

# HAPSS certification challenge

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New Dutch company, founded September 2022, developing a

Hydrogen Propulsion System (**HPS**)

from tank (liquid hydrogen, fuel-cell electric) up to propeller

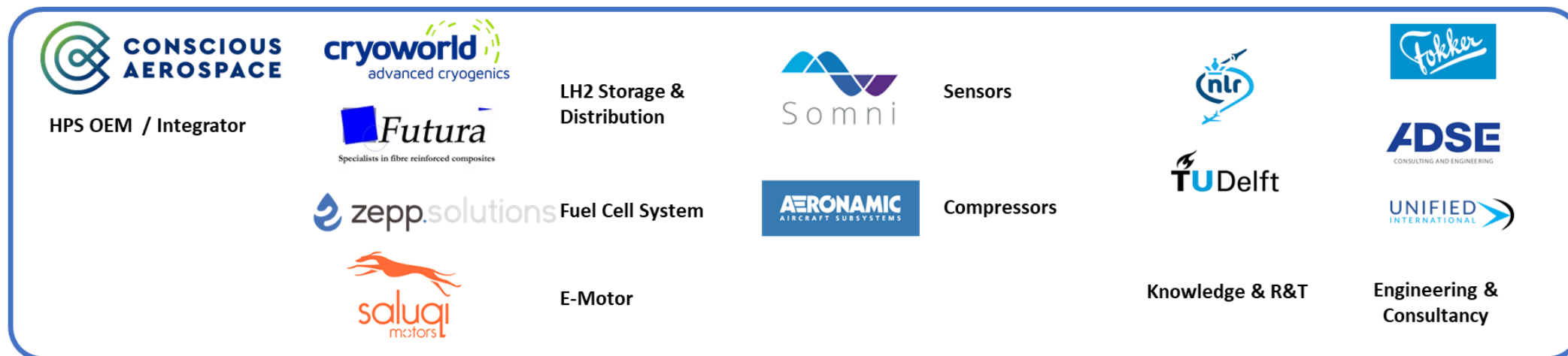
to be integrated into existing (**RETROFIT**)

and new built regional propeller aircraft (**CS-25**)



# HAPSS Project – NL National Growth Fund

- National Growth Fund awarded 383 Mln € funding to Ministry of Infrastructure & Water management “Aviation in Transition” Project
  - Hydrogen Aircraft Powertrain and Storage System (HAPSS) is the largest project under “Aviation in Transition” with a ~ 90 Mln € grant
- 12 partners – combining 100+ years of aviation experience incl. hydrogen innovations



