

Beyond
AERO



FEV
aerospace

14 MONTHS OF COLLABORATION · 400 kW AEROSPACE FUEL CELL SYSTEM



Rising costs, reliance and regulation

Aviation under increasing pressure

+60%

global **jet fuel prices**
increase in the last decade.

~95%

reliance on foreign sources, **The EU** is
almost **entirely dependent on imports**
for crude oil and petroleum products.

20%

SAF required by 2035, rising to
42% by 2040 and **70% by 2050**
under the ReFuelEU mandate.





Aviation will be electric

Making possible, certifiable and profitable the first electric business aircraft designed for hydrogen propulsion

GAZEOUS HYDROGEN TANKS

ONE



GAZEOUS HYDROGEN TANKS

INTRO

14 months: Zero to 400 kW.

How Beyond Aero and FEV aerospace co-developed a 400 kW aerospace fuel cell system for the first hydrogen-electric business jet



DESIGNED AND INTEGRATED IN FRANCE 



ONE

one

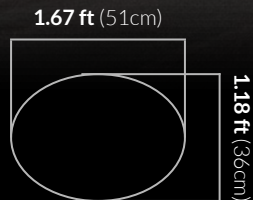
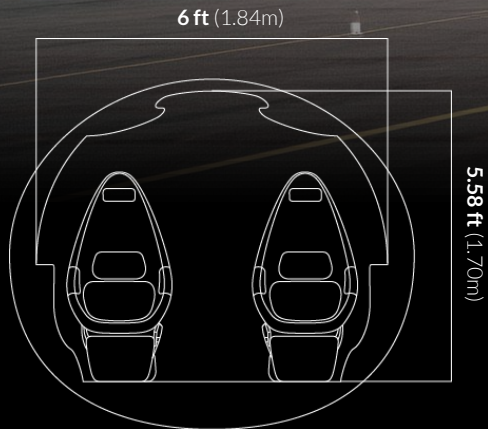
The first electric business aircraft

Designed for hydrogen propulsion

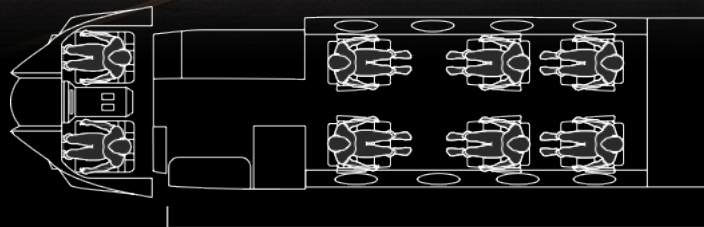


Business jet comfort without compromise

Among the widest in its class



Windows are **27% larger** than standard aircraft



18.27 ft (5.56m)



Quiet cabin

Cabin noise reduces by 13 dB(A), enabling comfortable discussions without headsets.

Seamless connectivity

Passengers stay connected with high speed Wi-Fi, delivering 135–310 Mbps speeds with ultra-low latency.





Why 400 kW matters

One channel of a 6 x 400 kW powertrain

AIR SUPPLY & FUEL CELL STACK

POWER: 6 x 400 kW - 2.4 MW
HIGH VOLTAGE (850 VDC)
LOW VOLTAGE (28 VDC)

H2 TANKS

CAPACITY: 193 kg - 6 TANKS
OPERATING PRESSURE: 700 BAR

TWIN PROP-FAN

SHAFT POWER 950 kW
STATIC THRUST: 2 X 11,500 N
FAN DIAMETER: 2.8 M

ONE ●





Jet experience

Propeller budget

up to **60%**

Maintenance costs are expected to drop up to 60%, reducing operational expenses and downtime.

.....

- **90%**

Fewer moving parts and no high-temperature turbine, greater durability and easy modular engine swaps.

