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CLEAN AVIATION
Info Session

31rd March 2022



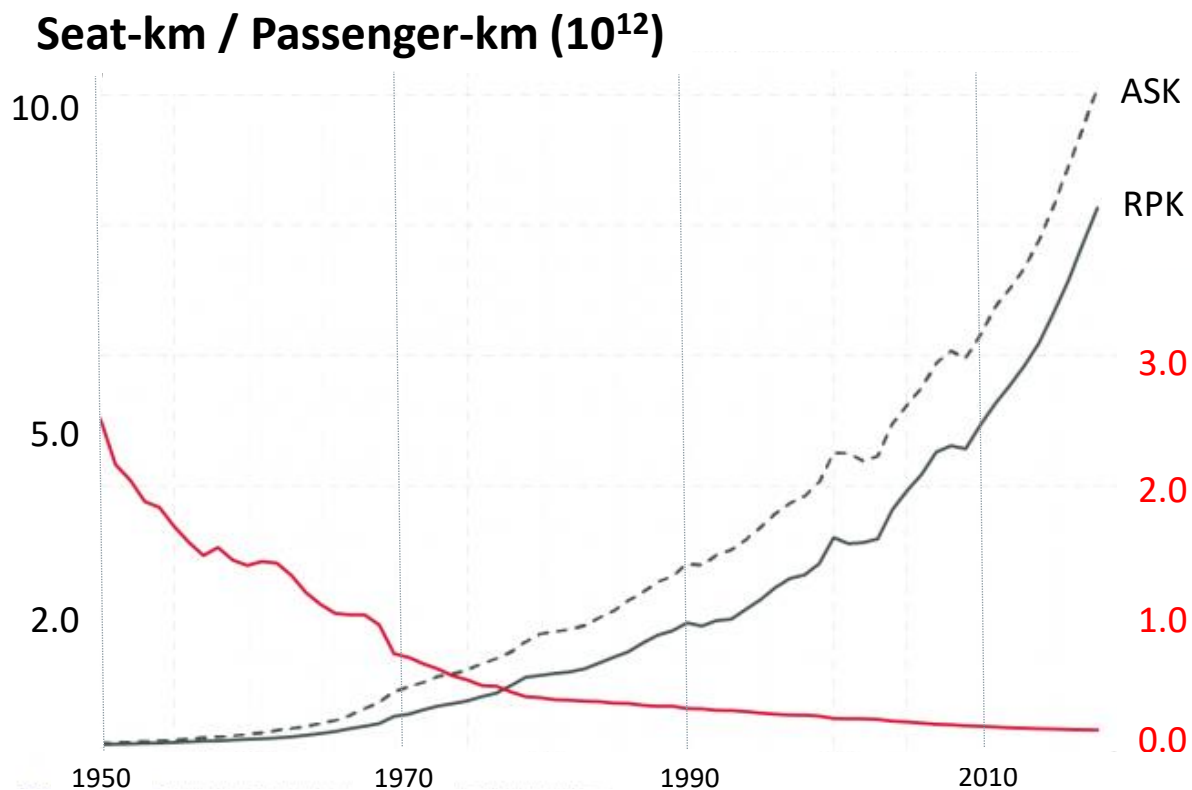
CLEAN AVIATION

**PROGRAMME OVERVIEW
AND CONTEXT – IN A
NUTSHELL**



Co-funded by
the European Union

Phenomenal progress in efficiency.
But growth has consistently outpaced these gains.



1989 – 2019:

- Air transport system quadrupled
- Emissions doubled
- Superb efficiency gains but absolute emissions growth = *exponential...*

