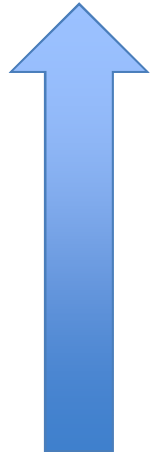


The Future of Aerospace by 2050



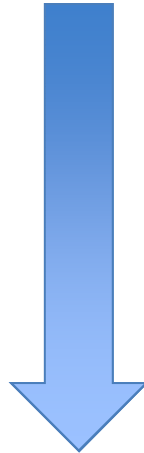
Robert Pearce
Deputy Associate Administrator for Strategy
NASA Aeronautics Research Mission Directorate

The Generational Challenge



By 2050, 16 billion
Passenger Trips

~ 4x today

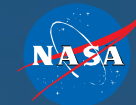


By 2050, 50% less
Carbon Emissions

More Efficient Aircraft

More Efficient Operations

Low Carbon Energy



D-8

Potential Purpose Built X-Plane



Propulsion-Airframe Integration enables reduced aircraft drag

HWB

Multiple Integrated Technologies



Non-circular composite fuselage

Aerodynamically efficient fuselage shape

Top mounted engines enable Ultra-High Bypass Engines

Truss-Braced Wing

Potential Purpose Built X-Plane



Very High Aspect Ratio wings substantially increases wing efficiency

Highly-efficient wing of conventional aspect ratio

Very-High Bypass Engines, reaching physical installation limits

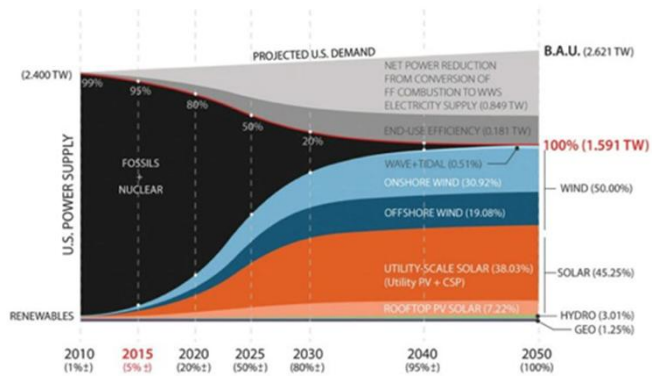
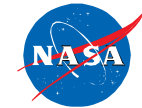
Composite fuselage of conventional shape

More electric sub-systems

787 image credit: Boeing



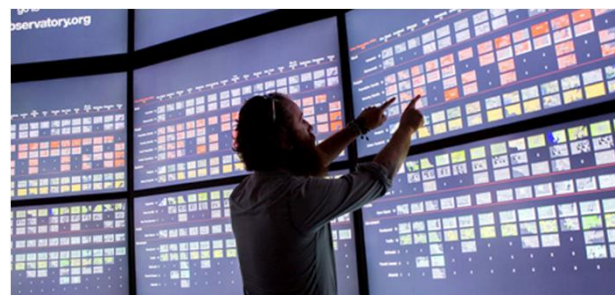
Convergence and Disruption



Energy Systems



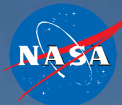
Machine Intelligence and Robotics



Data Analytics & Decision Making



Coordinated UAS Operations Across the 6
FAA UAS Test Sites with the NASA UTM
Research Platform



Ground
Experiments of
Distributed Electric
Propulsion



Flight Exps
Begin in
2017

Mobility to Connect the World's Cities

