International Energy Agency

Delivering sustainable fuels – Pathways to 2035

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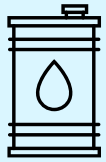
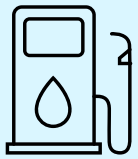
Sustainable fuels can offer multiple benefits

Improve Energy Security



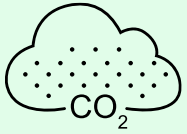
Reduce reliance on fossil fuel imports



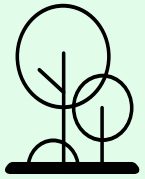
Diversify fuel supply chains

Enhance access to sustainable energy

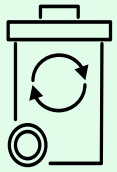
Advance Sustainability



Reduce GHG emissions

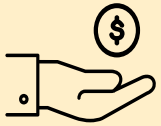


Advance land and water management



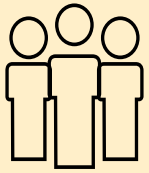
Improve waste management

Drive Economic Development



Increase investment opportunities

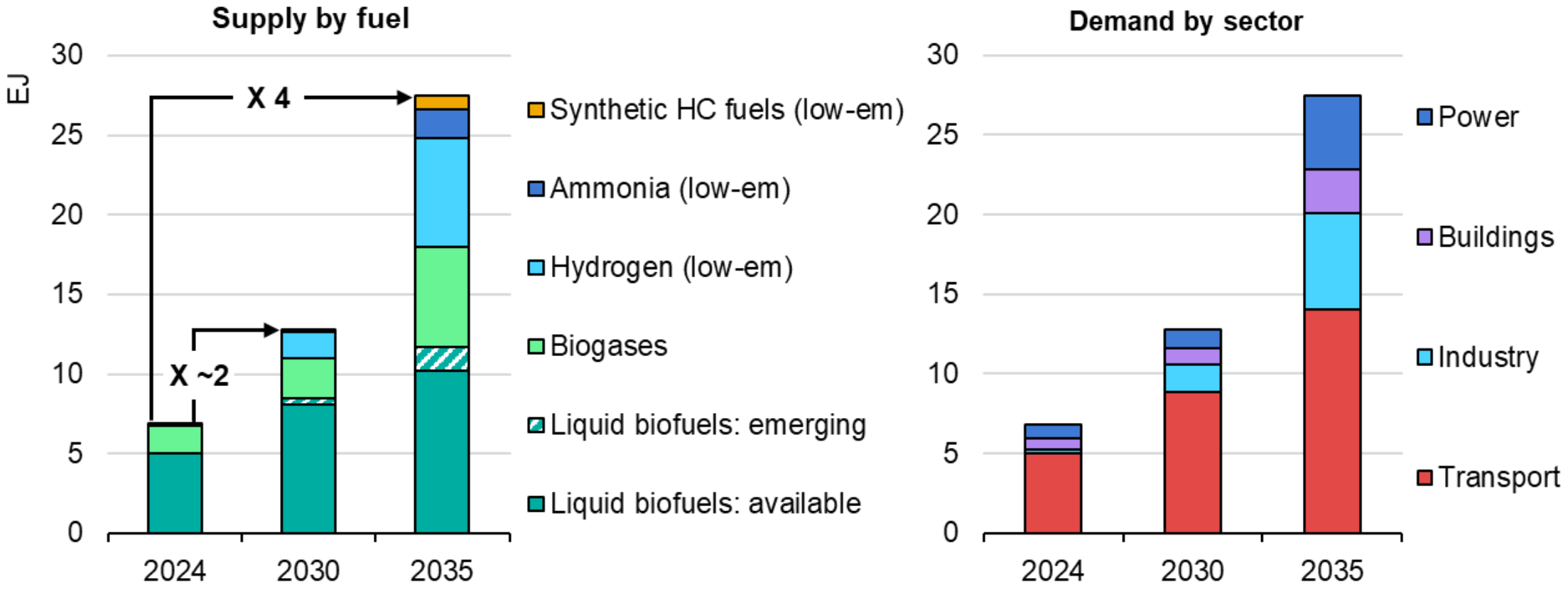
Grow local and global supply chains



Create new employment opportunities

Sustainable fuels quadruple globally if announced policies are implemented

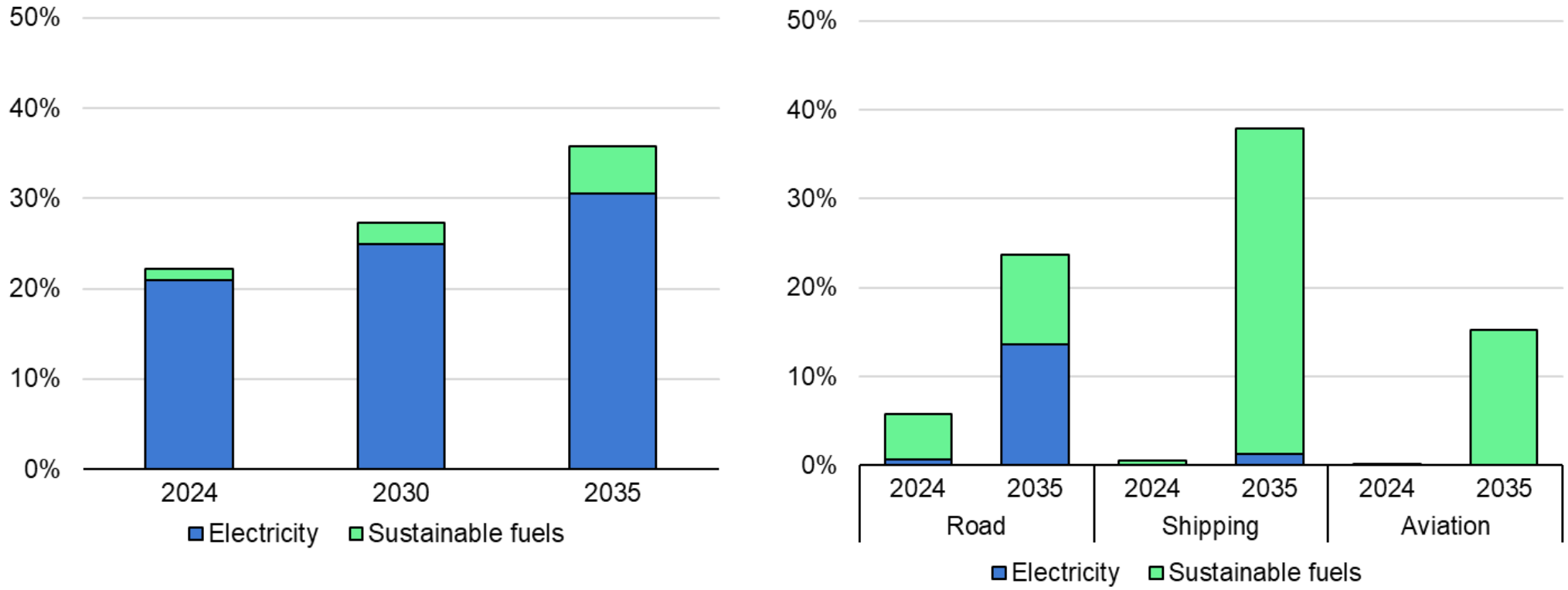
Sustainable fuel supply and demand in the accelerated case, 2024-2035



Depending on the country and regional circumstances, the sustainable fuels mix and shares can be very different from global averages.

