



APUS i-5 Cargo

overview



World-class Engineering. Superior Economics.
Clean Aviation.

APUS – Homebase

APUS Group headquarter is located in Strausberg, east of Berlin. With direct access to the runway APUS is able to prototype and test aircrafts with high efficiency.

APUS Group

Lilienthalstraße 2
15344 Strausberg
Germany



Key Numbers – APUS Group

Founded	2014
Staff-Experience:	20+ years
Certificates:	EASA DOA / ISO 9100
Engineers:	30+
Infrastructure:	350 sqm office 1 300 sqm workshop



Meet the APUS i-5

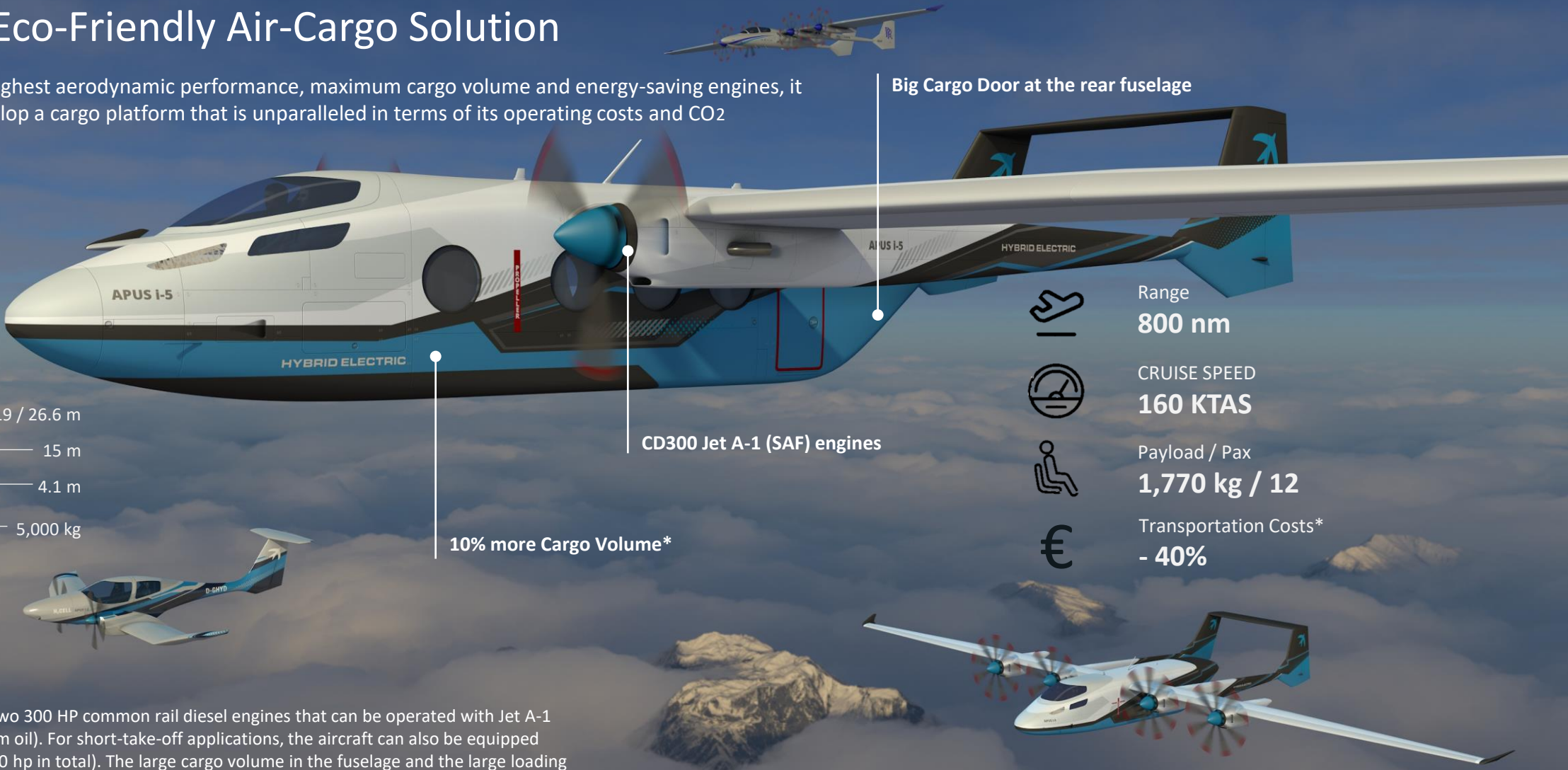
The most Eco-Friendly Air-Cargo Solution

By focusing on the highest aerodynamic performance, maximum cargo volume and energy-saving engines, it was possible to develop a cargo platform that is unparalleled in terms of its operating costs and CO2 emissions.

