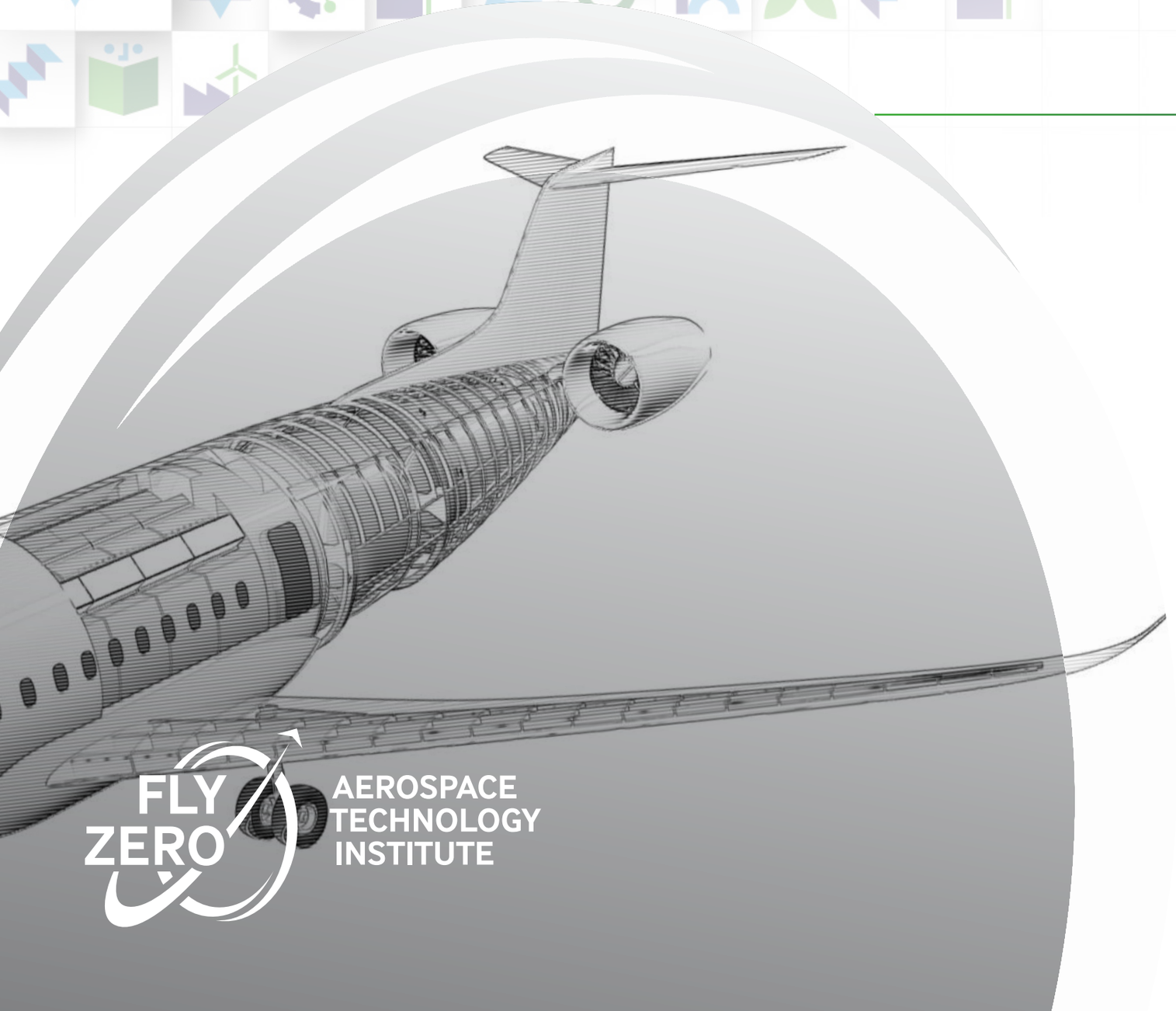
AERODYNAMIC STRUCTURES

Roadmap



FLY ZERO AEROSPACE TECHNOLOGY INSTITUTE

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CONTENTS

KEY & LIST OF ABBREVIATIONS

Key

- **Technology Development** – *Development required to bring roadmap technology to TRL6.*
- **Technology Mature** – *Transition to further integration and production readiness.*
- **Essential Enabler** – *Supporting activity or infrastructure to enable technology development*

List of Abbreviations

A/C – Aircraft
BLI – Boundary Layer Ingestion
CG – Centre of Gravity
CMC – Ceramic Matrix Composites
EMI – Electro-Magnetic Interference
HAR – High Aspect Ratio
HTP – Horizontal Tailplane
LE – Leading Edge
L.F.– Laminar Flow
LH_2 – Liquid Hydrogen
MDO – Multi-Disciplinary (MD) Optimisation
MRO – Maintenance, Repair & Overhaul
NDT – Non-Destructive Testing
Opt. – Optimisation
SFC – Specific Fuel Consumption
SMA – Shape Memory Alloys
SMPC – Shape Memory Polymer Composites
TE – Trailing Edge
UERF – Uncontained Engine Rotor Failure
VAN – Variable Area Nozzle
Volumetric energy density – available energy per unit volume
VTP – Vertical Tailplane

