

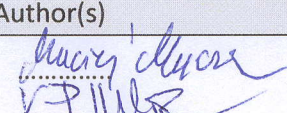
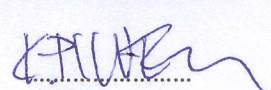
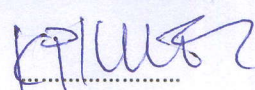
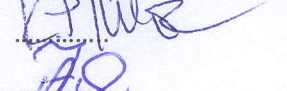
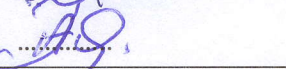


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AGENDA

Small Aircraft Transportations in the Future Roadmap Conference ILA

Date: 13th September 2012

Location:

ILA Conference Center II, Hall 5, Room Lima, Berlin,
Contact: Adriaan de GRAAFF (Ad Cuenta), adgraaff@hetnet.nl,
Krzysztof Piwek mobile phone +48 501 244 004

13th September 2012 - Thursday

10:00 – 13:30 Small Aircraft Transportations in the Future Roadmap Conference ILA

10:00 - 10:30 Registration

10:30 - 10:45 Welcome

Main subjects:

- 1. Vision for the development for SATS in Europe**
– **Marcello AMATO (CIRA)**
- 2. The technology roadmap**
– **Aniello COZZOLINO (Piaggio)**
- 3. Industrial consequences and future research actions**
– **Mariusz KUBRYN (PZL M)**
- 4. Questions and answers**
- 5. Discussion**

Brief conclusion:


- 35-46 million flights annually could emerge (substituting car travel in Spain, southern France, Italy, parts of Germany and UK), complementarity to, not the replacement of other segments of transportation to facilitate EU goals (4-hour door-to-door travel), a need of significant cost reduction (ideal: 40k EUR per small aircraft), an air fare level for travel attractiveness is highly significant, along with the major players unification and catching the opportunity of public programs (Clean Sky 2, TEN-T) support to coordinate efforts. A network of community should gather as many stakeholders as possible (not only manufacturers).
- need of one voice approach in the small aviation industry,
- industrial capabilities of 109 entities are available
- technology needs – a new engine (25% of costs), EASA regulations on new technologies implementation suggested facilitation

ATTENDANCE LIST

Small Aircraft Transportation in the Future - Roadmap Conference ILA, Berlin, 13th September 2012


ATTENDANCE LIST

item	Name	Country	Organisation	SIGNATURE
1	AMATO Marcello	IT	CIRA	
2	ARRA Michele	IT	Agusta Westland	
3	BANASZEK Krzysztof	PL	PANSA	
4	BRZĘCZEK Józef	PL	PZL M	
5	CHATEL Thomas	FR	Gifas	
6	CIMA Giovanni	EU	EASA	
7	COZZOLINO Aniello	IT	Piaggio	
8	CRONE James	CA	Pratt and Whitney Canada	
9	de GRAAFF Adriaan	NL	AD CUENTA	
10	DESVALLEES Patrice	FR	NSRG Contact Point France	
11	DZIUGIEŁ Bartosz	PL	IoA	
12	DZIUGIEŁ Malwina	PL	IoA	
13	GHIJS Stefaan	BE	Fly Aeolus	
14	GRANGER Richard	GB	Technology Partners	
15	HENLEY Tony	GB	THL	
16	HOLEKSA Bogusław	PL	BPTLPil	
17	HOLEKSA Michał	PL	BPTLPil	
18	IWANIUK Andrzej	PL	IoA	
19	KOŚMIDER Tomasz	PL	Technology Partners	
20	KUBRYN Mariusz	PL	PZL M	
21	LIEBHARDT Bernd	DE	DLR	
22	LUTJENS Klaus	DE	DLR	
23	MARTIN RUIZ Juan Luis	ES	INDRA	
24	MAĆZKA Maciej	PL	IoA	
25	MIKSA Wojciech	PL	IoA	
26	NAE Catalin	RO	INCAS	
27	PAGNANO Giuseppe	IT	Clean SKY	
28	PASZYN Jarosław	PL	samoloty.pl	
29	PEREZ-ILLANA Pablo	EU	EC-DG R&I-Aeronautics	
30	PIWEK Krzysztof	PL	IoA	
31	PODSADOWSKI Andrzej	PL	Clean SKY	
32	ROHACS Daniel	HU	BUTE	
33	ROHACS Jozsef	HU	BUTE	
34	SZELAĞ Daniel	PL	IoA	
35	TOWPIK Michał	PL	Technology Partners	
36	van SCHAİK Frans J.	NL	NLR	
37	WOŁEJSZA Zbigniew	PL	IoA	
38	VALCUENDE Ivan	PL	PZL Okęcie EADS-CASA	
39	ZAŁĘSKI Witold	PL	BPTLPil	
40	PIŁKUS Piotr	PL	WISLA AIRPORT	
41	CZĘDARY GALINSKI	PL	ILOT	
42	Schweiser Werner	DE	FLH	
43	PIETRUSZKA M.	PL	PZL	
44	FARIOLI Mario	IT	CIRA	
45	MIGLIANI COSTINI-CIPRIANI	RO	Clean Sky	
46	ERIL DAUTKAITIS	BE	" "	

47. MARTIN BRADAC CZ UNIS 

48. MIKULKA Zdeněk CZ EWEKTOR 

49. Cačnin Lukáš EWEKTOR CZ 

50. Jacek Pienigick PL Politechnika Rzeszowska 

51 Cornelius Schalingen Aerospace Controls, CH 

52 Zdobysten Gorye PW-W-ne PL 

1 WELCOME

Mr. de Graaff welcomed the participants with Polish “Na zdrowie!”. He recalled the last time meeting two years ago and underlined the achievements of the Small Aircraft transportation system analyses. He mentioned Flight Path 2050, a Commission document supporting the initiative. He said about SAT-CS2 meeting of 11th of September and underlined the possibility of further advancement. He presented the agenda of SAT conclusions, and possible, as he believed, more research directions and impact on the industry. He gave floor to Mr. Piwek.

Mr. Piwek welcomed everybody and thanked participants for coming. He described the main purpose of SAT – a main component in the European transportation system. He recalled previous EPATS project and presented consortium members of current, SAT project (manufacturers, research entities, universities and operators). He recalled issues of the past concerning lack of understanding of general aviation voice in Europe, sometimes getting the feeling it was prohibited. Currently, much changed, as the voice is heard, he called for action by quoting Prof. J. Rohacs of BUTE “Stop talking, let’s do it!”. He validated the way cleared for take-off for small aircraft by listing the important, fundamental EU resolutions. He concluded that one size-fit-all approach failed. The small air transport system could be built and using this new mode of transportation, the EU goals could be reached. 90% of travelers would be able to reach their destination within 4-hour door-to-door travel. A NUTS-3 level map of European Union was displayed indicating the locations with a thin passenger flow, perfect for SAT system. The burden of traffic volume in Europe is unbalanced because most of 1270 airports are slightly or not used at all, and the top 15 of them serve the 70% of traffic. The website links with detailed reports defining Small Aircraft Transportation System mode were presented. The displayed chart of modal split envisioning a possible shift of volume located the new mode significance at longer range distances in continent scale. A significant share of car travel volume could be rationally transferred to SATS mode. The resulting aggregated figures estimates are historically high, but they are very sensitive to Direct Operating Costs, load factors and annual flight hours levels. The SATS initiative brings the EU main goals to reality, especially in enhancing the competitiveness. He presented a list of current achievements milestones starting Sep 2011 with the Common Vision up to where the project was at the moment in Sep 2012. He stressed unification of the industry voice, of the atomized community of EU small aircraft stakeholders. Then he described evolving synergy from ESPOSA, SOFIA, EPATS, SATS into a green, component aircraft. He concluded with a wish the emerging small aircraft was a younger brother of AIRBUS children.

2 MAIN SUBJECTS

2.1 Vision for the development for SATS in Europe

– **Marcello AMATO (CIRA)**

Mr. Amato quickly summarized his presentation with the headlines including Flight Path 2050 importance, EU Societal and Market needs, protecting environment, keeping the level of safety and security, complementing instead of competing with large aircraft systems, 4-hour travel accessibility interconnected and tailored to individual needs. He underlined the existence of small communities which are in needs of transport ensured by SAT. A traditional cargo system

could also be complemented by the SAT system granting the distribution of goods at a European level. He supported the idea of the road travel to small aircraft shift rationale with parallel solutions applied in other parts of the world. Then he summarized the approach, that was followed. The risk was checked, the cost-benefit performance, regulation issues and technology roadmap altogether merged with industrial capabilities. In his opinion, the project conclusions should pave the way to the general acceptance at a political level. For politicians, with SAT achievements, it should be clear the system is an intelligible component of the EU transport system. He displayed a logic chart presenting the roadmap generating the feedback to ACARE and the Commission. He concluded that identified, general SAT activity routes, located in West-East or North-South directions could be served by using small airports, other landing facilities, exploiting small aircraft (4-19 seats), hydroplanes supported by Intelligent Air Transport Management system, that has to be further developed. A very bad transport situation example was envisaged using a satellite map of southern Italy. In his opinion the three given time horizons (short, medium, long term) limited the extent of potential action. The short term was described in the project quite well, the medium term was only signaled, and the long term was not touched. For the short term, the business models and load factors increasing (even ensuring) ATM models were the most crucial for him. He found, also, the need of coordination of the local communities on this type of transport, especially where there is a high need of such a system. In medium term he stressed the signals of a full public support importance, the small aircraft resilience to weather conditions, clean and silent propulsion systems, new communication and control, possibly single-pilot operation. The long term vision, undefined, could include, as he let his imagination give examples, green propulsion systems with slight or none emission levels, autonomous flight routes. Mr. Amato listed the enablers and most important among them – public funding. The answer to social need is cost reduction by incorporating new technologies. He envisioned the potential continuation within a new program.

2.2 The technology roadmap

– Aniello COZZOLINO (Piaggio)

Mr. Cozzolino welcomed participants and presented the reasons why the system had not been working so far. The first step to be done from the vision to the reality, according to him, was the technology. Another, as he said, were regulations, that unfortunately are the showstoppers. He focused on possible timing and presented a schematic chart of the efforts at the level of interentinty coordination. Then he moved on to present the demand potential and the way how it was estimated, with regional attractiveness and GDP, as the fundament, followed by the service, the fare, cost of time and possible constrains (lack of intermodality, airport/airspace availability) and harder to quantify aspects like safety, security and environmental perception. The fare reduction came out to be the most significant factor determining the transport mode choice. He said a turboprop aircraft operated on the distance of 400km was the most promising solutions. He reserved the jump to high fares and other aircraft would bring the business to completely different market, which is not the topic of this analysis. He stated a fleet of 10-15 of Cessna Caravan or Viking Otter seemed to be, currently, the most suitable configuration. He, also, warned not to follow the US idea of a huge fleet, that ended up catastrophic. Comparison of current small aircraft to hi-speed train costs of transport per available seat km indicated twice as high a burden on the aircraft side. He presented a breakdown of possible cost

reductions by 50% thanks to technology advancement, highlighting an urging need of a new engine, a new airframe and a new crew cost optimization.

A person from the public didn't understand the reduction percentage split.

Mr. Amato explained the percentage numbers of possible cost reduction totaled to a level of 50%. Then he repeated the cost drivers included a power plant, a GPS navigation, a limited crew. He said there's a gap between what was needed and what was possible. Expressing his positive opinion of a project small aircraft fly-by-wire, he turned to issues of the reliability. Development of systems have to be focused on electronic actuators. He remarked the airframe had to be less labor intensive and it could be achieved by using composites. He exemplified this by displaying properties of P180 aluminum wing, which weight had been satisfactory, but costs were not low enough. In his opinion, the regulations were to be adjusted by further legal framework facilitation of flying small aircraft commercially. Concluding, he said, there is a potential in the family of types from a single piston aircraft up to a larger turboprop. He rejected the possibility of use of the novel aircraft in the short or medium term. Mr. Amato invited participants to read the documents for more details.

2.3 Industrial consequences and future research actions

– Mariusz KUBRYN (PZL M)

Mr. Kubryn welcomed the participants and presented industrial consequences and potential cooperation. He displayed a chart of manufacturers in the aviation business and evaluated Europe's strong potential. He listed categories of manufacturers resulting from the analysis giving a number of 107 entities. Three manufacturers were already involved in SAT, but to have the one voice, Pilatus, Diamond and GE Aviation (former Walter) from Czech Rep. were invited as well. The displayed GAMA statistics chart revealed market specification shift. Despite the mentioned potential, general numbers for EU sales of piston, turboprop or jet aircraft are unsatisfactorily decreasing. The R&TD capabilities of the EU are large enough to risk the search for a new green, small engine. He presented a list of issues concerning certification rules and called for simultaneous efforts in this area, to tackle the usual several years lag between technology and regulations. He complained EASA methods are more complex, bureaucratic and time consuming in comparison to FAA. Keeping the same level of safety should be assured, of course, but in a friendly environment. Mr. Kubryn thanked for the attention and, again, underlined the importance of one strong voice of the small aviation industry.

3 QUESTIONS AND ANSWERS

Mr. de Graaff recalled the high reluctance received at the beginning of the projects, but as the time passed multiple efforts resulted in the attitude shift. He concluded that around 35-46 million flights annually could emerge (substituting car travel in Spain, southern France, Italy, parts of Germany and UK), an air fare level for travel attractiveness is highly significant, along with the major players unification and catching the opportunity of public programs (Clean Sky 2, TEN-T) support to coordinate efforts. A network of community should gather as many stakeholders as possible (not only manufacturers). For the end, he presented the 3 questions, inviting participants to come up with their answers, as well as, formulating their questions.

4 DISCUSSION

1. A person from Augusta Westland – about the types of markets, about SAT infrastructure
Mr. de Graaff – EPATS already analyzed this area

Mr. Piwek – it is a niche, a shift from car travel of up to 1300 km distance which volume was generated by a curve of equilibrium that resulted with a 15k aircraft fleet, depending on load factor. Currently only 500 hours per year operate the business, while the level of 1000 hours per year is critical. In Poland, in regions people start to understand the importance.

Mr. de Graaff – EPATS analyzed 2500 landing facilities. 90% of them are located within 20 km of cities greater than 100k of inhabitants.

Mr. Amato – Many available airports currently provide no connections and there's a risk they would disappear due to lack of activity.

Mr. de Graaff – A new project, ModAir, is to analyze the intermodality, that seems to be very crucial for SAT operations.

2. Mr. Schweizer (operator) – voices heard at AOPA Germany meeting seem to be aligned to SAT initiative, particularly, concerning small airports preservation. The signals from there, also, indicate a potential for SAT crew in retired pilots. The question is about the booking system and its way to reduce brokerage costs.

Mr. Amato – The IT system tackling, among other areas, booking would be covered network of operators to ensure the demand feasibility.

Mr. Piwek – The net-centric, IT system is a key for success here, but it needs funding.

Mr. de Graaff – The SAT operator oriented system is the condition sine qua non.

3. Mr. Pagnano – Upkeeping small airports is a political issue. The booking systems need to be reengineered to reduce the percentage of fare consumed by brokers, that leave airlines with no profit. The roadmap should become a proposal, however an engine cost reduction has to be presented by someone else, by its potential manufacturer.

