

Conclusions and recommendations from the aviation environmental committee

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**Summary by Professor Lars B Johansson, Chairman of the
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According to new forecasts, the role of aviation in Swedish domestic travel is diminishing, while the role of international aviation is expected to grow in importance as globalisation increases. Many of the aviation stakeholders, e.g. politicians, the industry, "the Swedish people" and others, do not question the benefits that aviation contributes to Swedish society, but the environmental costs of those benefits is coming under scrutiny. The aviation industry cannot rely solely on aviation becoming part of the European trade in carbon dioxide (CO₂) emission rights from 2011, other steps need to be taken before then. The industry must accept and be prepared for the cost, the very extensive cost, of maintaining and strengthening the confidence of its stakeholders, something which must also include confidence in handling the climate issue.

At present, the climate issue is one of the dominating aspects of politics, media and public debate. Just as all other human activity, aviation affects the surrounding world, the environment and the climate, in various ways. The aviation industry therefore must admit – and not shy away from – this fact. Aviation also needs to be placed in a systemic context that highlights the environmental and climatic impact of aviation in relation to other modes of transport. In all probability, the only option at present is to use the figures from IPCC¹ as a basis for a discussion about how aviation can live up to the so-called sustainability triangle².

Industries react and mature in a similar pattern as their stakeholders place greater demands on them to assume responsibility for various negative external effects – and the aviation industry is no exception. If the aviation industry wants to be a mature industry with proud employees and a good reputation, it will require a shift in focus from playing down the problems to coming up with new proposals, based on established views like "the polluter pays" and "the precautionary principle". Anyone who causes an environmental problem must pay to solve it and not let someone else foot the bill.

Therefore, the aviation industry stakeholders in all parts of society must be proactive and both describe the problems as well as present their own solutions to them. A close collaboration must be established between the various modes of

¹ IPCC = Intergovernmental Panel on Climate Change, <http://www.ipcc.ch>

² The term sustainability triangle comes from the UN report, "Our common future" from 1987, which was produced for the UN environment and development conference in Rio de Janeiro 1992. The report, also known as the Brundtland report as the commission that produced it was chaired by Gro Harlem Brundtland, defines sustainable development as something that "... meets the needs of the present without compromising the ability of future generations to meet their own needs".

Sustainable development consists of three interdependent parts:

- Ecological sustainability, which is about long-term preservation of the production capacity of the water, the soil and the eco-systems, and to reduce the environmental and health impact to what those systems can handle.
- Social sustainability, which is about building a long-term, stable and dynamic society where the basic human needs are met.
- Economic sustainability, which is about sparing the human and material resources in the long term.

transport and other parts of society in order to create the conditions for tackling this challenge jointly.

The aviation industry must also stop considering itself as unfairly treated in relation to other modes of transport. Aviation is there to serve society, not vice versa. If you are part of society, you must also be prepared to shoulder the responsibilities as a citizen of that society.

A solution to the environmental problems of aviation – particularly those concerning the climate – requires further research. This should not stop us from as soon as possible implementing the measures that are already possible. In the short term, financial incentive is the only method that will create quick results. Technological breakthroughs and implementation, improved fuels and more effective air-traffic control, as well as “eco-driving” must also be introduced as they become available. Under no circumstances should the aviation industry resort to the tactic of “wait-and-see”.

Aviation developments have long been about energy efficiency. Now that climate impact provides a new impetus, this striving for energy efficiency has laid a good foundation for future progress. Technologies enabling lower weight and less air resistance as well as more efficient engines all interact to reach ACARE’s³ goals of halving fuel consumption by 2020. More efficient design of the fuselage, wings, engines with higher pressure and flow, can still represent continuous improvement. However, the growing impetus for change will lead to a higher innovation pace in the aviation industry than we have seen over the last few decades. Further adaptations for lower environmental impact will take place through adapted design and usage.

The aviation industry – both airlines and manufacturers – must collaborate to further the evolution towards better energy efficiency and lower emissions that has been going on for decades and that doubtlessly still has great potential. Improvements should be made at the highest possible pace technology allows, considering the expectations of stricter demands in the future. However, the industry cannot rely exclusively on technology solving the environmental problems, particularly global warming, but should also present the potential of technological improvements without exaggeration, while, at the same time, implement other solutions to the problems.