DIMENSIONS

- Wing Span ——— 19 / 26.6 m
- Length ——— 15 m
- Height ——— 4.1 m
- MTOW ——— 5,000 kg

The i-5 is powered by two 300 HP common rail diesel engines that can be operated with Jet A-1 or bio-fuels (SAF or palm oil). For short-take-off applications, the aircraft can also be equipped with four engines (1,200 hp in total). The large cargo volume in the fuselage and the large loading door at the rear offer perfect loading conditions. The APUS i-5 is the perfect cargo work-horse for your fleet for cost sensitive missions.



Big Cargo Door at the rear fuselage

CD300 Jet A-1 (SAF) engines

10% more Cargo Volume*



Range
800 nm



CRUISE SPEED
160 KTAS



Payload / Pax
1,770 kg / 12

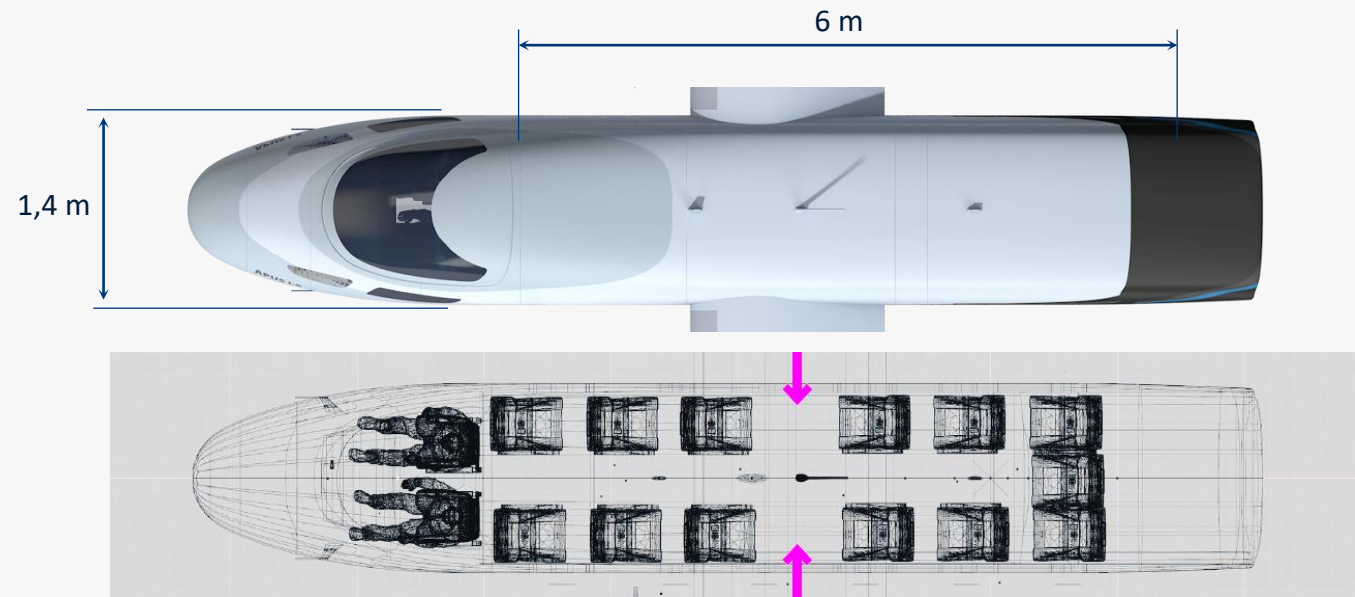


Transportation Costs*
- 40%

*) compared to Cessna C208B Grand Caravan

Cabin Dimensions

APUS i-5 Cargo (Pax)		
payload	Kg	1.770
Cargo volume	L x W x H	6 x 1,4 x 1,5 (12,6 cu m)
PAX		12 (+1)

