



# Welcome to the future of Global Communications

**Delivering a transformational  
next generation 5G  
network capability**

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# ***SPL platform combines best-in-class aircraft design with powerful LTE/5G-enabled antenna technology***



## **Certification**

Certified from outset for safe flight in civil airspace

## **Aircraft Design**

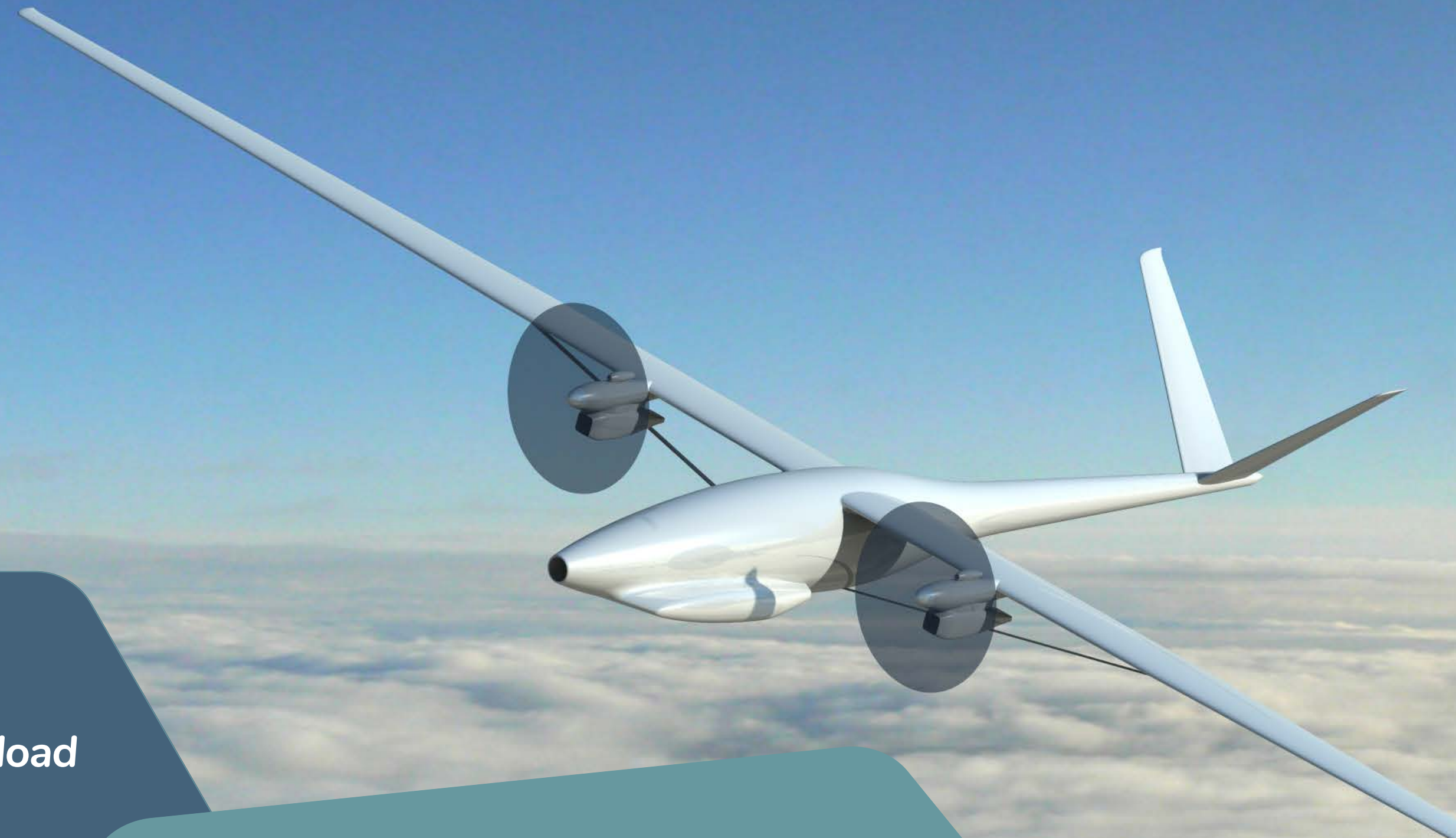
SPL platform can carry 140kg payload for high-spec antennas  
Endurance target of > 9 days  
Wing span: ~60m  
Operating Altitude: 60,000ft

