



United's Journey on Decarbonization



Our net-zero goal

United is playing a key role in making air travel more sustainable. We plan to become net-zero by reducing greenhouse gas (GHG) emissions by 2050 **without relying on traditional offsets**.



Progress toward our goal

As we approach 2050, we have set a mid-term goal to reduce **50%** of our emissions intensity by 2035¹. In May 2023, the Science-Based Targets Initiative (SBTi) approved our 2035 near-term emissions reduction target.

“

You've probably heard of carbon offsets. While they may offer customers some peace of mind, traditional carbon offsets – simply don't meet the scale of this global challenge. It's just not realistic to think we can plant enough trees to start bending that curve today. I believe the world and the airline industry have to be bolder.

Scott Kirby
CEO

”

The realities of air travel and the environment

Did you know?

Aviation presents a formidable challenge in reducing emissions. Current technology doesn't offer a viable alternative that matches the density and portability of fossil fuels, making it difficult to cut emissions.

Sustainable aviation fuel (SAF), which is similar to conventional jet fuel, is one technology that can help us decarbonize.

~3%

of yearly global greenhouse gas (GHG) emissions come from aviation

20%

of yearly GHG emissions will come from aviation if no changes are implemented

98.5%

of our total GHG emissions are from jet fuel use

Our environmental strategy

REDUCE our environmental footprint

We are focused on maximizing operational and fuel efficiency and reducing the usage of conventional jet fuel



REMOVE carbon

We intend to focus on efforts beyond current ways of reducing emissions by also focusing on carbon removal



INNOVATE in carbon reduction technologies

Our primary pathway toward reducing our environmental footprint is through replacing conventional jet fuel with sustainable aviation fuel



COLLABORATE with various stakeholders

We will work in collaboration with employees, customers, airports, suppliers, cross-industry partners, policymakers and others to advance the future of sustainable flight

Reduce our
environmental footprint



Fleet renewal

Reduce
our environmental
footprint

- **Estimated 17-25% improved fuel efficiency per seat**
- United announced 'United Next,' a historic aircraft order of the newest aircraft models today, which is expected to increase the total number of available seats per domestic departure by almost 30%, significantly lowering carbon emissions per seat
- The order includes more than 400 narrowbody and widebody aircraft, with options to increase that number to nearly 700 narrowbody and widebody aircraft, with an expected estimated 17-25% improved fuel efficiency per seat, compared to older planes.
- These new, more efficient aircraft, combined with fuel efficiency measures on seat density result in 20% of our forecasted emissions reductions needed to help us reach net zero by 2050 without the use of traditional carbon offsets.

Future aircraft technology

Reduce
our environmental
footprint



- Advancements in aircraft design and engine technology continually target improvements in fuel efficiency. We have forecasted a steadily increased fuel efficiency through 2050, through more efficient advanced technologies such as new engines, open rotors, more aerodynamic airframe designs, and future generation aircraft models that are currently in the design phase*
- Our estimate is that by 2050, future generation aircraft could be up to 30% more fuel efficient** than today's commercial fleet

* Does not include estimates of specific aircraft technology currently under development, but rather relies on estimates of both fleetwide intragenerational improvements assuming a combination of technologies and intergenerational improvements to aircraft efficiency consistent with historic leaps in aircraft efficiency. A selection of potential and illustrative technologies are included in ATAG's Waypoint 2050 report.

** Source: 2021 United States Aviation Climate Action Plan (faa.gov)

Alternative propulsion

Reduce
our environmental
footprint

- Zero-carbon aircraft technologies like battery, electric or hydrogen propulsion may be adopted for shorter-haul distance flights.
- We anticipate using renewable power to charge aircraft batteries and the electrolyzers used to make green hydrogen for hydrogen propulsion.
- Using 100% renewable power could reduce full lifecycle GHG.
- United believes that 4% of our reductions from Business as Usual to net zero will be attributed to the adoption of these alternate propulsion aircraft.





Reducing our noise footprint

Reduce
our environmental
footprint

- United is committed to working with a variety of stakeholders, including the Federal Aviation Administration (FAA), international air navigation service providers and our airport partners to improve the noise levels surrounding our airports.
- Our United Next aircraft order is expected to reduce noise at the airports we serve. For example, the Boeing 737 MAX aircraft is designed to be 40% quieter than the previous generation of 737s. Further, our investments in electric aircraft, such as Archer Aviation, promote technologies expected to reduce our noise profile where in service.

