

Task 39 Industry Hearing - October, 2026

SUSTAINABLE FUELS FOR LAND TRANSPORTATION

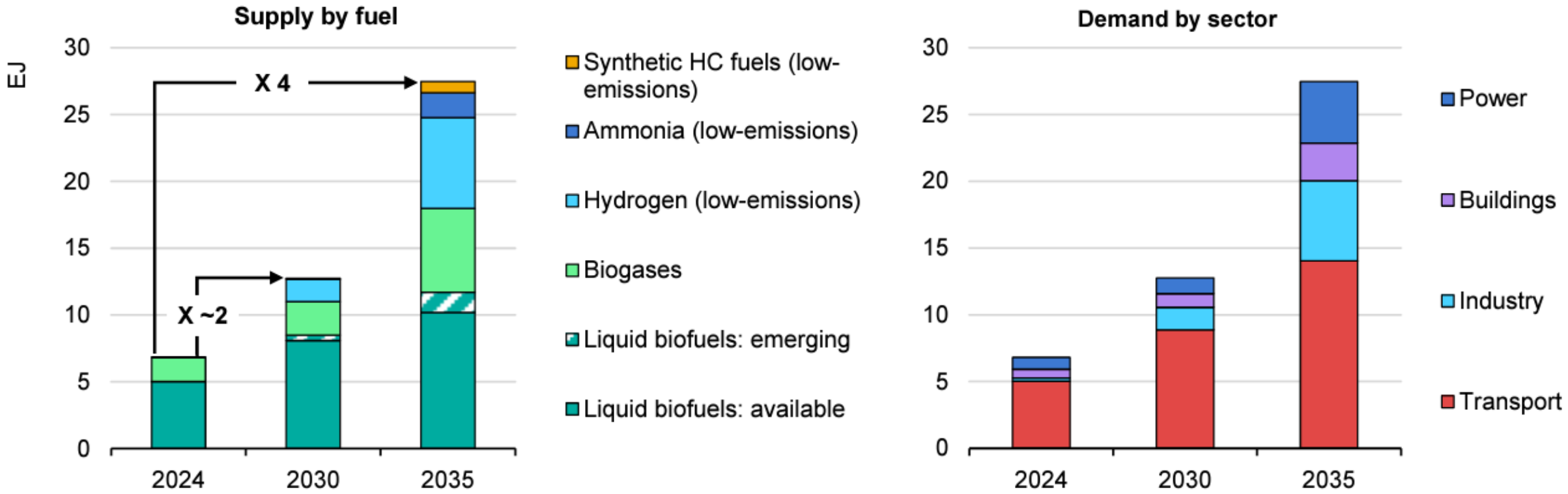
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IEA Sustainable Fuels, 2025

If fully legislated and implemented, current and proposed national and international policies would put sustainable fuel use on a path to nearly double from the 2024 level by 2030, and quadruple by 2035

Figure 5.7 Sustainable fuel supply by fuel and demand by sector in the accelerated case, 2024-2035



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The Global Land Transport Transition: Scale, Lock-In and Urgency

NEED FOR COORDINATED ACTION

4.7 EJ

5 - FUEL ROLE

Global biofuel use in transport

Blending mandates can reduce emissions immediately in existing fleets.

41.7% vs 1.5%

4 - FLEET TURNOVER

Electrified sales vs electricity share in transport energy

Vehicle sales are changing faster than the energy matrix.

+36.9 EJ vs 3.7 EJ

3 - REGIONAL ASYMMETRY

Transport growth outside OECD (2000–2023)

Most transport demand growth is occurring in emerging economies.

