

# Certification comes first, not last

Dr. Sebastian Seemann  
CTO VÆRIDION



**Certification  
Conference**

*October 24, 2023  
Cologne*

## Certification Pathways – 3 RAM Categories

### A. Electrification retrofit of certified combustion engine aircraft:

- Standalone engine / ETSO not certifiable
- Limited mission performance

- Considerable certification effort, no clear time & cost advantage
- Risk of being stopped during development

### B. New conventional aircraft with simple electric propulsion system:

- Perfect match with EASA approach
- Best achievable mission

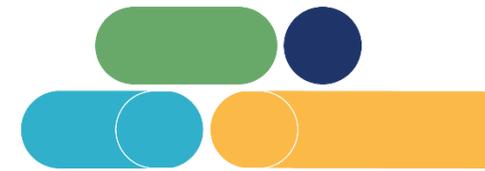
- Optimal balance of certification time, cost, and risk



### C. New disruptive aircraft with ambitious electric prop. system:

- Reliance on unconventional technologies
- High degree of system complexity

- Negative mass and complexity spiral causing major design pivots, cost, and delay
- Extreme certification effort and risk



# The Core Team



**Ivor van Dartel**  
Chief Executive Officer  
MSc Aerospace Engineering  




**Dr. Sebastian Seemann**  
Chief Technology Officer  
PhD Aerospace Engineering  




**100+**

years of passion in aeronautics

**14**

nationalities worldwide

**6**

Electric Aircraft programs



**Moritz Schuhmann**  
Senior Electrical Systems Engineer  




**Dr. Nando van Arnhem**  
Aerodynamics Lead Engineer  




**Victoria Dalceno**  
Project Engineer  




**Jasper van Wensveen**  
Overall Aircraft Design & Integration Engineer  

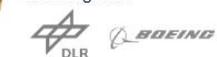



**Siju Sasidaran**  
Thermal Lead Engineer  




**Markus Kochs-Kämper**  
VP Engineering  




**Dr. Srinivas Vasista**  
Structure and Manufacturing Lead Engineer  




**Serkan Uyar**  
Airframe Lead Engineer  




**Bozhena Hryvnak**  
Business Manager  




**Jacob Chinnan**  
Senior Simulation Engineer  




**Geerte van der Linden**  
Office & Community Manager  




**Evan O'Connor**  
Mechanical and Materials Lead Engineer  




**Douglas Costa**  
Lead Propulsion Systems Engineer  




**Cristina Ortega**  
Aircraft Systems Engineer  

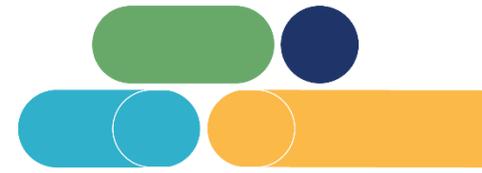



**Salma Mrabet**  
Electrical Systems Engineer  




**Markus Ekert**  
Founder's Associate / Finance  



