Opportunities for climate change mitigation from biofuels in the road transport sector in Norway

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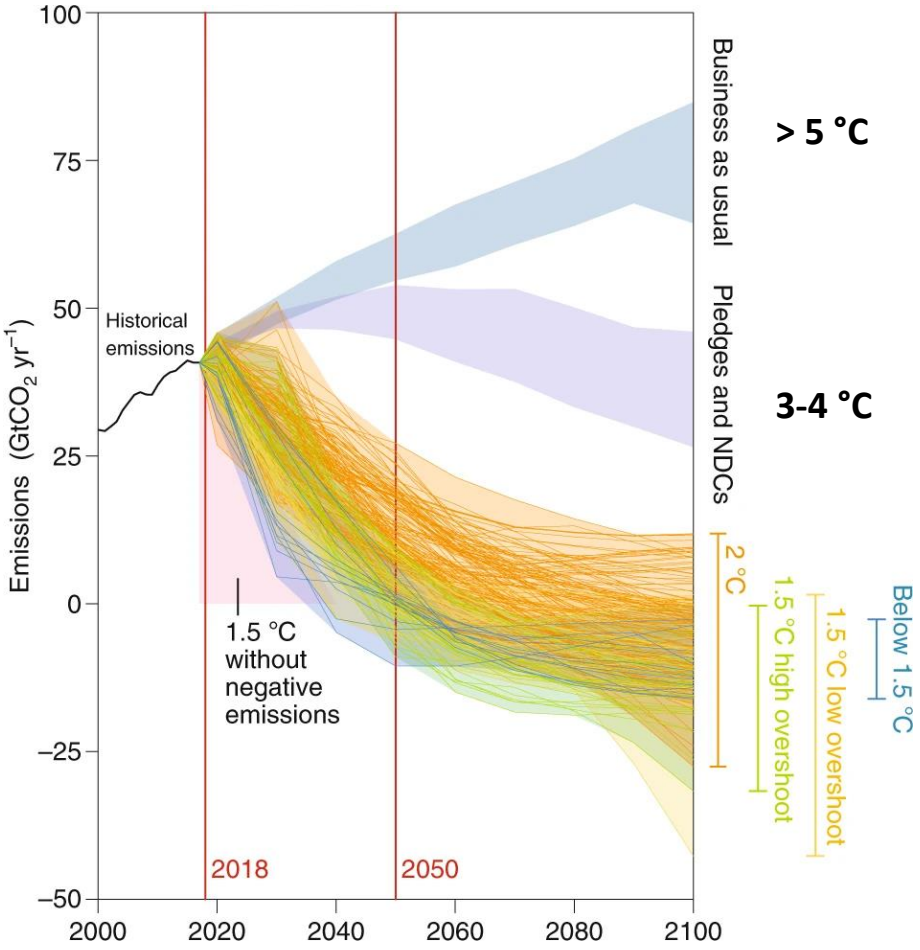
The challenge ahead

2°C goal: CO_2 emissions should decline by about **25% in 2030** and reach **net zero around 2070**.

Large-scale decarbonization will rely on **biomass resources**

What and how much biomass resources do we have?



Roe, S., C. et al. 2019. Contribution of the land sector to a 1.5 °C world. Nature Climate Change.

