



Sustainable Aviation: Advancing Innovative Technologies

RTX Sustainability Ambition and Approach

As one of the world's largest aerospace and defense companies, RTX not only has a responsibility to reduce the environmental impact of its products and operations, but it also has an opportunity to lead the way to reduce the sector's overall impact.

RTX has the ingenuity, expertise and talent to create innovative technologies with lower environmental impact than previous generations, while also advancing responsible stewardship in their operations. Innovating new technologies and advancing operations are closely aligned to the [RTX ESG strategy](#) and philosophy.

Since 2020, more than \$28 billion in customer-and company-funded research and development has been invested to help us reduce the environmental impact of RTX products and contribute towards the commercial aviation industry's goal of net-zero carbon emissions by 2050.

On the path to decarbonizing aviation

RTX is supporting the civil aviation industry's ambitious goal to achieve net-zero carbon emissions by 2050. To support the industry's goals, RTX aims to:



Reduce carbon dioxide (CO₂) emissions by

30%

By improving fuel consumption of the engines, aircraft systems and services (relative to 2015 technology levels and the associated emissions baseline).

Enhance system efficiency

By supporting airframer and aircraft operator initiatives to increase overall system efficiency.

Support increased sustainable aviation fuel (SAF) availability

By collaborating with energy industry value chain partners to achieve targets aligned with global deployment goals.

RTX Recent Progress and Advancements

RTX is developing a broad portfolio of solutions that will help reduce greenhouse gas emissions in the aerospace sector, including more advanced and efficient jet engines, advanced electric power systems, and data-driven tools for flight optimization.



ENGINE EFFICIENCY IMPROVEMENTS

Pratt & Whitney, an RTX business, pioneered a revolutionary geared fan architecture in the Pratt & Whitney GTF™ engine, which decreases fuel consumption and CO₂ emissions by up to 20% per trip over prior generation engines – saving more than 1.7 billion gallons of fuel and over 17 million metric tons of CO₂ since 2016.

We are continuously improving our current line of engines to deliver maximum performance and efficiency, reducing emissions in use.



SUSTAINABLE AVIATION FUELS

With almost two decades of SAF testing and certification, RTX is supporting greater adoption of SAF across the industry by ensuring future compatibility of all our modern engines, systems and components with 100% SAF.

On a net basis, SAF fuels could reduce CO₂ emissions by up to 80%, making it – along with other alternative aviation fuels – a key element in the roadmap to net-zero emissions by 2050.



HYBRID-ELECTRIC PROPULSION

RTX is exploring technologies that reduce fuel consumption including hybrid-electric propulsion for regional turboprop, single-aisle aircraft and future advanced air mobility vehicles.

