



The Quarterly
Bulletin of the

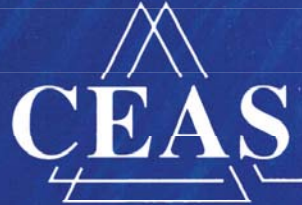
CEAS

COUNCIL OF EUROPEAN AEROSPACE SOCIETIES

3AF-AIAE-AIDAA-CzAeS -DGLR-FTF-HAES-IIK-NVvL-PSAA-RAeS-SVFW-TsAGI



Issue 4 - 2010
December



Aerospace for Europe More than just flying

ASD - CEAS CONFERENCE 2010 IN BRUSSELS

1 - 2 December 2010

- EDUCATION IN AEROSPACE
- AERONAUTICS: R & T and INNOVATION - VISION 2050
- SPACE: APPLICATIONS TO THE BENEFIT OF CITIZENS - VISION FOR THE FUTURE

CEAS

WHAT IS THE CEAS ?

The Council of European Aerospace Societies (CEAS) is an International Non-Profit Association, with the aim to develop a framework within which the major Aerospace Societies in Europe can work together.

It presently comprises 14 Member Societies: 3AF (France), AIAE (Spain), AIDAA (Italy), CzAeS (Czech Republic), DGLR (Germany), FTF (Sweden), HAES (Greece), IIK (Finland), NVvL (Netherlands), PSAS (Poland), RAeS (United Kingdom), SVFW (Switzerland), TsAGI (Russia) and EUROAVIA.

Following its establishment as a legal entity conferred under Belgium Law, this association began its operations on January 1st, 2007.

Its basic mission is to add value at a European level to the wide range of services provided by the constituent Member Societies, allowing for greater dialogue between the latter and the European institutions, governments, aerospace and defence industries and academia.

The CEAS is governed by a Board of Trustees, with representatives of each of the Member Societies.

Its Head Office is located in Belgium:

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www.ceas.org

WHAT DOES CEAS OFFER YOU ?

KNOWLEDGE TRANSFER:

- A well-found structure for Technical Committees

HIGH-LEVEL EUROPEAN CONFERENCES

- Technical pan-European events dealing with specific disciplines and the broader technical aspects
- The CEAS European Air and Space Conferences: every two years, a Technical oriented Conference, and alternating every two years also, a Public Policy & Strategy oriented Conference

PUBLICATIONS:

- Position/Discussion papers on key issues
- CEAS Aeronautics Journal
- CEAS Space Journal
- CEAS Quarterly Bulletin

RELATIONSHIPS AT A EUROPEAN LEVEL:

- European Commission
- European Parliament
- ASD (AeroSpace and Defence Industries Association of Europe), EASA (European Aviation Safety Agency), EDA (European Defence Agency), ESA (European Space Agency), EUROCONTROL
- Other European organisations

EUROPEAN PROFESSIONAL RECOGNITION:

- Directory of European Professionals

HONOURS AND AWARDS:

- Annual CEAS Gold Medal to recognize outstanding achievement
- Medals in technical areas to recognize achievement

YOUNG PROFESSIONAL AEROSPACE FORUM

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THE CEAS MANAGEMENT BOARD

IT IS STRUCTURED AS FOLLOWS:

- General Functions: President, Director General, Finance, External Relations & Publications, Awards and Membership.
- Two Technical Branches:
 - Aeronautics Branch
 - Space Branch

Each of these two Branches, composed of specialized Technical Committees, is placed under the authority of a dedicated Chairman.

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EDITORIAL

ABOUT THE ASD-CEAS CONFERENCE



Jean-Pierre Sanfourche
Editor-in-Chief,
CEAS Quarterly Bulletin

As expected, the ASD-CEAS Conference held in Brussels on 1-2 December 2010 was successful, considering the high level of the addresses and debates on the one hand and on the other, the fact that there was a good attendance. The credit for this achievement rightly belongs to François Gayet and Lucia Zivec, from ASD, and to Peter Brandt and Brigitte Beck, from DGLR, who carried out the preparation of the event remarkably well. May they find herein the expression of the warmest thanks from the CEAS management.

I have taken the initiative to dedicate the whole of the present issue of our Quarterly Bulletin to this Conference but, unfortunately, limitations of space only allow me to provide the reader with some outlines.

Among the topics dealt with, Education in Aerospace occupied a leading position. It is a topic on which I would like to comment, so obvious is it that it constitutes an absolute priority as regards the preparation for the future. Its priority is all the higher in that, over the past two or three decades, it clearly appears that there is a decreased interest of young people in science and technology, the brightest students having a greater preference for business and finance. Concerning the aerospace sector, if it is still considered as a challenge in some countries, it has no special attractiveness in others: it is therefore quite urgent to stop this dangerous trend by promoting its image. How to motivate the next generation to get interested in aerospace and to give engineering students the right skills for the future needs? A number of possibilities were outlined during the conference.

The necessity for defining and undertaking actions with a view to assessing the educational needs of engineers and researchers in aerospace was discussed: as a matter of fact, there is no mechanism for

establishing the link between the permanently changing demands of the aerospace sector and the skills provided by the European universities and higher schools. HE-MAN (Harmonizing the European supply and demand of huMAN resources in aeronautics), the European Project within the Framework Programme 7 precisely responds to this challenge. This Support Action which is presently proposed appears to me to be an initiative of extreme importance.

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ON 1 AND 2 DECEMBER 2010 : THE ASD-CEAS CONFERENCE TOOK PLACE IN BRUSSELS

Organised within the framework of the ASD Aeroweek, the ASD/CEAS Conference was held on 1 and 2 december 2010 in the prestigious Conrad Hotel of Brussels. Attended by nearly 200 delegates, it was a great success. Its key objective was to present and discuss the strategic issues facing European aerospace in the light of today's economic and environmental realities, as well as the challenges and opportunities posed by the European political choices as the union charts its way ahead for the next decade and beyond.

It was structured around an opening session, five workshops, two high level round tables and a conclusive session.

The opening session

The Conference was opened by Dr Joachim Szodruch, President of the CEAS.

After this introductory presentation, two keynote speeches were delivered, successively by Tom Enders, Chief Executive Officer of Airbus, and Sabine Laruelle, Belgian Eu-Presidency.



Aerospace for Europe
More than just flying
1 - 2 - 12 2010

OPENING

ASD - CEAS CONFERENCE 2010 IN BRUSSELS

10:00 - 11:00 am

MODERATOR:
Mr. Joachim Szodruch (President of CEAS, Co-Chairman ACARE)

1ST KEYNOTE SPEAKER:
Mr. Tom Enders (CEO Airbus)

2ND KEYNOTE SPEAKER:
Mrs Sabine Laruelle (President-in-Office of the Council of the EU, Minister for SME and Scientific Policy)

supported by




Joachim Szodruch, delivering his welcome words and presenting the organisation of the conference.



The ASD-CEAS Conference held on 1 – 2 December 2010 in the prestigious Conrad Hotel of Brussels, was attended by nearly 200 delegates.

KEYNOTE SPEECH By Tom Enders, CEO Airbus



“ Thank you Dr. Szodruich for that introduction, and for the invitation to join you here today.

May I congratulate CEAS on your decision to work alongside ASD and to have this conference here in Brussels during Aeroweek.

I have no doubt that there are some amongst you with the usual dose of scepticism about the usefulness of coming to the seat of the European Commission and Parliament.

The juxtaposition between engineering and science and politics or public policy is nothing new. Back in the 19th century, when a politician asked Michael Faraday what use his discoveries where he replied:

“Some day it might be possible to tax them!”

I think this somehow sums up some of the challenges we face. Gathering together aeronautical engineers and experts and showcasing examples of technology is really a great way to show what a positive, long-term story the European aeronautical industry is.

Bringing aerospace alive is part of my job description. Admittedly, I sometimes take this to extremes such as doing a parachute jump out of the A400M over La Juliana in Spain a couple of weeks ago with OCCAR’s A400M programme director Bruno Delannoy! But events like Aeroweek are perhaps a more practical option. I wish to thank the Belgian Presidency of the EU Council for providing this opportunity to look at how aviation can continue to contribute to:

- high value
- low carbon
- and Europe’s future

I would like to focus on a few key trends around these issues. Messages that our entire industry believes Commissioners and European Parliamentarians have a vested interest in listening to.

Ladies and gentlemen, the European Commission and the European Parliament have powerful roles to play in determining the future of aviation in Europe and the world. But as... Stan Lee’s Spider Man character says :

“with great power comes great responsibility”

Hopefully I won’t have to go as far as wearing lycra to get our messages across, but let me give you a insight into why they are so important.

(Trend 1): Aviation is an economic necessity

- The significance of aviation for the global economy today is already tremendous, supporting 33 million jobs worldwide and more than \$1.5 trillion in GDP, ranking us alongside countries like Italy and Spain.
- The aviation and aerospace industries together represent some 2.3% of European GDP and 3.4 million jobs. This generates an annual turnover in excess of Euro 100m.

- In Europe alone, that means our industry supports nearly 8 million jobs and almost \$600 billion.
- ASD estimates that there are 2,000 aeronautical companies in Europe with another 80,000 in the supply chain and the industry is about 50% more productive than the economy as a whole.
- It is a major contributor to the EU balance of trade – around three quarters of Europe’s civil aviation out-put is exported outside of the EU
- So, a significant sector in Europe, contributing to the intellectual property, technological developments, productivity, exports and, as Farady predicted – tax!

(Trend 2): Social value – high value skills

I cannot stand here in front of a conference organised by learned societies for European aeronautics without reminding us all of the brightest stars in the European flag of aerospace – namely engineers!

- The **key** resource which we have here in European aerospace is our intellectual capability in design and systems integration. And we need to keep it that way.

This is a key message which our stakeholders this week must listen to.

