IEA Bioenergy
Technology Collaboration Programme

IEA Bioenergy Task 39 – Biofuels to Decarbonize Transport

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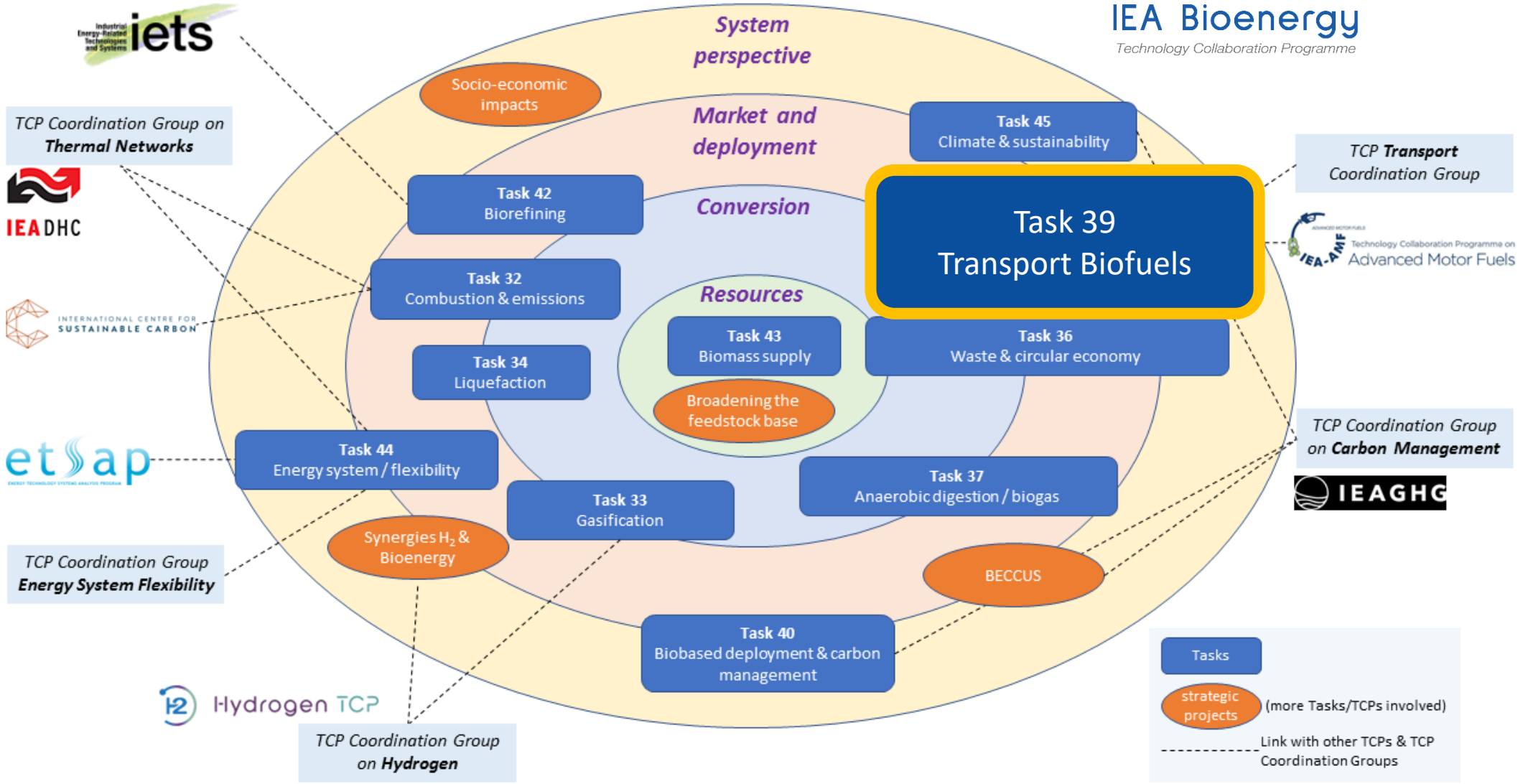
BioTheRoS Workshop at the CEBC 2026, Graz

IEA Bioenergy Activities: Tasks



IEA Bioenergy Task 39: Biofuels to decarbonize transport

Group of international experts from 18 member countries around the globe

- Australia, Austria, Belgium, Brazil, Canada, China, Denmark, European Commission, France, Germany, Ireland, Japan, Netherlands, New Zealand, Norway, South Korea, Sweden, USA

Goal: Advancing the decarbonization of the transport sector through biogenic, sustainable fuels with low carbon intensity.

