

# Under pressure, plane industry vows cleaner flight—someday

June 20 2019, by Angela Charlton

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An Israeli Eviation Alice electric aircraft electric aircraft is displayed at Paris Air Show, in Le Bourget, east of Paris, France, Tuesday, June 18, 2019. Israeli startup Eviation displayed an all-electric airplane prototype dubbed Alice at the Paris Air Show, as the aviation industry increasingly looks to electric and hybrid technology because of pressure from regulators and the public to reduce emissions. (AP Photo/Michel Euler)

Battery-powered planes, solar planes, hydrogen planes—jet makers are working on myriad ways to make flying less damaging to the planet. Yet clean flying on a mass scale remains decades away.

That's despite growing pressure from regulators and from a blossoming environmental movement to shun [air travel](#) altogether .

The problem, argue aviation powerhouses gathered this week at the Paris Air Show , is that growing world populations and economies mean that the number of planes in the sky could double in the next 20 years. And today's clean-aviation technologies aren't ready to keep up.

Here are some options already out there, and what's on the horizon.

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## ELECTRIFIED FLIGHT

Carmakers figured out how to go electric, so why can't we do it in the air, too?

Weight, altitude and storage, primarily. A mid-sized [passenger plane](#) weighs 100 times as much as a mid-sized car, and there is no battery system currently strong enough to lift a machine that size off the ground and keep it there.

So the dozens of companies working on electric planes—including Boeing and Airbus—are starting small.

Israeli company Eviation unveiled its 9-seat, all-electric [plane](#) named Alice at the air show, and won its first customer, U.S.-based Cape Air. It hopes to get the plane certified and in service by 2022.



Omer Bar-Yohay, Eviation CEO and co-founder, gestures as he speaks during a media conference next to his prototype electric aircraft at Paris Air Show, in Le Bourget, east of Paris, France, Tuesday, June 18, 2019. Israeli startup Eviation displayed an all-electric airplane prototype dubbed Alice at the Paris Air Show, as the aviation industry increasingly looks to electric and hybrid technology because of pressure from regulators and the public to reduce emissions. (AP Photo/Michel Euler)

With a sleek nose, futuristic aura and 3.8 metric tons of batteries built into the frame, the plane can theoretically fly up to 540 nautical miles (1,046 kilometers), or about the equivalent of a Washington-Chicago flight. But it travels at less than half the speed of fuel-powered planes traveling such routes.

Urban air taxis may be the first widespread use of electric aviation. Uber wants to start flying them by 2023 around Houston and Los Angeles, but needs to overcome technology and certification challenges first.

Safety is paramount, and batteries notably heat up. The CEO of the company that makes Alice's electric motors, Roei Ganzarski of magniX, notes that jet fuel too "is very combustible. But just like there are safety precautions on how to store fuel and use fuel on aircrafts, there will be safety precautions on how to use and store batteries on an aircraft. And so that too will be certified and tested way before it flies with passengers."

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## HYBRID OPTIONS

Until someone solves the battery weight problem, most of the industry is betting for now on some middle-ground solution instead, combining [electric power](#) and traditional jet fuel. Analysts say some 200 hybrid projects are under development.

Some use electric technology for takeoff and standard fuel for cruising. United Technologies announced this week that it's aiming to have a "city hopper" regional passenger hybrid jet within three years that would save 30% of fuel that way.

That's also the idea behind Voltaero, started by a former Airbus technology chief, Jean Botti.



In this May 8, 2019, file photo, a Boeing 737 MAX 8 jetliner being built for Turkish Airlines takes off on a test flight in Renton, Wash. Boeing announced its first order for 737 Max jets this week since two deadly crashes of the jet, and says it is in discussions with several other customers around the world interested in the plane despite concerns about software implicated in the accidents. (AP Photo/Ted S. Warren, File)

Botti wants to see it enter in service by 2021 or 2022, and says they've had interest from operators in Scotland, Norway and Switzerland for regional jets.

"Pure electric airplanes can be nice for training pilots, a nice little toy I can play with. But when it comes time for commercial and you want to have some range, hybrid is the solution," he told The Associated Press.

Manufacturers are also looking at recycling fuels or mixing them—adding synthetic fuel or renewable biofuel to kerosene to reduce its carbon footprint—or using hydrogen, a far-off but increasingly talked-about option.

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## PAYING TO POLLUTE

The industry is also looking for financial ways to ward off regulators and retain environmentally conscious passengers.

A U.N.-driven system called CORSIA will allow airlines to buy credits to compensate for, or "offset," their emissions. But critics say CORSIA—or Carbon Offsetting and Reduction Scheme for International Aviation— isn't ambitious or punitive enough.

Germany's Lufthansa is among the airlines that let customers offset their flights by calculating how much damage they are doing to the environment and paying a voluntary tax.



The Fouga Magister performs a demonstration flight at Paris Air Show, in Le Bourget, north east of Paris, France, Tuesday, June 18, 2019. The world's aviation elite are gathering at the Paris Air Show with safety concerns on many minds after two crashes of the popular Boeing 737 Max. (AP Photo/ Francois Mori)

Lufthansa works through Switzerland-based MyClimate to calculate how much passengers should pay. But climate-savvy travelers note that Lufthansa charges less than MyClimate itself calculates, because it ignores an effect called "radiative forcing" that experts say doubles the climate impact of airline emissions at high altitude.

## REALITY CHECK

While the aviation industry is doing more than ever to lower emissions, at times it seems overwhelmed by the task, or unwilling to dramatically rethink the business.

Even if Europeans shun planes for cleaner high-speed trains, most U.S. travelers don't have that option, Asia's growing middle class will increasingly take to the skies, and low-cost airlines are making air travel ever more accessible.

"It's the grand challenge of our generation. I don't think we have the solution," said Paul Eremenko of United Technologies.

The airline industry has committed to halving greenhouse gas emissions by 2050 compared with 2005 levels. That's far short of the target increasingly set by governments and backed by scientists to almost eliminate emissions by 2050.

Boeing's Chief Technology Officer Greg Hyslop says the industry's own targets are a "very hard problem."





An Embraer Profit Hunter E195-E2 rolls on the tarmac at Paris Air Show, in Le Bourget, east of Paris, France, Tuesday, June 18, 2019. The world's aviation elite are gathering at the Paris Air Show with safety concerns on many minds after two crashes of the popular Boeing 737 Max. (AP Photo/Michel Euler)

"It's going to be an all of the above approach," he said. "Because we don't know how we're going to solve that exactly."

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