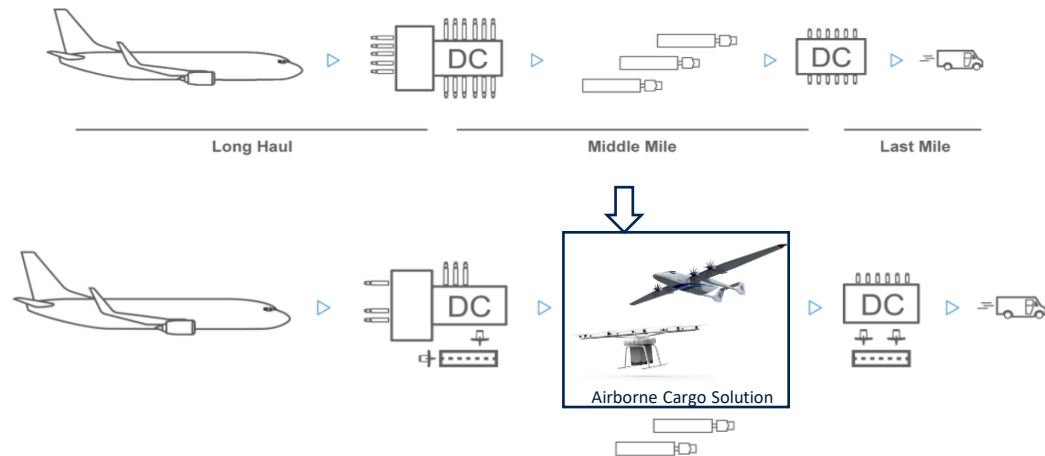


- Comfortable loading through big cargo door at the back and low cargo floor
- Reliable, modern and low cost technology for max. operating time vs. maintenance time
- Lowest operational costs due to very efficient FADEC controlled Jet A-1 engines



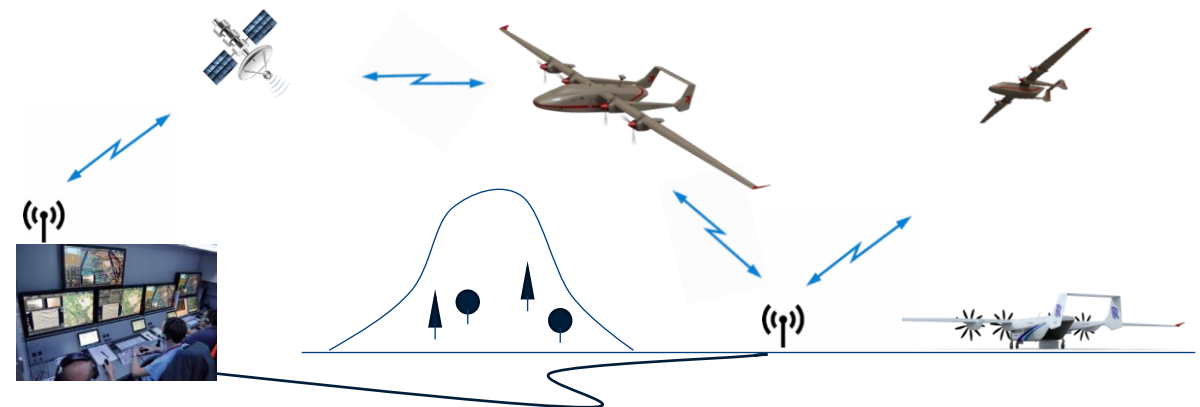
SPECIFIC APPLICATION – Unmanned Cargo Solution

APUS i-5 intends to revolutionize the mid-range cargo concepts of current logistic systems according to delivery time, delivery costs and delivery-reliability

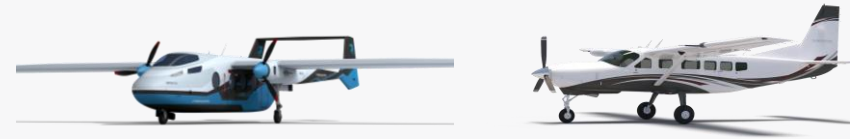


The APUS i-5 “Cargo” is designed as an optionally piloted vehicle already from the beginning. The control surfaces provide the necessary redundancies. Actuators for the fly-by-wire-system are already implemented. In the second phase of the program the APUS i-5 “Cargo” will be converted into a fully autonomous flying unmanned aircraft system (UAS), the APUS i-5 “Cargo-Drone”.