94.7% fossil

2 - FOSSIL LOCK IN

Transport energy still fossil-based

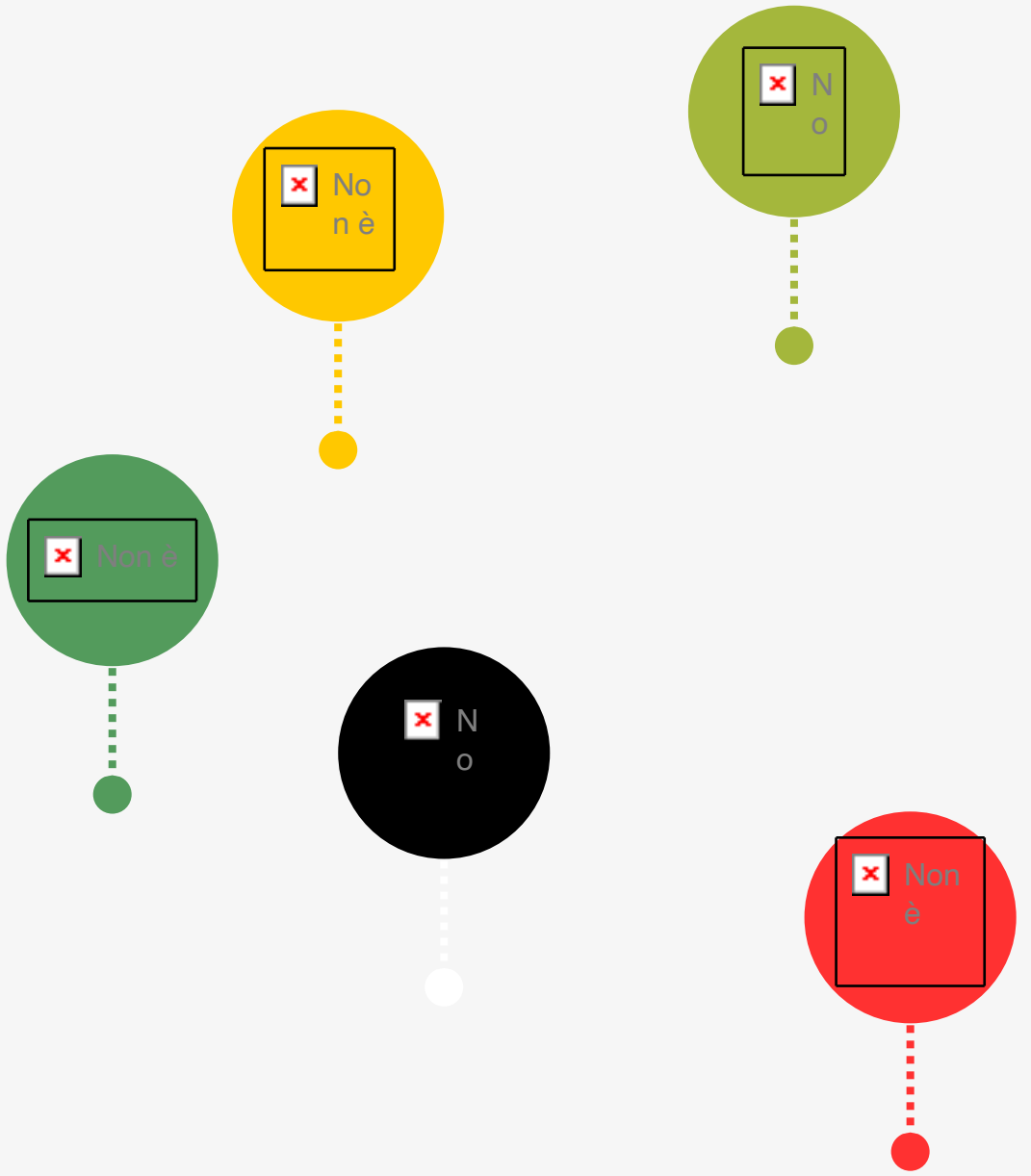
Oil products alone provide 90.1% of transport energy.

122.9 EJ
8.44 GtCO2eq

1 - SCALE

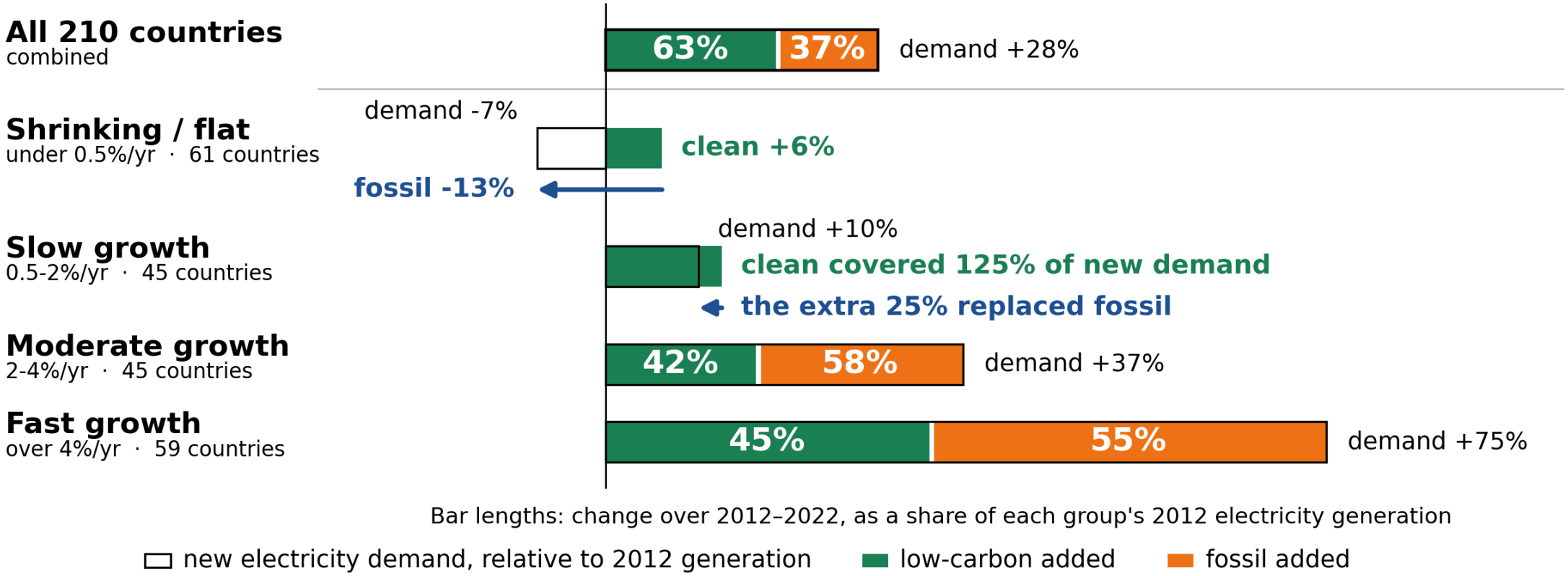
Global transport energy demand (2023)

