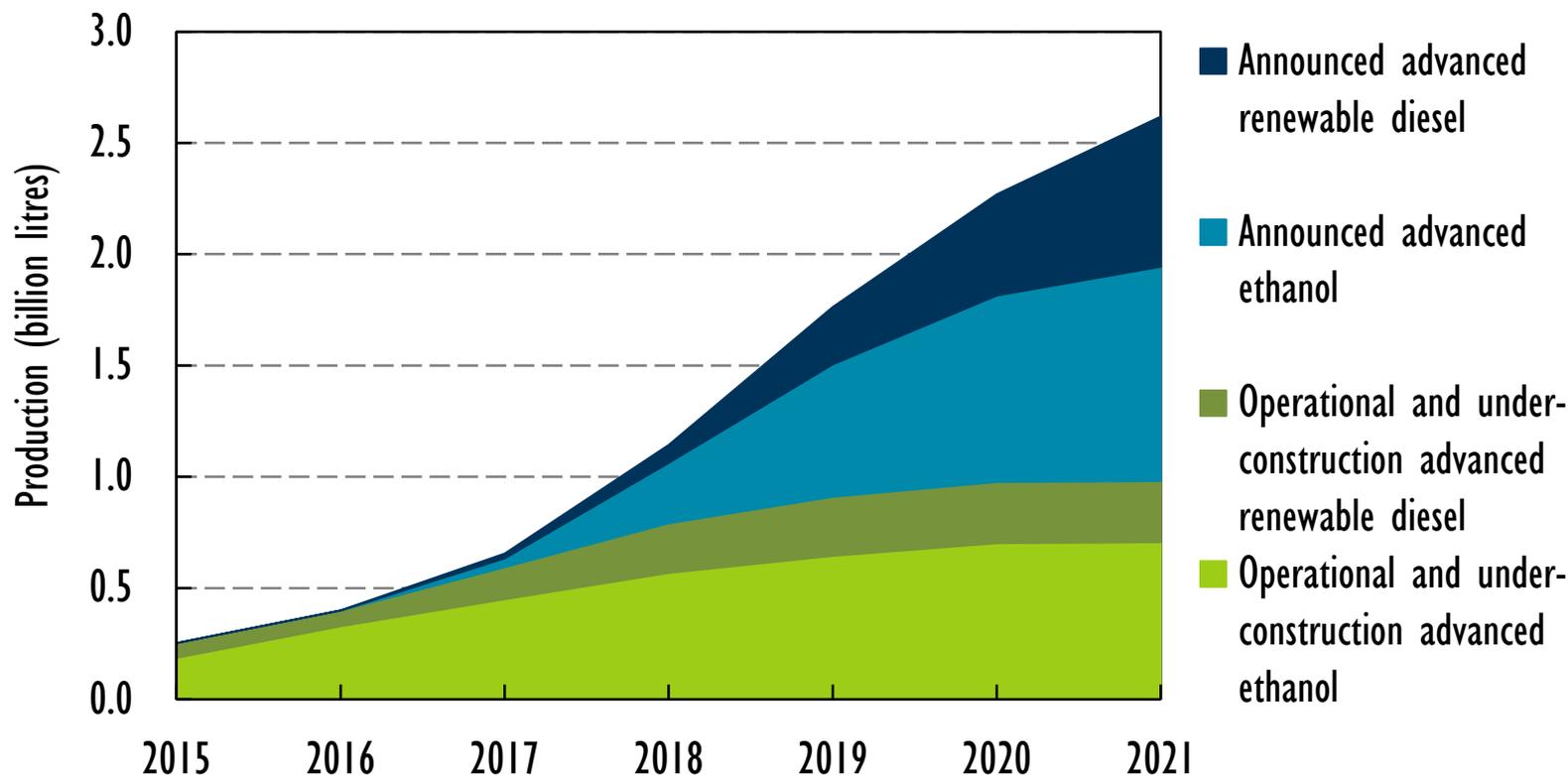
Global biofuels production and medium-term forecast compared with current IEA 2DS scenario requirements



A significant advanced biofuels contribution, alongside improved fuel economy and EV roll-out, is central to decarbonisation of the transport sector.

