

WINGS

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Leading Edge: Flying Green

Co-operation, ideas, innovation and action



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The issue of green aviation is both very complicated and very simple. Obviously complicated because the scientific and technological background that underlies the discussion and solutions of greenhouse gas (GHG) and other emissions is entirely in the domain of specialized expertise; simple, because we are all aware that what we do when we are burning jet fuel, or aviation gas, is impacting the quality of the air. In the past, noise and low-level pollution near airports were aviation's main pollution concerns. Today GHG emissions top the list. (The earlier concerns have not gone away.)

The most straightforward response to GHG emissions comes down to decreasing fuel burn. That's simple because of its direct cause and effect dynamic. The less we fly, the less we pollute. It's also not very practical. Aviation is a pillar of international trade, communication and travel, with no slowdown of activity in sight. (One needs only to look at the economic impact of Iceland's Eyjafjallajökull volcanic ash fallout in Europe to see the devastation caused by weeks of not flying in parts of Europe.)

Aircraft engines produce fairly typical fossil fuel combustion. However, a substantial proportion is emitted at altitude and that exacerbates the impact. It was back in 1999 that the Special Report on Aviation and the Global Atmosphere was prepared for ICAO by the Intergovernmental Panel on Climate Change in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer.

That landmark report pointed out "that aircraft emit gases and particles which alter the atmospheric concentration of greenhouse gases, trigger the formation of condensation trails and may increase cirrus cloudiness, all of which contribute to climate change; and "That aircraft are estimated to contribute about 3.5 per cent of the total radiative forcing (a measure of change in climate) by all human activities and that this percentage, which excludes the effects of possible changes in cirrus clouds, was projected to grow."

For some years after the report, aviation felt that it was off the hook since at less than four per cent of the overall problem, its contribution was minimal. (Business aviation's global CO₂ emissions are approximately two per cent of all aviation and 0.04 per cent of global man-made carbon emissions.) Over the last four or five years that attitude has been completely reversed with almost all members of the international aviation community now showing unprecedented concern over the issue. Today, OEMs are investing in increasing fuel efficiency through more efficient engines, examining alternative fuels, and working on improving aerodynamic designs. Some of these projects will require decades of development.

What can be done in the near future is similarly of great interest. Great promise is being displayed with improved navigation systems designed to shorten flight routes and air traffic management that concentrates on more efficient air traffic flows. Major airlines such as Emirates, Singapore Airlines, American Airlines and Air France are testing environmentally friendly flights on long routes and the resulting fuel savings have been impressive. (In a recent test flight, Air France cut fuel burn by two to three metric tons gate-to-gate on a Paris CDG to Miami run.) But, there is no silver bullet and solutions lie in a myriad of innovations.

Here at home, NAV CANADA has taken a leadership role through its Collaborative Initiatives for Emissions Reductions (CIFER). It is focusing on efficiencies with a number of new programs. One such program is Required Navigation Performance (RNP).

Through the program, in collaboration with WestJet, NAV CANADA has implemented a number of "short turn" instrument approaches that include a constant descent. There are more than 100 approaches published for 20 airports. WestJet is now reporting that the majority of its approaches are RNP. Read more about this in James Marasa's article, "Rounding the Corners: RNP is revolutionizing the instrument approach," on page 27.

The issue of flying greener is at the top of almost everyone's list of concerns. It will be through the combined and ongoing efforts of all involved that aviation can continue to decrease its environmental footprint across Canada and the world.