



Role of sustainable fuels in clean energy transitions

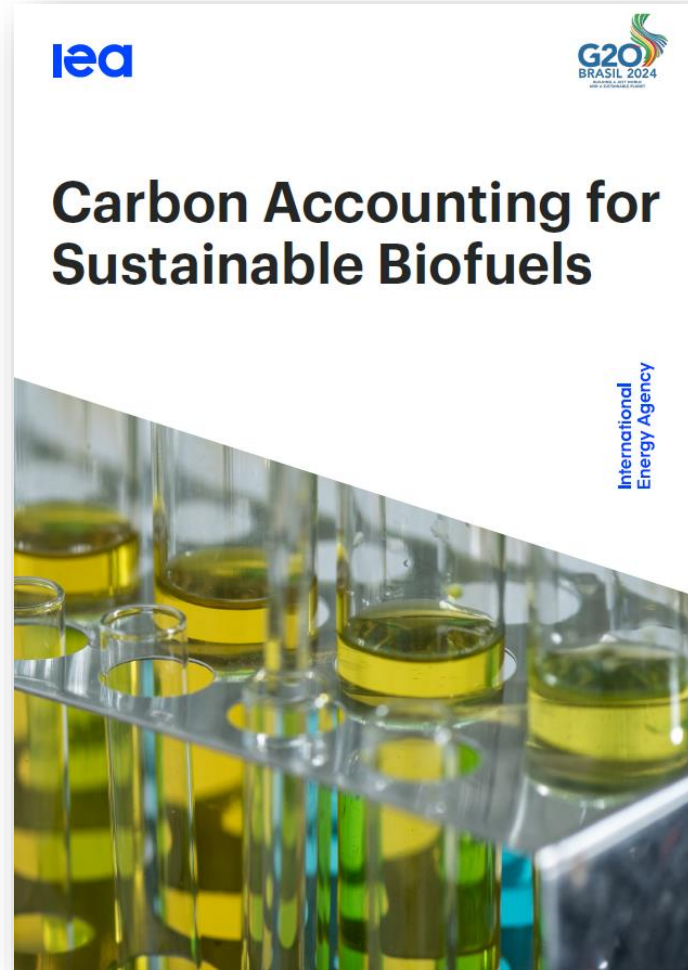
Dr Paolo Frankl, Head of Renewable Energy Division

