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Contents

New EU rules seen as too timid to reduce airport noise

New rules on aviation noise that are due to take hold across the European Union in 2016 fall short of what is needed to protect people living near airports, the leader of a leading civil action groups says.

[Heathrow Airport]

The EU's new regulation calls for creating a "balanced approach" to noise reduction, by encouraging the use of quieter aircraft, improving land-use planning around airfields, imposing quieter airport ground operations and - in extreme cases - limiting overnight flights.

But those who are fighting to reduce the racket at one of the world's busiest airports - London's Heathrow - say the regulation offers little relief. The law lacks binding noise reduction rules, they say, a criticism echoed by some of the noise regulation's early proponents in the European Parliament.

"Europe's gone the wrong way on aircraft noise," said John Stewart, chairman of the Heathrow Association for the Control of Aircraft Noise, or HACAN. "Until there is a definite target to be met, and a date by which that target has to be met, and legal limits, there really is very little incentive for airports or national governments to significantly reduce noise."

"They [Brussels decision-makers] certainly allowed themselves to be unduly influenced by the consistent and constant pressure that there was by the aviation industry," Stewart said in a telephone interview, though he conceded that "you can't set a tough target over night".

A bigger, quieter, Heathrow?

Located west of London, Heathrow is the world's third busiest airport by passenger numbers, and one of Europe's most important international hubs. Heathrow Airport Holdings Ltd., an international consortium that runs the airport, wants it to become even bigger. But past growth plans have been grounded by civil and political opposition.

In response to pressure both at home and from the European Commission, Heathrow has adopted a "balanced approach" to reduce its environmental impact. The airport fines airlines using noisy planes; 'names and shames' carriers in a quarterly ranking of their noise impact; and sets some limits on nighttime flying. Its Noise Action Plan offers a home insulation scheme for eligible residents, and today's Heathrow managers are credited with being more receptive to community concerns that in the past.

In May, Heathrow presented a revised plan for a long-sought third landing strip with a promise to gradually slash noise to the lowest levels in 40 years. The proposal is now being reviewed by the Airports Commission, a government body set up to address the needs of a growing industry, while also satisfying residents' concerns about pollution and annoyance.

Supporters say the need for a new

Continued on Page 2

Continued from Page 1

runway is vital to economic development, meeting 21st century demands for flying, and accommodating big aircraft. It would be the second runway capable of handling transcontinental jetliners built in the United Kingdom since the Second World War, according to Britain's Civil Aviation Authority, a regulatory body.

"We have worked closely with local residents, listened to their concerns and improved our plans," John Holland-Kaye, the airport's new chief executive, said in announcing the "improved expansion proposals" on May 13.

In another bid to clinch approval for a bigger Heathrow, two leading business groups, London First and Let Britain Fly, have called for creating an airport noise ombudsman with the power to arbitrate disputes. The proposal gained political muscle in June, when 34 members of the House of Commons, led by Labour MP David Lammy, backed the ombudsman for Heathrow.

If the ombudsman proposal takes hold, it would a notable exception in the EU's 28 states - and possible model for others to follow. Only France has a similar intermediary for its biggest airfields - the Autorite de Controle des Nuisances Aeroportuaires.

"An independent ombudsman would make sure that all airlines fulfill their obligations. It would give local communities the assurance that someone is looking out for them and policy makers a source of objective information on which to make their decisions," Baroness Jo Valentine, who heads London First, said in advocating an ombudsman last November in a bid to find a compromise in the Heathrow expansion debate.

Civic groups support noise czar

Hacan's chairman concedes that both the airport and its supporters are becoming more sensitive to civic concerns. "There are people within Heathrow who are genuinely trying to find ways of reducing the impact of noise and reducing the impact of the aircraft," said Stewart, who lives on the flightpath to Heathrow.

While supporting the move to create an independent noise czar, Stewart does not see it as the end game. He points to the lack of agreement on how many people are directly affected by Heathrow's clamour. European Commission figures put the number at 725,000, while the airport uses the more modest estimate of 275,000.

He also fears that the ombudsman could provide cover for a third runway at Heathrow at a time when the Airports Commission is weighing the airport's expansion plans ahead of a final recommendation that is expected next year.