## **Power System**

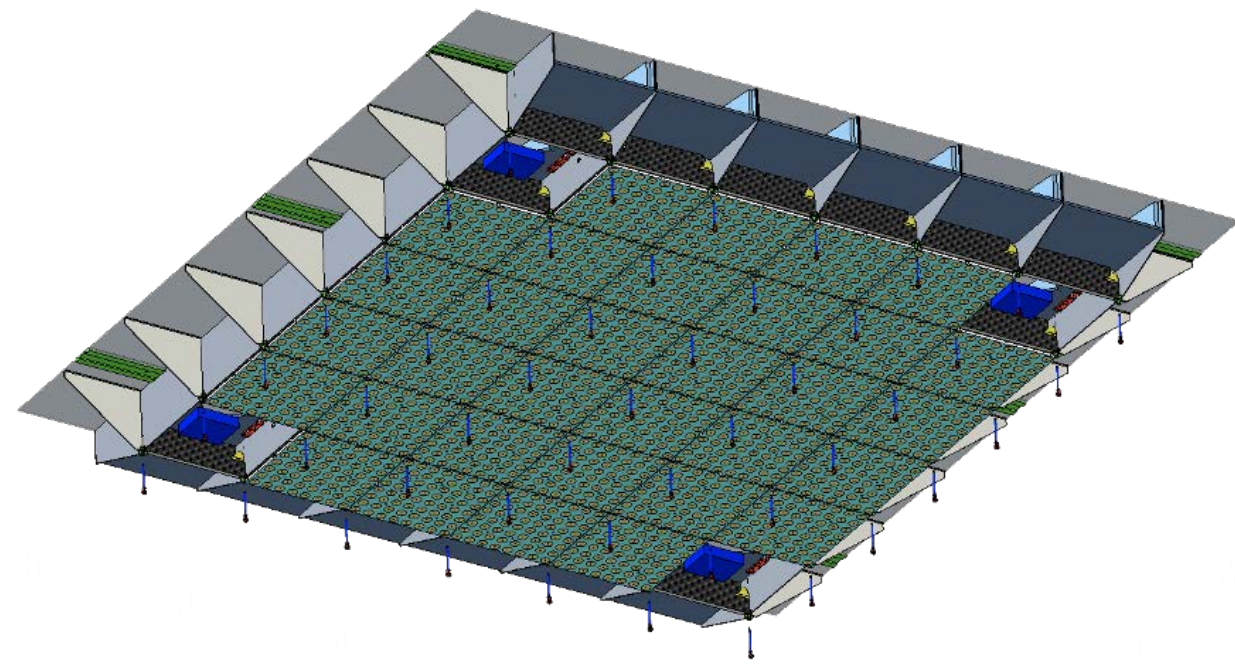
SPL platform uses an environmentally-friendly hydrogen fuel cell power system which provides high power levels for communications equipment and long endurance  
Does not rely on low power solar energy

## **Communications System**

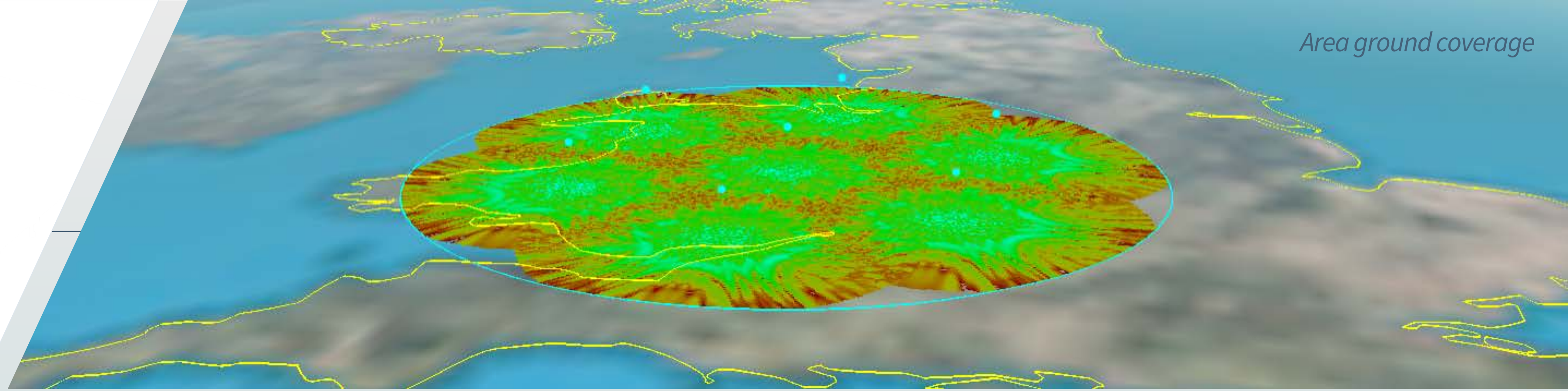
Phased-array antenna designed for standard LTE/5G phones delivering ubiquitous broadband connectivity at high speeds and low latency  
Next generation beam pattern technology enables even faster data rates