Focus: hard-to-electrify long distance transport (aviation, maritime, heavy duty transport)

Assist with the development and deployment of transportation biofuels

https://task39.ieabioenergy.com/

Management of Task 39

Task Leader
Glaucia Mendes Souza
Full Professor of Biochemistry at University of São Paulo

- One Task Leader, one Assistant Task Leader and three Subprogram (SP) Leaders
  - SP1 – Technologies and Deployment: focus on biofuel technologies, infrastructure, and distribution
  - SP2 – System Analysis, Biomass supply, and Sustainability: focus on sustainability, certification, sourcing, LCA, TEA, efficiency, policies, markets
  - SP3 – Dissemination and Outreach: focus on cross-cutting activities, partnerships, may include preparation of dissemination materials, factsheets, infographics, press releases, dashboard/database

Assistant Task Leader
Jean Felipe Leal Silva
Assistant Professor of Chemical Engineering at University of Campinas

Leader of Subprogram 1
Franziska Müller-Langer
Head of Department of Biorefineries at DBFZ

Leader of Subprogram 2
Andrea Sonnleitner
Senior Researcher and Project Leader at BEST

Leader of Subprogam 3
Tomas Ekbom
Technology Manager at AFRY Sweden AB

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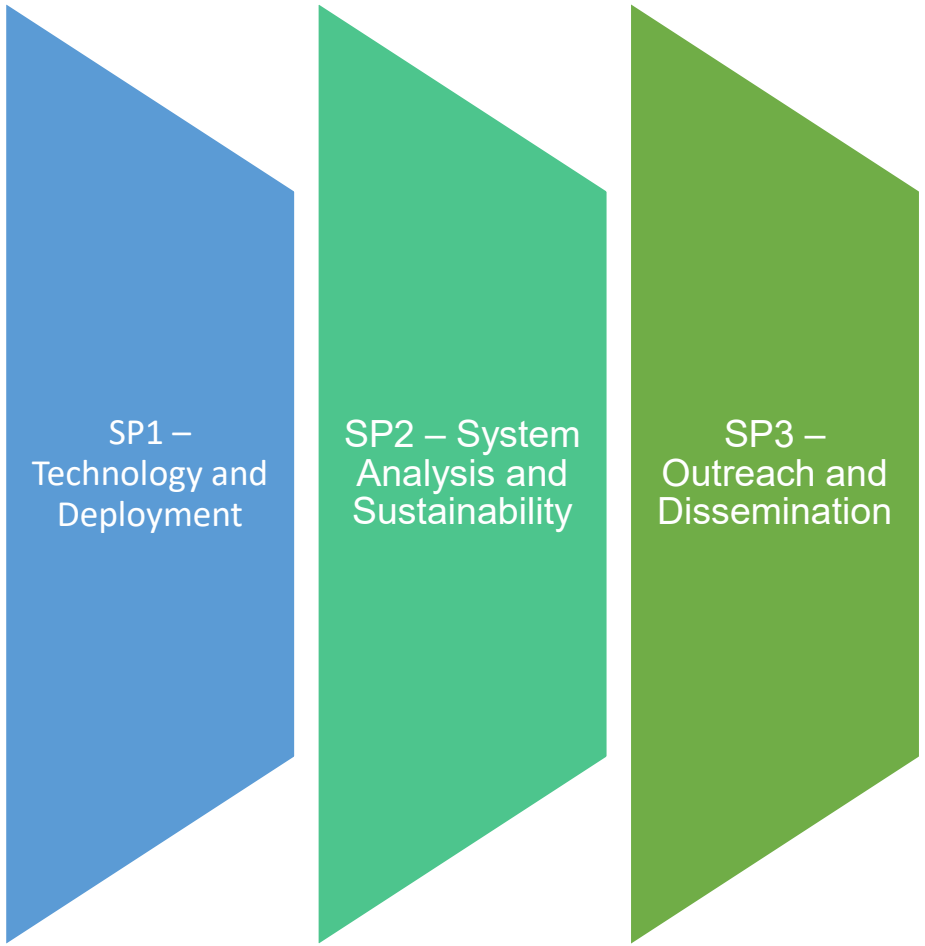
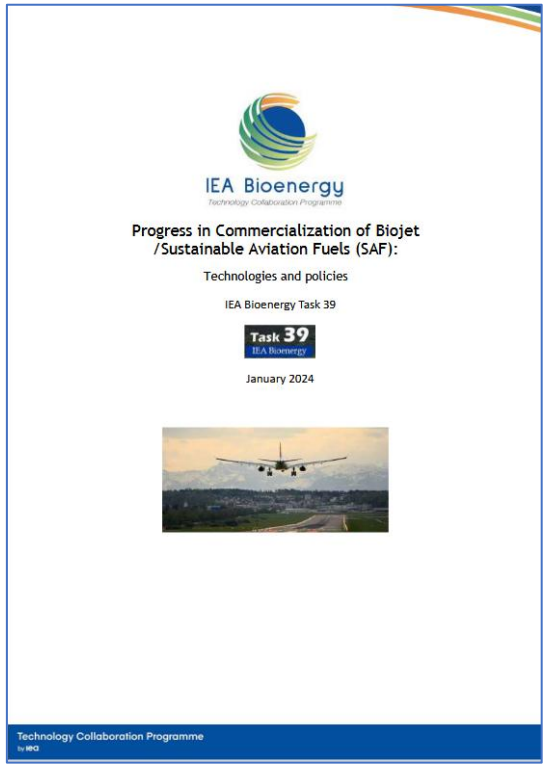
Projects and Subprogrammes Triennium 2025-2027