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ICELAND

Strategic aircraft specs

Satisfying 85% of Europe's routes

62%

of flights departing Paris
can be done by One
(<1500km and <8pax)

52%

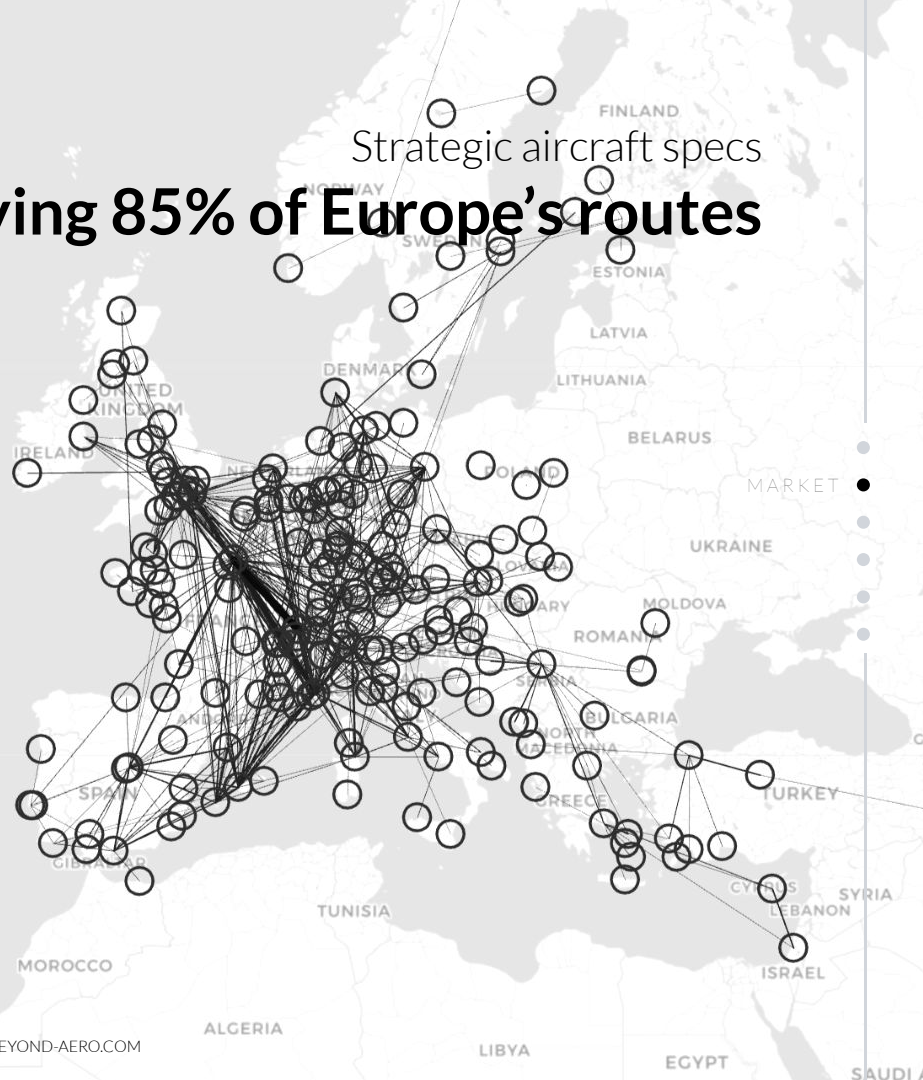
of flights from Le
Bourget fly **less than**
600 km

8 flights

daily between **Paris** and
Geneva, 9 between Paris
and all London airports

- Main routes
- Main business aviation airports

Data: The rankings include routes below 1,500km, served by entry-level jets, very light jets, super light jets, and light jets in 2022. Since then, the market has stabilized at approximately 8% below 2022 levels.





Two teams, one fuel cell system

The partnership

PARTNERS



AIRCRAFT OEM • SYSTEM OWNER

Developing One, the first electric business aircraft designed for hydrogen propulsion. Defines the requirements, the mission and the integration.

2.4_{MW}

fuel cell powertrain

80

engineers & PhDs

880_{NM}

max. range

Aircraft maker meets fuel cell engineering house

Two complementary partners



FEV AEROSPACE • ENGINEERING PARTNER

Global engineering and consulting group for mobility and energy. Selected as engineering partner for the fuel cell system, from concept to test.

