

# Advanced Technology

To meet the commercial aviation industry’s net-zero ambition by 2050, it will take an approach that includes SAF and other advanced technologies. Boeing has extensive experience on the “and,” through research, studies, testing and partnerships. The future of flight will incorporate the latest digital design, test and production tools, airframe, propulsion and systems technology, and different power and energy solutions will apply to different market segments and aircraft sizes.

Informed by the company’s extensive evaluation and testing of alternative propulsion sources and renewable energy and its research partnerships, and supported by Boeing’s expertise in commercial aircraft design and history of innovation on alternative energy and propulsion systems, Boeing has launched a new effort to conceptually design and assess the potential environmental impacts of “Future Flight Concepts.” These concepts are exploring applications of technologies including electrification and alternative fuels, such as hydrogen.

## NASA awards sustainable flight program to Boeing and partners

In January 2023, NASA selected Boeing and its industry team to lead the development and flight testing of a full-scale Transonic Truss-Braced Wing (TTBW) demonstrator airplane through the Sustainable Flight Demonstrator (SFD) program. Through this unprecedented public-private partnership with NASA, Boeing and its industry partners are contributing more than half of the funding needed to shape the demonstrator program.

**Why it matters:** The technologies demonstrated and tested will inform future designs and could lead to breakthrough aerodynamics and fuel efficiency gains.

When combined with expected advancements in propulsion systems, materials and systems architecture, a single-aisle airplane with a TTBW configuration could see reduced fuel consumption and emissions of up to 30% relative to today’s most efficient single-aisle airplanes, depending on the mission.

**Years in the making:** The TTBW airframe concept is the result of more than a decade of development supported by NASA, Boeing and industry investments. Under previous NASA programs, including the agency’s Subsonic Ultra Green Aircraft Research program, Boeing conducted extensive wind tunnel testing and digital modeling.

“One of the key outputs of this activity is really the learning, the knowledge. What at the integrated airplane level ... will the benefits be? And depending on the results of this effort, and market conditions — that’ll dictate whether this shows up on a future commercial product.”

Todd Citron, Chief Technology Officer