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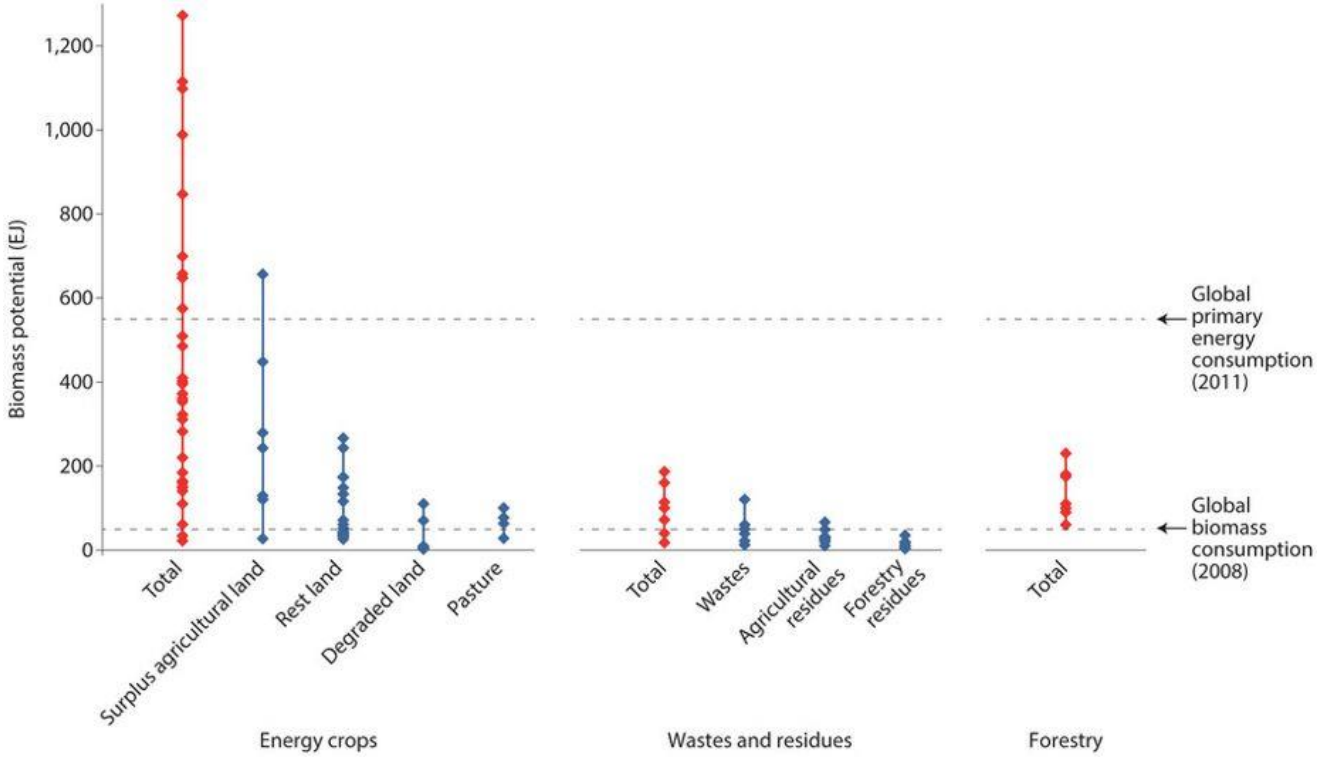
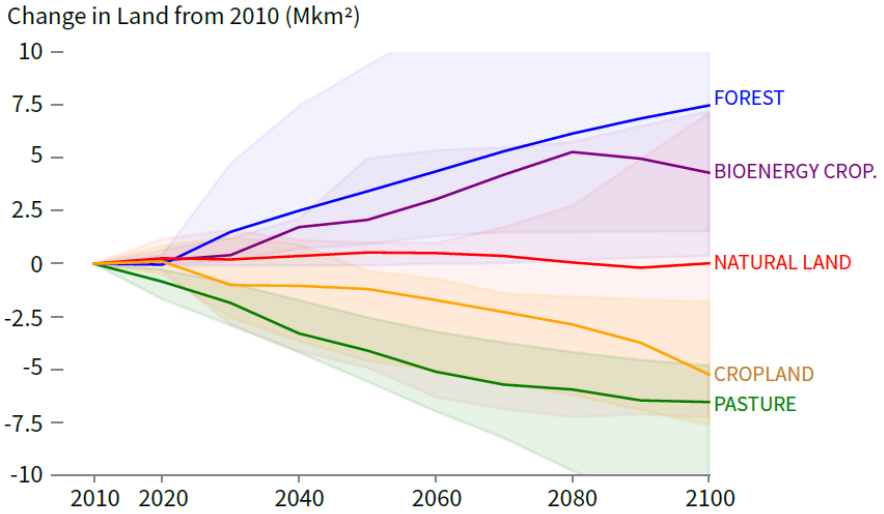
Bioenergy potential from residues is limited, large-scale decarbonization requires dedicated energy crops



