



GO BEYOND

Smarter. Cleaner. Greener.

How Pratt & Whitney is Powering Sustainable Aviation



**POWERING
SUSTAINABLE
AVIATION™**

**SMARTER.
CLEANER.
GREENER.**

Pratt & Whitney, a world leader in sustainable propulsion, supports its customers' goals to achieve net zero CO₂ emissions by 2050 through a strategic framework for powering the future of sustainable aviation. Pratt & Whitney's strategy focuses on advancing smarter aircraft propulsion technologies, enabling aviation's transition towards cleaner fuels, and protecting the environment through greener and more efficient manufacturing and operations.

“Our industry faces the critical challenge of significantly reducing aviation's impact on the environment and we, at Pratt & Whitney, are determined to be a leader in this effort. With our development of products like the GTF Advantage, our advancement of innovative technologies like hybrid-electric propulsion, and our work to enable the use of cleaner fuels, we are continually striving to reduce emissions and operating costs for our customers.”

CHRIS CALIO

President, Pratt & Whitney



GO BEYOND

Smarter. Cleaner. Greener.

How Pratt & Whitney is Powering Sustainable Aviation

Smarter Technology

Pratt & Whitney, a Raytheon Technologies business, has led the advancement of engine technologies to improve aircraft efficiency by 1-2% per year on average since the beginning of the jet age. Now powering more than 14,000 customers – ranging from helicopter operators to large commercial airlines and military aircraft fleets – Pratt & Whitney is uniquely positioned to drive impact across a range of applications, pursuing smarter technologies to continuously improve aircraft efficiency.

Pratt & Whitney demonstrated its commitment to the GTF as the key architectural platform to underpin future advancements in sustainable propulsion systems for large transport aircraft, with the launch of the Pratt & Whitney GTF Advantage™ engine for Airbus A320neo family aircraft. The GTF Advantage engine extends the GTF's fuel efficiency and CO₂ emissions reduction by an additional 1%, for a total of 17% improvement from the prior generation of engines. At the same time, the GTF Advantage engine offers a higher thrust rating of up to 34,000 pounds, making it the most powerful engine available for the A320neo family, and offering new route opportunities for operators.

Pratt & Whitney has also set a new benchmark in performance for turboprop engines, with the [launch of the PW127XT-M engine](#) for the ATR 42/72 aircraft, which delivers 3% better fuel efficiency and lower CO₂ emissions, as a result of improvements to turbine and compressor technologies. Besides extending the sustainability advantages of regional turboprops, this new engine also offers significantly improved operating economics, with 20% lower maintenance costs and 40% extended time on wing.

Further opportunity to improve efficiency and performance will result from investments in advanced materials, such as ceramic matrix composites (CMCs), reducing weight and improving thermal efficiency. To support this effort, Pratt & Whitney recently opened a new CMC development facility in Carlsbad, California, and the company is collaborating with NASA on CMC-based engine core technologies, as part of [the HyTEC program](#).

Pratt & Whitney is also advancing disruptive engine architectures, including hybrid-electric propulsion. In partnership with De Havilland Canada and Collins Aerospace, Pratt & Whitney is developing a hybrid-electric demonstrator, based on a Dash 8-100 regional aircraft, targeting a 30% improvement in fuel efficiency compared to today's most advanced turboprops. Supported by investments from the governments of Canada and Québec, the project will mature technologies and component designs, which could have wider application across different segments, from regional to single-aisle aircraft.

**POWERING
SUSTAINABLE
AVIATION™**

SMARTER.
CLEANER.
GREENER.



GO BEYOND

Smarter. Cleaner. Greener.

How Pratt & Whitney is Powering Sustainable Aviation

Cleaner Fuel

Alongside the pursuit of ever more efficient aircraft propulsion technologies, Pratt & Whitney is also leading efforts to reduce aviation's dependence on fossil-based fuels by enabling the use of cleaner alternative fuels, such as sustainable aviation fuels (SAF) and hydrogen. As a "drop in" solution for aircraft flying today and over the coming decades, SAFs will be critical to help achieve the target of net zero CO₂ emissions for aviation by 2050.