Mr. de Graaff – I agree and applaud the unification of the manufacturers efforts. Remote regions transportation in other parts of the world is, sometimes, subsidized. I ask for the permission to contact airports representatives to build the network of those in need of public money.

4. Mr. Załęski (Bielski Technological Park) – There will be no system without a revolution. Cessna Caravan is from the 60s. Why aircraft from the 60s are the most successful? The airports will start to disappear if there's no activity. The air transport is, currently, the most expensive mode of transport if airport costs were to be included in the air fare.

Mr. Cozzolino – Why Caravan? It is simply the cheapest. There's the death valley of technology to be passed to satisfy the requirements. We understand and it is clear, without a real breakthrough there's nothing.

Mr. de Graaff – As I remember it was FedEx that build the Caravan success. Their massive demand pulled the Caravan's success. And on the long run, 2030 or beyond, novel configurations VTOL, STOL, tiltrotors, autogiros shouldn't be excluded.

Mr. Rohacs – I would like to add to the answer. Cessna Caravan still operates as the cheapest one, because nothing new was added to new aircraft since the 60s.

Mr. de Graaff – I agree

5. Mr. Pieniżek (RUT) – What does it mean an aircraft control is simplified? Pilots should be aided by on board systems and fly-by-wire systems. What is simplified? In manufacturing part or in the part for pilots?

Mr. de Graaff – an autonomous airplane is on the horizon of 2030-2050. Small airplanes will be the first applications for these systems. Provided the accidents levels of US military examples are reduced.

Mr. Cozzolino - the first step is reaching currently available safety level and further on the levels

6. Mr Michele Arra – fly-by-wire are good for helicopters or military fighters, but

Mr. Cozzolino -flight enveloped protection, a mech systems are working ok today, the autopilot is just tracking the reout, but we are talking about a pilot out of envelope.

Mr. de Graaff – the roadmap addressed the issue of a situation awareness

7. Mr. Giovanni Cima (EASA, ops) – new EASA rules are almost there, Oct 2012. Some flexibility provision are there. These rules are airline designed and maybe this segment voice was not heard enough.

Mr. de Graaff agreed.

Mr. Cozzolino fully agreed.

Mr. de Graaff - EASA could be involved as observer to the projects, so regulations could be quickly forged.

Mr. van Schaik suggested publishing the report online.

Mr. de Graaff agreed and invited the community to think forward. He thanked for the participation and expected to see everybody during next ILA airshow.

5 ACTION TO BE FULFILLED

Item	What?	Who? Responsible /Cooperate	When?
1	Distribute ILA presentations	ILOT	2012-09-17
2	Provide list of attendees for future network	ILOT	
3	Provide email to participants announcing that a network will be established	ILOT	
4	Finalize roadmap doc with inputs from Nello presentation	A. de Graaff	
5	Finalize other sat roadmap docs	all	
6	Finalize report on workshop	ILOT	
7	Prepare proposal for cs2 on October 4 (note it is still unclear if CS2 will cover only I-2 and -3 or that it will also cover I-0 and I-1)	all	
8	Extent sat roadmap project for 2 month	ILOT	
9	All partners to provide ILOT with overview of expenditures asap	all	
10	Industry to agree on an EEIG asap	Piaggio/ Diamond	
11	ADG to contact Albert grade for more positive input from PILATUS	A. de Graaff	
12	Prepare meeting on 4 October	ILOT	
13	Contact organisations to create the network (again): operators, airports, engine manufacturers, equipment manufac.	S. Ghijs, ILOT, A. de Graaff	
14	Connect research establishments and universities to SAT program (use EASN)	CIRA, ILOT, A. de Graaff	
15	Contact SESAR for future requirements	A. de Graaff	
16	Contact DG move with help of DG research	ILOT, A. de Graaff	
17	Prepare timeline for actions	T. Henley	

Attachments

Attachment 1: Welcome and Short Introduction to the SAT-Roadmap Project- [Krzysztof PIWEK](#)

Attachment 2: Common Vision of the development of Small Aircraft Transport System in Europe - [Marcello AMATO](#)

Attachment 3: Roadmap for Research&Technology Development of Small Aircraft Transport (SAT) Mode – Small Aircraft Big Challenge – [Aniello COZZOLINO](#)

Attachment 4: Industrial Consequences and Cooperation on SAT Mode – [Mariusz KUBRYN](#)

Attachment 5: Question and Answers – [Adriaan de GRAAFF](#)

Document Change Log:

Version	Author /Organisation	Date of Release	Description of the release	Modifications (sections affected and relevant information)
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Number	Company	Company's short name	Company's Country	Name of the Company's Project Manager	Marking
1	Instytut Lotnictwa	IoA	Poland	Krzysztof PIWEK	X
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12	Fly Aeolus B.V.B.A.	FLY AEOLUS	Belgium	Stefaan GHIJS	X
13	M3 SYSTEMS SARL	M3S	France	Isabelle LAPLACE	X
15	Tony Henley Consulting Limited	THL	United Kingdom	Tony HENLEY	X
16	EUROPEAN COMMISSION	EC RD	Europe	Pablo PEREZ-ILLANA	X

„Small Aircraft Transportation in the Future”

Roadmap Conference ILA, Berlin, 13th September 2012

Welcome and Short Introduction to the SAT- Roadmap Project

Krzysztof Piwek

SAT-Rdmp Project Coordinator

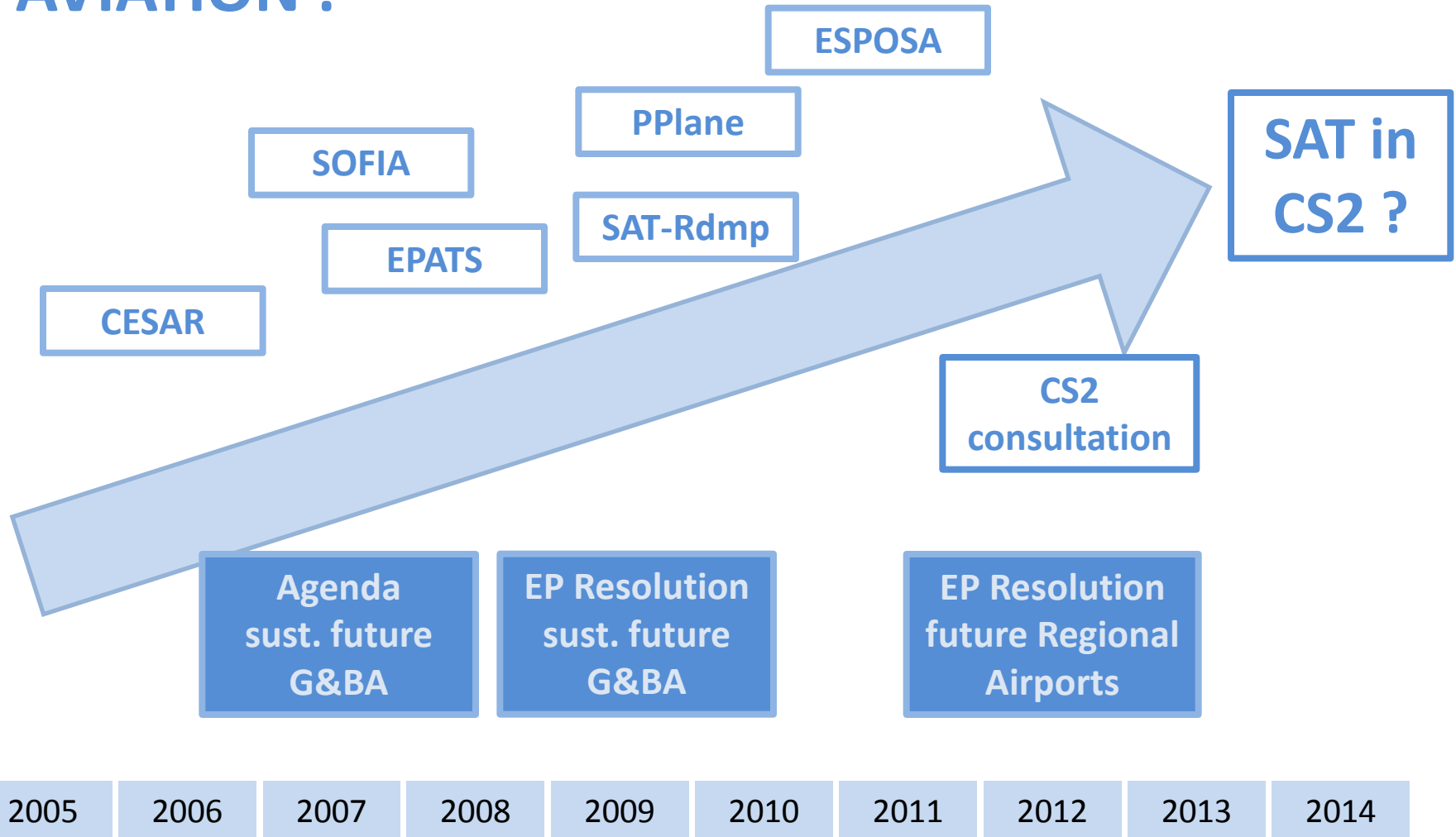
PROJECTS AND PARTNERS:



Projects funded by European Commission



EUROPEAN RESEARCH AREA AND GENERAL AVIATION :



An Agenda for Sustainable Future in General and Business Aviation – Feb 2009

- “general and business aviation complements regular air transport performed by commercial airlines”
- „Current regulations govern the operation of highly complex commercial aircraft place a disproportionate burden on operators of small aircraft. Therefore , one-size-fits-all regulatory approaches to different aviation sectors have proven inappropriate!”

On the future of regional airports and air services in the EU – May 2012

- „whereas the connectivity offered by aviation to citizens in EU regions, and in particular in inaccessible regions and islands, is extremely important and helps ensure the economic viability of such areas”;
- „Takes the view that regional airports, should be considered eligible to apply for financing under EU funds, recommends that the Commission take into consideration the opportunities offered by regional airports as part of the European central transport network”;

CRUCIAL TRANSPORT GOALS IN FP 2050



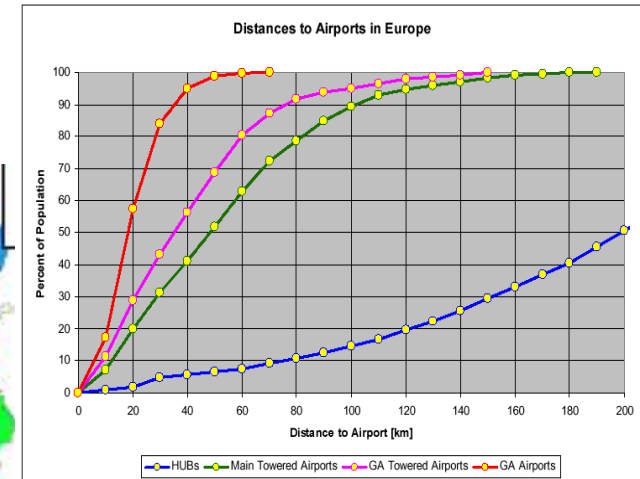
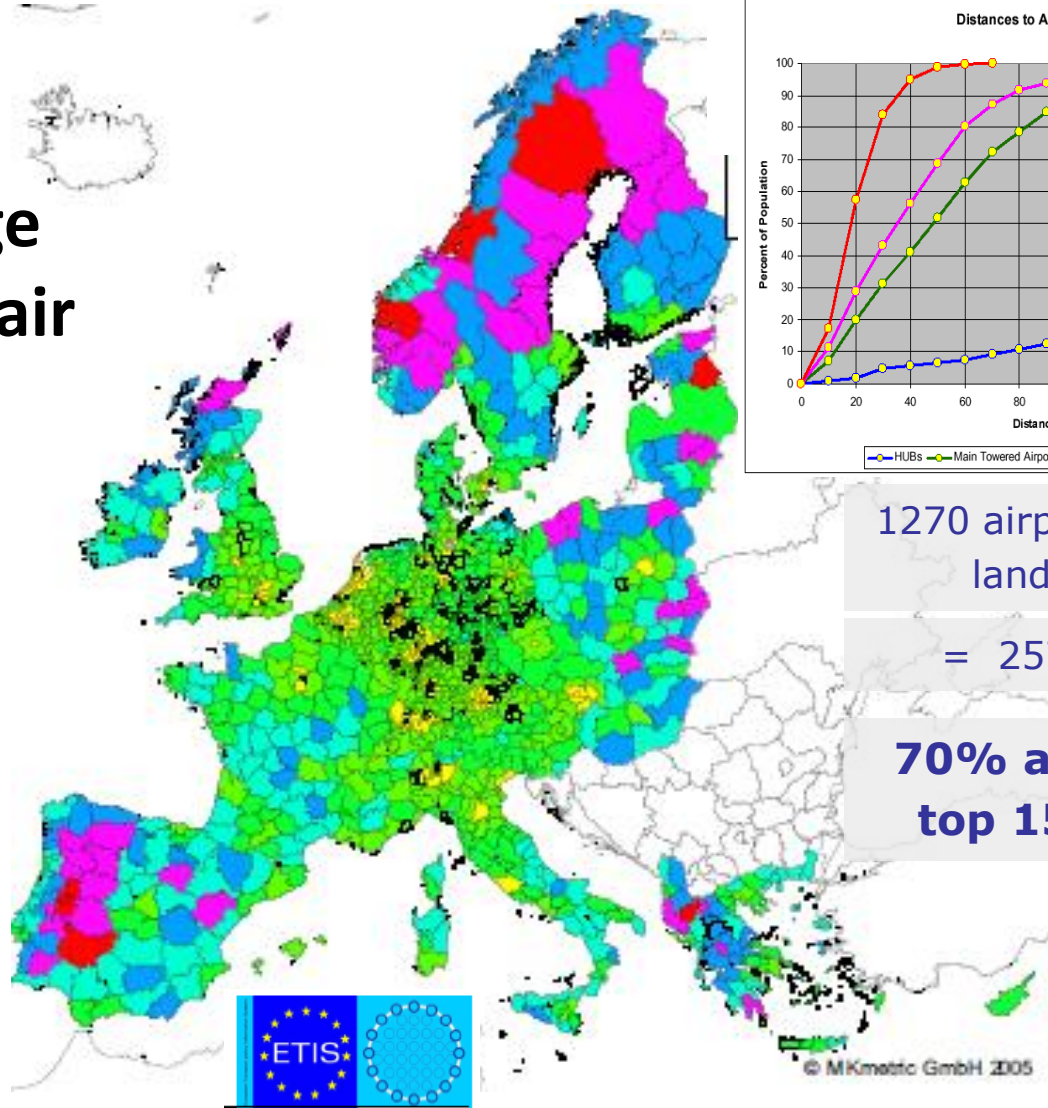
Meeting Societal and Market Needs

- European citizens are able to make **informed mobility choices**
- 90% of travellers within Europe are able to complete their journey, **door-to-door within 4 hours.**
- Flights arrive **within 1 minute** of the planned arrival time
- Air traffic management system is capable of handling **25 million flights** a year in Europe
- A coherent **ground infrastructure** is developed



90% D2D WITHIN 4 HOURS IN 2050 = EUROPEAN PERSONALIZED AIR TRANSPORT SYSTEM

What is average travel time by air transport for regions?



1270 airports and 1300 landing fields

= 2570 airfields

70% air traffic = top 15 airports

What is the Small Aircraft Transport Mode?

