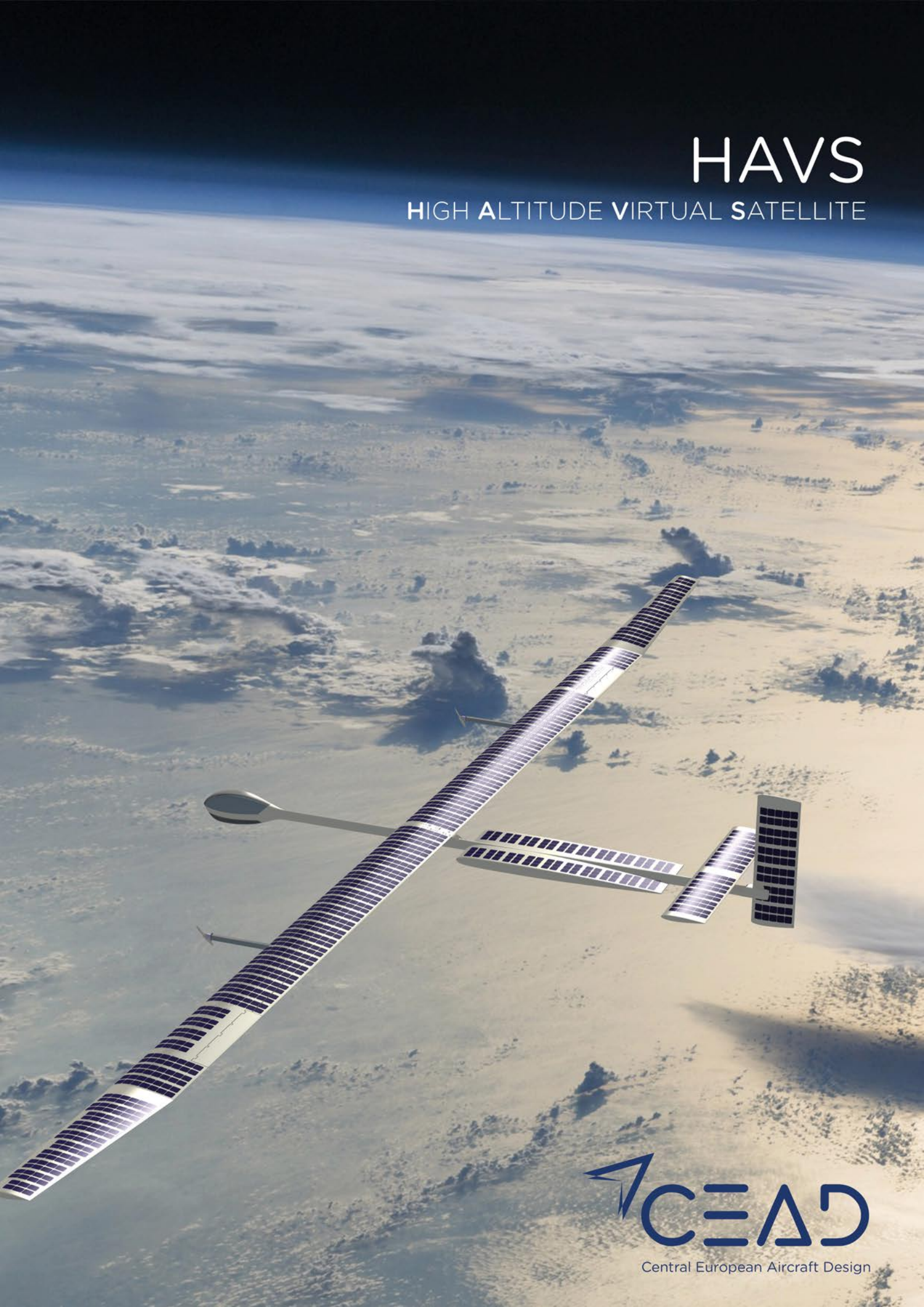
HAVS

HIGH **A**LTITUDE **V**IRTUAL **S**ATELLITE



CEAD

Central European Aircraft Design

HAVS

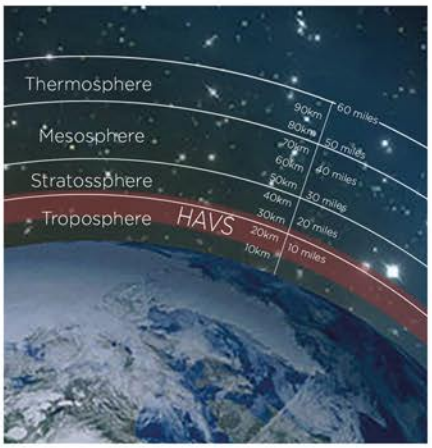
HIGH ALTITUDE VIRTUAL SATELLITE

Maiden flight- Proof of concept airframe Jan. 2020

How it works:

The **H**igh **A**ltitude **V**irtual **S**atellite is a 28 m [92 ft] wingspan solar powered UAV which provides the same functions as a geostationary satellite....