Sustainable fuels are complementary to electrification

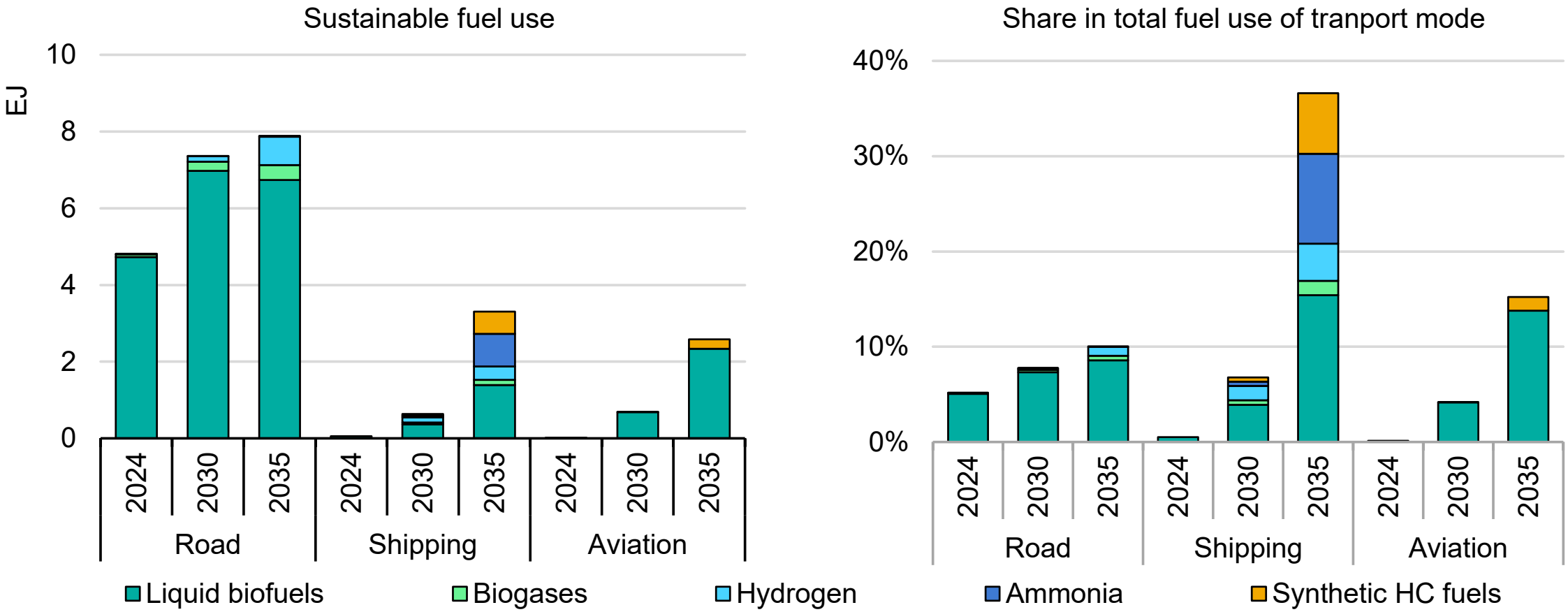
Shares of sustainable fuels and electricity in global final energy demand (left) and in selected sectors (right) in the accelerated case, 2024-2035



Direct electrification and energy efficiency are essential to transitioning away from fossil fuels, but sectors such as aviation, shipping, heavy industry and parts of road transport, continue to rely on fuel-based solutions.

