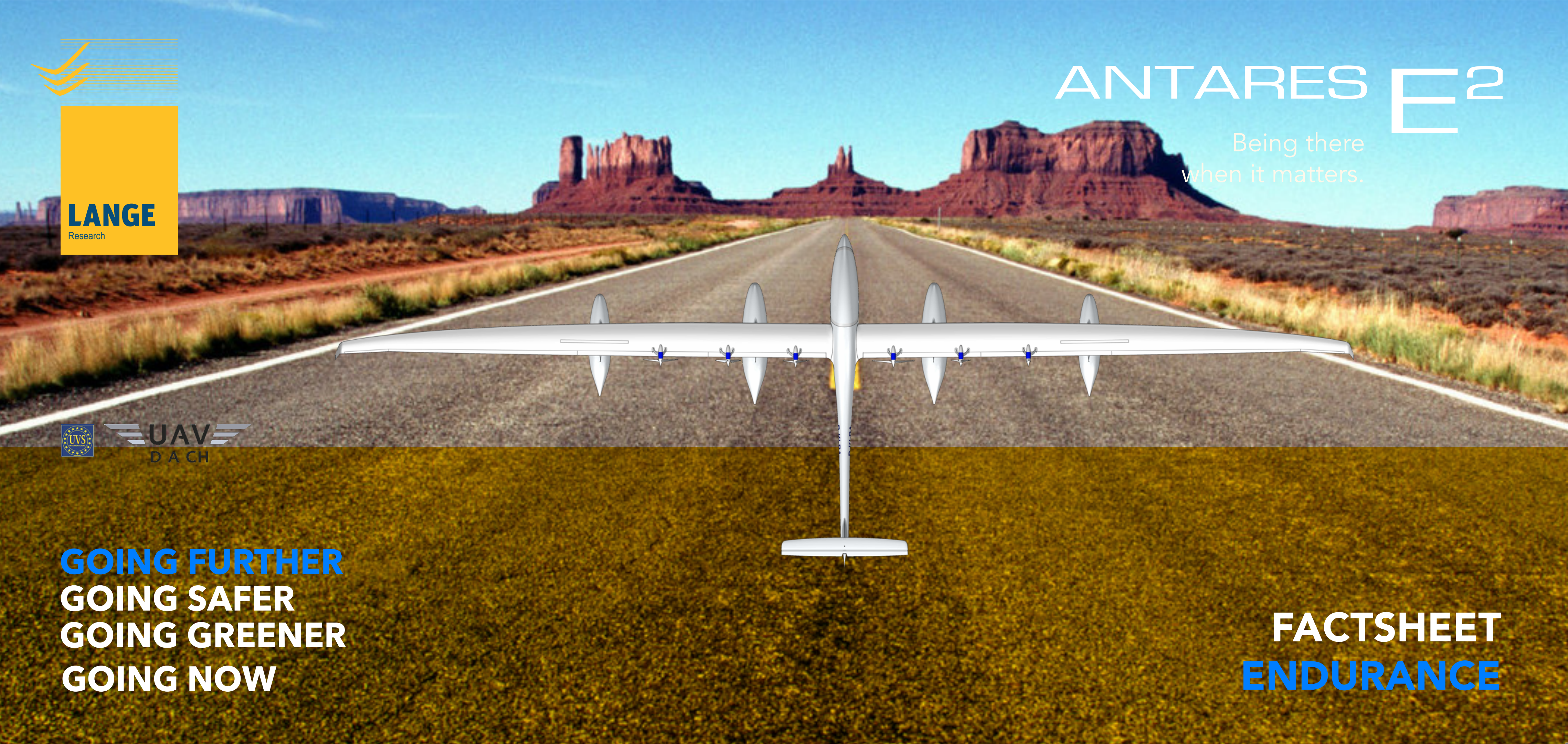
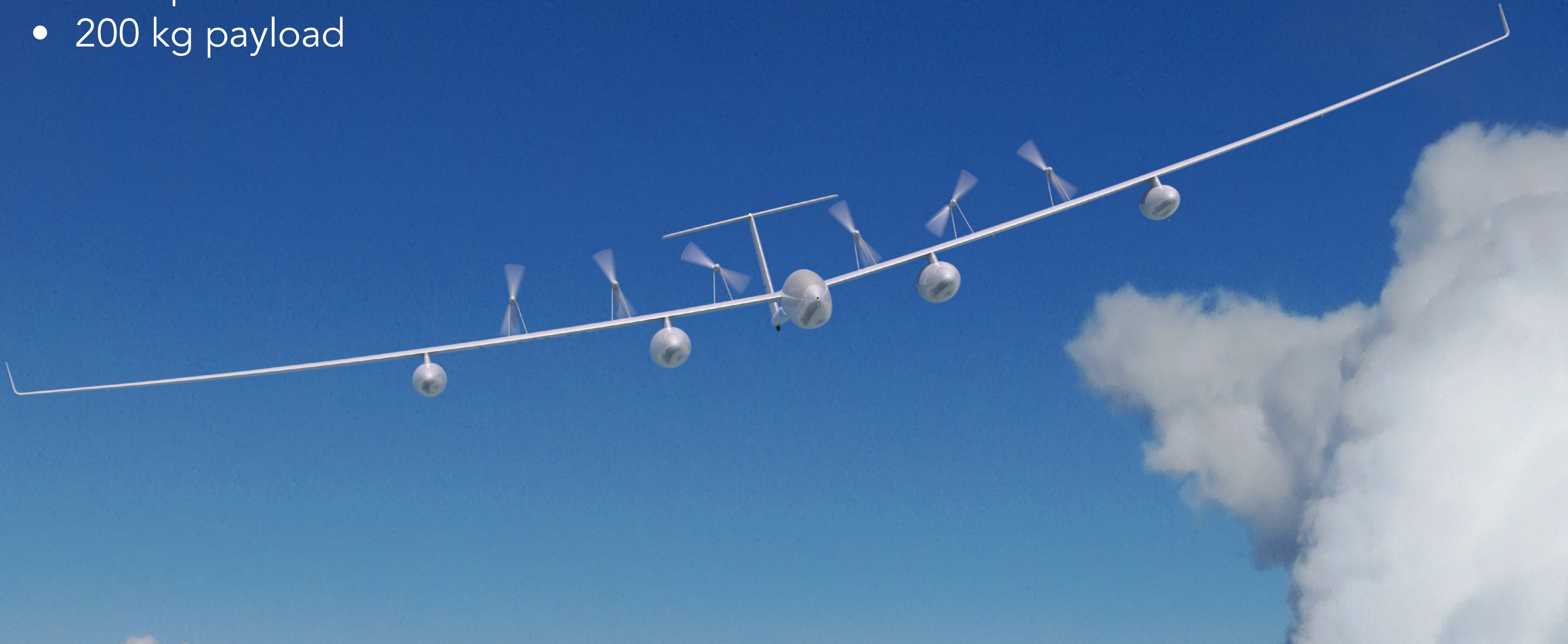