Transport accounts for 28.6% of world final energy consumption.



IEA World Energy Balances Highlights 2025; IEA Global EV Outlook 2026; Robbie Andrew vehicle sales, World Bank WDI AR5 GHG series; transport GHG = transport CO2 + CH4 + N2O from energy.

The fastest-growing countries built clean power but also used more fossil

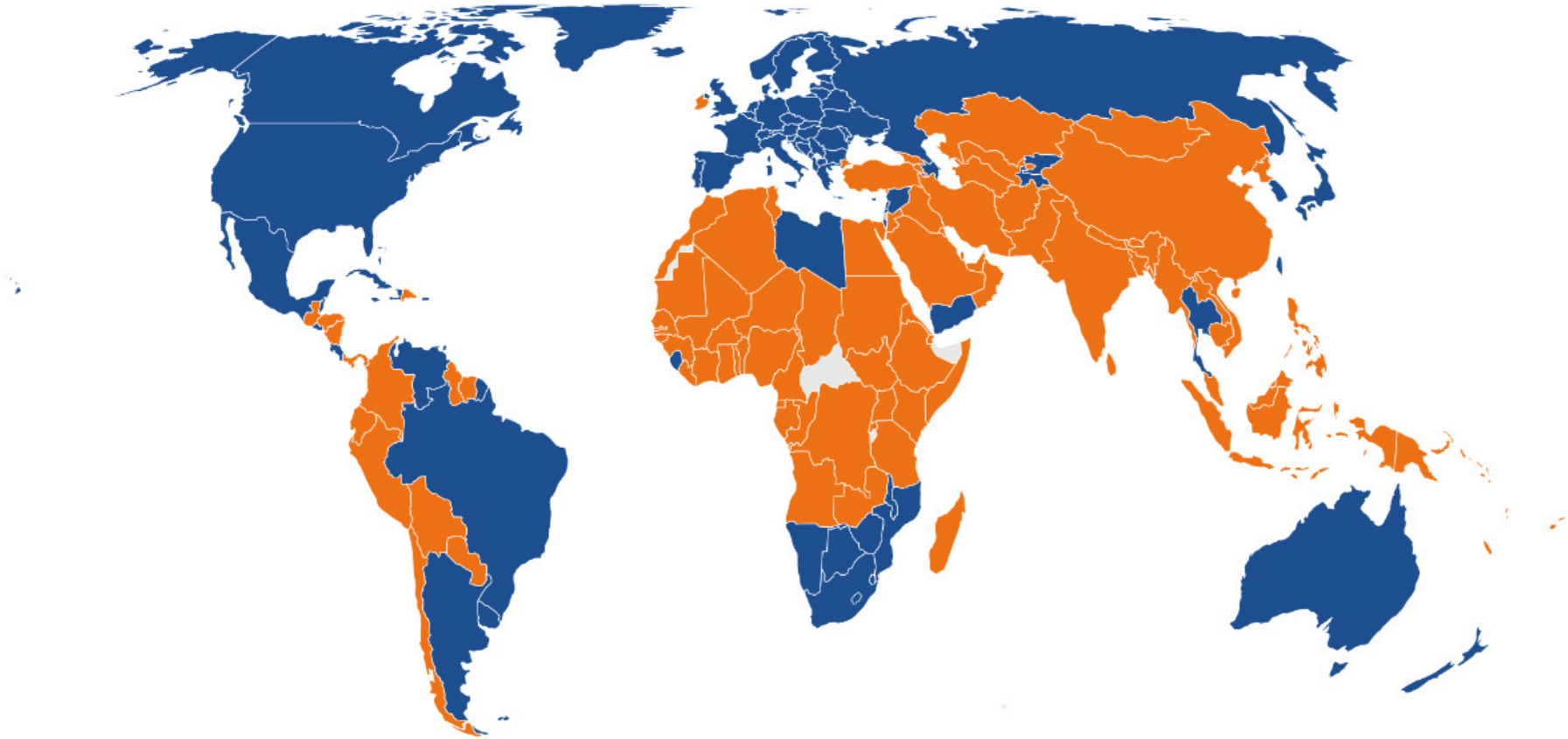


Clean power grew 45% but demand grew 75% in fast growing countries