- Cooperation with De Havilland Canada



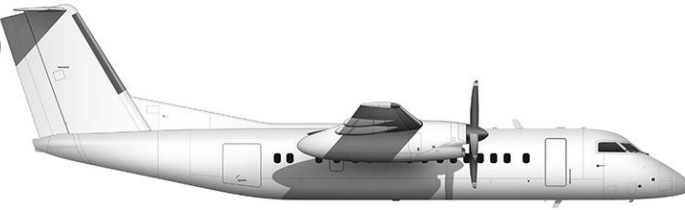


# Envisaged Certification route

Planned to be  
certified by 2028

Existing Dash8-300

- TC A/C
- TC engine
- TC Propeller



Significant  
Change

- Remove engines
- Modify A/C
- Install Hydrogen Propulsion System



HAPSS Dash8-300

- STC A/C
- TC HPS
- TC Propeller

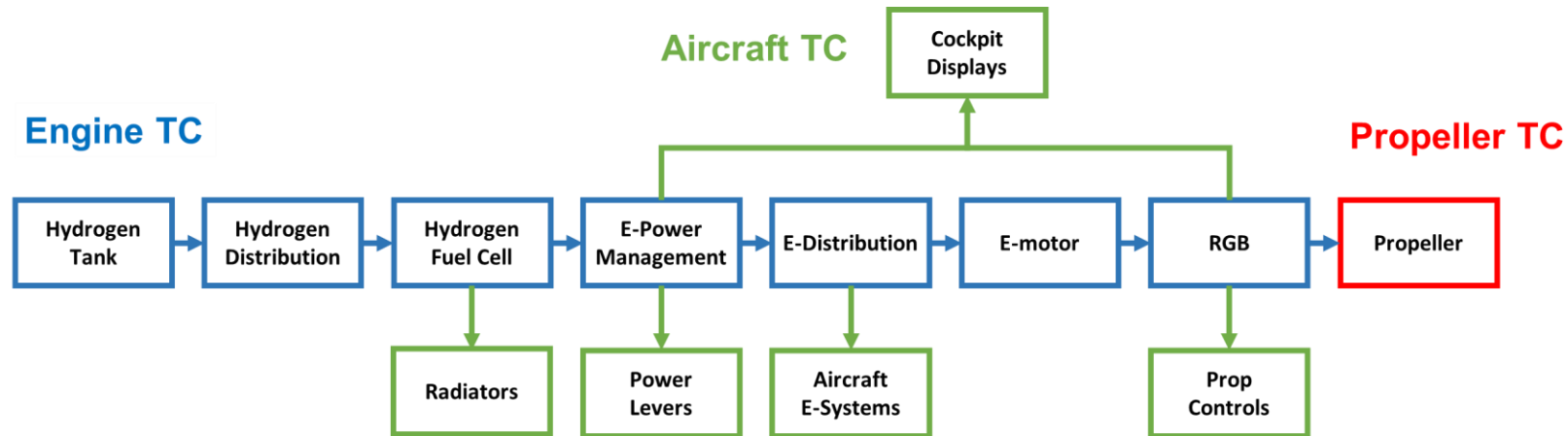
Build a Design Organization

- DOA



# Proposed Type Certificate HPS

Type Certify the “Hydrogen Propulsion System” (HPS) from storage system up to propeller.  
In analogy with the SC E-19 Hybrid Electrical Propulsion System



Rationale:

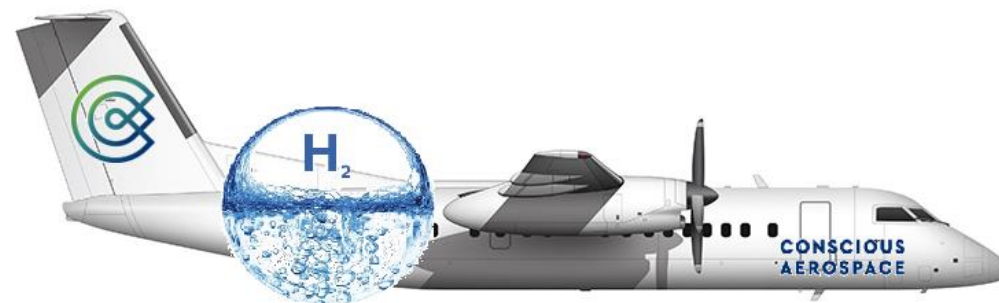
Aircraft performance is driven by a tight, centralized control of the energy chain:  
physics phase change - chemical to electric - electric to mechanical



# Proposed A/C certification approach

Aircraft Level: STC

- With aircraft OEM support
- Effects of hydrogen
- HPS installation as powerplant



Envisaged Certification Route to Market

- Demonstrator / Permit to Fly from NL CAA
- HPS TC from EASA
- Aircraft STC under EASA and/or Transport Canada
- Export of STC to aircraft operator countries



# Certification base for A/C & HPS

HPS is novel:

- Requires a lot of conversations
- Requires learning to master new technologies
- Requires educating specialists & CVE
- Requires understanding of failure modes
- Requires public consultation
- Requires...



In execution

Innovation Partnership Contract  
Pre-application  
Application

Certification Base







# Certification Challenge

Dancing...



...is all about timing

Funding

Resources

Technology

Demonstrating  
Performance  
& Safety

- Special Condition
- LOI
- CRI

Technology  
knowledge

Resources

Funding



# Certification Conference

October 24, 2023  
Cologne

# Thank you!



**CONSCIOUS  
AEROSPACE**



**EASA**  
European Union Aviation Safety Agency

