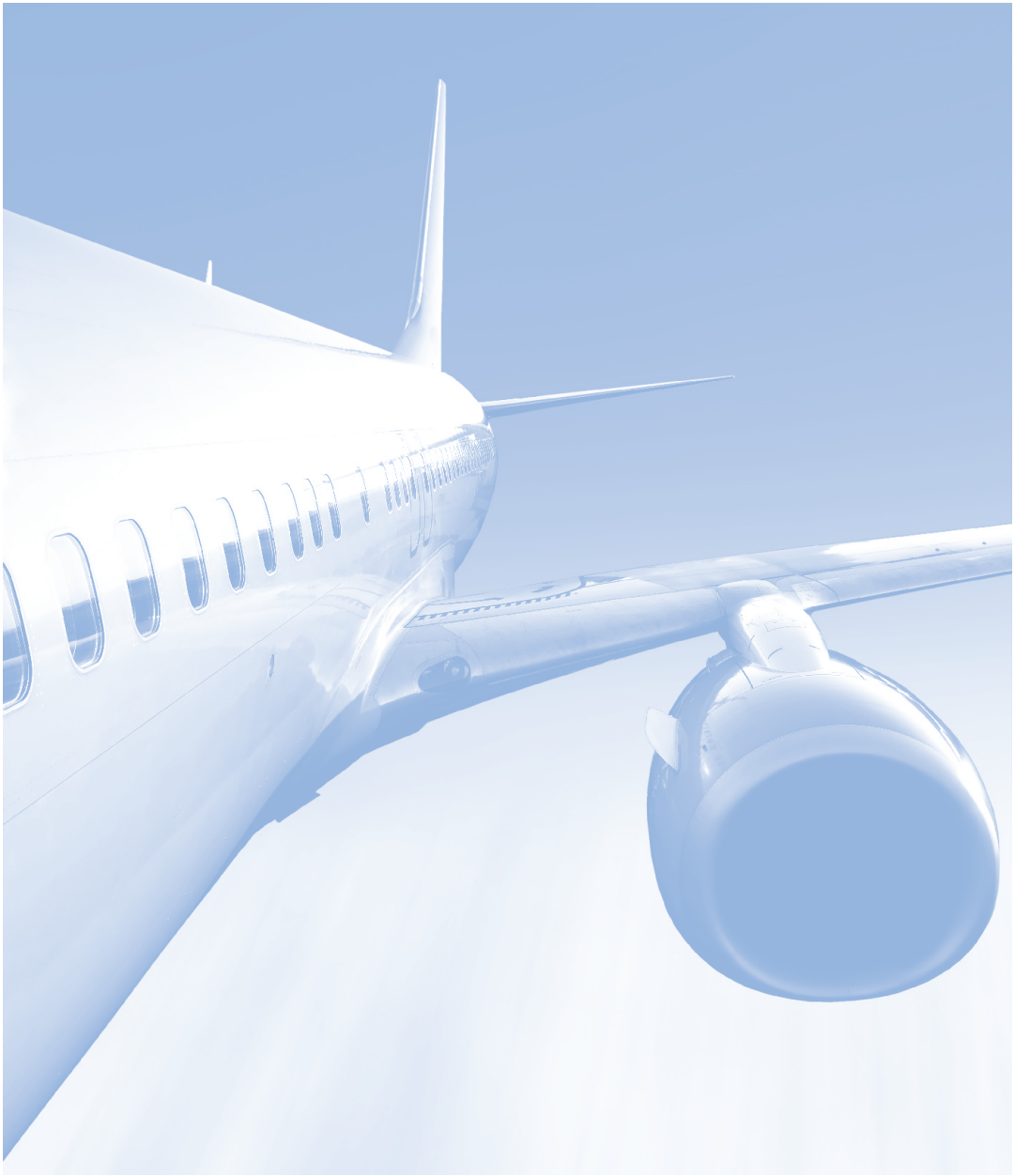
Summary of report 2013/14:RFR16

The Committee on Transport and Communications

SVERIGES RIKSDAG

Aviation in the future



Foreword

The Committee on Transport and Communications' working group on research issues has commissioned a study on aviation in the future, focusing solely on civil aviation. Some of the aspects the working group wanted to illuminate were research and development on aviation fuel, aircraft engines, aircraft construction, air-traffic control (including traffic routes and green flight) and emissions. An important point of departure was aviation's current and future impact on the environment and climate, and the conditions for sustainable aviation in the future.