A cargo-drone system consists of three flying systems and a ground control station. A redundant telemetric system by a LOS and a BLOS (satellite) communication ensures safe missions and reliable cargo service.



Variable Operational Costs – Compared to C208B “Grand Caravan”

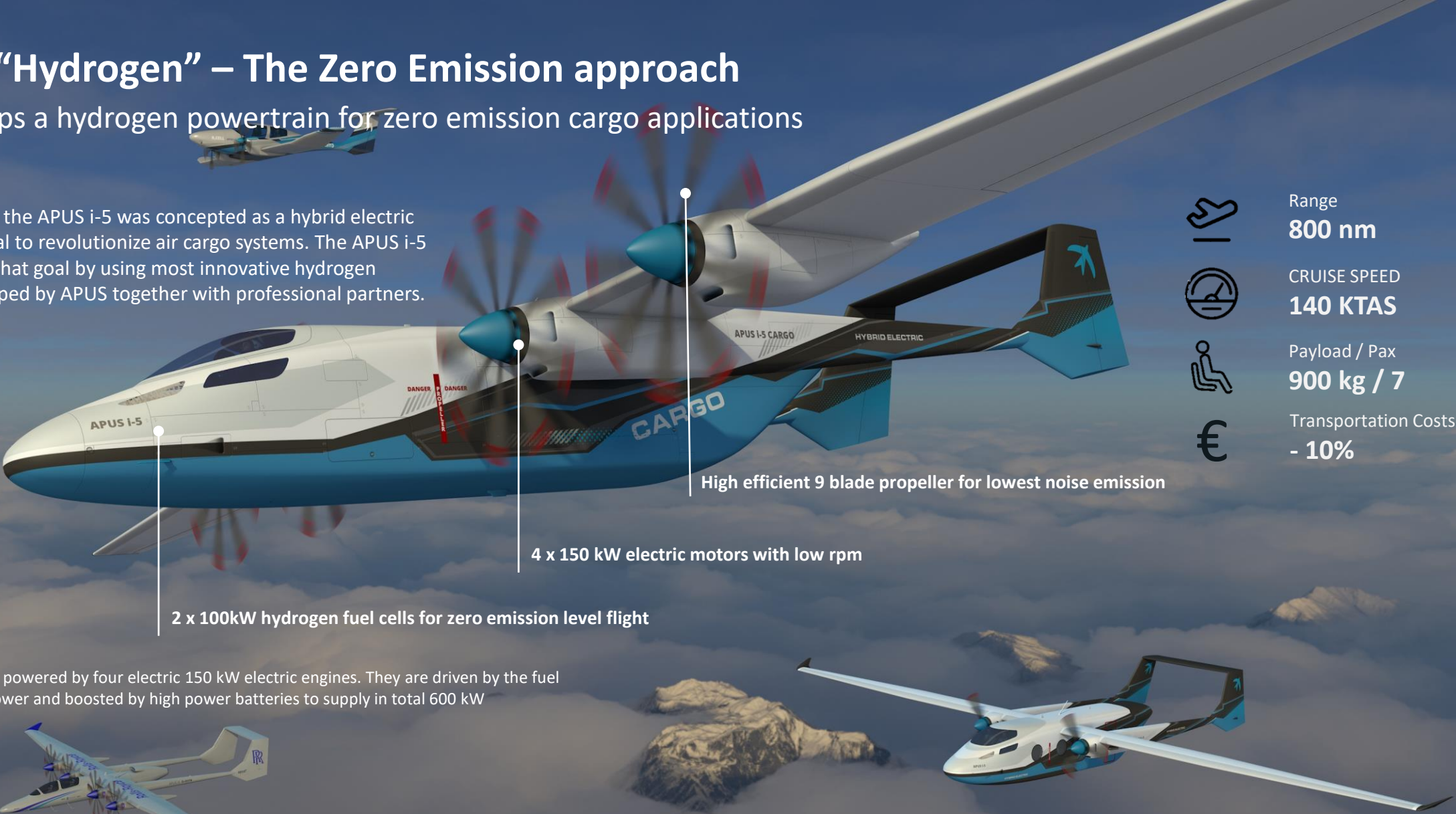


		APUS i-5 Jet A-1	Cessna Caravan
MTOW	kg	5000	4000
dry payload	kg	1770	1500
pax		14	14
Powertrain (overhaul)		180.000,00 €	810.000,00 €
TBO	h	2000	6000
energy consumption	kW/h	1118,6	1785
price per kWh	EUR/kWh	0,17	0,17
price per h	EUR/h	190,16	304,05
cruise speed (standardized)	kts	160	180
			0
Energy Costs	EUR/NM	1,19 €	1,69 €
PowerDriveCost	EUR/NM	0,56 €	0,75 €
including PowerDriveCosts	EUR/NM	1,75 €	2,44 €
cost per seat per NM	EUR/NM/pax	0,13 €	0,17 €
cost per 1t (payload) and NM	EUR/NM/1t	0,99 €	1,63 €
Compared to conventional Cessna Grand Caravan	EUR/NM/pax	64%	100%
Compared to conventional Cessna Grand Caravan	EUR/NM/1t	61%	100%

APUS i-5 “Hydrogen” – The Zero Emission approach

APUS develops a hydrogen powertrain for zero emission cargo applications

From the beginning the APUS i-5 was conceived as a hybrid electric aircraft with the goal to revolutionize air cargo systems. The APUS i-5 “Hydrogen” fulfills that goal by using most innovative hydrogen powertrains developed by APUS together with professional partners.



Range
800 nm



CRUISE SPEED
140 KTAS



Payload / Pax
900 kg / 7



Transportation Costs*
- 10%

High efficient 9 blade propeller for lowest noise emission

4 x 150 kW electric motors with low rpm

2 x 100kW hydrogen fuel cells for zero emission level flight

The i-5 “Hydrogen” is powered by four electric 150 kW electric engines. They are driven by the fuel cell for continuous power and boosted by high power batteries to supply in total 600 kW