- The aeronautic industry alone has half a million highly qualified directly employed engineers – and we need more – at least 3,000 more right now. One option is to find home grown talent, matured and educated at our local universities and allowed to flourish with European based companies.
- But another option, is to recruit overseas – higher education is just as global as our market
- And likewise we can build engineering centres where the capability is – we have design facilities in the US and India, which hire local talent but are closely tied into our European expertise.
- So we have to look not only to established aeronautic bases such as Europe and the US, but also to the emerging talent pools in the BRIC nations. Obviously, by investing in such facilities in key non-European markets we are ultimately contributing to the preservation of our industrial sites at home. In fact, it would be economic suicide to only think inside narrow national boundaries. However, Europe as a whole surely has to question how far we want to see the core innovation activities moving overseas?
- Engineering and natural sciences are the building blocks of Europe’s economic position in the world and aerospace companies do a lot to encourage young people to consider a career in engineering.
- In fact, if you visit our exhibition in the European Parliament this week we have some of the winners from Airbus’ “Fly your Ideas” university competition with us . – an ideal opportunity for you to find out what else we can and should be doing to strengthen future engineering capacity in Europe.

(Trend 3): Impact on other European sectors

- More important than its own contribution, is what aviation means for other sectors. Some 2.5 billion people travel by air every year – to study, work, visit relatives. All of which have knock-on effects.
- For example tourism brings social development and economic growth to remote and de-industrialised regions, increasingly promotes environmental objectives and supports some three and a half million jobs in Europe alone
- Likewise International trade relies on air transport wherever perishable or highly specialised products need to cover large distances quickly. It may not be essential for us to have flowers and fruit from Kenya, but what would their economy develop without access to European markets? Do we want trade or aid?
- And what about the environmental aspects? If you take into account the artificial lighting, fertilizers, transport, etc., often used in European climates, “buy local” isn’t always the greenest strategy. Most of us burn more CO₂ driving to an out-of-town supermarket to buy green beans than it takes to airfreight them from Kenya.

(Trend 4) Sustainable growth

- Air transport is expected to continue growing by roughly 5% each year for the foreseeable future. In Asia this will be more like 6% compared with a global average of 4.7% (including Europe at 4.3% and North America at 2.4%).
- The industry contributes 2% of man-made CO₂ emissions today and thanks to technology, will contribute no more than 3% by 2050. Having reduced fuel burn and emissions by 75% in the last forty years, our track record shows the extent to which newer aircraft and technology can mitigate much of the environmental impact of that growth. The car industry is making a lot of noise about its environmental improvements, but we already left them a long way behind; the **A380**, consumptions less than 3 litres (2.9) per passenger over 100 km- It will take another 25 years for the average fuel consumption of the world fleet to achieve this

For example if replacing a Boeing 747-400 with an A380 for a round trip from Paris to Tokyo will save more than 55 tonnes of kerosene for just one trip!

- And you can expect similar performances from the **A350XWB** when it enters service in 2013. With more than half the aircraft made from carbon fibre, it will use about 25% less kerosene than today’s competition.

Such improvements are not restricted to new programmes

- we constantly improve existing aircraft. Take the A340, which currently burns some 54 tonnes of kerosene on the Paris to New York Route.
- Innovation is an enormous contributor to this. We are one of the most R&D intensive sectors in Europe, with 12% of turnover dedicated to research. Some 85% of Airbus’ R&D spend is linked to environmental improvements
- With the Climate Change Conference going on in Cancun this week, it is important to remind ourselves that aviation has been working hard on an agreement for industry tar-

gets – Commission Vice-President Kallas has said “aviation is the first mode of transport to succeed. Aviation has gone to Cancun with its homework done!” Through IATA the industry has already committed to halving net emissions by 50% by 2050 (compared to 2005 levels).

– (Trend 5): Need for pragmatic regulation

- But innovation can only take us so far. Truly sustainable growth in aviation will only be achieved by engineers and politicians working together. When you consider that every \$100 million spent on aerospace R&D generates an additional \$70 million year-after-year, the potential benefits to society are enormous.
- This is why it is important that policy makers understand the importance of continuing to support aerospace research.
- This is why we need Michael Faraday’s words ringing in our ears again – taxes are NOT the way to limit aviation emissions. Some of the current proposals are very blunt and will actually end up hurting the trade, tourism, wildlife and eco-systems in the very countries the global climate fund is meant to help.
- We instead call for proceeds from new regulations such as Emissions Trading to be reinvested into Aviation R&T and infrastructure. This would place aviation at the heart of EU Priority Action, provide for continuity of Framework 7 instruments such as Clean Sky and hopefully lead to a distinct aeronautics research topic for Framework 8.
- In the high density coastal areas of Asia, Europe and the US, there is a jostling for space in the sky and on the ground at peak times. Flight safety modernisation programmes have already been put in motion in the US and Europe to give more aircraft access to the sky. Airbus and Boeing are actively involved in both SESAR and NextGen, showing that even competitors work together to find solutions in this industry. Technologies like satellite navigation can deliver huge economic and environmental benefits in this area, but only if combined with a reduction in the multitude of restricted and exclusion zones in European airspace. It needs co-operation to succeed.
- The aviation industry has already been working for a long time on ways to reduce noise emissions, and we’ve succeeded.
- In the past 40 years we have lowered noise emissions by 75% and at a European level, we’ll cut them by a further 50% by 2020. Everyone can experience what has been achieved already whenever the A380 lands. You don’t need fancy high tech gauges to measure the difference with the old jumbos just your ears!

So to conclude,

I have sought this morning to outline the importance of continuing the dialogue on what the aeronautical industry can bring to policy development. The engineering community in Europe is vital to ensuring that European policy makers are aware of how important it is to support the aviation industry, which in turn supports so many others. This is certainly my key message of today. Don’t forget: *“Philosophers have only interpreted the world in various ways, but the real task is to alter it” [Karl Marx] ”*

KEYNOTE SPEECH

By Sabine Laruelle, President-in-Office of the Council of the EU, Minister for SME and Scientific Policy



“Ladies and gentlemen,

As minister in charge of Science Policy I have regularly talked about the importance of the aeronautic, space and defence sectors, particularly for the SMEs. Equally important are the research and development activities in these vital sectors. Take the aeronautic sector for instance. It alone employs 95

000 people in Europe, 20% of which work for R&D. Therefore, the stakes in the aeronautic sector are crucial on the economic, societal and environmental level. It is striking that companies like Airbus estimate that nowadays 80% of its R&D is aimed at improving the environmental performance of its machines. The added value of this research can be found in the fact that it has consequences for more than just the aerospace sector. The innovations developed in this sector have important applications in our daily lives. Therefore, I think it is crucial that the aerospace sector is considered by policymakers as a vital sector for European economic growth.

An important sector has to benefit from both an adapted attention and an adapted policy. For instance, every year the aeronautic sector in Europe is between 3,000 and 3,500 engineers short. According to the European Commission an additional 600,000 to 700,000 extra research scientists will be necessary in Europe to reach the objectives of the 2020 Strategy. Yet, the aerospace sector is a very attractive sector to young people. It prepares them for their future career by giving them the opportunity to do internships in the companies. Of course the message needs to come across and I am happy that you will discuss this during this week.

Apart from this lack of qualified personnel, the access of the SMEs to the EU framework programmes for research represents another essential stake. I think every measure taken in support of research and companies needs to be devised for the SMEs. Therefore the Small Business Act for Europe, adopted in June 2008 under the French Presidency of the EU, is a formidable impulse for the development of policies adapted to the SMEs. This is why a few months after the adoption of the SBA, Belgium adopted its implementation plan via the federal SME plan. I am very happy that the first effects of the latter are now becoming visible.

This new consideration for the SMEs, and especially the SMEs in the aerospace sector, should not hide the enormous technological, scientific and political challenges the European Union faces today. The emergence of Brazil, Russia, India and China in the aerospace sector does not allow EU member states to procrastinate any longer. We need to progress on the political level in order to guarantee the know-how and the competitiveness of our companies. Within this framework the R&D activities linked to the environment are particularly important. As of 2020, CO₂ emissions in the aviation sector will have to be mitigated. The sector will rely on the modernisation of the fleets, the improvement of engine efficiency and a better organisation of air traffic. The only way we can achieve all of that is by continuously supporting R&D activities.

What role can Belgium play in this globalised sector, at the heart of these crucial economic and environmental stakes? With regard to space, Belgium was the only country to increase its budget by 20% during the last ESA ministerial council. With this decision we showed just how essential these matters are to us. We also want to keep playing a visible role, with our companies and our research centres, in the development of the European space policy. In the 2009-2013 timeframe Belgium will contribute 190 million ? per year to the ESA programmes.

It is good to remind everyone that in Belgium about seventy research teams and about forty companies are active in the space sector. The same applies to the aeronautic sector where the participation of our industries in the Airbus programmes has intensified over the years. The most recent decision of the government to support research and development in the Belgian aeronautic sector is based on the development of the Airbus A350 XWB. An envelope of 150 M Euro was liberated for this occasion in order to support the Belgian aerospace sector. It is an ideal opportunity to contribute to the 2020 Strategy. That is why there is a very large growth potential between now and 2020.

It is a commitment we have been taking for several years. A commitment that is based on a strategic vision and the extraordinary competence you have developed at the heart of your companies and research teams. I would like to say it again, but for every euro invested in the space or aeronautic policy, several euros return to the economy.

I thank you for your attention and hope your discussions will be fruitful”

WORKSHOP 1: EDUCATION IN AEROSPACE



ASD CEAS
Aerospace for Europe
More than just flying
11:30 - 12:45 am
Workshop 1
EDUCATION IN AEROSPACE
MODERATOR:
Prof. Spiros Pantelakis (Dept. of Mechanical Engineering and Aeronautics, University of Patras)
SPEAKERS:
Mrs Anke Heinz (HR Business Partner Engineering, Airbus)
Mr Thomas Vermin (President of International Board, EUROAVIA)
Mrs Elizabeth Donnelly (Project Manager Skills, AIDIS GROUP)
Mr Dietrich Knoerzer (Research Programmes Officer, Aeronautics, DG RTD, European Commission)
Mrs Liz Allen (Head Teacher, Newstead Wood School)
SESAR
CLEANSKY
eu
DLR

A critical element for the future of Aerospace in Europe is its attractiveness to current and future students and the availability of appropriate education and training. This workshop allowed the participants to present and to discuss these issues with contributions from both students and education providers with a focus on meeting the challenges at a European level.