COP29 JAMA seminar

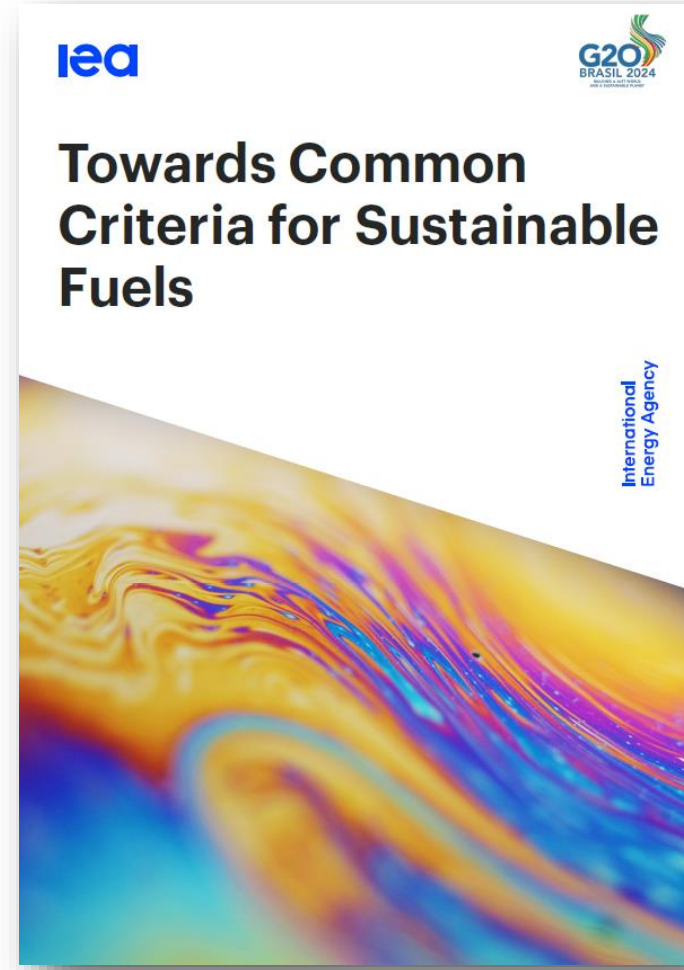
20th November 2024

Two recent reports in support of Brazil's G20 Presidency

Released 23rd July 2024

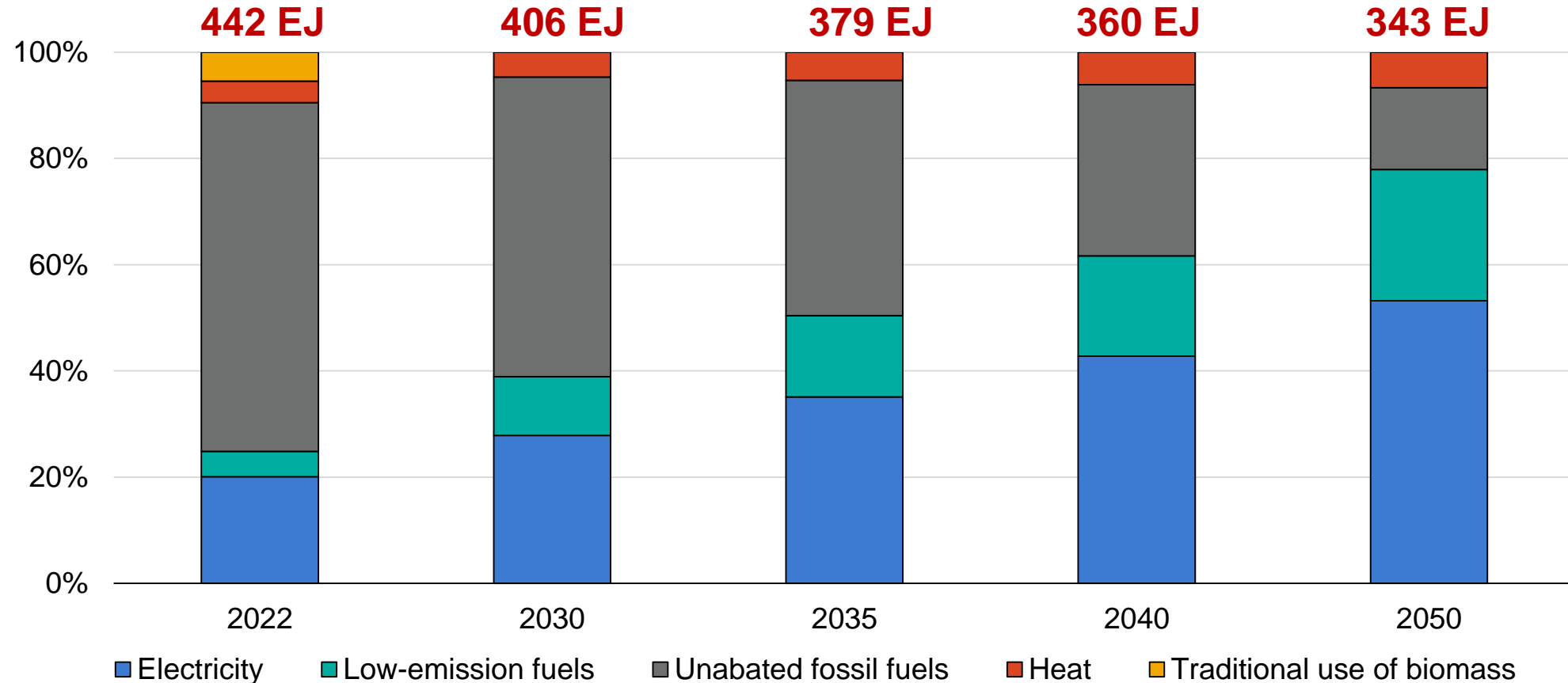


Released 25th Sep 2024



Sustainable fuels are a pillar of the energy transition

