

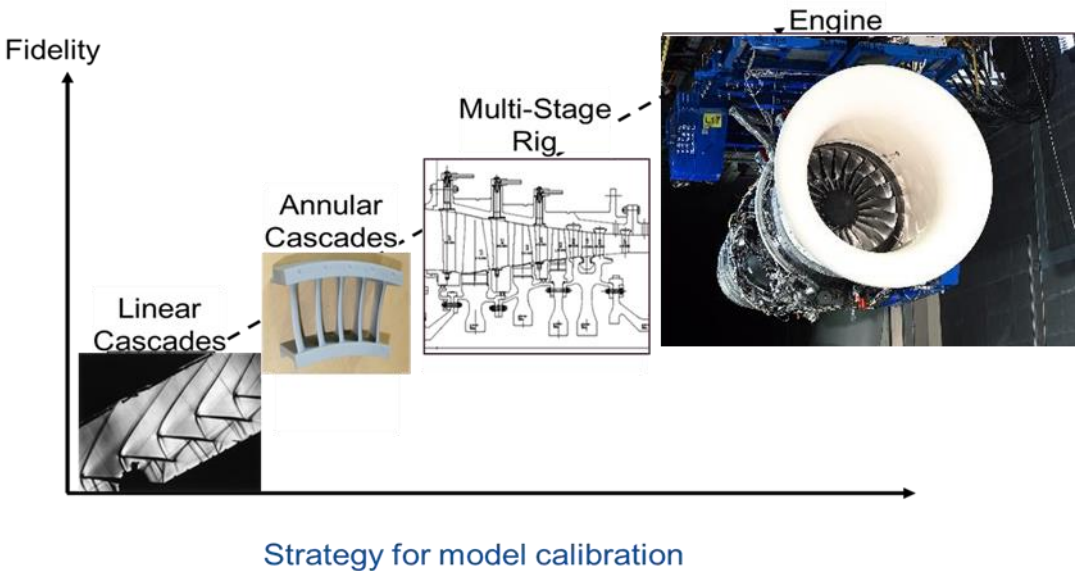
NWTF Strategy Subgroup for TRL5+ Wind Tunnels

Raul Vazquez (Rolls-Royce), Paul White (Airbus) and Nicholas Oettle (JLR)

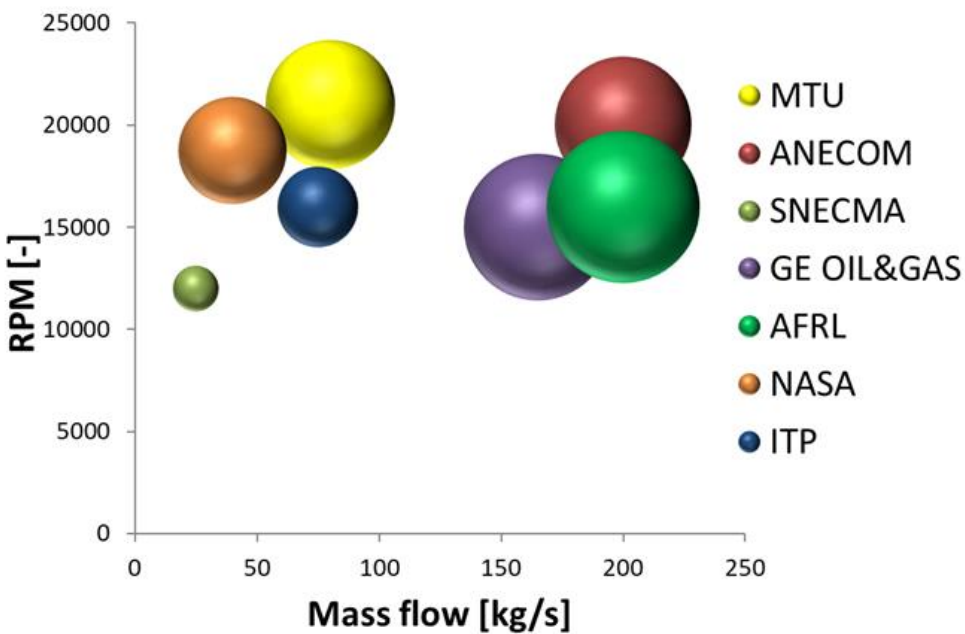
- Following recommendation from last NWTF Conference, a White paper was drafted by Raul, Jonathan, Harry and Claire in 2024.
- White Paper was circulated for feedback in January.
- 20 Feb. Meeting hold on Bristol with good participation in person and by Teams to discuss feedback and agree way forward.
- It was agreed:
 1. The scope of the white paper should be extended as much as possible in order to include all the potential stakeholders, among others, civil and defence aviation and any other sectors that could have used of our national wind tunnels infrastructure, such as renewables, automotive, etc.
 2. Some of the nomenclature and concepts used in the white paper should be better defined, like what is TRL5+, what kind of wind tunnels are considered, what is strategic, etc.
 3. Some of the recommendations could be addressed by the Subgroup prior to any further escalation.
- Next steps:
 1. Paul White and Raul to pull together the industry gaps (across civil aerospace, defence and automotive), identifying facilities that could be used abroad but have access issues, facilities that simply don't exist and facilities required for defence. **The aim is for a presentation of the gaps to be shared at the NWTF conference.**

- We didn't progress as much as we had liked.
- Other stakeholders identified and contacted to become part of the team.
- Nicholas made a good progress for automotive.
- Raul and Paul are progressing on the aviation and propulsion ... but still it is WIP.

