

Port of Seattle SAF Study Session

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United is the only airline globally to commit to **net-zero** without offsets—here's our path to decarbonization

New aircraft and engine technology



- Aviation demand continues to grow, so fuel efficiency must continue to improve as well

- Launch customer for 18 new aircraft types
- Nearly 300 new aircraft on order—with 15%-20% CO₂ reductions
- Invested in Archer Aviation to scale up urban air mobility—with potential for future larger applications (2021)

Ample, affordable low-carbon fuel



- Reducing fuel use isn't enough—low-carbon sustainable aviation fuel (SAF) offers ~80% CO₂ reductions

- First airline to fly on SAF on an ongoing basis (2016)
- Largest airline investment in a SAF producer (\$30M)
- Purchased more SAF than any other airline
- Nearly half of publicly announced SAF commitments

Capturing CO₂ directly from the atmosphere



- Likely not enough SAF, but carbon capture can achieve the remainder

- Only airline investment in carbon capture and sequestration via multimillion-dollar investment in 1PointFive (2020)

Appealing to eco-conscious customers

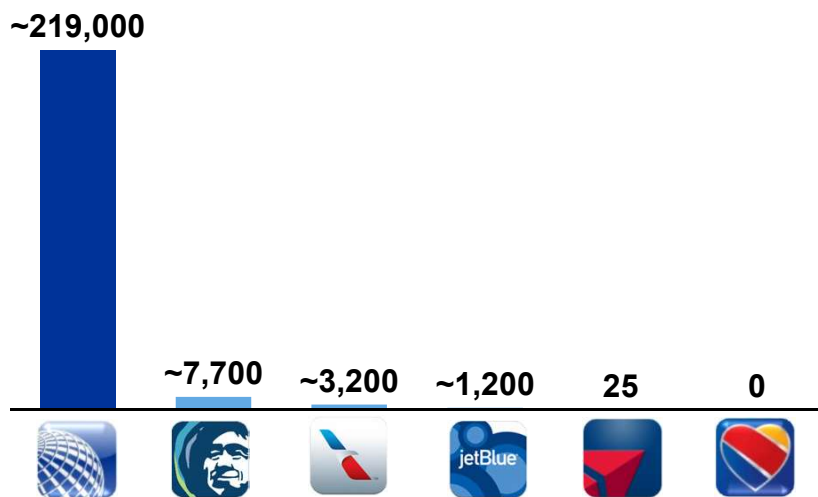


- Making customers feel good about flying—on airlines innovating and leading decarbonization

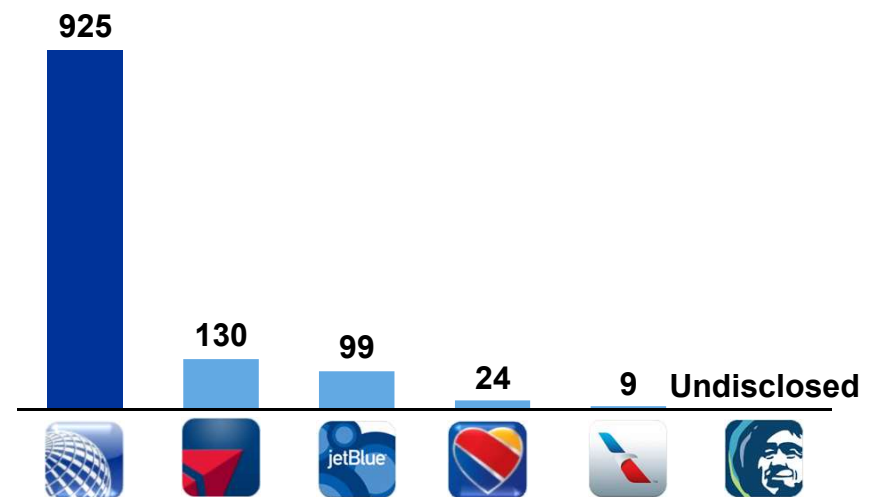
- First U.S. airline with a carbon offset calculator (2007)
- Testing display of CO₂ emissions in booking process
- Greening onboard product and airport facilities

United backs its ambitious decarbonization goals by leading the airline industry in developing SAF