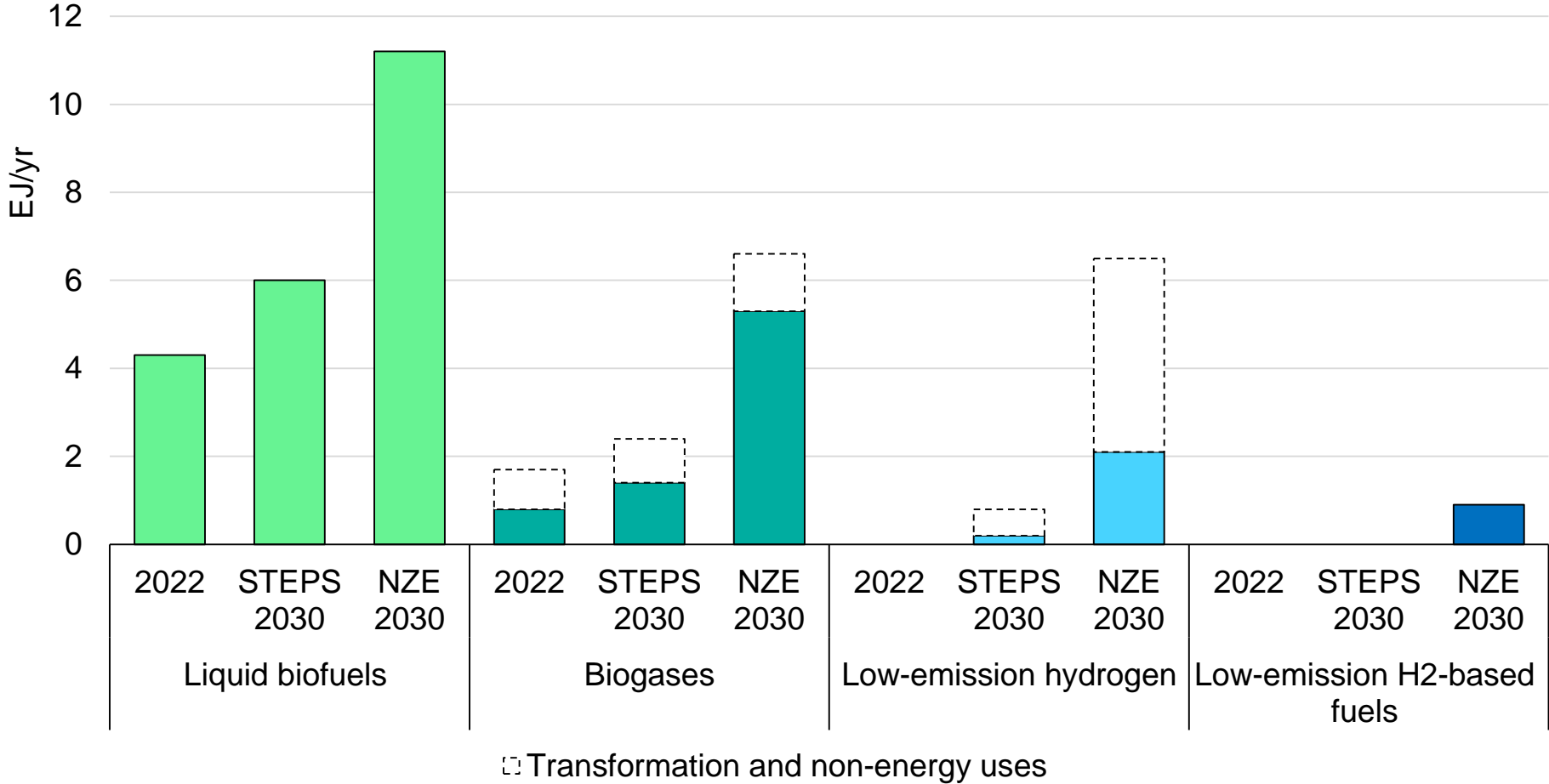
Total energy consumption, IEA Net Zero Scenario, 2022 to 2050



Sustainable fuels such as biofuels, hydrogen and hydrogen-based fuels provide 85 EJ of energy in 2050 in NZE, equal to global electricity demand today. By 2050 they support one quarter of global energy consumption.