INNOVATE in carbon reduction technologies

What exactly is Sustainable Aviation Fuel (SAF)?

Did you know?

A drop-in fuel can be used instead of traditional fuel without changing current infrastructure, such as the fuel tanks at an airport.

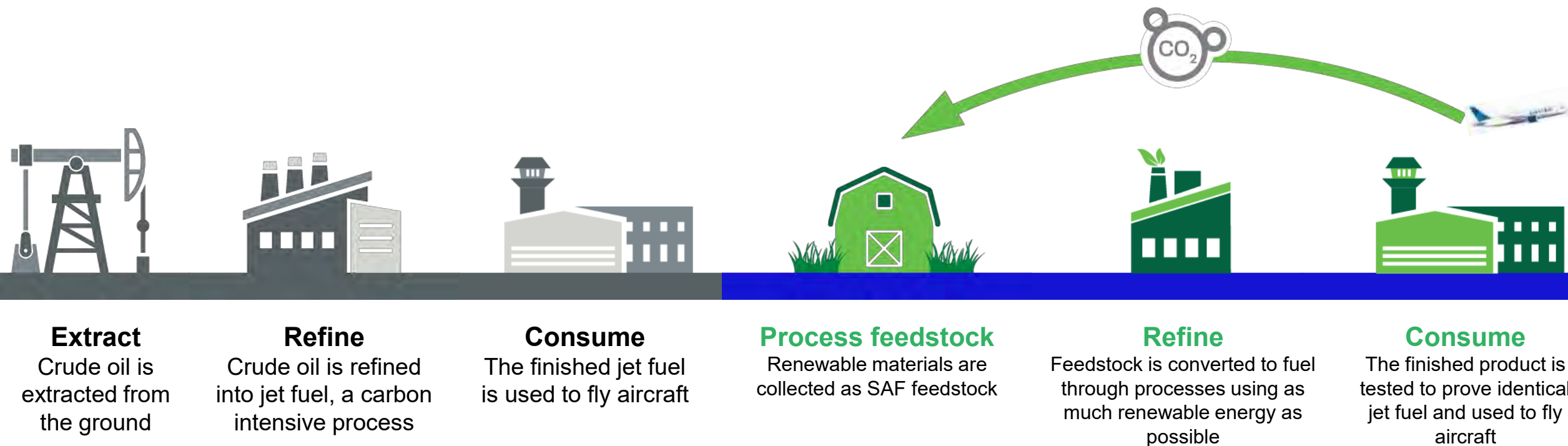
Sustainable aviation fuel is a drop-in replacement for conventional jet fuel

Innovate
in carbon reduction
technologies

- SAF is a lower-carbon alternative to normal jet fuel that can be used to fuel existing aircraft without significantly modifying the aircraft and its engines
- It is chemically very similar to conventional jet fuel; however, unlike conventional jet fuel derived from crude oil, it is made from sustainable sources like used cooking oil or animal fat
- It emits up to **85%** less greenhouse gas emissions on a lifecycle basis overall than fossil jet fuel
- It is currently the fastest and most effective way to reduce GHG emissions across our fleet

SAF is an alternative to conventional jet fuel

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Did you know?

SAF is currently made from feedstock like used cooking oil and greases – but one day it could be made from captured CO₂

However, SAF supply is limited

Limited SAF supply

In 2022, the aviation industry used almost **90 billion** gallons of conventional jet fuel globally. In 2022, less than **80 million** gallons of SAF was available globally¹

Therefore, only **0.1%** of global fuel use is SAF.

Economic reasons for limited SAF

The same production processes used for SAF can be used to produce other, more lucrative hydrocarbons like renewable diesel, which means:

- Renewable Diesel (RD) sells for more
- Lower production costs for RD
- More government incentives for RD
- Limited geographies for commercial SAF production (Europe and Singapore)



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technologies

Our progress so far on SAF

- | First definitive, ongoing SAF purchase agreement by an airline globally



2013

- | First ongoing use of SAF on flights out of Los Angeles International Airport



2015



2016



2020



2021

- | Launched Eco-Skies Alliance. First Passenger flight Using 100% SAF in one engine. Established United Airlines Ventures.