Advanced biofuels anticipated to scale up from current production levels

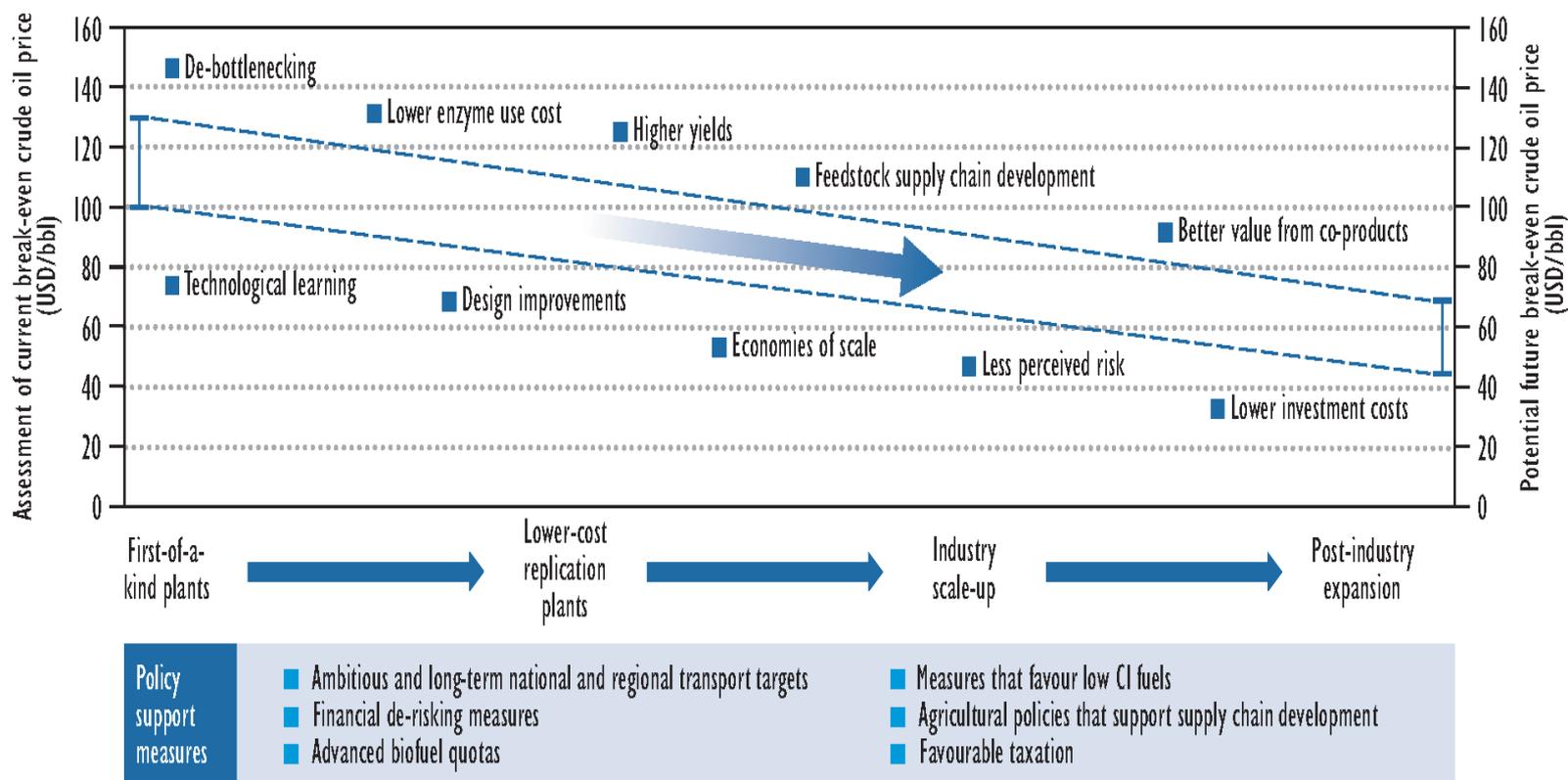
Advanced biofuels production forecast, 2015-21



Advanced biofuels are needed in the longer term to sustainably reduce the overall carbon footprint of the transport sector, but the industry remains in an early stage of development.