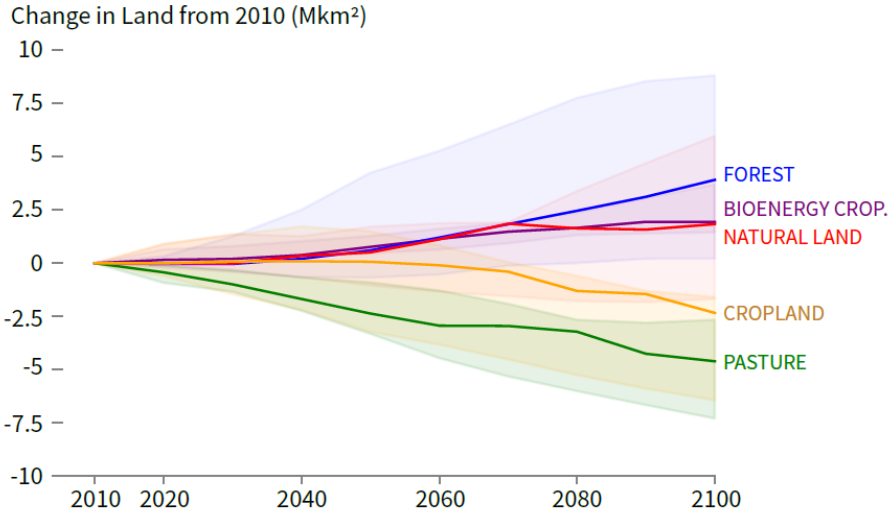
*Slade, R., et al. (2014). "Global bioenergy resources." Nature Clim. Change **4**(2): 99-105.*

Land use changes & climate change mitigation

Sustainability-focused (SSP1 at 1.5°C)

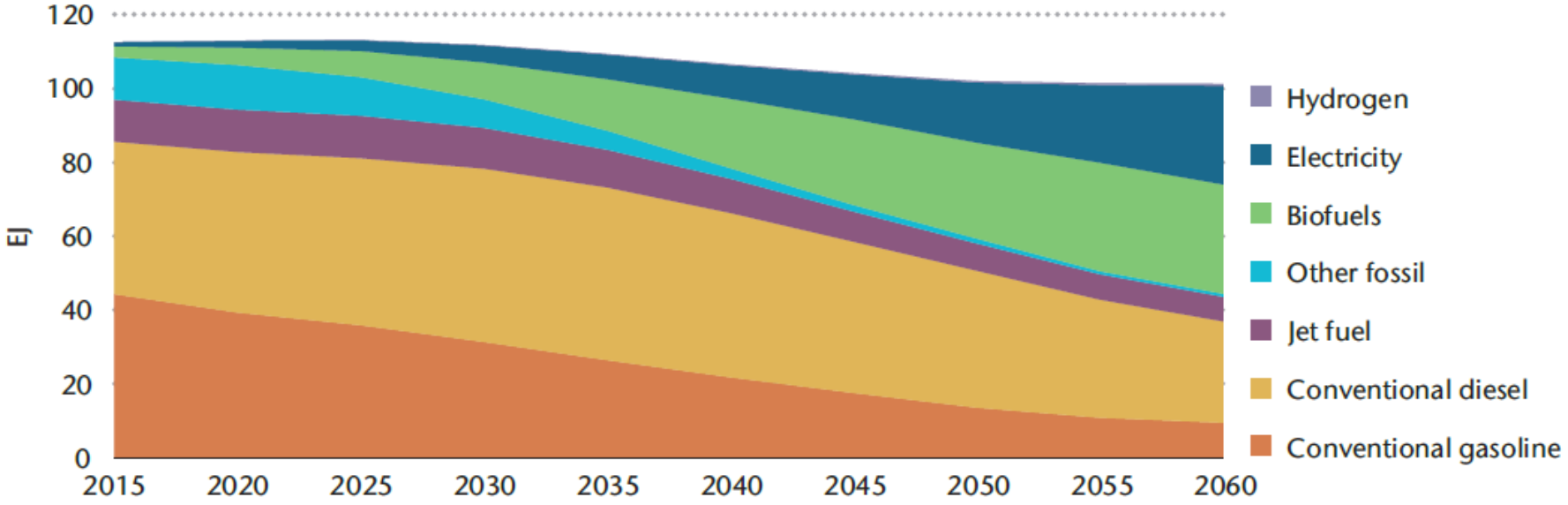


Sustainability-focused (SSP1 at 3°C)