2022

- | First U.S. airline to publish CO₂ emissions for flights and launch Sustainable Flight Fund



2023

- | Largest investment in SAF

- | First commitment to 100% green by reducing 100% of GHGs by 2050 without relying on traditional offsets

- | First International SAF expansion into Amsterdam Airport by U.S. airline.

Current SAF use at United

- Our use of SAF has grown rapidly over the last years from **1M** gallons in 2020 to an expected **10M** gallons in 2023¹
- Despite this growth, it is only **2%** of what we need
- In 2023, we used SAF at Amsterdam Schiphol (AMS), Los Angeles (LAX), London Heathrow (LHR) and San Francisco (SFO)
- We are exploring new sources of SAF to obtain more supply in the future

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technologies

Today
Fats, oils
Greases
Used cooking oil



Tomorrow
Agricultural waste feedstocks
Banana peels
Woody biomass
Trash



REMOVE Carbon

United is the first airline to announce plans to invest in carbon capture and sequestration

Capturing carbon, not offsetting it

- Multi-million dollar investment in 1PointFive, which will build the first industrial-sized direct air capture facility in the U.S.
- A single plant is expected to capture and permanently sequester 1 million metric tons of CO₂ per year – the equivalent of 40,000 trees

Collaborate with other
stakeholders

Educating our customers

Collaborate
with other
stakeholders

- In February 2023, we became the first US airline to show customers an estimate of their flight's carbon footprint when booking, on a per economy seat passenger basis. We believe transparency with our customers is important as we embark on our transition toward more sustainable flying.

The screenshot displays a flight booking interface. On the left, flight details are shown: 'DEPART ON: March 22', departure time '8:59AM', arrival time '11:48 AM', route 'ORD 1H, 49M IAD', and aircraft 'UA 2496 (Airbus A3200)'. Below these details are links for 'Details' and 'Seats'. A carbon footprint indicator '100_{kg} CO₂' with a question mark icon is circled in black. To the right, three fare options are presented in columns:

Basic Economy (most restrictive)	Economy	Economy (fully refundable)
	\$375	\$375
	United Economy (V)	United Economy (V)

How we can work together?

Through collaboration with corporate and cargo customers, we can fund the green premium in the short term and reduce customers' scope 3 emissions, such as those from business travel or shipping on our aircraft.