Flights using sustainable fuel¹



Sustainable fuel contracted² millions of gallons



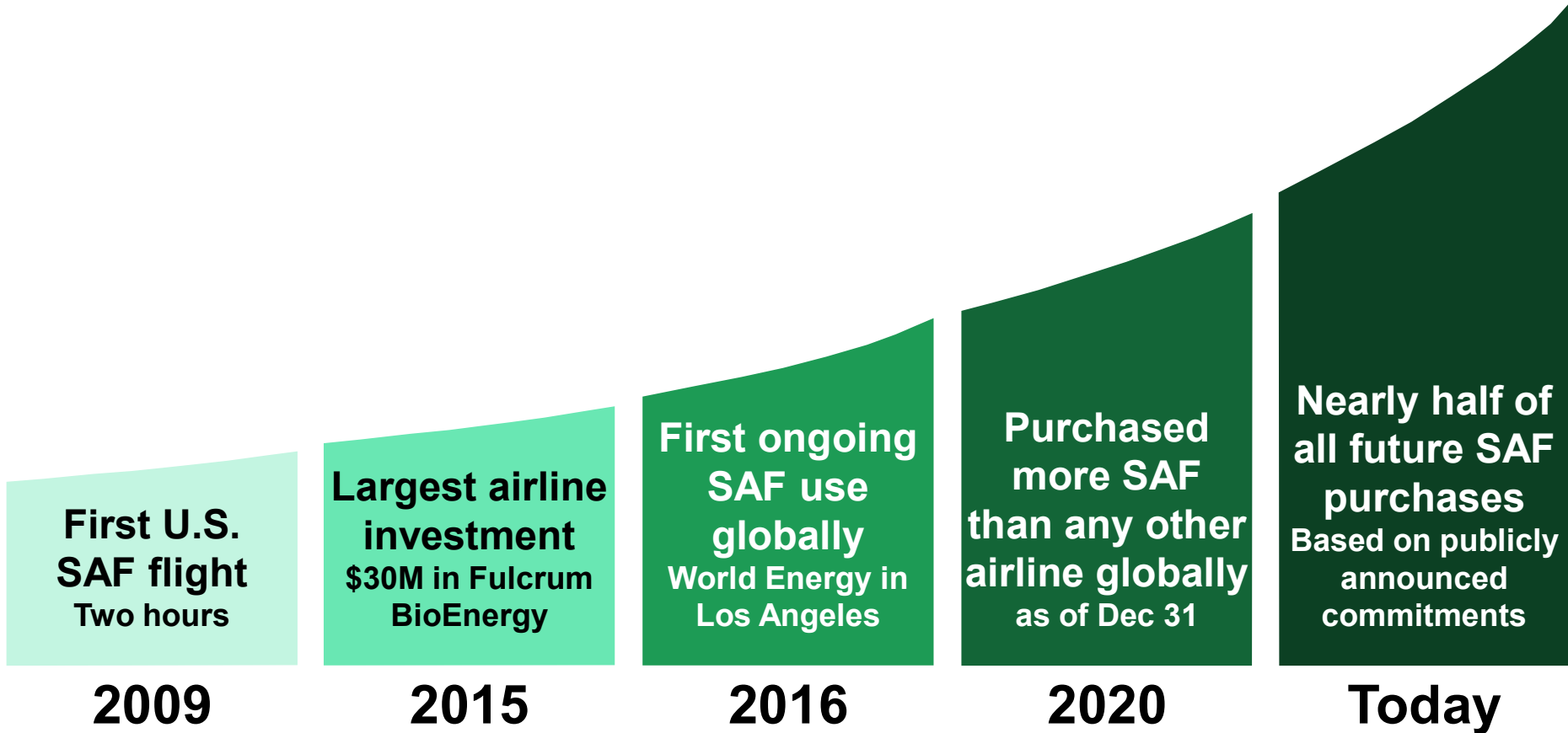
¹ Bureau of Transportation Statistics, 2019

² Includes two ties

¹ Through December 31, 2020; scheduled departures at airports with SAF contracts, test flights, and announced delivery flights

² Publicly announced commitments

United backs its ambitious decarbonization goals by leading the airline industry in developing SAF



United works with two SAF producers and has the largest purchase agreement and investment globally