7,000

employees
worldwide

>300

test cells, incl. fuel
cells

25+_{yrs}

fuel cell
development

PARTNERS



Who did what

Clear roles, one integrated team

BEYOND AERO

Specify, integrate, test

Aircraft-level requirements & specification

Mission profile & performance targets

Powertrain architecture & integration layout

Test cycles & load-compatibility requirements

Joint design reviews and freeze decisions

FEV AEROSPACE

Design, build, commission, test

.01 System concept & layout

.02 System co-design & simulation

.03 Component selection & supplier management

.04 E/E design

.05 Packaging & design

.06 Fuel cell control unit software

.07 Prototype assembly

.08 LV & HV commissioning

.09 Calibration

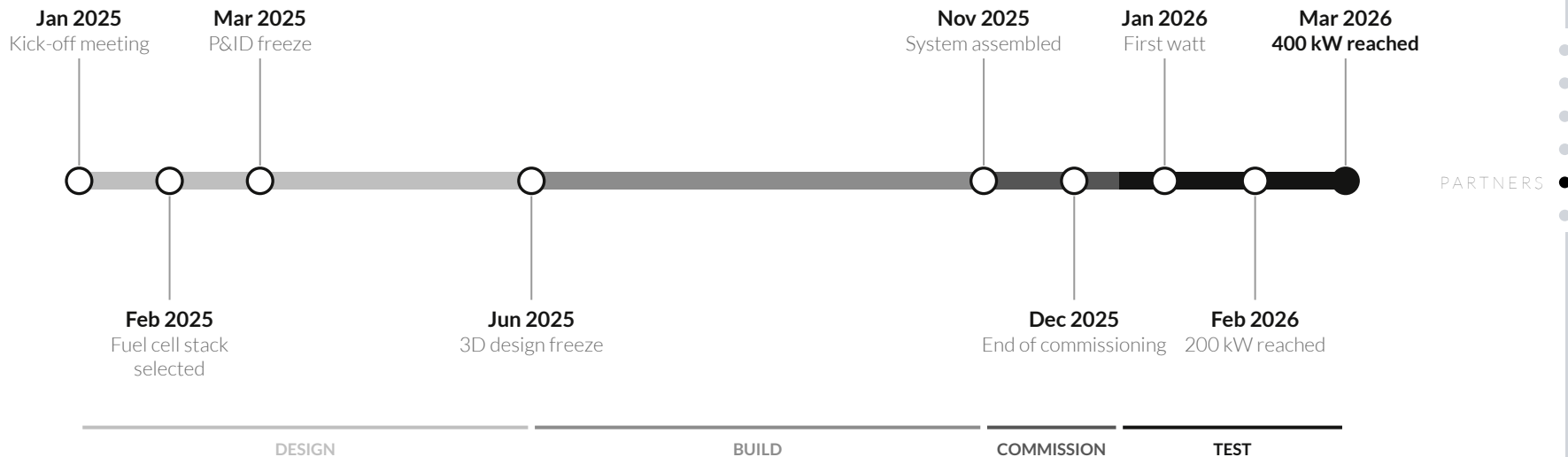
.10 Testing

PARTNERS



Project timeline

14 months from kick-off to 400 kW





What we built together

Results

RESULTS



Specified by Beyond Aero, engineered by FEV

A tailor-made 400 kW fuel cell system

.01 Fuel cell stack