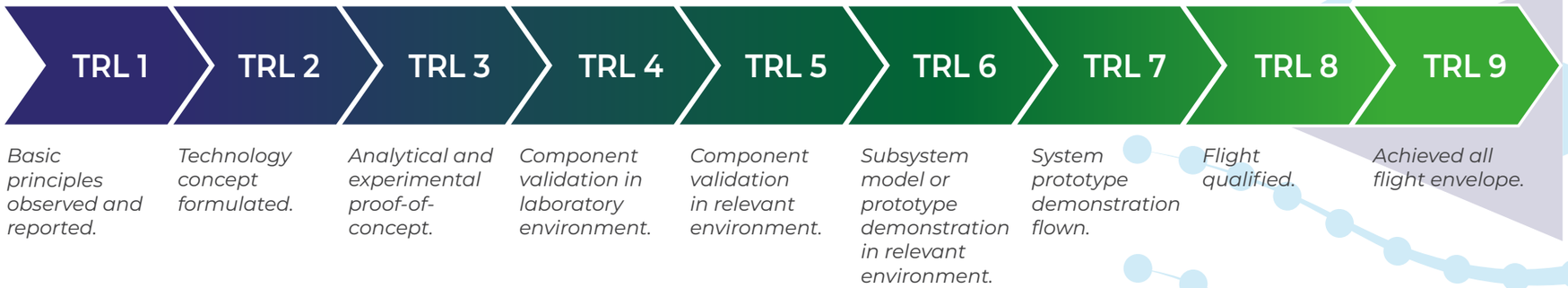

Figure 1 – Technology has been assessed against the NASA Technology Readiness Level (TRL) scale

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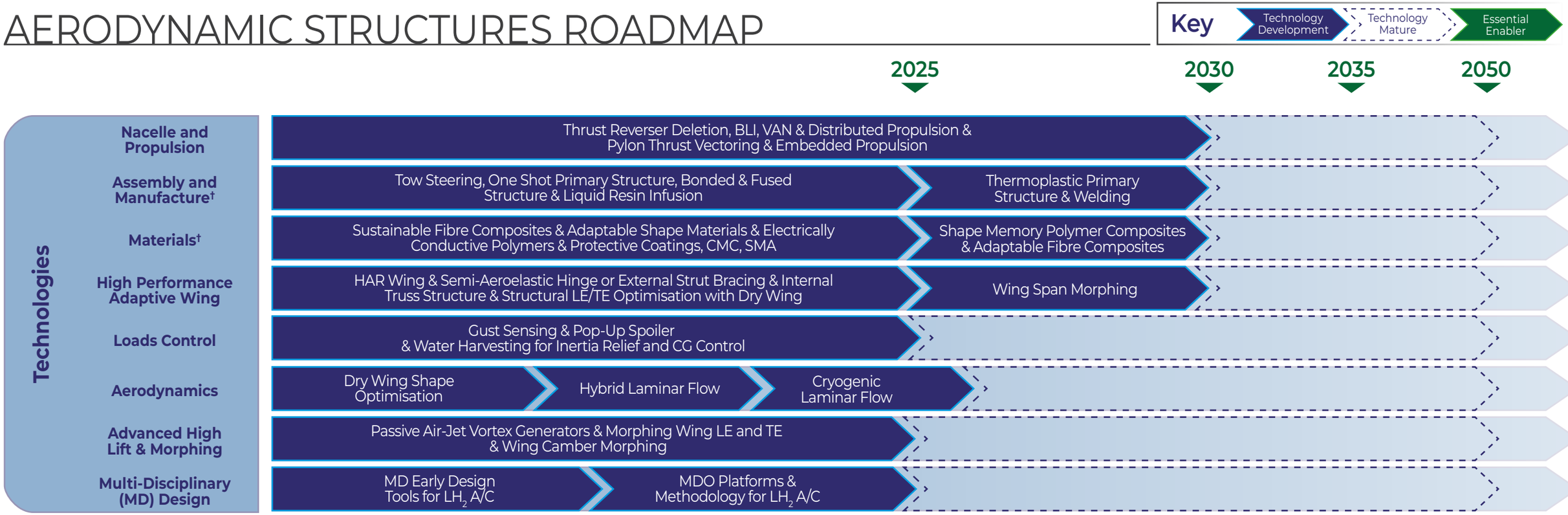

† The focus in this roadmap for the materials and manufacturing clusters has been on composites given their high potential for weight saving however metallics are still a primary choice for airframe structures and technology development in this area should continue apace.

ABOUT FLYZERO

Led by the Aerospace Technology Institute and backed by the UK government, FlyZero began in early 2021 as an intensive research project investigating zero-carbon emission commercial flight. This independent study has brought together experts from across the UK to assess the design challenges, manufacturing demands, operational requirements and market opportunity of potential zero-carbon emission aircraft concepts.

FlyZero has concluded that green liquid hydrogen is the most viable zero-carbon emission fuel with the potential to scale to larger aircraft utilising fuel cell, gas turbine and hybrid systems. This has guided the focus, conclusions and recommendations of the project.

This report forms part of a suite of FlyZero outputs which will help shape the future of global aviation with the intention of gearing up the UK to stand at the forefront of sustainable flight in design, manufacture, technology and skills for years to come. To discover more and download the FlyZero reports, visit **ati.org.uk**

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These roadmaps have been developed with a view to accelerate zero-carbon technology development and maximise the potential future value for the UK. They are unconstrained by the availability of funding.

Department for Business, Energy & Industrial Strategy

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Front cover image © ATI

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