FULL ELECTRIC REGIONAL FLIGHT - THE CHALLENGES

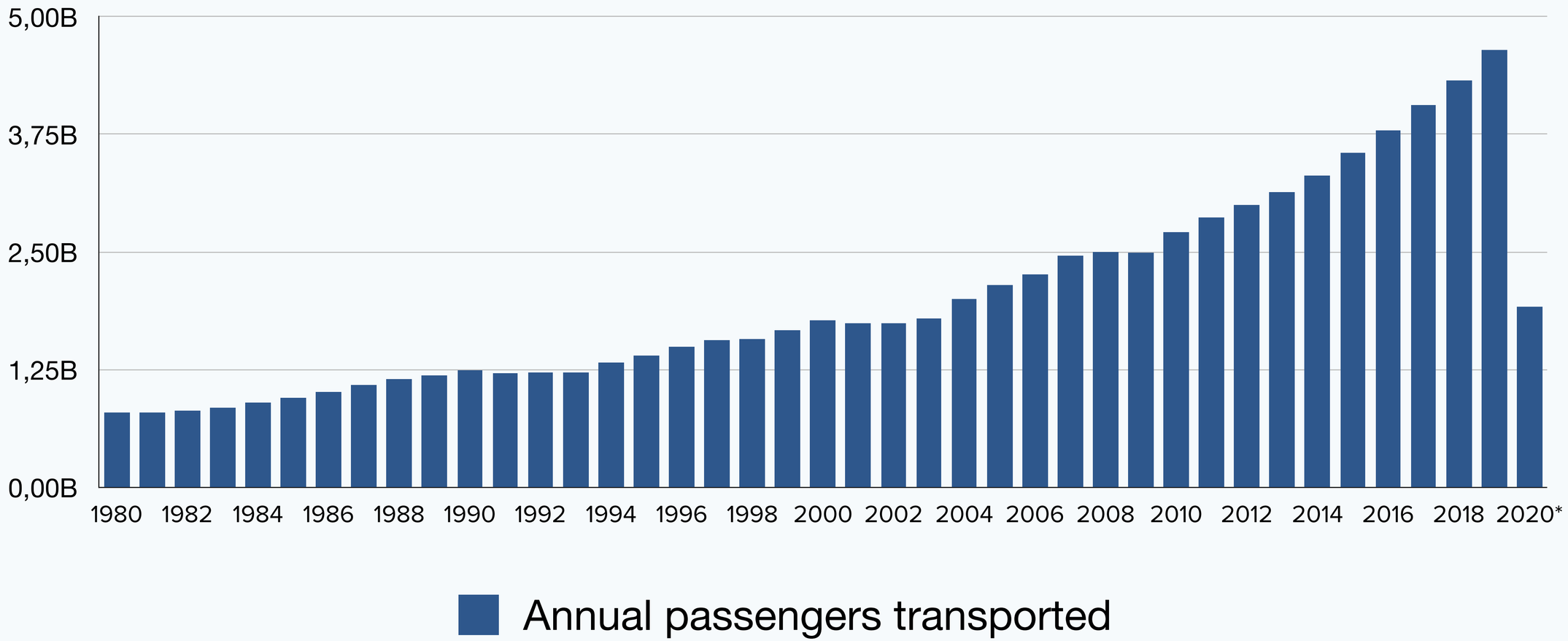
APRIL 6TH, 2022

PRESENTATION NAG

WHY DID WE START VENTURI?

AVIATION GROWS WITH **4% PER YEAR**

AND IT DOUBLES **EVERY 15 YEARS**



2022:
200 COAL FIRED POWER PLANTS

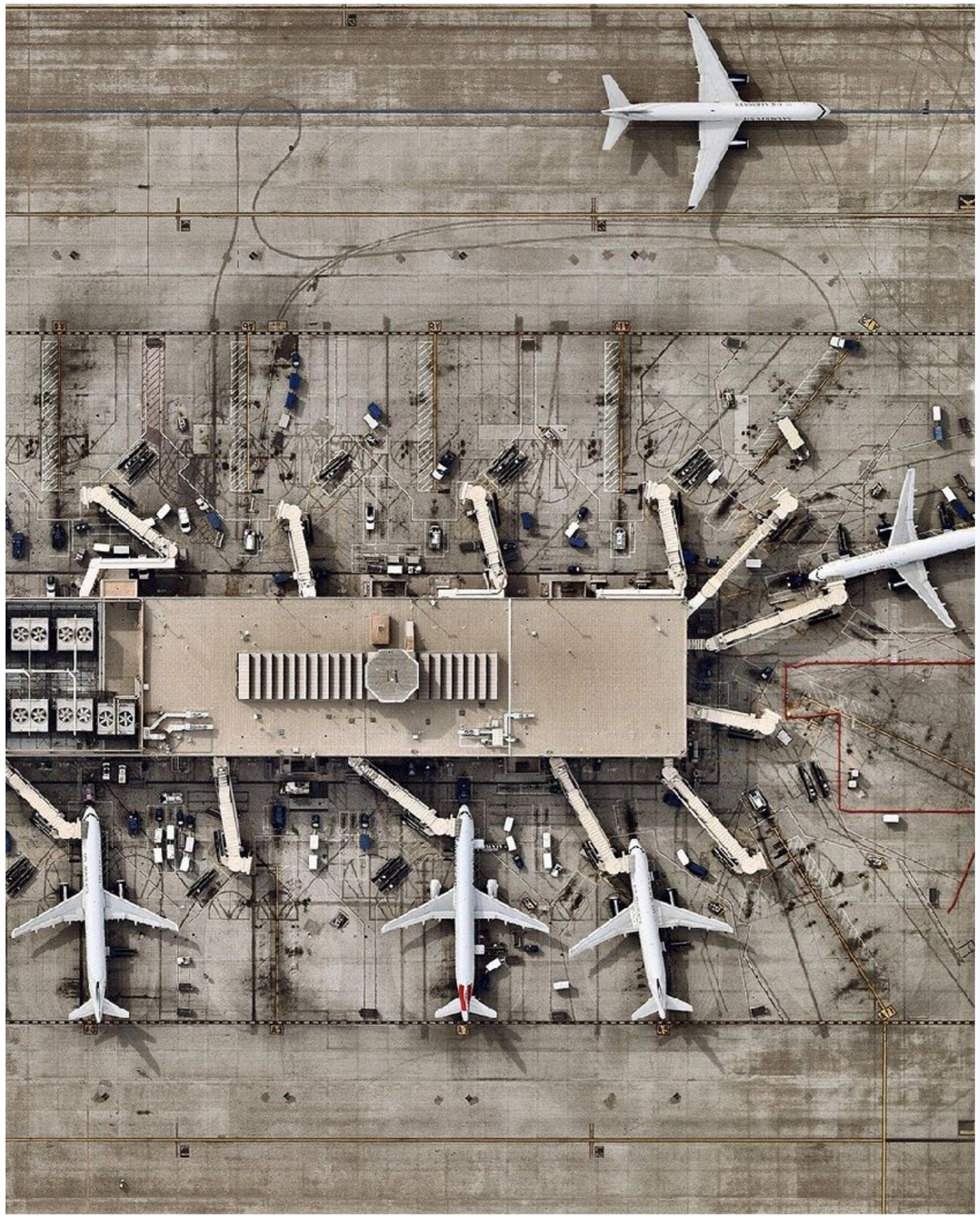
LET'S OPEN 8
NEW COAL
PLANTS
EVERY YEAR...

