The Contribution of Advanced Renewable Transport Fuels to Transport Decarbonisation in 2030 and beyond

How to introduce the future transport system

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Main barriers

- Costs for building the new infrastructure
- Multitude of fuel/vehicle options
- Complexity of stakeholder system
- Transposing societal benefits into cost benefits
- Fluctuating policy
Current and future transport system

100 years of optimization
- Well-performing fuel/engine/after-treatment combinations
- Established material compatibility
- Many vehicle models available
- Robust vehicle repair infrastructure
- Good driving range
- Well-established fuel production
- Ubiquitous refueling infrastructures
- Existing fleet uses existing fuels

Offers predictable income to established stakeholders

Infrastructure yet to be built
- Adaptation of fuel/engine/after-treatment system required
- Ev. lack of material compatibility
- Few models available
- New repair knowledge required
- Sometimes lower driving range
- Fuel production infrastr. has to be built
- Refueling infrastructure has to be built and might not be profitable
- New fleet has to be built up

Higher costs and risks → Unclear and risky business cases
Alternative fuel and vehicle options

- Biodiesel
- Ethanol
- HVO
- BTL
- Bio-methane
- Methanol
- DME
- ED95
- Electricity
- Electrofuels
- Hydrogen

- Gas engines
- Dual-fuel engines
- Flex-fuel vehicles
- Battery electric vehicles
- Hybrid electric vehicles
- Plug-in hybrid electric vehicles
- Fuel cell vehicles

• Transport Decarbonisation

IEA Bioenergy

European Commission

Technology Collaboration Programme on Advanced Motor Fuels

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Low-blend biofuels, drop-in biofuels, electrofuels

- E5 (based on cellulose)
- BTL
- HVO, E5 (food-based)
- Diesel, Gasoline

Fuels in alternative fuel vehicles

- E85 in FFV (based on cellulose)
- Biomethane (gasification)
- Biogas (AD)
- E85 in FFV (food-based)
- Natural gas

Transport Decarbonisation

IEA Bioenergy
Choice of fuel/vehicle system

Is based on

- Cost considerations
- Availability of feedstock and fuel
- Sustainability / GHG emission reductions offered
- National fuel demand per sector
- National production capacity / potential imports

→ No single fuel/vehicle alone will solve it all
Multiple stakeholder system

Automotive industry

Fossil fuel industry

Alternative vehicles production

Alternative fuel production

Vehicle marketers

Freight sector

Private car owners

Alternative fuel production

Fuel marketers

Policy

Supporters

Opposing parties

Society

Transport Decarbonisation
Set of political measures

- RD&D funding programmes
- Loan guarantees for demonstration facilities
- Corporate tax breaks to newly built biofuel facilities
- Biofuel production incentives
- Sustainability safeguards
- Alternative vehicle purchase incentives
- Blending mandates
- Tax reductions/exemptions
- Renewable/low-carbon fuel standards
Fluctuating policy drivers

Improved current system:
- New oil/gas supplies, lower oil/gas prices
- Improved conventional technologies (fuel/after-treatment/control)
- Competition from other alternatives / questioning of biofuels sustainability

Future system:
- Better energy diversity
- Lower local emissions
- Lower GHG emissions
- More rural income
Policy recommendations

- Long-term predictable policy
- Beginners: blending mandate
- For higher contributions: low carbon fuel standard
- Send strong price signals
- Address the complex system of stakeholders
- Be technology neutral
- Measures can be adapted over time, but the support to the original goal has to remain at high level
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More information: https://iea-amf.org/content/news/TD-WS
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