Our World in Data energy dataset, retrieved 9 March 2026. 210 countries grouped by compound annual growth in electricity demand, 2012–2022. Bars are changes in annual generation over that decade, each as a share of the group's own 2012 generation.

Half the countries.
95% of the new electricity demand.

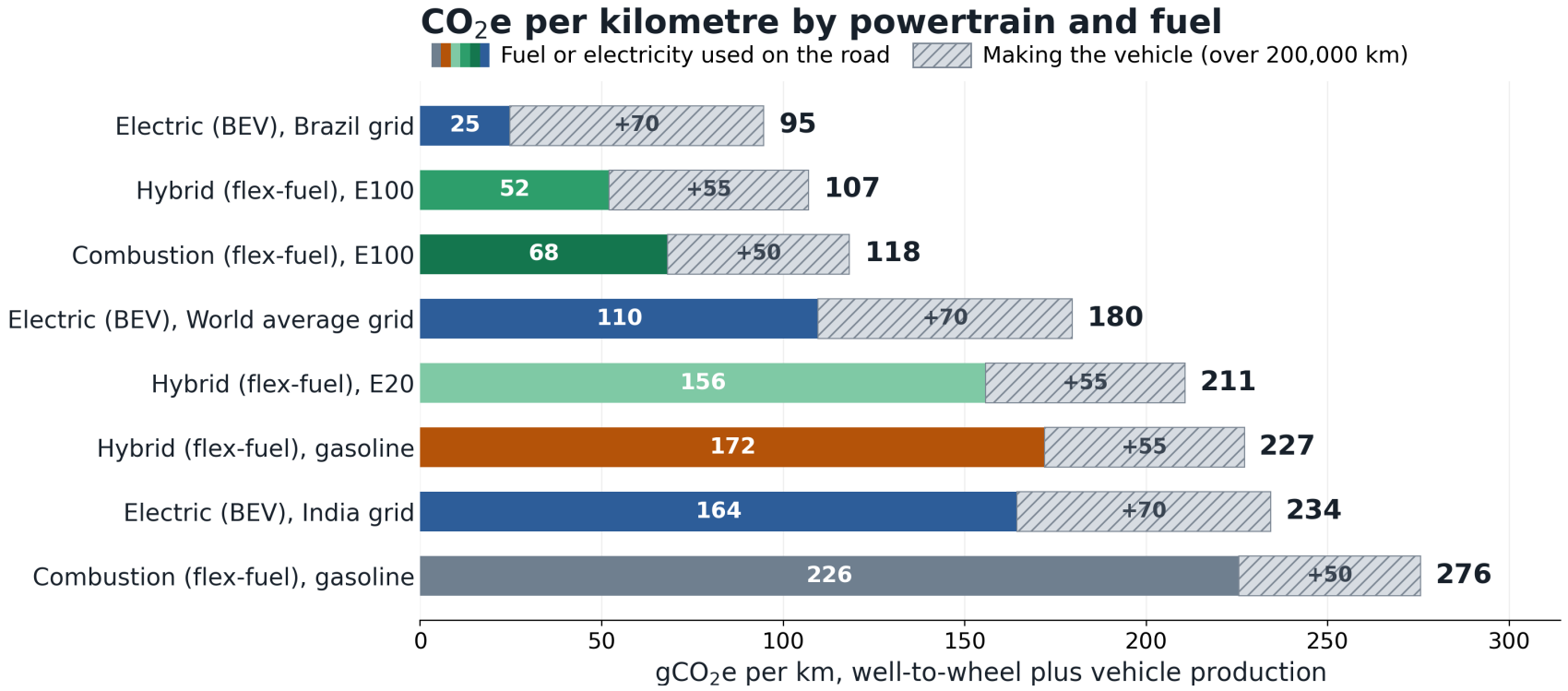
210 countries, split at 2%/yr electricity-demand growth, 2012–2022.