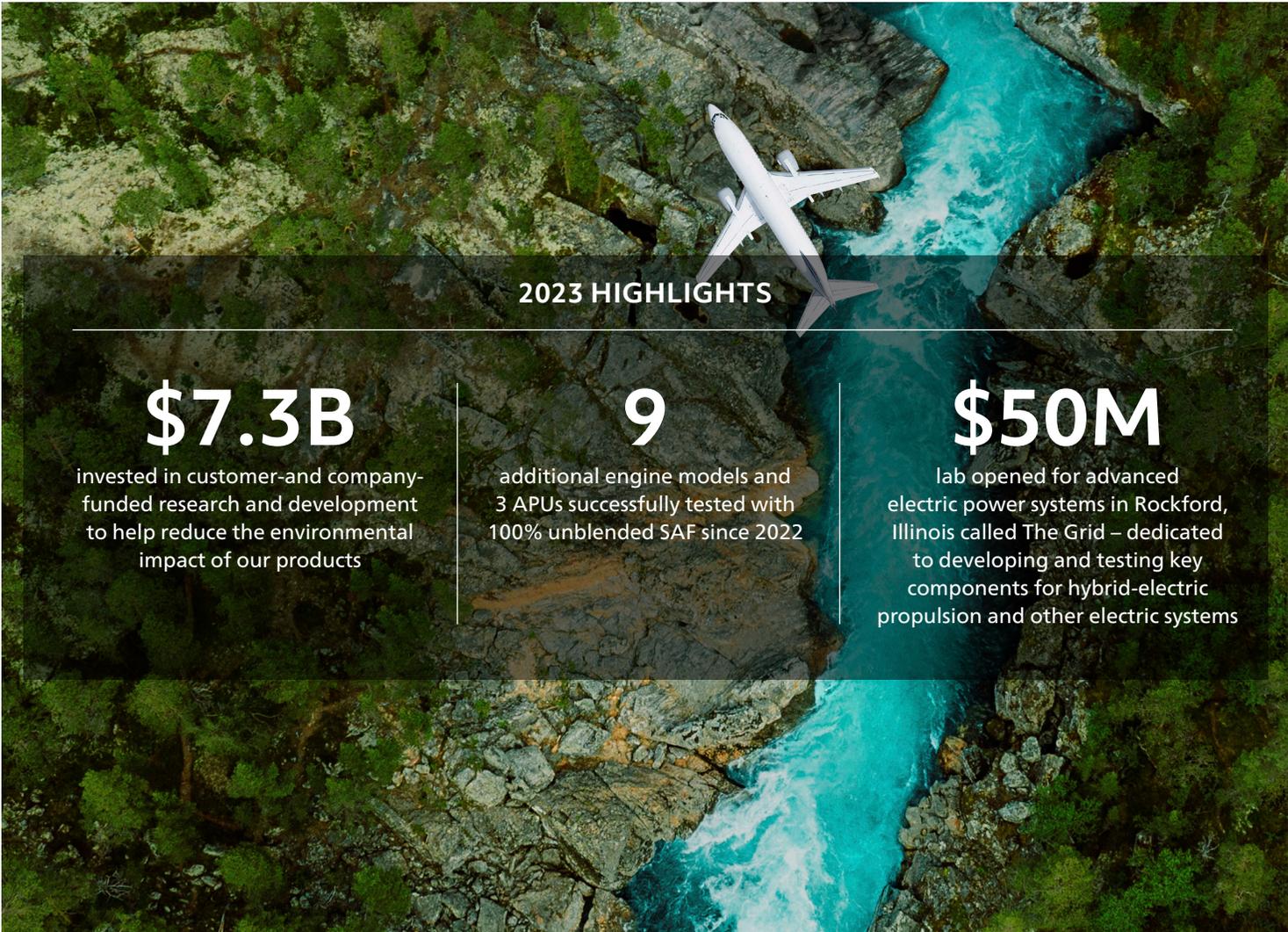
We are developing and testing key components for hybrid-electric propulsion and more electric systems at The Grid, our state-of-the-art advanced electric power systems lab located in Rockford, Illinois.



AIR TRAFFIC ROUTES AND OPERATIONS

RTX acquired FlightAware to improve route efficiency with predictive flight tracking data and products to make air traffic more efficient.

The optimization of air traffic routes and flight operations are key to reducing the carbon footprint of air travel with technologies such as upgraded aircraft avionics that enable optimal trajectory planning and enhanced air traffic management systems.



2023 HIGHLIGHTS

\$7.3B

invested in customer-and company-funded research and development to help reduce the environmental impact of our products

9

additional engine models and 3 APUs successfully tested with 100% unblended SAF since 2022

\$50M

lab opened for advanced electric power systems in Rockford, Illinois called The Grid – dedicated to developing and testing key components for hybrid-electric propulsion and other electric systems

Reaching the sector’s ambitious 2050 goals will be challenging, and we will only be successful with cross-sector industry actions and support from policymakers. Over 60,000 RTX engineers and scientists are pursuing multi-year efforts with industry partners, suppliers, customers and others across the value chain to develop and improve upon quality products and systems to help drive progress toward a more sustainable, and more connected world for all.

Read more on RTX [sustainable aviation solutions](#) and its approach to sustainability in the [2023 ESG Report](#).