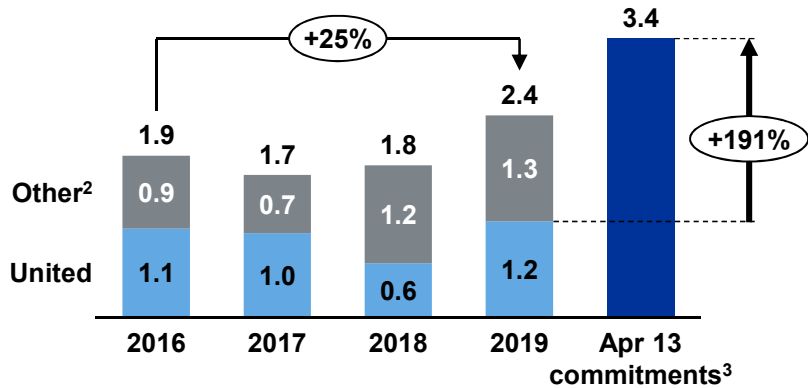


- Purchase agreement for up to 5M gallons/year for 5 years, starting in 2016
- SAF produced from waste fats, oils, and greases using HEFA process
- Nearly 80% CO₂ emissions reduction
- Production in Paramount, California—then delivered to Los Angeles International Airport
- Equity investment of \$30M in 2015, the largest airline investment in SAF
- Purchase agreement for up to 90M gallons/year for 10 years, the largest globally
- SAF to come from landfill waste using Fischer-Tropsch process
- Greater than 80% CO₂ emissions reduction
- Reno, Nevada facility under construction; Gary, Indiana planned

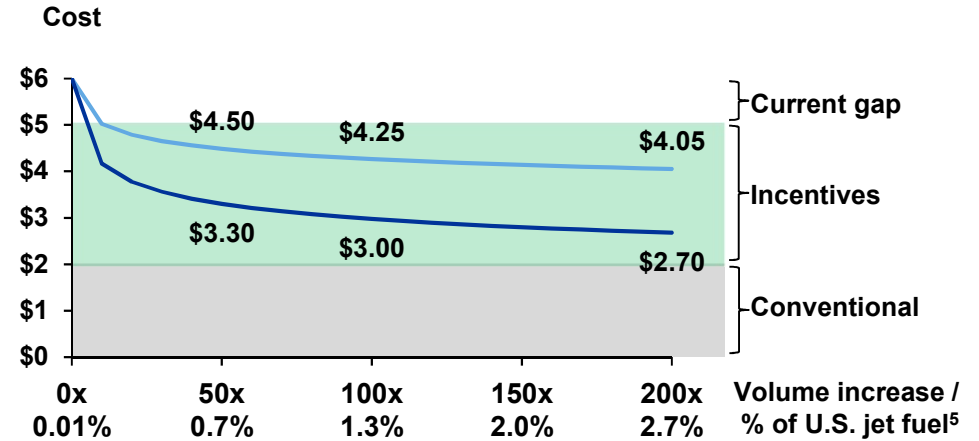
Corporate adoption of SAF would significantly accelerate supply and reduce price premiums

- U.S. SAF supply has increased 25% since 2016, but has yet to achieve needed exponential growth
- Modest SAF commitments by corporates would result in a large increase in SAF supply—and long-term, a decrease in costs

U.S. SAF supply¹
Gallons (M)



Economies of scale⁴
5% / 10% curves



¹ RIN issuances by EPA

² Primarily foreign airlines buying in the U.S.

³ Commitments from over a dozen United customers announced on April 13

⁴ Wright's Law (aka Learning Curve): for every doubling of output, unit costs will decrease by x%; for illustrative purposes only

⁵ U.S. jet fuel demand of ~20B gallons in 2019



The Eco-Skies Alliance program offers a new way to decarbonize via sustainable aviation fuel (SAF)

Over a dozen United customers are funding SAF's green premium, including:

- Autodesk
- Boston Consulting Group
- CEVA Logistics
- Deloitte
- DHL Global Forwarding
- DSV Panalpina
- HP Inc.
- Nike
- Palantir
- Siemens
- Takeda Pharmaceuticals



Direct reductions

SAF provides direct reductions within aviation, rather than buying carbon offsets that don't solve the core underlying problem



~80% less CO₂

SAF provides a nearly 80% reduction in CO₂ emissions—far more effective than the 15%-20% of flying on a newer aircraft



Made in California

United's SAF is produced ~15 miles from Los Angeles International Airport, the closest and fastest delivery to an airline from any SAF producer



Brand differentiation

Flying on SAF offers significant opportunities to differentiate a customer's brand and demonstrate sustainability leadership—with customers and employees



UNITED



A STAR ALLIANCE MEMBER 

**We plan to land
on the green side
of history.**

*United is going 100% green by 2050 by reducing
our greenhouse gas emissions by 100%.
Learn more at [united.com/100green](https://www.united.com/100green)*

fly the friendly skies[®]