LANGE
Research
ANTARES E2
Being there
when it matters.
UVS
UAV
D A CH
GOING FURTHER
GOING SAFER
GOING GREENER
GOING NOW
FACTSHEET
ENDURANCE

GOING FURTHER
GOING SAFER
GOING GREENER
GOING NOW

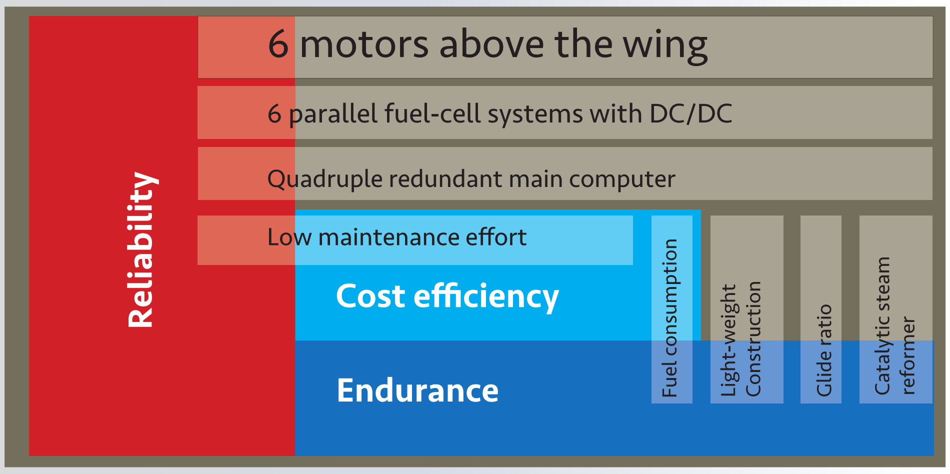
- 40 h flight endurance
- 6.000 km mission range
- All weather capable
- piloted or UAV version
- low operation cost
- 200 kg payload



