

# EXPLORE FLIGHT

WE'RE WITH YOU WHEN YOU FLY

Sustainable Aircraft Technology Development

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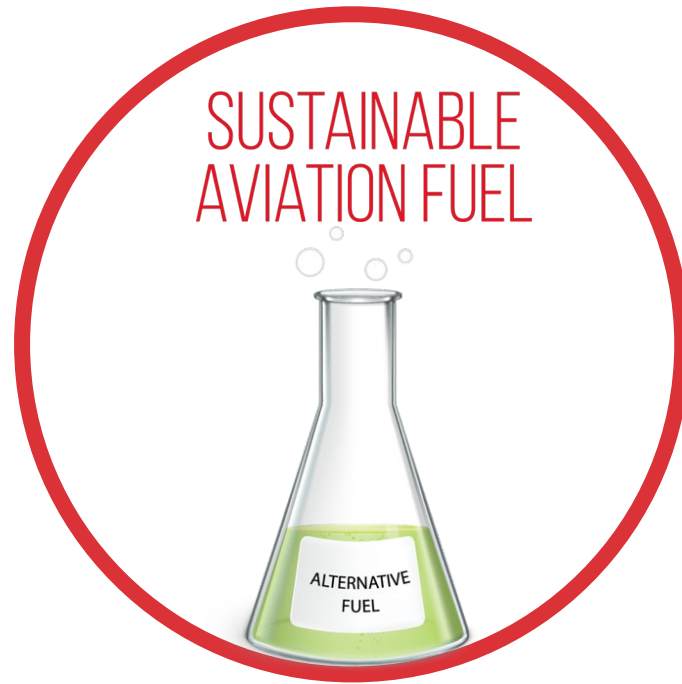
# Aviation Industry Pillars for a Sustainable Future



Global Aviation Industry's GOAL: 50% reduction in carbon emissions by 2050 relative to 2005 and possible net zero emissions by 2060 through these three means



NASA = Primary Role



NASA = Supporting Role

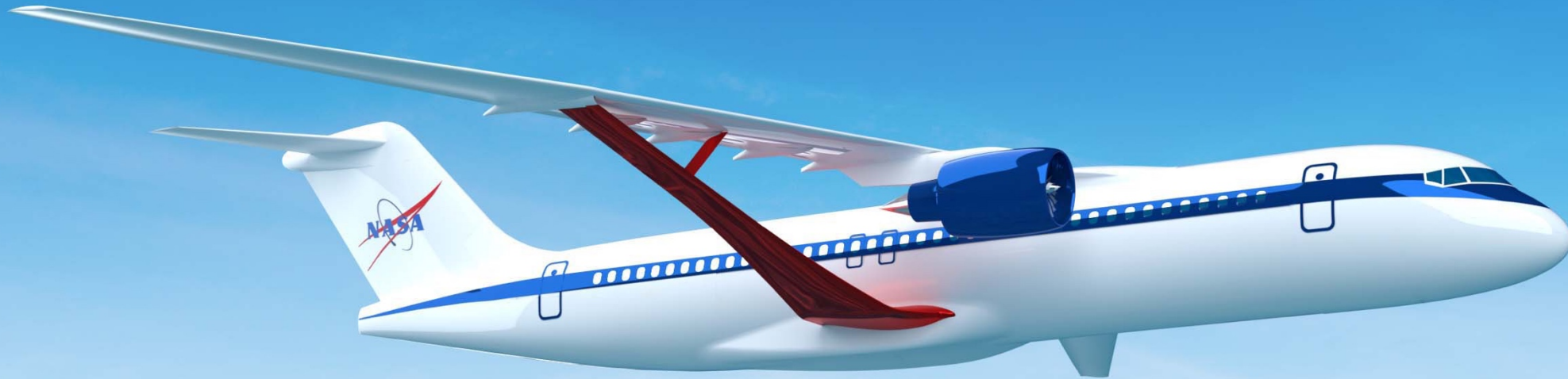


NASA = Primary Role

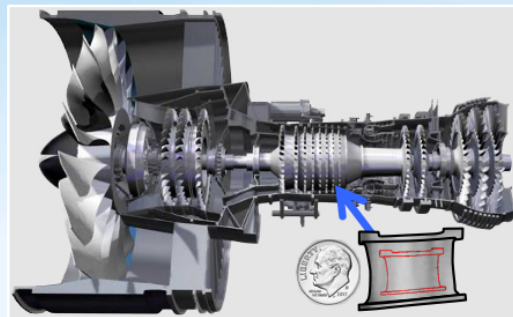
# Subsonic Transport Technologies



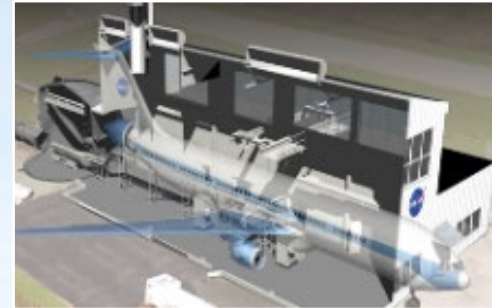
Ensure U.S. industry is the first to establish the new “S Curve” for the next 50 years of transports



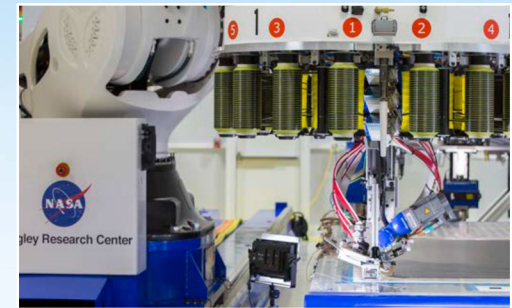
**Transonic Truss-Braced Wing**  
5-10% fuel burn benefit



**Small Core Gas Turbine**  
5-10% fuel burn benefit



**Electrified Aircraft Propulsion**  
~5% fuel burn and maintenance benefit



**High-Rate Composite Manufacturing**  
4x-6x manufacturing rate increase

# Subsonic Transports: Integrated Technology Development



FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
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Technology Readiness Target

Model Based Systems Analysis & Engineering

Sustainable Flight Demonstrator (SFD)

Flight Test

Leverage the Asset - Future Spirals

AATT - Transonic Truss Braced Wing

TC Completion

Hi-Rate Composite Aircraft Manufacturing (HiCAM)

Mfg Demo & Structural Test

Hybrid Thermally Efficient Core (HyTEC)

Core Demonstration & Test

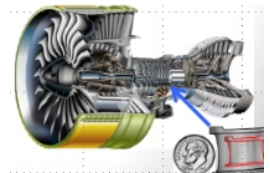
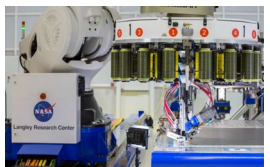
Planned  
Notional

Electrified Powertrain Flight Demonstration (EPFD) Flight Test

AATT - Electrified Aircraft Propulsion

TC Completion

Achieve TRL 6 in time for Industry Product Decision-Making



# Long-Term Transport Technology & Innovation



*New round of generational studies to inform future technology investments*



## Opportunities for N+4 Concepts and Beyond

- Advanced Concept Studies for 2040+ EIS
- Net-Zero Emissions Concepts
- Promising Technology & Architectures
- Support Aviation Community with NASA-unique Contributions