... at a fraction of the costs!

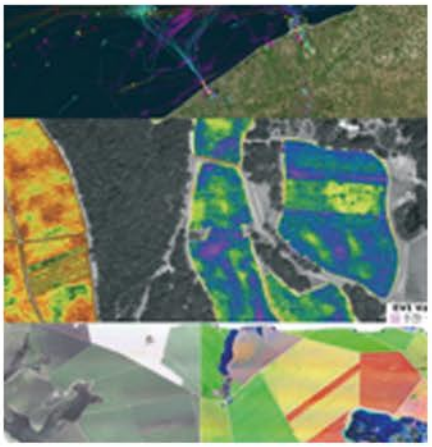


Operation:

HAVS circles in altitudes up to 25 km [82,000 ft] (ideally between 14 and 19 km [46,000 and 62,000 ft]) only by using solar power. While day the HAVS recharges batteries for night operation. While night the HAVS is powered by batteries which are again recharged on the next day.

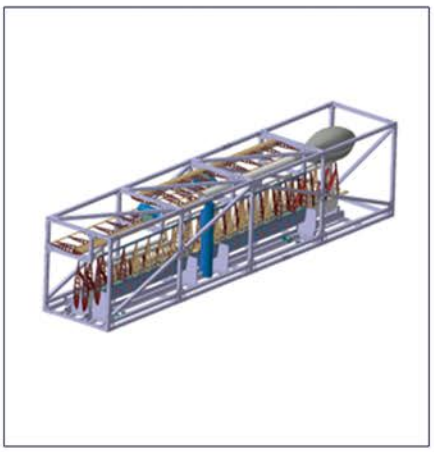
Advantages:

- Endurance only limited by parts lifetime/maintenance intervals (designed for min 60 days continuous operation)
- Extremely low purchase/operational costs compared to satellites
- Stable platform which is essential for missions
- Minimum coverage at minimum altitude (14km) = ø 1500km [930 miles]
- Fully redundant; designed for reliability
- Various payloads are possible (min. 20kg [44 lbs] sensor/equipment payload)
- HAVS is scalable: configurations with lighter/heavier payloads are possible



Missions:

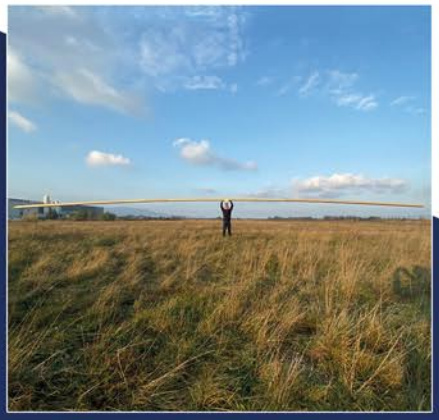
- High altitude research
- Relay Station (Internet)
- Climate & Atmosphere research and monitoring
- High altitude survey / Geo research
- Pipeline monitoring
- Oil spill detection
- Natural disaster surveillance
- Ship monitoring
- Forrest mapping
- Magnetic survey
- Multispectral / Hyperspectral surveillance



Preliminary Performance data (HAVS-1) *):

MASSES	**MTOM (Maximum Take off mass)**	**139**	**kg**	**306**	**lbs**
	EM (Empty mass)	119	kg	262	lbs
	PL (Sensor Payload)	**20**	**kg**	**44**	**lbs**
SPEEDS	vSO: (Stalling speed sealevel)	7,8	m/s	15,2	KTS
	vSO: (Stalling speed Alt: 20,000m)	19,4	m/s	37,62	KTS
	Optimum Performance crusing speed @ 15,000m	25,6	m/s	49,77	KTS
	Maximum Speed @ 20,000m	50,9	m/s	99	KTS
RANGE & TIMES	**Max Flight time**	**60**	**days**		
	Climbing time to 15,000m	7	hours		
	Minimum runway size	400 x 20	m	1300 x 65	ft
DIMENSIONS	span	28	m		
	length	10,7	m		