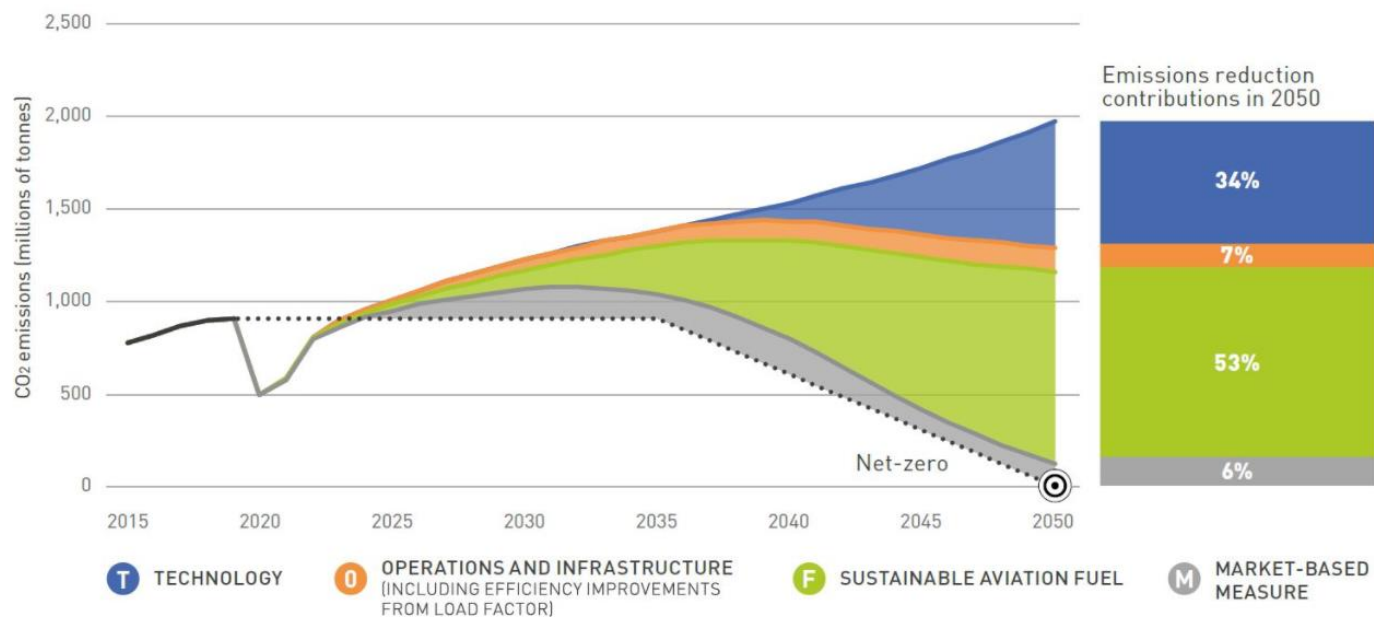
kg CO₂ per RPK

2018: 0.125kg CO₂ per RPK

Source and copyright: OurWorldinData.org

EUROPEAN AVIATION SECTOR AND THE EUROPEAN GREEN DEAL

Committed to work towards a climate neutral European aviation system by 2050.



 **Destination 2050:**
A Route To Net Zero European Aviation

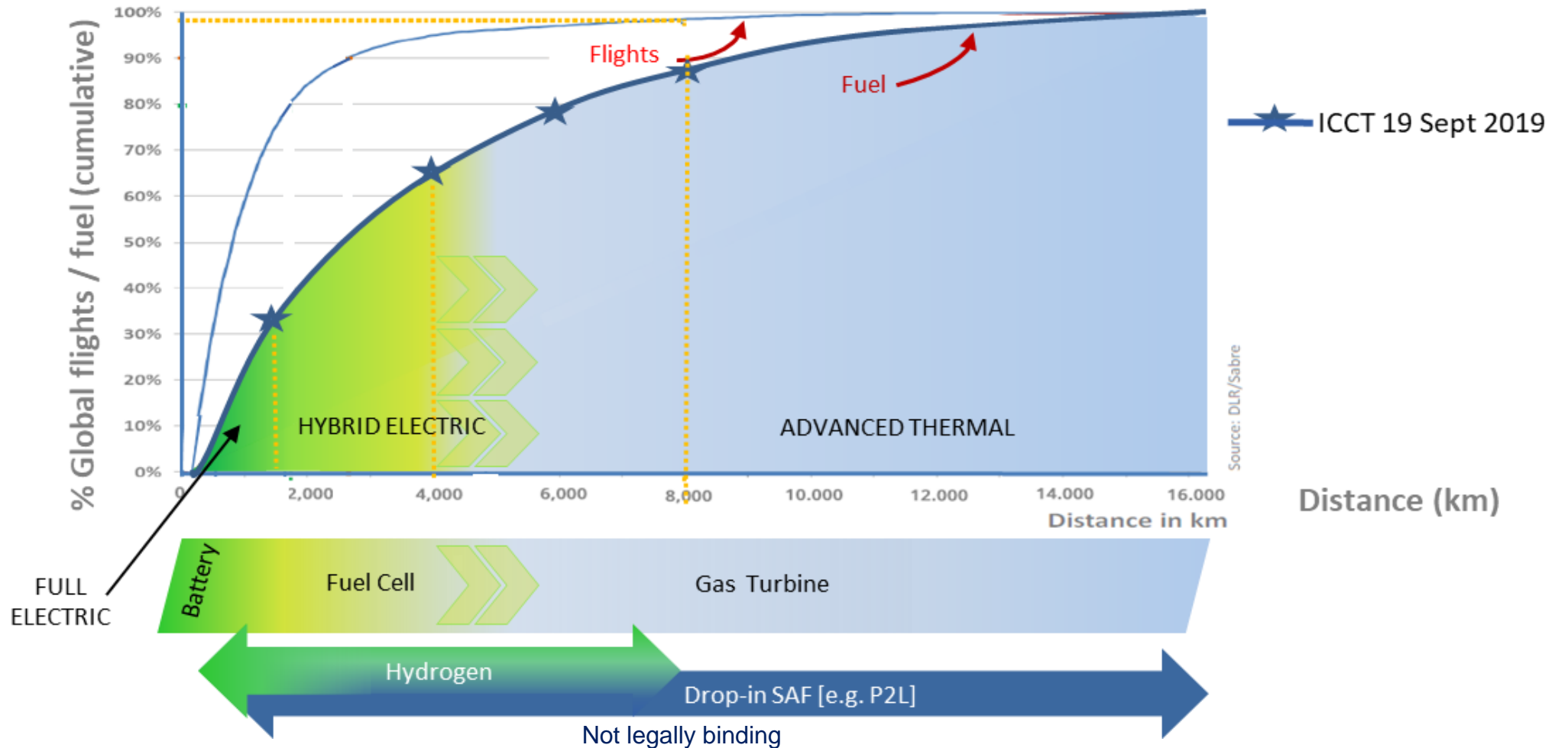
Regional: -50%
Single Aisle: -30%
Single Aisle/H₂: -35%
Short/Medium Range Twin Aisle: -30%
Long Range Twin Aisle: -30%