*Tx/Rx Tile*

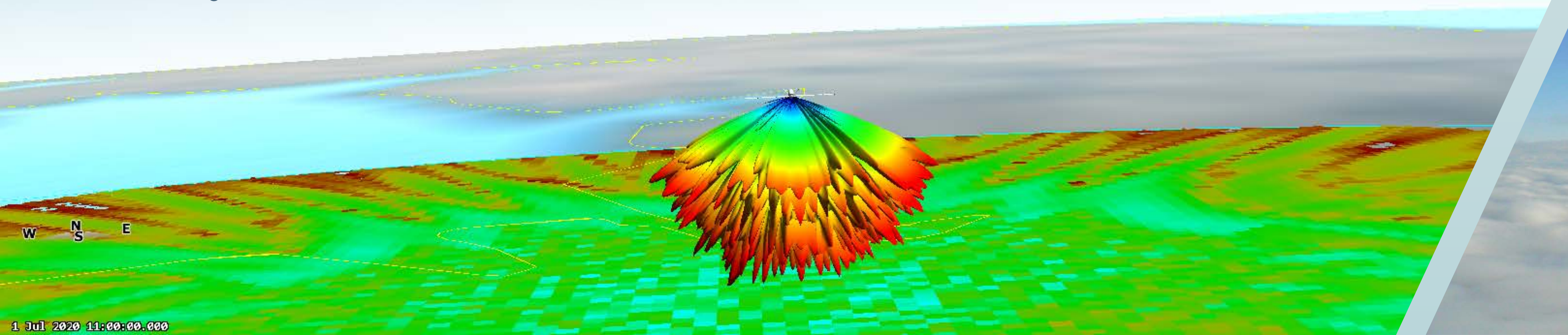


*Area ground coverage*

# ***Production communications system***

- High RF power yet ultra light weight for installation
- Coverage of up to 140km diameter
- Choice of frequencies and waveforms to meet current and future WRC and operator requirements
- Large antenna surface area provides high gain for outstanding user experience
- Stratospheric cooling system optimized for low stratospheric atmospheric pressures and temperatures
- Meets challenging aircraft installation requirements: environmental and regulatory.