<http://epats.eu>

<http://sat-rdmp.eu>

It is a segment of high-speed transport market,
that serves local and regional low traffic connections

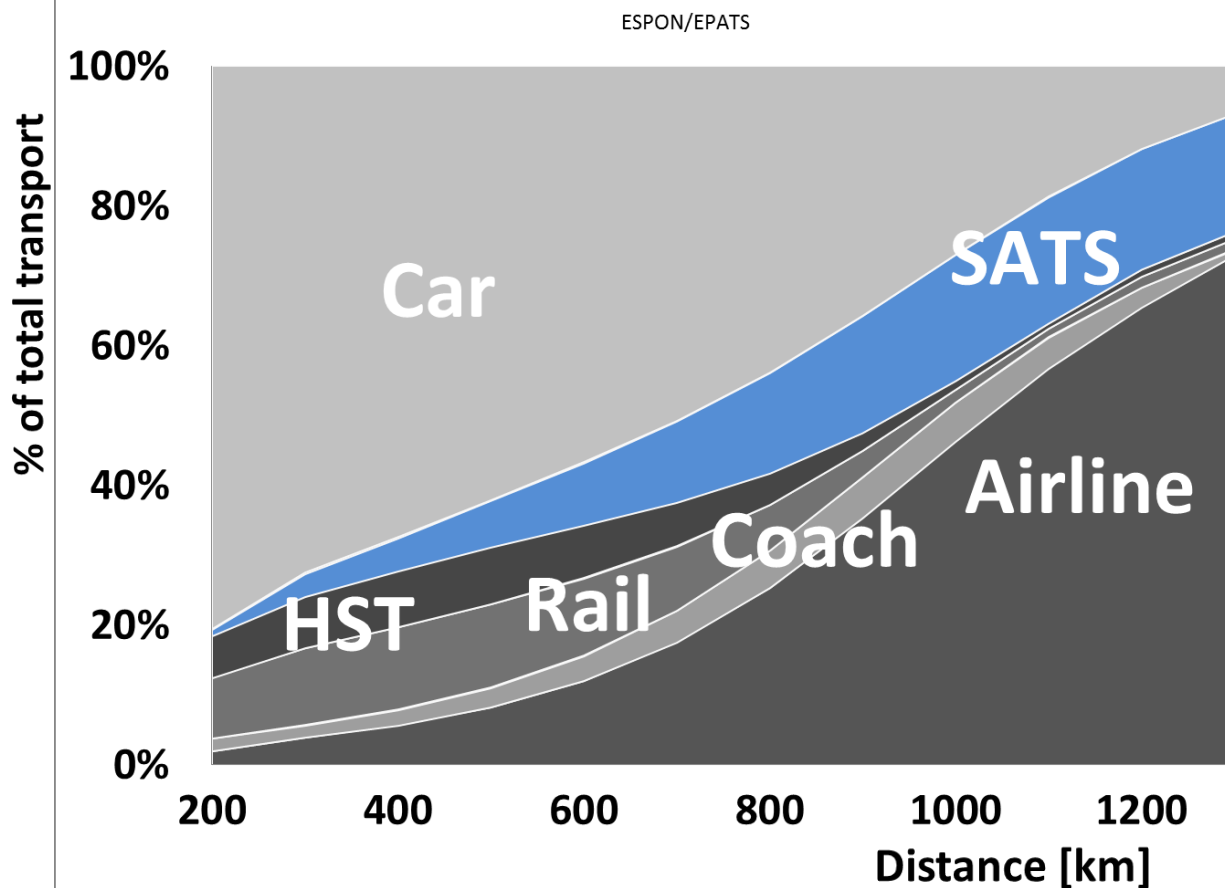
Aircraft - small 4 to 19 seats, that are low DOC, green, safe, and secure

Infrastructure on the ground and in the air - Regional Airports + ATM/ATC services integrated in SESAR

Net – Centric Management & Acquisition – ICT based logistic and management system for SATS, integrated within the SESAR's System Wide Information Management (SWIM)



Modal split of trips in Europe. 2020



**MAIN
FINDING**
**SHORT HAUL
NICHE**

MAIN IDEA
To shift part of
long distance
trips from
**cars to
small aircrafts**

CRUCIAL INDUSTRY GOALS IN FP 2050



Maintaining and Extending Industrial Leadership

- The whole European aviation industry is strongly competitive

Small aircraft industry should play significant role in fulfilling this goal

- Europe maintains leading edge design, manufacturing and system integration capabilities and jobs
- Streamlined systems engineering, design, manufacturing, certification and upgrade processes have addressed complexity and decreased development costs



COMMON VISION -> ROADMAP -> PUBLIC



What	What (topics)	To	When
COMMON VISION Workshop, Joint meeting with GA Projects	<ol style="list-style-type: none"> 1. European Mobility, Demand, Business Models 2. Requirements 3. Common Vision on Small Air Transport 	RTD Community, EC, ACARE, Regulators	Sept 2011
ROADMAP Workshop	<ol style="list-style-type: none"> 1. Common Vision – refining 2. Business scenarios - refining 3. Capabilities and Master Plan 4. The Technology Roadmap 5. Recommendations on SRIA, Horizon 2020, Clean Sky 2 	Manufacturers Community EC, EGAMA, IMG, Operators	July 2012
SAT-RDMP Conference	<ol style="list-style-type: none"> 1. Synthesis of Small Air Transport Mode 	General Aviation Community, Public	ILA Airshow Sept 2012

MAIN GOAL OF THE CONFERENCE:



Discuss with representatives of the SAT Community (Industry, Research, Academia, SME), EC, Regulators, Operators to build up a “Common” shared view on

SMALL AIRCRAFT TRANSPORTATION SYSTEM

as a component of the Customer - Oriented European Air Transport System,

AGENDA:



Conference moderator: Mr Adriaan de GRAAFF (Ad Cuenta)			
10:00	Registration		30 min
10:30	Welcome	Krzysztof PIWEK (IoA)	15 min
10:45	Vision for the development of SATS in Europe	Marcello AMATO (CIRA)	30 min
11:15	The technology roadmap and future Research actions	Aniello COZZOLINO (Piaggio)	30 min
11:45	Industrial consequences and cooperation on SATS	Mariusz KUBRYN (PZL M)	30 min
12:15	Questions and answers		15 min
12:30	Time for discussion		60 min
13:30	Closure		

THANK YOU FOR ATTENTION

I WISH YOU FRUITFUL DAY

Krzysztof PIWEK

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Institute of Aviation

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02 - 256 Warsaw, Poland

tel: +48 22 868 56 81

Technology Roadmap for Small Aircraft Transport Mode
ILA, Berlin, September 2012

Common Vision
for the development of
Small Aircraft Transport System
in Europe

- ❖ **Expected Benefit for Europe by developing SAT**
- ❖ **SAT-Rdmap project - Objectives and Expected Impact**
- ❖ **SAT Common Vision**
 - **The Overall Approach**
 - **The SAT concept**
 - **Stages of SAT system development**
 - **The Specific SAT Challenges**
 - **Enabling conditions**
 - **Main Recommendations**

- ❖ **The SAT system will allow to answer to the Flight Path 2050 Challenges:**
- meeting Societal and Market Needs
 - maintaining and Extending Industrial Leadership
 - protecting the Environment and the Energy Supply
- ensuring Safety and Security.

Meeting Societal and Market needs

- ❖ SAT system will **create additional mobility (door-to-door/point-to-point)** for the European citizens as a component of an inter-modality transport system.
- ❖ SAT system will enable the strategic goal: **“90% of travelers within Europe are able to complete their journey, door-to-door within 4 hours”**
- ❖ SAT System will be **interconnected, accessible, predictable, dependable and comfortable.**
- ❖ SAT will be part of a variety of transport services **tailored to individual needs.**
- ❖ The SAT system will **ensure access of small communities to air service**

Maintaining and Extending Industrial Leadership

- ❖ The deployment of the SAT system will ensure the growth of European industry and of SME **ensuring jobs and innovation.**
- ❖ The SAT deployment will be a stimulus **for ensuring a level playing field between Europe and the rest of the world for small aircraft aviation;** this will have to be supported by the right policies, certification processes, funding and regulations, in close cooperation with the main stakeholders.
- ❖ **The SAT system will complement the traditional cargo system** allowing freight distribution in regions with less developed road/train infrastructures or among city pairs with less commercial volumes, partly substituting freight transport by tracks.
- ❖ **Export SAT products out of Europe covering emerging markets.**

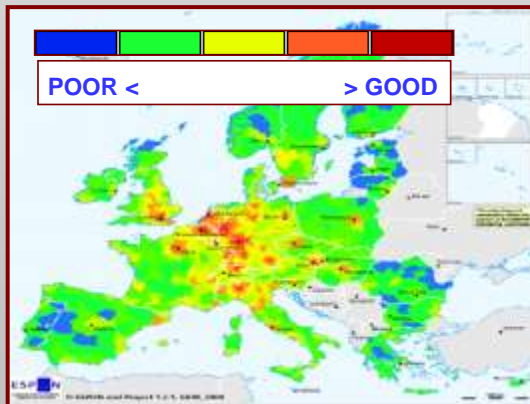
Protecting the Environment and the Energy Supply

- ❖ **SAT System will be environmentally friendly**, affordable, safe and secure., The system will enable a reduction of emitted greenhouse gasses compared to other means of travel **by adopting more easily alternative fuel and alternative power sources.**
- ❖ **SAT System development will reduce road travel.** The benefits include the prospect for reduced emissions and energy consumption, in comparison with road transport.

SAT-Rdmap Project Objectives

- ❖ Definition of a **common vision** of the small aircraft transport system for inter-regional mobility.
- ❖ Identification of **demand** and design of a **business case** compliant with the identified requirements which describes the relations among all the system's components.
- ❖ **Risk Assessment** and **cost/benefit performance** of the identified new system's concept.
- ❖ Identification of the **SAT requirements** in terms of **technology needs** and **regulatory issues** to be addressed.
- ❖ Assessment of **current capabilities**.
- ❖ Definition of a **roadmap** to fill the **technology/regulatory/operational** gaps between current capabilities versus the requirements.
- ❖ **Dissemination** actions and establishment of a stable and well **recognised network of stakeholders**.

- ❖ **Pave the way for the general acceptance** of the added value of small-size aircraft transport, operating on commercial scheduled or non-scheduled flights, as a component of the European (Air) Transport system.
- ❖ **Define a highly customer** (passenger and freight) **oriented service** able to achieve the strategic goal: 90% of travellers within Europe are able to complete their journey, door-to-door within 4 hours in Europe.
- ❖ **Identify the RTD needs** of the European transport service operators and manufacturing industry in order **to become the world leader** in operating, designing and producing small aircraft.



2008 Addendum
to the
Strategic
Research Agenda

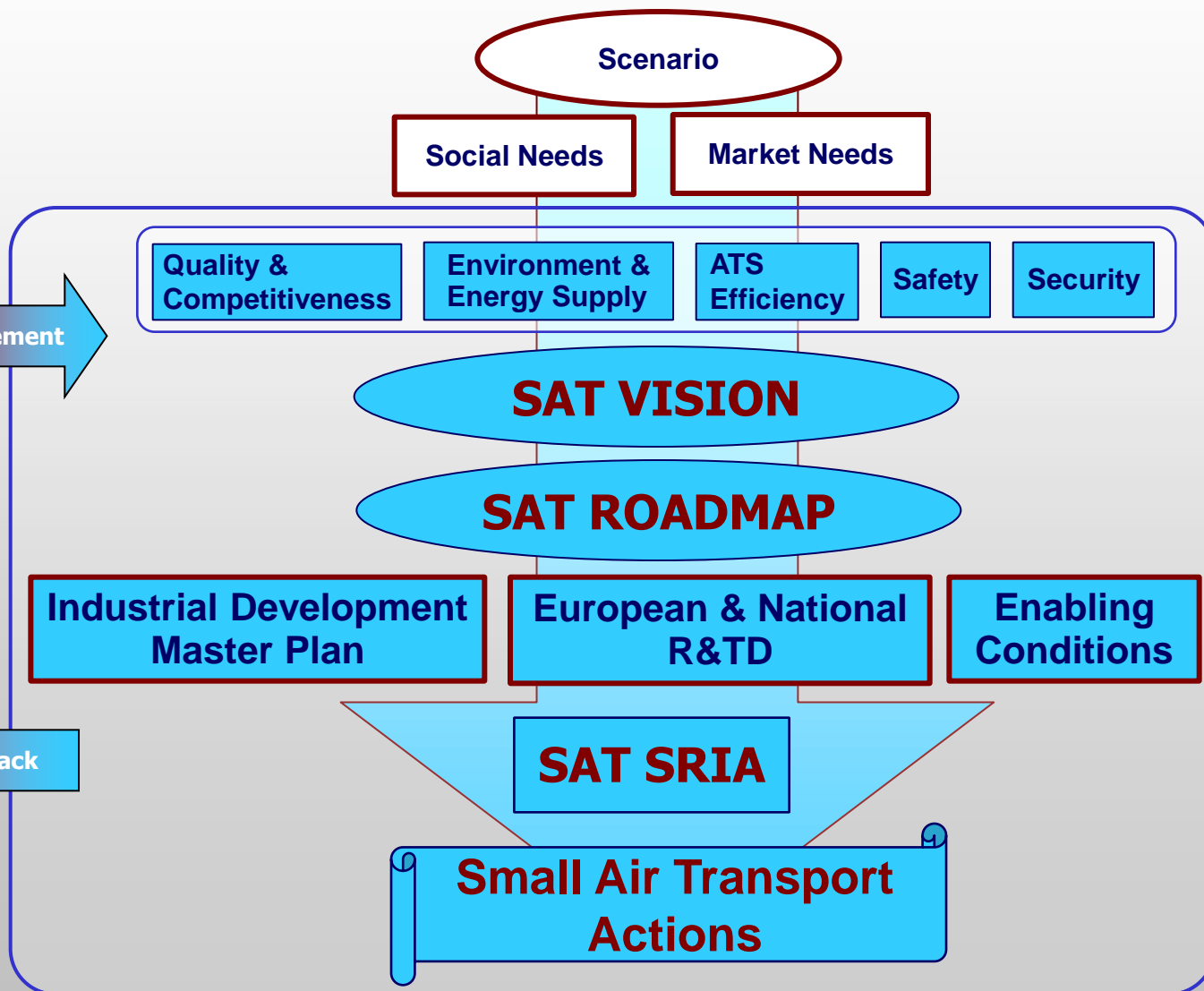
Flightpath 2050
Europe's Vision
for Aviation

Report of the High Level Group
on Aviation Research



Engagement

Feedback



SAT Common Vision

Social Needs

Market Needs

Challenges

Quality & Competitiveness

Environment & Energy Supply

ATS Efficiency

Safety

Security

SAT Demand

Scenarios

SAT Products

Aircraft Rotorcraft

Engines

On Board Comm. & Systems

Insertion in SES

Airports

Certification Standard & Rules

Booking Systems
Fleet Management

Pilot Training

.....

.....

