

FUTPRINT50 Roadmap

Future Propulsion and Integration

towards a hybrid-electric 50-seat regional aircraft

Development of the Initial Certification and Technology Roadmap for the FUTPRINT50 Framework

Presenter: Evert Windels

Authors: Nicolas Moebis, Ricardo Reis, Evert Windels, Katharina Ertman, Timoleon Kipouros, Michelle Westin, Andreas Strohmayer



University of Stuttgart
Germany



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 875551



"(..) deliver, by 2050, a fully climate neutral air mobility system, meaning that from 2050, emissions do not add to climate change."

FUTPRINT5 The logo for FUTPRINT5, featuring the text "FUTPRINT5" in a green, sans-serif font. To the right of the text is a circular icon containing a stylized airplane and a leaf, symbolizing sustainable aviation.

Enable Entry into Service of aircraft that deliver neutral to zero emission regional aviation by 2035-2040

Enable CO2 neutral regional aircraft

Enable zero CO2 regional aircraft

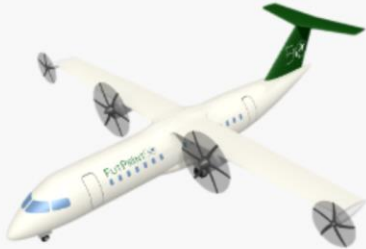
50 PAX

Range design mission 400 km

Max range 800 km

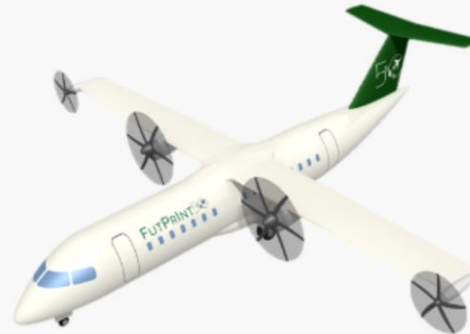
Cruise speed Mach 0.5

EIS by 2035-2040



Concept products

Enable CO2 neutral regional aircraft



Producing a Capability enables realisation of a Concept Product

Aerospace electric propulsion system

Aircraft design for a Hybrid Electric Propulsion System

Aerospace Energy storage battery

Aerospace high voltage power distribution

Thermal Management System for the electric propulsion system



To advance and create and aerospace Electric Propulsion System (EPS)

To design the EPS for the aircraft

To manufacture the EPS for an aerospace application

To certify the EPS for an aircraft application

To operate, sustain, decommission the aircraft using an EPS

A Capability is composed of other Sub Capabilities

Aerospace electric propulsion system

Overview



Description

To advance and create an aerospace Electric Propulsion System (EPS)

Key features

[4 - 5] MW total power

[0.6 - 1] MW electric power

Long Description

Long Description

The electric propulsion system required for the hybrid electric aircraft needs to be created using novel and existing technologies. The electric propulsion system together with the conventional propulsion systems can be used to propel the aircraft.

