

# FUEL CELLS

Roadmap



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*FZO-PPN-MAP-0032*

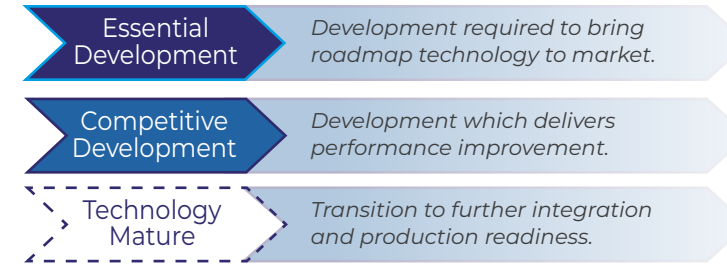
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# KEY & LIST OF ABBREVIATIONS

## Key



## List of Abbreviations

- APU - Auxiliary power unit
- BoP - Balance of plant
- BPP - Bipolar plate
- GDL - Gas diffusion layer
- H<sub>2</sub> - Hydrogen
- HT-PEM - High-temperature proton exchange membrane
- LH<sub>2</sub> - Liquid hydrogen
- LHV - Lower heating value
- LT-PEM - Low-temperature proton exchange membrane
- MEA - Membrane electrode assembly
- PGM - Platinum group metal
- R&D - Research and development
- TMS - Thermal management system
- TRL - Technology readiness level
- V&V - Verification and validation

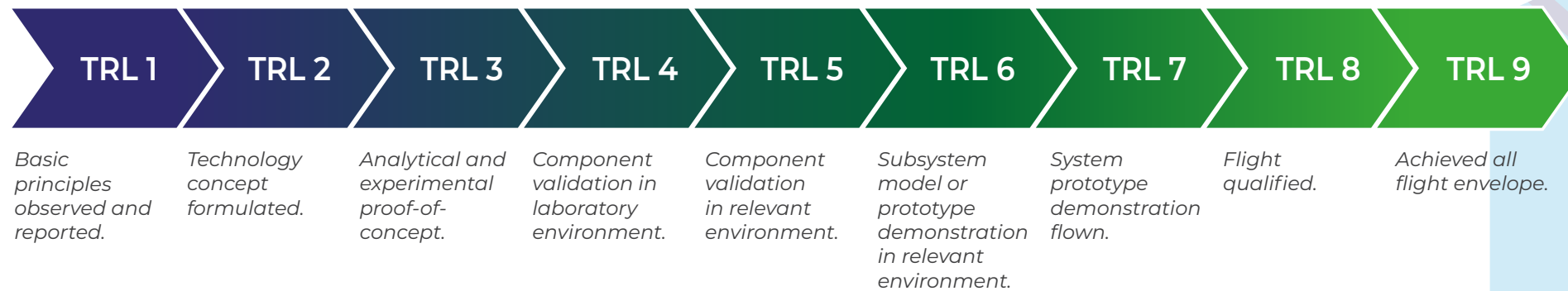
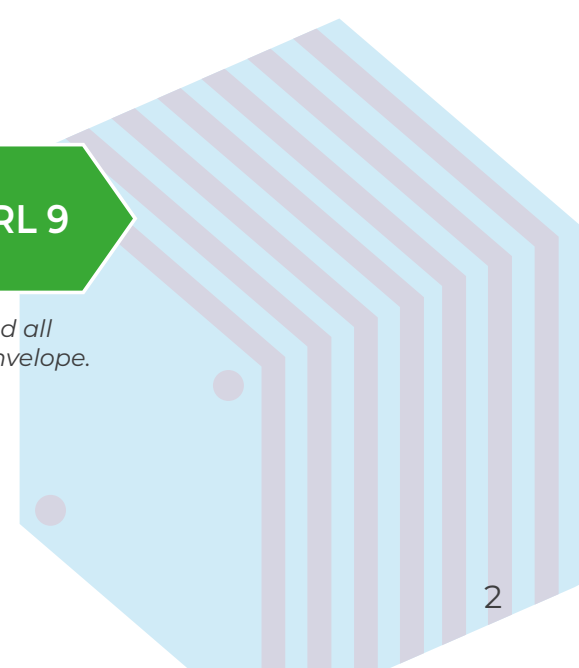
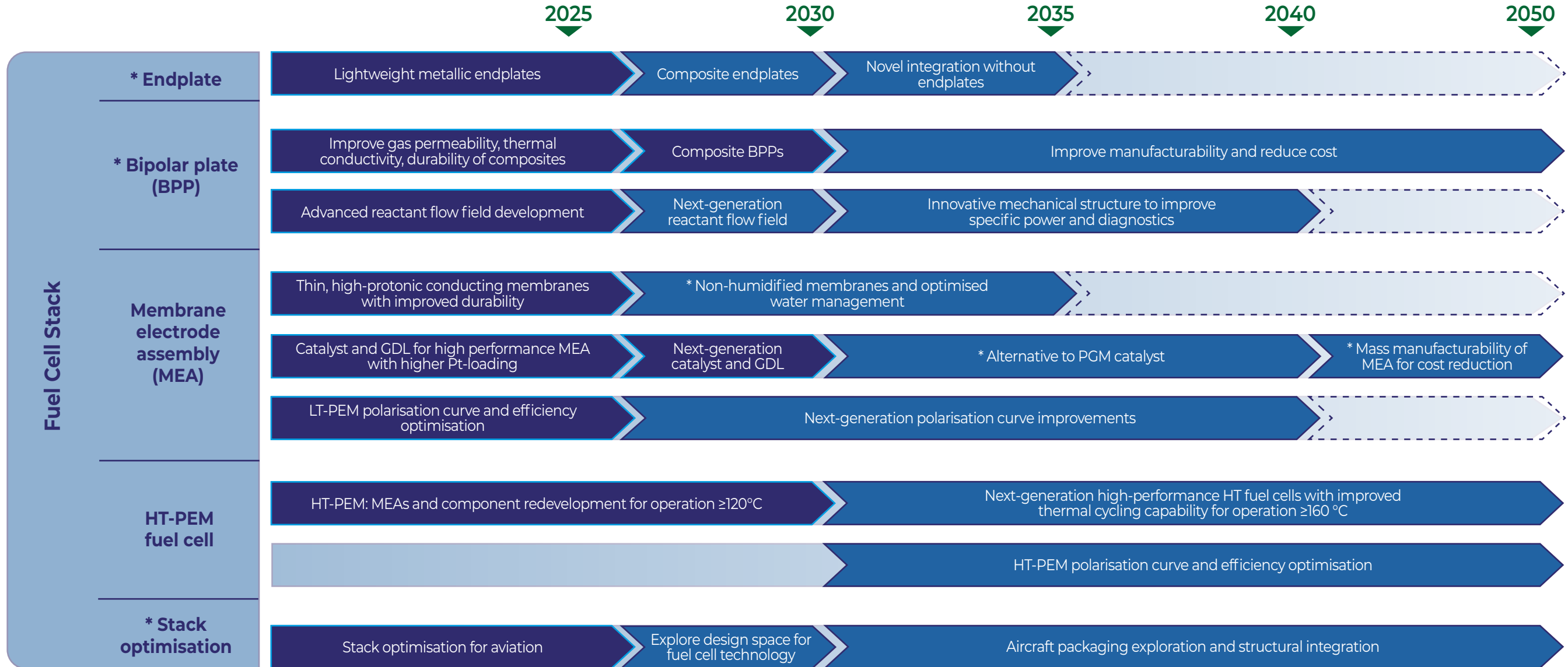