Alternative fuels (bio fuel and hydrogen) are not today, nor will they be in the future, a “Quick-fix” for the environmental problems in aviation. The impact of high altitude emissions remains, not least by the fact that emissions other than CO₂ (vapour trails and nitric oxide) are not eliminated by a switch to bio fuel. The

³ ACARE = Advisory Council for Aeronautical Research in Europe. ACARE consists of around 40 members, in the form of representatives of the EU member states, the commission and other stakeholders in the form of the aviation industry, airlines, airports, regulating bodies, research institutes, universities and colleges, etc. ACARE’s goal is to have technology available in 2020 that enables a fifty percent reduction of CO₂ emissions and perceived noise levels as well as an eighty percent reduction of nitric oxide emissions.

water vapour emissions actually grow if hydrogen fuel is used. In addition, competition for alternative fuels will be fierce, not least considering the vast tracts of land needed to grow the raw material.

The alleged benefits of hydrogen-powered airplanes are exaggerated or even non-existent, and the fuel itself will not be readily available for decades. Within the foreseeable future therefore, hydrogen will not contribute to reducing the environmental problems in aviation. Adapting today's aviation technology to a fuel that does not yet exist and also has doubtful environmental benefits, is pointless.

The aviation industry should not invest in research about hydrogen-powered flight. Its drawbacks for flight are partly due to the laws of physics and beyond any technological breakthroughs. If, in the distant future, it turns out that hydrogen is available in sufficient quantities and at a reasonable price and after other, better areas of environmental use have had their share, the aviation industry still has plenty of time to adapt the best aviation technology to hydrogen.

Even if alternative fuels do not solve the problems, we should still invest in R&D in the field. Even if those fuels are not used in aviation, they still have environmental impact, something that can be used by the aviation industry to show how they contribute to reducing emissions.

One single airline cannot influence technological developments in the industry to any great extent, but they can choose to implement the very best technology. They can also introduce measures to reduce their emissions – eco-driving, green approaches are some examples. By collaborating with other parts of the industry and society at large in various development projects, they can also reduce emissions and environmental impact in several ways. In addition, they can, as SAS and others are already doing, offer climate neutral travel to their passengers.

All airlines should introduce benchmarking to see what the most progressive companies are already doing. Many measures for reducing energy and thus lowering emissions are already available today and should be implemented. In the longer term, the companies should collaborate with society at large to ensure that the financial incentives that in all certainty will be introduced, irrespective of what the aviation industry says, are as cost-effective as possible.

Historically, constructing a system that uses taxes and fees, or subsidies, in order to effectively control consumption and production of certain goods – e.g. travel and transport – has been paved with difficulties. In spite of that fact, using financial incentives is probably the only available method for achieving a quick and effective counteraction to the environmental problems with aviation. The success of the European Union's proposal about trading aviation emission rights is uncertain, but there are several other things that the industry itself – not least on a voluntary basis – can choose to do in order to achieve the necessary environmental improvements.

The industry itself should – particularly if the EU proposal fails – take the initiative to introduce financial incentives – either through a voluntary trade in

emission rights, or by designing a system of CO₂ tariffs that stimulates technological advances and efficiency. If the industry itself fails to take those steps and voluntarily contribute to a solution, in all probability taxes and fees will still be introduced with the added risk that they are designed in such a way that the efficiency of the environmental gains for the aviation industry is less than perfect.

The system of so-called off-sets, or CO₂ compensation, has been criticized, both on moral grounds as it enables the rich parts of the world to continue to travel at the expense of the environmental space of the poorer people in the world, but also on the grounds that each sector in society should shoulder their own responsibility for the emissions and that the resources should go to reducing the aviation emissions in total. There is also the risk that the long-term effects of the measures cannot be guaranteed and that it will only lead to postponement of the political decisions necessary to come to terms with the real, underlying problems.

However, the aviation industry should continue to work within the system, but for the credibility of the industry it is important that the off-sets that they are trading with have undergone a quality assurance by an independent third party, as well as the companies working towards creating a joint standardised calculation method for emissions. A joint calculation method will also become necessary when the environmental issues become part of the financial system, e.g. when trading emission rights and when logistics buyers and travellers place environmental conditions on suppliers for tenders and procurements.

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