HL Objectives

Recommendations for
Practical Implementation

Expected Benefits
HL Objectives vs. Challenges

VISION



COMMON VISION on the development of a Small Aircraft Transportation system

SAT-CommonVision-D1.1

Version - 6.0

by

Marcello Amato

(CIRA)

WP1 - Leader

and

Angela Vozella (CIRA)	Krzysztof Flisek (SA)	Adriaan de Graaff (AdCoenta)	Isabelle Laplace (NE Systems)	Stefaan Ghijs (Fly Asavia)
Daniel Rohacs (RRT)	Alfred Baron (SA)	Tony Henley (THL)	Janusz Pietruszka (PZLM)	Jiri Duda (Evezor)
Catalin Nae (NCAS)	Frans van Schaik (ALF)	Claude Le Taliec (ONERA)	Aniello Cozzolino (Pieggio Aerodynamics)	Richard Curran (TU Delft)

Small Aircraft Transport System will serve:

- ❖ **the need for low-intensity intercity routes** (e.g. for west/east directives also in central Europe), which has been dependent so far on road transport;
- ❖ **regions with less developed infrastructures** (e.g. out of the central European “economic banana”, sea costal regions and islands);
- ❖ **the needs of European personalized and business travel.**

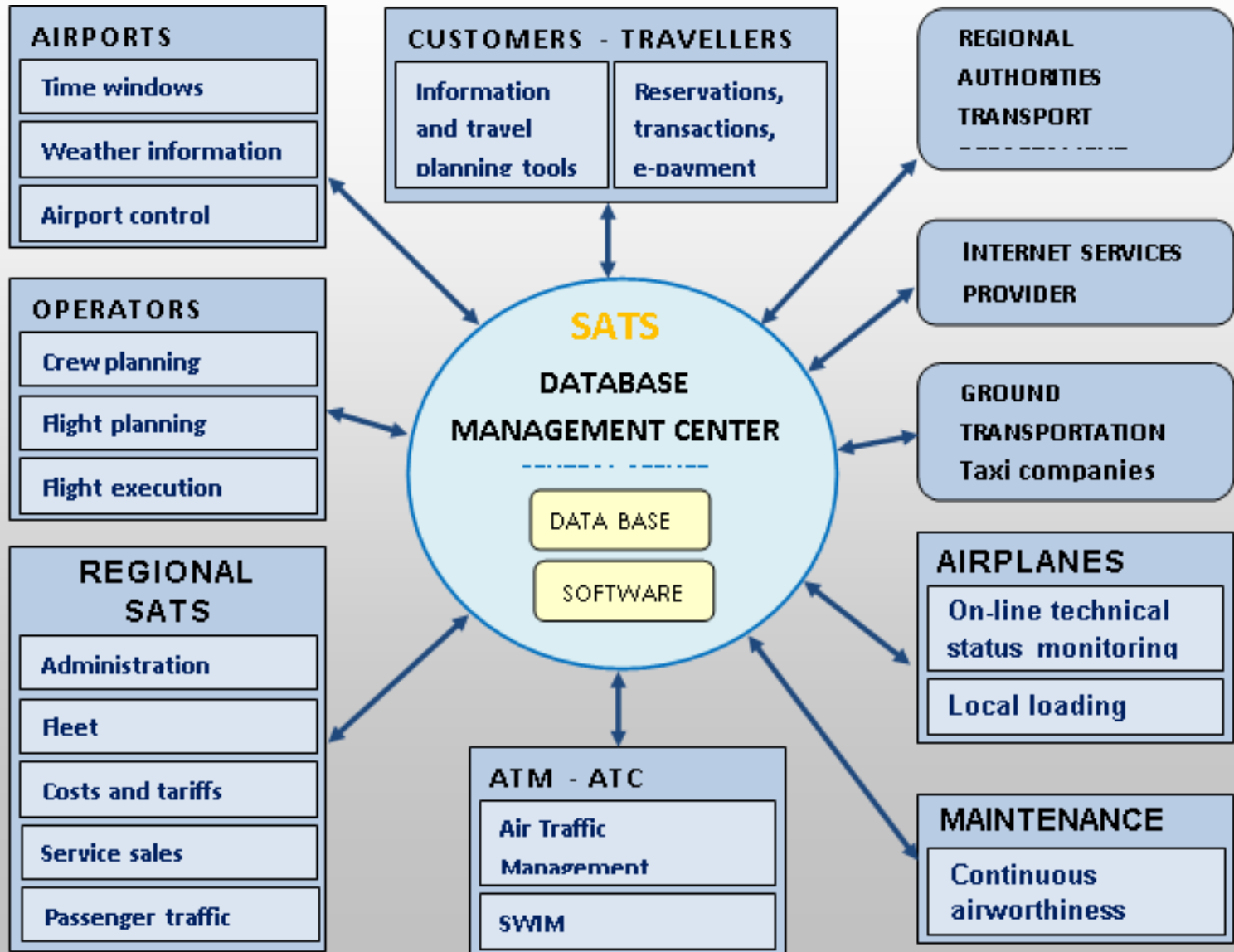


The SAT Concept

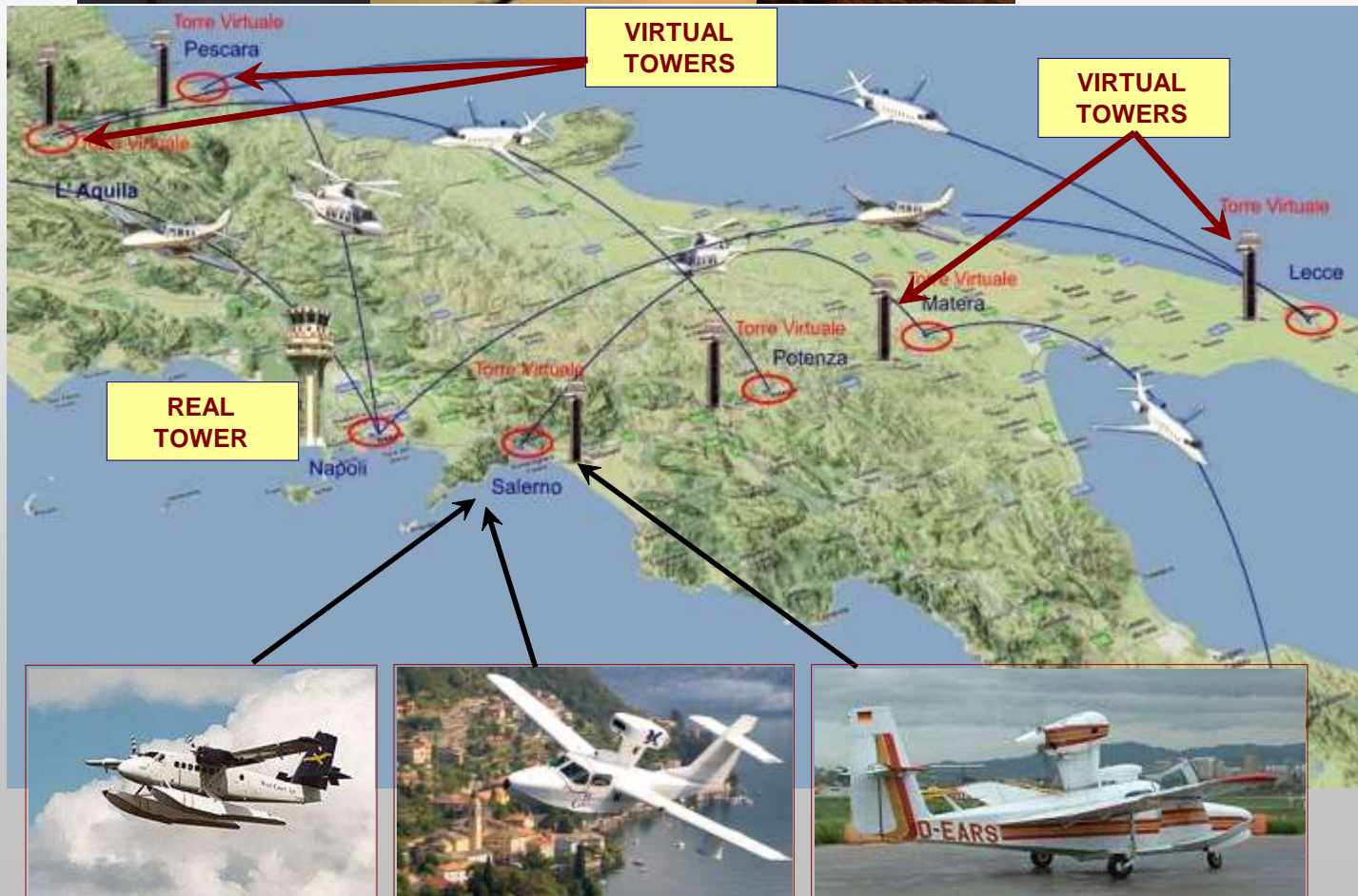
- ❖ **SAT system will offer increased mobility** with a highly customer oriented approach.
- ❖ **The SAT system will add a new modality within the Air Transport System and complement international and regional transport.**
- ❖ The SAT System will be **highly customer oriented** (affordable, accessible, predictable, dependable and comfortable), **environmentally friendly, safe and secure, interconnected,**
- ❖ **SAT system will exploit small airports, aerodromes, heliports, seaplane aerodromes,** thus answering to the growing and segmented demand for air transport and will increase the accessibility to transport.
- ❖ **The system will be based on small aircraft and rotorcraft,** with 4 to 19 seats, including amphibious aircraft, **operating scheduled and unscheduled flights in an integrated and intelligent transport management system.**

PROVISIONAL CONCEPT

Intelligent Small Aircraft Transportation System Concept



The SAT Concept



The SAT Concept





Stages of SAT system development

In order to get the full deployment of the SAT system according to the Vision, steps should be performed according to the following time frames:

- ❖ **Short term 2020**
- ❖ **Medium term 2035**
- ❖ **Long term 2050**

The SAT Roadmap will focus up to 2035.

- ❖ **General acceptance of the added value of small-size aircraft and rotorcraft**, operating on commercial scheduled or non-scheduled flights, as a component of the European (Air) Transport system.
- ❖ **Perform RTD projects** according to the needs of the European manufacturing industry, service operators and ATM **in order to become the world leader in design and production of small aircraft and in operating a new transport mode.**
- ❖ **Perform dissemination activities.**
- ❖ **SESAR ATM takes into account the SAT system operations** already in the employment phase in 2014.

- ❖ **New business models and IT systems** will be developed **to manage cost effective transport services and to support flight operations**, which should allow achieving high load factors and lower service costs.
- ❖ **The Small Aircraft community** should improve their **coordination** and define an industrial development master plan.
- ❖ **The enabling conditions to develop a SAT system** should be improved at **regional, national and EU level**.
- ❖ **The system will start developing in some MS or regions** most interested in low cost personal business travelling.

- ❖ **Integration of small-size aircraft and rotorcraft**, operating on commercial scheduled or non-scheduled flights, within a **seamless inter-modality transport system**.
- ❖ **The European manufacturing industry** becoming the **world leader** in design and production of small aircraft.
- ❖ **Appropriate business models** for a full deployment of the SAT system available.
- ❖ **Full public acceptance and political support**.
- ❖ Small aircraft are **resilient to adverse weather**.

- ❖ **New advanced aircraft** vehicles including **clean and silent propulsion systems** available.
- ❖ **Situation Awareness** by the availability of innovative cockpit, flight management systems, new communication and automation. The technology should allow single pilot operations and assist less trained pilots.
- ❖ **New safety and certification regulations tailored to SAT** are available.
- ❖ **Innovative take-off and landing/launching techniques** are adopted.

- ❖ Innovative small aircraft and rotorcraft are developed in EU with **zero pollutant emissions, very small noise foot print, and low environmental impact all along the life cycle.**
- ❖ The SAT system has the same safety and resilience level of the large aircraft ATS.
- ❖ **Free flight and/or free** routing are the standard for operations.
- ❖ **Fully automated SAT aircraft** flying according to **autonomous flight rules.**

- ❖ The main goal of Small Aircraft Transportation System is to **provide high-speed passenger transport to European Regions serving city-pairs with low-intensity traffic.**

Currently these cities are connected mostly by personal cars or anyhow with a travel time from door to door greater than 4 hours, and without near term perspectives for the introduction of high-speed train or scheduled airlines.

- ❖ The SAT System must be
 - **highly customer oriented (passenger/freight)**
 - **environmentally friendly**
 - **safe and secure**
 - **interconnected**
- ❖ The SAT system might be a forerunner of a future reservation system enabling seamless flow for both passenger and (small) freight.

- ❖ The following **enablers** have been identified for the “Product Technologies”
 - Funding
 - Cost models
 - Business Models
 - Certification, Standards and Rules
 - R&TD activities and infrastructure
 - Flexible fleet and pilots
 - Small Aircraft community networking
 - Cooperative network of airports
 - The needed logistics and related technical issues to set up a SAT system must be fully identified.
 - Human issues related to the SAT System are studied for improving public acceptance.

- ❖ The deployment of a SAT system should be recognised as **an answer to the social need** for additional mobility specifically in some regions and city-pairs; these areas would increase their access to transport.
- ❖ A part of the **cost reduction** may come **by setting up the enabling conditions** and among these the proper business model and service operations.
- ❖ **Another part of the needed cost reduction will come by technology improvements.**
- ❖ SESAR should recognize the importance of SAT system taking into account the SAT system operations already in the employment phase in 2014, avoiding expensive late adjustments. ATM costs reductions are important for SAT deployment.

