



Regional Enterprise Innovation Scoping Scheme 2022
Scéim Scópála Nuálaíochta Fiontar Réigiúnach 2022



An Roinn Fiontar,
Trádála agus Fostaíochta
Department of Enterprise,
Trade and Employment

Date; September 14th, 2022

Subject - Request for Interest (RFI) from Potential Partners

Introduction;

[ZE-Aviation Alliance CLG \(ZEMAVA\)](#) is a sustainable aviation technology incubator hub established in the mid-west of Ireland to accelerate market readiness for zero-emission aviation technologies. ZEMAVA will build real environment testbed demonstrators to evaluate technologies as part of an entire regional aviation ecosystem. The goal will be optimisation of technology implementation for sustainable regional air connectivity.

This document presents an invitation for expressions of interest from suitable partners to participate in a discussion to form a consortium for future large-scale funding applications (including but not limited to Enterprise Ireland [DTIF](#), [REDE](#), and various EU [InterReg](#) Programmes). ZEMAVA has secured feasibility funding from [MIDAS Ireland](#) and Enterprise Ireland funded [REISS](#) for the initial Demonstrator project outlined in this document.

Demonstrator # 1 Project - Digital Health Monitoring of Battery Power Management System for Electric/Hybrid Aircraft

Project Objectives

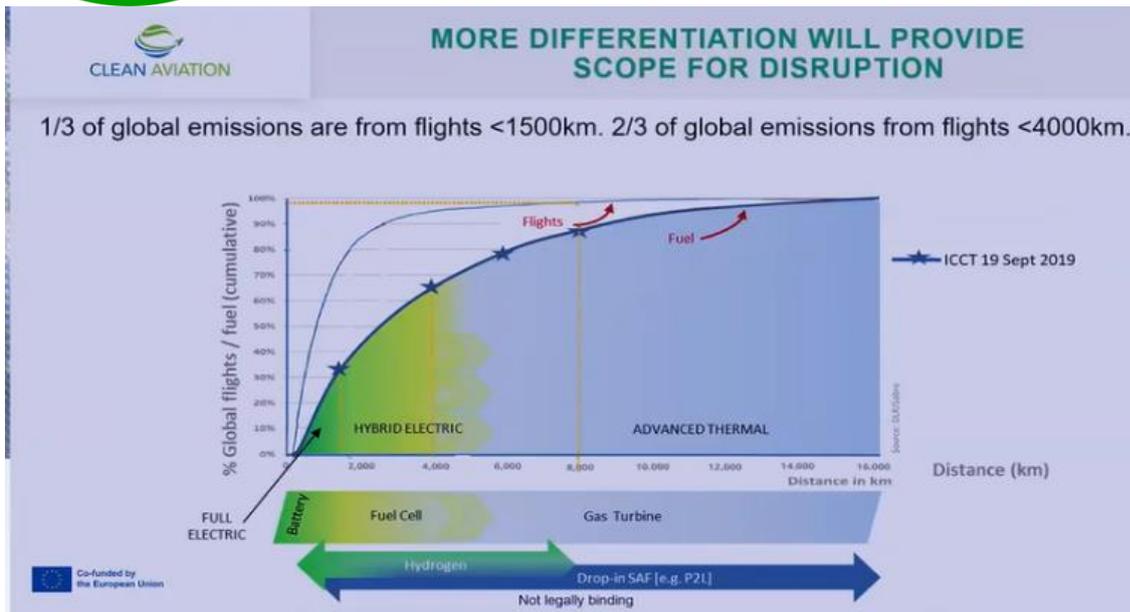
The goal of this project is to demonstrate the implementation and readiness requirements for the aviation industry for the use of current (Li-ion) battery power technology under real environment conditions.

There is an increasing amount of full-electric battery-powered commuter/regional and eVTOL aircraft in development and targeting entry into service from 2026. In order for those aircraft to be operational at airports, there is work to be done to understand the required infrastructure to power those aircraft, and address the regulatory, certification and operational challenges along the energy chain. These aircraft types addressing flight ranges less than 1500 miles and are responsible for up to 30% global aviation emissions, are on a critical path for entry into service and to ensure aviation industry can reach net zero emissions by 2050.