P1 - Implementation Agenda	P2 – Advanced Biofuels Demonstration
P3 - Renewable hydrocarbons for Heavy duty and jet fuel sectors	P4 – E-Fuels and Synergies with Biofuel Production
P5 – Biofuel Value Chain Analysis: Case Study-Based Approach for Maritime Biofuels	P6 - Management of Biogenic CO2: BECCUS Inter-Task Phase 3

IEA Bioenergy Task 39 - Reports

https://task39.ieabioenergy.com/publications-new/



LOWERING HINDERS FOR MARITIME BIOFUELS – IDENTIFYING MEANS TO INCREASE THE USE OF BIOFUELS IN THE MARINE SECTOR

Apr 2025

Biofuels could be the key to cleaner shipping, but higher costs, lack of infrastructure and regulatory hurdles stand yet in the way to lower the climate impact of the shipping sector. Which means exist to tackle current barriers for larger deployment? The maritime shipping sector is under growing pressure to reduce its greenhouse gas emissions. [...]

read more

CASE STUDIES OF CO2 UTILIZATION IN THE PRODUCTION OF ETHANOL

Dec 2024

This policy brief, produced within the framework of IEA Bioenergy Task 39 (Biofuels to decarbonize transport) presents an analysis of two case studies: (1) the use of biogenic CO2 from sugar-to-ethanol fermentation in Brazil, and (2) the utilization of industrial exhaust gas from the steel industry in China for bioethanol production. The findings include an assessment of [...]

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DEVELOPMENT AND DEPLOYMENT OF ADVANCED BIOFUEL DEMONSTRATION FACILITIES 2024