None of the main fuel pathways are on track for net zero

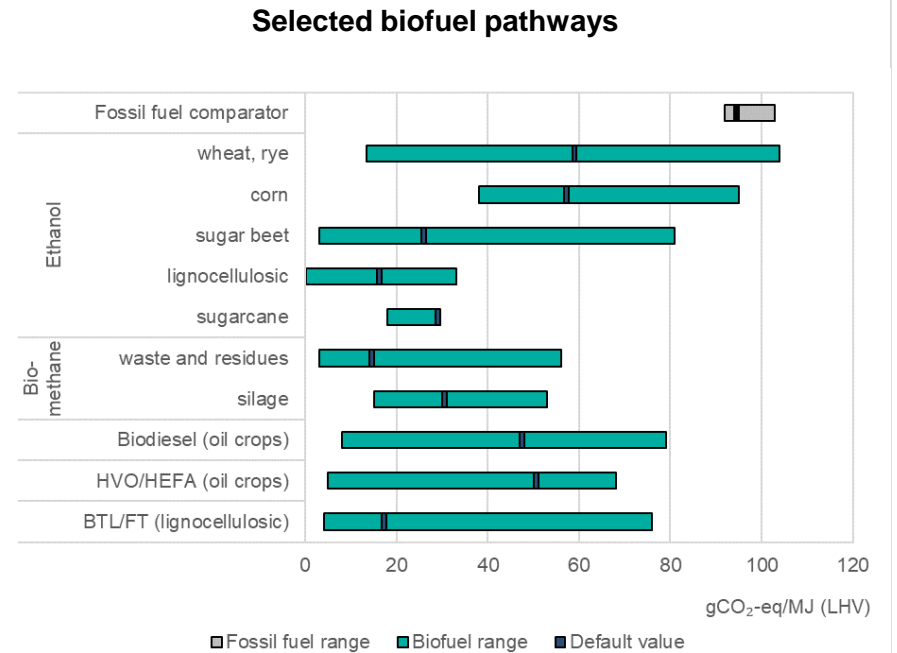
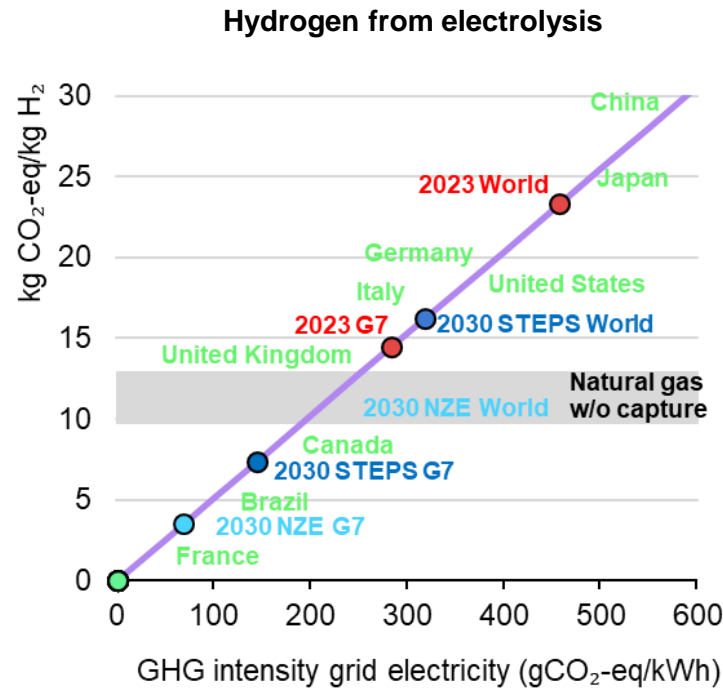
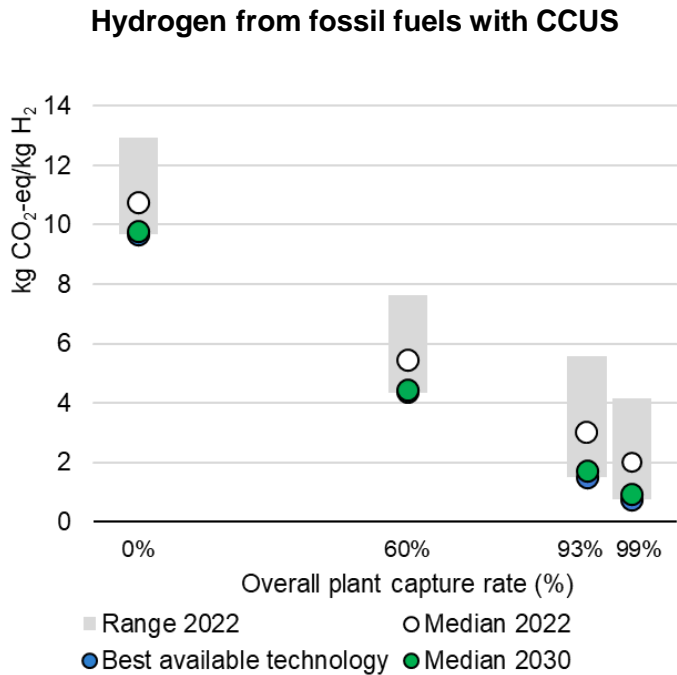
Total final consumption of liquid and gaseous low-emission fuels in 2022 and in STEPS & NZE scenarios by 2030



