# Climate Change is in the Air.

Department of the Air Force response to our changing physical world…

## OPERATIONAL ENERGY AND CLIMATE CHANGE MITIGATION

**Optimizing DAF aviation fuel use:**
- ➢ improves our capability and readiness *and*
- ➢ reduces greenhouse gas emissions (GHG)

- Aviation fuel – and related transportation logistics – are an inherent risk to the warfighter and play a critical role in lethality and mission success.

- DAF is the largest US Govt fuel consumer (45%). Aviation fuel accounts for 80% of DAF energy use.

### How We're Optimizing Fuel Use:

**Technology Solutions:**
- Aerodynamics
- Weight Reduction
- Advanced Propulsion
- Engine Sustainment

**Process Solutions:**
- Planning Software
- Optimized Operations
- Efficient Flying
- Data Visibility

### Optimizing Aviation Fuel Use Leads to:

**IMPROVED**
Combat Capability

**INCREASED**
Aircraft Lifespan

**DECREASED**
Aircraft Maintenance

**MORE**
Training Opportunities

**HIGH**
Return-on-investment

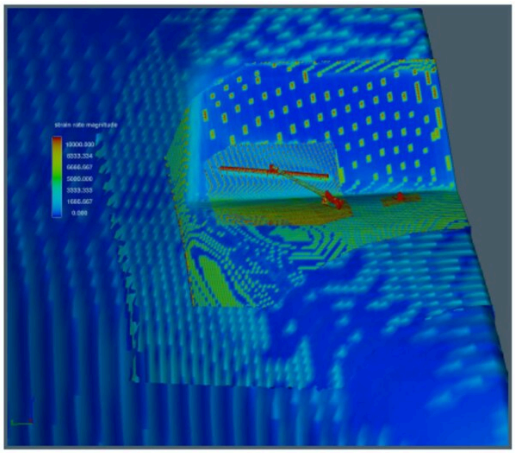

*Jigsaw,* a tanker planning tool, digitizes and streamlines aerial refueling planning, reducing fuel use by 180K gallons per week and preventing **46K metric tons of $CO_2$ emissions** annually.

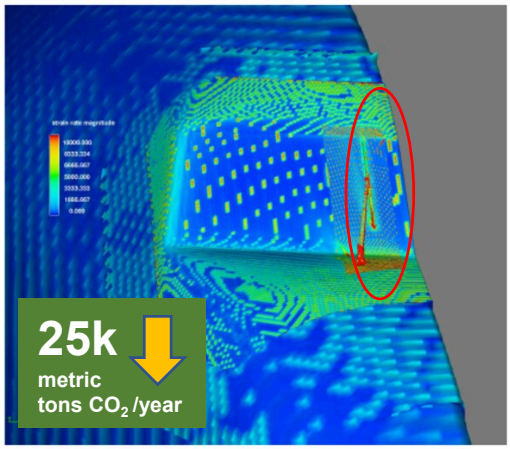
Engine sustainment processes, like compressor blade coating ***(saves 185K metric tons of $CO_2$ / year)***, and engine foam, detergent, and water washing ***(saves 177K metric tons of $CO_2$ / year)***, prevent buildup of engine debris and residue, improves performance and allows the engine to run cooler and with fewer maintenance issues.




*continued* ▶

# OPERATIONAL ENERGY AND CLIMATE CHANGE MITIGATION (continued)






Drag-reducing technologies, such as KC-135 vertical windshield wipers *(left)*, KC-135 winglets *(center left)*, and C-17 Microvanes *(center right)* can **reduce $CO_2$ emissions** by a combined **186k metric tons yearly.**