"I am not under any allusions why they are listening to us more. It's because they desperately want to get a third runway in place, and the last time round they tried, they antagonised everybody. This time, they've got to try to be seen as taking on board our concerns about noise," Stewart said.

Hacan also insists on being an equal partner in any discussions about creating a noise czar. "We are not just coming on board as a passenger in the back seat, who puts up his hand every now and then because he wants to go to the toilet," Stewart said.

As aircraft become quieter, health concerns about noise grow louder

Millions of urban Europeans are exposed to aviation noise that contributes to stress, high blood pressure and even weight gain, say health specialists who want stronger measures to make flying quieter.

While new-generation jet engines are on average 75% quieter than than their 20th century predecessors, the advance in technology has been offset by a steady rise in flights and a demand for bigger passenger planes.

Stephen Stansfeld, a noise expert who heads the Centre for Psychiatry at Queen Mary University of London, says there is little doubt that "repeated and prolonged exposure" to the commotion of aviation is linked to heart and blood pressure problems, and can cause diminished learning in children.

People's annoyance with air traffic also seems to be rising, "and it's not entirely understood why that should be, whether it is greater sensitivity to airport operations, or whether it's due to the fact there is more change around airports in terms of noise exposure which could sensitise people," Stansfeld told EurActiv in a telephone interview. "The noise level from individual aircraft has gone down, but of course there are many more of them."

Marie-Eve Héroux, technical officer on air quality and noise at the World Health Organization's Centre for Environment and Health in Bonn, points to "significant research" into the health impact of transportation noise in general. As examples, she cites sleep disturbance, annoyance, cognitive impairment, ringing sounds in ears, as well as a rise in cardiovascular diseases, hearing impairment and adverse birth outcomes.

"Compelling evidence points at a significant burden of disease from noise and provides convincing arguments for strong action to properly manage noise sources, including aircraft noise," she told EurActiv in an e-mail.

Medical researchers at the Karolinska Institutet in Stockholm added weight gain to the potential impact of noise on public health. In a study of people living near the Swedish capital's Arlanda Airport, the research team found that prolonged exposure

Continued on Page 3

Continued from Page 2

to aircraft noise caused a "statistically significant" increase in waist sizes.

New noise regulations

Policymakers have not been deaf to public health concerns. A new EU law (Regulation 598) is due to take effect on June 13, 2016, putting the EU in line with the International Civil Aviation Organization's "balanced approach" to reduce noise by encouraging airlines to capitalise on a new generation of quieter engines, improving airport planning and - as a last resort - imposing restrictions on night flights.

It remains to be seen how effective those measures will be.

Civic groups have expressed dismay that the EU did not set verifiable reduction targets or impose bans on nighttime operations, and continue to make their own noise. This spring, for instance, landing patterns over Brussels became a hot potato in parliamentary elections, while protesters held their 100th demonstration at Frankfurt Airport, accusing Europe's third largest aerodrome of harming neighbours' health and demanding measures to reduce noise levels.

Roads and rails make noise, too

Yet aviation alone is far from a lone culprit in transport noise pollution.

Overall, annual noise pollution from roads, rails and runways erase one million years of healthy living among urban residents of EU countries, and that may be a conservative estimate, according to a 2011 study by the World Health Organization (WHO) and the European Commission's Joint Research Centre (JRC).

The UN body uses a disability-adjusted life year - the gap between current and ideal health conditions - to measure environmental impacts on humans. When it comes to noise-induced problems from all forms of transporation, it calculates that 903,000 years are lost to disturbed sleep, 61,000 to cardiovascular disease, 45,000 to learning impairment in children, and 22,000 to tinnitus - or hearing-related problems.

The WHO-JRC study showed that about half of Europe's 285 million urban dwellers were regularly exposed to traffic noise above 55-decibels (dB) - a level WHO considers to be unacceptably high. That compares to five percent (14.3 million) for rail and four percent (11.4 million) for air traffic. More conservative industry estimates put the latter figure at closer to 3.5 million.

