



Global Urban & Advanced Air Summit

2-3 March 2022

SHAPING THE FUTURE OF AIR TRAVEL



Global
**Urban &
Advanced Air
Summit**

2-3 March 2022

SHAPING THE FUTURE OF AIR TRAVEL

GKN Aerospace Innovative AAM Solutions

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~£2.6BN
SALES

39
SITES

4
GLOBAL
TECHNOLOGY
CENTRES

15,000
EMPLOYEES

12
COUNTRIES

ON BOARD
100,000
FLIGHTS A DAY



Our Products



AEROSTRUCTURES



- > Fuselage, wing primary structures
- > Nacelle & pylon
- > Empennage

ENGINE SYSTEMS



- > Fan Statics/ Rotatives
- > Compressor
- > Turbine Exit
- > Space subsystems
- > RM12 OEM

SPECIAL PRODUCTS



- > Transparencies
- > Ice protection systems
- > Lightweight missile canisters

WIRING INTER-CONNECT SYSTEMS



- > Electrical Wiring Interconnection Systems (EWIS) for aircraft and aircraft engines

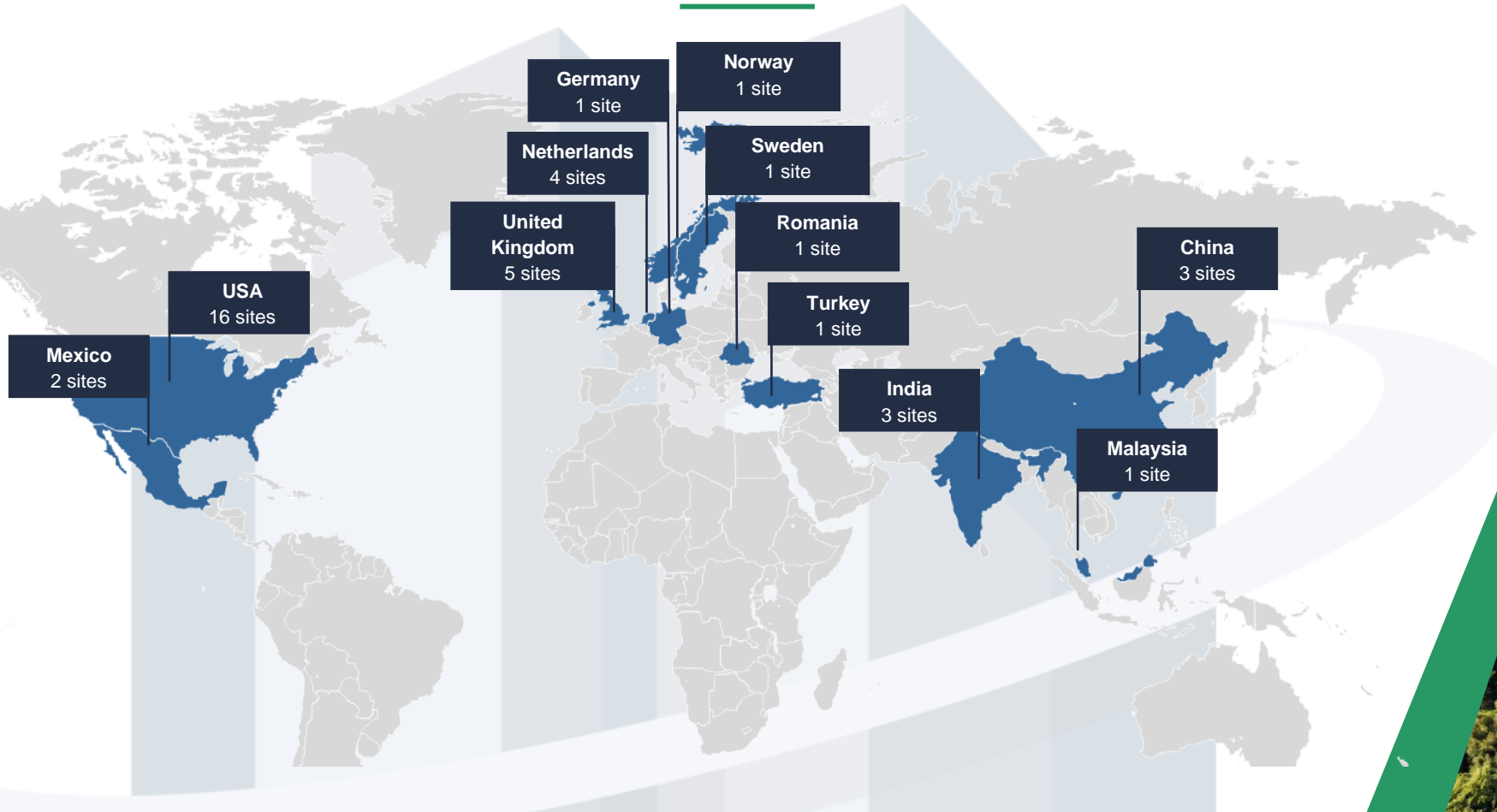
LANDING GEAR



- > Helicopter landing gear
- > Composite landing gear components



Our Footprint



(Manufacturing sites only)