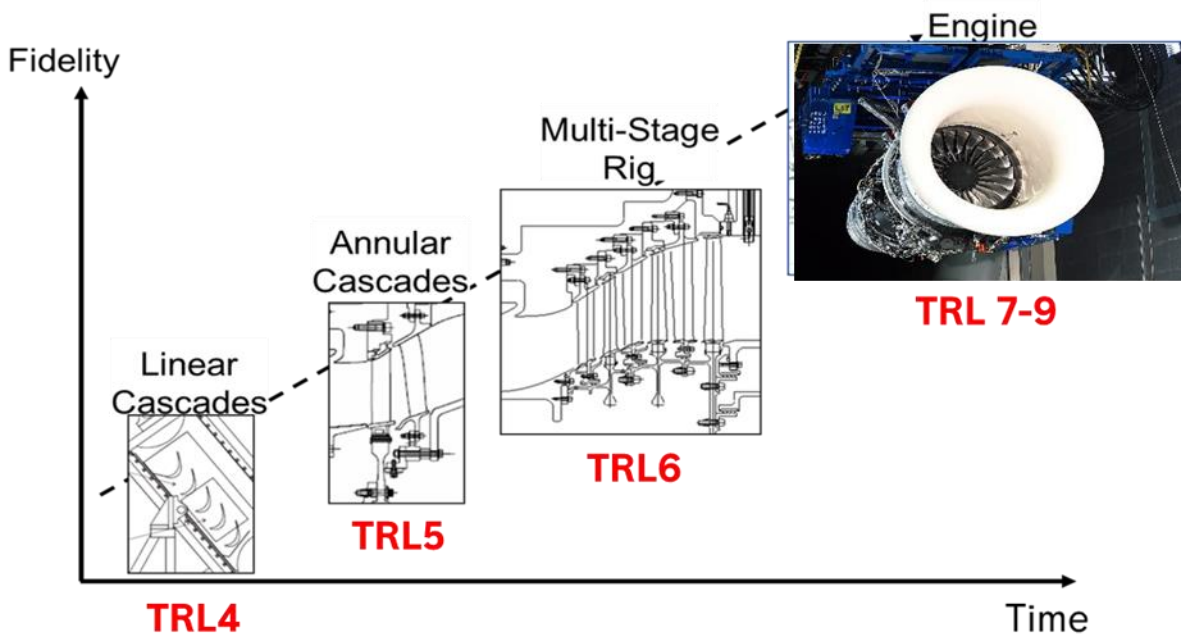
Axial Compressors Validation



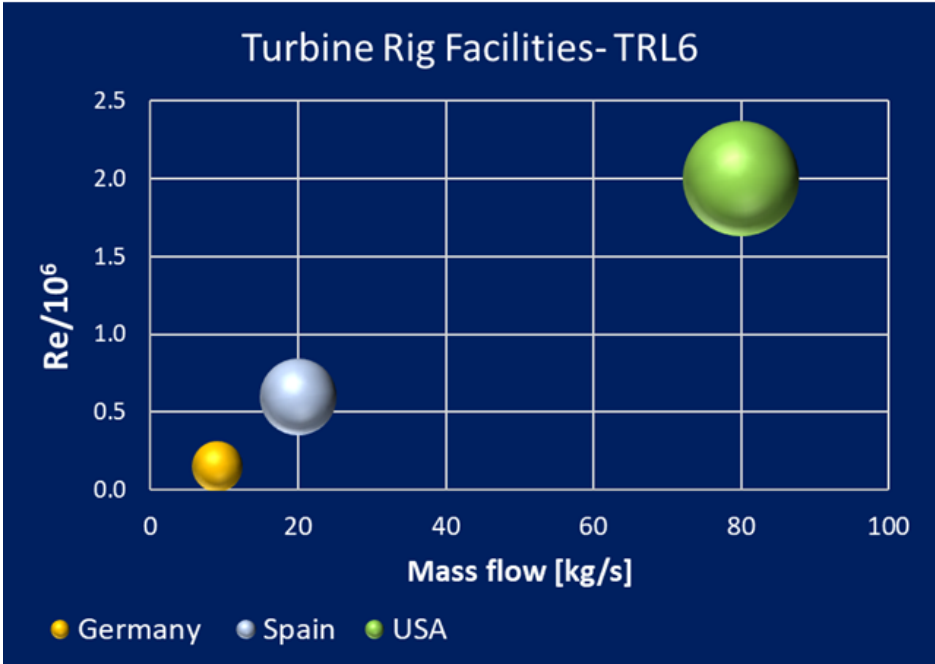
TRL6 Facilities for Axial Compressors



Example for Axial Turbines



TRL6 Facilities for Axial Turbines



WIND TUNNEL REQUIREMENTS: AN AUTOMOTIVE MANUFACTURER'S PERSPECTIVE

EUROPEAN FULL-SCALE AUTOMOTIVE WIND TUNNELS

NO UK-BASED AERODYNAMIC FACILITIES TO MEET AN AUTOMOTIVE MANUFACTURER'S REQUIREMENTS

- **No certification can take place in the UK:** reliant on wind tunnels overseas
- Customer wind tunnels (examples presented), or tunnels from sister companies
- **Capacity limitations** drive the amount of development and R&D time after certification
- Limits to collaboration with other departments (design, engineering)
- Shipping impact - prototype utilisation efficiency, paperwork
- Increased vulnerability to external factors



S2A [8]



FKFS [1]



PININFARINA [4]