*) compared to Cessna C208B Grand Caravan, price of 5 \$/kg hydrogen

BRIN – INDONESIAN/GERMAN Partnership Research Program





Smart Airborne Logistic System “SMALOS”

Based on the **existig Indonesian MALE-Drone program** a next application for autonomous airborne systems should be developed. The need for airborne cargo systems due to **explosion of e-commerce** is huge. A high efficient integrated **air cargo system** can reduce delivery times and cargo costs. Therefore it is intended to develop the basics for such an airborne cargo system. The general idea is to apply for a **development and research program at BRIN** with Indonesian partners and GARUDA INDONESIA as a main applicant. Result of the SMALOS-program should be a demonstrator air cargo system with zero emissions and autonomous capabilities. Partial goals are to show the economical potential of such a system and to strengthen Indonesian technology excellence in:

1. Aircraft development
2. Innovative and sustainable powertrains
3. Unmanned systems
4. Advanced airborne logistics

At the same time the economical aviation sector should be enabled to compete on the global market with advanced and pace making technologies.

The idea is to apply for a development and research program at BRIN with Indonesian partners and GARUDA INDONESIA as a main applicant.

PARTNER	ROLE
 Garuda Indonesia	Airborne Operations / Logistic Concepts
  Rolls-Royce	Cargo Platform and emission free powertrain
	Service and Maintenance Concepts
 	Flight Control System
 TECHNISCHE UNIVERSITÄT DRESDEN	E-commerce Concepts / Logistic Simulations





ACQUISITION COST*
1,990,000 EUR

ANNUAL FIX COST
200,000 EUR

VARIABLE COST
500 EUR/h

info@apus-aero.de
www.apus-aero.de

)* serial-production aircraft, powered by CD300, basic avionics, no AFCS installed