Significant cost reduction potential identified for cellulosic ethanol

Cellulosic ethanol cost reduction potential

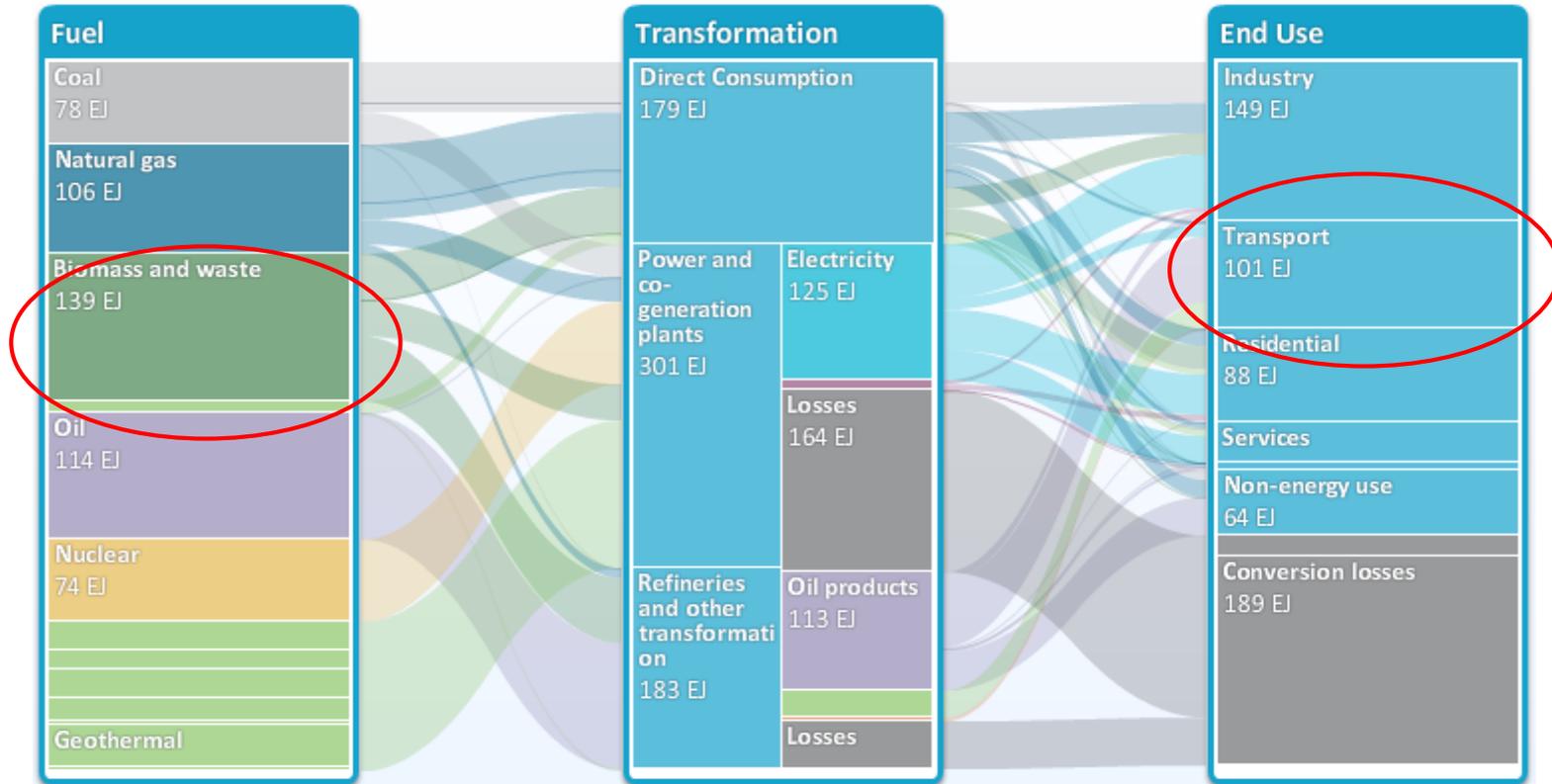


Industry expansion is anticipated to facilitate improved competitiveness of cellulosic ethanol, but more widespread policy support is needed to enable cost reduction potential.