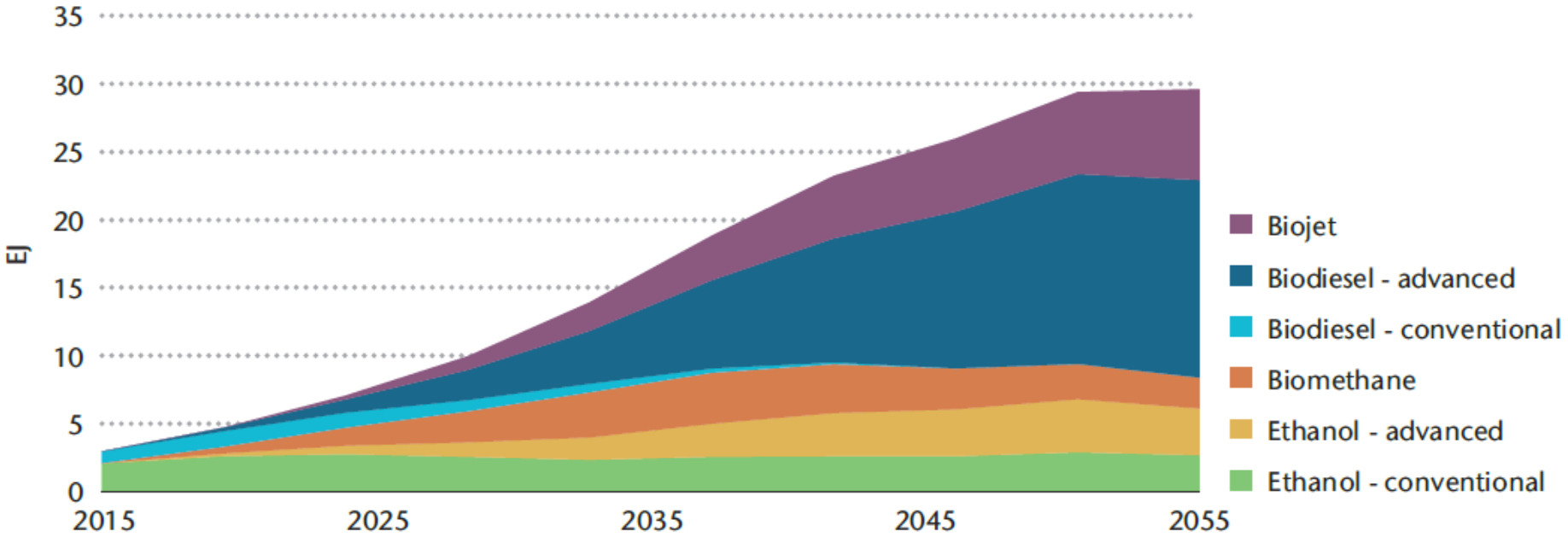
IPCC Special Report on Climate change and Land, Figure SPM.4