400 kW-class EKPO PEM stack, selected one month after kick-off

.02 Balance of plant

Air supply, H₂ recirculation and thermal loops sized to our targets

.03 Power electronics

PDU and DC/DC delivering ~800 V to the high-voltage bus

.04 Control software

FEV fuel cell control unit, calibrated on the test bench

.05 Integrated prototype

Assembled, commissioned (LV & HV) and tested at FEV

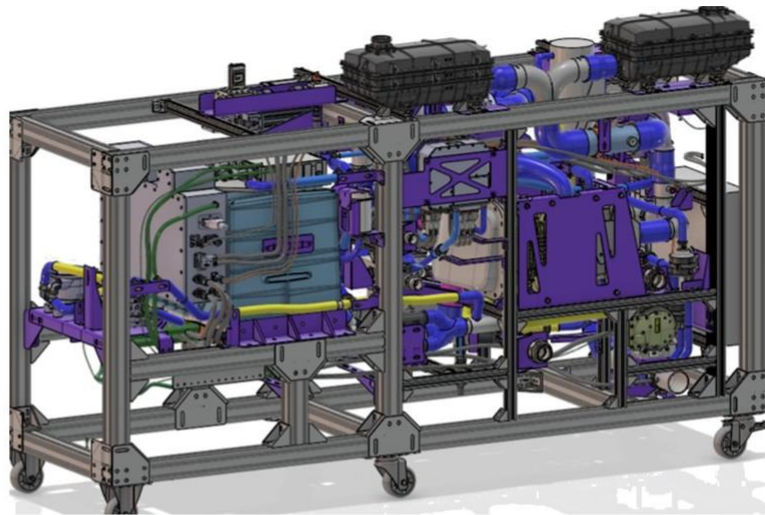
RESULTS



5 March 2026

Full power on the bench

Fourteen months after kick-off, the system reached its full 400 kW rating - and held it.



The 400 kW fuel cell system (FEV CAD render)

RESULTS

400 kW

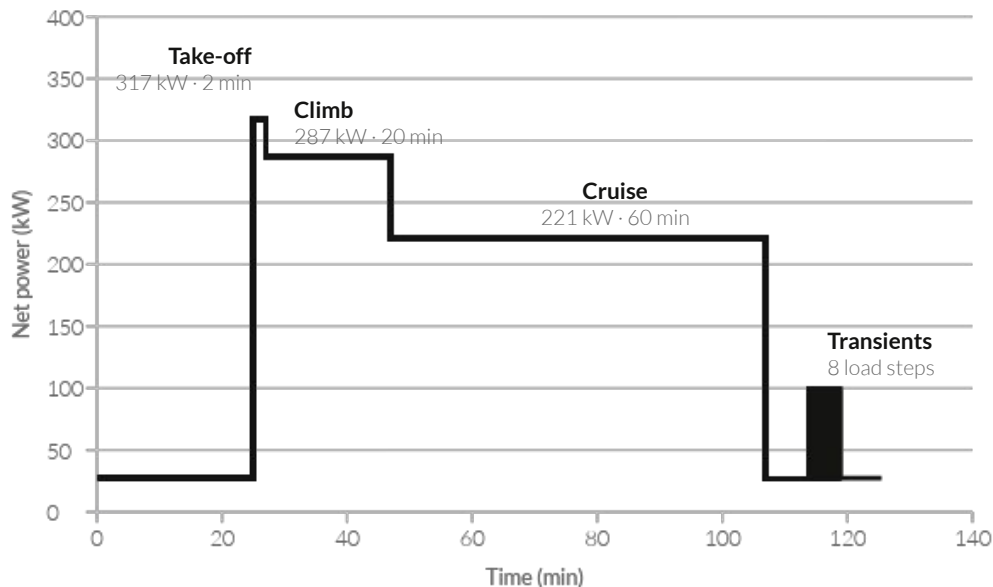
Key figures

Stack power	401 kW
Net power to the bench	350 kW
Held at full power	15 min 44 s
Continuous run at 900 A	34 min



Beyond Aero test cycle, ran twice on 16 March 2026

Flying the mission on the ground



2

complete cycles run
back-to-back

24_s

from idle to take-off
current (60 → 805 A)

