

High-level roundtable: a new vision for the future

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ICAO Stocktaking Seminar

A New Vision for the Future

Paul Stein, Rolls-Royce Chief Technology Officer

9th September 2020



Increasing Platform Efficiency



Sustainable Aviation Fuels



Disruptive 3rd Gen. Technologies



Operations & ATM



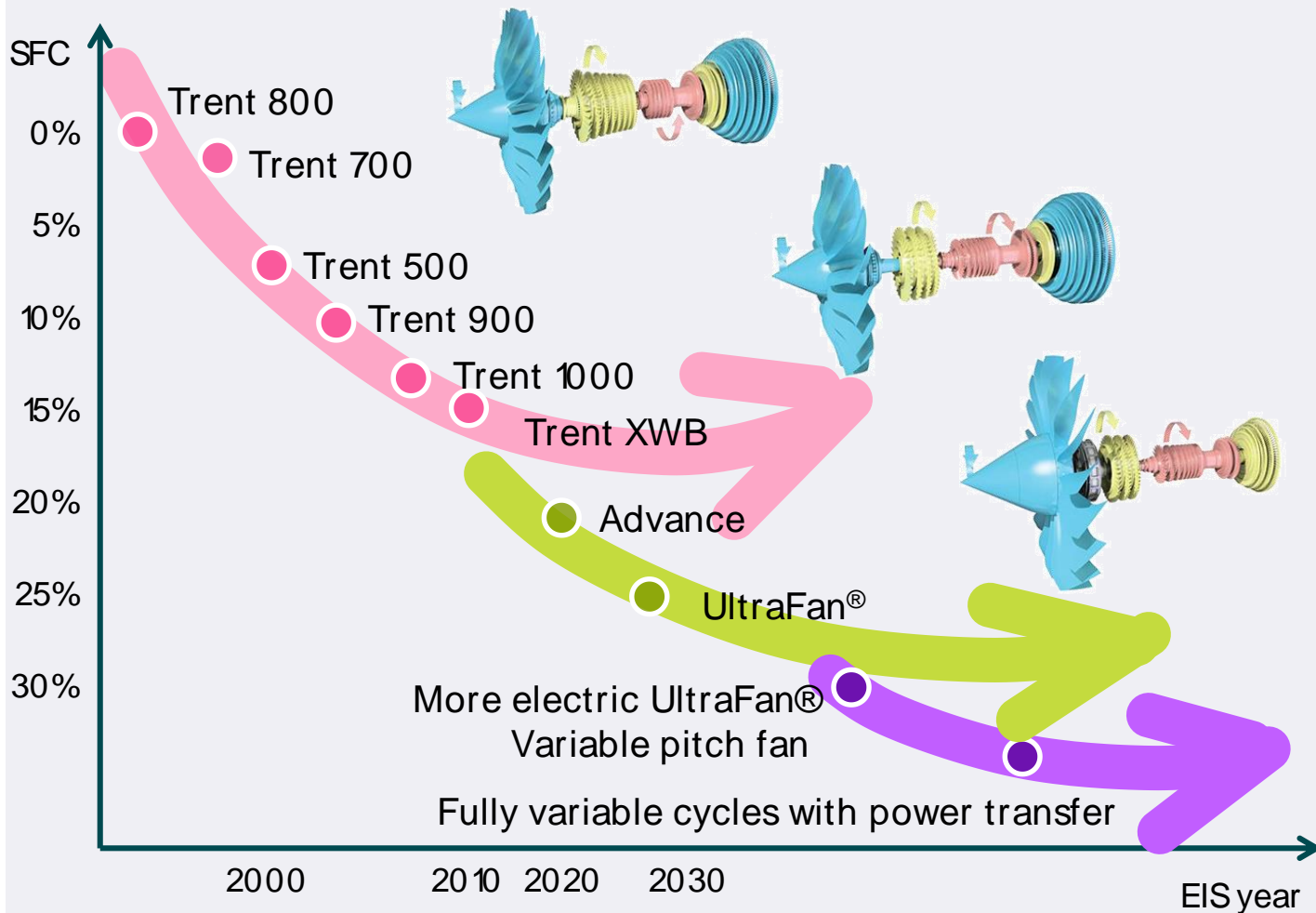
Market-Based Measures

Key contributors to our 2050 goals



Evolution of wide body aero engines

- Trent family
- Technology demonstrator engine targets
- ACARE (Advisory Council for Aviation Research and Innovation in Europe) Flightpath 2050 target