Still, a far higher percentage of people complained to the WHO-JRC researchers of being "highly annoyed" by airport noise, consistent with the findings of leading academic studies on noise pollution and particularly on the nighttime disturbances that trigger the biggest concerns.

WHO guidelines set 40 dB as the recommended nighttime outdoor target "to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly." The health organisation says 55 dB "is recommended as an interim target for the countries where the [nighttime guideline] cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach.

Making peace

Driven by confrontations with angry citizens, bad press and legislation, airports and airlines have taken steps to reduce their noise footprint. London's Heathrow has instituted a Noise Action Plan and public outreach programme that have won kudos even from traditional critics. Copenhagen's airport has imposed requirements on airlines - including restrictions on engine use during taxiing and requiring parked aircraft to connect to ground power rather than use onboard generators - steps designed to reduce noise and air pollution.

Meanwhile, airlines are investing in flying machines with quieter engines, components and aerodynamic features. The shift is not purely altruistic, though - planes that are quieter to operate also tend to gulp less fuel.

Queen Mary University's Stansfeld acknowledges that aircraft are becoming quieter and that airports are more accommodating to complaints. Yet health problems associated with aviation noise have not declined and - alluding to the controversial plans for a third runway at London Heathrow - he says public health may be taking a back seat to economics.

"It seems to me the economic considerations - rightly or wrongly - are predominating at the moment and the environmental considerations take rather a second place," he said, while pointing out that jobs are important too. "Obviously [there are] positive effects on health from full employment and airports do provide full employment or at least a very good source of employment."

Finding a balance between healthy people and a sound economy aren't simple, he says. "Ultimately, what one is hoping is that there will be much quieter aircraft."

Small is beautiful: How a tiny device cuts aircraft noise

The name - vortex generator - sounds more complex than the device itself. Yet the small component developed by German researchers provides a big solution to noise produced by one of the most widely flown passenger aircraft.


[Photo courtesy of Lufthansa]

Under pressure from airlines and new regulations, aircraft manufacturers are locked in a fierce competition to produce planes that are easier on the ear and the environment. During rollouts of new or revamped models of engines and aircraft at the Farnborough International Airshow this week, manufacturers are touting new or updated commercial products billed as the cleanest and quietest ever.

The vortex generator, however, required no big shift in technology or major manufacturing investment. Developed by the German Aerospace Centre, or DLR, the device diverts wind from vents on the underside of wings on the Airbus 320. It reduces the sound radiating from the aircraft in its clean configuration, just before the landing gear and flaps are deployed for landing.

For Jan Werner Delfs, who heads DLR's Department of Technical Acoustics, the A320's noise is like the sound produced by blowing across the opening of a beer bottle, though at many magnitudes of difference. In the airplane's case, the whistle occurs when air passes over circular openings used to equalise the pressure in fuel tanks mounted inside each wing.

"If you listen to landing aircraft you can always say this is an A320," Delfs explained in a telephone interview from the northern German town of Braunschweig. "You believe those tones are coming from the engines, but they are really coming from those holes."

'Very annoying' tone

The DLR attached a 5-cm triangular piece of aluminium sheet metal upstream of the two vents on each wing, in order to divert the air flow and stop the whistle. A decade of research went into the vortex generator, which stems from efforts to mask a similar whistle produced when air blows over the gun ports of warplanes.

"You will certainly very much notice the difference," Delfs said, noting that it knocks about six decibels off the sound contour of the A320. "It's not only the question of decibels, by the way. It's also a question of the kind of sounds and tones, (which) are usually perceived as much more annoying than some featureless noise without tones. If you have a rushing by of something, it's not very annoying, but if you have a distinct tone, it's very annoying. So it's not just the decibels, its the way [the noise] is perceived."

This year, Germany's Lufthansa began installing the device on more than 150 A320s and its sister models, the A319 and A321, and announced that it was deploying new aircraft with the device pre-installed. The airline - Europe's second carrier in passenger numbers - said it was part of its overall scheme to make airplanes quieter.

A Lufthansa spokesman told EurActiv that the noise appears to affect only the Airbus line of single-aisle jets. He said the airline was spending "a single-digit million amount" to retrofit its fleet.