(all figures excluding SAF effect)

Source: ATAG report 2021

MORE DIFFERENTIATION WILL PROVIDE SCOPE FOR DISRUPTION

1/3 of global emissions are from flights <1500km. 2/3 of global emissions from flights <4000km.



INNOVATION ARCHITECTURE BUILDING ON PREVIOUS ACHIEVEMENTS

Mobilising talent and expertise across Europe and non-aviation sectors

Clean Sky



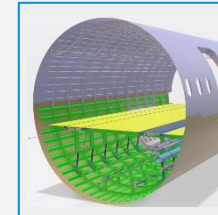
Open Rotor
Laminar Flow
ALPS



Clean Sky 2



RACER
MFFD
UHPE
NextGen Tilt Rotor



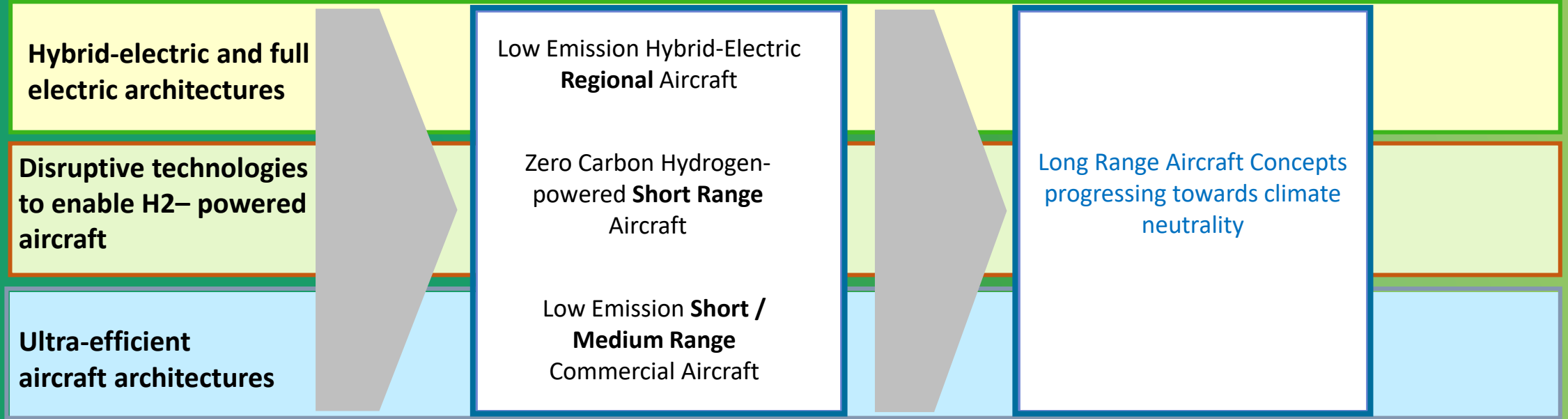
Clean Aviation



(Hybrid) Electric
Hydrogen Propulsion
Ultra-efficiency



CLEAN AVIATION – LINCHPIN IN EUROPE’S R&I FOR THE TRANSITION



Flight demonstration in Clean Aviation JU and Impact by 2035

Development of disruptive technology options

The
MOST
EXCITING
TECHNOLOGICAL
DECADE
for AERONAUTICS
IS
BEGINNING

»»»»»»» **Keep pushing the envelope in all ‘traditional’ aeronautical sciences**

»»»»»»» **Non-traditional sciences and disciplines will need to bring key enablers**