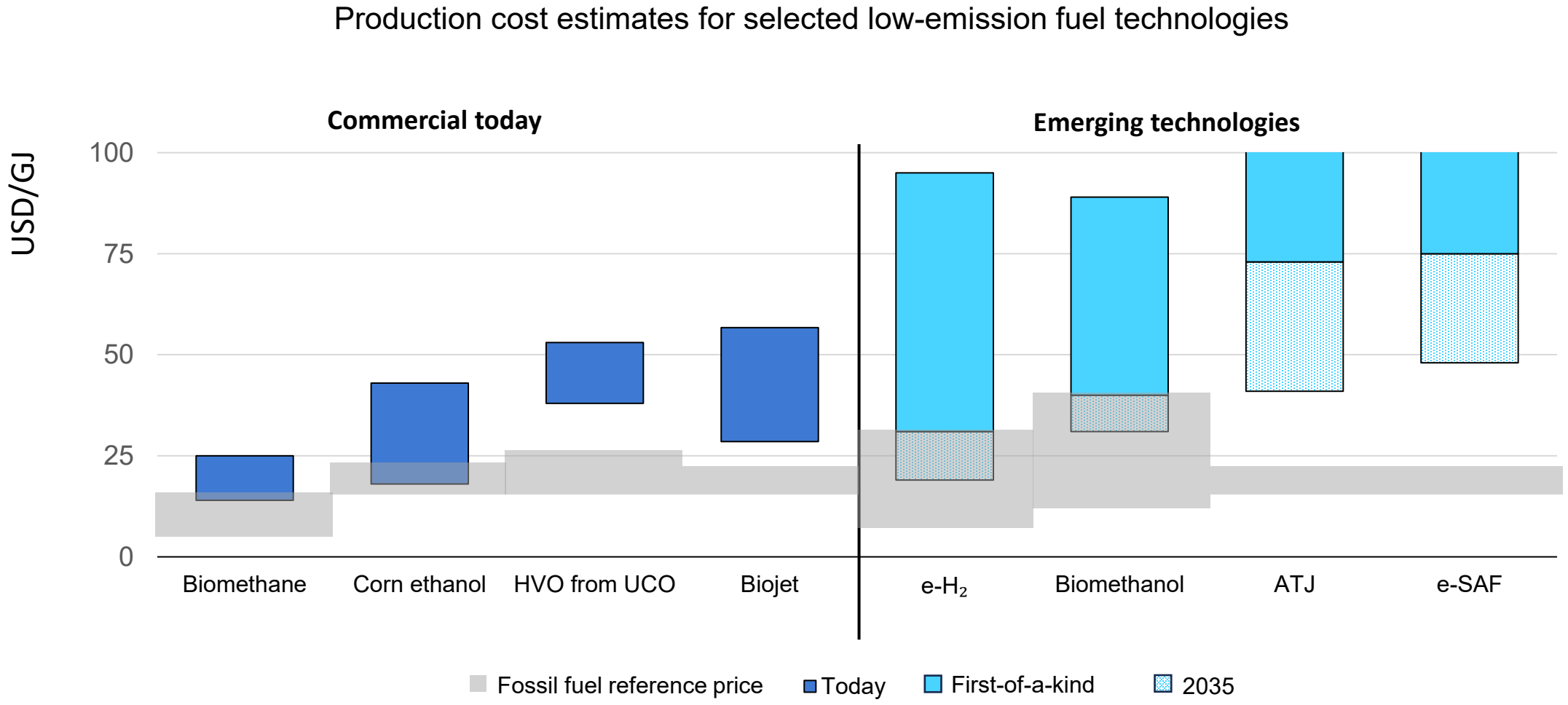
Demand for Sustainable Fuels Triples in Transport by 2035

Sustainable liquid and gaseous fuel use by fuel type for selected transport modes



Growth of Sustainable Fuels is largest in marine transportation, followed by road and aviation transport.

