Zephyr’s contribution to a sustainable future

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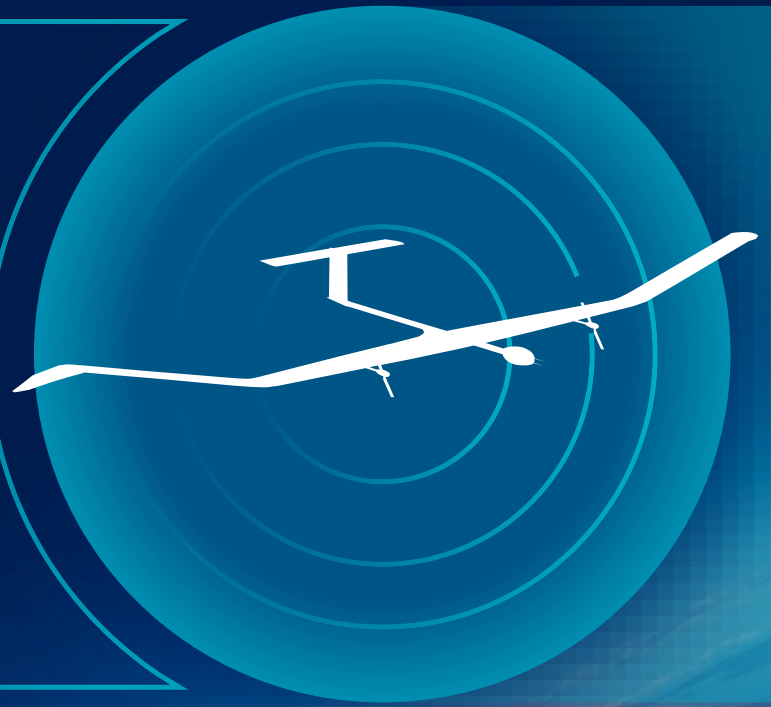
AIRBUS

High Altitude Platform Stations (HAPS) fill in a unique capability gap

SATELLITE
- Endurance
- Global reach

DRONES AND MANNED MISSION AIRCRAFT
- Low latency
- Affordability
- Precision



- ✓ Wide reach
- ✓ Flexibility and retasking
- ✓ Real time
- ✓ Stationary & persistent
- ✓ Accuracy
- ✓ Low latency
- ✓ Low detectability

Combines the persistence of satellites with the flexibility and accuracy of a drone, being complementary to both.