- ❖ **A proper dissemination and political leverage** is needed to improve awareness of sustainability and possible social benefits of a SAT system.
- ❖ **In the short term** (within 2020) it is essential to perform **dedicated research and dissemination activities**.
- ❖ **SATRdmap Vision and Research Agenda outcomes should be considered as elements of ACARE SRIA.** Research, Testing Capabilities and Education will have to be prioritised taking into account the need for the SAT System deployment.
- ❖ **Horizon 2020 should foresee R&I activities dedicated to the full deployment of the SAT system as an element of future European Transport System.**

END

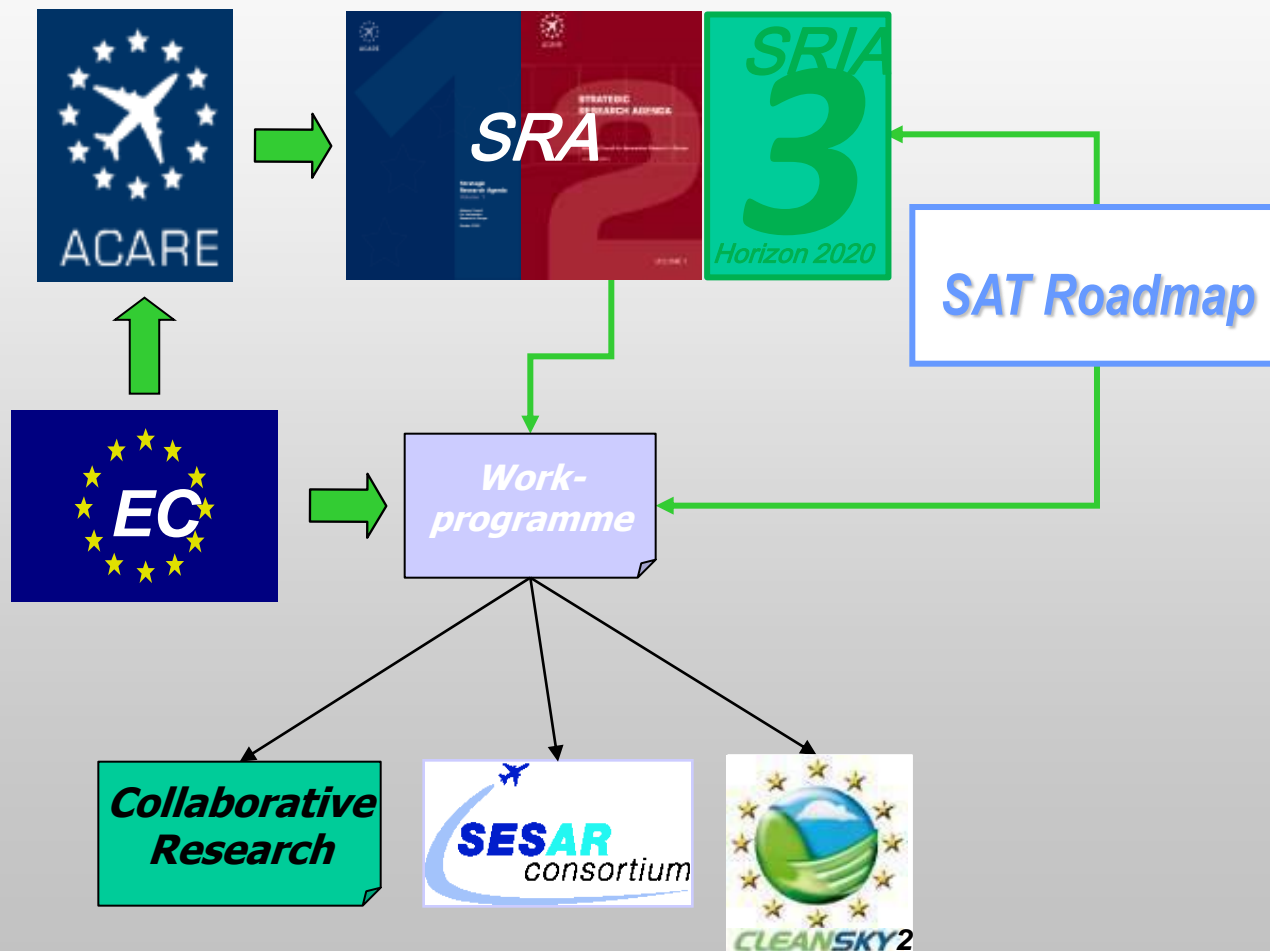
Roadmap for Research & Technology Development of Small Aircraft Transport (SAT) Mode

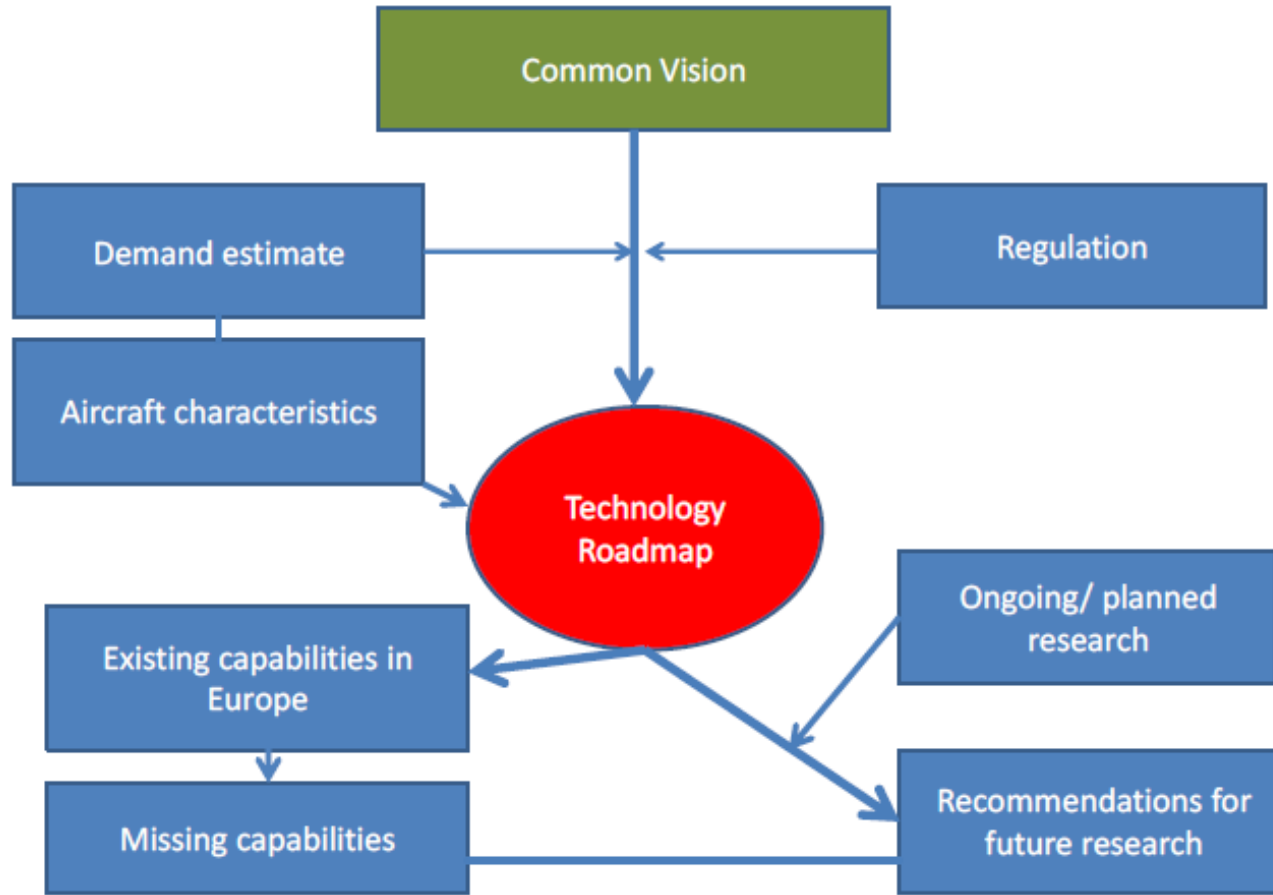
Small Aircraft Big Challenge

A. Cozzolino (Piaggio Aero)

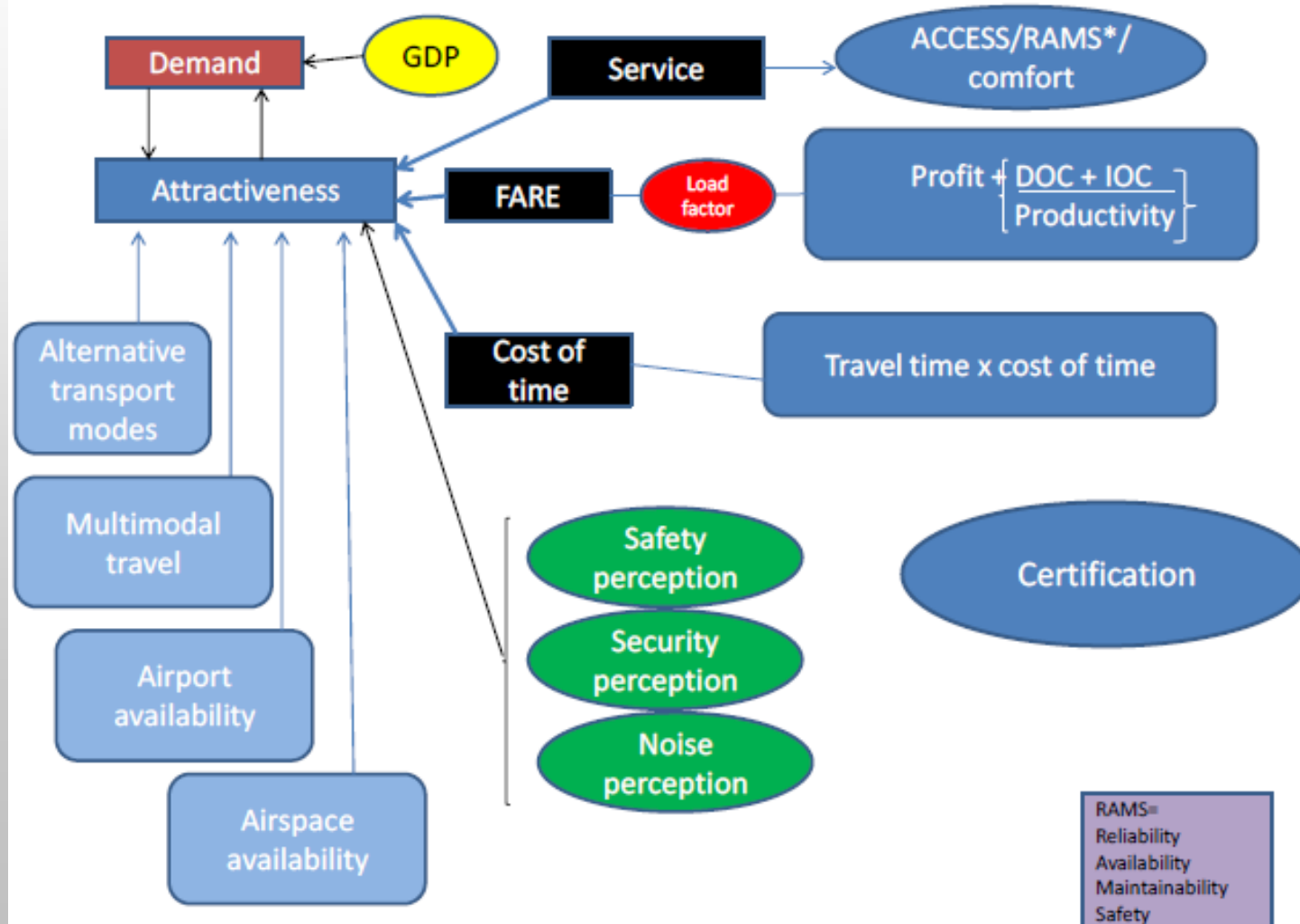
Berlin , September 12 2012

- The SAT Technology Roadmap aims to identified research and technology issues needed to be addressed in the future to enable the SAT system development.
- The roadmap will address the technology needs for future small aircraft (4-19 seats) for on demand as well as scheduled air transport.
- The roadmap identifies the solution needed in the 2020-2035 timeframe matching the already on going research to avoid overlaps.

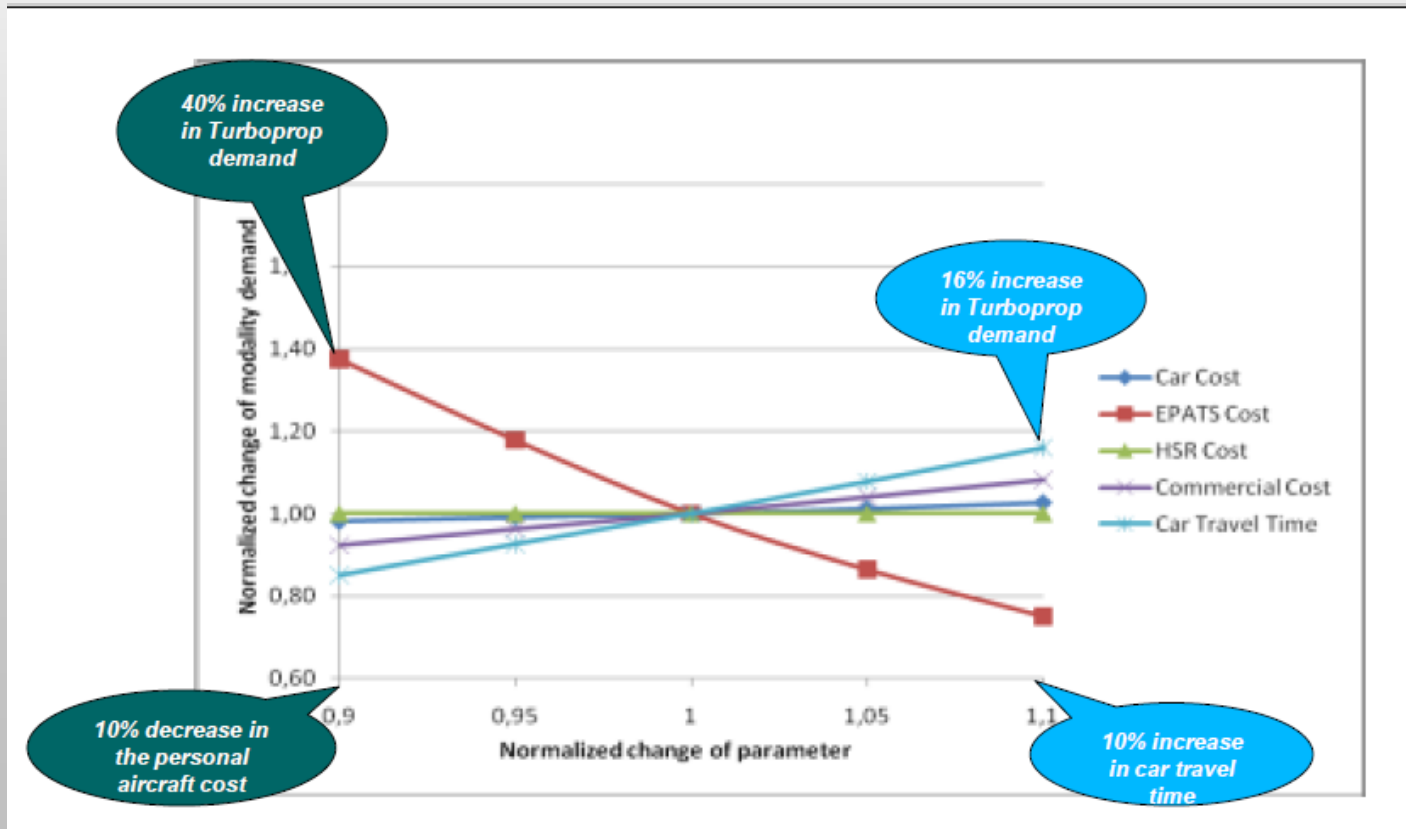




Demand Model and A/C Characteristics

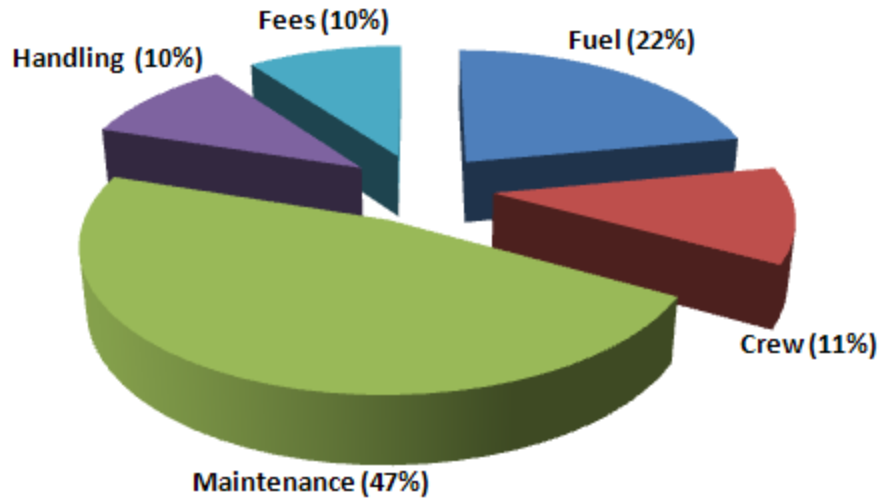


- The analysis shows that a fare reduction has the biggest impact on demand for transportation by small aircraft.
- Turboprop powered aircraft cover larger distances of on average 400 Km. These aircraft seems to have a more stable customer base which includes scheduled services.