THREE BASIC QUESTIONS WERE DISCUSSED:

- **Focusing on school level:** Is the aerospace industry presented and seen as an attractive career option to the current school student, boy or girl and are the school curriculums across Europe adequate to the demands of further education at University level?
- **The University experience and other training needs:** Are current aerospace courses appropriate for perceived Industry needs and what is the best balance of theoretical knowledge and actual experience within a given course or period of training?
- **Europe wide standards:** Each nation currently sets its own standards regarding professional qualifications such as registered Engineers but Industry now operates at least at European level if not wider. Is there is a case for developing an acceptable European wide standard?

THE POINT OF VIEW OF ADS: ADVANCED UK AEROSPACE, DEFENCE AND SECURITY INDUSTRIES:



Ms Elizabeth Donnelly presented ADS, the premier Trade Organisation advancing UK AeroSpace, Defence and security Industries globally. After having given the main lines of the UK education and of the UK University Courses, she discoursed on industry experience, student

experience and graduate experience. Regarding the latter, she pointed out three observations: (i) for 15/16 year olds in the UK, engineering is seen as boring, difficult and dirty; fashion and media may not lead to a job, but are seen as relevant, easy and “sexy”; (ii) there is a lack of career advice; (iii) students are reluctant to apply to SMEs (big name aerospace companies are known, essentially). She summarized her vision of the future as follows: greater industry and university collaboration, entry of industry barriers removed. Concerning UK, she called for best practice schemes such as Southampton University’s Graduate Passport adopted and also on the necessary reconsideration of tuition fees increases.

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THE POINT OF VIEW OF EUROAVIA INTERNATIONAL

Mr Thomas P. Vermin, President EUROAVIA Delft, presented the results of a study conducted by this organisation:

- in the current situation the aerospace industry does not benefit sufficiently from the present number of students;
- the decision to choose a career in the aerospace industry remains largely based on the challenging environment, good financial perspective and job security;
- the challenging environment also is a disadvantage, since this represents an unfamiliar and less comfortable prospective for the student;
- the key is to inform the students about the benefits of an aerospace career, but also the demands, in a direct and open way;
- the essence of a personal connection is perhaps not stressed enough; in effect, student motivation are largely based on experiences with persons as well as with companies;
- the opportunities for students that are available, such as internships and vacancies, lack a centralized point with an easy accessibility;
- from a middle school perspective, the challenging environment does not involve a career in aerospace but also involves the University career;
- a student has difficulty to cope with the transition from middle school to University level;
- the last year of middle school and first year of University can be better attuned to each other to improve the results through a coordinated effort of both levels of education.

Contact EUROAVIA

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HIGH LEVEL ROUND TABLE "AERONAUTICS"



This round table by key personalities from aircraft manufacturers, airline, european commission, european parliament and from organisations outside europe allowed to identify and debate the challenges for the future of aeronautics in europe in relation to decarbonisation, environment, intermodality, new competition and new materials.

ACARE: ADVISORY COUNCIL FOR AERONAUTICS RESEARCH IN EUROPE

Mr François Quentin recalled the work achieved by this Council since 2001, the Strategic Research Agenda (SRA) supporting Vision 2020 having paved the way for significant improvements in sustainable, reliable, affordable and passenger-friendly aviation to reduce the environmental impact of air travel across the world.

Beyond Vision 2020

The perception and requirements of air transport have changed in a significant manner, so that an ambitious high-level vision, beyond 2020, is now needed to concentrate available resources on European aeronautics and air transport research for delivering solutions necessary to meet the challenges for the future.

New challenges

The 11 September 2001 dramatic event, growing environmental awareness, the rise of oil prices in 2008, recent financial crisis: in the future, aviation is likely to face even more radical challenges.

Environment

ICAO is promoting effort in 4 key areas: improved technology, efficient operations, effective infrastructure and positive economic measures. Similarly, AITA has fixed a target to stabilise net carbon emissions by 50% in 2050 compared to 2005 level.

- Europe will play a major and leading role the definition of global aviation's approach to sustainability.

A challenging world

Global forecasts show a potential demand for some 25,000



new passenger and freight aircraft between 2008 and 2028 representing an order book value of Euro 3 trillion. This will need more fuel efficient and eco-efficient aircraft to handle additional capacity, the replacement of older generation aircraft as well as important changes in infrastructure and operations.

- Europe, with its unique infrastructure, is able to develop multimodal transport solutions.

Financial pressure

Despite present tough times, more than 12% of aerospace turnover is dedicated to R&D. However, the scale of the challenge is such that securing financing for vital new programmes and technologies will be a major issue for the future.

- Europe needs a suitable solution to overcome the economic crisis and ensure appropriate support for an efficient and sustainable Air Transport System.

European aviation competitiveness

The European Air Transport sector must continuously innovate to remain competitive against North America as well as emerging economies. The shift from economic power to the East implies new markets, but at the same times new competitors will emerge from Brazil, Russia, India and China. The ability of the European Air Transport industry to meet future challenges will only be possible with a strong commitment to the vigorous evolution of current technologies and achieving new breakthrough technologies: an extended timescale towards 2050 is needed.

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

Mr CALLEJAS's PRESENTATION

Mr Daniel Calleja Crespo - Director, Air Transport-Infrastructure & Airports, DG MOVE, European Commission - approached the different challenges ahead for aeronautics and aviation in Europe: the Single European Sky, climate change, technological development and innovation, alternative fuels, the full integration of aviation in the European transport system, safety and security, global markets, and the biggest issue which is "how to deal with the particularly long innovation cycles".

Concerning the latter, he said:

"Early 2011 the Commission will publish the new **Transport White Paper**, the revision of the trans-European Transport networks, and will later conclude on a European Strategic Transport Technology Plan and a Clean Transport Strategy".

"For Aviation, Vice-President Kallas, in the lead for transport research, and Commissioner Geoghegan-Quinn are inviting a High-Level Group for Research to develop a "Vision 2050". This vision should address concrete long term goals and how to address the technological challenges. This the first concrete measure in the context of the new Aviation Platform which advises the Vice –President on all issues of importance for the aviation sector and on the follow-up on the volcanic ash crisis in early 2010".

THE EASA

Patrick Goudou recalled the main responsibilities of the European Aviation Safety Agency:

- expert advice to the EU for drafting new legislation;
- implementing and monitoring safety rules, including inspections in the Member States;
- type-certification of aircraft and components, as well as the approval of organisations involved in the design, manufacture and maintenance of aeronautical products;
- authorization of third-countries (non EU) operators;
- safety analysis and research.

The agency's responsibilities are growing to meet the future challenges; in a few years, it will also be responsible for safety regulations regarding airports and air traffic management systems. Based in Cologne, the EASA already employs some 500 professionals from across the world.

www.easa.europa.eu

HIGH LEVEL ROUND TABLE "SPACE"

The Lisbon Treaty, specially article 189(1) reads as follows: "to promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the union shall draw up a european space policy. to this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space." this round table "space" by key personalities addressed steps which need to be undertaken to ensure the competitive edge of space industry on the global market.

CHANGE! INNOVATION! VISION 2050!

by Giuseppe Morsillo, Head of Director General's, Polcicy office, ESA

Broad excerpts from the speech delivered by G. Morsillo are reproduced here below :

" The question we are confronted with today is: Which steps need to be undertaken to ensure the competitive edge of the European space industry? Several questions need to be addressed before this one can be.

- First, what do Europe and European actors want to do in and with space.
- Discussing article 189 of the TFEU is a good opportunity to ask this question. Just one year ago EU Member States unanimously gave a competence in space to the EU through the EU Treaty.
- This reflects their wish that Europe has space as a tool to promote scientific and technical progress, industrial competitiveness and tackle world-wide challenges, and more specifically support the implementation of EU policies. And indeed space is a critical tool in areas such as environment, climate change, maritime security, crisis management.
- Today we should be able to draw the benefits of the EU Treaty.

A first effect of the Treaty should thus be to reinforce the strategic vision of space in Europe, adding to the European leadership in space - built on the activities of ESA and of its Member States - the leadership of Europe in policies making use of space; this could be accomplished by:

- raising the vision at the highest political level
- asserting and using space as an essential tool for strategic policies (strategic value of space) and at the service of citizens (social value of space)
- increasing the leverage of space on the overall economy (economic value of space).
- In order to serve such a perspective, the European space sector should adapt as appropriate in order to take the full benefit of both its current assets and the new EU Treaty. [...]

- ▶ Thanks to the new EU Treaty, the EU is now a fully fledged actor for space, bringing its political weight alongside ESA and Members States' management competences and technical expertise. So the question is how do we articulate the strengths and competences of MS, EU and ESA

to do more (since I think we all agree that the objective is not to do the same differently, but to do more)?

► What we are talking about when addressing space programmes is a set of four different levels:

- the policy level, which is about defining high level objectives, providing a general budgetary frame, defining a scheme for international cooperation if relevant;
- the programme level, which is about understanding the users' needs and elaborating mission requirements;
- the project level, where contractual requirements are defined leading to the development by industry of the corresponding technical objects;
- the exploitation level, where operations and sustainable service provisions are ensured, meeting in a sustainable way the users' needs.

► Let's try then to outline some basic guiding principles for the evolution of the European space sector:

- **Policy level:** essentially a responsibility of Member States, which are behind the establishment of their national policies, the EU policies, the space policy of ESA

- In which set-up? One Council of Member States or several?
- Evolution of the Space Council, currently a concomitant meeting of two separate Councils?
- Relationship with sectorial Councils?
- This is an open issue.

- **Programme level:** the current diversity of programmes is likely to grow in future, responding to different objectives and being based on different funding sources: already today we have categories of programmes such as: ESA mandatory and optional, national, communitarian, defence, operational, etc.