An Airbus spokesman at Farnborough said the device is available as a retrofit on its aircraft and is already being installed on new-model A320s. Other Airlines, including Air France, have announced that they are installing the sound-reducing component on the affected Airbus aircraft.

Investing in the future

Both airline and components manufacturers are rolling out other technologies that reduce both noise and air pollution. The world's dominant aircraft manufacturers, Airbus Group and the Boeing Company, are competing with each other at this week's biennial Farnborough trade show to announce new or revamped aircraft that are billed as quieter and offer better fuel efficiency.

Boeing, for instance, announced a stretch version of its signature 737 line -

Continued on Page 5

Continued from Page 4

the 737 Max 8 - that it says is 20 percent more fuel efficient than its Next Generation 737, which it previously sold as one of the most efficient mid-size passenger jets. Airbus, meanwhile, announced a revamp its long-range 330 jet, promising a 14 percent reduction in fuel consumption over its predecessor.

Both airlines say these aircraft combine new engines and aerodynamic features to make their airlines quieter as well as cleaner on the environment.

Aviation engineers say today's newest engines are on average 75% quieter than those produced just a few years ago, and one engine expert told EurActiv the race is on to make the aircraft body itself quieter.

"Before, the designers of the airplane hadn't had to worry to worry about noise very much because the airplane noise was buried by the engine noise - was overwhelmed by the engine noise," said Alan H. Epstein, vice president for technology and environment at Pratt & Whitney, the Connecticut-based aircraft engine manufacturer. "And now the engine people have cut it down to about equal and the next generation of engines will cut it down still more. That leaves the airplane people exposed - they have to get to work, and they are starting to, to reduce the airframe noise."

New EU regulation

Yet even as planes become quieter, the steady growth of air traffic means noise remains a political bombshell in Europe, which leads the world in noise-based flight restrictions. EU states are obliged to limit noise around airports under a 2002 regulation, and the European Parliament and Council approved on April 16, 2014 new aviation noise rules (Regulation 598). The new regulation, which is due to take effect in 2016, puts the EU in line with the International Civil Aviation Organization's "balanced approach" to noise reduction through measures such as requiring the use of modern aircraft, quieter ground-control operations and - as a last resort - restrictions on nighttime flying.

Still, it could take years for new technology and policies to pay off. More immediate solutions might be found with relatively simple developments, like the vortex generators.

"This tone problem and the vortex generator is rather exceptional," said Delfs of DLR's Department of Technical Acoustics. "It's an exceptionally simple means to get rid of this noise."

Other noise-reduction efforts may be far more complex and take longer to develop, he said. "At the moment, we are at a stage where any further decibel reduction takes a lot of effort because today's aircraft are [already] relatively silent."

Jet engine executive: industry racing to reduce fuel use

While global talks continue on a possible market-based approach to reduce aviation carbon emissions, jet engine manufacturers are "running as fast as we can in order to reduce the fuel burn", said Alan H. Epstein, stressing that engines are growing quieter and more efficient every year.

Dr. Alan H. Epstein is vice president for technology and environment for Pratt & Whitney, the Connecticut-based aircraft engine manufacturing division of United Technologies Corp. This is an excerpt of a telephone interview with EurActiv ahead of the Farnborough International Airshow, 14-20 July.

Alan H. Epstein [Pratt & Whitney]

New aircraft engines are significantly quieter and use far less fuel than their predecessors. This generational change in technology is good for the environment, good for airlines. What is the next big leap in technology?

In the broadest possible terms, what enables us to jump in fuel economy and noise reduction is putting very large, very low-speed fans on the front of engines. Your house fan will pump more air if you turn up the speed but it makes a lot more noise. It's also less efficient. So if you want a lot of air at low speed then you need a bigger diameter fan. And the future will be the fans [on engines] getting even larger and larger.

Not the next generation, but the one after it, there is a conundrum that they won't fit on the airplane anymore. There are two obvious solutions. One is airplanes that don't look like today's airplanes. That is, you could say that all of today's airplanes look like the directly lineal descendants of the 707 [Boeing's first commercial jetliner that made it debut in the 1950s]. There are lots of other concepts out there, some of which look very attractive and these would enable you to put larger diameter engines on airplanes.

