



# AVIATION CO<sub>2</sub> REDUCTIONS



STOCKTAKING SEMINAR  
TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS



# Clean energy

**Xavier Vigor**

Vice-President Technologies and Industrial  
Management – Air Liquide Hydrogen Energy



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# Air H2 worldwide producer story, vision, green H2, opportunities and challenges

Xavier Vigor, Vice-President Technologies and Industrial Management  
H2 Energy



# Liquid H2 technologies were developed 50 years ago...

ESC-A LH2 tank

EPC LH2 & LOX tanks

LHe storage

**ARIANE 5 : Launcher**

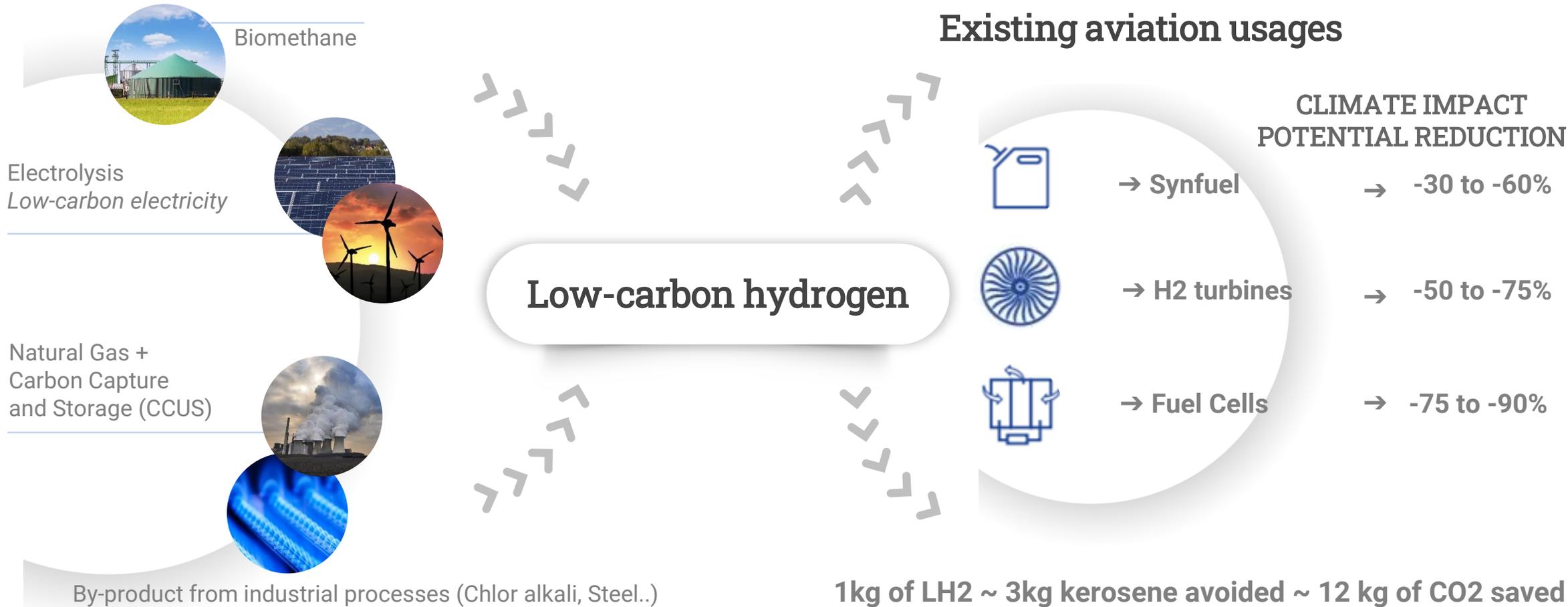


**HEAVEN**  
Cryogenic Hydrogen Tech Aircraft

**Liquid H2 will fly in 2022**

Liquid hydrogen contains ~3 times more energy than aircraft kerosene per kilogram (1kg LH2 ~ 3kg Kerosene)  
 → Less fuel but larger volume needed (~x4)

# Hydrogen will be low carbon:



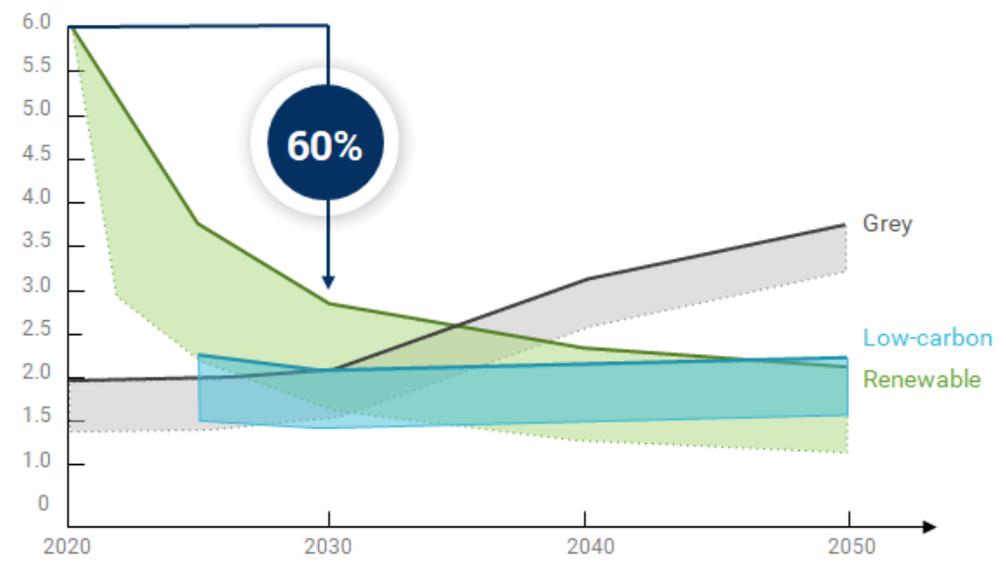
**Hydrogen Council** commitment in 2030, 100% H2 low carbon for mobility

# H2 will be economical

## Aviation Fuels

H2 direct-burning turbines	e-fuels
Fuel Cells	<i>Liquid H2</i>

Renewable hydrogen production costs can be reduced by 60% through 2030 :



Up to - 100 % of direct CO2 emissions avoided



Volumes will bring cost down



LH2 for aviation will benefit from synergies with ground mobilities well established in 2030



Regulations and political support

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# Thank You