- Each type of programme could be ruled by the funding entities organised in specific Steering Boards, each type of programme could have specific implementing rules, including procurement rules even customised if more appropriate also depending on applicable objectives, within nevertheless overall policy guidelines defined at the policy level.

- **Project level** (i.e. management of programmes): while the programme level may be diversified, the management level should possibly be as unified as possible in order to avoid unnecessary duplications (no interest for Member States to finance several management layers or in parallel), and for optimising technical synergies.

- A same management set-up can implement programmes according to different rules, as ESA has already demonstrated (depending on the funding sources we can implement ESA rules, PPP rules, Eumetsat rules, EC rules, national rules under delegation agreements).

- The management of resources can be based on the principle of subsidiarity, exploiting existing resources in ESA and national centres.

- **Exploitation level:** also the exploitation level may be diversified, depending on the specificity of the programme to be exploited. Exploitation set-ups may even have several successive phases. However, there should always be a strong link between the project level and the exploitation level because the success is relying upon an end-to-end approach.

► Learning from recent experience with programmes such as Galileo and GMES, we can underline:

- The necessity for the European space sector to learn from difficulties encountered, while preserving the strengths of the current set-up, in particular the attractiveness of the ESA system for States (also for non-ESA Member States) to invest in common endeavours.

- The importance of industrial and procurement policies taking into account the specific nature of space.

- The necessity to try to avoid mixed procurement policies (and therefore mixed funding) in a same phase of a project.

- The importance to have some flexibility (including for industrial and procurement policies), within the boundaries set by the common policy objectives, which aim in particular – as outlined in the VII Space Council Resolution unanimously adopted in November 2010 – at:

- supporting the European capability to conceive, develop, launch, operate and exploit space systems,
- strengthening the competitiveness of European industry for both its domestic and export markets;
- promoting competition and a balanced development and involvement of capacities within Europe.

► In any case while we continue our discussions on how we collectively implement the right set-up to consolidate and further develop European strengths in space, we should not be side-tracked from our priorities, which are the successful development and implementation of programmes, starting from current programmes.

► The focus on governance, the how, shall not be at the detriment of the focus on the activities to be performed, the what. The success of the sector is measured indeed by the successful delivery of technically performing programmes, while constantly improving in terms of timely delivery and respect of costs.

► So we institutional actors have to ask industry to keep improving, in particular in terms of cost and schedule, planning and control, but we institutional actors have as well to do our homework, we have to grant not only appropriate rules and sufficient financial resources, but also the certainty and stability of rules and resources. Complementary and coordinated objectives, for mutual benefit! ”

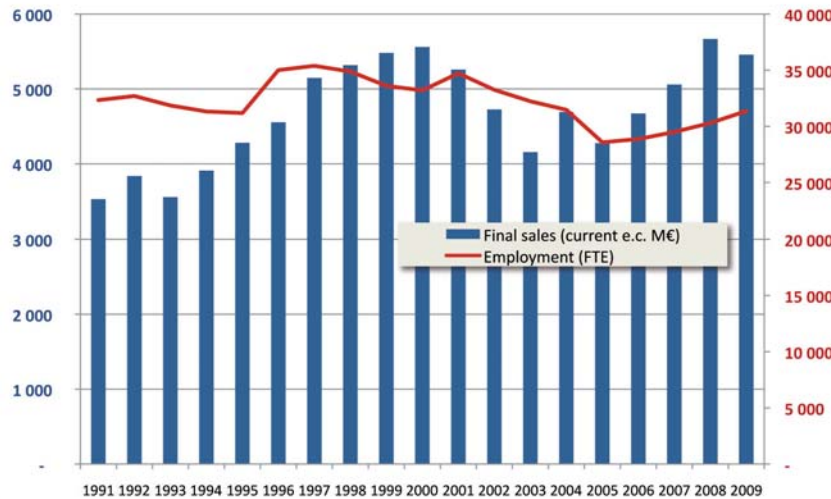
SPACE INDUSTRY OUTLOOK

by Jean-Jacques Tortora, Eurospace Secretary General

ASD-EUROSPACE
The Space Group of ASD
Space Industry
Outlook

**European space manufacturing industry
Final sales (current M€) & employment (FTE)**

In 2009 the European space industry posted final sales worth 5.5 Billion Euro, slightly receding from 2008, but still well above the average values of the decade (4.9B€). Direct employment figures in 2009 reached 31369, in growth from 2009.



Main industry facts	2008	2009
Direct industry employment	30 301	31 369
Other personnel working on site	3 267	1 482
Total space employment (FTE)	33 568	32 851
Final sales (€ million)	5 666	5 457

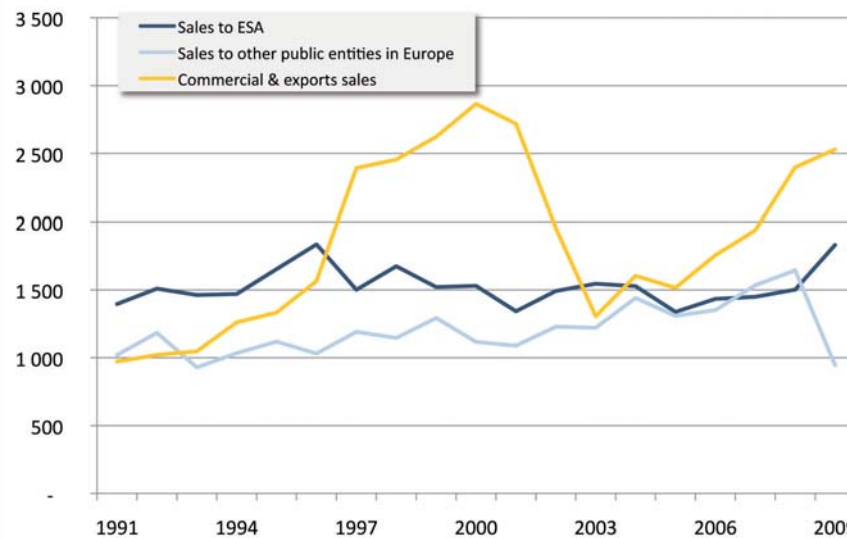
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**Space industry sales by main programme customer
Institutional Europe vs. commercial & export customers
(current M€)**

ASD-EUROSPACE
The Space Group of ASD
Space Industry
Outlook

Space industry in Europe is active on two main market segments:

- A segment composed of European institutional customers (civil and military)
- A segment composed of commercial (private) customers and exports (exports may include sales to government/public entities outside Europe).

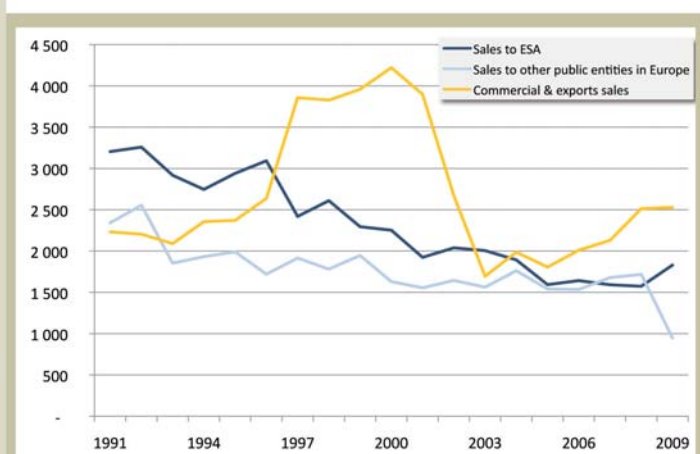


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Space industry sales by main programme customer
Institutional Europe vs. commercial & export customers
(constant M€)

Space industry in Europe is active on two main market segments:

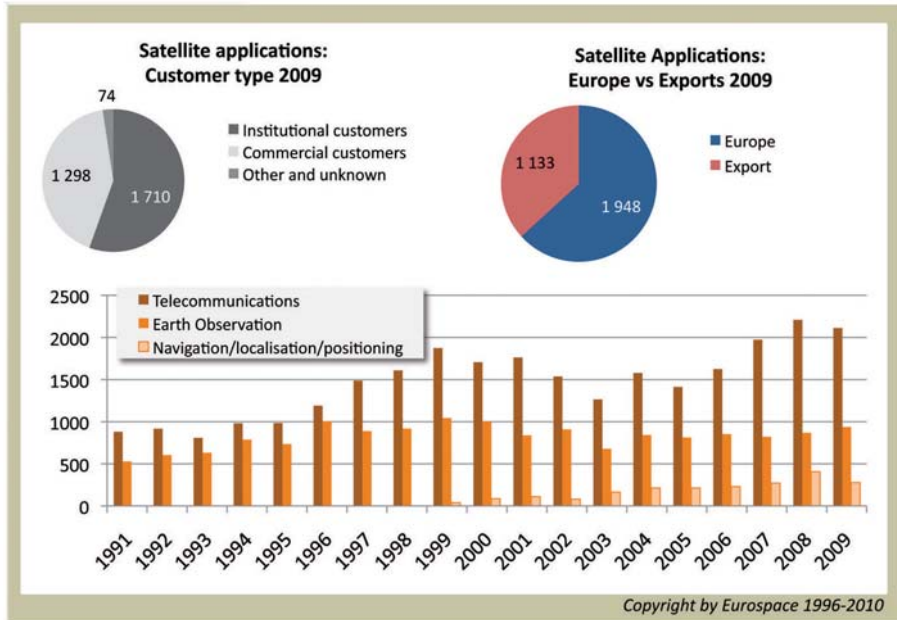
- A segment composed of European institutional customers (civil and military)
- A segment composed of commercial (private) customers and exports (exports may include sales to government/public entities outside Europe).