Moderate or fast growth · over 2%/yr	104 countries	73% of world population	**95% of new demand**
Flat or slow growth · under 2%/yr	106 countries	27% of world population	**5% of new demand**

Sources: Our World in Data energy dataset (retrieved 9 March 2026); country outlines from Natural Earth 1:110m, Equal Earth projection.
Grouping is the compound annual growth rate of electricity demand, 2012–2022. All 210 countries are counted above; 41 small island states are too small to draw.

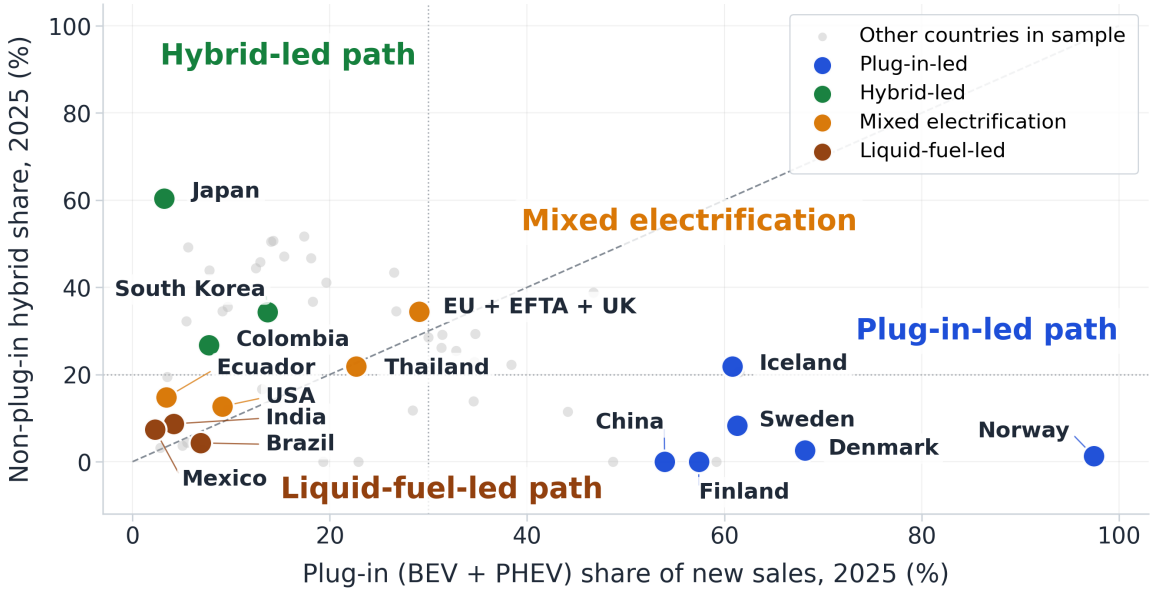
Ethanol, hybrid, and electric cars all reduce GHG emissions
They do it in three different ways — through the vehicle, the fuel, and the grid.



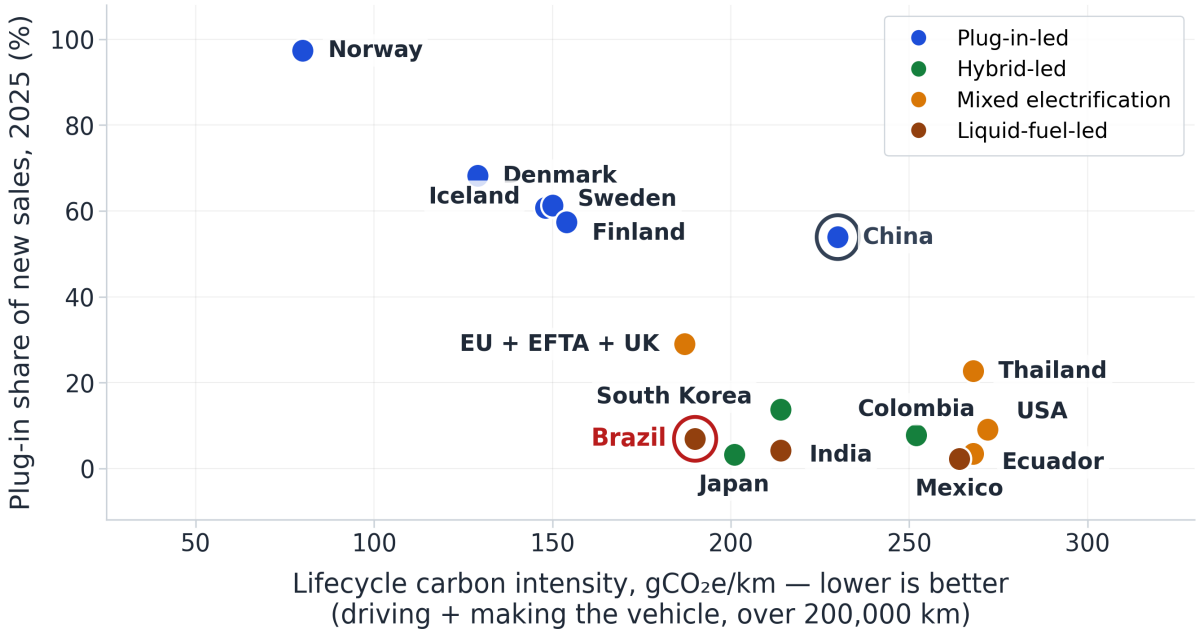
Battery electric vehicles carbon intensity is in manufacturing the vehicle