Key Features

Key features

[4 - 5] MW total power

[0.6 - 1] MW electric power

Overview

Image Panel



Relationships

Battery hybrid architecture

To certify EPS

To design for EPS

To manufacture EPS

Resources

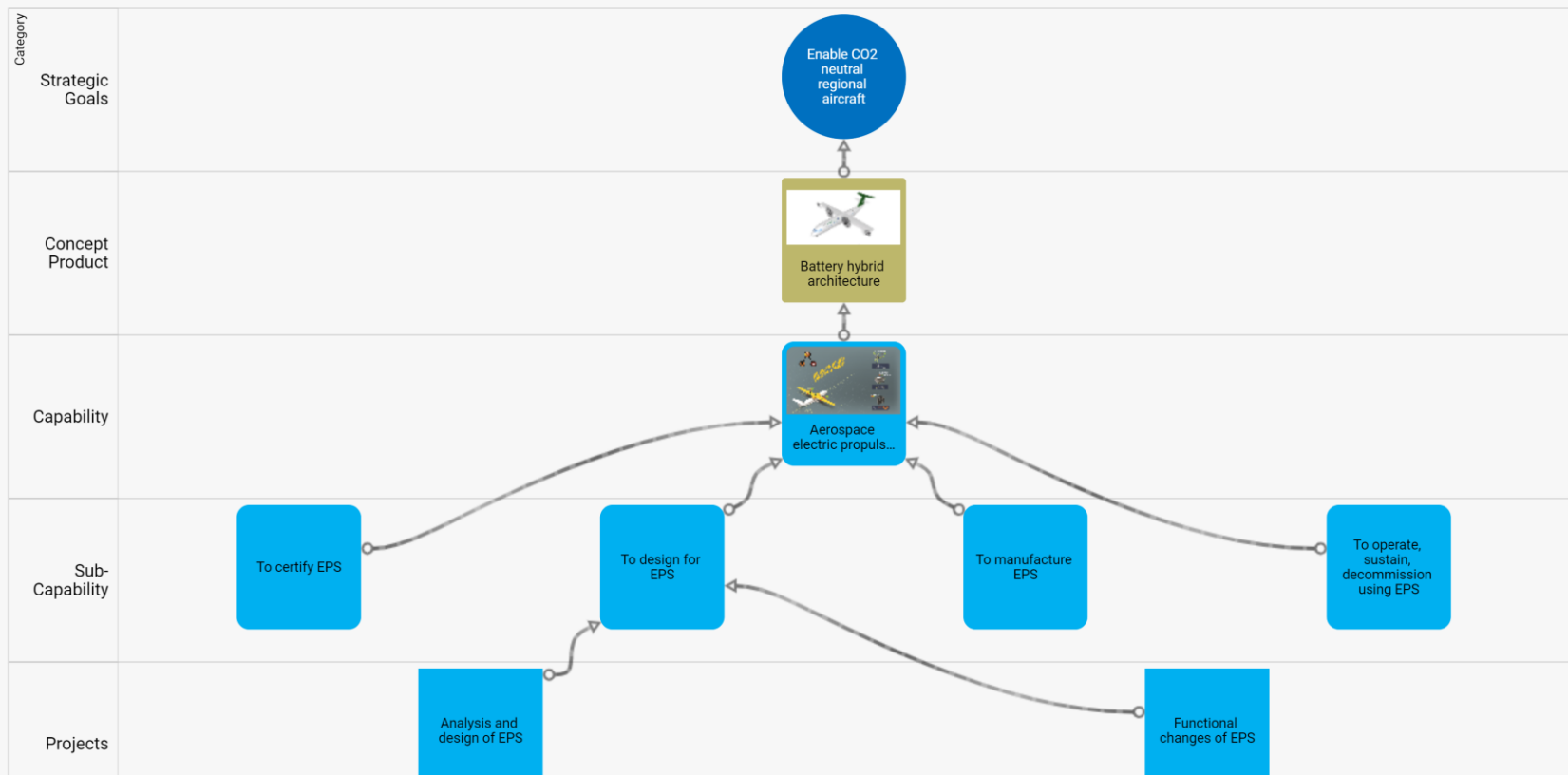
Tags

Capabilities addressed

CC0010

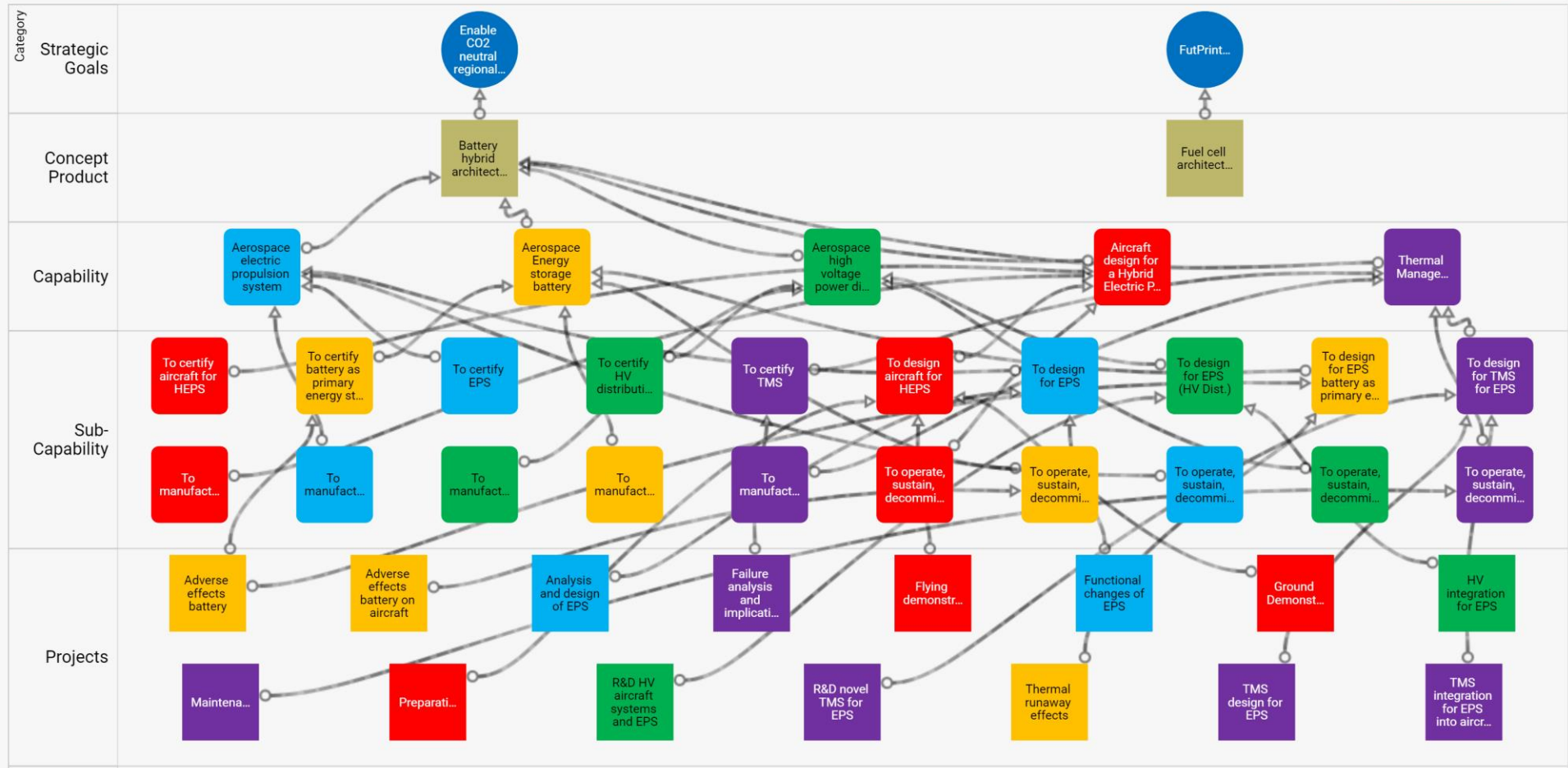
Aerospace Electric Propulsion System (EPS) Projects