Bioenergy is central to the long-term decarbonisation of the energy system

ETP
2016

Energy system in 2050 within the IEA's 2 degree scenario (2DS)



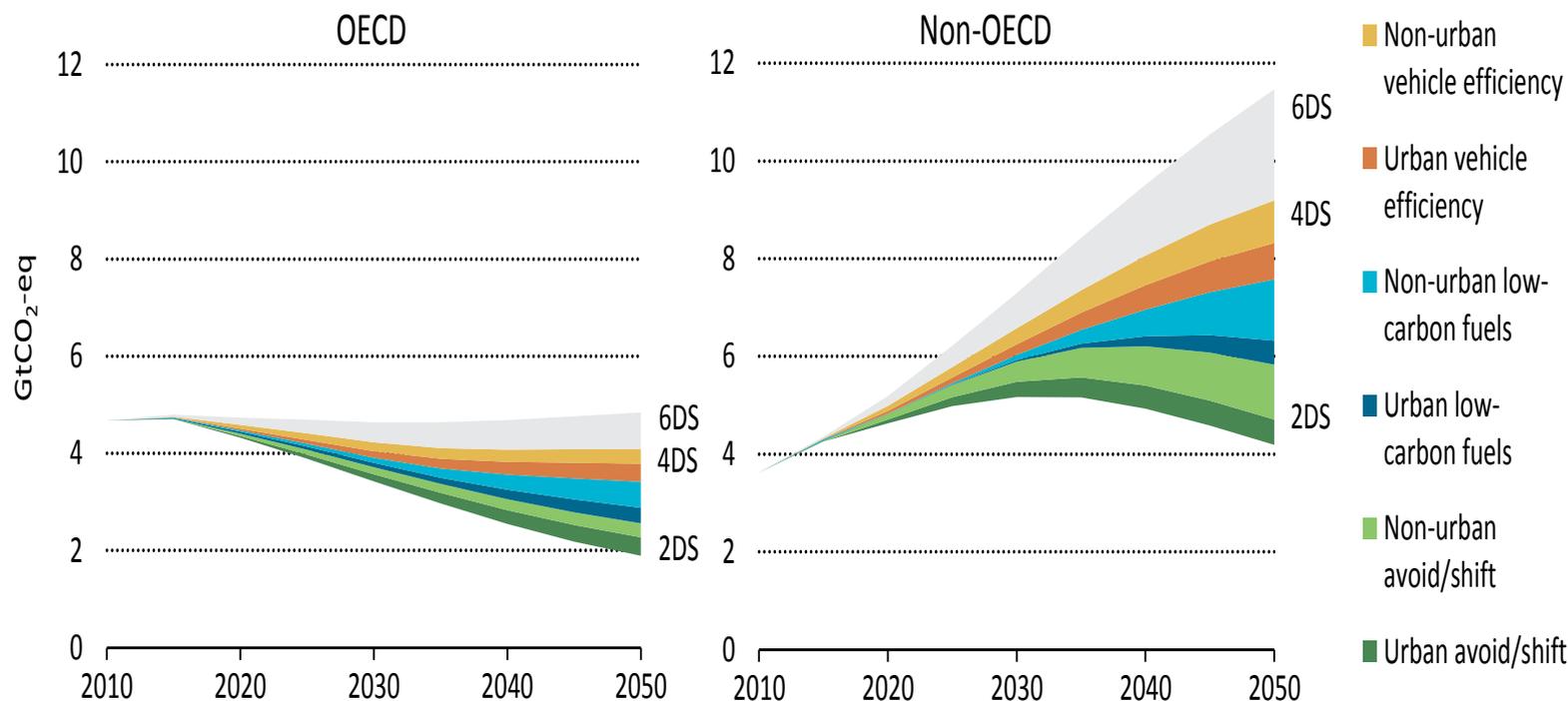
Source: IEA Energy Technology Perspectives (ETP) 2016.