Source: small-SUV class; 2025 PBEV energy use, 2024 OWID grids. Production factors from IPCC AR6 WGIII Ch. 10 (Transport), p. 1076 — ICE 10, BEV 14 tCO_2e/vehicle, HEV interpolated at 11 — over 200,000 km. End-of-life excluded.

How countries are implementing decarbonization technologies in mobility: Battery electric vehicles, Plug-in Hybrid Electric Vehicles, Non-plug-in hybrid, Combustion with Blends, Flex-Fuel Vehicles



Path chosen

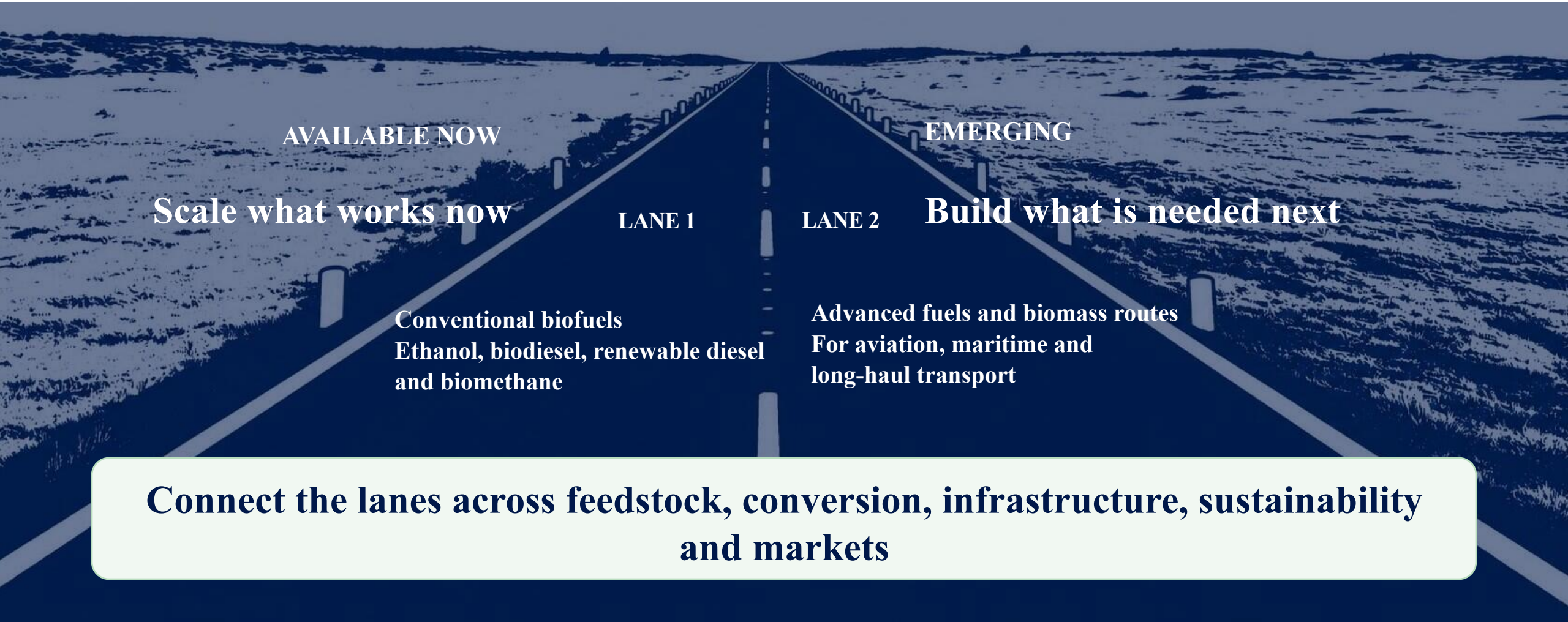


Carbon Intensity

Sources: Robbie Andrew country panel, 2025 full-year new-vehicle sales (plug-in = BEV + PHEV). Right panel adds GFEI/TDC 2022 efficiency, 2024 OWID grids and IPCC AR6 WGIII Ch. 10 production factors (p. 1076: ICE 10, BEV 14, HEV 11 tCO_2e/vehicle) over 200,000 km; end-of-life excluded.

Task 39 contribution to the COP30 Belem 4x Pledge Roadmap

Scale the proven and build the future



Industry Hearing process

This synthesis draws on evidence and multidisciplinary technical input from the **Industry Hearing;** it does not represent or imply endorsement by any participating organization.

1 International Advisory Committee input

Consultations with Task 39, an International Advisory Committee and invited experts.

2 Stakeholder questionnaire

103 respondents from across the transport and biofuel value chains.

3 Online discussions

Structured online discussions, generating 93 comments on barriers and 79 on solutions.

4 Prioritization

International prioritization of draft conclusions based on consolidated evidence and deliberations.

5 Symposium presentations

Presentation and discussion of findings with a broader community.

6 Closed-session deliberations

Review and consolidation of the six highest-prioritized conclusions for further technical review.

Participants

Task 39 National Team Leaders and contributors from international organizations, industry associations, public agencies, research institutions, universities and companies across the transport and biofuel value chains.

Organizations represented