*Beam modelling*



*Transmission*

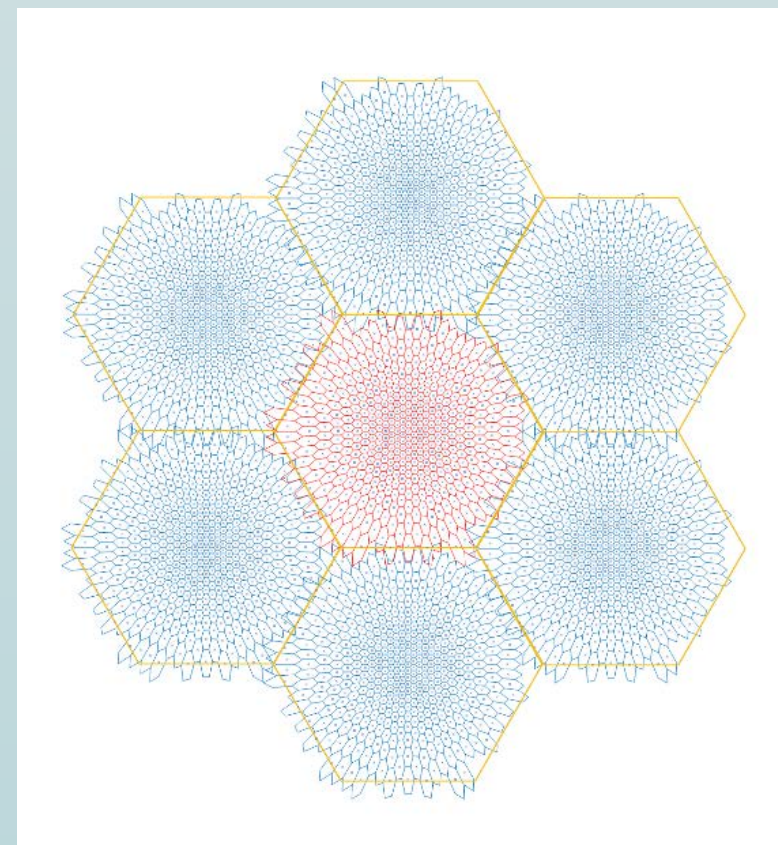




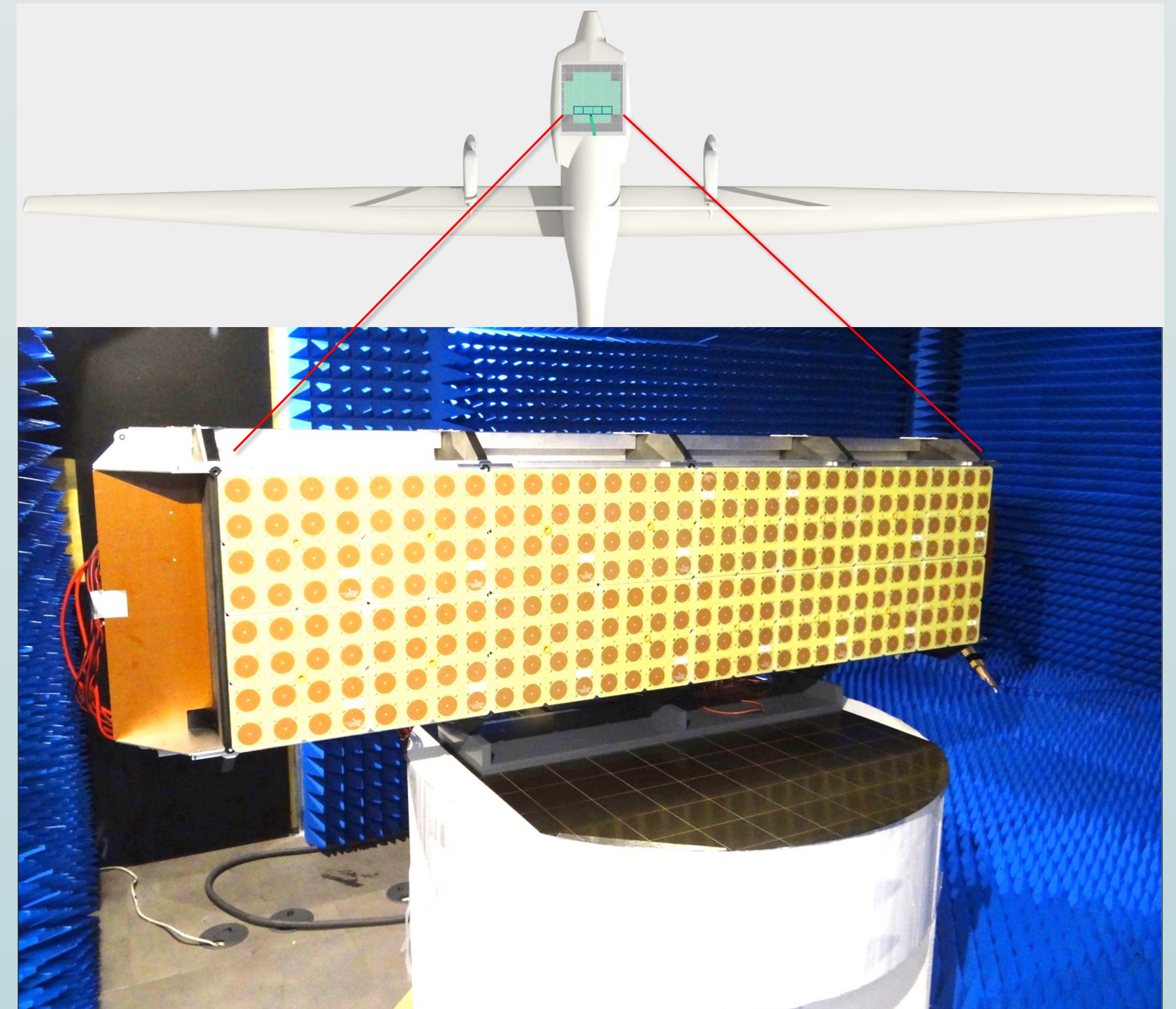
# Development of the world's largest commercial airborne communications antenna