Quicker growth depends in part on achieving a common understanding of what makes a fuel “sustainable”. No international consensus on terms like “green”, “blue” or “advanced”, and they lack quantitative information on GHG emissions.

Most fuel pathways have potential to achieve low GHG emissions overtime

GHG emission ranges for the main sustainable fuel pathways



Several measures can be applied to improve GHG performance of fuels, but incentives are required to cover extra costs.

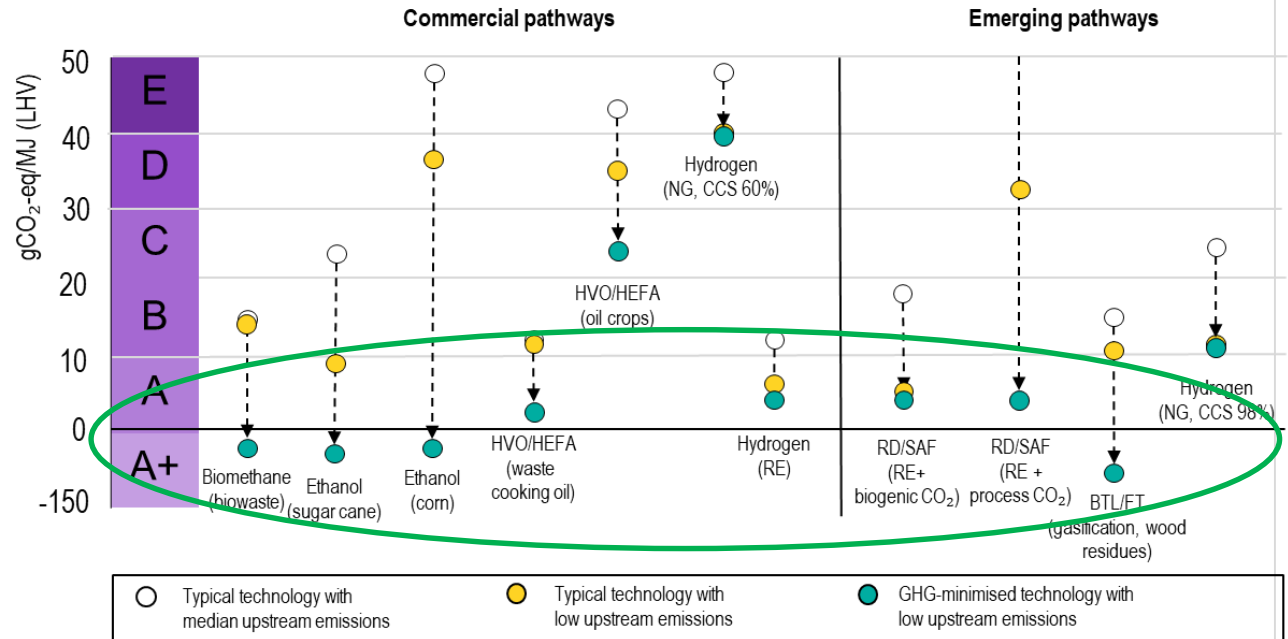
Developing a common GHG intensity label for sustainable fuels