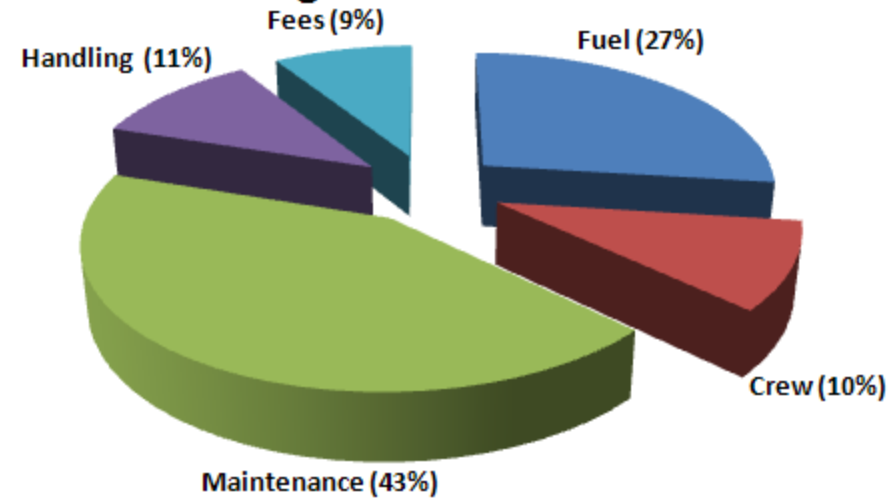




Cessna C208 Gran Caravan



Viking DHC6 Twin Otter



	1 A/C	5 A/C
Insurance	20,000	100,000
Lease Rate	200,000	1,000,000
Training	5,000	25,000
Indirect Personnel (incl. AOC)	110,000	300,000
Commercial Costs-Marketing	30,000	50,000
General Costs	60,000	130,000
TOTAL	425,000	1,605,000

It is better to have a larger aircraft fleet.



0.39 €

Total cost

0.27 €

0.7 Load Factor

+

10% Profit Margin

0.61 €

Fare

0.42 €

- The target is the **reduction** of the **Total Operating Costs** of **50%**.
- To reach the target the indicative breakdown reported below has to be realized.

COST	ELEMENT	2035
DOC	Engine related	-/- 25%
	Airframe related	-/- 8%
	Systems related	-/- 2%
	Crew related	-/- 3%
IOC	Insurance	-/- 1%
	Leasing cost	-/- 7%
	Training	-/- 1%
	Other	-/- 1%

DOC	Engine	Airframe	Systems	Crew
Fuel	***	**	**	
Crew			**	**
Maintenance	***	***	***	
Handling	*	*	*	**
A/C price	***	***	***	

- The economic performance of future Small Aircraft products depends on **efficient, less expensive aircraft power plant**.
- The acquisition cost will depend on **low cost production airframe**.
- To **improve safety** and reduce the pilot workload in all weather condition:
 - GPS navigation.
 - Flight envelope protection (FbW).
 - Less power consuming anti-ice.
 - Air traffic, weather condition, aerospace border easily displayed.

Technology Roadmap: ESPOSA project

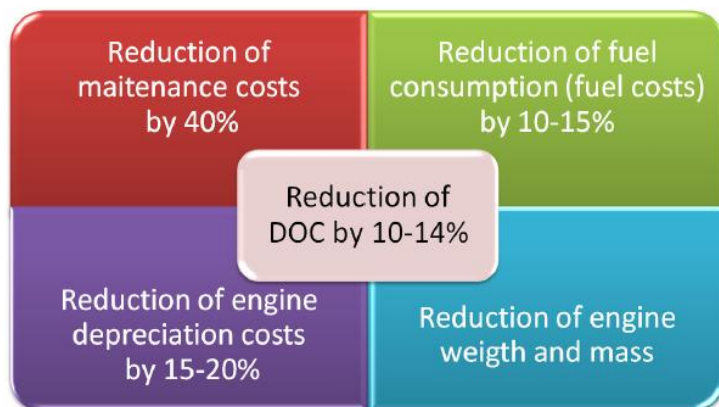
Reverse of obsolete aircraft engines (piston, old GTE types)

- Immense operational workload for the pilot
- Intensive and long maintenance, repair & overhaul
- Spare parts limited availability for older engine types
- AVGAS limited availability for piston engines
- Lead contamination in case of AVGAS fuel

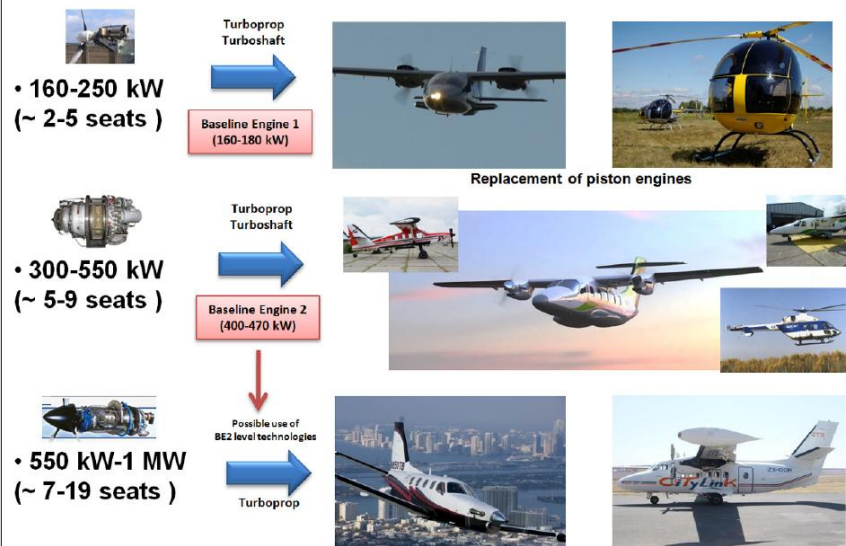
Caused
by

**Out-of-date parts
and engine technology**

ESPOSA objectives for engine technologies



SMALL REGIONAL TURBOPROP AIRCRAFT, LIGHT HELICOPTERS, TRANSPORT UTILITY AIRCRAFT, COMMUTERS AND UNMANNED AERIAL SYSTEMS FOR CIVIL USE (UAS)

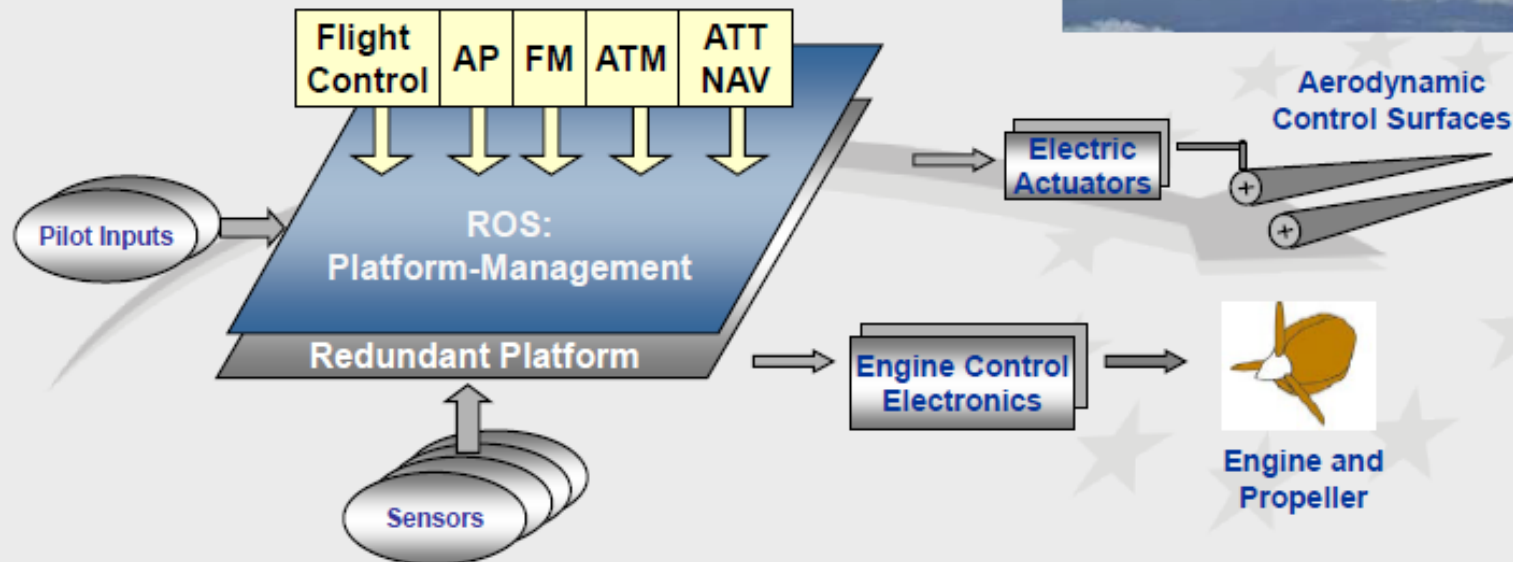


Technology Roadmap: SAFAR project Small Aircraft Future Avionic Architecture

SAFAR – FBW Platform Concept 1/4

Platform includes

- Platform management incl. redundancy management (RM)
- All relevant applications



RESULT: Fulfillment of Safety Target

Technology Roadmap: SAFAR project

Small Aircraft Future Avionic Architecture

AUTOMOTIVE VS AVIATION - Safety

COMPARISON AUTOMOTIVE VS AVIATION SAFETY

■ CS25	$P_{\text{VEHICLE}} \{CAT\} < 10^{-6}$	$P_{\text{CONTROL}} \{CAT\} < 10^{-9}$
■ CS23 / Class 1	$P_{\text{VEHICLE}} \{CAT\} < 10^{-4}$	$P_{\text{CONTROL}} \{CAT\} < 10^{-6}$
■ Automotive	$P_{\text{VEHICLE}} \{CAT\} \sim 5 \cdot 10^{-6}$	$P_{\text{CONTROL}} \{CAT\} < 10^{-7(8)}$

DIFFERENCES AUTOMOTIVE VS AVIATION

■ AUTOMOTIVE	Safety (Integrity) Reliability	Very High Fail/ Operational 10min
■ AVIATION	Safety (Integrity) Reliability	Very High Very High

SAFAR OBJECTIVES

■ CS23 / Class 2 scalable to	$P_{\text{VEHICLE}} \{CAT\} < 10^{-5}$	$P_{\text{CONTROL}} \{CAT\} < 10^{-7}$
■ CS25	$P_{\text{VEHICLE}} \{CAT\} < 10^{-6}$	$P_{\text{CONTROL}} \{CAT\} < 10^{-9}$

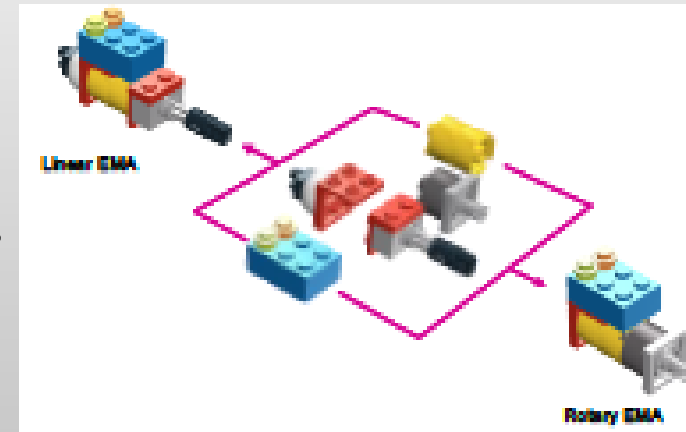
OVERALL OBJECTIVE

Achieve European leadership in Electric Actuation for Aerospace Industry:

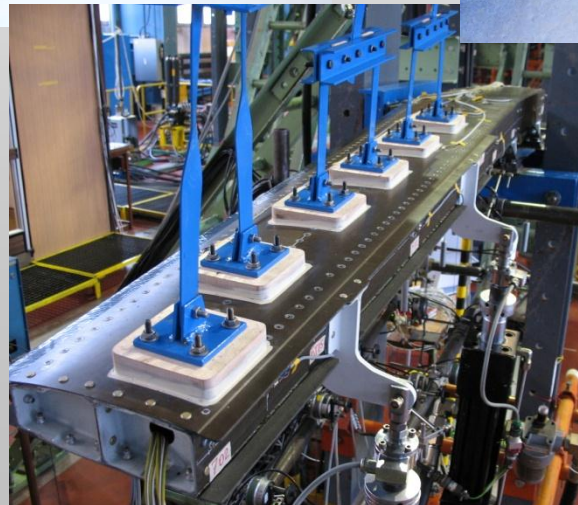
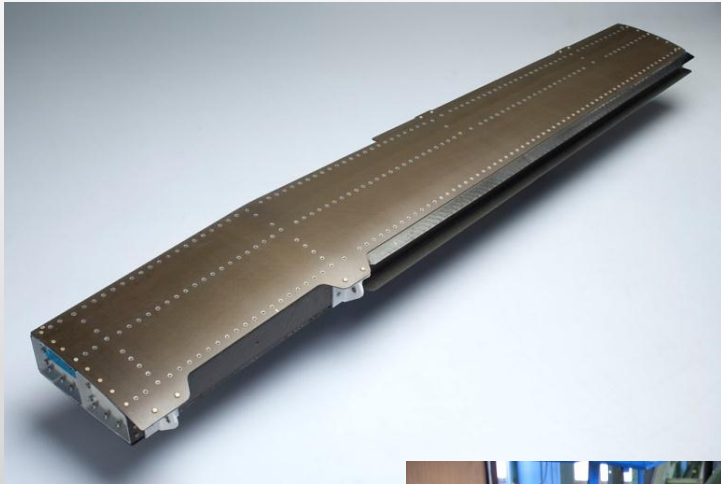
- ***driving the transition from “More” to “Full” Electric Aircraft.***
- ***developing a new Electrical Modular Standardized Actuation concept.***
- ***achieving a Cost and Reliability optimization.***

SPECIFIC OBJECTIVES

- ***Reducing the overall A/C LCC (development, certification, maintenance and operation).***
- ***Improving the actuation Reliability.***
- ***Maturing the Technology (from TRL3 to TRL5).***
- ***reducing the actuation Weight (fuel burn reduction).***



- P180 Fwd wing AFP technology with concurred spars and RTM ribs.