As considerable expertise is required in order to describe this field, the Committee's working group considered it appropriate to ask researchers at universities, university colleges or institutes compile the available knowledge in the area. In the light of this, four researchers and experts were assigned the task of producing the background material for the study. The experts were: Ulf Ringertz, the Royal Institute of Technology (aircraft construction), Tomas Grönstedt, Chalmers University of Technology (engines), Martin Hagström, the Swedish Defence Research Agency (fuels) and Tomas Mårtensson, the Swedish Defence Research Agency (air-traffic control). Tomas Grönstedt was also assigned the task of coordinating the study.

All of the experts were asked to highlight issues relating to emissions and the impact of aviation on the environment and climate within their respective fields. The assignment included identifying both technical solutions that may be in use in 2030, and more long-term and visionary innovations and projects.

The researchers worked independently on the basis of the terms of reference from the Committee on Transport and Communications' working group and the Evaluation and Research Secretariat. They are all answerable for the material they have provided.

The working group gave Jonas Åkerman, researcher at the Royal Institute of Technology with a systems perspective on transport and environmental

research, the assignment of briefly commenting on the background information provided.

The Committee on Transport and Communications' research group comprised Lotta Finstorp (Moderate Party), chair, Suzanne Svensson (Social Democratic Party), Annika Lillemets (Green Party), Lars Tysklind (Liberal Party), Anders Åkesson (Centre Party), Tony Wiklander (Sweden Democrats), Bengt Berg (Left Party) and Annelie Enochson (Christian Democrats). The report was submitted in April 2014 and was discussed at a public hearing on 3 April 2014. It has been published in the Reports from the Riksdag series, 2013/14:RFR16 and may be downloaded from the Riksdag website www.riksdagen.se. This brochure is a summary of the report.

Summary

The four experts agree that there are technical and operative solutions for aviation that can be sustainable in the future. They show that measures are being taken to increase efficiency both within the framework of established technologies and methods, and by means of more radical solutions. The report shows that technical and flight operation measures can supplement each other. The implementation of more innovative and revolutionary solutions is taking place alongside the development of existing technologies. New technology is being introduced at different rates in the various areas.

The report contains several examples of technical solutions and flight operation measures that will presumably have been introduced by 2030. There are also examples of more revolutionary changes in technology and air-traffic control which could lead to greater efficiency, but that will probably not be in operation before 2050.

There are considerable obstacles to the introduction of new technologies. One is that the development of new aviation technologies takes time. Owing to stringent safety requirements, new technologies are tested for long periods before they can be certified. Aircraft, engines and fuel have

been developed in parallel and are all interdependent. The civil aviation industry is, by nature, a global market, and all aircraft should, in principle, be able to land anywhere, which creates long periods of adjustment. Large investment costs and tough competition lead to a cautiousness among stakeholders investing in new aircraft technology. The development of biofuels should not lead to competition with food production or carbon dioxide emissions during the actual manufacturing process. Many parties and countries need to agree when new technologies and air-traffic controls are to be introduced.

The practical and economic obstacles are, in other words, extensive and are the reason why many people believe in improvements within the framework of established technologies as opposed to a development in leaps and bounds. This does not exclude the introduction of more radical technologies within certain areas.

Something that may change the course of developments is fuel prices. Fuel prices may lead to the quicker implementation of more radical technologies. Higher fuel costs have historically been a driving force for the development of aviation technologies, since fuel is a sizeable and unpredictable expense for the aviation industry.

According to the report, it is more cost and energy efficient to use renewable fuels within other modes of transport, as the requirements on jet fuels are especially stringent. Even if there are renewable aviation fuels that have been approved, both the cost and energy consumption are still higher than in other areas of use for the same fuels.

The introduction of both new technologies and flight operation measures often gives rise to various considerations. Quite often, environmental goals are weighed up against aviation capacity. Likewise, different measures to promote environmental efficiency are weighed against each other.

The experts consider that there are greater opportunities to achieve more extensive environmental improvements through technological developments of aircraft and engines than through flight operation measures.

However, this does not mean that one should refrain from implementing efficiency measures in the field of flight operations.

The report sets out that international cooperation and a long-term perspective are the best foundations for sustainable aviation in the future. Rapid changes, on the other hand, are considered unwelcome in a sector already characterised by great uncertainty. National rules are not assessed to have a significant impact on global aviation.

In his comments, Jonas Åkerman draws the conclusion that aviation emissions will increase unless the annual rate of growth of aviation is reduced in relation to most current forecasts. It is doubtful whether such an increase in emissions is compatible with the achievement of the EU's and Sweden's long-term emissions targets.

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