Innovation can narrow the cost gap with conventional fuels



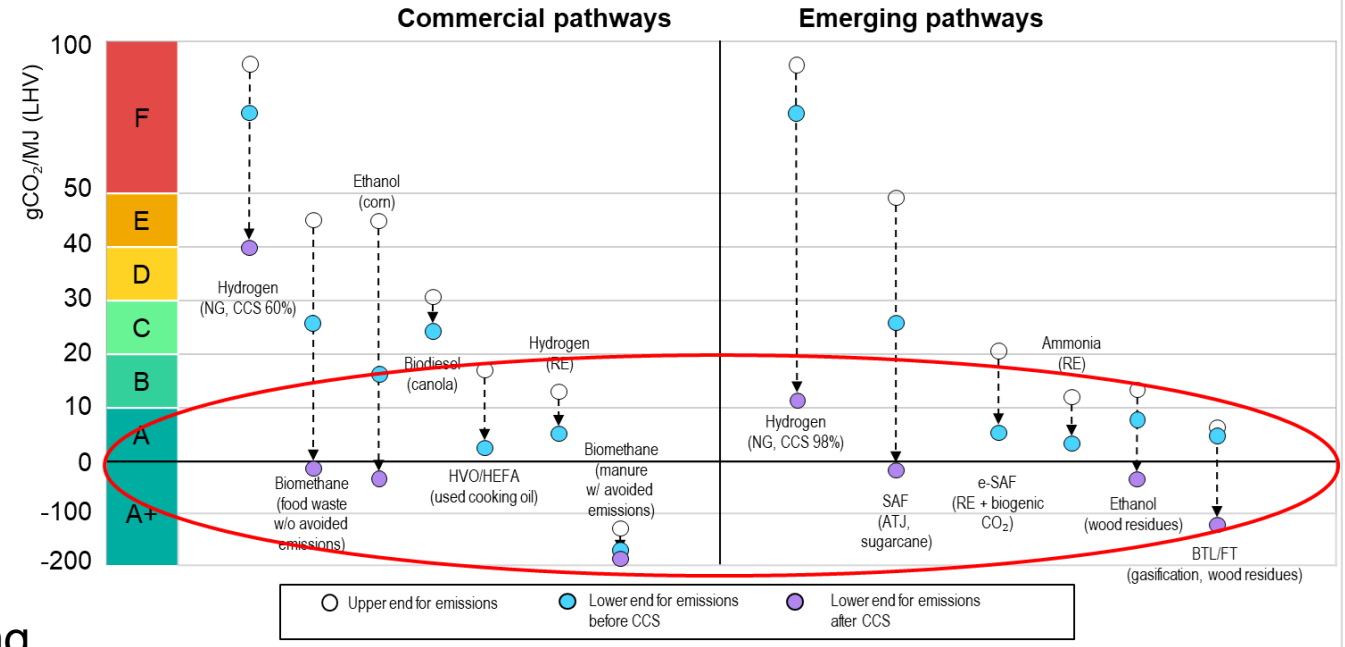
Despite higher costs, impact on end-use consumer prices is expected to be limited by 2035. A 15% SAF blend would increase the flight ticket price by 5-7%. The price of a car made with low-emission steel would increase by <1%

With well-designed policies, most fuels can reach very low emissions

A **tiered labelling system** allows:

- Consistent **comparability** across fuels and existing schemes
- Defining **minimum emission reductions** compared to fossil fuels
- Recognising and rewarding **better performance** beyond threshold
- Measuring and fostering **continuous improvement** over time
- Using a **portfolio of low(er)-GHG fuels** during the transition and provide guidance to EMDEs

Example of a quantitative GHG intensity labelling system for selected sustainable fuel pathways at the point of delivery



The IEA recommends 6 priority actions

A **fourfold growth in a decade is ambitious but achievable**, if announced policies are consistently and fully implemented and market barriers are removed. Priorities include:

1. **Establish roadmaps, targets and support policies** tailored to regional and national contexts
2. **Increase demand predictability** to increase market confidence and attract investment
3. **Cooperate in developing transparent and robust carbon accounting methodologies,** to enhance comparability and enable policies rewarding progress in measurable emission reductions
4. **Support innovation to narrow cost gaps** to accelerate economies of scale and reduce costs of emerging technologies
5. **Develop supply chains and address infrastructure and integration needs** anticipating long-term needs and economic development opportunities
6. **Make financing more accessible** to unlock the vast potential of sustainable fuels, particularly in Emerging and Developing Economies