Energy use for transportation system under a 2°C target



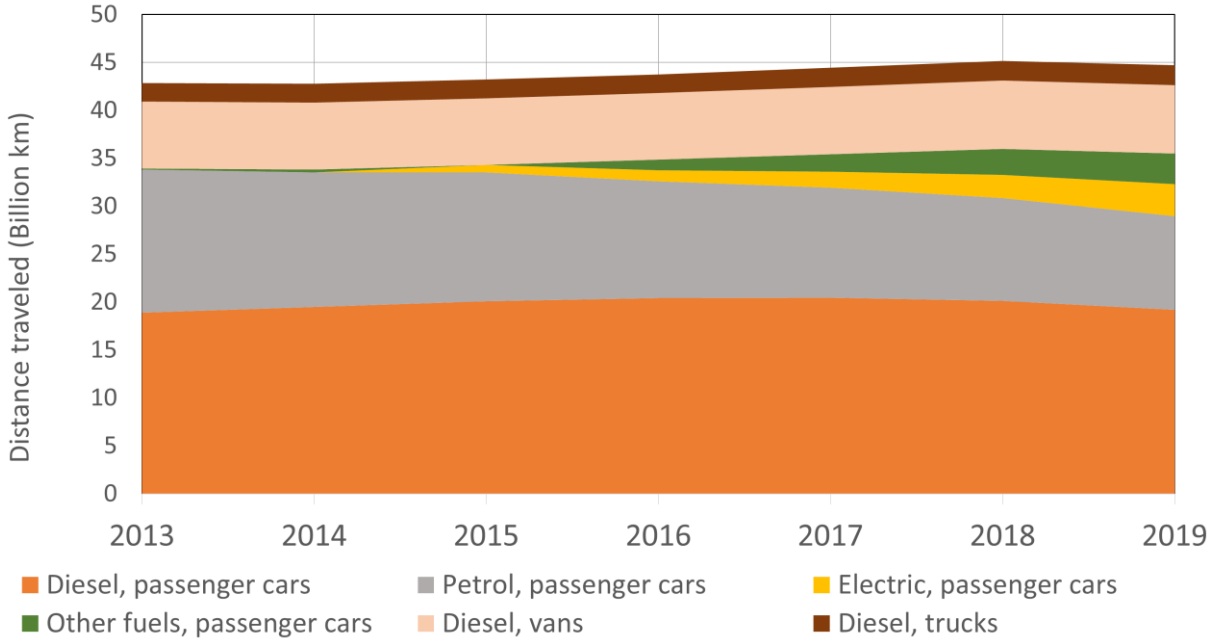
IEA, 2017. Technology Roadmap. Delivering Sustainable Bioenergy

Biofuels outlook in a 2°C world



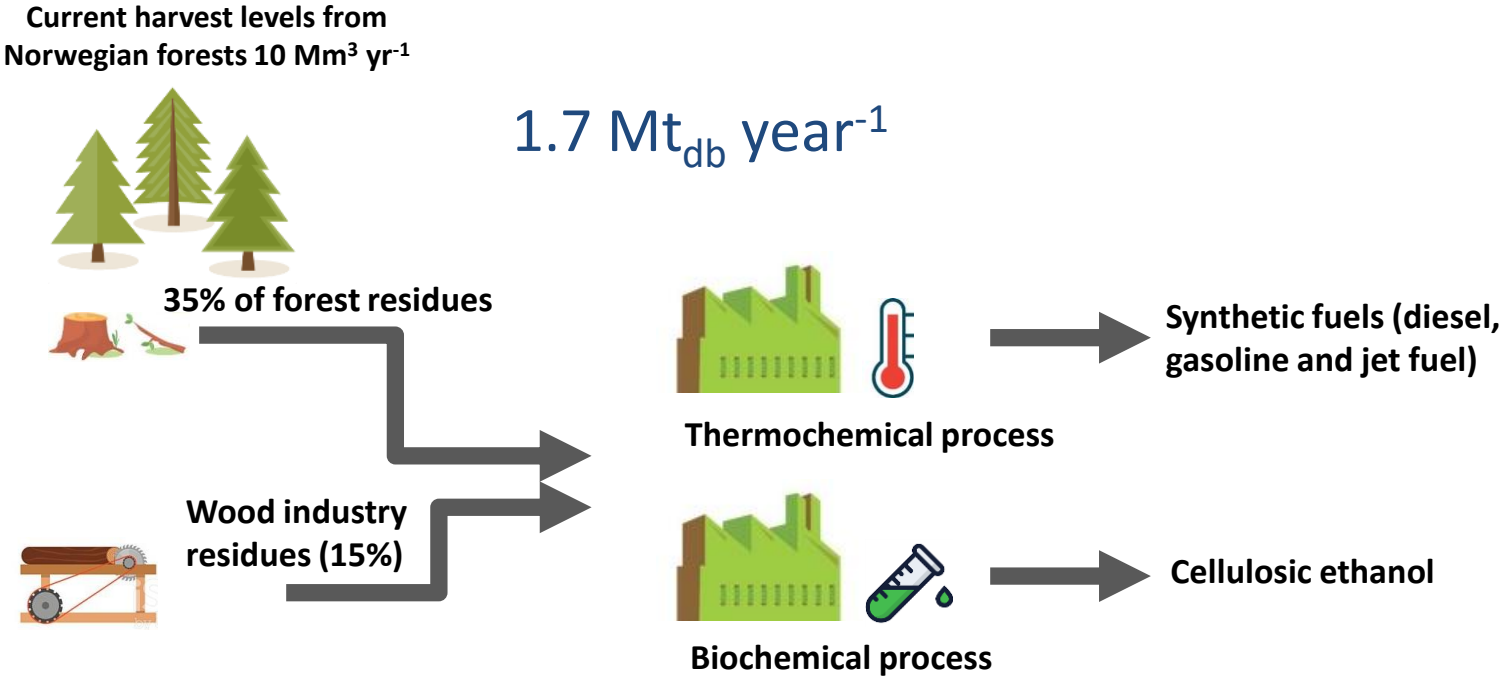
IEA, 2017. Technology Roadmap. Delivering Sustainable Bioenergy

