The Boeing Cascade Climate Impact Model

Cascade is a modeling tool that assesses aviation's major strategies to reduce emissions, built in response to aviation's commitment to reach net-zero carbon emissions by 2050.

Publicly launched in 2023 and a new version released in 2025, Cascade analyzes changes in five major areas that impact aviation's carbon footprint: Traffic, Aircraft, Operations, Energy, Offsets & Removals .

Cascade sets itself apart by accounting for lifecycle emissions across the whole value stream, as it's the total climate impact of emissions that determines the sustainability impact.

Click here to learn how to use Cascade to create your own scenario.

MEET CASCADE

Build scenarios and detailed analysis of emissions reductions over time and out to 2050.
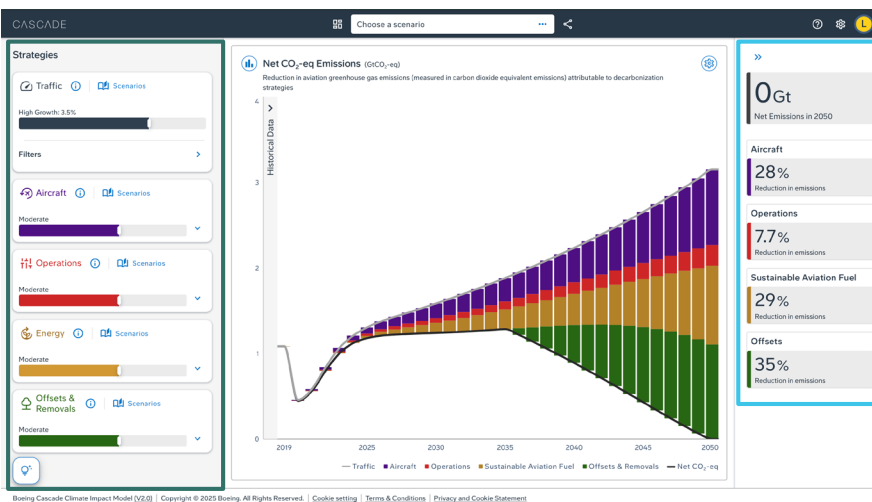

Strategies ●

Cascade allows the user to model various paths to decarbonization utilizing user-selectable scenarios for the five core strategies:

- Traffic
- Aircraft
- Operations
- Energy
- Offsets & Removals

Goal Panel ●

Track the impact each strategy has on reducing emissions toward 2050.

CUSTOMIZE STRATEGIES FURTHER

Filter your dataset and set specific parameters to get answers to your most prominent questions.

Explore Varying Assumptions

For each decarbonization strategy, the user is provided with slider options to modify the level of ambition.

In Energy, for example, users can customize electricity generation, hydrogen production, and sustainable aviation fuels across a wide range of production pathways.
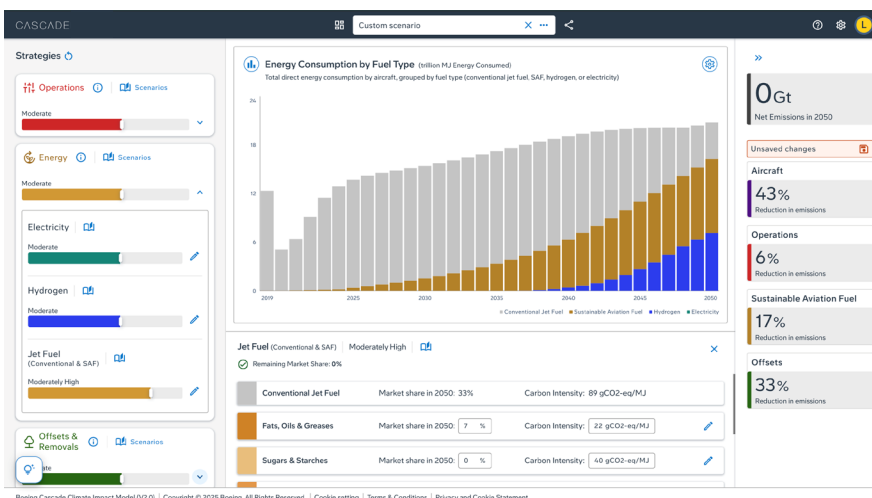
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Since 2023, Cascade has been evolved with feedback sought out from aviation, policy, energy and finance, driving data-driven conversation on aviation's decarbonization.

Cascade has now become even more comprehensive, customizable and user-centric.