Figure 1 – Technology has been assessed against the NASA Technology Readiness Level (TRL) scale

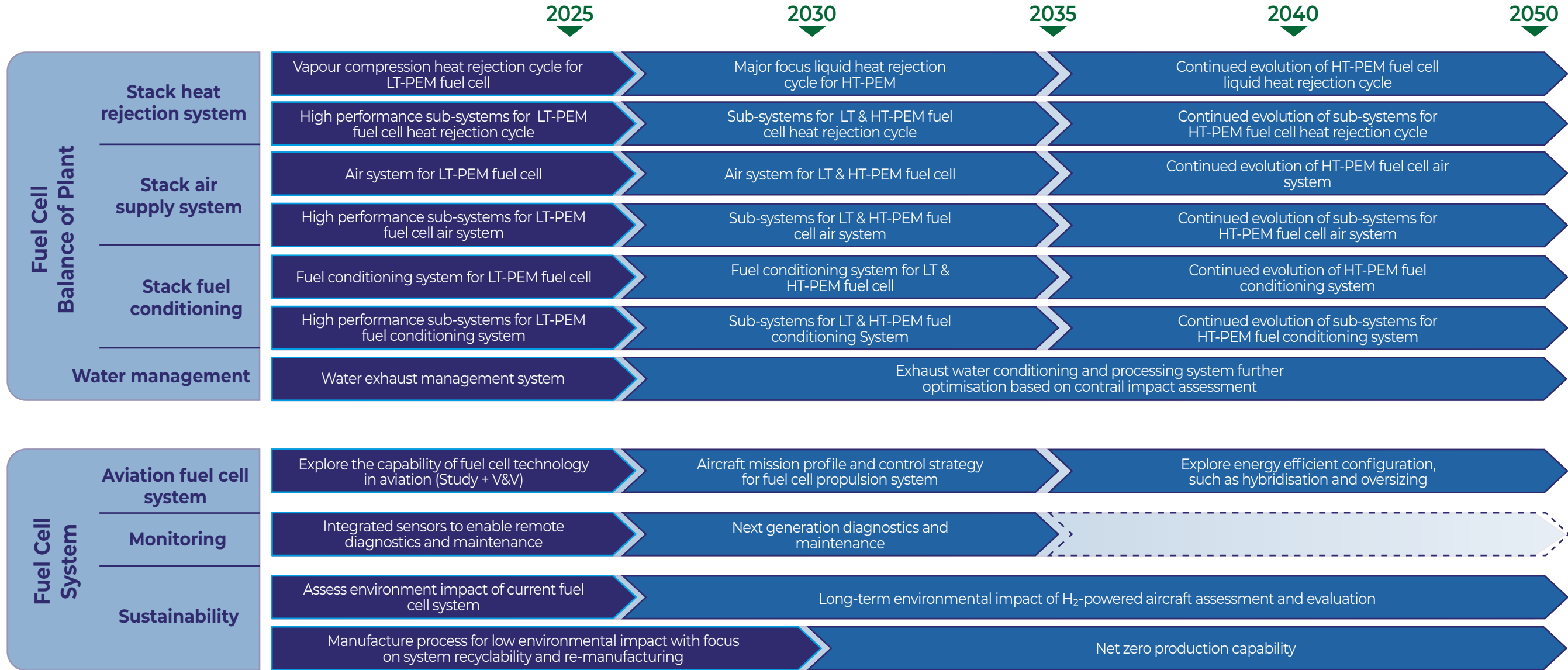


# FUEL CELL STACK COMPONENT ROADMAP



\*Development potentially suitable for both LT-PEM and HT-PEM fuel cells

# FUEL CELL SYSTEM ROADMAP



# ABOUT FLYZERO

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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](https://ati.org.uk)

# ACKNOWLEDGEMENTS

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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.*



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A decorative header element consisting of a grid of various icons in shades of green, blue, and purple. The icons include symbols for technology, nature, and industry.

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