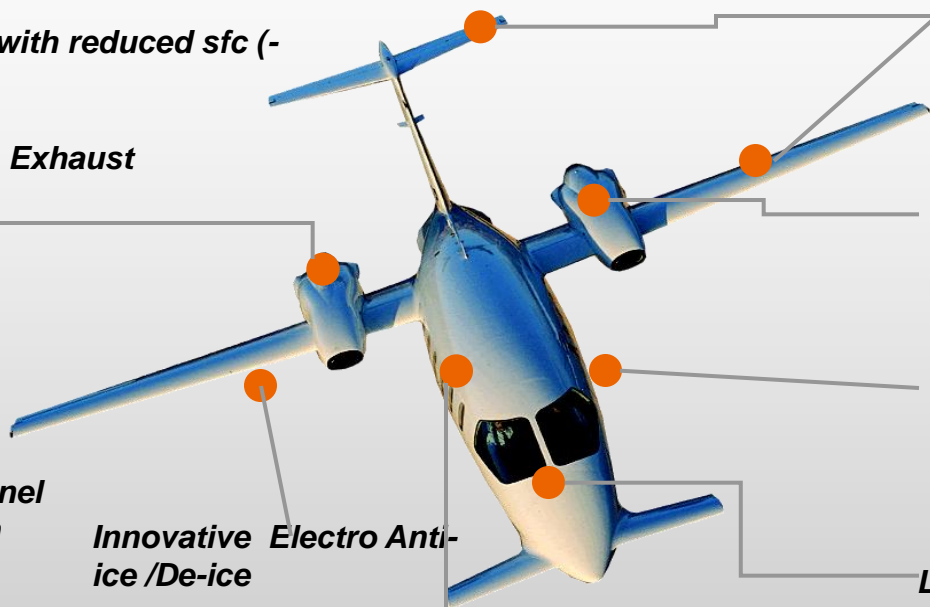
Main results vs metallic

- ***Weight saving 24%***
- ***Part number saving 22%***
- ***Cost reduction 20%***

- Analyzing the **effect of LSA regulation on sport aircraft** more than 30 new manufacturer entry in the market:
 - The Small Aircraft need new **simplified CS/FAR23 rules for certification**.
 - EASA raised the issue of a new concept for regulation of non complex aircraft, used in non-commercial activities.
- **Pilot training:** The accident analysis suggests that the majority are caused by pilot error. This impose to look at how training is done and how it can be improved.
- **Airport & Aerospace accessibility:** Despite efforts, the number of public-use small airports continues to decline and the air traffic management is not getting benefit by the ADS-B technology due to its cost (still too expensive for Small Aircraft application).

- Small aircrafts are a transportation tool and, ranging from light single piston engine up to larger turboprop, have got the potential to service within a flexible transportation system (SATS) answering to medium and long term needs.
- Technology has to be focused on reducing operating cost, pilot workload and improve safety without increasing the acquisition cost like:
 - Propulsion TP with reduced fuel consumption, maintenance and acquisition cost
 - Low cost composite airframe (out-of autoclave)
 - Simplified FbW to improve safety
 - Low power consumption anti-ice
- New concept and new configuration are exotic but the real needs are

New Engine (no bleed) with reduced sfc (-15%) FADEC
Increased TBO
Low Noise Propeller & Exhaust



Low Cost Composite Airframe

High Voltage Electrical Generation for More Electric Aircraft

Smart Landing Gear with Electro Mechanical Actuation

Low Cost FbW

Multi Layer Trim Panel for low Noise Cabin



Innovative Electro Anti-ice /De-ice



SAT Roadmap on the Development of a Small Aircraft Transportation System

AD CUENTA B.V.

BELEIDS ADVIESBUREAU / CONSULTANTS

SAT-Rdmp-D3.1

Deliverable D3.1



SAT roadmap

Version v- 5.2

Final draft



„ Small Aircraft Transportation in the Future - Roadmap Conference ILA”

ILA, Berlin, 13 September 2012

INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE

Mariusz Kubryn
PZL Mielec, Poland



„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



Presentation Table of Contents:

- ❖ Inventory of industrial capabilities,
- ❖ Design/production qualifies,
- ❖ Total production volume possible in Europe,
- ❖ R&TD capabilities,
- ❖ Issue of certification.

Meeting Societal and Market Needs

- European citizens are able to make **informed mobility choices**
- 90% of travellers within Europe are able to complete their journey, **door-to-door within 4 hours**.
- Flights arrive **within 1 minute** of the planned arrival time
- Air traffic management system is capable of handling **25 million flights** a year in Europe
- A coherent **ground infrastructure** is developed



Inventory of industrial capabilities

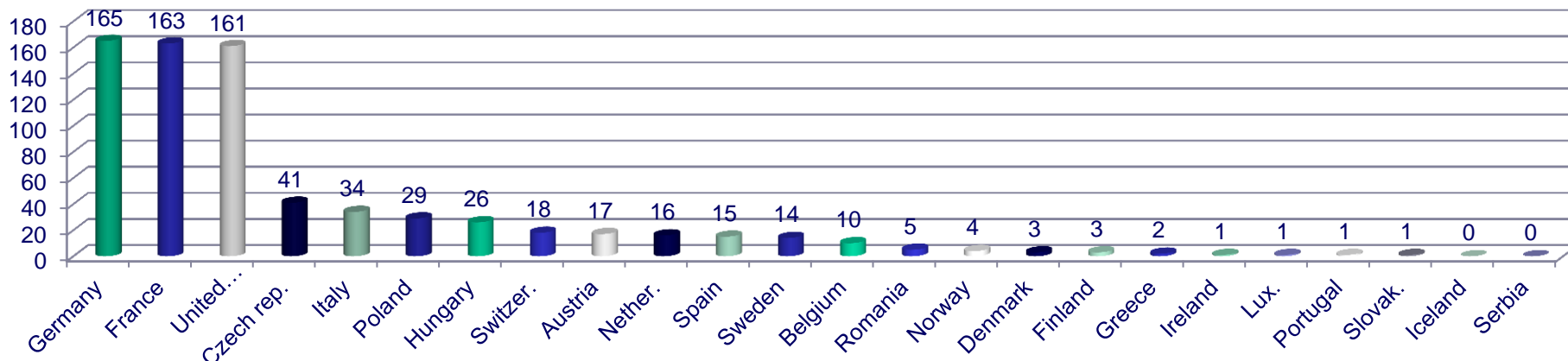
- ❖ Four groups were created
 - **Manufacturers (with or without POA)**
 - **Design organizations (with or without DOA or ADOA)**
 - **R&T / universities**
 - **Consulting service and Others**
- ❖ Information sources
 - ✓ EASA
 - ✓ International projects from the 7th framework program
 - ✓ Individual companies
- ❖ These four groups include companies and institutions oriented on aviation industries
 - Airframe, Engine, Avionics and IT technology, Components, ATM systems, Airport systems, System manufactures, Maintenance (with or without Part 145), Training (with or without Part 147, Part 66), Safety and Security, Research and Development
 - International projects (matrix System/Technology)
 - System – Airframe(wing), Engine(propeller), Avionics, ATM/Airport, others(focused on aviation)
 - Technology – Design and Development, Manufacturing, Certification and Operation, Maintenance, Safety and Security, Environment

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”

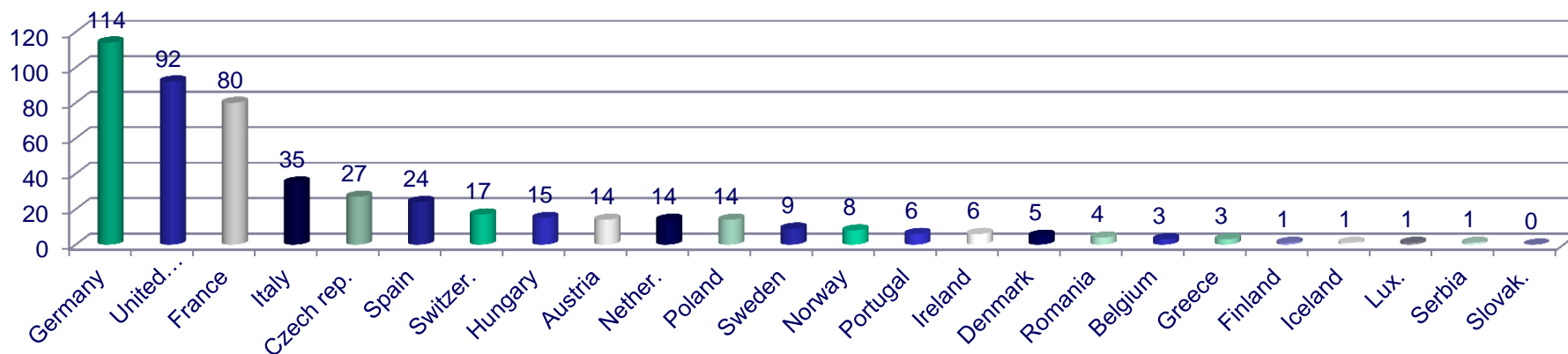


Inventory of industrial capabilities

Number of manufactures with or without POA



Number of Design organizations with or without DOA (Part 21) or Alternative Design Organisation ADOA



„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



Design/production qualifies

❖ In the SAT project the capabilities for small aircraft production, airframes (wings) and small engines, exploitable within the scope of door-to-door transport, are assessed.

The analysis shows:

- **17** manufacturers of small aircraft according to CS-23, CS-27 and CS-29 (including **5** manufactures of helicopters),
- **16** manufacturers ultra-light aircraft (including 1 manufacture of UL helicopter),
- **17** manufacturers of piston engines (including 1 manufacture of Wankel engine),
- **5** manufacturers of turboprop engines,
- **6** manufacturers of jet engines,
- **33** manufacturers of avionic and IT technology
- **11** manufacturers focused on production of airframe parts for GA aircraft,
- **2** manufacturers focused on production of engine parts for GA aircraft

In total gives number of: **107** manufacturers.

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



Design/production qualifies

❖ SAT consortium (14 Partners) include following industrial Partners:



With possibility close cooperation in area SAT-in –CS2



GE Aviation



imagination at work

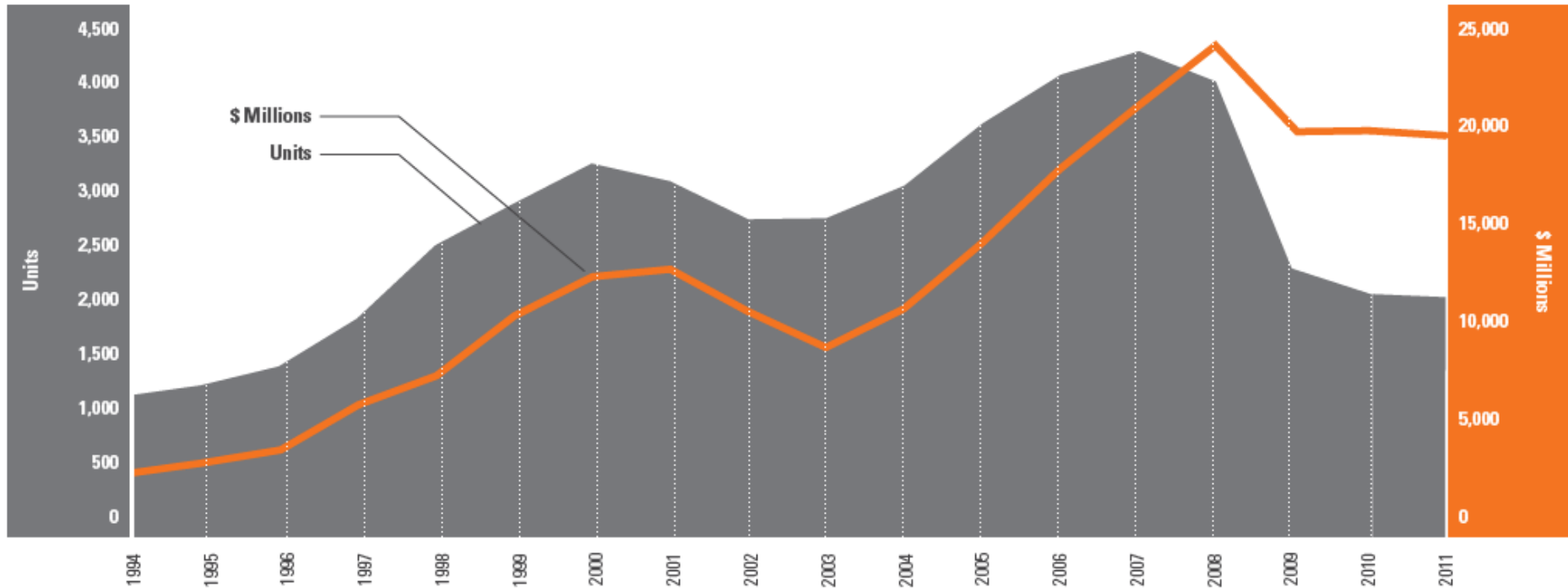


„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



Total production volume possible in Europe

General Aviation Airplane Shipments and Billings Worldwide (1994-2011)



Source: GAMA

Over **320,000** general aviation aircraft worldwide, ranging from two-seat training aircraft to intercontinental business jets, are flying today; over **223,000** of those aircraft are based in the United States.

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



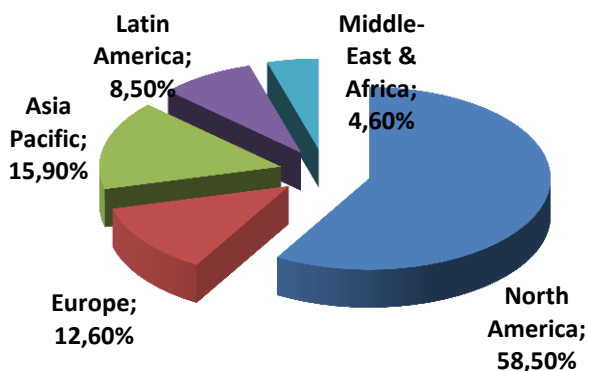
Total production volume possible in Europe

Delivery by Region (in Percent of Total) for General Aviation Airplane Shipments by Type of Airplane Manufactured Worldwide (2007-2011)

Source: GAMA

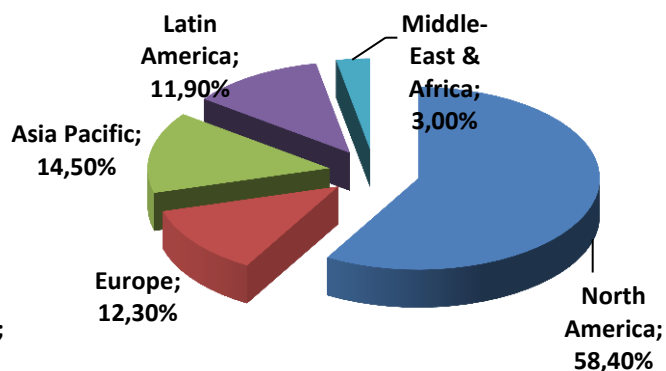
Year	Piston					Turboprop					Business Jet				
	North America	Europe	Asia Pacific	Latin America	Middle-East & Africa	North America	Europe	Asia Pacific	Latin America	Middle-East & Africa	North America	Europe	Asia Pacific	Latin America	Middle-East & Africa
2007	66.5	16.3	9.2	5.4	2.7	57.2	16.3	8.6	14.4	3.4	58.3	24.9	4.2	7.5	5.2
2008	68.1	15.2	7.5	7.3	2.0	57.3	21.9	6.0	7.4	7.4	53.8	25.9	4.7	9.4	6.3
2009	59.4	21.2	9.5	6.8	2.8	57.8	17.5	8.7	8.1	7.8	49.4	26.3	8.6	9.2	6.4
2010	53.4	18.6	13.7	8.8	5.5	43.2	15.2	16.8	14.7	10.1	42.1	22.8	11.8	14.3	9.0
2011	58.5	12.6	15.9	8.5	4.6	58.4	12.3	14.5	11.9	3.0	50.3	19.5	13.5	9.7	7.1

Piston (2011)