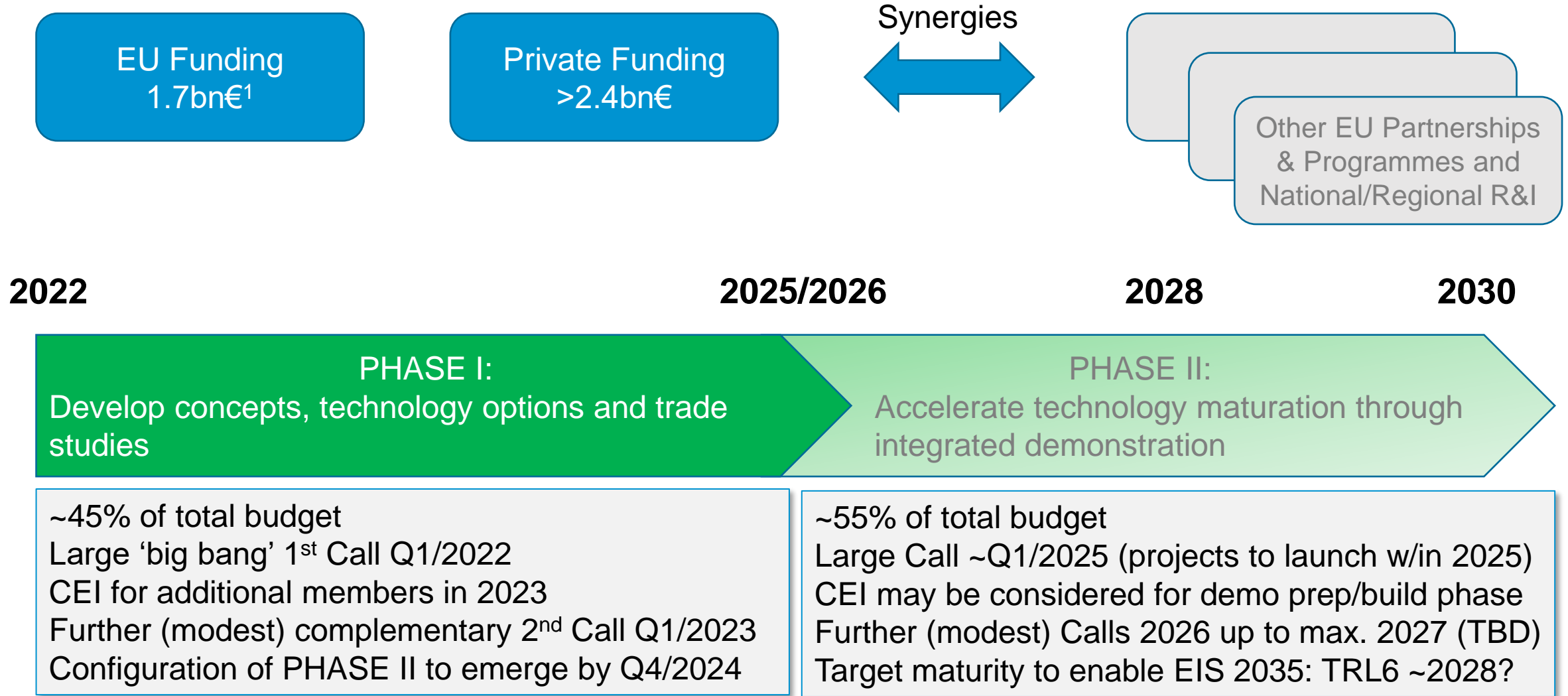
- Electrical power generation & distribution (high voltage; >>1MW)
- Thermal management
- Energy management systems enabling hybridisation
- LH2 storage & fuel systems
- Distributed systems & increased autonomy

»»»»»»» **Manufacturing system**
(aim: replacing ~75% of the global fleet by 2050)

»»»»»»» **Simulation, digital twin and innovative certification methods**

»»»»»»» **Life-cycle aspects and recyclability**

THE PROGRAMME SETUP IN A NUTSHELL





CLEAN AVIATION

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