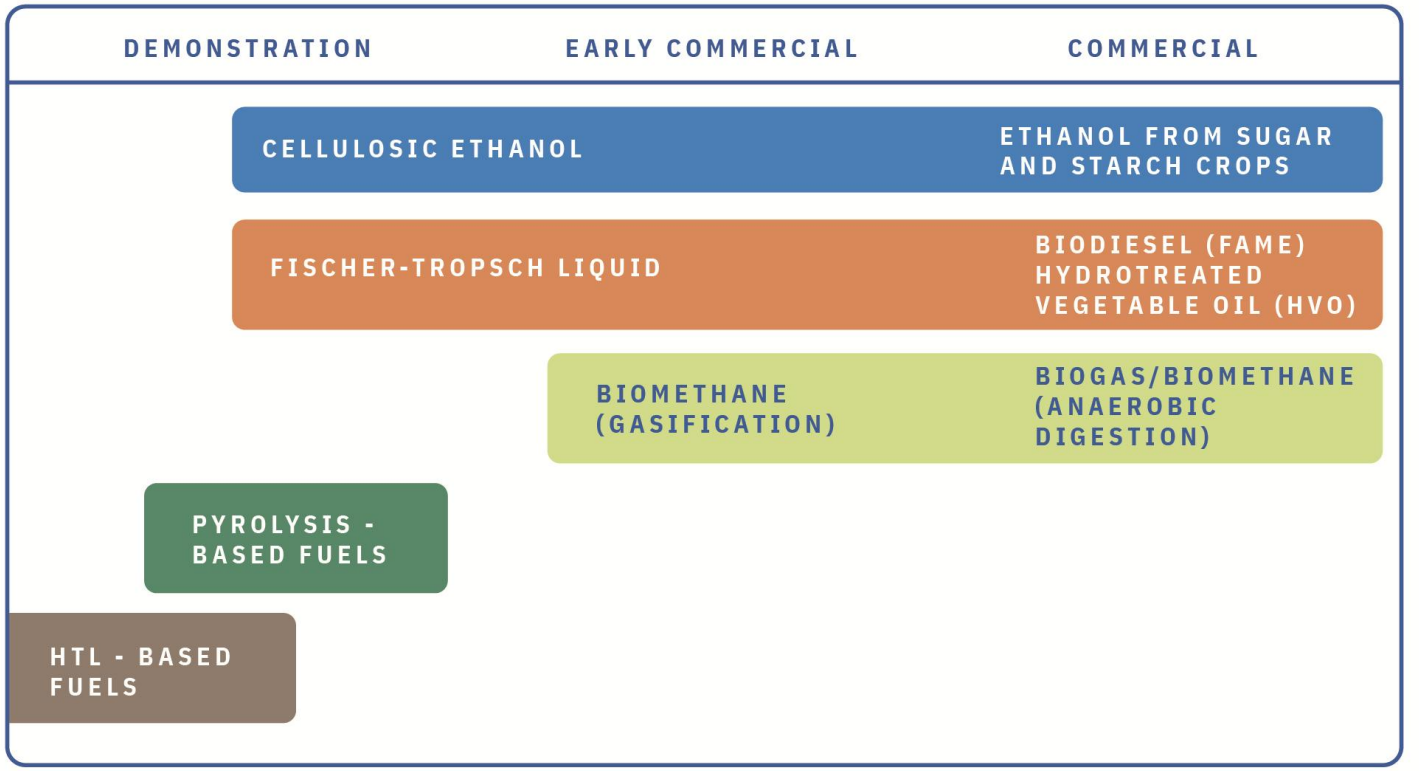
Dec 2024

Decarbonizing the transport sector is critical for achieving global climate and energy targets due to its significant contribution to greenhouse gas emissions and reliance on fossil fuels. Biofuels, in particular advanced biofuels, play a particularly important role in decarbonizing transport and increasing the share of renewable energy in the transport sector by providing a low-carbon solution [...]

read more

Technology pathways and TRLs

residues



crops

IEA Bioenergy, Bioenergy Review 2023, https://www.ieabioenergyreview.org/transport-biofuels/

Development and Deployment of advanced biofuel demonstration facilities

Drive commercialization forward – need of:

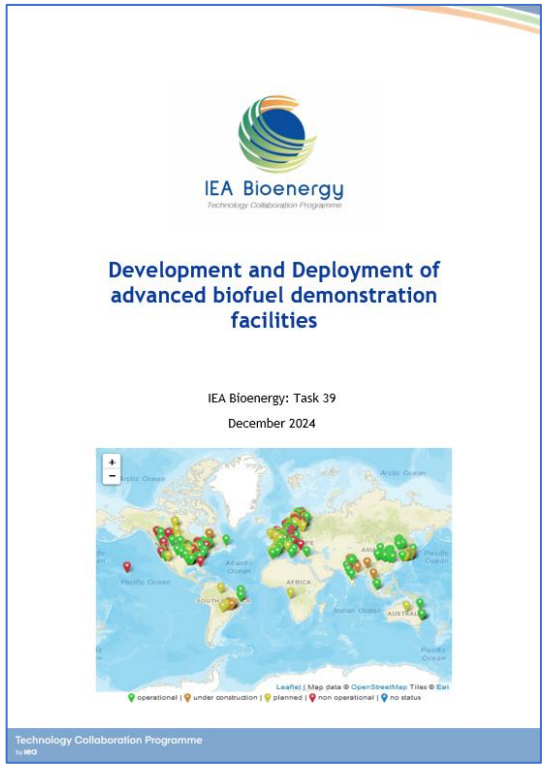
- Demonstration and scale-up of different technologies
- Reduction of costs and financial risks
- Long-term policies and comprehensive strategy

Positive development in emerging countries

Promising opportunity: long-distance transport

Variety of different technologies and new demonstration facilities

More information available in 2025 publication of IEA Bioenergy Task 39:



Sustainable Aviation Fuels production

Many plants with (planned) SAF capacity and many announcements

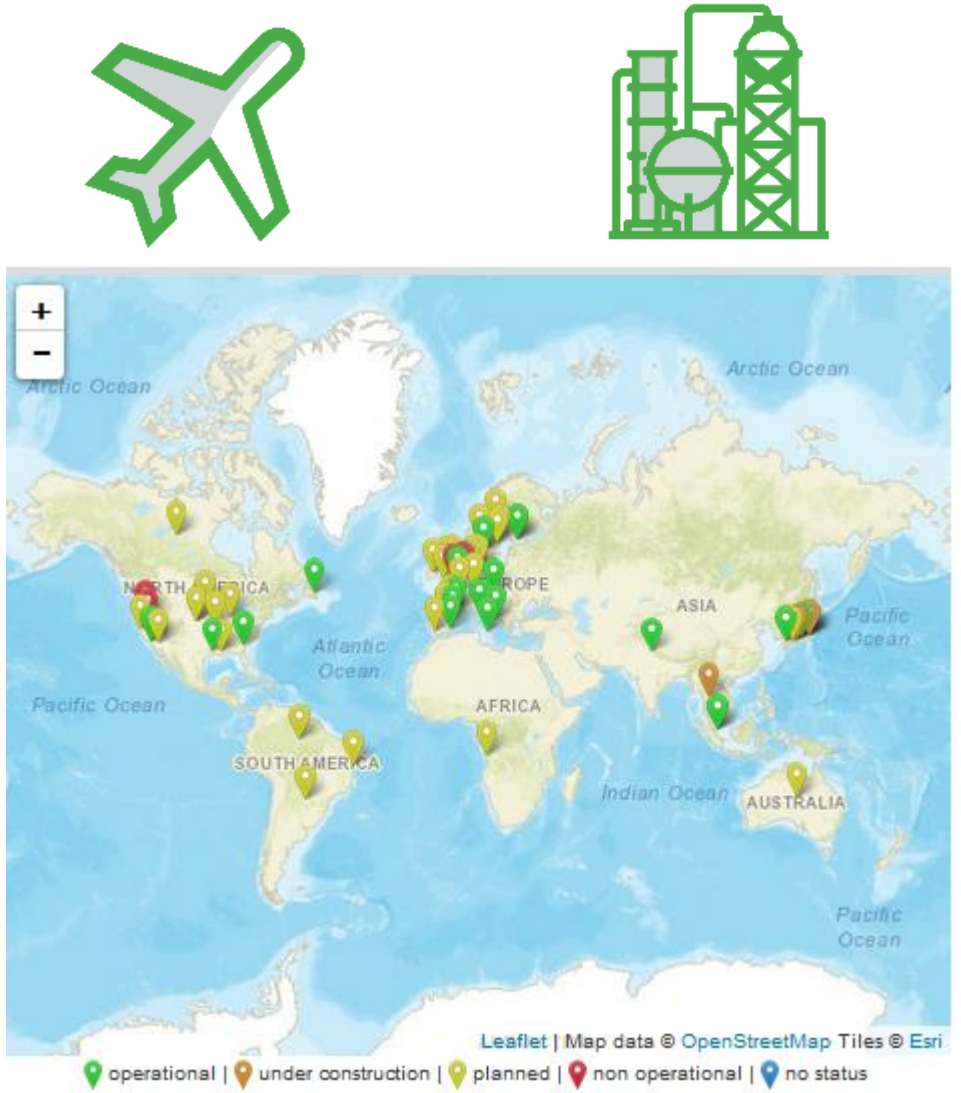
SAF fraction can be increased

- SAF is one of the possible products, favorable fraction depending on economics and policies

Technologies: **Hydrotreatment**, **Co-Processing**, Alcohol-to-Jet, Power to Liquid, Gasification

Rising competition for lipid feedstock and residues

→ Other technologies like Gasification and FT Synthesis or Pyrolysis and Upgrading become more important



Implementation barriers / opportunities

- High production **costs** of advanced biofuel
- **Financial risks** of demonstration and First-of-its-kind facility
- Uncertainty of regulatory framework and **policies**
- Availability and sustainability of **Feedstock**
- **Policy focus** on other options

- Based on broad variety of biomass feedstocks – **diversification of energy supply**
- Biomass production provides **regional income**
- Applicable in current vehicles now – offer **immediate GHG emission reductions**
- **High energy density** – alternative solution for sectors that are **hard-to-electrify**
- Passenger cars → trucks, ships, planes

Conclusions and Outlook Advanced Biofuels

Importance of scale up and demonstration

- Validates feasibility and efficiency
- Variety of feedstock
- Reduces production costs
- Reach commerzialisation is critical, but needs time
- Challenges for demonstration and scale up

Advanced Biofuels: Key to Transport Decarbonization

- **Benefits** – Broad feedstock base, fleet compatibility, high energy density, storable
- **Needs –** Scale-up, cost reduction, risk mitigation, long-term policy support
- **Opportunities** – Aviation, shipping, heavy-duty transport, emerging economies

Thank you for your attention!

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