Facts & figures endurance

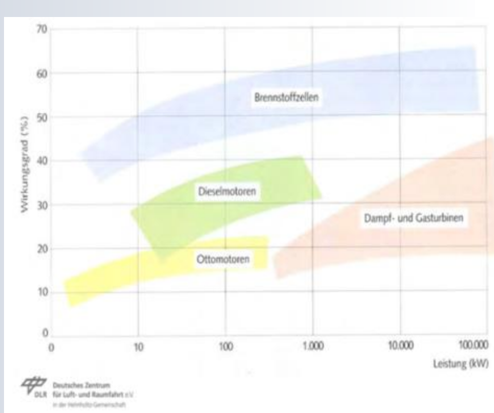
Antares E2 enables missions with continuous flight times of up to 40 hours and ranges of up to 5,500 km. It paves the way for flight operations that were previously not possible. The POI (Point of Interest) can thus be more than 2,500 km away, served and the mission can be carried out on site in sufficient time.

The Antares E2 can be operated either with pilot or without (RPAS). This is an important option because of its long range, a flight duration of more than 15 hours would overwhelm a person's biological limits.



Efficiency

TThe conceptual approach to increasing the range of the Antares E2 is based on three pillars: the efficiency advantage of the fuel cell over conventional drives, the excellent aerodynamics and the high efficiency of the electric drive. While endurance is often perceived as a limiting factor by the public in the discussion about electromobility, its efficiency in the Antares E2 leads to a competitive advantage and helps to open up new markets. The actual energy density of methanol as a chemical compound is lower than that of diesel fuel. Since the methanol is not fired in the process, but split off in the reformer of the fuel cell system (with a partial efficiency of 51% and hydrogen has an energy density of 33,3 kWh/kg), the typical energy utilization of such a system is higher in overall comparison to diesel. The overall efficiency of electric motors is well known and documented. For example, in the new European driving cycle, an overall efficiency of around 45% is expected for electric drives; in the case of highly advanced technology, an internal combustion engine achieves approximately 25% (direct injection diesel engine with common-rail injection) *.

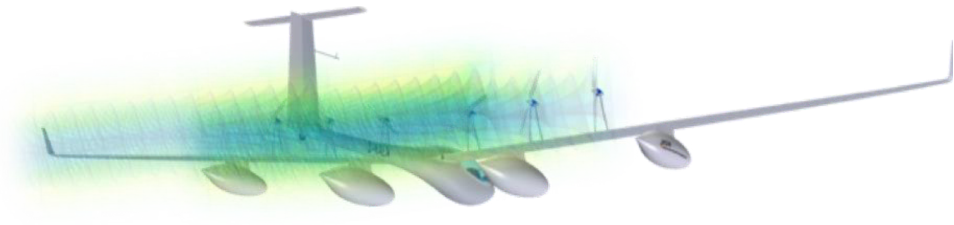


*from H2ydrogeit.de

Aerodynamic efficiency

The aerodynamic design of the Antares E2 is based on the Antares family of high-performance motor gliders. For more than two decades, these glider designs have been refined and optimized for maximum performance. The result is the most aerodynamic class of aircraft on the market. An impeccably streamlined hull blends into extremely long and slender wings. The lift-to drag-rate of the model is more than three times that of conventional powered aircraft. For the Antares E2, this also means that the aircraft requires very little energy to maintain the mission altitude during long-range flight.

