## AR6, WGIII, Chapter 10: Mitigation in the Transport Sector

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# The transportation sector accounts for 15% of global greenhouse gas emissions.



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"Demand-side options and low-GHG emissions technologies can reduce transport sector emissions in developed countries and limit emissions growth in developing countries (high confidence)."



Carnegie Mellon University Engineering & Public Policy "Demand-focused interventions can reduce demand for all transport services and support the shift to more energy efficient transport modes (medium confidence)."

*Behavioral change:* Avoid demand for transport services; Shift to more-efficient modes

Systemic change: Changes in urban form; Investments in transit and active transport infrastructure; Changes in economic structures; Teleworking; Dematerialization of the economy; Supply chain management; e-commerce; Smart mobility; Shared mobility; Vehicle automation.

"Electric vehicles powered by lowemissions electricity offer the largest decarbonization potential for landbased transport, on a life cycle basis (high confidence)."



median life Median well-to-wheel emissions cycle GHG emissic intensity ty](gCO<sub>2</sub>: ġ vkm)

# EV technology is at a high technology readiness, costs are decreasing, and concerns are increasingly addressable

**Investment:** to increase the scale of electric vehicles.





- Reductions in the greenhouse gas footprint of battery production
- Solving concerns about critical materials needed for batteries (Examples include diversifying supply/ materials, recycling materials, or using them more efficiently).



**Technology:** advances in battery technologies could help with the electrification of heavy-duty trucks.

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"Sustainable biofuels, low-emissions hydrogen, and derivatives (including synthetic fuels) can support mitigation of CO<sub>2</sub> emissions from [...] and **heavy-duty land transport** but require production process improvements and cost reductions (medium confidence)."

"Sourced sustainably and with low-GHG emissions feedstocks, biobased fuels, blended or unblended with fossil fuels, can provide mitigation benefits, particularly in the short and medium term (medium confidence)."

"Low-GHG emissions hydrogen and hydrogen derivatives, including synthetic fuels, can offer mitigation potential in some contexts and landbased transport segments (medium confidence)."

"While efficiency improvements [...] can provide some mitigation potential, additional CO<sub>2</sub> emissions mitigation technologies for aviation and shipping will be required (high confidence)."



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### Will the transport sector reach net zero CO<sub>2</sub> emissions?

#### Net Zero

The transport sector is unlikely to reach net zero CO<sub>2</sub> emissions so carbon dioxide removal is likely needed to counterbalance residual CO<sub>2</sub> emissions from the sector.

> Limiting warming to 1.5C with no or limited overshoot likely requires a 40% to 70% reduction in transport emissions by 2050, compared to 2020.

Limiting warming to 2C likely requires a 15% to 45% reduction in transport emissions by 2050, compared to 2020.

#### Emissions reductions will vary by region.



**Developing countries:** Technology transfer and financing can support developing countries transition or go directly to low emissions transport systems.



#### Energy

Reducing emissions from the transport sector largely depends on power sector decarbonisation, and low emissions feedstocks (for biofuels) and production chains.

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### "Many mitigation strategies in the transport sector would have various co-benefits [...] ((high confidence)."



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## Citation for Chapter 10

- Jaramillo, P., S. Kahn Ribeiro, P. Newman, S. Dhar, O.E. Diemuodeke, T. Kajino, D.S. Lee, S.B. Nugroho, X. Ou, A. Hammer Strømman, J. Whitehead, 2022: Transport. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.012
- Many of the figures in this presentation came from a forthcoming factsheet the IPCC has prepared for the WGIII report.