Trends in road transport activity in Norway



SSB, 2020 road traffic volumes

How much biofuels can be produced from the today forestry sector in Norway?



Cavalett, O.; Cherubini, F. (2018) Contribution of jet fuel from forest residues to multiple Sustainable Development Goals. Nature Sustainability. vol. 1 (12)

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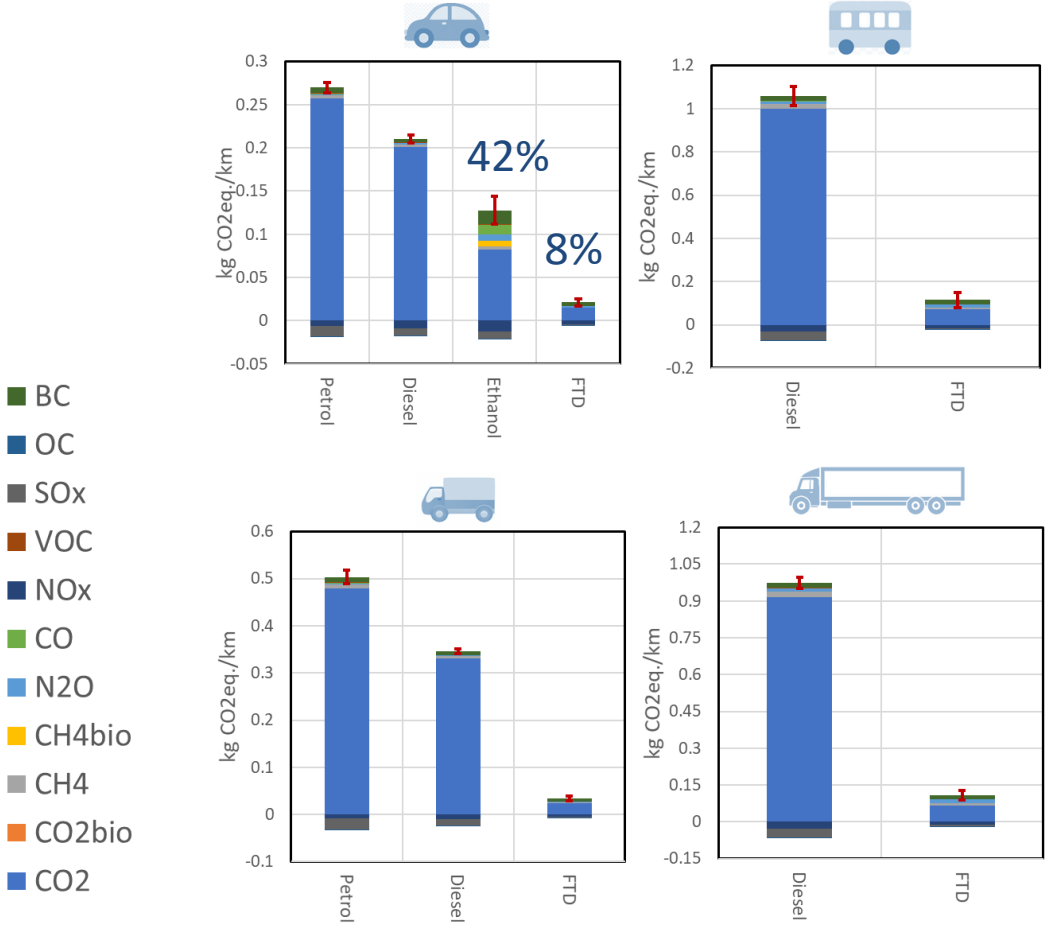
Share of **current energy use** in transport attended with biofuels from forest residues