Pratt & Whitney has been active in the field of SAF testing and certification since 2006, and contributed to the definition of today's technical standards, which allow all of the company's engines to operate with SAF at blends of up to 50% with standard Jet A Kerosene. Pratt & Whitney continues its collaboration with industry regulators, customers and partners, towards establishing new standards for the use of 100% SAF, and will ensure that all currently in-production engines will be fully compatible with a 100% SAF standard.

The full emissions reducing potential of cleaner fuels will only be realized, however, when SAF becomes available in vastly greater quantities than today, and at a more competitive price. To that end, Pratt & Whitney welcomes the efforts of governments around the world, in taking steps to significantly scale up SAF production and incentivize greater usage, alongside other measures to support the development of net zero aviation technologies.

Pratt & Whitney is also developing technologies for zero carbon alternative fuels, foremost hydrogen. With extensive expertise of hydrogen-fueled propulsion systems dating back to the 1950s, Pratt & Whitney continues to evaluate the potential of alternative fuels, including in partnership with aircraft OEMs, and through research initiatives funded by public-private partnerships.

Greener Business

While Pratt & Whitney is focused on enabling sustainable aviation by developing more efficient propulsion technology, the company is also committed to continually reducing the environmental footprint of its own operations and facilities, through various energy, emissions and waste reduction initiatives.

As part of Raytheon Technologies, Pratt & Whitney sets regular Environmental, Health & Safety (EH&S) [goals](#), including targets to reduce greenhouse gas emissions, water usage, and waste. Greener business improvements include energy efficiency upgrades, expanding the renewable energy portfolio, and minimizing landfill waste and water usage. Since 2006, Pratt & Whitney has reduced annual greenhouse gas emission reductions significantly and has increased waste recycling while reducing annual water consumption by double-digit percentages.

**POWERING
SUSTAINABLE
AVIATION™**

SMARTER.
CLEANER.
GREENER.



GO BEYOND

Smarter. Cleaner. Greener.

How Pratt & Whitney is Powering Sustainable Aviation

Pratt & Whitney has also launched a dedicated effort across the company's worldwide manufacturing footprint to modernize and transform its operations, supporting the overall Raytheon Technologies Industry 4.0 strategy, which in turn has resulted in lower energy consumption and less waste in the production cycle.

A prime example of Pratt & Whitney's modernization initiative is its new, 1.2M square foot turbine airfoil production facility in Asheville, North Carolina, due to open in 2022, which is vertically integrated and highly automated. In the current manufacturing process, a part travels over 2,500 miles, with at least eight different site handoffs, before installation.

In the new Asheville facility, that same part will be produced within one factory, with a total travel of less than 1 mile with zero handoffs. The entire value stream from core production and part casting to a coated and finished airfoil will be housed in the new production facility. Globally, Pratt & Whitney has 14 buildings that are certified LEED Silver or better and the company is pursuing LEED certification for its new facilities in Asheville and Carlsbad.

To extend the reach of the company's efforts, Pratt & Whitney shares its sustainability goals and expectations with its supply chain. Together, Pratt & Whitney and suppliers are focused on reducing facility waste, water and energy use, as regularly evaluated through the Supplier Health Assessment process within Raytheon Technologies Performance+. Those suppliers who meet or exceed these sustainability expectations, along with other best-in-class performance requirements, are awarded and recognized with the Raytheon Technologies Platinum supplier certification. Additionally, Pratt & Whitney works with its supply chain to proactively reduce materials of concern in products and processes.

About Pratt & Whitney

Pratt & Whitney is a world leader in the design, manufacture and service of aircraft and helicopter engines, and auxiliary power units. To learn more visit www.prattwhitney.com. To receive press releases and other news directly, please sign up [here](#).

**POWERING
SUSTAINABLE
AVIATION™**

SMARTER.
CLEANER.
GREENER.