2037:
400 COAL FIRED POWER PLANTS

TARGET:
6% SAF BY 2020

REALITY:
< 0,1% IN 2021

OF ALL KEROSENE IS
SUSTAINABLE



WILL SOCIETY TOLERATE MORE POLLUTION?

NOS

Grote zorgen kabinet over Schiphol, aantal vluchten mogelijk fors omlaag

LUCHTVAART NIEUWS.NL

ROND LELYSTAD AIRPORT WORDT MET SPANNING OP UITKOMST FORMATIE GEWACHT

deVolkskrant

Frankrijk verbiedt korte binnenlandse vluchten

DENMARK: ALL DOMESTIC FLIGHTS 100% FOSSIL FREE IN 2030

MARKET DYNAMICS

THE AVIATION SECTOR IS SET FOR GROWTH

"IN THE NEXT 20 YEARS, AIRBUS FORECASTS A NEED FOR SOME 39,000 NEW-BUILD PASSENGER AND FREIGHTER AIRCRAFT"

HTTPS://AIRBUS.COM/NEWSROOM - NOVEMBER 12, 2021

HOW ABOUT **COMPETITION**?

EVIATION

9 pax

792 km

2024

Sold out!

Heart Aerospace

19 pax

300 km

2026

Sold out!

ZUNUM Aero

19 pax

300 km

2026

Operations stopped

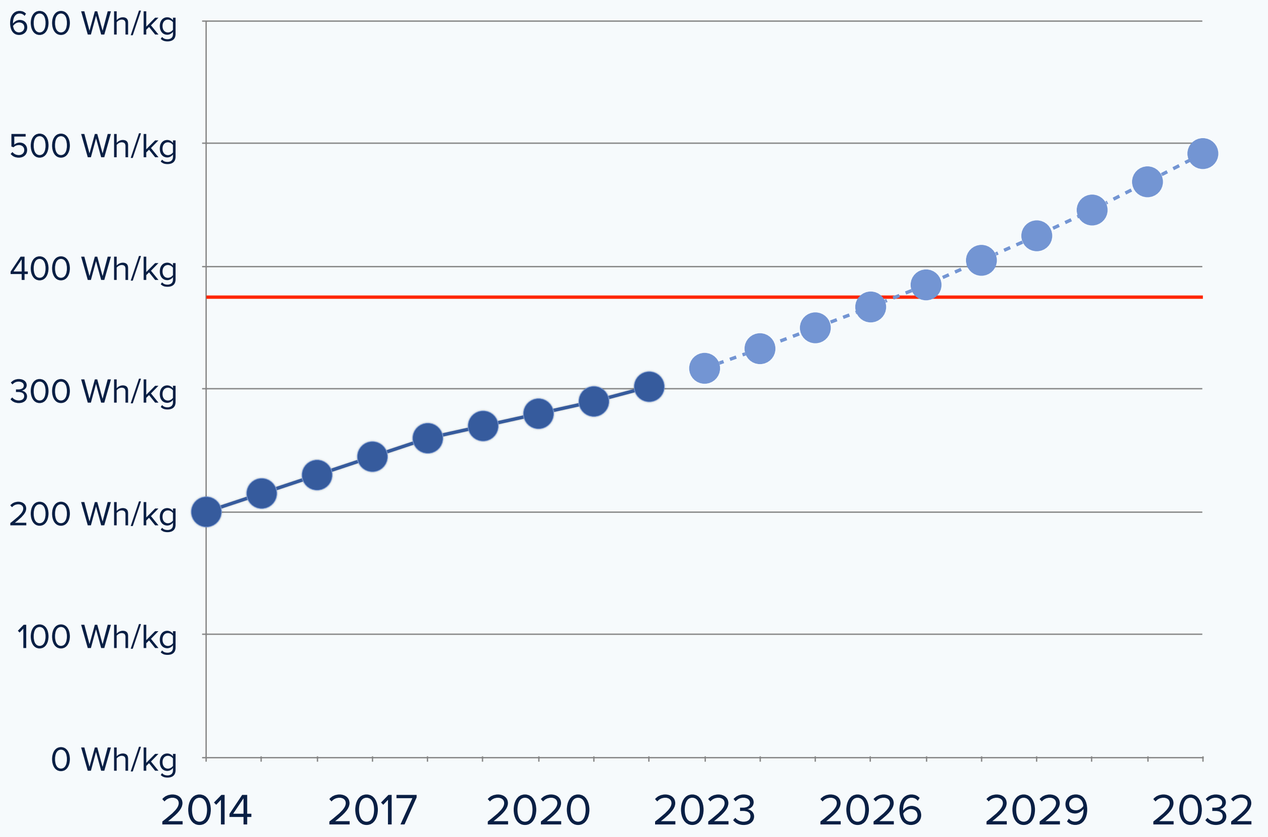
THE VENTURI PLAN

AIRCRAFT DEVELOPMENT:

8 - 10 YEARS

*“TO HAVE A COMPELLING AIRCRAFT, YOU ONLY NEED ABOUT **400WH/KG**”*

BATTERY TECH IS IMPROVING. IT’S TIME TO **ELECTRIFY** AVIATION.



375 Wh/kg at the cell level - 300 Wh/kg at the pack is the critical point. **To be reached in 2027.**

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OUR MISSION

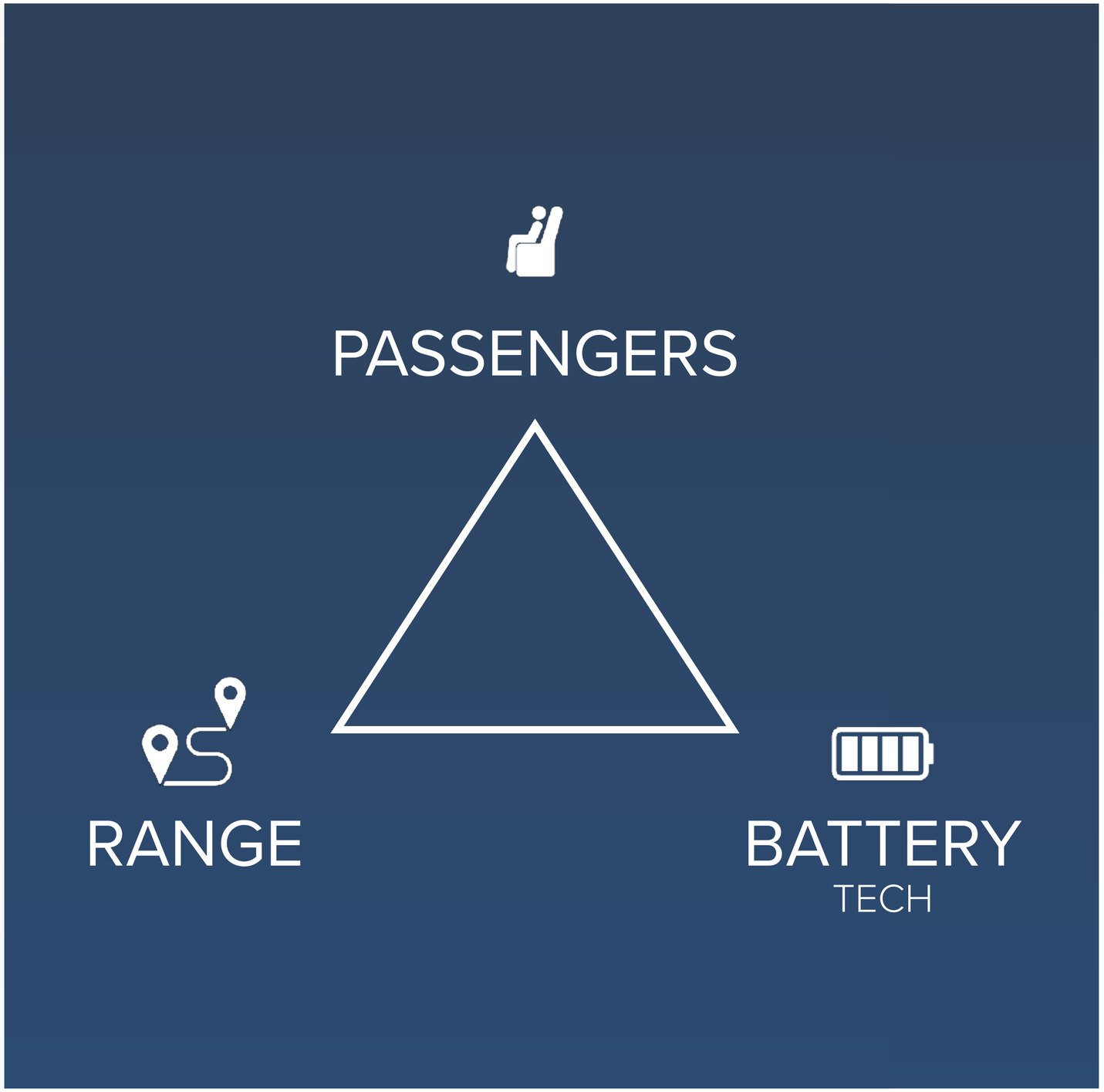
VENTURI