*) Preliminary data only; final performance data may differ



Transport

- 3-4 HAVS units fit in a standard 40" container
- Simple road transport possible with normal long trailers
- Packing volume: 8000 x 1500 x 1790 mm
- Simple rigging procedure

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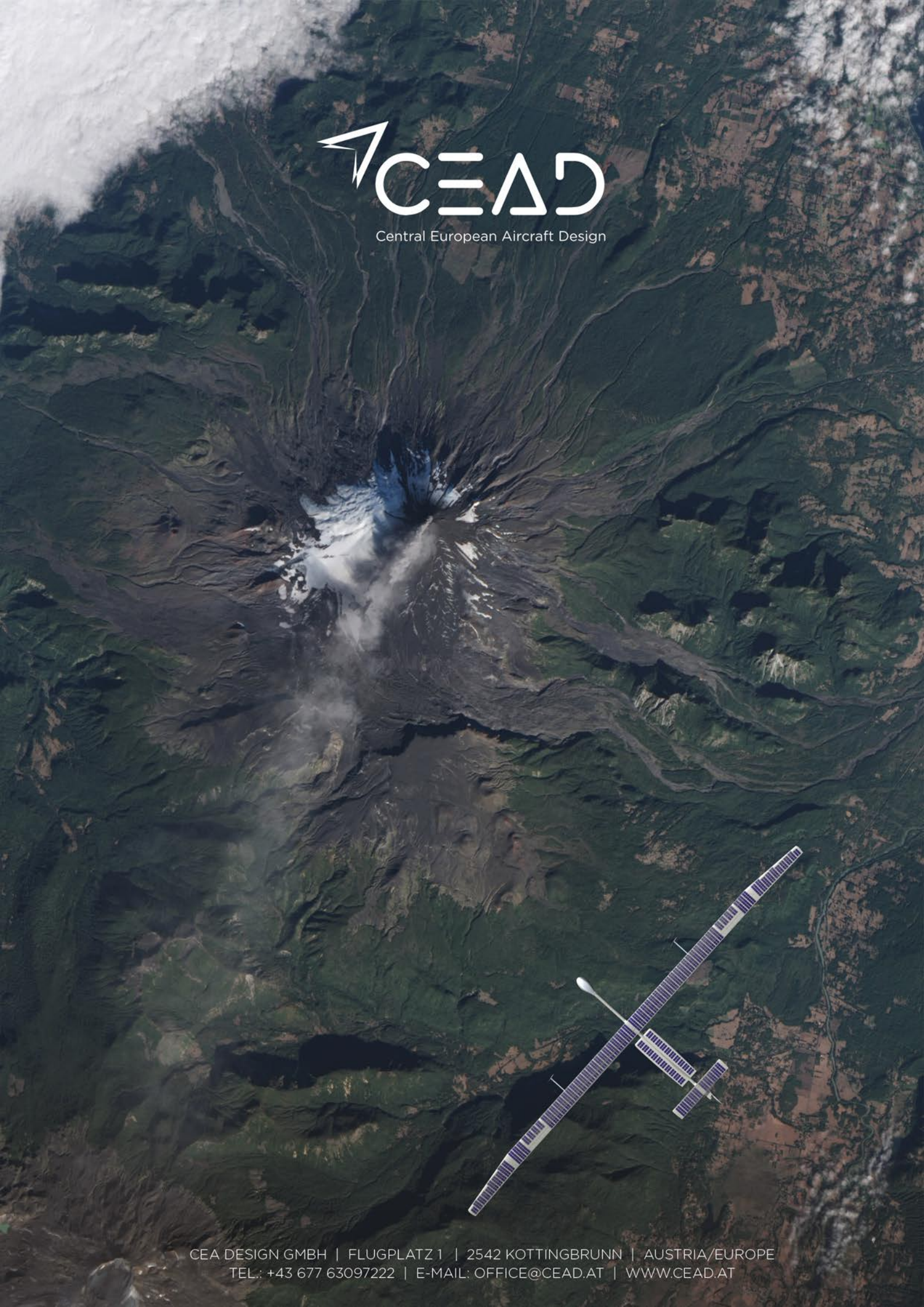

CEA DESIGN GMBH | FLUGPLATZ 1 | 2542 KOTTINGBRUNN | AUSTRIA/EUROPE
TEL.: +43 677 63097222 | E-MAIL: OFFICE@CEAD.AT | WWW.CEAD.AT