Meet Zephyr, the Airbus HAPS

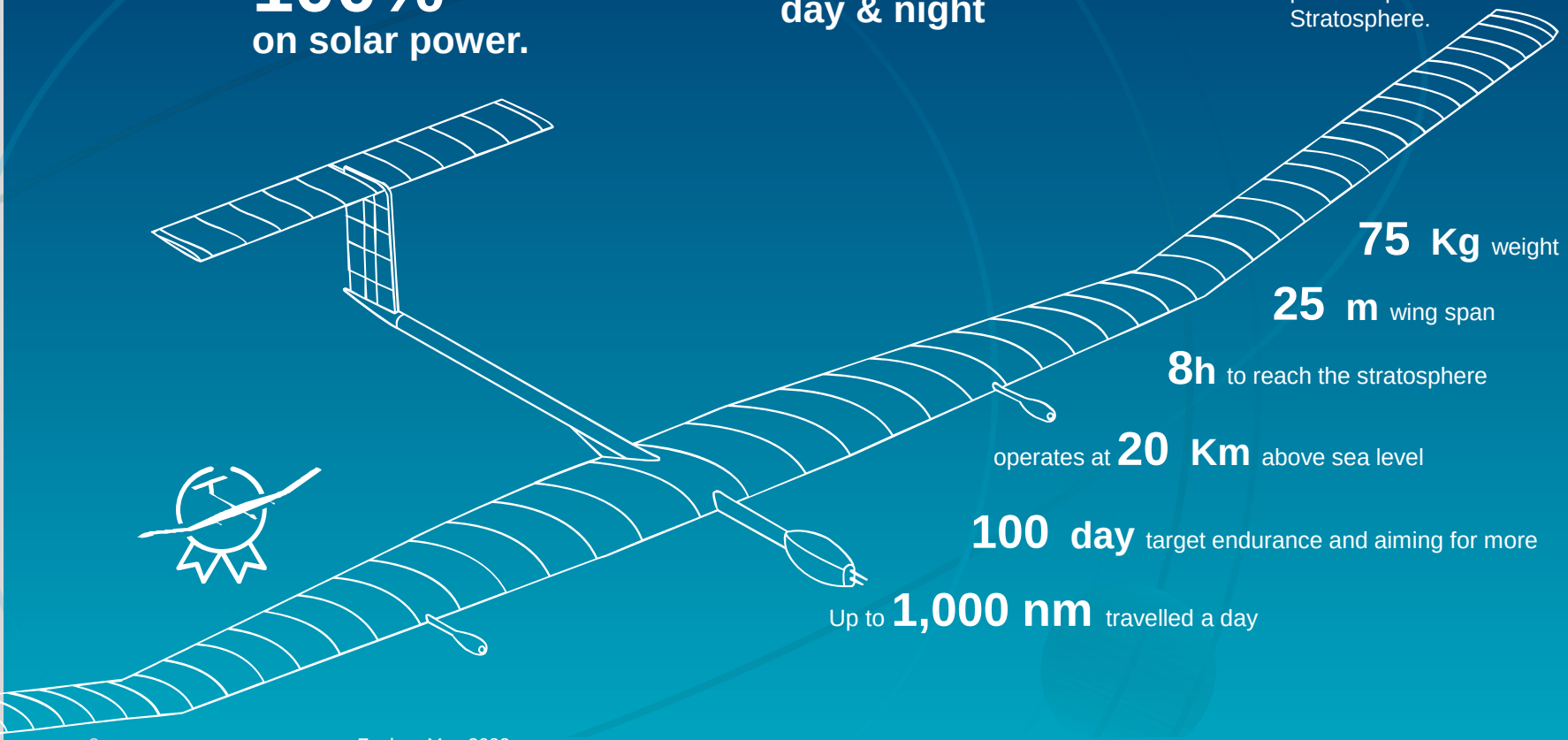
Facts Figures

Sustainable,
Relies
100%
on solar power.

Electrical,
Uses sunlight to fly and recharge its batteries to continue operating
day & night

Autonomous,
Has demonstrated almost
26 days of continued, precise operations in the Stratosphere.

Connected,
Provides Earth Observation and Connectivity:
See, Sense & Connect



75 Kg weight

25 m wing span

8h to reach the stratosphere

operates at **20 Km** above sea level

100 day target endurance and aiming for more

Up to **1,000 nm** travelled a day

10 years
of research, **design, prototyping and flying** development activities.

Zephyr is payload-agnostic
compatible with
Airbus in-house OPAZ system
or other payloads

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A wide array of payload possibilities

	Commercial	Institutional	Military
Earth Observation and Sensing	Oil and Gas	Wildfire Monitoring	Maritime Security Persistent ISR
	Crop Monitoring	Land Administration	Land / Coastal Border Protection
	High-res typography	Environmental Monitoring	SIGINT
	Smart Cities	Land Border Protection	Carrier Strike Group
Connectivity	Comm. LTE bubble	Disaster recovery	V/UHF
	Direct LTE	ADS-B + voice over ocean	Military LTE Bubble
	Cellular backhauling		Mobile COMs/MESH
	Broadband services		

OPAZ images – © Airbus DS – view from Airbus Zephyr

Zephyr is capable of providing a range of continuous surveillance, communications and monitoring services

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How does Zephyr contribute to the UN SDGs?

3.8
Billion People

or about **half of humanity**, don't have access to the internet

Internet access transforms communities Generating **$2.2 trillion** in additional GDP, a **72% increase in GDP** growth rate, and **>140 million new jobs** in developing economies

