The existing ACARE Vision 2020 and associated Strategic Research Agendas (SRAs) have successfully steered European aeronautics research in recent years. The ability of the European Air Transport industry to meet future challenges will only be possible with a strong commitment to the rigorous evolution of current technologies and achieving new breakthrough technologies. There is now a need to set new priorities for an extended timescale towards 2050.

R&T is an area where public and private authorities can combine their efforts most effectively for the European as well as national levels. This is especially relevant in the search for urgently needed technology breakthroughs. One way of dealing with this obstacle is to optimise the support processes for research. An appropriate share of funding should be allocated to R&T support, proving technological capability by demonstration, and then entering the (market financed) development process. This would shorten development times, reduce costs and risks, and implement more efficient solutions in the marketplace.

Europe needs an efficient, flexible and user-friendly support system for Research & Development with appropriate funding necessary to generate the required levels of innovation.

A new vision “Towards 2050” is essential and must be established at the highest level within Europe to set a strategic direction for European Aeronautics and Air Transport on the revised horizon.

The background document will be available on the ACARE website as of April 2010.

www.acare4europe.org
Aviation has dramatically transformed society over the past 100 years. The economic and social benefits throughout the world have been immense in "shrinking the planet" with the efficient and fast transportation of people and goods. The growth of air traffic over the past 50 years has been spectacular, and will continue in the future, particularly in the growing markets of the Far East.

The European Air Transport sector, made up of civil aviation and Air Transport, generates a turnover in excess of Euro 94 billion and represents a pinnacle of ACARE (the Advisory Council for Aeronautics and Space Research and Technology) roadmaps for proposed solutions to achieve the vision of Air Transport will be difficult to accomplish and will have to deal with, energy availability in the coming decades to continue as an important development factor in future societies. Aviation will have to develop long-term strategies for energy supply focusing on alternative fuels - that will be technically suitable and commercially scalable as well as environmentally sustainable.

Environmental trade-offs, including those between emissions and noise, will have to be balanced to ensure that the possibilities for the whole Air Transport System. A European Commission. This collaborative framework needs the likely volume of activity in the future, aviation must bring about step changes in technology and is becoming more so with future emissions-related regulation expected to become more prevalent than today.

Tough challenges lie ahead. Globally civil aviation emitted 666 million tonnes of CO2 into the atmosphere in 2008 representing some 2% of man made CO2 emissions. Non-CO2 emissions including oxides of nitrogen, and condensation trails which may lead to the formation of cirrus clouds, also have impacts but require better scientific understanding. In response to the likely volume of activity in the future, aviation must bring about step changes in technology and operational procedures on the top of the current available solutions, to improve its environmental performance by keeping total climate effects at sustainable levels. However, any reduction in absolute emissions from Air Transport will be difficult to accomplish and represents a major challenge.

Reducing disturbance around airports is also a challenge with the need to ensure that noise levels and air quality around airports remain acceptable. Aviation is directly impacted by energy trends. As with other sectors, aviation is dependent on, and will have to deal with, energy availability in the coming years. The SRA goals have had a clear influence on current aeronautical research. There is strong evidence of a vigorous programme of Aeronautics and Air Transport research, which is already developing important initiatives and benefits for the aviation industry, including: EU collaborative research in Aeronautics and Air Transport (S2E Framework roadmaps); research, the Clean Sky Joint Technology Initiative, the SESAR Joint Undertaking, national programmes in many countries, Euro-States and research establishments as well as private company programmes.

The SRA has shown the combined strength of working together across the whole community of industry, research establishments, universities, research organizations and the European Commission. This collaborative framework needs to be maintained to delivered an even more successful future Aeronautics and Air Transport System in Europe.

Towards 2050 - New Challenges

Since 2001, society’s perception of Air Transport has changed following the dramatic events of 11th September 2001, growing environmental awareness, the rise of oil prices in 2008, and the recent financial crisis. In the future, aviation is likely to face even more radical challenges - with some arising from its own success.

Aviation is a key strategic economic domain for Europe. The role of Air Transport has never been more important to society, and it is vital that aviation is prepared to meet the challenges of a changing world.

With changing demographics and increased urbanisation, society towards 2050 will need more long-term transport to connect, man and people. Passenger travel will increase with growth in business and social-related mobility independent on the proportions for the whole Air Transport System and its sub-systems of the future. A European interdependency modelling capability is needed for this task.

An effective way to respond to the environmental pressure would be to improve the environmental performance of aviation in the market place by redirected resources generated through the aviation emissions trading scheme towards the development of Research & Technology and deployment of the most efficient technological innovations. In this regard, any aviation emissions trading schemes should be designed on a global level and prove their long-term economic and environmental validity.

With the aim of a global solution, International Civil Aviation Organisation (ICAO) is promoting efforts in four key areas: improved technology, efficient operations, effective infrastructure and positive economic measures. Similarly, the International Air Transport Association (IATA) has declared a target to stabilise net CO2 emissions through net carbon emissions by 2050 compared to 2005 level.

The Copenhagen Accord "noted" by the United Nations Framework Convention on Climate Change (UNFCCC) in December 2009, will probably be an important milestone in aviation’s history as it is seeking the mandate to implement the necessary actions for aviation.

Air Transport will be having innovative ways to meet the forthcoming demand and need mobility. "This new version" of aviation must be competitive and complementary with other transport modes.

Air Europe needs a suitable solution to overcome the huge challenges, and the success will need appropriate support for an efficient and sustainable Air Transport System.

Europe, with its unique infrastructure, is ideally suited to develop advanced cost-effective transport solutions (including an appropriate role for aviation) in order to provide safe, affordable and sustainable transport solutions.