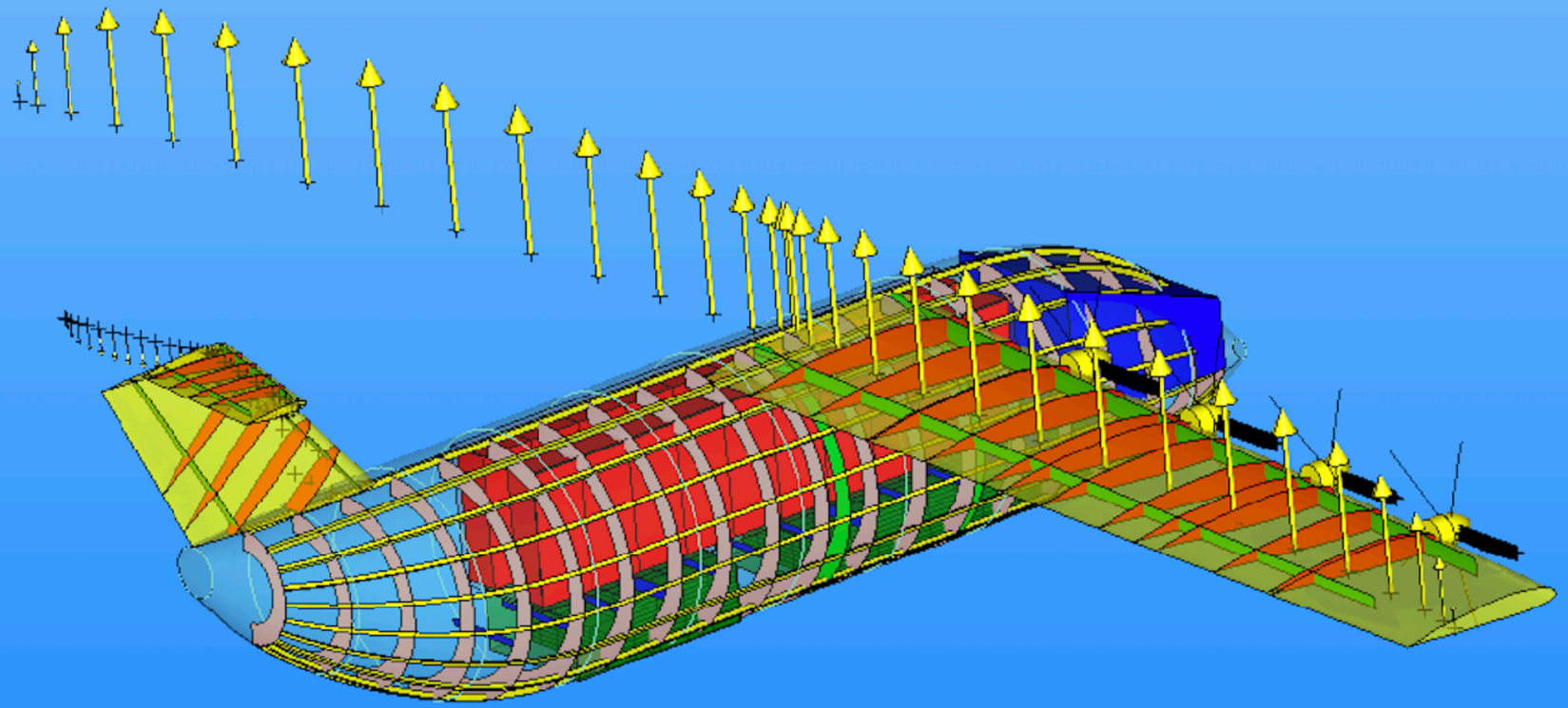
OUR MISSION

TO DELIVER WORLDS FIRST

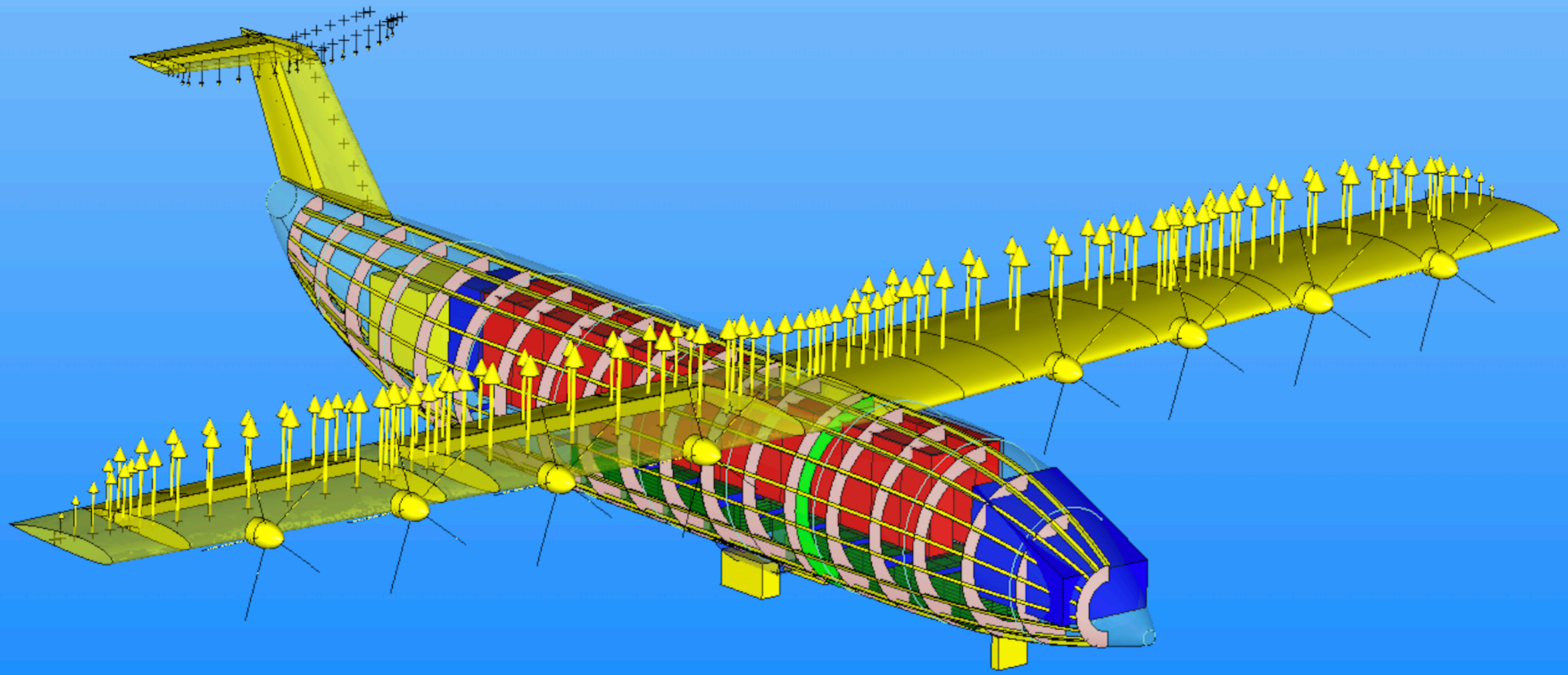
ALL-ELECTRIC COMMUTER AIRCRAFT

FIND THE **OPTIMUM**





19 PASSENGERS



35 PASSENGERS

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ECHELON 01

VENTURI

44

Passengers ex crew

490 km/hr

265 KTAS Cruising speed


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CHARGING PROVIDED