Zephyr directly **addresses** all **SDGs**

HAPS

OPAZ

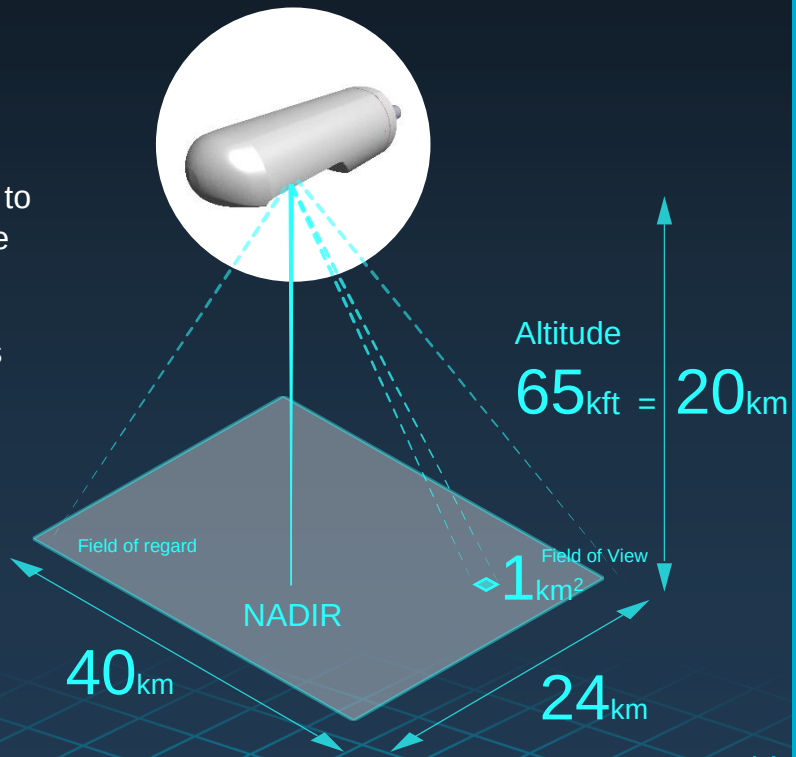
The Airbus stratospheric Earth Observation payload

OPAZ: The Airbus stratospheric Earth Observation payload has been successfully used with both Zephyr and Balloons

Both Balloons and Zephyr are environmentally sustainable, and rely on **100% Solar power**

Platform agnostic: we tailor our services to the customer needs, offering the most indicate platform for every use case

Complementary: Balloons and fixed wings can compose a mixed fleet to better serve customer needs



Live video & imagery

Main sensor (steerable)

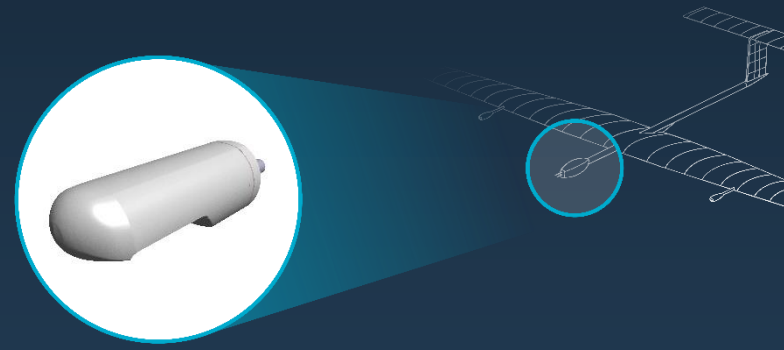
Electro-optical RGB resolution ……..…. @ 18 cm

Medium Wave Infra-red resolution …..... @ 70 cm

Secondary sensors (fixed)

100 km² RGB resolution ……..... @ 2 m

AIS sensor



Zephyr, May 2022

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Zephyr reached new heights in 2021

The **world's leading** solar-electric, fixed-wing **stratospheric HAPS**

Zephyr achievements to date:

3
World records

3,000+
Stratospheric Flying hours

Zephyr completed another stratospheric flight campaign in 2021, setting a new world record for absolute altitude for this class of UAS at 76,100ft, and adding an additional 36 days of stratospheric flights to the books.

20,000+
Images, in only one test flight

Secured and exercised FAA flight approvals operating inside the US civil National Airspace.

Demonstrated successful flight with multiple payload integrations and tested new imagery OPAZ payload, streaming earth observation data.