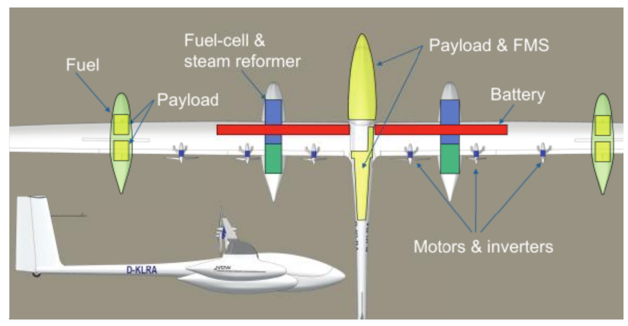
The engines are located on pylons with the propeller discs above and behind the wing. This avoids drag-generating aerodynamic interactions between the airframe and the propeller drag and noise-



intensive and efficiency-reducing aerodynamic interactions between the keel of the airframe and the propeller.

Propulsive power

The state-of-the-art electric motors and motor controls of the Antares E2 work with extremely high efficiencies. By distributing the power to several smaller engines, each individual engine can run at a higher speed. This in turn results in higher engine power densities while keeping the propeller disk load low, which in turn leads to high propeller efficiencies. Complicated?



No not at all. Controlling electrical drives requires less effort than with internal combustion engines. Choke, mixing ratio, ignition timing are history. Sophisticated design and good software determine the future and bring the decisive competitive advantage.

The high aerodynamic and driving efficiency of the Antares E2 affects its endurance in two ways:

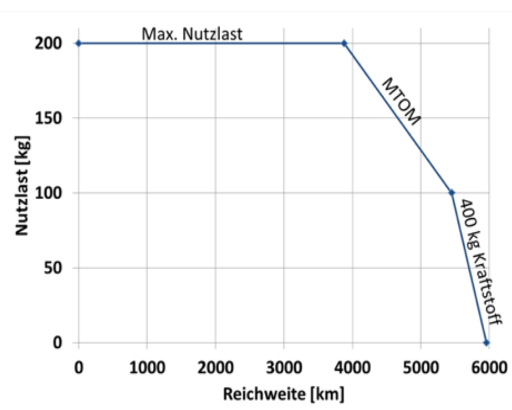
- The high efficiency leads directly to a longer flight time (due to the lower fuel consumption).
- In addition, the high efficiency leads to lower power requirements in regular flight.

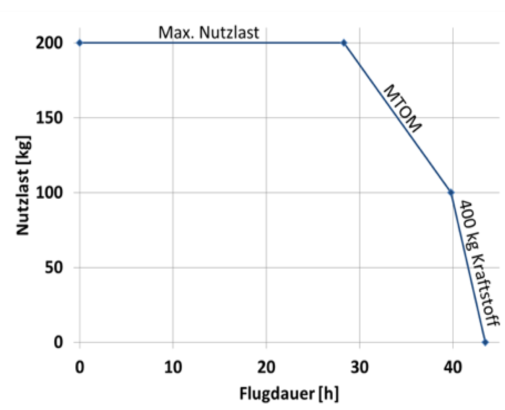
This then results in fewer fuel cells (mass) and leaves more mass for fuel left over. The end result is an aircraft with enough stamina to get where it's needed in each mission.

Payload and fuel

The distribution of masses for fuel and payload can be adjusted. A total load of 500 kg is planned.

In the standard application 300 kg for fuel and 200 kg for other load (cameras, communication, pilot, ...) are provided. By reducing the other payload up to 400 kg of fuel could be taken to release reserves in the range.





GAME-CHANGING TECHNOLOGY

The Antares E2 uses a state of the art electric drivetrain consisting of fuel cells and electric motors with multiple redundancy. This yields a combination of high endurance and high reliability which means that expensive sensor-payloads can safely be carried further and longer.

Built-in capabilities for rough weather combined with the possibility of flying both manned and unmanned applications gives the aircraft a high degree of mission readiness exibility. The payload carrying capability of the Antares E2 allows the installation of a comprehensive set of sensors and communication systems, making the system well suited for a wide variety of applications.

ANTARES E2 - A GAME-CHANGER IN REMOTE SENSING.

LANGE
Research

Brüsseler Strasse 30
66482 Zweibrücken

Fon 06332-9627-0

www.lange-research.com
info@lange-research-aircraft.com