## Operates on DT's assigned 5G frequency

- Performs as a “Mast in the sky” – seamless user experience
- Massive 9m<sup>2</sup> digital steerable phased array antenna
- 2048 dual polarisation phased array transceivers
- Equivalent to ~500 terrestrial antennas
- Fuel Cell Power System provides 20kW to antenna
- High spectral density
- 5G latency - typically 1ms
- Ability to dynamically create virtually any cell pattern on the ground to cover roads, canals and borders



*Nested beam pattern*



*Production development antenna & aircraft location*



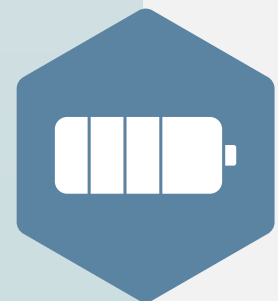
# Environmentally friendly Hydrogen Power System



Liquid hydrogen uniquely suited to high energy, low weight requirements



System designed to EASA safety standards



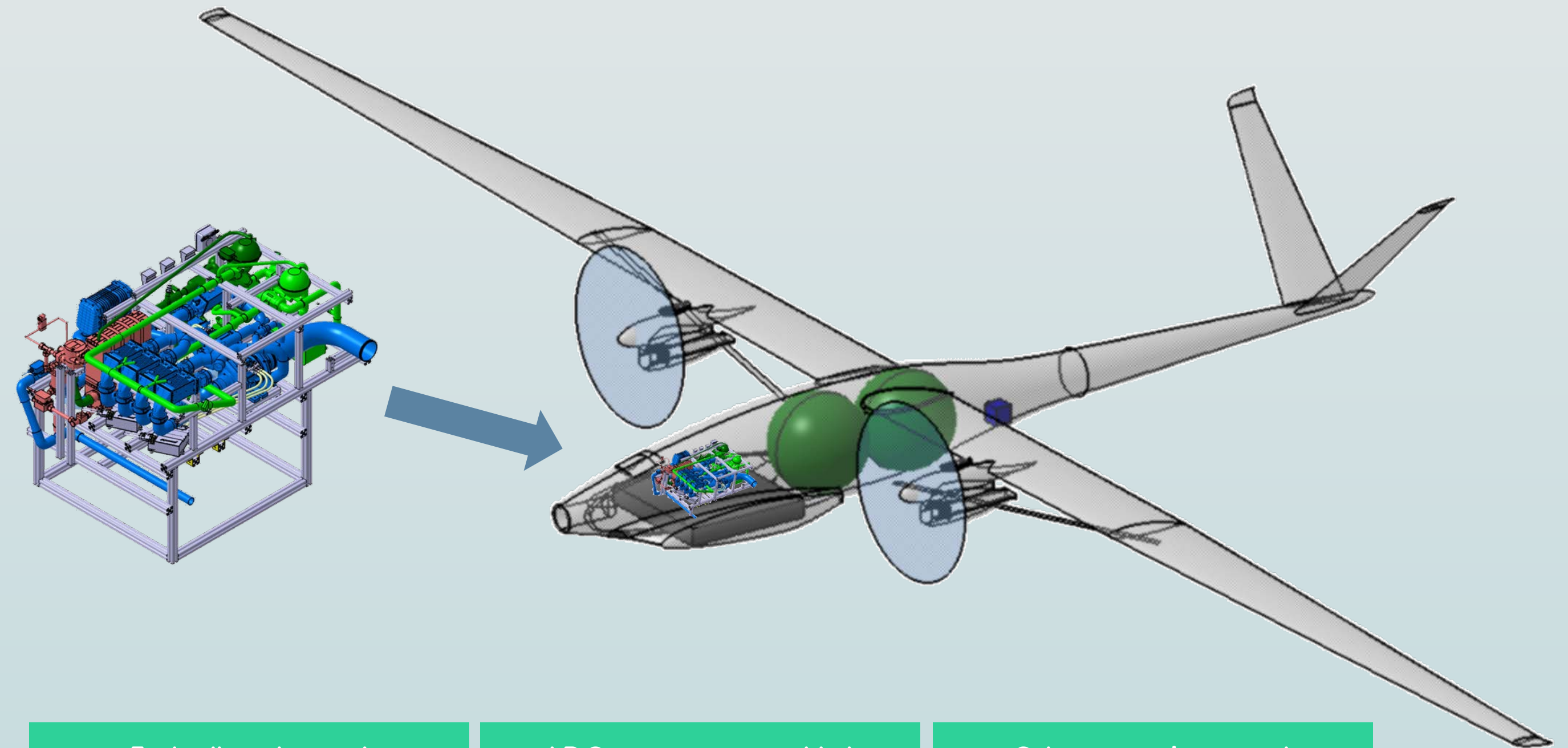
Fuel cell power system adapted from automotive industry