In the IEA 2DS biomass and waste become the principal primary energy source in 2050

The key transport decarbonisation challenge lies in non-OECD countries

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OECD and non-OECD WTW GHG emissions from the 6DS to the 2DS

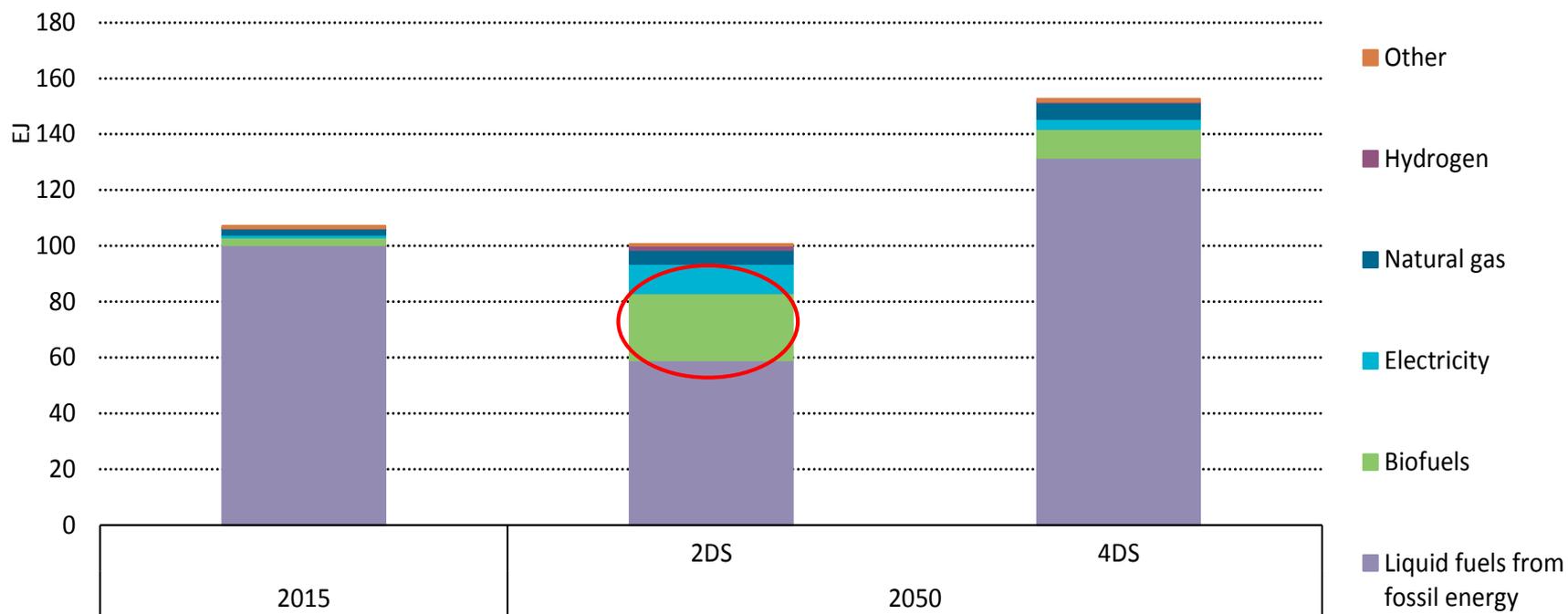


Meeting the 2DS requires ambitious policies across all transport modes, with roles for a range of low carbon fuels, vehicle efficiency improvements and modal shifts.

Transport biofuels play an important role in the 2DS

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Transport fuel demand comparison 2015 with 2DS and 4Ds in 2050

