The role of low-carbon gases in the IEA’s Net Zero by 2050 Roadmap

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Where are we along the road to Net Zero?

For the first time, today’s pledges – if implemented on time and in full – would keep the rise in global average temperatures in 2100 to below 2°C, but there’s still a large gap to 1.5°C.
Gaseous fuels play key roles in energy transitions

Consumption of liquids, gases and solids

Fuels remain an integral part of the global energy mix to 2050, and sustainable sources of bioenergy play a major role across all fuels in climate-driven scenarios.
Tackling methane leaks is a first-order task

Very large leaks from oil and gas operations were detected by satellite across 15 countries in 2021. The areas open to observation by satellite are increasing, although the coverage they provide today is still far from complete.
Gaseous fuels on the pathway to net zero

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Total gaseous fuel demand in the Net Zero by 2050 scenario

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A global assessment of the costs and potential of biomethane

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Upgrading biogas to biomethane underpins growth in all scenarios

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How fast can hydrogen rise to 2030?

Low-carbon hydrogen and hydrogen-based fuel demand and supply by scenario in 2030

A key barrier for low-carbon hydrogen has been the cost gap with hydrogen from unabated fossil fuels, but these constraints start to look different in a context of expensive natural gas and gas security concerns.
The growth of new energy-related commodities

Under announced pledges, a growing share of oil and gas trade flows towards developing economies in Asia. In all scenarios, but especially in the net zero pathway, critical minerals and hydrogen-based fuels are on the rise.

Value of international energy-related resource trade

- **2019**
  - USD 1.5 Trillion
  - Oil (66%)
  - Natural gas (14%)
  - Coal (9%)
  - Critical minerals (11%)

- **2050: Announced Pledges Scenario**
  - USD 1.5 Trillion
  - Oil (58%)
  - Critical minerals (18%)
  - Hydrogen (7%)
  - Natural gas (12%)
  - Coal (5%)

- **2050: Net Zero Scenario**
  - USD 0.9 Trillion
  - Critical minerals (47%)
  - Hydrogen (35%)
  - Oil (11%)
  - Natural gas (5%)
  - Coal (2%)