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Hydrogen is improving, but the 2050 net-zero target remains elusive

November 26, 2025

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HydrogenHaber – The analysis published by AirInsight Group emphasizes that although studies on solutions such as hydrogen fuel cells and hydrogen-modified jet engines have gained momentum, especially in aviation, they are still at the “scaling stage” in commercial application.

The analysis reveals that while green hydrogen (H_2 derived from renewable energy) has the potential to significantly reduce direct CO_2 emissions in flights, it faces several technical, infrastructure and economic barriers.

CHALLENGES FACED

Technological: The volume and weight of hydrogen tanks remain a major challenge; scaling of both fuel cell systems and hydrogen storage on large passenger aircraft is not yet fully realized.

Infrastructure: Hydrogen refuelling infrastructure is virtually nonexistent at airports, and the clean energy target of 1,600 TWh required by 2050 is ambitious.

Economical: Green hydrogen costs 3–6 times more than jet fuel for airplanes; drop-in biofuels currently meet 0.1% of demand.

CONCLUSION AND MESSAGE FORWARD

The analysis highlights that while hydrogen has potential for regional flights, achieving net-zero on long-haul flights with hydrogen alone is very difficult.

The article's salient point is this: Achieving the 2050 targets without the "hydrogen + sustainable aviation fuels (SAF) + efficiency" trio appears highly risky. This analysis once again highlights the need to shape industrial and energy policies in line with both technical and financial realities.

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