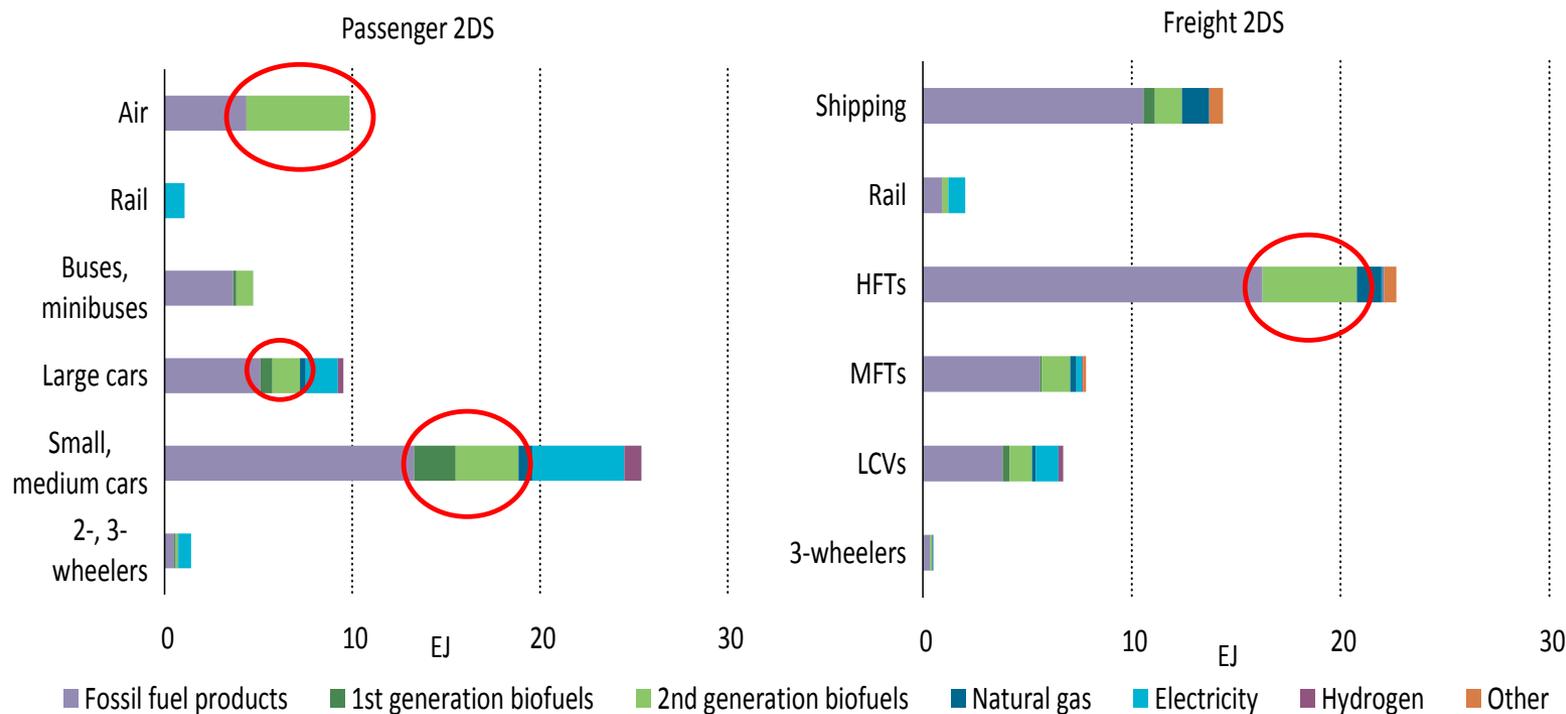


A significantly increased biofuels share is essential to move towards a 2DS in the transport sector.

Biofuels have a role to play across both passenger and freight transport

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Fuel shares in 2050 for passenger and freight modes by scenario