Most fuels have the potential to achieve **very low GHG emissions over time**

A **tiered labelling system** allows:

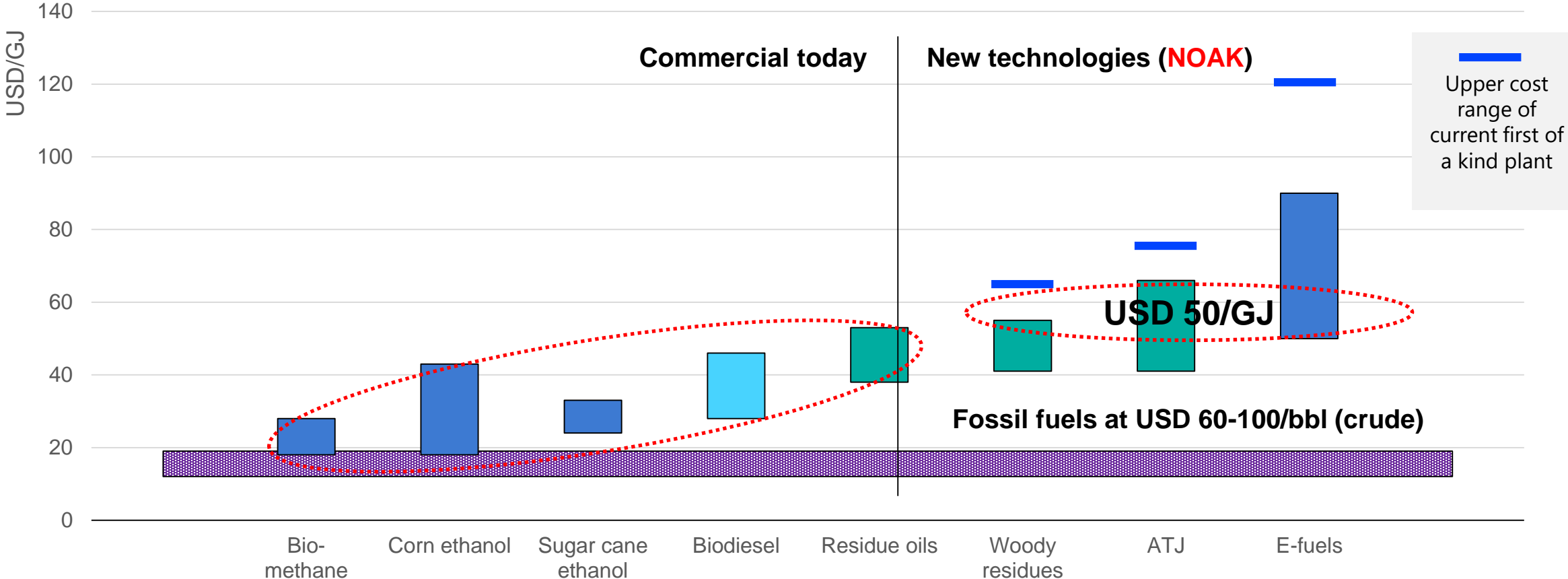
- Consistent **comparability** across fuels and existing schemes
- Defining **minimum emission reductions** compared to fossil fuels
- Assessing and rewarding **better performance** beyond threshold
- Measuring and fostering **continuous improvement** over time
- Using a **portfolio of low(er)-GHG fuels**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

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



Expanding to new technologies will lead to a jump in costs

Production cost estimates for selected low-emission fuel technologies



Several emerging technology pathways can jointly deliver higher blending shares of low-emission fuels post 2030. Although initially more expensive, they could compete with waste oil-based biofuel technologies once at scale.

- Accelerating the deployment calls for a coordinated effort to **increase consensus on common criteria** for sustainable fuels.
- Further strengthening the collaboration among international organisations such as **ICAO and IMO**, but also with end-use sectors beyond transport, like **steel and fertilisers**.
- Establishing a voluntary expert group to **further develop and test a tiered labelling system** in selected countries
- The IEA stands ready to **support Brazilian COP30 Presidency** to develop a vision for sustainable fuels by 2030 and 2035, underpinned by robust and factual analysis.

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