Global Technology Centres

Committed to a more sustainable future:

Our 2025 Targets	
Reduce GKN Aerospace emissions as a Business	Energy, Waste & Emissions Reduce Scope 1 & 2 emissions by 50%
	Our Supply Chain Source 95% global electricity from renewable sources
Conserve our planet's natural resources	How our people live & work Divert waste from landfill by 95%
	Responsible Consumption Reduce water intensity by 25%
Enable Aviation's route to Net Zero 2050	Product Performance 80% of R&D on climate related solutions
	New Business 80% of new products contribute to decarbonisation

Enabled by a network of Global Technology Centres:

- > Trollhättan, Sweden
- > Bristol, UK
- > Oak Ridge, US
- > Hoogeveen, The Netherlands



Develop Capability to expand our differentiation



Industrialise Sustainable Technology



Create an Ecosystem hub to leverage wider expertise



Increase Collaboration internally & with our partners



Demonstrate capabilities prior to industrialisation



Showcase GKN Aerospace capabilities

GKN Position in AAM Market



- Established Tier 1 technology supplier on ***Aerostructures, EWIS & Transparencies***
- ***Certified*** EASA Design & Production Organization
- Proven processes to ***rapidly*** design, build, test and certify aerospace products
- ***Global Industrial*** capability for manufacturing at high rates at high delivery and quality performance
- Offering **multi technology** integrated aircraft sub-systems enabling further optimization in integrated design



Key AAM Market Requirements

Success Criteria

1. **Range & payload**
 - i. Intra-urban aiming at 20-30nm with 4-5 pax
 - ii. Some aspirations for inter-urban range
2. **Low noise** a crucial requirement for urban operations
3. **EASA certifying** under SC-VTOL, FAA using part 23 with special conditions
4. **Lifecycle sustainability** will continue to grow in importance

Challenges and opportunities

1. **Product:** Performance, weight, efficiency, durability
2. **Process:** Aggressive **cost targets** and industrialization for **ultra high rate**



Key Technology Solutions



1. EWIS

- i. Affordable and certifiable HVHP solutions
- ii. More EWIS driven design especially with battery operated vehicles

2. Airframe technology developments

- i. Rapid design & development to accommodate fast product evolution
- ii. Scalable low cost lightweight materials
- iii. Industrialisation for ultra-high rate production
- iv. Dependable quality

3. Notional platforms development

- i. Deep understanding of performance and certification requirements



High Voltage, High Power Applications

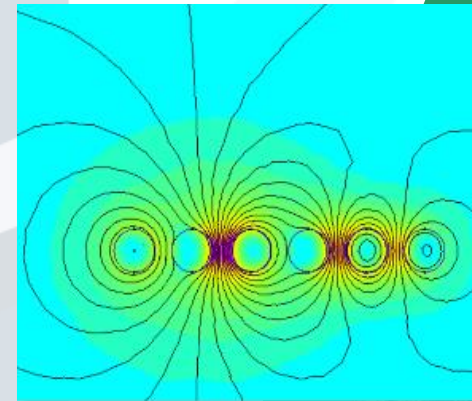
A key challenge for (hybrid-) electric AAM propulsion is integration of high voltage, high power & high frequency electrical capability

> Key Product Features

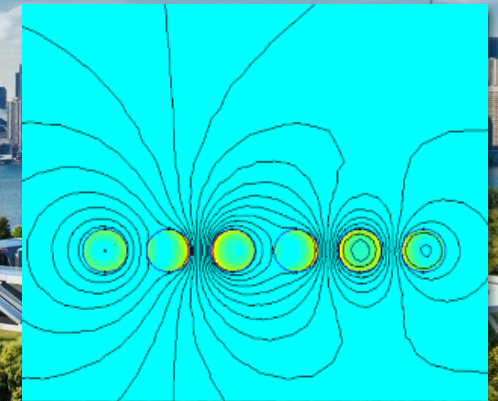
- i. Uncharted territory – new market & requirements
- ii. No international standards exist (yet)
- iii. Unique technological advancements – e.g. miniaturization
- iv. Custom-made parts & materials
- v. Future-proofing the aviation industry

> Key Capabilities

- i. Modelling electro-magnetic behavior of HV systems
- ii. Co-development of application-specific components
- iii. Leveraging our eco-systems and partnerships
- iv. Integration design for existing & new aircraft



Flux density



Electric density

Conclusion



- > AAM requirements are multifaceted as expected in the aero industry but even tighter (cost, performance, rate, technology) which can only be achieved through **greater integration**
- > Knowledge of how we **certify** such products is key
- > Get ready to be **flexible** as these products will evolve faster in terms of timescales but as the rates will be high, each evolution has the possibility to offer a good business case.
- > **Rapid development** and **optimisation** are key aspects. The first to market with improved platform will capitalise.
- > This is a true fusion between automotive market product reactions and aerospace stringent safety requirements.

GKN Aerospace – the most TRUSTED and SUSTAINABLE partner in the sky