Framework



FUTPrint 50 Framework

Roadmap



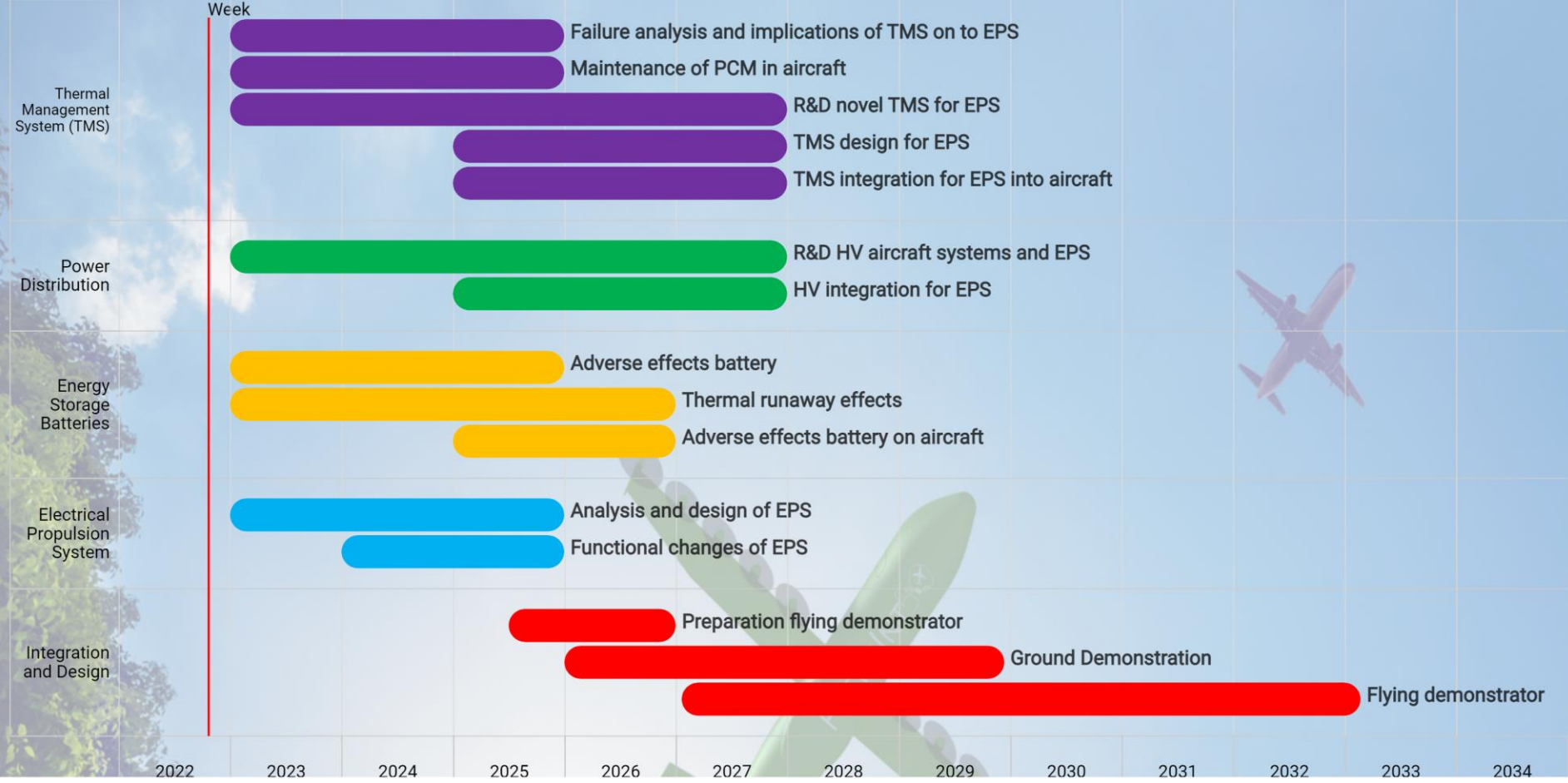
FUTPrint 50 Roadmap - Projects

TRL Dashboard

Total No. of Items: 15

Tech. Capabilities

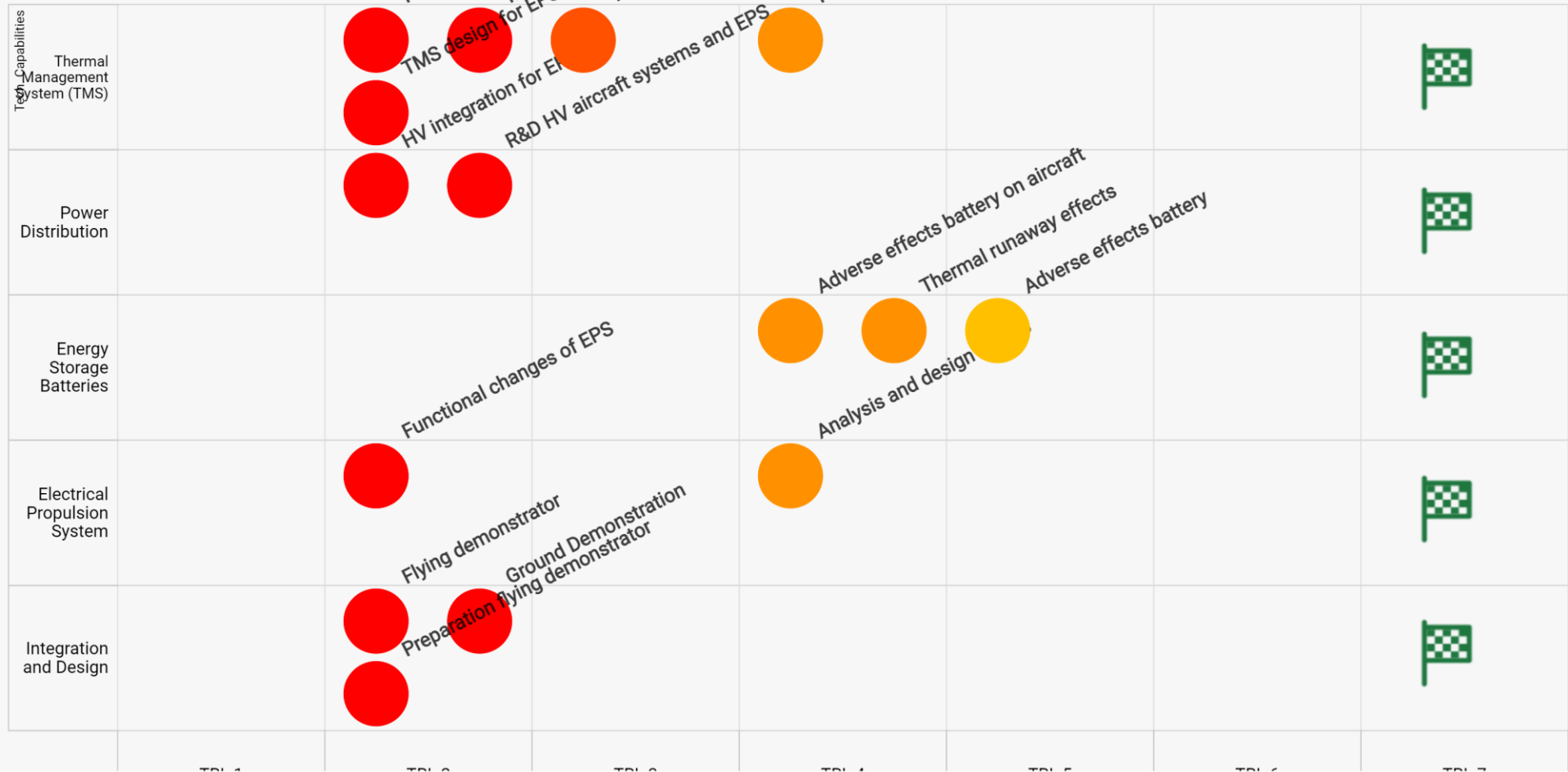
Week



2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034

TRL Dashboard - Target TRL 7

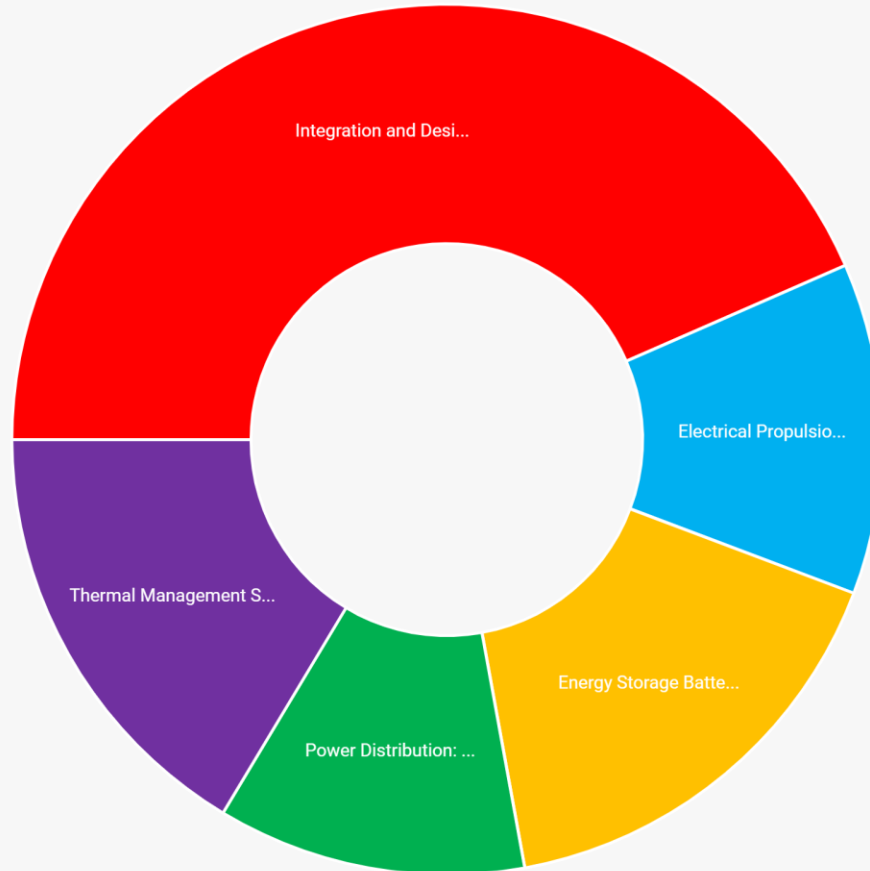
OOM € Costs




Costs - Order of Magnitude €M

Regulatory

Total value for Estimated Budget: €2,440 M





Q&A


 Aerospace electric propulsion system

IMOTHEP