2030 targets for biofuels in Norway

*Cavalett, O.; Cherubini, F. (2018) Contribution of jet fuel from forest residues to multiple Sustainable Development Goals. Nature Sustainability. vol. 1 (12)

Value chain emissins of fossil fuels and biofuels in Norway



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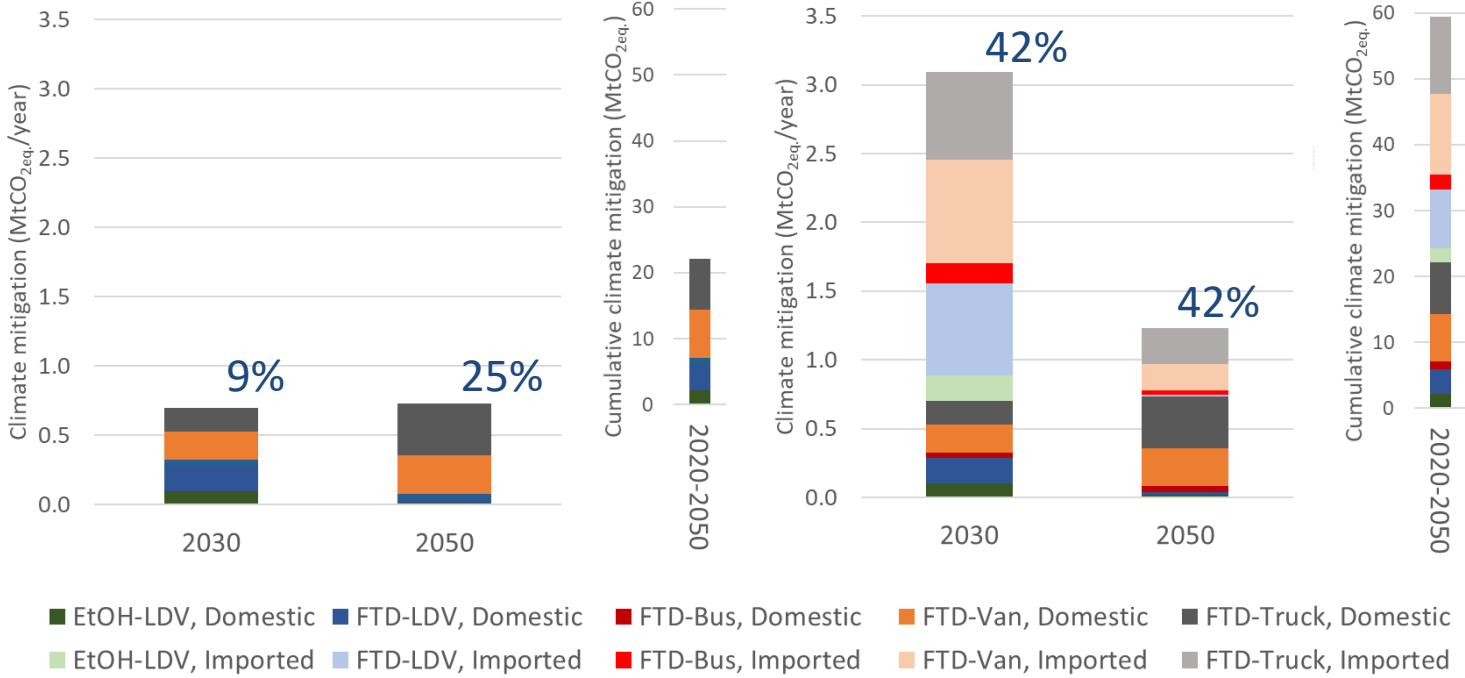
Role of biofuels for climate mitigaiton in Norway