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Industry sales – Programme type
Satellite applications programmes: overview (current M€)

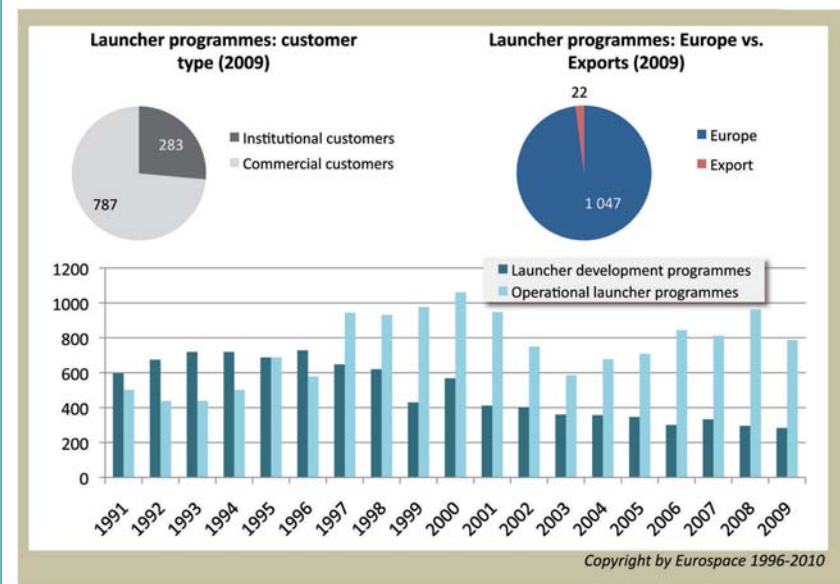
With a total 3 B€ sales in 2009 satellite applications (56% of final sales) were the largest market segment of the European industry. They include operational programmes procured by private and public customers, and preparatory, technology and development activities procured by space agencies (mainly).
Telecommunications: satellite systems (e.g. Eutelsat, Artemis,) and development programmes.
Earth observation: satellite systems (e.g. GMES Sentinels, Helios, Cosmo-Pleiades), and preparatory activities (e.g. EOPP).
Navigation/localisation: this application domain started gaining importance with the ESA/EC EGNOS programme, and shall grow significantly with the Galileo programme.



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Industry sales – Programme type
Launcher programmes: details (current M€)

Currently European industry produces the large Ariane 5 launcher and develops the small VEGA launcher. Launcher programmes include two very different, but complementary market segments.
Launcher development: development programmes are funded almost exclusively by ESA, they aim at preparing the future (e.g. FLPP, VEGA) or at consolidating and improving existing systems (e.g. ARTA, VERTA).
Operational launcher programmes: the space industry produces and integrates the Ariane launch system for Arianespace. It also exports launcher parts (e.g. fairings, nozzles) that are integrated on non European launchers (e.g. Atlas). The share of development programmes has been decreasing in recent years, posing a challenge for the preservation of competences.



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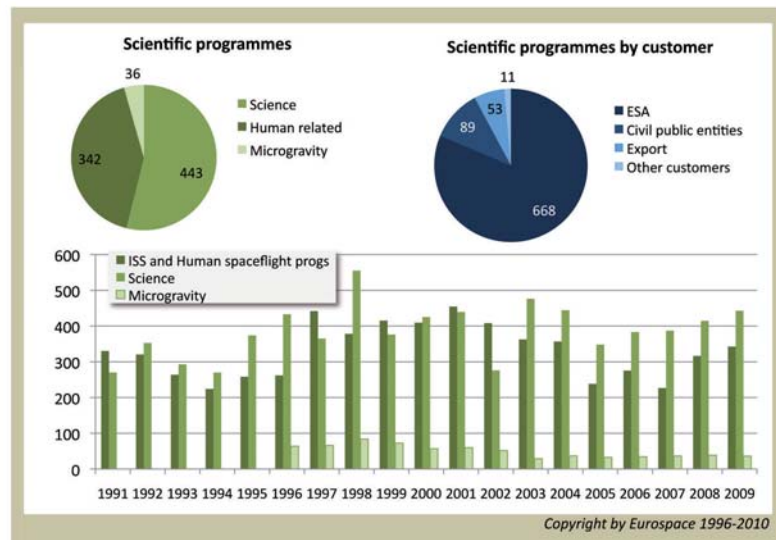
Scientific programmes are exclusively funded by civil public entities, mainly ESA.

These programmes include very diverse activities: satellite systems for Earth orbit applications (Earth science and astronomy), spacecraft, landers and probes for exploration, space station elements, human activities and microgravity experiments.

With the stability offered by the funding scheme of the Science programme of ESA, the sales in this area are remarkably stable. In contrast the other areas (such as Human Space Flight) have been in slow decrease over the last decade.

Industry sales – Programme type
Scientific programmes: details
(current M€)

ASD-EUROSPACE
Space Industry
Outlook



WORKSHOP 2 : RESEARCH, TECHNOLOGY AND INNOVATION IN AERONAUTICS

ASD CEAS
Aerospace for Europe
More than just flying
17. 12. 2010

09:00 - 10:15 am
Workshop 2
Research, Technology and Innovation in Aeronautics

MODERATOR:
Mr Francois Quentin (Co-Chairman ACARE)

SPEAKERS:
Mr Rudolf Strohmeier (Deputy Director General, Scientific Advances, DG RTD, European-Commission)
Mr Eric Dautriat (Executive Director, Clean Sky JU)
Mr Detlef Müller-Wiesner (Chief Operating Officer – Innovation, EADS)

SESAR
CLEAN SKY
europa
DLR

The strengthening of internal eu competition is the new yardstick for the future of european research funding. This must be properly taken into account for the forthcoming FP8. ACARE will promote an aggressive innovation policy and pursue a holistic approach from basic research to the implementation of R&D results to developing lead markets with a clear aim to facilitate and promote tomorrow's air transport through newly defined key technologies and concepts, including, to limited too, co-modality.

CLEAN SKY: INNOVATING TOGETHER, FLYING GREENER

Mr Eric Dautriat, Executive Director of Clean Sky, gave a very complete description of the current status of this Joint Undertaking:

- The JU is autonomous since November 2009;
- Demonstrators content and schedule were revised in June 2010;

- Environment and performance forecast are under refinement;
- Most of the large demonstrators will be delivered in 2014-2015.

Among the major recent technical achievements, the following ones were highlighted: measurement on a Falcon 7X of laminarity extension using FLIR IR camera, successful high energy impact test on a advanced composite (nano-modified composite material), specifications finalized concerning the helicopter Diesel engine, good progression of the large 3-shaft engine demonstrator (first blades already manufactured for bird strike test), ground tests of the electrical environment system's components, selection of the candidate technologies for minimizing the environmental footprint of aeronautical products throughout the life cycle (eco design for airframes), first flight test campaign performed in June 2010, of the helicopter Flight Path optimisation, first air intake noise reduction test campaign on A380 from 29/09 to 21/10/2010 (advanced lip extended acoustic panel).

CLEAN SKY DIFFERS FROM OTHER FRAMEWORK PROJECTS:

- Its size, with a total activity of 1.6 BEuro, of which 50% will be funded by the EC;
 - Its structural organisation through a Governing Board and a Joint Undertaking (JU);
 - Its operational organisation gathering 86 members.
- Through the Calls for Proposals, Clean Sky is involving more and more stakeholders, well beyond its 86 founding members? Presently, after Call 6 evaluation in November 2010, more 300 new partners have joined it, coming from

Clean Sky is about demonstrators...

Integrating breakthrough technologies into full scale demonstrators

www.cleansky.eu

Clean Sky Integrated Technology Demonstrators

Green Rotorcraft

Eurocopter & AgustaWestland

Smart Fixed Wing Aircraft

Airbus & SAAB

Green Regional Aircraft

Alenia & EADS-CASA

DLR & Thales

2 years	3 years	3 years
Technology Evaluator		
First Definition of ecology efficiency Refined Definition of ecology efficiency		

Targets: -20 to -30% CO₂, noise in the range of -10 db

Sustainable and Green Engines

Rolls-Royce & Safran

Eco-Design

Dassault & Fraunhofer

Systems for Green Operations

Thales & Liebherr

www.cleansky.eu

22 countries and with a high percentage of SMEs (> 40%).

A JOINT TECHNOLOGY INITIATIVE (JTI) FOR FRAMEWORK PROGRAMME (FP8)

Eric Dautriat expressed the opinion that dropping the JTI instrument at the end of FP7 would be a lost opportunity and make little sense in view of the added value it has brought. He said: "A second generation JTI should be requested for area(s) where following features apply: sha-

red funding, shared governance, flexibility, ability to coherent, wide, cross-cutting approach, operational management ability."

STATEMENT EXPRESSED BY Dr Detlef MUELLER-WIESNER

Among the numerous opinions expressed by Dr Müller-Wiesner, Chief Operating Officer "Innovation" at EADS, and president of DGLR, some of them are recalled here below:

- Research converts money into knowledge when innovation converts knowledge into money, so we need to have the best possible vision on the expected market requests beyond 2020.
- A real new short range must become a game changer with respect to eco-efficiency, direct operational costs, passenger comfort, etc.
- It is time now to work in basic research for a future long range concept.
- VTOL (Vertical Take-Off and Landing) needs new concepts for integration into affordable inter-modality concepts.
- Looking forward to 2050, autonomy of aircraft (not only the today's UAVs) will become an essential element, and thus the question about the further development of ATM technologies has to be addressed.
- ACARE may further develop a European strategy from basic to applied research far beyond 2020 but should not neglect what still needs to be done in R&TD in order to meet the 2020 targets.
- For bigger aircraft there is no alternative to burn something, whatever the propulsion concept will be! Bio-fuels of the 3rd generation need to be further developed and

the production based on European sources (kerosene based on algae-oil) should be enabled to reach an economical scale.

GENERAL RECOMMENDATIONS:

- R&TD and the specific programmes should contribute to the big societal challenges of our time; using different types of technologies and solutions closer to the market. A top-down approach – big challenges – and a bottom-up approach (stakeholders' recommendations) should be the two main axes for the FP8 preparation.
- Collaborative research should remain the core of the FP.
- New financial instruments should be introduced only with a clear and transparent legal framework and without having consequences on the existence and the budgets of existing instruments in the FP: upstream research, integration and validation projects, large demonstration projects.
- Administrative and financial simplification (procedures, accounting and auditing methods).
- Evaluation criteria in FP8 should be more detailed.