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35 minutes

Charging time

At all major airports

Following Echelon 01

CHALLENGE #1: BATTERY WEIGHT

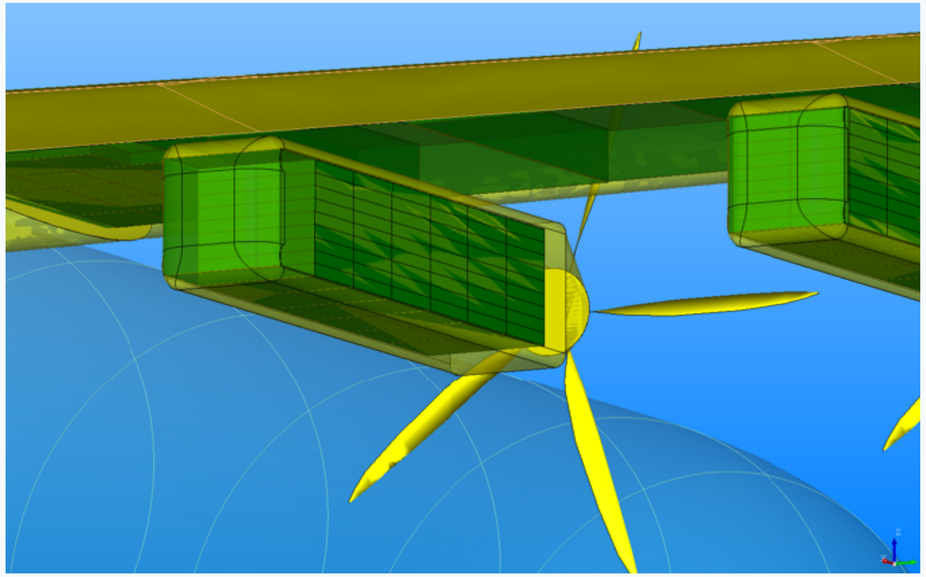
ACCOUNTING FOR MASS

BATTERY WEIGHT

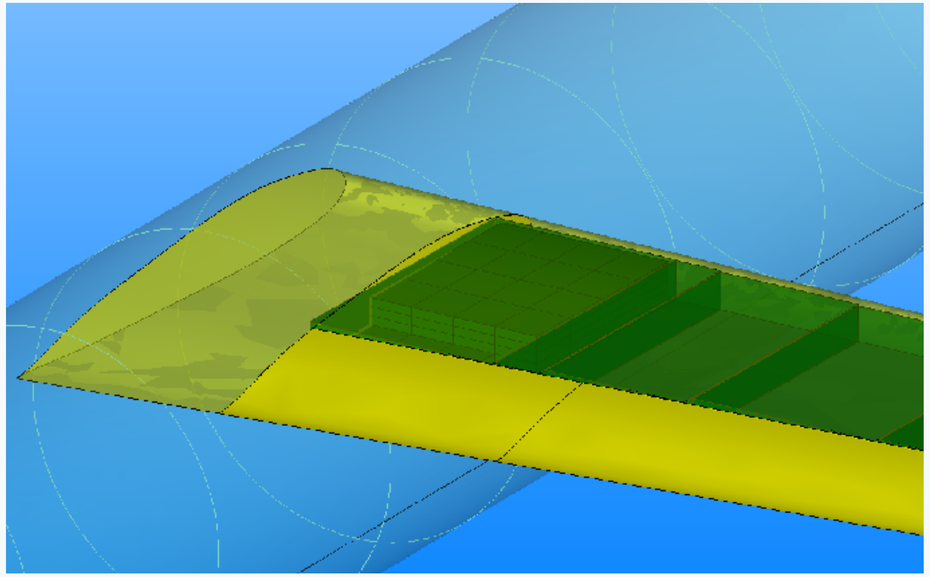
- **± 45.000 KG** TAKE-OFF WEIGHT
- **± 22.500 KG** IS BATTERY WEIGHT
- NO WEIGHT DECREASE @ FLIGHT