So that's one path. The other path

Continued on Page 6

Continued from Page 5

is that I need area, not necessarily size. Today's paradigm is airplanes with two engines on them. I could go to more engines - four or six or eight - and have the same total area but smaller in diameter. So … one solution is to go retrograde … just like automobile styles go in and out of fashion, although the insides of the automobile continues to evolve technologically but their designs, they look retro.

The other thing about the noise … noise is getting tough and here's the reason: On the new Pratt PurePower [PW1000G] engines, on approach [to the airport], the engines don't make any discernible noise. In other words if you turn the engines off on approach to landing, the people on the ground wouldn't hear the difference because now the engines make less noise than the airplane. And the next generation will probably drop the engine noise on takeoff to the same level.

So that's another motivation for thinking of new airplane design. Before, the designers of the airplane hadn't had to worry to worry about noise very much because the airplane noise was buried by the engine noise - was overwhelmed by the engine noise. And now the engine people have cut it down to about equal and the next generation of engines will cut it down still more. That leaves the airplane people exposed - they have to get to work, and they are starting to, to reduce the airframe noise.

We've reduced both of them dramatically [engine takeoff and landing noise] but certainly the next round will focus more on takeoff than on landing.

Prompted by the European Union's emissions scheme, the International Civil Aviation Organisation, or ICAO, is talking about ways to control carbon emissions. But if engine efficiency improves at say 1.5 percent every year, and the number of flights is growing at 3 or 4 percent - and I am using industry figures here - that's a big gap that still means a rise in carbon emissions. What is your estimate on when that gap will close?

Just set the record straight a little. The airplane in total - the engines plus the airframes - improve about two-and-a-half percent a year. They're not going to improve any faster. There's only two ways of making up the gap, assuming that aviation continues to grow. There's a technical solution and there's a political solution and it's not an either or. The technical solution is to use low-carbon fuel. We've demonstrated, as an industry, that you can make a manmade low-carbon fuel and put in existing airplanes …

A simple solution - simple in words and not that easy to do - is biofuels. But they have to be sustainable biofuels and sustainable means they don't interfere with food supply and water and things like that. We know that's technically feasible because Pratt & Whitney has approved several biofuels for use in its engines and there will probably another five more in the next two years. …

The big change is that the first biofuels used vegetable oil and the newest ones are using cellulose. So in other words instead of using corn you use the corn stock, or the leftover waste in a lumber mill or paper mill or even industrial waste.

You're talking about mixing biofuels with regular jet fuel, not running engines on 100 percent biofuel?

The reason for that in general is just for conservatism. In other words, there isn't enough biofuel to make any economic difference whether you do 100 percent biofuel or 30 percent or 50 percent. But since all of our experience - billions of miles of commercial jet flight is based on petroleum - we the industry thought it was wisest to say, let's get experience at 50-50 and then as it becomes necessary, as we have that experience - and the experience is all about safety - then we'll up the percentage. …

About the gap between fuel efficiency and aviation growth - it is the same for noise, isn't it? Quieter aircraft, but more of them crowing the skies around airports?

There are two issues. One is how quiet do you have to be before the community stops complaining about airplane noise? If I were standing on the street here outside the hotel [in London] and an airplane flew over, and I couldn't hear it because it was quieter than the noise on the street, that's probably how quiet you have to be. If people can hear it at all, they are going to complain. …

A modern airplane is now about the same noise level as a high-speed train. There was a joint study by MIT [Massachusetts Institute of Technology] and Cambridge University on virtually silent airplanes and that indicated that it might be feasible to consider building an airplane that was below the noise level of the urban environment. The hard part was not the engines, it was the airplane.

You sit on an airplane, especially if you are sitting near the wing as you approach landing, you can hear the noise - as the flaps go down, it gets noisier, and then the landing gear go down and the plane gets noisier. So the airplane people need to work on getting [this] noise out. And the university research pointed out some of the challenges and what some of the solution paths might be. There wasn't much motivation to do that until now because now the engines are so quiet it's exposed the airframe noise sources.