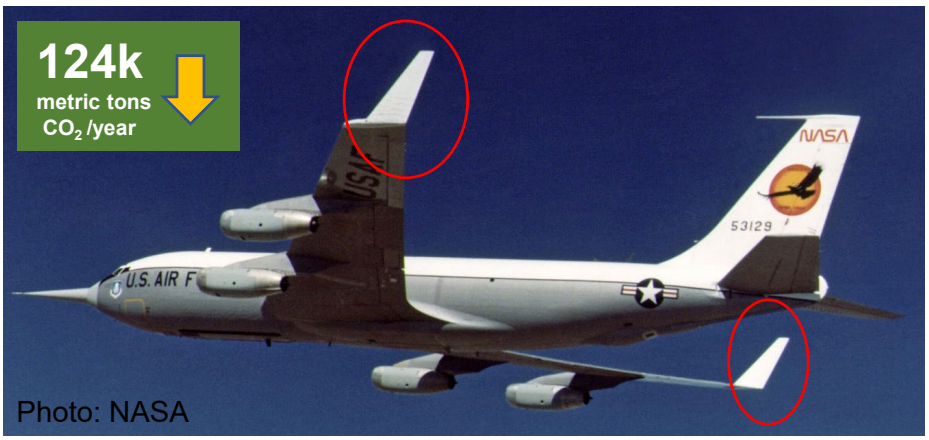


Photo: NASA


## Future Possibilities

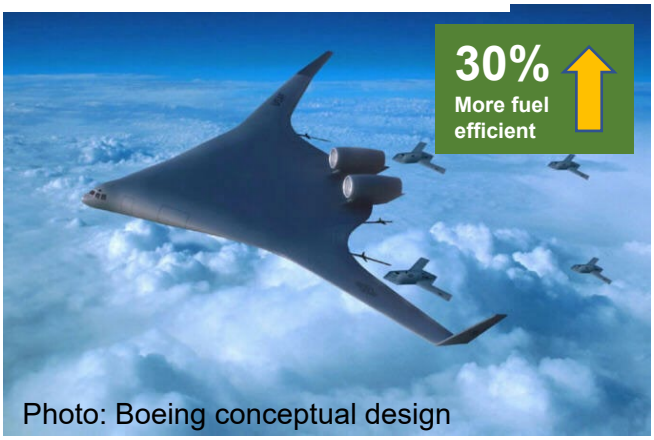
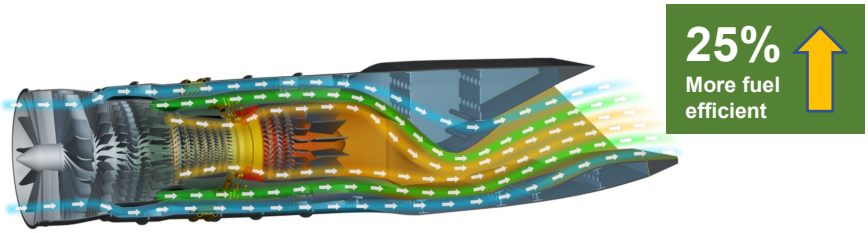
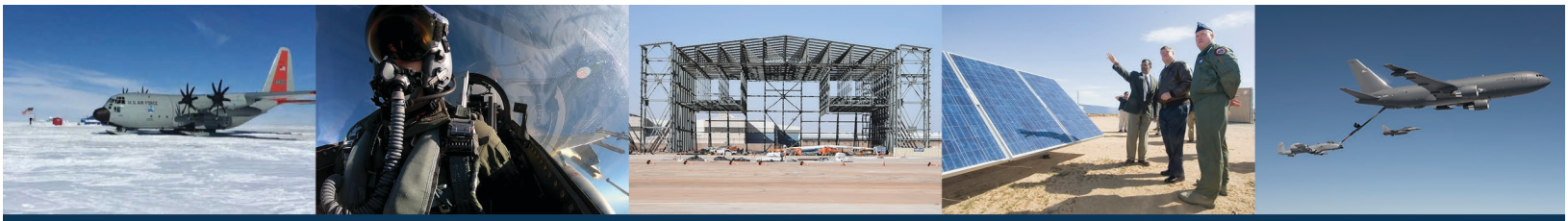


Photo: Boeing conceptual design

A Blended Wing Body aircraft *(above)* could be **30% more fuel efficient** than a tube and wing aircraft.

Adaptive engines on fighter aircraft will use a third stream of air to increase engine thrust during combat conditions, maximize fuel efficiency during cruise, and **more than double power and thermal capacity** (25% more fuel efficient overall).



**"Mitigation" - Measures to reduce the amount and speed of future climate change by reducing emissions of heat-trapping gases or removing carbon dioxide from the atmosphere. (USGCRP Glossary)**