Road, adjusted to meet biofuel targets under high electrification scenarios



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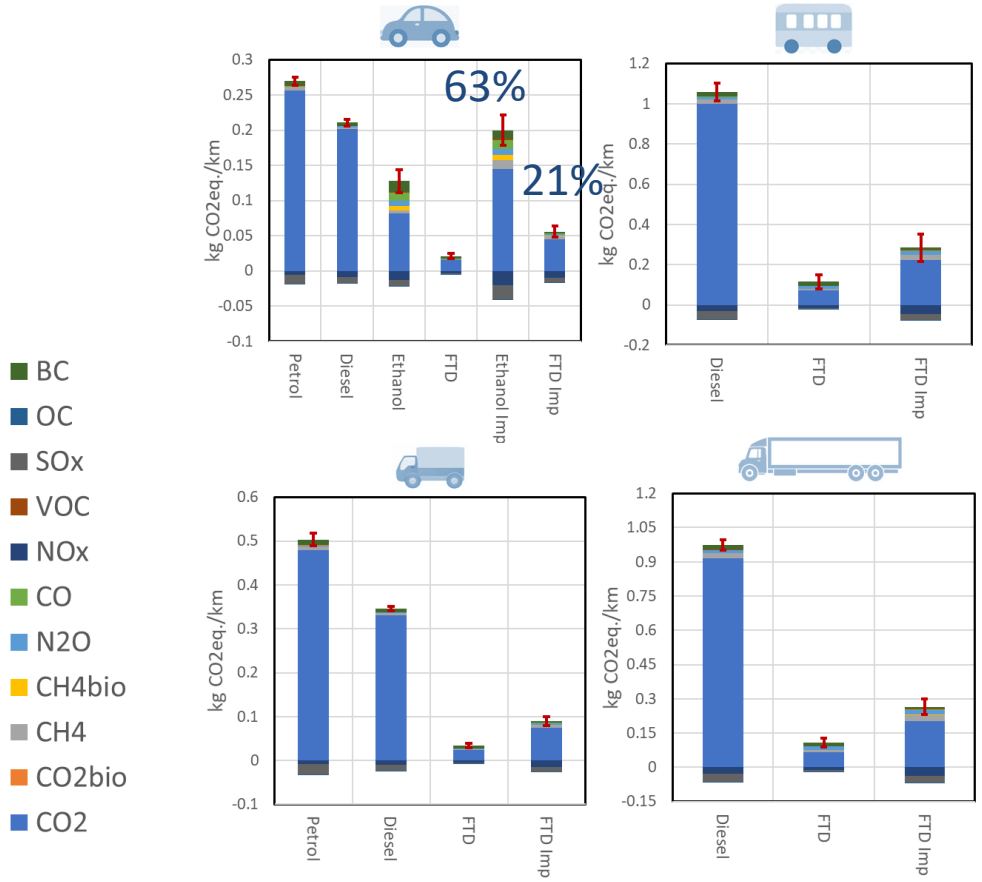
Imported biofuels

- ✓ Life-cycle results for **imported biofuel** indicate that the **long-distance transport does not totally offset** its climate mitigation benefits
- ✓ Sustainable supply of biofuels from international market is key



Key points

- ✓ **Bioenergy is a key** climate mitigation option.
- ✓ Norway has important biomass resource available from the **forest sector**, but **they are limited.**
- ✓ **Domestic biomass** from forest residues **can supply significant shares of the demand in the transport sector, but likely to be not enough** to supply all the biomass demand in the **many other sectors** that need to **decarbonize** with its energy transition.
- ✓ Important dependence on **sustainable biomass supply** from **imported biofuels**.
- ✓ Even with substantial electrification, **biofuels can supply more than 40% of the mitigation in the road transport sector**, mostly form use of FTD in vans and trucks.

Thank you

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