# True Sustainable Air Transport Before 2030

VAERIDION



**Zero new infrastructure.**

**Highest energy efficiency.**

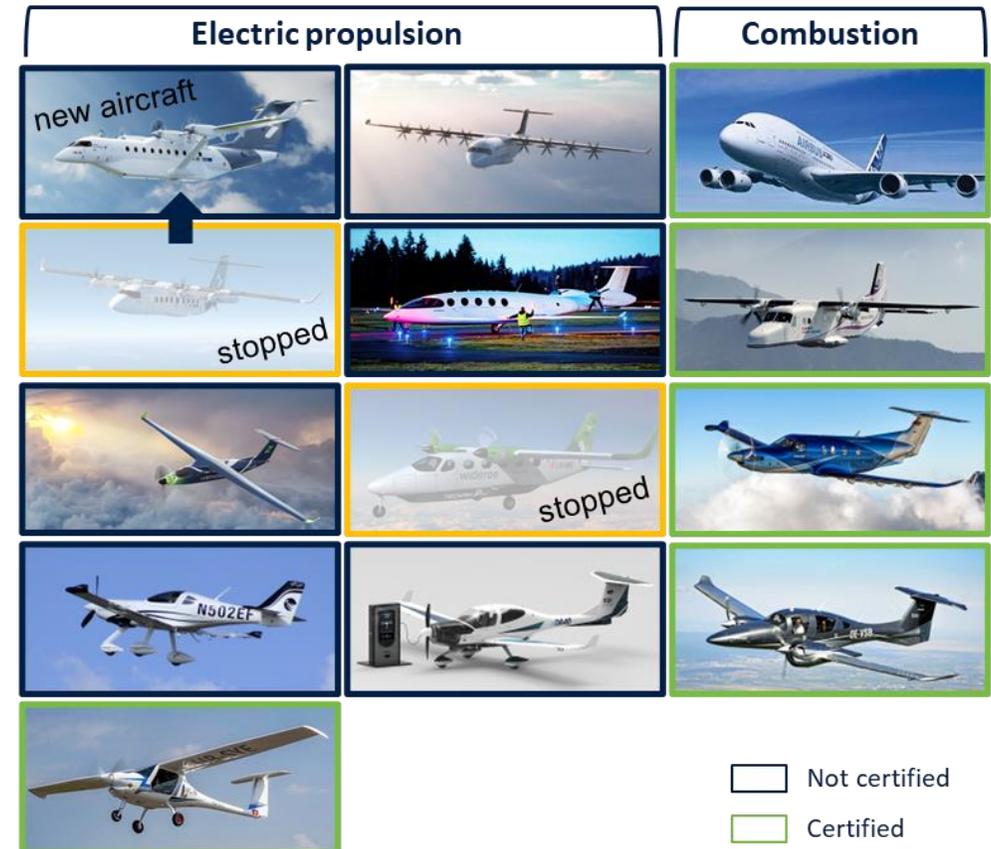
**Fastest route to certification.**

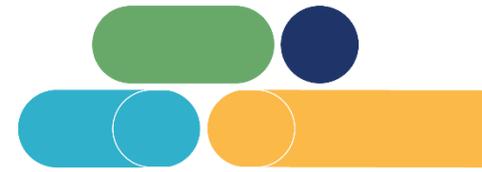


# Distinct Certification Frameworks for Fixed-Wing Aircraft

Category & Level	Aircraft Category	CAT IFR *	Decisive Requirements
CS-25	Large Aeroplanes	Yes	<ul style="list-style-type: none"> <li>• MTOM <math>\geq</math> 8.618 kg</li> <li>• MOPSC <math>\geq</math> 20 (pax)</li> </ul>
CS-23 Level 4	Performance Class A, Commuter Category	Yes	<ul style="list-style-type: none"> <li>• MOPSC <math>19 \geq</math> 10 (pax)</li> </ul>
CS-23 Level 3	Performance Class B, Normal Category	Yes	<ul style="list-style-type: none"> <li>• MOPSC <math>\leq</math> 9 (pax)</li> </ul>
CS-23 Level 2 & 1	Performance Class B, Normal Category	No	<ul style="list-style-type: none"> <li>• MOPSC <math>\leq</math> 6 (pax)</li> </ul>
CS-LSA	Light Sports Aircraft	No	<ul style="list-style-type: none"> <li>• MTOM <math>\leq</math> 600 kg</li> <li>• MOPSC <math>\leq</math> 1 (2 incl. pilot)</li> </ul>

\*: Commercial Air Transport (CAT) under Instrument Flight Rules (IFR) common in this category

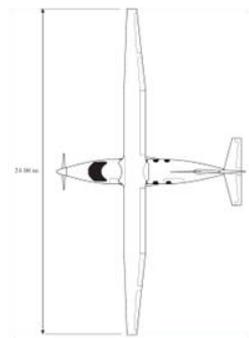




# Design for Certification and Technology De-Risking

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2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030



Key patent applications

Start of Sales



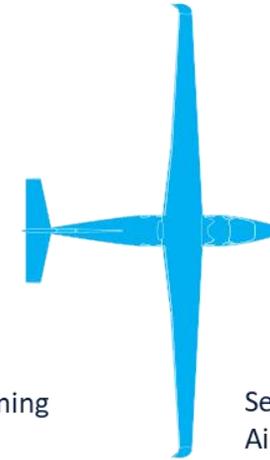
Electric Propulsion Unit Demonstrator



Full Scale Copper Bird Ground Test



Certification Conforming Prototype



Series Production Aircraft

Aircraft Concept Design & Initial Sizing



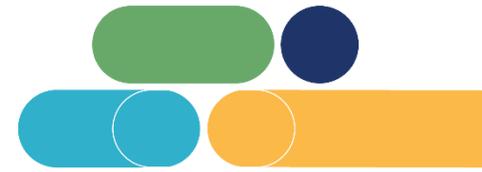
EASA Pre-Application Services



1st Battery-Wing-Box Demonstrator

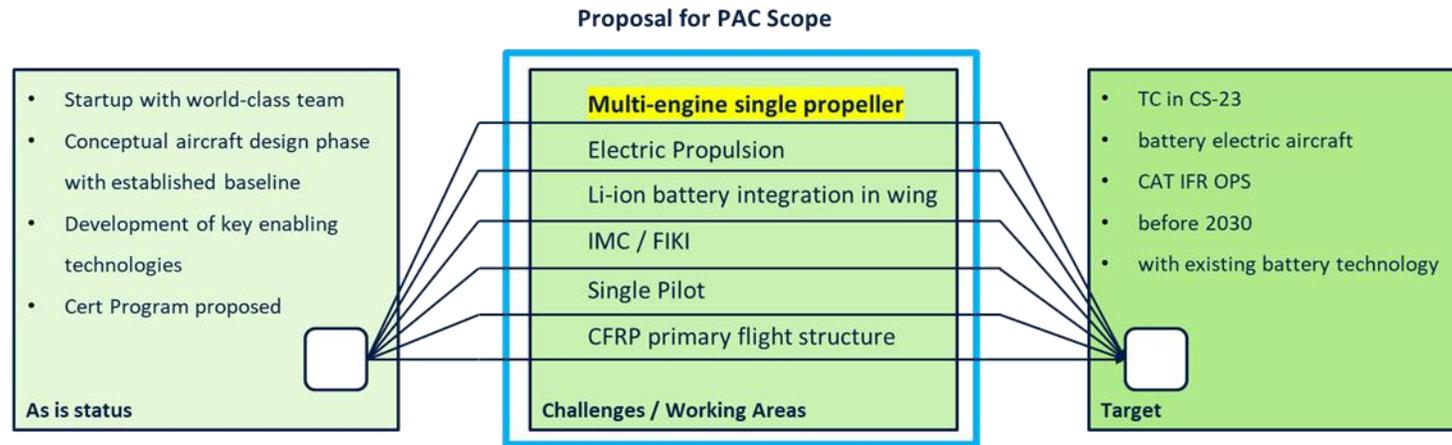


2nd Battery-Wing-Box Demonstrator



# EASA Collaboration in Pre-Application Contract

VÆRIDION



1. EASA considers VÆRIDION a project with success potential.
2. Formalities for Pre-Application Contract (PAC) are now being prepared.
3. Focus area will be multi-engine single prop certification.

# Certification Conference

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# Thank you!