WORKSHOP 3 : SPACE ET APPLICATIONS TO THE BENEFIT OF THE CITIZENS

ASD CEAS
Aerospace for Europe
More than just flying
17. 09. 12.2010

09:00 - 10:15 am
Workshop 3 - Space Applications to the benefit of the citizens

MODERATOR:
Mr. Jean-Jacques Tortora (Secretary General, EUROSPACE)

SPEAKERS:
Mr. Yves Blanc (Director Institutional and International Affairs, EUTELSAT)
Mr. Giuseppe Virgilio (Chairman, Telespazio SpA)
Mr. Edgar Thielmann (EU Satellite Navigation Programme: Applications, Security, International Aspects; DG ENTR, European Commission)

Logos: SESAR, CLEAN Sky, eu, DLR

The development of space applications, once driven by the availability of new technologies, is now user-driven. This is particularly true in the area of public services with the emergence of promising initiatives for climate change monitoring or environment protection where space brings unique remote sensing capabilities. This workshop reviewed the status of on-going initiatives, as well as the expected development of integrated applications.

THE EUROPEAN GNSS PROGRAMMES

Edgar Thielmann made a very complete presentation from which some excerpts are given here below.

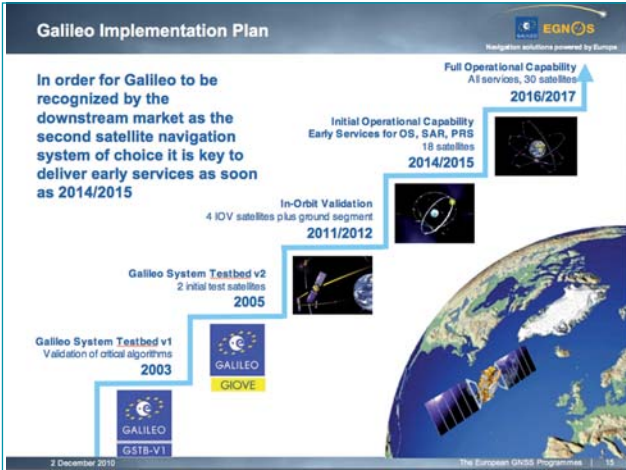
EGNOS

EGNOS has been delivering a free Open Service over Europe since October 2009 and it will continue to deliver services on a long-term basis (< 20 years).



GALILEO

Galileo is progressing, at the crossing between the development (IOV) and deployment phases: GIOVE-A and GIOVE-B missions on-going, FOC procurement on-going, first operational IOV satellites in 2011, early Galileo services from 2014/2015:



GNSS DOWNSTREAM MARKET

Edgar Thielmann highlighted the fact that Europe has not taken yet an appropriate share of the GNSS application sector (around 20% only) and that in consequence, there is a risk for Europe to miss a big opportunity with respect to the EU 2020 strategy for growth and jobs; EU industry share of GNSS global market must increase. With a view to improving the present situation, the European Commission adopted an Action Plan on 14 June 2010:

The need to act !

- ★ **EC's Action plan on GNSS Applications adopted on 14 June 2010:**
 - ★ Duration : 2010-2013
- ★ **24 actions** to be implemented by the Commission with the assistance of the GSA:
 - ★ A series cross-cutting actions, to foster GNSSs pervasiveness
 - ★ A series of actions in priority domains (LBS, Road transport, Aviation, Maritime transport, Environment and Agriculture, Civil protection and surveillance).
- ★ **Type of actions :**
 - ★ Certification, standardization, and coordination activities
 - ★ Information dissemination, information exchange, and awareness-raising campaigns
 - ★ Fund-raising for GALILEO or EGNOS-based innovation
 - ★ Regulatory measures (mainly for road transport)
- ★ **Some Examples :**
 - ★ Galileo FP7 3rd call : published on 20 July 2010 / Deadline: 16 December 2010 (17:00) / Indicative budget: EUR 30.5 million
 - ★ Establishment of a **virtual information centre** (technical and legal information, developers' toolkit, helpdesk,...)
 - ★ **Increase of awareness among SMEs** : Enterprise Europe Network / GNSS-innovation voucher scheme

GLOBAL MONITORING FOR ENVIRONMENT AND SECURITY (GMES)

Mauro Facchini, EC/ DG-ENTR, presented the GMES programme: objective, key milestones, organisation, services, the programme evolution and next steps.

Some key milestones

- 1998: Initiation of GMES, Baveno Manifesto
- 2000: Gothenburg EU Summit "establish by 2008 an operational European capacity for ... GMES"
- 2001+: Investments by ESA and EC on services
- 2005: GMES becomes 'flagship' of the European Space Policy. ESA C-MIN in Berlin approves GMES Space Component programme. GMES Bureau creation.
- 2006: 1,2 BC in the period 2007-2013
- 2008: EC-ESA agreement on GMES signed. GMES services presented at Lille Forum
- 2009: Commission proposal for a GMES Programme Regulation. Commission Communication on the GMES Space component
- 2010: EP and EU Council adopt the regulation;
- 2012+: Launch of first GMES Sentinels

GMES Components

GMES is an EU led initiative

In-situ component – coordinated by EEA

- Observations mostly within national responsibility, with coordination at European level
- air, sea- and ground-based systems and instruments

Space Component – coordinated by ESA

- Sentinels - EO missions developed specifically for GMES:
- Contributing Missions - EO missions built for purposes other than GMES but offering part of their capacity to GMES (EU/ESA MSs, EUMETSAT, commercial, international)

GMES Services

Monitoring of Earth systems

- Land
- Marine
- Atmosphere

Horizontal applications

- Security
- Emergency
- Climate Change



GMES Services

Monitoring of Earth systems

- Land
- Marine
- Atmosphere

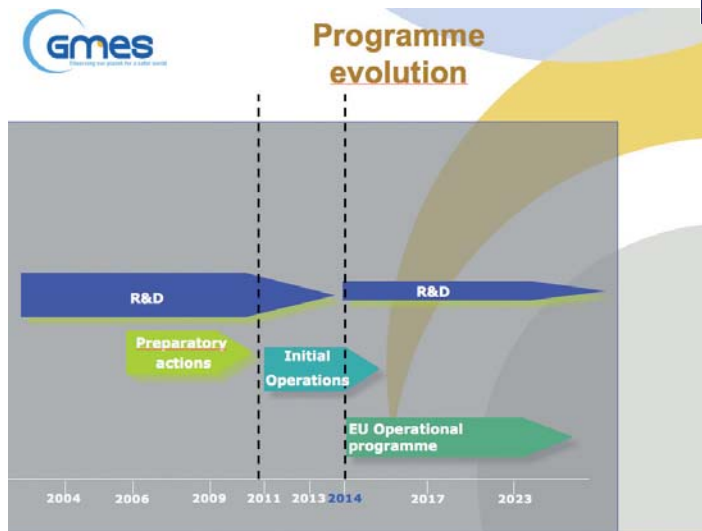
Horizontal applications

- Security
- Emergency
- Climate Change



GMES Next programmatic steps

- > Estimate funding required before and after 2014
 - Cost analysis
- > Prepare GMES Governance, for build-up and operational programme
 - GMES legislative programme



For further information:
 EC GMES Web: www.ec.europa.eu/gmes
 EU Space Research: www.ec.europa.eu/enterprise/policies/space/research
 FP7 services: www.gmes.info

WORKSHOP 4 - AERONAUTICS “VISION 2050 + ECONOMIC DEVELOPMENT”



ASD CEAS
 Aerospace for Europe
 More than just flying
 1st - 8th 12.2010

10:45 - 12:00 am

**Workshop 4 - Aeronautics
 Vision 2050 and Economic
 Development**

MODERATOR:
 Mr Georges Bridel (Vice President Capability & Technology Sales and Marketing, EADS Defence & Security)

SPEAKERS:
 Prof. Armin Reller (Solid State Chemistry, Institute of Physics, University of Augsburg)
 Mr Joachim Sauer (Vice President Human Resources, Airbus Operations)
 Mr Thomas W. Jung (Owner and President of the Board Acustronic)
 Mr Michel Peters (General Director NLR)
 Mr Sergey Chernykh (CEO Central Aerohydrodynamic Institute - TsAGI)

supported by: SESAR, CLEAN SKY, eu, DLR

INTRODUCTION

Dr Georges Bridel, after having introduced the speakers, presented the main topics which would be discussed: the consequences of temperature increase due to CO₂ increase, the question of the increasing waste of resources, the “pressure” on the environment and the other challenges to come. The latter, concerning Europe, are its human resources evolution (ageing societies, education, keeping of high level skills, keeping of technology and innovation lead,...), the competition with the emerging countries, and also of course the financial constraints. It is clear that to perform the study “Vision 2050”, the estimate of the air travel demand is only one component of a very complex system of systems.

The bottom line: “No straightforward extrapolation of traditional economical growth”

ABOUT THE PRESENTATION GIVEN BY PROF. ARMIN RELLER: STRATEGIC RESOURCES

Prof. Armin Reller (Solid State Chemistry, Institute of Physics, University of Augsburg) gave a very detailed and

Who would dare making a guess on the aeronautics’ situation 40 years from now on? Although a simple and accurate extrapolation will not produce sustainable results, some trends are already visible today. This workshop discussed serious concerns and addressed some possible measures to maintain the competitiveness of the european aerospace economy.

rich presentation concerning the question of the strategic resources: competing materials and their relative importance in the course of time, supply chain functional scheme, the way in which we are using up minerals at an alarming rate and the associated question: "how long before they run out?", processes involved in the extraction and refining of base metals, rare Earth metals deposits, high-tech trash, different maps of strategic resources locations.

THE EREA STUDY

Michel Peters, Chairman of the EREA (association of European Research Establishments in Aeronautics) presented a summary of the study conducted by this organisation with the objectives to provide its view of the future of the ATS (Air Transport System) going beyond 2020 (2020-2050) and to recommend clear research directions

for preparing this next generation ATS. An analysis is being carried out showing the necessary step changes and the associated breakthrough technologies options that need now to be investigated.