GETTING - HYBRID - ELECTRIC




 Aircraft design for a Hybrid Electric Propulsion System

 Aerospace high voltage power distribution

 Thermal Management System for the electric propulsion system

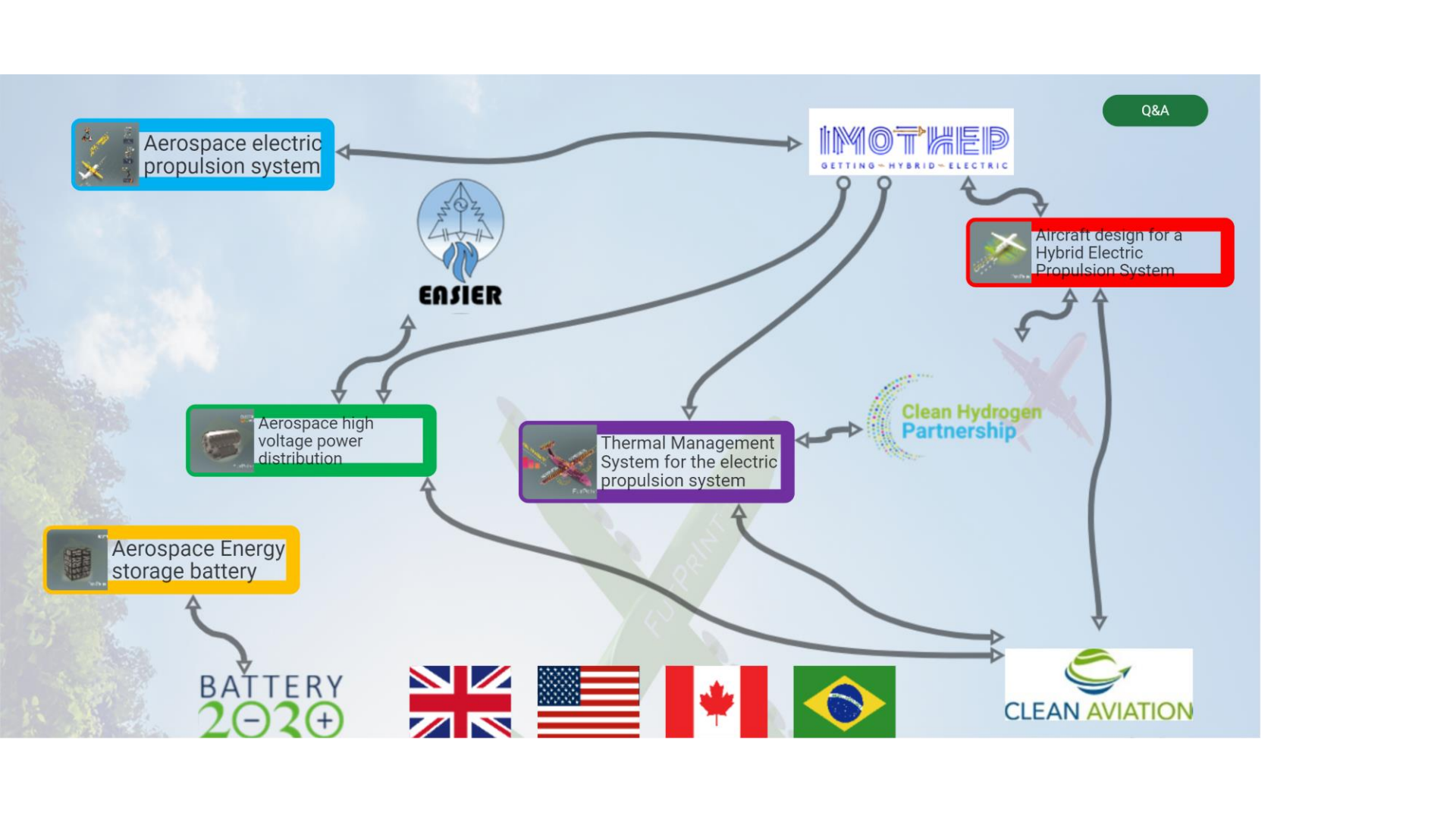
Clean Hydrogen Partnership

 Aerospace Energy storage battery

BATTERY 2020+




CLEAN AVIATION



Questions / Comments?

Scan the QR code to leave your question or comments



Are the number stated for the motor design in the IMOTHEP presentation a first estimate or results of high fidelity simulation?

Does the panel think all project roadmap outcomes are sufficiently aligned?

For IMOTHEP, are the motors and generators developed in house, or are they off the shelf? If developed in house then, how is the process connected to the development of other systems?

How can we bring timeframes in receiving rewards closer to automotive industry? This is one of the challenges to work closely with automotive.

How can we connect our roadmaps so we can share knowledge?

What about the resources needed in each technology options? Knowing that they need to be shared with other sectors

What's the panel opinion on integrating air transport with other modes (such as trains)?

FutPrint 50 Roadmap

FUTPrint50 Questions / Comments

If you have a question or a comment please enter in the field below and we will respond and post a reply here. If you leave your name and contact details we will reply to you directly.

What is your question?

Add additional information here

Enter your name here

Enter your email here

Q&A



Powered by