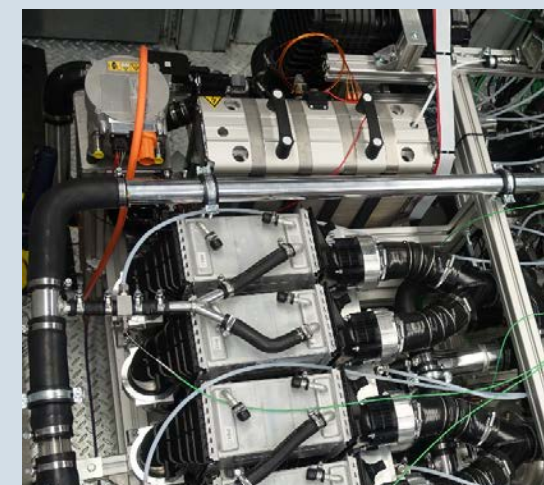
Novel insulated tank designed to store fuel for long endurance flights



Fuel cells already tested under simulated stratospheric flight conditions producing 49kW power



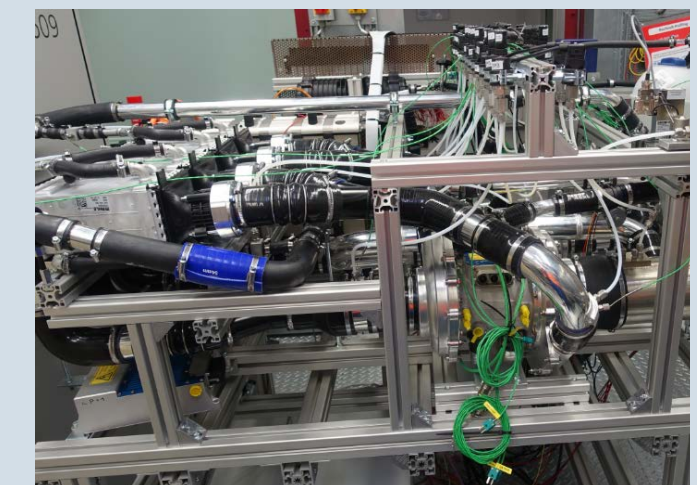
Fuel cell stack tested



LP Compressor assembled



Sub-systems integrated





# Industry leading unique aircraft design



Aircraft uses lightweight carbon fibre materials and automated production



Designed to carry 140kg payload – 10x greater than other HAPS



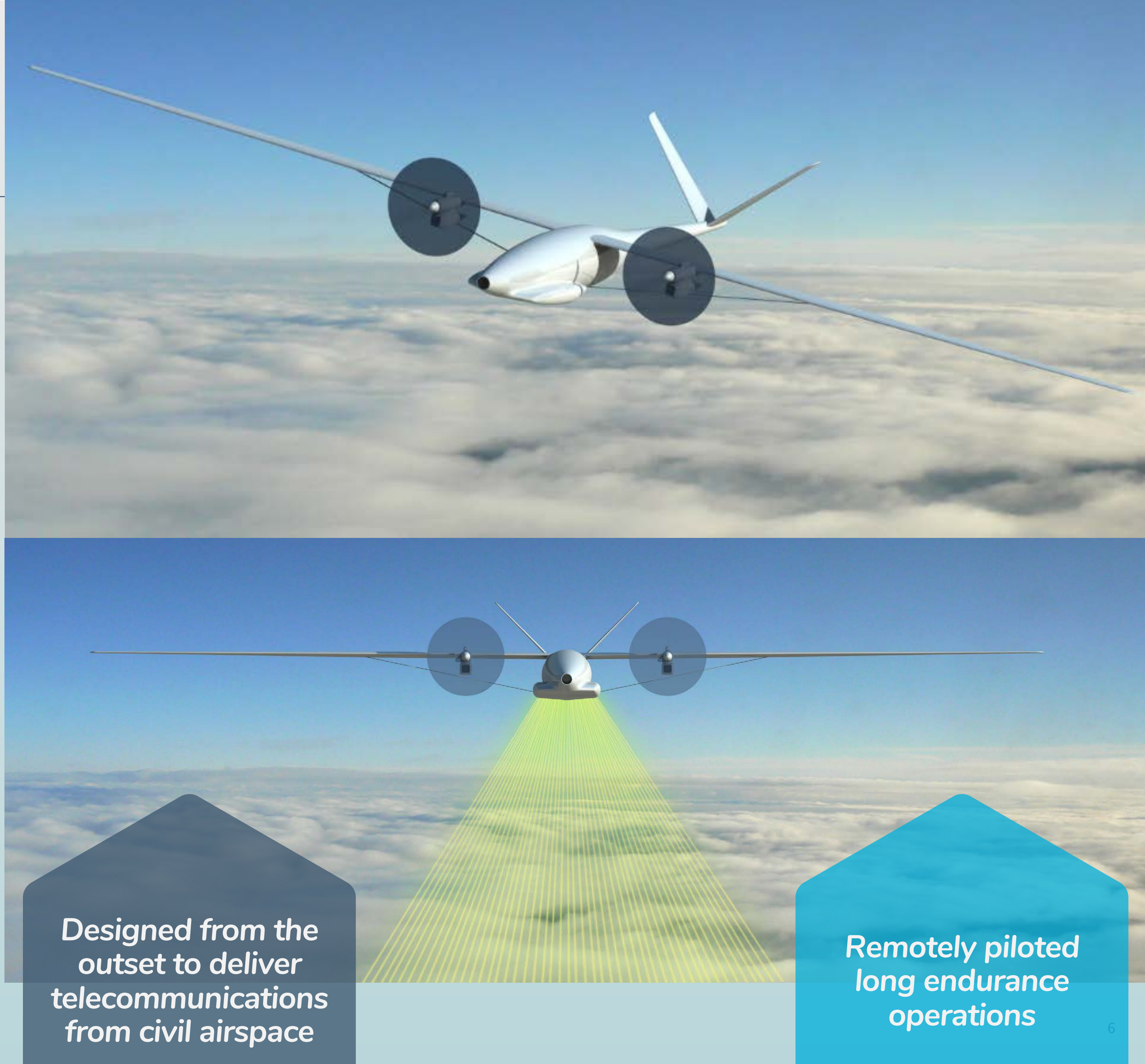
Endurance target of > 9 days



Development wing section already built and tested to EASA standards



Initial flight of prototype & testing planned for 2022



Designed from the outset to deliver telecommunications from civil airspace

Remotely piloted long endurance operations



# Operational infrastructure



SPL is creating an alliance of partners to support and deliver ground & airspace operations



Development of Hydrogen as a fuel source and associated ground infrastructure rapidly accelerating



Aircraft operates within standard ICAO airport and airspace civil aircraft procedures



Deployment modelling and manufacturing planning for service delivery with partners underway