This study has considered four scenario options: N° 1 Unlimited Skies, N° 2 Regulatory Push & Pull, N° 3 Fractured World, N° 4 Down-to-Earth. The degree of priority of the different technologies has been estimated for each scenario: electrical aircraft, CO₂ neutral propulsion, CO₂ neutral airport, revolutionary aircraft configurations and concepts, full automation, and other lower priority level technologies.

How to proceed to continue the 2050 Vision Study? The four slides here below answer this question:

How to proceed (Grand Challenges)

- Air Transport is part of a global infrastructure, and interacts with other global orientations:
 - Is affected by economic conditions and creates prosperity
 - Is affected by climate change and generates emissions
- The presented Scenarios already focus on Profit and Planet and addressing the Grand Challenges shall be further elaborated
- To meet the Grand Challenges, European research must be focused. Institutions, member states and the EC must cooperate better and the systems must build on openness and trust

How to proceed (Joint Research Initiative)


A more competitive ATS of the future is to be knowledge-intensive, technology-based and business-competitive, through:

- Business models
- Research Infrastructures & Education
- International collaboration

↓

European Joint Research Initiative

Multinational programmes are to be based on the use of large-scale demonstrators.
 Demonstrators to be supported within upcoming research policy and funding to allow the transformation of research into commercial products, combining a number of capabilities, technologies and disciplines.



EREIA follow-up study

- To implement a European Joint Research Initiative « ATS 2050 »
- To promote the EREA vision on technology axes
- With focus on priority technical domains with regard to:
 - Air vehicles (revolutionary propulsion concepts, configurations, on-board systems)
 - ATM (full automation)
 - Airport infrastructure (from home to runway, CO2 neutral, innovative ground support systems)



Recommendation

**To promote an EREA demonstration program
 for the implementation of long term
 revolutionary technologies and concepts
 covering the ATS: vehicles, airports and ATM**

ATS 2050

**To create a European Joint Research Initiative
 to implement this program**

WORKSHOP 5 - SPACE : "VISION FOR THE FUTURE"



ASD CEAS Aerospace for Europe
More than just flying
1st, 2nd, 13 2010

10:45 - 12:00 am
Workshop 5 - Space
Vision for the future 2050+

MODERATOR:
 Mr Constantinos Stavridis (Head of Mechanical Engineering, ESA)

SPEAKERS:
 Mr Yves Blanc (Director Institutional and International Affairs, EUTELSAT)
 Mr Michel Courtais (Director Technical & Quality Management at ESA, Head of ESTEC)
 Mr Jacques Breston (Senior Vice President, Sales & Customers, Arianespace)
 Mr Thomas Reiser (Former Astronaut, Member of the DLR Executive Board, Responsible for R&D)
 Mr Reinhard Schulte Braucke (Head of Unit Space R&D, DG ENTR, European Commission)
 Mr Patrice Brudieu (Deputy Director, Senior Manager for Applications, R&T, Programmes and Defence, Directorate for Strategy, Programmes and International Affairs, CNES)



This workshop addressed steps to be taken to meet the requirements of the diversified space activities in Europe. Leading space figures will envision the evolution in the next 20 years of European space strategy, European space explo-

ration initiatives, ESA/EU/EDA cooperation on product non-dependence and procurement policy, and European approach to space innovation.

THE SPACE SITUATIONAL AWARENESS (SSA): A VERY STRATEGIC DOMAIN

N. Bobrinsky, from ESA, presented the European SSA preparatory programme, addressing the following points:

- The vulnerability of space assets - for access to key services such as Communications, TV, Navigation, ... - against different hazards (collision with space debris, effects of space weather such as solar storms or magnetic storms, ...);
- the necessity to protect our space infrastructure, which has been recognized at the level of the Space Council, on 25 November 2010;

- the need for a European SSA capability built on defined civil and military user requirements (dual system).

The SSA Preparatory Programme has started in November 2008 at ESA in close coordination with the EU institutions. IN 2012, the outcome should be an architecture with associated cost estimate and initial precursor services in the areas of Space Surveillance, Space Weather and Near Earth Objects (NEOs). In parallel, a joint effort is made to define the governance of the future European SSA system and to identify required SSA operating entities. The next step should be the decision taken by EU and ESA to start the development of an operational European SSA capability over the period 2013-2020.

THE EUROPEAN SPACE RESEARCH IN SPACE WITHIN FP7 AND FP8

Dr Reinhard Schulte-Brauchs, Head of Space Research and Development at the European Commission presented the EU & Space political perspectives, the EU Space Research within FP7 and Space within FP8.

Space in the EU Research Framework Programmes

7th Framework Programme for research and development - FP7 (2007 – 2013)

- About € 1.4 billion over 7 years
- Two main areas of research:
 - Global Monitoring of Environment and Security - GMES
 - Strengthening Space Foundations

Opportunities for stakeholders to influence future space research priorities

- FP8 Hearing **8 December 2010** in Brussels
- Feedback form – possibility to propose new FP8 space research areas
- Link: http://ec.europa.eu/enterprise/newsroom/cf/itemlongdetail.cfm?item_id=4635&lang=en&tpa=0&displayType=calendar
- Already **90** written contributions received
- Expected **160** experts from European and international research and industry

First ideas for future European space research (1)

- **Exploration**
 - Robotic exploration of asteroids and planets
 - Planetary navigation and communication
 - Break-through propulsion for planetary missions (solar sails, high power highly efficient propulsion systems)
 - Astronaut support on long space missions
 - Large deployable structures and habitats

THE 7th FRAMEWORK PROGRAMME

First ideas for future European space research (2)

- **Space Science**
 - Microgravity and gravitational biology
 - Astrobiology – search for life beyond Earth
 - Exploring mysteries of the Universe (dark energy and matter, gravitation)
 - Exploiting results from scientific space missions
 - Solar-Earth interactions, space weather
 - Novel instrumentation for astrophysics space missions

FP8 – TAKING SPACE RESEARCH FURTHER

First ideas for future European space research (3)

- **Earth observation and Earth related space based applications**
 - Research for advancement of GMES services
 - Security of space assets, space debris, NEOs
 - Space based solar power production
 - Integrated applications and services (navigation, communication, remote sensing)
 - Monitoring and modelling of processes in the atmosphere and on ground (climate, pollution, seismic events)

ARIANESPACE PERSPECTIVES

Jacques Breton, Senior Vice-President at Arianspace, talked about the steps to meet the requirements of diversified space activities in Europe, as regards the future launchers. After having recalled the absolute necessity of the independent access to space and that this access must be guaranteed by reliability and availability, he showed the Arianspace diversified offer answering any demand:

Diversified offer answering any demand

- **Demand parameters for the coming decade**
 - **Governmental demand**
 - Diversified needs
 - Mass from 100 kg up to few tons: LEO for Earth observation and technology, MEO for navigation, few GEO for telecommunication and meteorology, escape trajectories for science
 - Scarce large missions: Science favoring mid-size missions when possible, decisions on exploration not made
 - **Commercial demand: satcoms mass**
 - Not expanding beyond common Proton, Ariane and Zenit performance (6.2 t): 50% of the demand in the coming decade
 - Compliancy with Soyuz and potentially Land Launch for small ones (below 3.5 t: expected 30-40% of the market in the coming decade) GTO market remains dominant (20-25 satcoms per year on the market)
 - **Family of launchers to answer any requirement from users**
 - **Ariane 5**
 - * ECA version to launch satellites in GTO, ES version for deployment of large systems in LEO (20 t to the ISS)
 - * Operational availability: up to 7 launches per year
 - **Soyuz at CSG**
 - * Commercial service in 2011
 - * Telecommunication satellites in GTO (3.0 tons), Earth observation satellites in LEO (5.0 tons), Galileo constellation in MEO, scientific satellites in specific orbits
 - **Vega**
 - * Commercial service in 2011
 - * Scientific and Earth observation missions in LEO (1.5 tons)

5

Workshop V "Vision for the Future" – ASD CEAS Conference – Brussels, December 2, 2010



SPEECH GIVEN BY JEAN-JACQUES TORTORA, SECRETARY GENERAL OF EUROSPACE, AT THE CLOSING SESSION OF THE AEROWEEK



"Europe is moving forward

I would first like to start with a few words of thanks and congratulations to the Belgium Presidency which was very active for Space and managed to keep up with their ambitious roadmap:

- Organisation of a conference on Space and Africa, highlighting how our infrastructures are made for universal services for the benefit of the world citizens,
- Successful 2nd ministerial conference on Space Exploration which fine tuned the content of the EU action, with the next step expected to be a conclusive meeting in 2011,
- Approval of the 7th Space Council resolution which sets the main priorities for the European Union in Space for the next few years,
- And finally, the Innovation Union for Europe conclusions, explicitly mentioning Space technology to serve the development of the European economy with applications to be useful for our citizen day to day life.

But the situation is very fragile

The reality is that Europe is losing ground to other Space powers:

- In the Space telecommunications area, in 2010, three international bids from European operators worth 1 B\$ have been lost to US competitors: one from Eutelsat, one from Inmarsat and one from Hispasat. This demonstrates the aggressive return of the US Space industry on the commercial market now that US public funds are getting scarce, with exchange rate conditions detrimental to the European providers,
- In the remote sensing sector, US Department of Defence high definition imagery acquisition policy recently led to commit over 7 B\$ worth of data to US commercial providers. Open competition is not sustainable any more under such conditions.
- In the field of Space Transportation, we could also mention the US "COTS" (Commercial Operational Transport-

tation System) procurement of launchers and capsules to service the ISS, which triggered large privately supported delivery contracts and developments.

European Institutional framework

To date, the fragmentation of Europe is detrimental to an efficient decision making process and Space - which ignores borders by nature - is hampered by the complexity and the lack of consistency of regulations at regional level. This is in particular one of the major drawbacks to be overcome for the operational deployment of SESAR.

Lengthy discussions between European institutions for leadership are detrimental to the sector. The reality is that economic, industrial and strategic interests are at risk.