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2021 Zephyr flight test campaign achievements

6 flights

2 stratospheric for 18 days each

Continuing airworthiness demonstrated on two aircraft by “re-flying” both

FAA approval for commercial overflight in US National Airspace

Precision flying stratospheric manoeuvrability & station keeping 250 way points for airways work

Highest quality images received from OPAZ payload from >60,000 feet

5 days

of continuous live data streaming from OPAZ EO payload

Team growth in a combined UK, US and European team with more people than ever trained and qualified to fly the air system

Zephyr, May 2022

Zephyr will stretch boundaries even further in 2022

2 flights in national airspace and beyond

Beyond Line of Sight operation

Further technical improvements to systems and operational processes

Integration of new payloads

New technical solutions on-board this year

Further expansion in the team

Remote operation of the air system

Longer flight durations than ever before

OPAZ, the Airbus imagery payload for Zephyr

Real world images captured from the stratosphere

High resolution imagery captured from OPAZ

2021 flights tests confirm possibility to track people and convoy movement on a persistent basis

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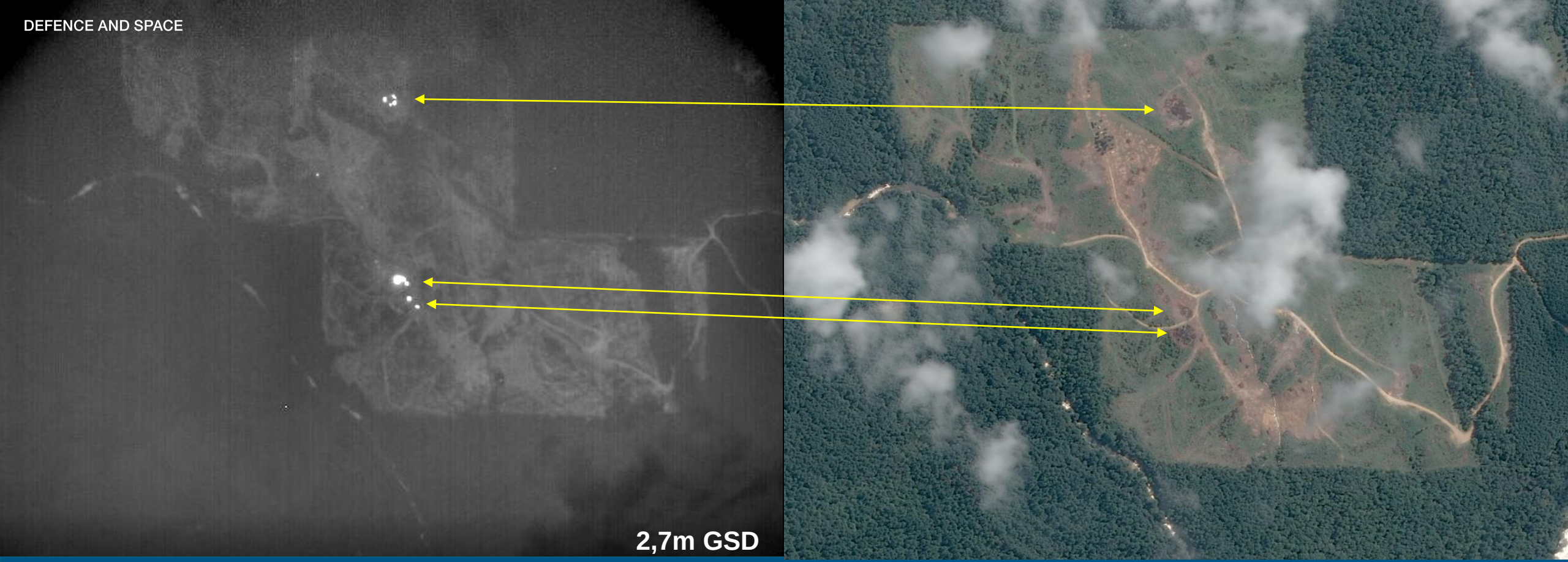
FIRE-RES


Lightning events
EFFIS *Extreme* and *Very high* danger of wildfire
Potentially large fire
Protected natural area
Drought, wind and high temperature forecast
EU HAPS Wildfire Service



Still image extracted from a 5 fps video.
GSD = 2.7m
1730 x 1300m

Two hot spots detected
in a forest area

MWIR sensor
Equipped with zoom:
0.7m 336x448m
17m 9x11km

All indicators at green to proceed to Zephyr operations ramp up

Preparing for operations at scale

Under contract with 5 customers:

Government & commercial
Europe, US, Asia-Pacific

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“All air vehicles are limited by physics,
some by fuel,
all others by imagination.”
Chris Kelleher, father of Zephyr