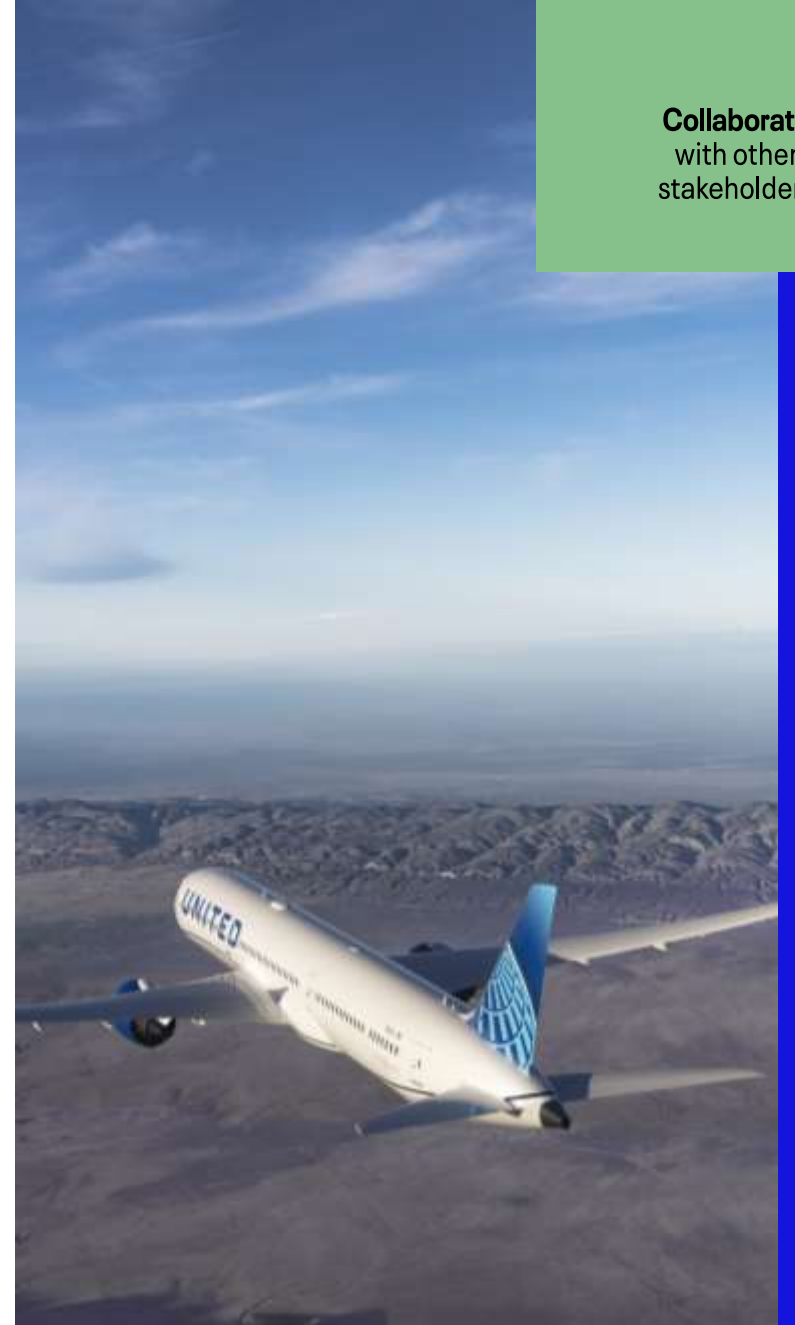
Work with United through



OR



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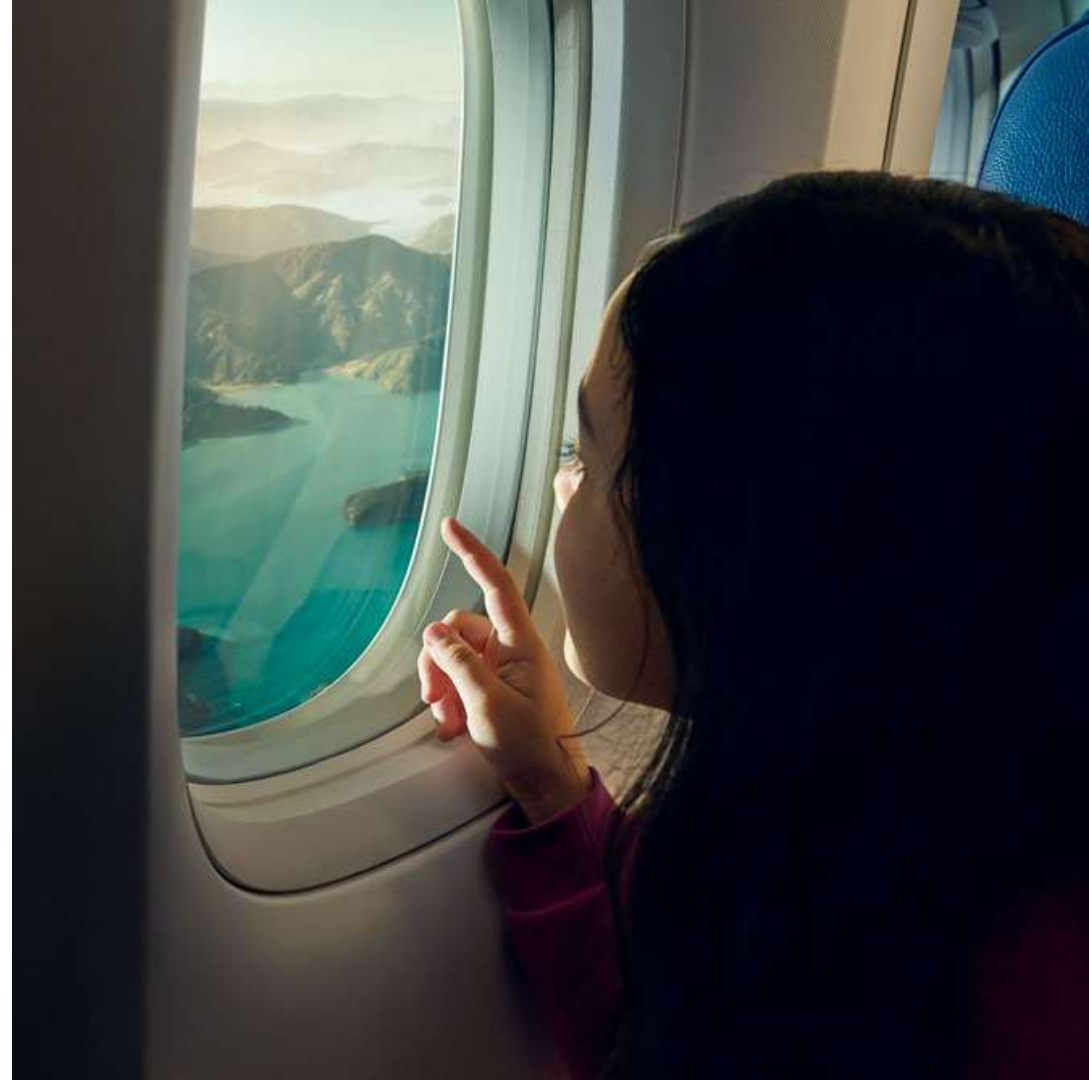