Europe has been the trend-setter on aviation emissions. But some critics would say market-based measures are not enough - that taxing carbon consumption would spur airlines and their suppliers to become more innovative much faster. What do you think?

I don't understand the distinction. In other words, a market-based measure to me is another form of tax. Whether I tax fuel or have market-based measures that

Continued on Page 7

Continued from Page 6

make me go out and buy carbon credits proportional to the amount of fuel I burn, it still increases the price of fuel. So I don't see that there is much difference, other than if you tax the fuel you know exactly what the tax is [while with] the market-based measure … the laws of unintended consequences are probably stronger there.

On a widebody airplane now, the fuel is more than 50 percent of the cost of operating the airplane. We're sort of running as fast as we can in order to reduce the fuel burn. …

The world has agreed that there are going to be market-based measures and that they should go through ICAO, and ICAO is very actively trying to put together a set of market-based measures. Some of the challenges are pretty obvious. One is … the common but differentiated responsibilities for third-world nations, then you have some of the smaller nations whose economies are immensely dependent on air transportation, for either tourism or exporting of goods, and they don't want to slow down their economic development. Whereas [for] the developed nations, it would be less intrusive part of the economy.

So it will take time to come to some agreement, as does with anything that has 198 nations associated with. But the industry is behind it.

Aviation group pushes for 'level-playing field' on alternative fuels

A leading British aviation group Wednesday (16 July) called for immediate action to develop alternative jet fuels while seeking to skirt the controversy that has forced the European Union to reconsider biofuels targets for motor transport.


[Timothy Spence]

The Sustainable Aviation Council urges a mix of government regulatory action and private investment to produce alternatives to petroleum, saying biofuels could contribute to the EU's climate policy goals, and fulfill the industry's pledge to halve its carbon emissions by 2050.

"The most critical period in terms of developing alternative fuels is now," Jonathon Counsell, chair of Sustainable Aviation and the head of environment at British Airways, said at the Farnborough International Airshow in England. The trade group released a paper - "Fuelling the future" - that says developing new sources for jet fuel "will create jobs, increase fuel security and establish the UK as a centre for sustainable aviation fuels".

The group calls for some $6 billion (€4.4 billion) in investment over 15 years in the refining capacity of Britain alone, to produce liquid energy from agricultural waste, fermented sugars and other sources that could be mixed with conventional fuels.

In comments to EurActiv, council members also urged all EU governments to "level the playing field" by extending to the aviation industry incentives such as those now given to support alternative power for ground transport. They also urged additional emphasis on electric mobility, in order to free up refining capacity for alternative airplane fuels.

EU goes in reverse on biofuels

Although shown to lower carbon dioxide and other harmful emissions from engines, traditional biofuels are politically explosive. Biofuels have been blamed for food shortages and price spikes, deforestation and land degradation.

During a round of spiralling food prices in 2012, a top UN human rights official urged both the EU and United States to scrap their subsidies for biofuels, citing their impact on food supplies, particularly in developing nations.

Mounting criticism prompted the

Continued on Page 8

Continued from Page 7

EU to reconsider its 10% biofuel target in ground transportation by 2020, although national energy ministers and the European Commission differ on how much to cut the target.

In a bid to skirt the food-versus-food debate, the Sustainable Aviation Council's "Fuelling the Future" paper calls for the development of energy sources that do not compete with food supplies, contribute to tropical deforestation or harm biodiversity. It also seeks public input before developing a carbon-reduction "roadmap".

"There is a lot of criticism around the issue of biofuels," Counsell told journalists. "We are very aware and cognisant of that issue. This is a very live issue around the world, particularly here in the EU."

Price, supply concerns

Airplane fuel prices have remained volatile since they hit historic peaks in 2008, with recent spike driven by unrest in Iraq and Libya. Airlines are pressuring their suppliers to rethink the need for improving the efficiency of current aircraft, as well as exploring the development of alternative fuels.

Jet fuel accounts for 40 to 50% of airline operating costs, up from single-digit figures a generation ago, industry officials say.

European carriers are particularly sensitive to fuel price spikes, because of narrower profit margins due to labour and fuel costs that are typically higher than the rest of the world. Throwing a bone to struggling airlines, EU leaders late last year shelved a planned import duty on jet fuel less than a month before it was to go into effect.