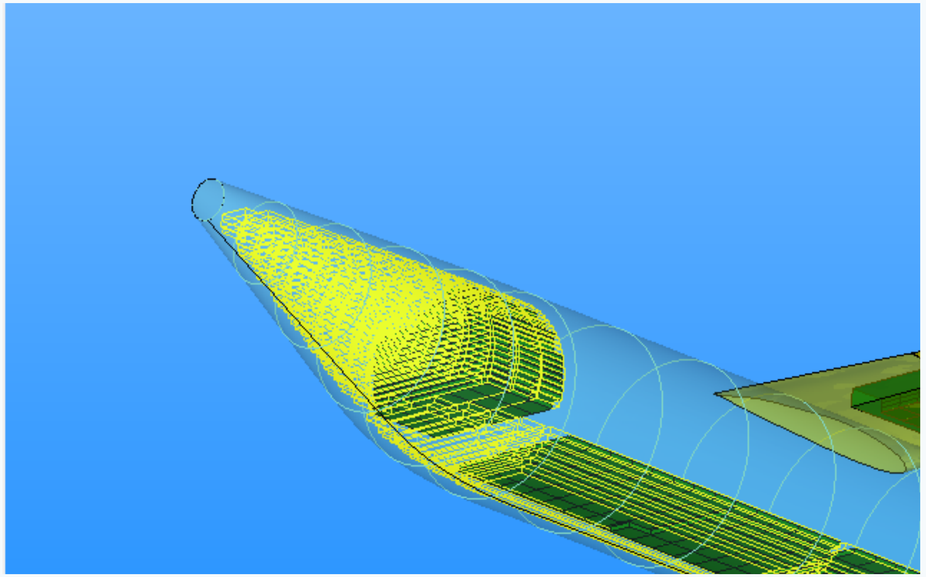
50% MORE WEIGHT *THAN AN ATR-42*

Motor

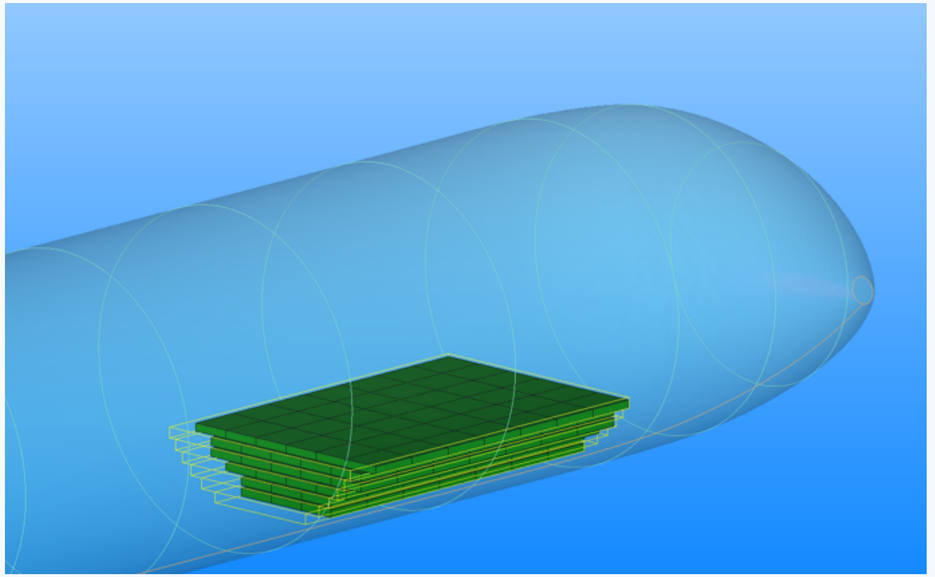


Wing





Tail



Fuse

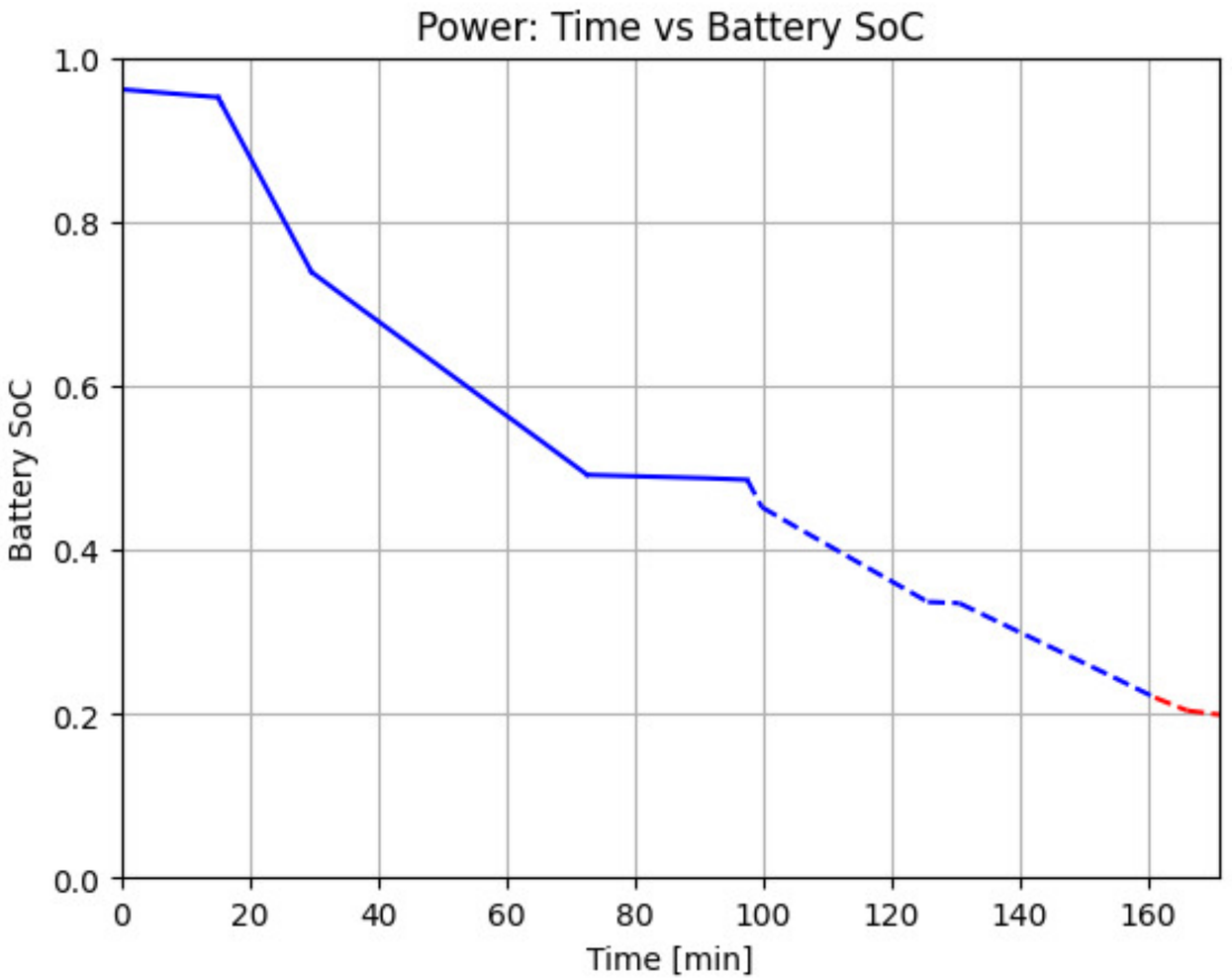
CRITICAL CHALLENGES

- LANDING / TO DISTANCE (<1500M!)
- ACCOUNTING FOR BENDING LOADS
- LANDING GEAR ENGINEERING

CHALLENGE #2: BATTERY LIFE-TIME

ACCOUNTING FOR CHANGE-OVER

HOW IS A BATTERY USED DURING FLIGHT?



Net energy, minus:

- SOH reserve (10%)
- SOC reserve (10%)
- Legal reserve
  - Ascend
  - 185 km
  - 30 minutes pattern

LIMITED BATTERY LIFE-TIME

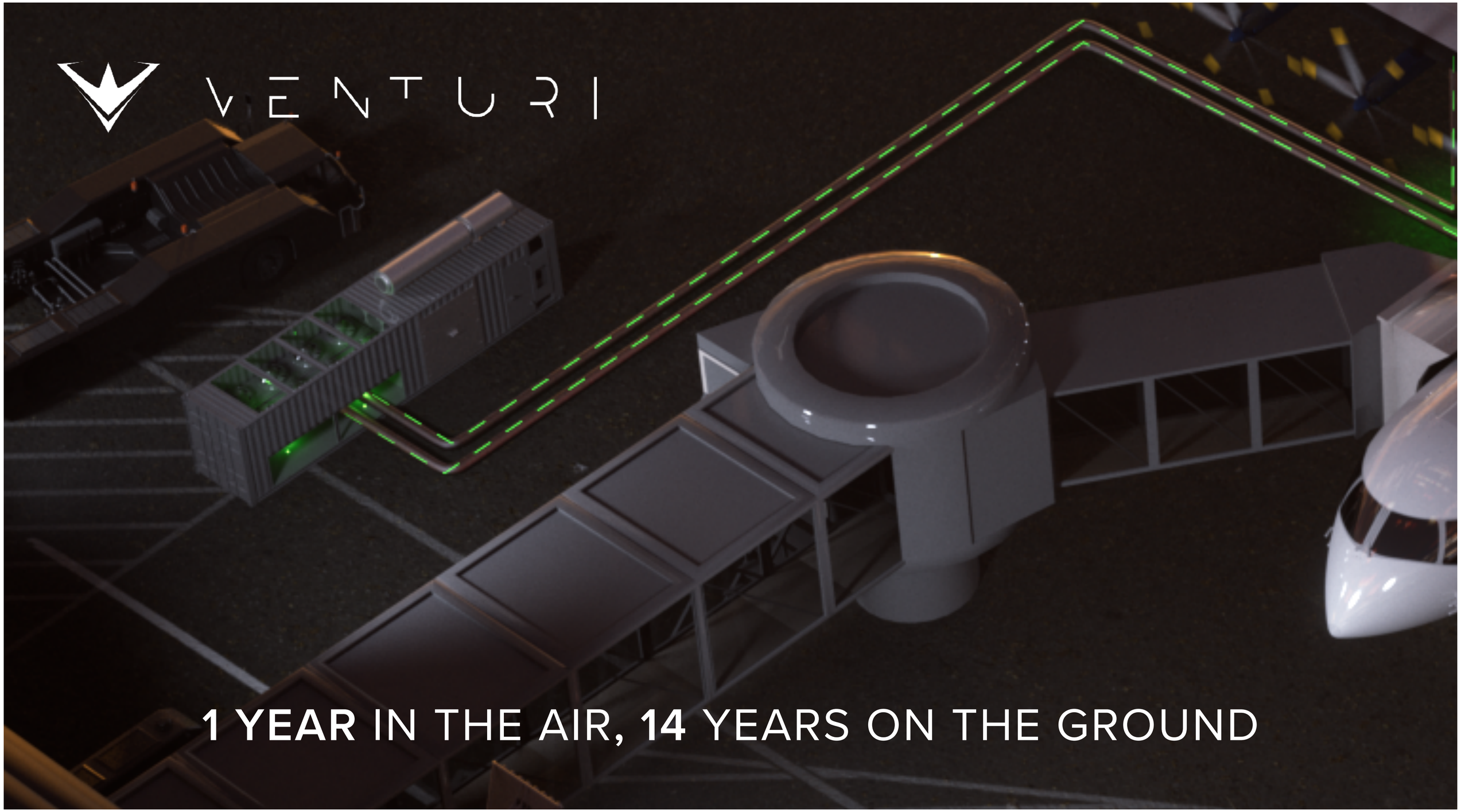
- **AVG. CYCLE:** 50% SOC WINDOW
- **TERMINAL SOH:** 85 - 90%
- **LIFE-TIME:** 1000 CYCLES
- **REPLACEMENT:** 1500 - 1800 FLIGHTS

CRITICAL CHALLENGES

WHENEVER REPLACING, WE MUST ENSURE:

- **ELECTRICAL** INTERCONNECTIVITY
- **MECHANICAL** INTERCONNECTIVITY
- **THERMAL** INTERCONNECTIVITY

THIS MUST BE DONE WITHIN 12 HOURS.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1 YEAR IN THE AIR, 14 YEARS ON THE GROUND

CHALLENGE #3: LIMITED ENERGY

ACCOUNTING FOR OPERATIONAL LIMITATIONS

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RANGE - UPGRADING OVER TIME

SO WHY ELECTRIC FLIGHT?