At European level, a framework for the decision of new programmes must urgently be set in order to ensure the success of the 2012 ESA ministerial Council which is the next concrete major milestone in the implementation of the European Space policy.

Industrial and Procurement policies are definitely an important part of such decision process, and industry must be involved in their elaboration.

Above all, what Space industry needs is one single European procurement desk, and a competent customer:

- With the right level of expertise,
- Capable to procure under adapted contract types,
- Ensuring there is an open market between public and private players,
- Capable of structuring the markets by fostering a standardised approach between member States, stimulated by appropriate regulations.

Support to competitiveness

With 50% of its turnover made on export markets, the European Space industry demonstrates its global competitiveness. Such competitiveness is not a given. It is the fruit of decades of selected and relevant investments.

It must now be set as a political objective and support to competitiveness must be organised at European level through continued R&D support.

Of course, European Space public contracts must be awarded through Intra-European competitions whenever possible.

When impossible, European preference must be the rule just like all other Space powers worldwide do:

- Launch service is probably the most emblematic area in which Europe cannot afford multiple sources of supply, but most of the “critical” technologies are in the same situation,
- In such cases, European institutions must accept to deal with oligopolies, maintain internal technical expertise and develop cost audit capacities accordingly.

Another issue is the development of a Europe-wide domestic market for Space products and services. Unlike all other space faring nations, Europe makes little use of its Space capabilities, would it be for civil, security or defence

purposes. This is where the European Union timely and opportunely steps in.

A remarkable work has been done by the European Commission to identify where GMES and Galileo could serve the objectives of its various policies (border control, maritime surveillance, civil security, disaster management, agriculture, Environment monitoring, natural resources management, etc...). It is now time to concretely set the adequate framework for the actual implementation of these policies.

What is at stake is the capacity of Europe to ensure the sustainability of its industrial “space” base.

Technological independence

Technological independence of Europe must be set as a priority. Despite the commitments repeatedly stated by various European policy makers to take up this challenge, there is a growing technological gap, especially to the United States.

It should not be forgotten that technological independence of Europe:

- Conditions its access to commercial markets,
- It also ultimately conditions the capacity of Europe to get the top performance services it deserves.

Long term commitments

What European Space industry needs is:

- Rules and stability of rules for future public procurements,
- Budgets and predictability of budgets devoted to such procurements.

Long term perspectives are needed to motivate industry and private stakeholders to continue to invest into Space. It also conditions the capacity of Europe to set up future Public-Private Partnerships.

Conclusions

The implementation of Art. 189 of the Lisbon treaty should lead the European Union to define the right EU financed Space programmes, with themes serving its policies wherever it brings an EU added value.

The 7th Space Council identified such possible programmes and we do hope that the next steps, namely the Space Communication and the legislative subsequent proposal, will confirm these principles into tangible decisions with clearly defined governance principles and procurement rules and tools.

I thank you for your attention.”

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AERODAYS 2011: HELP SHAPE THE FUTURE OF AERONAUTICS IN EUROPE

The **European Commission** and **Centro para el Desarrollo Tecnológico Industrial** in Spain invite you to register now for the sixth Community Aeronautics days in Madrid, 30 March-1 April 2011.

The theme for Aerodays 2011 is: **“Innovation for sustainable aviation in a global environment”**.

The sixth edition of this major international conference on air transport will bring together aeronautics stakeholders, ministries, agencies and R&D centres for a unique opportunity to network and advance the agenda.

“The Aerodays are a perfect place to see what European research and innovation efforts can accomplish in a sector like air transport, which revolves around high level knowledge,” says EU Commissioner for Research and Innovation Máire Geoghegan-Quinn, “A conference like this stimulates everyone to work across borders and to find innovative ways for Europe to remain a global player.”

European Commissioners Máire Geoghegan-Quinn (Research and Innovation) and Siim Kallas (Transport) are keynote speakers, and will be joined by Spanish Minister of Science and Innovation Cristina Garmendia, leading experts and policy-makers representing all aspects of the air transport sector.

Conference highlights

Plenary sessions will introduce key topics such as sustainable air transport; how the global market is evolving; the future of air traffic management; and air transport as a joint effort for Europe. Technical sessions will enable participants to examine aspects of these in depth. Technical visits will shed light on how the industry works from the inside.



Flight simulator at INDRA, technical excursion



PRACTICAL INFORMATION

When: Aerodays 2011 take place from 30 March to 1 April

Where: Madrid, Spain (Palacio Municipal de Congresos).

Conference participants will have access to:

- conference exhibition;
- technical and plenary sessions;
- conference dinner and cocktails;
- technical visits, showcasing air transport facilities in and around Madrid.

Register now to secure your reservation!

Thinking together

The conference exhibition will feature outcomes of European Commission-funded research in air transport and aeronautics, as well as presenting ongoing research and development. Research institutions will have the opportunity to combine and coordinate research actions, pooling their capacities and finding partners in innovation.

Business opportunities

Aerodays 2011 offers an unrivalled forum in which European businesses can interact. It now attracts worldwide interest and attendance at a high level, hence an opportunity to meet potential partners from emerging economies such as Russia and China.

Shaping policy

Aerodays 2011 will be a major opportunity for EU policy-makers at all levels to meet and help move Europe towards better air transport.

YEAR 2011

1-3 February • **ESA** – Cryostat Validation workshop – ESRIN, Frascati, Italy
www.esa.int

15 February • **ESA** – ISU 15th Annual International Symposium: The International Space Station: Maximizing the Return from Extended Operations – Strasbourg, France.

22 March • **ESA** – Sentinel scientific products for Land, Ocean and Cryosphere – Assessment and Consolidation Workshop – ESRIN- Frascati, Italy

28-30 March • **3AF in partnership with AIAA** – Applied Aerodynamics – Orléans, France
lisa.gabaldi@aaaf.asso.fr

30 – 31 March and 1st April • **European Commission (EC) DG Research** – Aeronautics Days 2011 ‘Innovation for Sustainable Aviation in a Global Environment’ – Political top-down messages- Technological achievements-Review process of meeting the 2020 Vision goals and the Aeronautics research Agenda - Palacio Municipal de Congresos, Madrid, Spain
www.aerodays2011.org

First Announcement
 Aeronautics Days 2011
 30 / 31 March & 1 April 2011

EUROPEAN COMMISSION
 Community Research

Aeronautics Days 2011
 “Innovation for Sustainable Aviation
 in a Global Environment”

Madrid/ Spain
 Palacio Municipal de Congresos
 30th & 31st March and 1st April 2011

CDTI Centro para el Desarrollo Tecnológico Industrial
 SEVENTH FRAMEWORK PROGRAMME

DG Research-H - 1 -

12 April • **ESA** – 11th Symposium on Advanced Space Technologies in Robotics and Automation (ASTRA) – ESTEC, Noordwijk, NL

13-14 April • **RAeS** – Aerospace 2011: Funding the Future – Aerospace and Aviation in the Age of Austerity
 London, UK – www.aerosociety.com/conference

13-15 April • **CEAS** – Euro GNC 2011 – 1st Specialist Conference on Guidance, Navigation & Control – Hosted by DGLR. Venue: Technische Universität München City Campus - Munich, Germany
gnc@dgfr.de / +49 228 30 80 5-0 – Florian@Holzapfel@tum.de / +49 89 289 16081

3-6 May • **3AF** – Missile Defence – San Sebastian, Spain – lisa.gabaldi@aaaf.asso.fr

5 June • **ESA** – GNC 2011 – 8th International ESA Conference on Guidance, Navigation & Control Systems – Carlsbad, Czech Republic – www.esa.int

YEAR 2011

6-8 June • **AIAA/CEAS** – Aeroacoustics Conference – Portland, Oregon (USA) – www.aiaa.org

8 June • **ESA** – International Workshop on Planning and scheduling for Space – IW PSS 2011 – ESA/ESOC – Darmstadt, Germany

8-9 June • **RAeS** – The World Outside The Aircraft – Simulating The operational Environment – Spring Flight simulation Conference- London – www.aerosociety.com/conference

14-16 June • **SEE/GIFAS** – European Test and Telemetric Conference (ETTC) – Toulouse, France – communication@see.asso.fr

11 July • **ESA** – 4th International Symposium on Physical Sciences in Space – ISPS 4 Bonn Bad-Godesberg, Germany.

20-26 June • **International Air Show – PARIS LE BOURGET** – Professionals: 20-23 June

26-30 June • **3AF** – International Forum on Aeroelasticity and structural Dynamics (IFASD) – Paris. lisa.gabaldi@aaaf.asso.fr

13-15 September • **Organiser NVvL - Rotorcraft Community** – 37th European Rotorcraft Forum – ERF 2011 – Vergiate/Gallarate – Ticinio Park - Italy – hermans@nlr.nl

28-29 September • **RAeS** – An International Approach to Flight Crew Training Standards – annual RAeS International Flight Crew Training Conference – www.aerosociety.com/conference

3-7 October • **IAC 2011** – – 62nd International Astronautical Congress – Central theme: African Astronautics – Venue: Cape Town International Convention Center (CTICC), Cape Town, South Africa.

17-21 October • **CEAS** – 3rd CEAS European Air & Space Conference – Giorgio Cini Foundation – Venice, Italy. www.ceas2011.org

17 November • **IAA** – Conference: Climate Change and green systems, Disaster Management & Natural hazards, Planetary& Lunar exploration, Human Spaceflight. Ronald Reagan Building and International Trade Center, Washington DC – sgeneral@iaaweb.org

YEAR 2012

12-17 June • **ILA Berlin** – International Airshow – www.ila-berlin.de

09-15 July • **International Farnborough Air Show**

23-28 September • **ICAS** – ICAS2012 Congress – Brisbane, Australia – secr.exec@icas.org

1-5 October • **IAC** – 63rd International Astronautical Congress- IAC2012 Nostra D'oltremare Convention Center- Naples, Italy



Sixth European Aeronautics Days

Aerodays 2011

*Innovation for Sustainable Aviation
in a Global Environment*

Palacio Municipal de Congresos, Madrid / Spain
30th March - 1st April 2011

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