ABIOGÁS, ABIOVE, AFRY, Agroicone, ANFAVEA, Bayer, BEST, BNDES, Bosch, CEM Biofuture Platform, CGEE, the Chinese Academy of Sciences, Copersucar, DBFZ, FS, Geo Biogás & Carbon, Global Biofuels Alliance, Guangxi Academy of Agricultural Sciences, IEA, IICA, IPT, ISSCT, John Deere, Mauá, MBCBrasil, Praj, Raízen, SAE Brasil, SINTEF, Toyota, Toyota Foundation, Tupy, UFSCar, UNICA, Unicamp, UNIFEI and World Bioenergy Association.

Role of the Advisory Committee and participants. The Advisory Committee helped shape the scope and review the materials; participants brought evidence, operational experience and regional perspectives to assess implementation barriers, cases and knowledge gaps.

INDUSTRY HEARING: KEY AREAS OF CONVERGENCE

Stakeholder perspectives on biofuels for land transport decarbonization

Respondents broadly align on the **enabling conditions** needed to accelerate the contribution of biofuels to decarbonize land transport.

1. **Biofuels are relevant for near-term mitigation**
   Broad recognition that biofuels can reduce emissions in the current fleet using existing vehicles, infrastructure and available fuel pathways.
2. **Existing fleets must be part of decarbonization strategies**
   Strong agreement that transition strategies must address vehicles already operating in the fleet.
3. **Infrastructure and supply chains are critical for scale-up**
   Infrastructure and fuel supply are key determinants of deployment potential.
4. **Lifecycle assessment is central to decision-making**
   Well-to-wheel approaches are widely supported for comparing pathways and assessing sustainability.
5. **Policy stability and regulatory certainty are essential**
   Predictable policies, regulatory continuity and trusted systems are viewed as key enablers of investment and scale-up.
6. **Technology-neutral and performance-based frameworks are preferred**
   Respondents support policies that evaluate measurable outcomes rather than selecting specific technologies, with preference for technology-neutral, performance-based approaches.

SHARED FOUNDATIONS

Common enabling conditions for the transition, including **existing fleets, infrastructure, lifecycle assessment, policy stability and technology-neutral frameworks.**

These areas of convergence provide a strong foundation for ***practical solutions*** to accelerate the role of biofuels in decarbonizing land transport.