Check out some of the features below to learn how to use models to build scenarios.
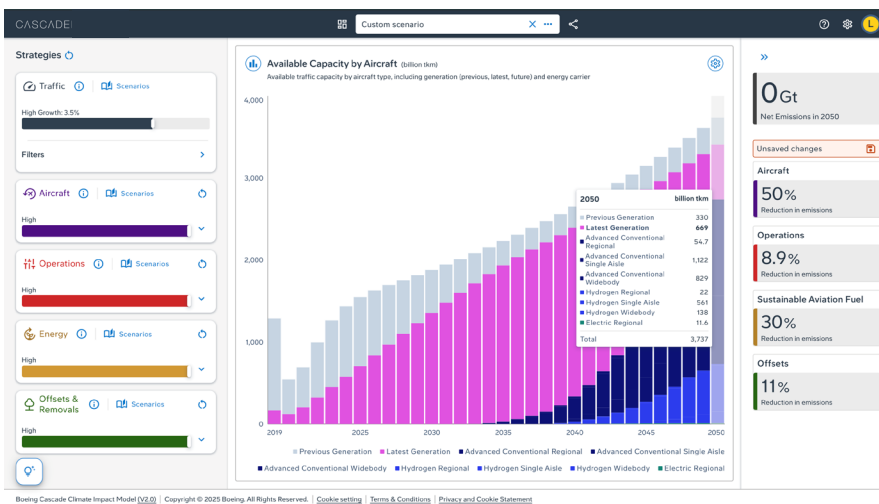
SCENARIOS
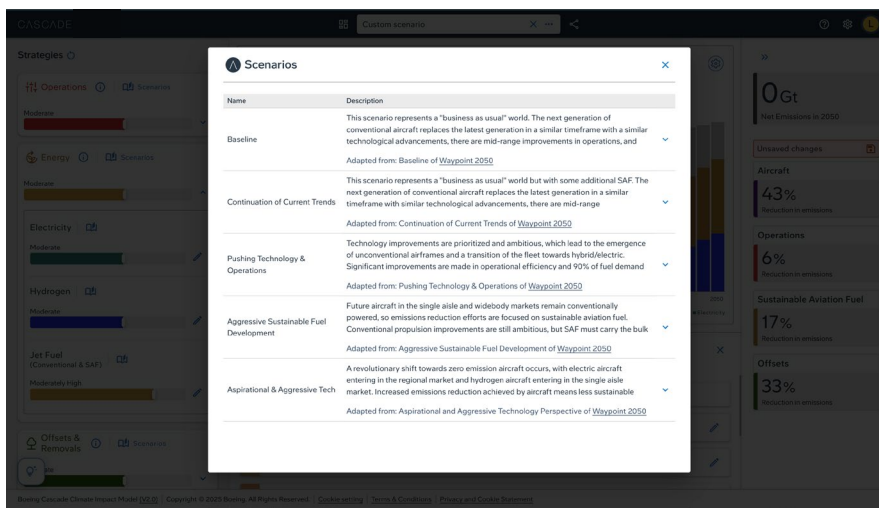
Not sure where to start?
View scenarios from industry experts to understand the impact of technology developments, investment decisions, and policy measures over time.

Scenarios are available at the global level as well as for individual strategies.

VISUALIZATIONS

Analyze the Data Further
Explore how much energy will be required, how advancements in aircraft affect aviation's capacity over time, historical fuel efficiency improvements, and other metrics.

To access these, click the chart icon next to the chart title.

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Through continuous enhancements in user experience and educational aspects of the application, Cascade is accessible to all users, regardless of level of expertise.

See below for features that have been developed to support the continuous use and learning on aviation decarbonization.

INSIGHTS
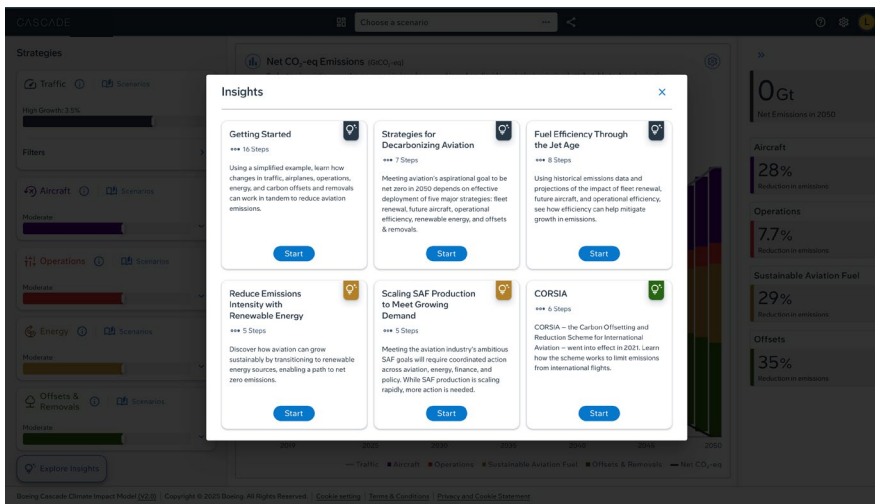
Guided Storytelling

To further educate and align stakeholders on the challenges of decarbonizing aviation, Insights have been added into Cascade.

Insights focus on important, but complex topics within aviation sustainability such as traffic growth, historical emissions data, renewable energy, and overall strategies to decarbonize.

SAVE, SHARE, EXPORT
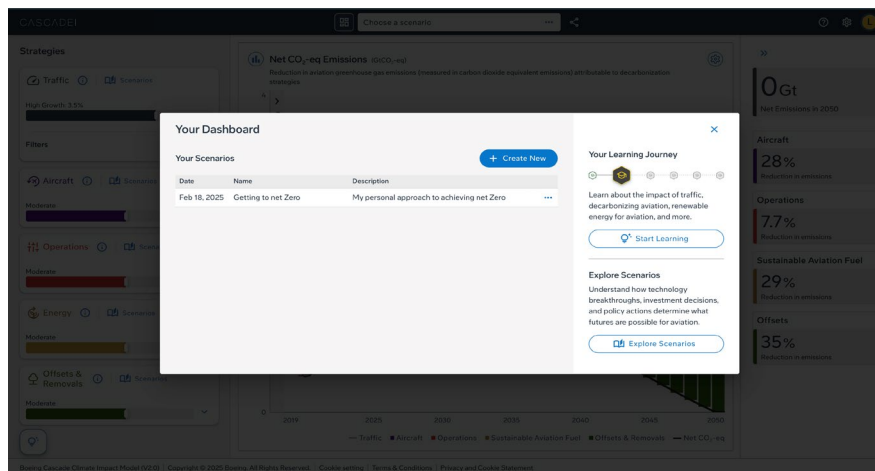
User-Friendly Dashboard

Users have a convenient way to load previously-saved scenarios and share findings through links to stakeholders.

Want to access the dataset powering each chart? Export the data to a csv file.

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