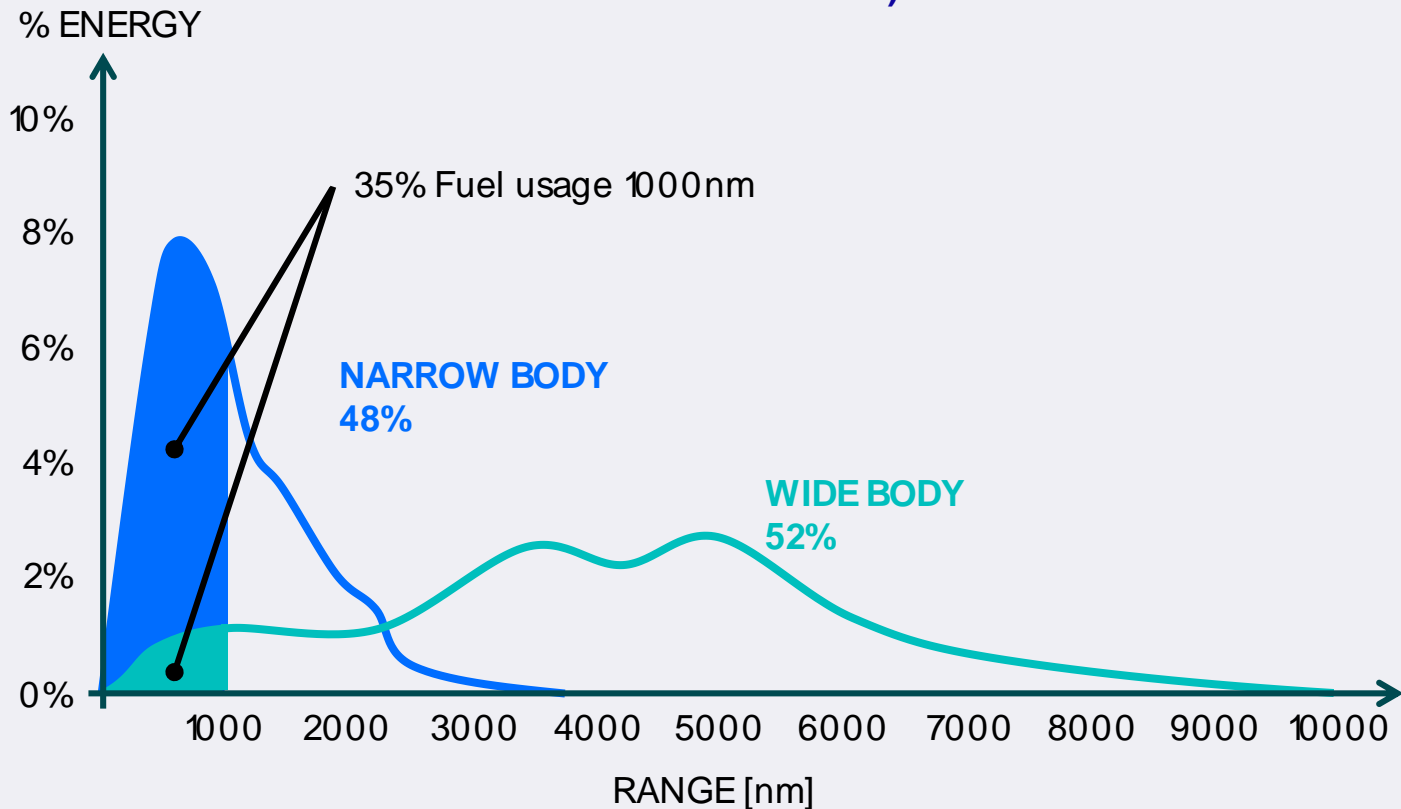




World Commercial Aviation Fuel Usage

65% of all aviation fuel consumption is used on flights beyond 1000 miles

2019 JET-A VOLUME 365MT PER YEAR PROJECTED REQUIREMENTS IN 2050 (WITH NEW FUEL EFFICIENT ENGINE/AIRCRAFT) = 500MT





Sustainable Aviation Fuel (SAF)

Critical to the decarbonisation of our industry

Latest Trent and business jet engines are already compatible with blended SAF



Biomass

Biofuels



Waste

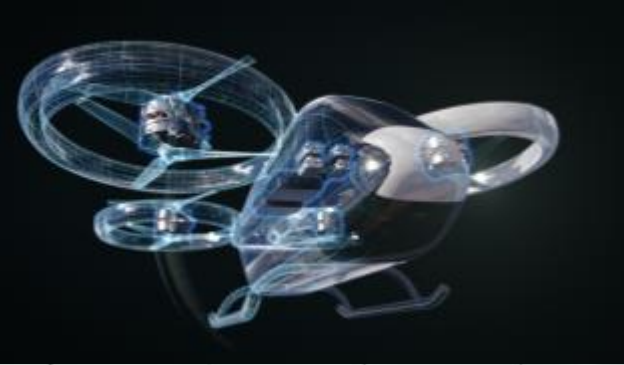


Nuclear

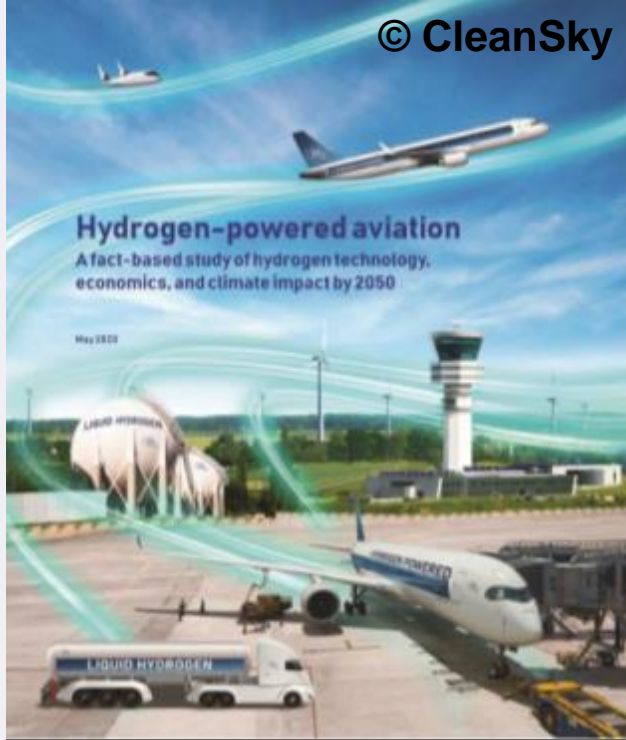
Synthetic Fuels
"eFuels"



Renewables



Electrification



Hydrogen



Other Fuels

Disruptive 3rd Generation Technologies



- From a technical perspective, achieving net zero carbon for aviation by 2050 is possible.
- This requires relentless improvements in airframe and engine efficiency. Rolls-Royce will be in introducing Ultrafan as a major contribution in the latter part of this decade, unlocking double-digit percentage improvements.
- 500 million tonnes of SAFs will be required by 2050. This is an enormous industrial undertaking and requires the right regulatory and economic environment.
- Disruptive technologies will play a part, but aviation needs to be realistic about maturity timeframes and environmental impact.