Consolidated barriers and solutions

Seven strategic areas to accelerate the deployment of sustainable biofuels in land transport

Strategic area	Key barriers	Priority solutions
1 **Policy certainty and market creation**	• Unstable policy cycles and fragmented regulation. • Lack of long-term targets and integration of energy security.	• Stable, predictable and technology-open frameworks. • Blending mandates and carbon-intensity standards with clear, long-term targets.
2 **Credible lifecycle and emissions accounting**	• Inconsistent methodologies and definitions. • Limited data, traceability gaps and low transparency.	• Harmonized, transparent methodologies. • Shared, verifiable databases and mutual recognition.
3 **Economics, finance and bankability**	• Fossil fuels retain price advantage and subsidies. • High capital needs and uncertain business cases.	• Green premiums, concessional finance and minimum carbon prices. • Targeted public support and market incentives.
4 **Fleet and infrastructure compatibility**	• Vehicle and engine limitations for higher blends. • Insufficient storage, distribution and refueling infrastructure.	• Expand flex-fuel and hybrid-flex vehicles. • Invest in infrastructure, including biomethane.
5 **Political narrative, social legitimacy and environmental integrity**	• Dominant focus on electrification; limited understanding of biofuels. • Concerns on food vs. fuel, environmental and social impacts.	• Real-world case studies and clear evidence. • Transparent communication and robust sustainability safeguards.
6 **International coordination with regional differentiation**	• No global institution or common standards. • Inconsistent rules across regions and sectors.	• Global and cross-sector standards with regional flexibility. • Mutual recognition and stronger international forums.
7 **Scalable, inclusive and affordable certification**	• High costs, duplicated requirements and complex systems. • Limited recognition for small producers and emerging economies.	• Intergovernmental baseline framework. • Risk-based, mutually recognized and affordable certification schemes.

01 Existing fleets and near-term emissions reductions

KEY CONCLUSION

Sustainable renewable fuels may contribute to near-term emissions reductions from existing road fleets where fuel supply, vehicle compatibility and infrastructure permit. Existing assets can be used alongside targeted upgrades.

TECHNICAL BASIS

Slow fleet turnover; limitations on higher blends; engine compatibility; uneven distribution infrastructure.

IMPLEMENTATION RELEVANCE

Flex-fuel and hybrid vehicles; targeted fleet upgrades; demonstrations; government procurement; biomethane, bioethanol and biodiesel projects; expanded distribution and refueling.

02 A complementary technology portfolio

KEY CONCLUSION

Evidence and participant perspectives support assessing sustainable renewable fuels, electrification and other low-carbon solutions as a complementary portfolio. Their roles vary with vehicle segment, power systems, regional resources and infrastructure.

TECHNICAL BASIS

No single pathway addresses all fleet categories or regional conditions at the same pace.

IMPLEMENTATION RELEVANCE

Assess options for passenger, commercial, heavy-duty and agricultural transport according to operating conditions and emissions performance.

03 Predictable and context-appropriate policy frameworks

KEY CONCLUSION

Policy predictability, technology openness and context-appropriate instruments can reduce investment uncertainty and support deployment. Instruments should be selected according to national circumstances.

TECHNICAL BASIS

Electoral cycles, shifting priorities, fragmented regulation and unpredictable targets weaken demand signals and investment.

IMPLEMENTATION RELEVANCE

Potential instruments include stable tax and pricing regimes, carbon-intensity standards, blending mandates, predictable targets and market incentives.

04 Lifecycle climate performance and evidence

KEY CONCLUSION

Lifecycle greenhouse gas performance provides a basis for assessing transport-fuel climate outcomes. Transparent data, credible methodologies and periodic updates enable comparison of measurable reductions across pathways.

TECHNICAL BASIS

Inconsistent well-to-wheel and lifecycle methods; limited or non-comparable data; traceability gaps; divergent land-use accounting.

IMPLEMENTATION RELEVANCE

Shared databases; verified carbon-intensity systems; capacity building; prospective lifecycle assessment; periodic methodological updates using regional evidence.

05 Renewable fuels in transport policy frameworks

KEY CONCLUSION

Sustainable renewable fuels can be considered alongside electrification and other low-carbon options in transport policy, especially for existing fleets, infrastructure constraints and near-term emissions reductions.

TECHNICAL BASIS

Climate objectives must be evaluated against practical fleet and infrastructure conditions, while retaining complementarity with electrification and other measures.

IMPLEMENTATION RELEVANCE

Assess credible pathways using measurable lifecycle climate performance and relevant operating conditions.

06 Interoperability and international cooperation

KEY CONCLUSION

Greater interoperability across sustainability frameworks, certification, fuel specifications and lifecycle accounting may facilitate trade and reduce transaction costs while reflecting regional circumstances.

TECHNICAL BASIS

Road transport lacks a global coordinating institution comparable to those for aviation and maritime transport. Incompatible requirements delay deployment and raise costs.

IMPLEMENTATION RELEVANCE

Meta-standards; mutual recognition; international forums; regional roadmaps; knowledge exchange and capacity building, while retaining regional differentiation.

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THANK YOU!

FOR THE INDUSTRY HEARING OUTCOMES

IEA Bioenergy Task 39 Webinar
October 2026

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