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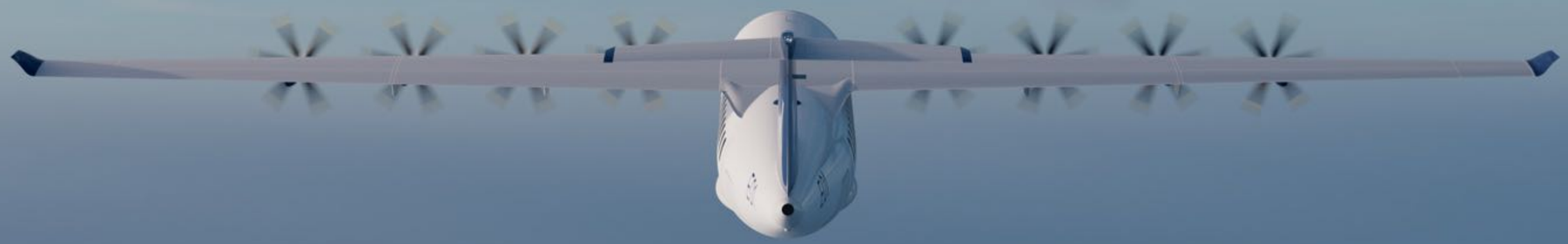

TACKLING UP TO 9% OF GLOBAL AVIATION CO_2 (89,6MT CO2)

(McKinsey, 2020)

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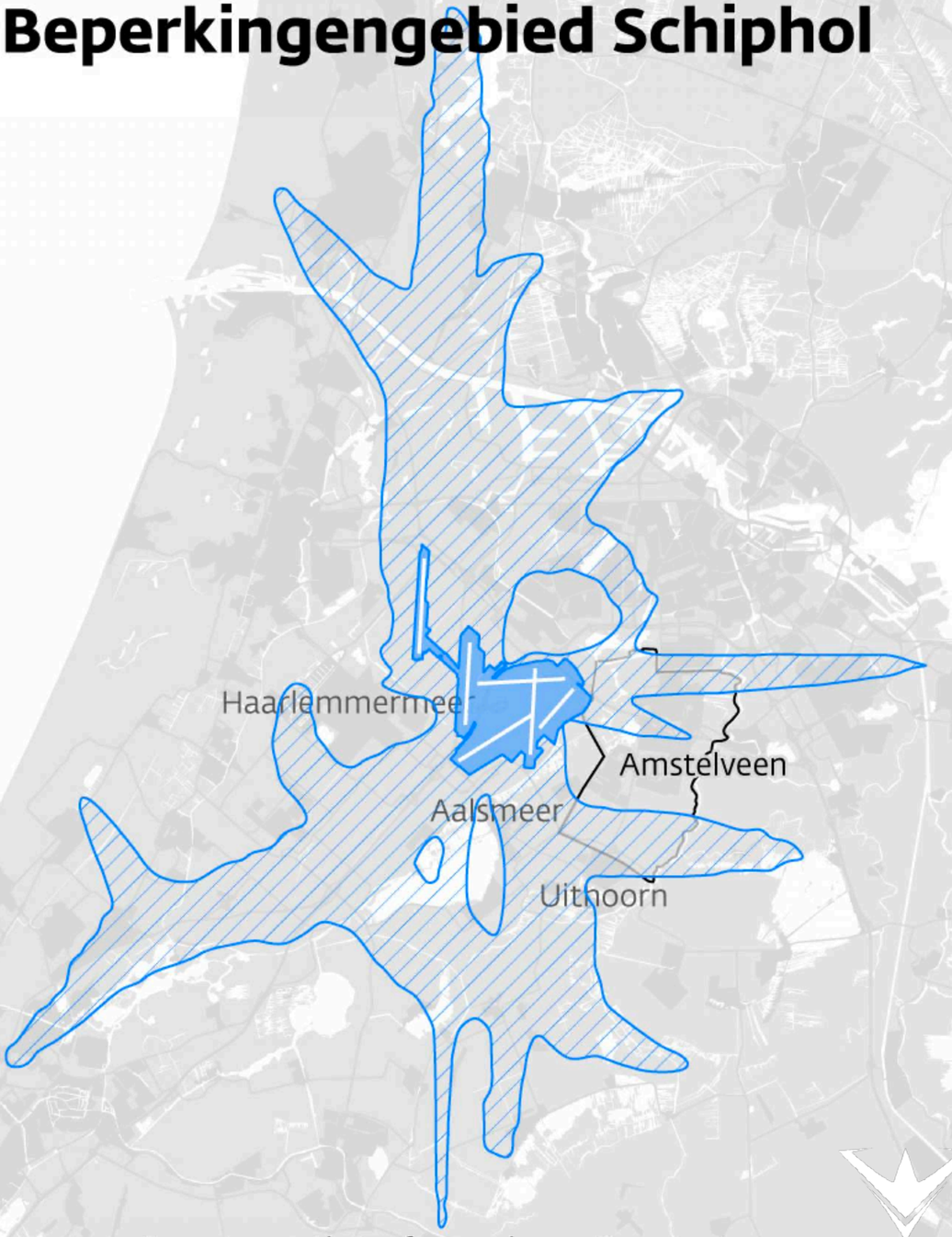
40% lower noise

At Take-off

(Noise of an office meeting)

Beperkingengebied Schiphol



Bron: Inspectie Leefomgeving en Transport


€0.15 COST/SEAT/KM
-33% operating cost with comparable aircraft

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AVIATION FOR A GENERATION THAT WANTS TO TRAVEL, NOT POLLUTE