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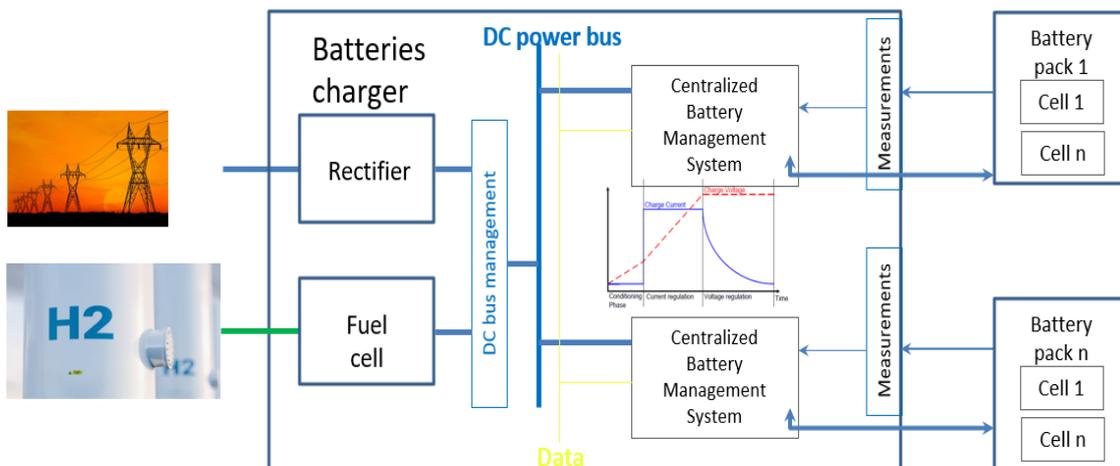
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There is a clear need for a robust health monitoring system along the full energy system from the source of energy to the aircraft itself and a significant commercial opportunity to leverage new digital technologies such as Artificial Intelligence and Blockchain as a means to reduce risk, increase safety and accelerate adoption of technology and entry into service of these new aircraft.

The project will develop a commercial solution for a Prognostics & Health Management approach together with an associated digital model which will collect, analyze, store and disseminate data securely across key parameters of the energy system.

Scope - Block Diagram





Project Scope;

Hardware; Ground Based Battery Charging

- 1) Select, research and test sources of “ground” energy for the battery charging system – electricity grid, local microgrid, fuel cells, liquid hydrogen and storage systems. The end-use electric aircraft application may require up to 600 KW battery power. Must be reliable and safe source of energy.
- 2) Charger system – develop a power conversion system charging multiple batteries at the same time, optimizing electrical power and control systems.

Software; Health Monitoring System

- 1) Data acquisition system with prognostic mechanism for predicting failure and time for maintenance/repair
- 2) Managing global energy consumption system on the aircraft and predictive performance over the life of the aircraft for a given flight mission profile
- 3) Using software and artificial intelligence to predict, optimize and track carbon emissions of the aircraft over the life of the battery for a given aircraft type.

Communication; Data transmission, cybersecurity considerations

Infrastructure;

Airport - laboratory, Microgrid Power energy Source

Aircraft – test vehicles for potential flight tests

Consortium Partners;

ZEMAVA will bring together a consortium of partners to build real environment testbed demonstrators to evaluate technologies as part of an entire regional aviation ecosystem. This collaborative approach between government, industry, academia, and investors is essential to reach net zero emissions in aviation with a clear ambition for impact driven technology acceleration. Eligible enterprise partners can include MNCs based in Ireland, SME organizations as well as Research Performing Organizations (RPOs) and Local Authorities.

RFI Process;

ZE-Aviation Alliance (ZEMAVA) invites expressions of interest submission to info@zemava.com by COB Friday September 30th, 2022.