The Council said allowing the 4.7% tariff to take effect under a new duty scheme "would likely cause an increase in the price of jet fuel in the EU" at a time when European leaders were focused on economic growth and many European carriers were struggling to break even.

European carriers suffered the sharpest operating losses in the first quarter of 2014, losing $1.91 billion compared to an industry profit of $1.9 billion in North America, International Air Transportation Association figures show.

"Fuel efficiency is the Number One challenge," Randy J. Tinseth, marketing vice president for Boeing Commercial Airplanes, told EurActiv in an interview at Farnborough. "We need to do better at what we do by working on sustainable fuels and improving fuel economy."

The aviation industry has used this week's trade show in Farnborough to strut out new or revamped models of aircraft they claim are "greenest" ever.

"This is one of the very rare win-win situations," Kevin Morris, aviation and environment manager at ADS, a trade group representing Britain's aerospace industry, told EurActiv ahead of the Farnborough airshow. "It doesn't matter for what reason you are reducing the fuel use by the aircraft or by any other mode of transport. At the end of the day that reduces the amount of carbon monoxide and other emissions into the atmosphere, so it has an environmental benefit as well.

"Just doing it for environmental reasons alone is the wrong way of looking at it. It helps with the bottom line itself," said Morris, who is also on the board of the Sustainable Aviation Council in Britain that published the "Fuelling the Future" paper.

Alternatives: A drop in the tank

But sustainable fuels are a long way from addressing either environmental or economic concerns. Biofuels remain largely experimental in aviation, despite their growing use as additives in automotive fuels.

E4Tech, a Swiss energy consulting group, estimates that non-petroleum jet fuel will account for less than 1% of jet fuel by 2020 – the year the global aviation industry has committed to achieve carbon-neutral growth – and 3.1% under the most optimistic projections by 2030. Still, the group estimates that alternative fuels could reduce aviation's greenhouse gas emissions by up to 24% by 2050. The industry wants to cut its emissions to half the 2005 levels by mid-century.

ICAO under pressure to forge deal on aviation emissions

The failure to clinch a global deal within two years on reducing aviation greenhouse gas emissions could pave the way to a patchwork of regulations that would harm airlines and the environment, analysts say.

Aviation industry representatives and environmentalist tell EurActiv that there is no time to waste in reaching a global deal to create a market-based scheme to mitigate carbon dioxide (CO2) emissions and a CO2 standard for aircraft. Years of fumbling by the International Civil Aviation Organization (ICAO) mean that a global framework will not be agreed before 2016, leaving a small window for full implementation before the target deadline four years later.

The absence of an agreement at the ICAO's next assembly in Montreal in 2016 could trigger the European Union to reimpose its now-frozen emissions scheme on foreign carriers operating at EU airports. Also by that time, the US environmental agency will have decided whether aviation emissions pose a threat to public health and should be regulated.

'In limbo'

Environmental groups have long

Continued on Page 9

Continued from Page 8

[Timothy Spence]

complained that the ICAO, the de-facto global aviation regulator, has failed to follow through with recommendations outlined under thee 1997 Kyoto protocol to develop measures to control greenhouse gas emissions produced by aircraft. Transport and Environment, an environmental pressure group, called the years after Kyoto "the lost decade" because of ICAO's hedging on setting global emissions standards.

European industry officials have also privately expressed concern that the absence of an ICAO framework hurts airlines, especially those based in the EU, which currently has the only binding policy to control aviation carbon output, the emissions trading system, or ETS.

"We've been in limbo for a long time," one airline executive familiar with the ongoing ICAO talks told EurActiv at the Farnborough International Airshow in England, adding that the international delay in setting standards contributed to the EU's move to develop its own measures.

"Aviation is a global business and emissions are a global issue. We can't operate with a patchwork of regional laws and regulations," said the executive, who spoke on condition of anonymity, citing his industry's observer status in the ICAO negotiations. "To be competitive, there cannot be one standard for Europe and a lower standard for someone else. We either operate under a common rule book, or we're going to see a level of confusion that hurts us financially and certainly does no good for the environment."

