



A small Canadian airline using a 63-year-old seaplane is on the forefront of electric-powered flight

By **Ian Duncan**

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Running alongside Boeing, NASA and Uber in the race to launch electric planes is a small Canadian airline that has installed an electric motor on a 63-year-old seaplane.

This month, Harbour Air's modified de Havilland Beaver made its first flight above the waters near Vancouver, staying airborne for a few minutes. The feat prompted the airline to claim that it had conducted the world's first commercial electric flight.

It might seem a modest achievement in an era when jets routinely cross the globe, but Greg McDougall, Harbour Air's chief executive and the pilot on the maiden flight, said it's a big step toward a cheaper, cleaner and quieter future for aviation.

“There’s a whole bunch of advantages,” McDougall said.

Interest in electric planes has been growing in recent years, with established players and start-ups both undertaking projects and a group of U.S. senators backing more research and testing. The technology could open the door to new kinds of aviation businesses like airborne taxis and flying cars, while cutting flying’s environmental impact.

In late December, aircraft engine company Rolls-Royce unveiled a plane it hopes will break a speed record for an electric aircraft during a flight scheduled for late spring 2020. And NASA has announced plans to fly an electric plane later next year, part of a project to investigate the unique advantages of battery-powered flight and develop advanced technologies.

The challenges are immense, not least because today’s batteries can’t hold as much energy as oil-based fuels and manufacturing defects can cause them to catch fire.

But McDougall said his company's operations make them a good testing ground. Its seaplanes fly relatively short distances, and in the case of an emergency, they can land anywhere if they're over water.

"We're in this position where we're able to look at it a lot sooner than anyone else," he said.

McDougall said he began wondering about the possibility of an electric plane after getting a Tesla about five years ago. Then in February, motor company MagniX approached McDougall about trying to get a project underway before the end of the year — a tight timeline in aerospace.

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On Dec. 10, the Beaver took off, watched by crowds along the shore. McDougall said improvements in the plane's performance were immediately noticeable, and inside the plane, the racket from the piston engine — which required crew and passengers to use headsets to communicate — was gone.

"I'm really anxious to get back in the aircraft and do some more actual flying," McDougall said. "We didn't get a chance to put it through its paces."

The potential for electric aircraft to be much quieter than jets has drawn the attention of lawmakers, who regularly field complaints about noise.

In November, Sen. Ben Cardin (D-Md.) and several of his colleagues introduced legislation that would direct NASA to expand its research and provide six years of funding totaling \$1.2 billion. The proposal envisions planes approaching the size of a Boeing 737 coming into service by 2040.

Parts of the bill have been included in legislation authorizing NASA's operations for the coming years.

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“As air traffic volumes increase, so has exposure to noise and air pollution that has an adverse impact on our communities and environment,” Cardin said when the legislation was introduced.

“This has been a problem in Maryland, and it cries out for a long-term solution. We need to harness American ingenuity and find a new way to support our thriving aviation industry while addressing these concerns,” he said.

NASA's project involves a plane dubbed the X-57 Maxwell, the latest in a

venerable line of the agency's so-called X-planes and the first to carry a pilot on board in two decades.

Sean Clarke, the project's principal investigator, said NASA is looking to employ the technology in ways no other organization could, ultimately hoping to demonstrate a motor system that uses a fifth of the energy of a gas-powered engine.

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But to get there, Clarke said, "We're finding a lot of technology breakthroughs necessary."

The NASA team has already developed a battery setup that resists catching fire when there's a problem in one of the plane's 5,000 double-A-sized cells, consulting experts from the agency's space station and spacesuit teams for ideas.

Clarke's team plans to gradually incorporate more electric technology into the plane, a modified version of an aircraft built by Italian company Tecnam, flying an early version late next year. The final envisioned design would have 14 motors in all, including some almost at the tips of the wings, which is expected to dramatically improve the plane's

efficiency.

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Battery-powered planes are not likely to replace large airliners, but hybrid engine technologies could play a role on the biggest aircraft. Clarke said that even if batteries might not make sense for flights of over an hour, that still encompasses a lot of potential uses.

“This is a technology that may change the way people live their lives for the next 20 or 30 years,” Clarke said. “We’re very excited to be able to support that and help spawn this new industry.”

Among the possibilities are air-taxis and flying cars, small planes that would quickly speed people around large urban areas. The idea has led Boeing and Porsche to team up on creating a flying car for the rich, while Uber is pitching airborne taxis for the masses.

McDougall said his airline is effectively already in that business, carrying people around the Pacific Northwest from downtown Vancouver, Seattle and Victoria and the islands in between.

“We’re a big part of the transportation network,” he said. “People use us

the way they would the buses and ferries.”

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Quieter planes are less disruptive as they fly into waterfront areas that are now people’s neighborhoods, McDougall said, and if electric planes can help bring down his operating and maintenance costs, that could mean more customers.

The next step is for Harbour Air and MagniX to get the plane and motor certified by the Canadian government. Within two years, McDougall said, he aims to be carrying passengers.

“We’re very focused and determined on getting this done,” he said.

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