7_s

per 60 → 228 A load step,
3 s back down

67 °C

peak PDU busbar
temperature vs 100 °C
limit

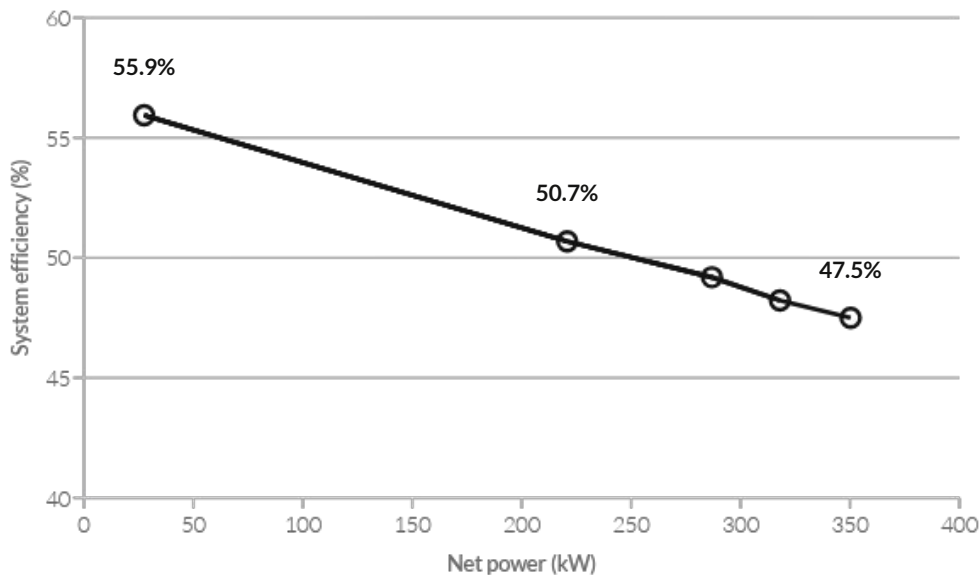
RESULTS

Net power per cycle point as measured; phase names indicative. A voltage-step test emulating Beyond Aero's resistive load was also passed in both power directions.



Measured system performance

Efficient across the power range



47.5%

system efficiency at
350 kW net (H_2 LHV
basis)

6.2 g/s

hydrogen flow at full
power

42 kW

balance-of-plant
consumption at full
power

System efficiency = net power / H_2 power (LHV). Tuned at 20 °C air, sea-level pressure; calibration not yet optimised for efficiency.

RESULTS



Full-scale testing

Integrated hydrogen-electric powerplant lab

PROTOTYPE

1200 KW

1,200 kW

Type IV hydrogen tanks at 700 bar, designed for industrial-grade safety and scalable deployment, tested on the full-scale propulsion system.

Base specs

E-storage	Between 400 & 500 kW
FCS CH-2	400 kW
FCS CH-1	Between 300 & 400 kW





In 2024, we achieved

France's first manned fully hydrogen-electric flight

PROTOTYPE ●

85 KW ●

○

○



85 kW

Hydrogen-electric flying test bench developed from a retrofitted G1 Aviation two-seater. The flight campaign in Southern France included 10 take-offs and two full flights, with a propulsion system powered by $\frac{2}{3}$ gaseous hydrogen and $\frac{1}{3}$ batteries.



[Watch the movie on Youtube](#)

Base specs

Max speed	130 km/h
Autonomy	20 mins
Tank pressure	340 bar
MTOW	525 kg



TRL6 achieved

Flight-proven hydrogen-electric powerplant

PROTOTYPE ●

800 kW ●

○



800 kW

Beyond Aero acquired Universal Hydrogen's hydrogen-electric propulsion intellectual property, flight-test data and engineering assets.

Base specs

Flight tests completed	13
Maximum altitude achieved	10,000 ft
Technology accelerating the certifiable powerplant	2.4 MW



Entering detailed engineering

Preliminary design review completed

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.01 **Aircraft configuration converged**

Overall architecture converged

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.02 **Hydrogen storage**

700-bar gaseous H₂ tanks integrated above the wing

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.03 **Pusher prop configuration set**

