EUROCONTROL, EBAA and IAOPA

Yearbook 2009: the business of flying

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Cleaner fuel for General Aviation

Recession is temporary but the environment is forever. European General Aviation could easily reduce its negative impact on the environment but the pumps must first be primed with a new approach to taxation. **Brendan Gallagher** explains

"A hundred tonnes of lead enter the air every year because so few piston-engined General Aviation aircraft are using unleaded fuel"

2008 will be remembered by many aircraft operators as the year when a historically high spike in the price of oil drove some out of business – and called into question the future of the rest. But now, for the time being at least, the oil price is back below $50/barrel and another, more permanent, concern is coming to the fore again.

That aviation must do everything in its power to minimise its impact on the environment is no longer a matter for debate. Some of the leading airlines are pioneering the introduction of cleaner, non-fossil fuels. Jet engine manufacturers are vying with one another to not only meet, but exceed emissions targets. Even the piston-powered General Aviation (GA) community has a part to play, through the adoption of fuels from which lead and other pollutants have been eliminated.

Lars Hjelmberg has been interested in a cleaner, greener world for a lot longer than most people. Founder of Swedish fuel distributor Hjelmco, he developed an unleaded fuel for aviation piston engines in the 1970s and has been selling it and a successor product in Sweden for more than a quarter of a century.

He was impelled originally by a desire to eliminate one of the most harmful pollutants in standard Avgas (aviation gasoline). "Around a hundred tonnes of lead enter the air of Europe every year because so few piston-engined General Aviation aircraft are using unleaded fuel," he says.

The unleaded fuel that Hjelmco distributes across Sweden, and to a limited degree in a few other countries, has a medium-octane rating. But many engines need a higher rating, a demand conventionally met by 100LL (100/130-octane) leaded fuel. "We have flown a high-octane unleaded fuel meeting the 100LL standard and have tested its environmental qualities to the satisfaction of a European civil aviation authority," says Hjelmberg. "It also has a biological component – another of our strategic objectives is to make a fuel that's as close as possible to carbon dioxide-neutral."

So why isn't unleaded Avgas taking Europe by storm? Regulation, economics and politics all have a part to play in holding back the broad adoption of unleaded fuel by the European GA community, Hjelmberg maintains: "The certification process is complex, we're a long way short of the critical volumes of production that will yield a reasonable return for suppliers and attractive pricing for users, and there seems to be a lack of political will to facilitate a transition to unleaded."

Hjelmco certificated its medium-octane, second-generation unleaded fuel in 1991

and it's still the only one on the market. The company's high-octane product entered regulatory scrutiny at ASTM International, formerly the American Society for Testing and Materials, two years ago. The relevant standard, called D910, covers the existing approved grades of Avgas – grades 80, 90, 100 and 100LL – and is used by the FAA when it grants engine and airframe type certificates.

An ASTM technical committee is tasked with incorporating the Hjelmco high-octane unleaded fuel into D910. Despite the existence of a 400-page report from a major US airframe manufacturer backing the company's bid for approval, which would allow it to be used as a blanket substitute for 100LL, there is currently no published timetable for completion of this work.

Aircraft certification is also a significant hurdle. "Fuels have to be specified not only in the engine-type certificate but also in that of the aircraft itself," Hjelmberg explains. "But the majority of the aircraft in Europe certificated to use leaded fuel are in fact powered by engines cleared by their manufacturers for unleaded."

The answer, Hjelmberg maintains, is a change to the rules so that if an engine is certificated for unleaded the airframe should automatically have the same status. "The issue is understood by bodies like EASA [European Aviation Safety Agency]," he declares. But it is a question of jumping through more hoops.

The hard economics of fuel distribution also come into play. Currently, the vast majority of GA fields have a single fuel tank – for 100LL leaded Avgas. "In any future transition from leaded to unleaded there will be a need to supply both fuels simultaneously for a number of years," says Hjelmberg. "That will mean putting up a second tank at each field for unleaded. Not only would this be a significant investment, but the incumbent supplier would see a reduction in leaded consumption and would be inclined to cut his price to compete."

In this scenario, the incumbents would have a built-in advantage, explains Hjelmberg. "Their tanks and other equipment are already paid for, having been used for

"The European Commission allowed national governments to cut tax on fuel and car buyers enjoyed substantial tax discounts on new cars that could use unleaded"

20 years or more. So they would be in a better position to cut prices than a newcomer planning to build a new station for unleaded and pay for it from scratch."

Unleaded fuel is now commonplace on the world's roads, however, and Hjelmberg believes there is much to learn from experience in that sector. "When unleaded for cars was introduced in the 1980s there was a lot of government encouragement to get it out into the market," he recalls. "The European Commission allowed national governments to cut tax on the fuel, which gave garages an incentive to acquire the new facilities they needed, and car buyers enjoyed substantial tax discounts on new cars that could use unleaded."

On the face of it, there's no reason why similar measures, particularly in relation to tax, should not work in GA. Under European law, a minimum tax level is set for each class of goods, identified by its own 'statistical number'. National governments are free to impose a higher level of tax, but they may not go below the minimum. Two years ago a number of EU governments, together representing around 170 million people, said that they wished to be free to make their own decisions about taxes on Avgas.

The unleaded fuel community is still waiting for a response from the European Commission and for the 'statistical number' needed to identify unleaded Avgas as a separate product for taxation purposes.

This may well be a golden opportunity to enable Europe's private pilots to make their contribution to a greener world. ●