Eco-Skies Alliance

The Eco-Skies Alliance brings leading global corporations together with United to purchase SAF and enables customers to reduce their travel footprint while helping reduce aviation emissions by using SAF.

Our team of experts supports our customers' sustainability journey, providing feedback on industry trends, explaining SAF accounting and working with third-party auditors for end-of-year reporting.

Nearly 40 corporate customers have joined the Eco-Skies Alliance since its founding in 2021



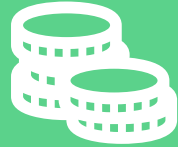
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stakeholders

Eco-Skies Alliance Overview

Eco-Skies Alliance is United's Corporate Customer SAF Program

- SAF green premium is two to four times that of conventional jet fuel¹
- Customers fund the premium, receiving environmental attributes towards their travel emission reporting
- In 2023, United voluntarily received SAF at AMS, LAX, LHR, SFO²

Participation in the program creates a strong demand signal for future SAF supply



Invest

You invest in the desired quantity of SAF emissions reductions through the Eco-Skies Alliance program



Source

We source, purchase and deliver SAF for use in operations and allocate emissions reductions



Fly and Claim

You claim emissions reductions against all your United flying to reduce your scope 3 emissions



Support

You'll receive ongoing support from our sustainability team

Collaborate with other stakeholders

¹Average 2023 price premium as of July 2023, [Sustainable Aviation Fuel Leader Talks Green Premiums and Impact of Tax Incentives – WSJ](#)
²Other locations (ARN, CDG and NCE) also received SAF volumes due to government mandates in France and Sweden; however, these volumes are not counted towards our go

United Airlines Ventures

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United created a formal investment vehicle by launching United Airlines Ventures (UAV), a corporate venture capital arm that seeks promising sustainable aviation technologies and innovation to usher in the future of air travel. As of March 2023, UAV is the only airline venture capital fund launched to specifically target technologies and startups that complement a transition to net zero aviation.

Sustainable Flight Fund

- In February of 2023, United Airlines launched the United Airlines Ventures (UAV) Sustainable Flight Fund, a first-of-its-kind investment vehicle focused specifically on SAF technologies.
- We recently announced new corporate partners joining our Sustainable Flight Fund!
- We now have a total of 22 corporate partners made up of all parts of the aviation supply chain.
- In total, they've committed more than \$200 million while collaborating to provide strategic expertise to help the Fund's portfolio companies reach commercialization.
- Our customers can also play a role in these efforts too by contributing to the fund before check-out on United.com or in the United app. In less than 12 months, more than 115,000 people have contributed nearly \$500,000!

Collaborate
with other
stakeholders



Answers to audience questions:

1) What about hydrogen technology?

Hydrogen propulsion technology (part of UA portfolio): ZeroAvia (decades away - infrastructure challenges, most likely in European market first). United also interested in Hydrogen as feedstock as part of our focus on SAF initiatives.

2) Can you talk a little about carbon capturing?

Carbon capture (sequestration or utilization): Dimensional, Svante, Banyu, OXCCU, Cemvita (these are all companies taking CO₂ as a feedstock and capturing it and/or converting it), we do not have an investment that is specifically sequestering CO₂ (underground). Additionally, we have a relationship with 1PointFive, but not a focus for us right now.



Thank you