Fuel-cell electric architecture with twin propfans

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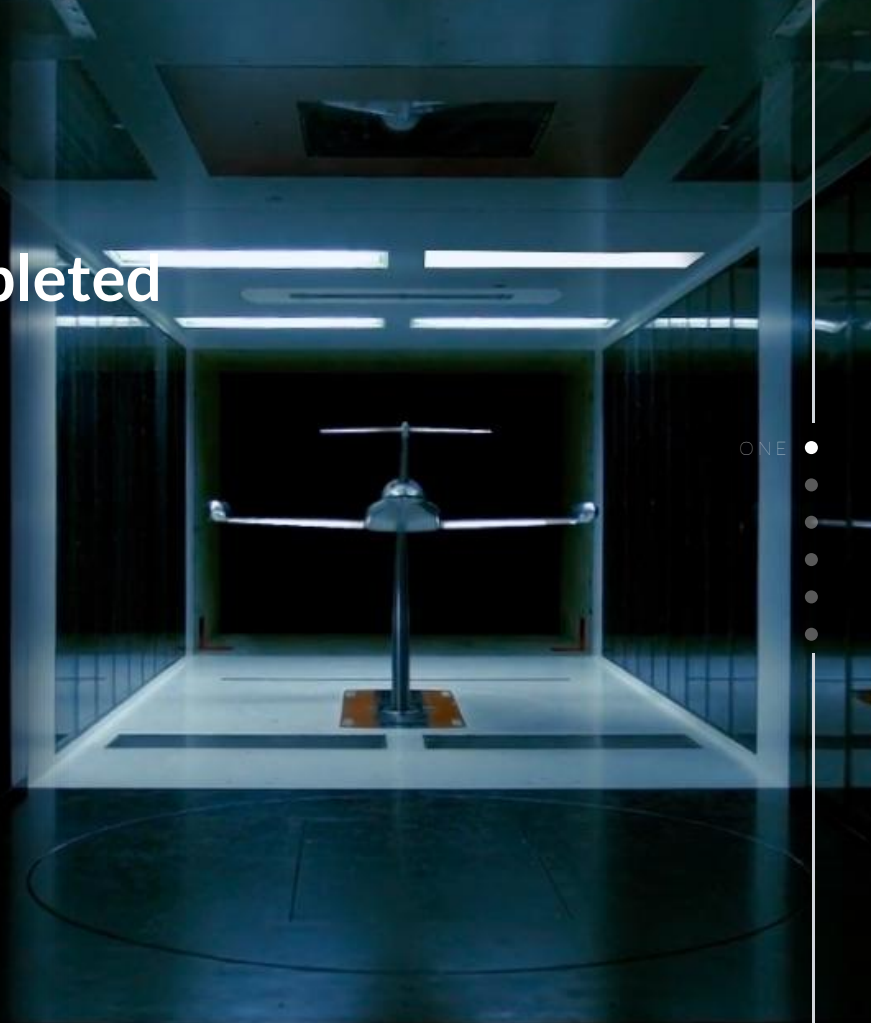
.04 **Systems integration**

Electrical, thermal and safety systems integrated

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.05 **Aerodynamics confirmed**

Design assumptions validated through wind-tunnel testing



ONE



Lessons from 14 months

What made it work

.01

Co-design from day one

Our mission profile and integration constraints drove FEV's design choices. Stack selected in one month, P&ID frozen in three, 3D design in six.

.02

Pragmatic maturity steps

A TRL 4 A-sample built from off-the-shelf components proved the concept fast, with a follower phase planned to raise maturity.

.03

One shared test campaign

FEV ran Beyond Aero's own mission cycle and load-compatibility tests on its bench, with all data shared in a joint tuning report.

NEXT



What comes next

Toward 2.4 MW

01

DONE · MAR 2026

400 kW channel

TRL 4 A-sample: 401 kW stack, 350 kW net, mission cycle validated.

02

INTEGRATION

1.2 MW powerplant lab

Two fuel cell channels plus e-storage tested as one powerplant.

03

MATURITY

B- and C-samples

Weight, volume and altitude operation toward flight targets (TRL 5→7).

04

AIRCRAFT

One: 6 x 400 kW

A certifiable 2.4 MW hydrogen-electric powertrain.

NEXT



Thank you

To the Beyond Aero and FEV aerospace teams who made 400 kW happen

Join us

Scan for open positions

