

BY BRIAN DUBIE

I am a commercial airline captain. I am also Vermont's lieutenant governor, and I chair the Aerospace States Assn. With more than 20 years and thousands of hours of flying experience in both commercial and military aircraft, I know I speak for all pilots when I cite the great pride we take in operating our aircraft not just as safely as possible, but also as cleanly, and with the best fuel efficiency as possible.

In addition to being a pilot and lieutenant governor, I also own and operate a maple sugaring operation with my brother in Vermont. We depend on our 20,000 maple trees to produce an annual crop of the finest maple syrup in the world. In fact, my brother feeds his family of five with the yield from those trees. But in recent years, the effect of climate change on our trees has both of us concerned. Our trees depend on cold nights and warm days for their springtime sap run.

In all of my professional roles, I know we must all take the threat of climate change seriously. And I'm happy to say the aviation industry is taking aggressive action to respond to our world's long-term environmental and climate change challenges.

Commercial airliners today are huge. When you compare the size of a big jet transport to an automobile, it is easy to lose perspective. Today there are 600 million automobiles on the road worldwide, and that number is forecast to double to 1.2 billion in the next 30 years. The environmental impact of those 600 million vehicles greatly exceeds the impact of the world's 22,000 airliners. Those aircraft account for just 3% of the world's annual petroleum usage. They produce only 1.5% of the world's annual carbon dioxide (CO₂) greenhouse gas output. And modern aircraft are more than three times as efficient as today's average car, with fuel efficiencies of 67 passenger-miles to the gallon. The next generation of aircraft, like the Boeing 787, will increase fuel efficiency to 78 passenger-miles to the gallon, far exceeding any modern compact car on the market.

Although safety is my top priority, I also strive to fly my jet as "greenly" as possible. There are many things a pilot does to use less fuel and thereby produce less CO₂. I know that for every gallon of fuel I keep from burning (in my jet or in my car), I avoid producing 22 lb. of CO₂. When possible, we taxi on one engine; climb, cruise and descend at the optimum airspeed; and fly the best route at the optimum altitudes.

I regularly fly from Boston to Dallas and back. At certain times of the year, we fly into a headwind of more than 200 mph. caused by the jet stream. By changing course or varying altitude, we can avoid the jet stream and dramatically save on fuel. In the last year alone, the airline I fly for saved 100 million gal. of fuel (and avoided producing 2.2 billion lb. of CO₂) by running a smarter operation. The airline industry estimates that further operational improvements can bring an additional 2-6% in fuel savings with the corresponding reduction in CO₂ production.

Modern fleets are 70% more fuel-efficient than they were


40 years ago. Carbon monoxide emissions have been reduced by 50%, while unburned hydrocarbons and smoke have been cut by 90%. The aerospace industry is committed to further reducing the environmental impact of airliners. For example, General Electric is developing a new engine, the GENx, which will be far friendlier to the environment than today's engines. It is designed to operate at lower temperatures. As a result, it produces 30% less nitrogen oxide (N₂O) than the engine it will replace—just half of the levels that the latest international standards allow. GENx engines also will be 15% more fuel-efficient than current powerplants, further reducing CO₂ emissions.

On the airframe side, Boeing is designing a more environmentally friendly aircraft. To improve performance, Boeing has redesigned its next-generation aircraft to be produced from composites, not aluminum. The resulting aircraft will be lighter, stronger, and more comfortable. When the GENx engines are installed in the 787, the combined effect will be an aircraft that burns 20% less fuel, produces 20% less CO₂ and is much quieter.

But such breathtaking advances are only achieved through costly research and development. That's why it is critically important that the U.S. government invest in basic aeronautical R&D. Research programs now underway aim to achieve another 50% in fuel savings and an 80% reduction in N₂O by 2020. To ensure that these programs continue, Congress should move toward funding NASA at 1% of the federal budget.

Air traffic management system improvements have the potential to reduce fuel burned by another 6-12%. Modern aircraft are designed to operate at high altitudes and certain cruise airspeeds. When a pilot is forced to fly at a lower altitude, or ordered to fly in holding patterns at low airspeed for sequencing at an airport, enormous amounts of fuel are wasted.

Louisville (Ky.) International Airport has decided to find a better way of doing business. The FAA, working with airlines, has designed a continuous descent approach—air traffic procedures that significantly reduce noise and save up to 500 lb. of fuel per flight. But we need to modernize the air traffic system, using all available technologies. These upgrades would reduce jet fuel usage by 146 million barrels a year, in turn eliminating 57.5 million metric tons of CO₂ emissions per year. In 2007, Congress must reauthorize the FAA and ensure that the air traffic management system is upgraded to support air travelers and to keep our skies blue (see p. 24).

Finally, if aviation is to make operations even greener, we must inspire the next generation. We're doing that in Vermont at the Aviation Career Education Camp in Rutland. Young people there may someday be designing or flying hydrogen- or solar-powered zero-emissions aircraft. It is our responsibility to inspire and equip this generation to solve our future challenges with the same optimism, creativity and persistence that enabled Orville and Wilbur Wright to soar over the dunes at Kitty Hawk. 

Thinking Green In Our Blue Skies