Another industry official also pressed for a global agreement sooner than later, saying "regional measures detract from the market". The EU's initial inclusion of foreign airlines operating in European airspace under the ETS triggered an international furore, with threats of retaliation from key business partners, including China and the United States. "It was tantamount to a trade war," said Kevin Morris, aviation and environment manager at ADS, which represents Britain's aerospace industry.

Officials at the ICAO's Montréal headquarters did not respond to questions on the status of the talks. The ICAO's 191-member decision-making assembly only meets every three years. Recommendations from its working groups are due next year.

Continued on Page 10

Continued from Page 9

US may impose its own standards

The EU ETS originally applied to industries and utilities, and took effect for airlines on 1 January 2012. The system initially imposed a cap on carbon dioxide emissions for all planes arriving or departing from EU airports, while allowing airlines to buy and sell "pollution credits" on the bloc's carbon market to reward low carbon-emitting aviation.

EU leaders agreed to suspend the application of the rule to foreign carriers. The European Parliament agreed a compromise deal on 4 April 2014 that extends the freeze through 2016.

In a victory for environmental groups, last month, the US Supreme Court upheld the Environmental Protection Agency's power to regulate carbon emissions under the country's landmark Clean Air Act. Irene Kwan of the International Council on Clean Transportation, a research organisation based in San Francisco, told EurActiv that the ruling positions the agency to determine whether aviation emissions have an impact on public health. If such a determination is made, as is expected in the coming months, the agency could order remedies such as carbon-performance standards on aviation fleets, or emissions rules on jet engine manufacturers. The EPA currently only regulates aviation nitrogen emissions.

Such a move would put the United States - which formally opposed the extension of the EU ETS to international carriers - in the position of pursuing policies that could conflict with ICAO standards. Under the Clean Air Act, the EPA has broad independent power to impose regulations.

Dan Rutherford, an aviation expert and Kwan's colleague at ICCT, has warned that if "ICAO cannot develop global measures fast enough, or ambitious enough, to address aviation emissions growth, those regional measures might again come front and centre".

ICAO's two-part mandate

It remains to be seen what approach the ICAO will take, even if an agreement can be reached amongst its 191 member states. It's two-part mandate - setting emissions standards for aircraft, and creating market-based system to reduce emissions - is being hashed out by working groups representing the governments, the aviation industry and NGOs.

Kwan, the ICCT researcher, said it was crucial that the emissions targets for airplanes apply to more than just future aircraft. "We're pushing for a standard that would also cover current, in-production aircraft versus just new, clean-sheet, in-design aircraft," she said in a telephone interview.

In the meantime, environmental groups worry that pressure from emerging economies, and some industry groups, will lead to a timid, market-based system. One possible compromise would be foregoing a cap-and-trade system like the EU ETS - which sets an overall cap on emissions - for a credit-based scheme, where a business-as-usual baseline is set and airlines could score credits for exceeding the baseline. The latter approach might appease developing and emerging nations opposed to burdensome measures, but is seen as less of an incentive for airlines to change.

Industry's voluntary action

The industry has already made voluntary commitments to improving their environmental footprint. The Association of European Airlines, a trade group representing some 30 companies, aims to reduce emissions through the development of "state-of-the art aircraft and engines, of operating measures to reduce fuel consumption in flight, and through better use of its infrastructure and facilities: airspace, airports and air traffic control."

In addition to these goals, the International Air Transport Association (IATA), another trade group, has committed to carbon-neutral growth in the commercial aviation industry by 2020 and supports reducing net aviation carbon emissions of 50 percent by 2050, relative to 2005 levels.

Last year, the IATA prosed a credit-based, carbon-offset system whereby air carriers or individual countries would have to buy credits to cover each tonne of carbon emitted over a baseline recommended by ICAO.

Whatever emerges from the next ICAO assembly, the EU gets at least some recognition for compelling the UN body to act.

"The EU got ICAO to take emissions seriously and deserves credit," said Morris, who is also on the board of the UK Sustainable Aviation Council. "At least people are talking about it, which wasn't the case in the past."