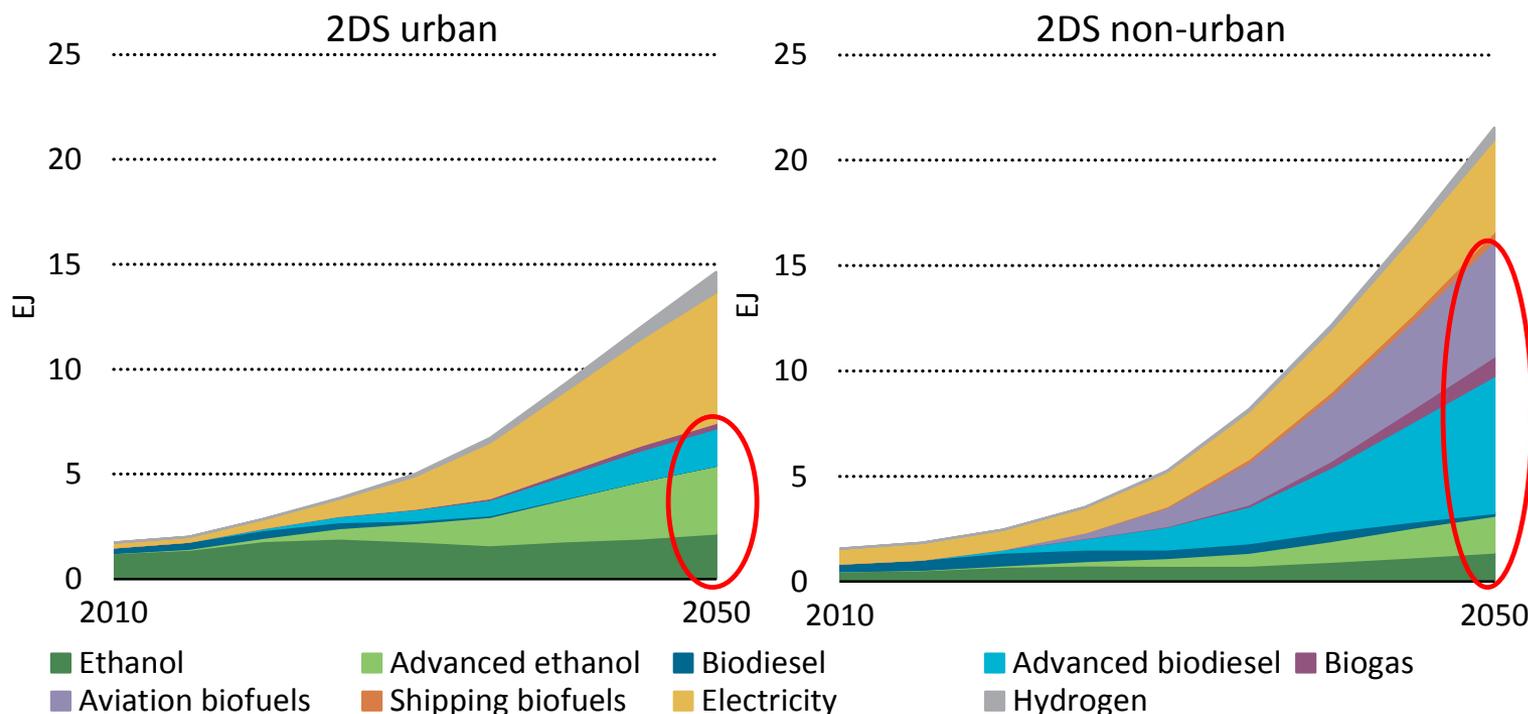


Conventional, and to a greater extent advanced, biofuels make key contributions within the 2DS by 2050. Especially in aviation and heavy duty road freight transport.

Commercialisation of a range of advanced biofuels needed by the 2DS

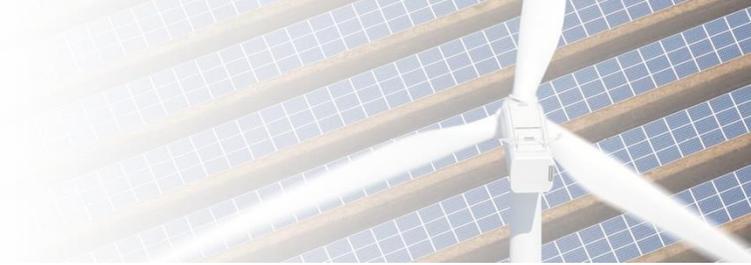
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Urban and non-urban contribution of fossil fuels alternatives within the 2DS



Electrified transport is crucial for urban transportation in 2050 within the 2DS, while non-urban mobility requires a range of biofuel solutions.

Concluding remarks



- **Bioenergy is an essential component of long-term low-C scenarios**
 - Both conventional and advanced biofuels have a key role to play in the IEA's 2DS for the transport sector
- **However, disconnect between current rates of market development and deployment needed within 2DS**
- **Important recent technology progress in advanced biofuels, but still a minor fraction of fuel supply in the medium-term**
- **Enhanced policy support is required in order to enable industry expansion and deliver lower investment and production costs**
- **The IEA is updating its Technology Roadmap on Bioenergy and stands ready to collaborate with the Biofuture platform.**