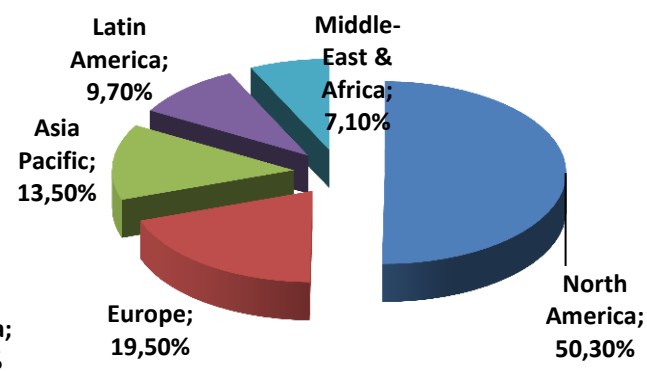
Europe: 108 units

Turboprop (2011)



Europe: 40 units

Business Jet (2011)



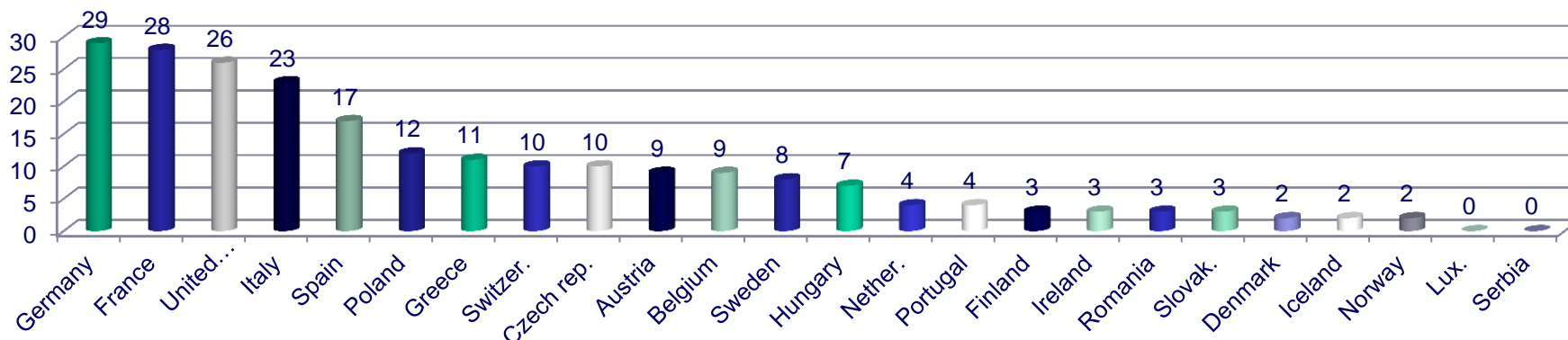
Europe: 133 units

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”

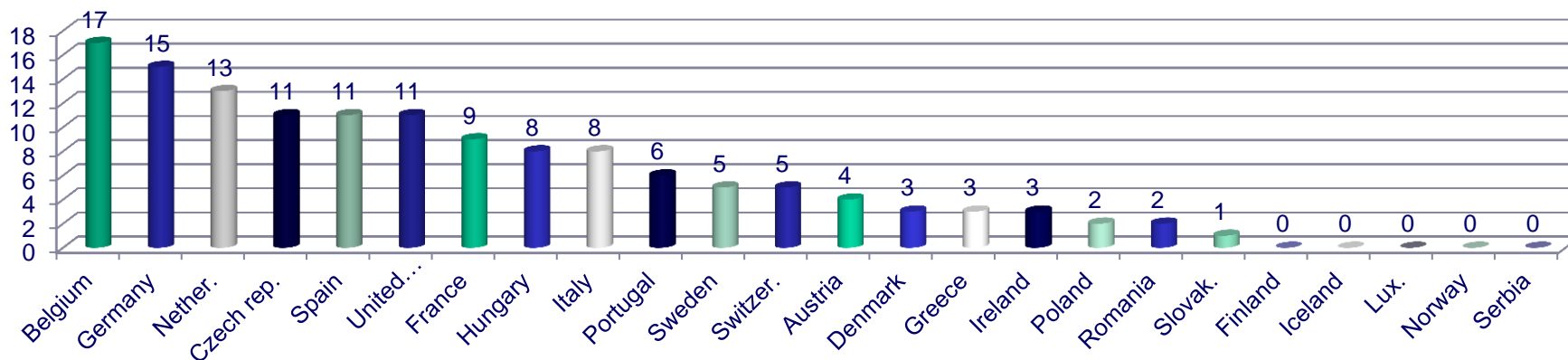


R&TD capabilities

Number of R&T / universities



Number of Consulting service and Others



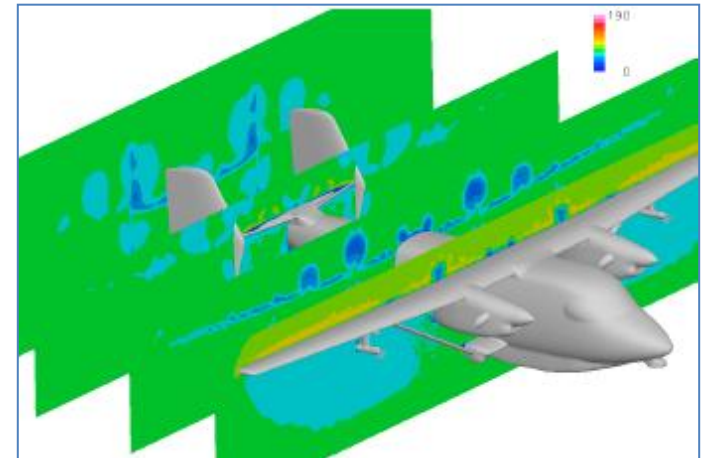
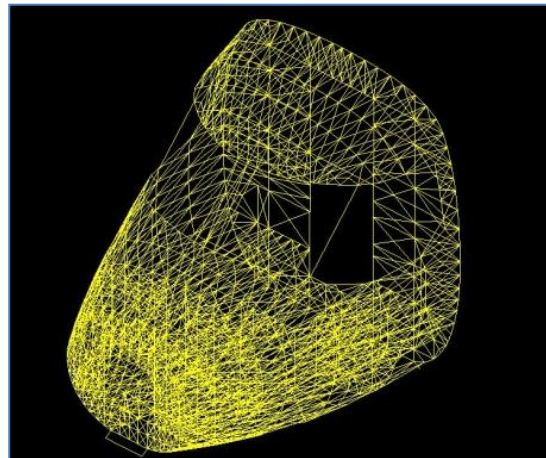
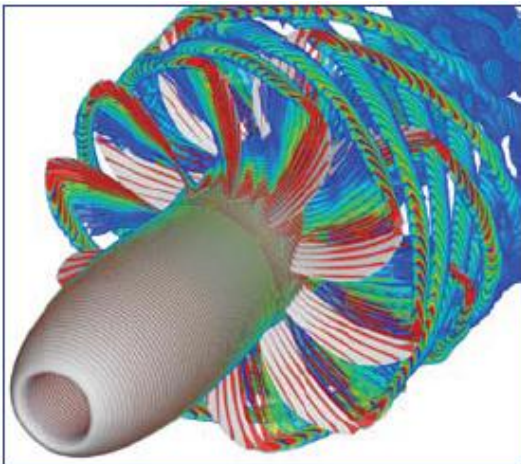
„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



R&TD capabilities

R&TD activities and relevant infrastructures have to be ensured to grant:

- development of specific simulation tool for multidisciplinary simulation and optimization,
- step changes in small aircraft technology,
- development of new small engine technology,
- development of an ATM concept suitable for SAT system.



Issue of certification

New A/C requirements:

- ❖ Small aircraft should have safety levels comparable to large commercial A/C.
- ❖ New rules for pilot training, certifications and operations.
- ❖ Overcome small aircraft sensitivity to adverse weather
- ❖ Low cost certified operators for maintenance are needed.
- ❖ Improved weather awareness without on-board weather radar.
- ❖ Affordable solutions in the detection and processing of atmospheric phenomenon.
- ❖ Capability to operate with limited ATM services.
- ❖ Use of advanced technology (modern GPS, tablet, etc) for traffic and positioning awareness.
- ❖ Low cost Traffic and Collision Avoidance Systems (TCAS) providing guidance to the pilot to restore safe separation (ACAS)
- ❖ GPS-based approaches on secondary airports allowing IFR flights in and out without expensive ground-based systems.
- ❖ Use simulations as certification tools.

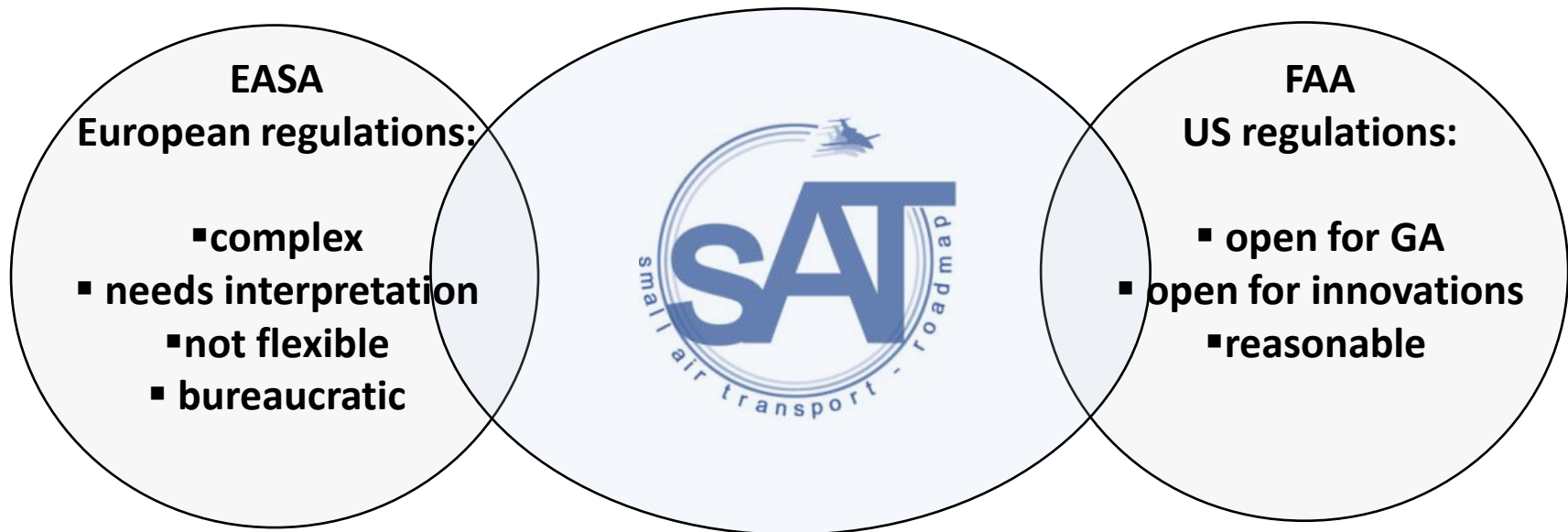
**The new A/C requirements will pose new challenges for certification.
Early engagement of the regulators is essential.**

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”



Issue of certification

Certification of aircraft, engine, aircraft unit, aviation personnel or organization is for most of companies quite a demanding activity from time, finances and administration point of view.



Reduction of these costs will enable a larger development of Small Aircraft Transport segment (SAT) in Europe and it will open the way to the development of new airplanes for small aircraft.

„INDUSTRIAL CONSEQUENCES AND COOPERATION ON SAT MODE”

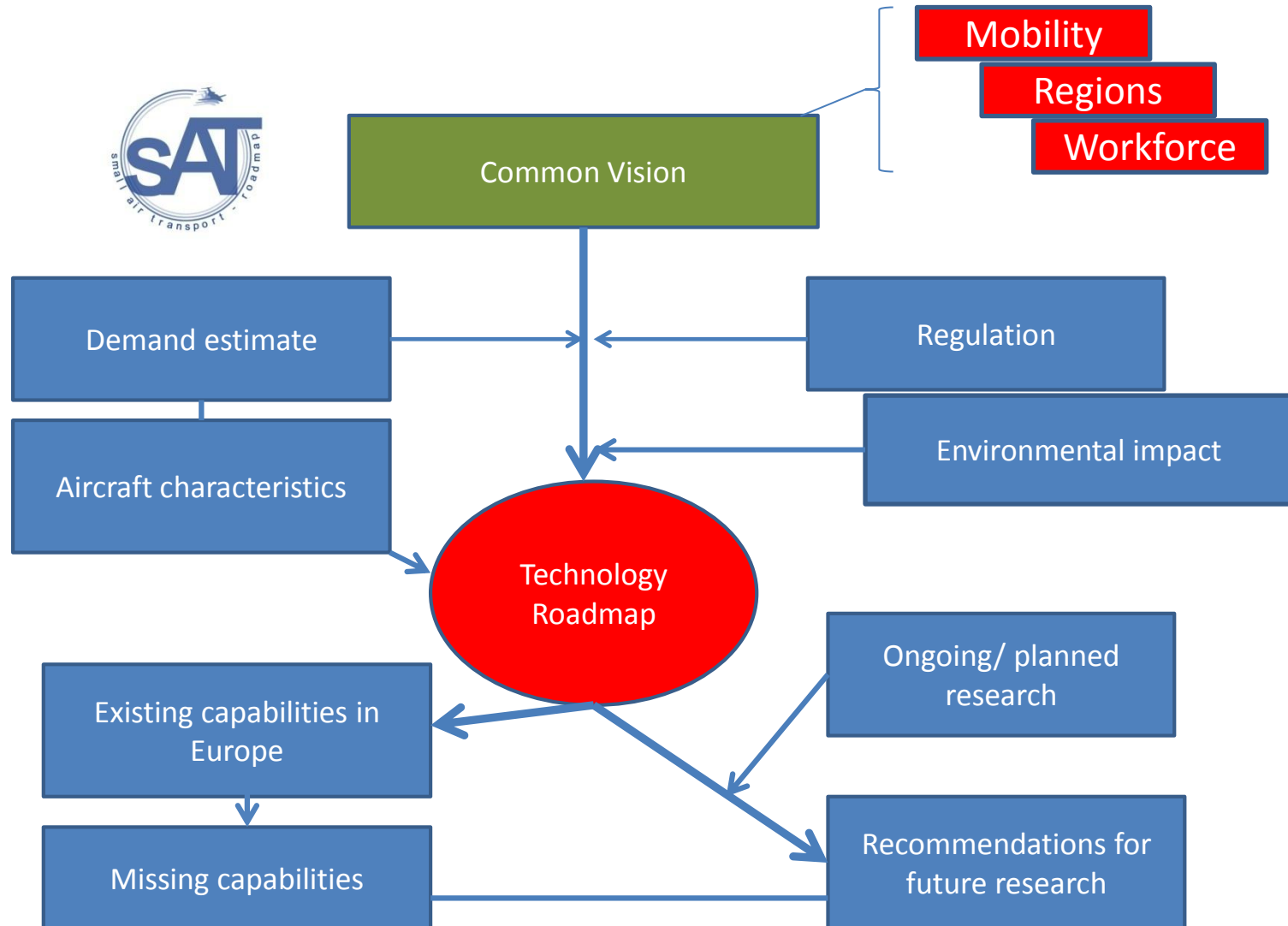


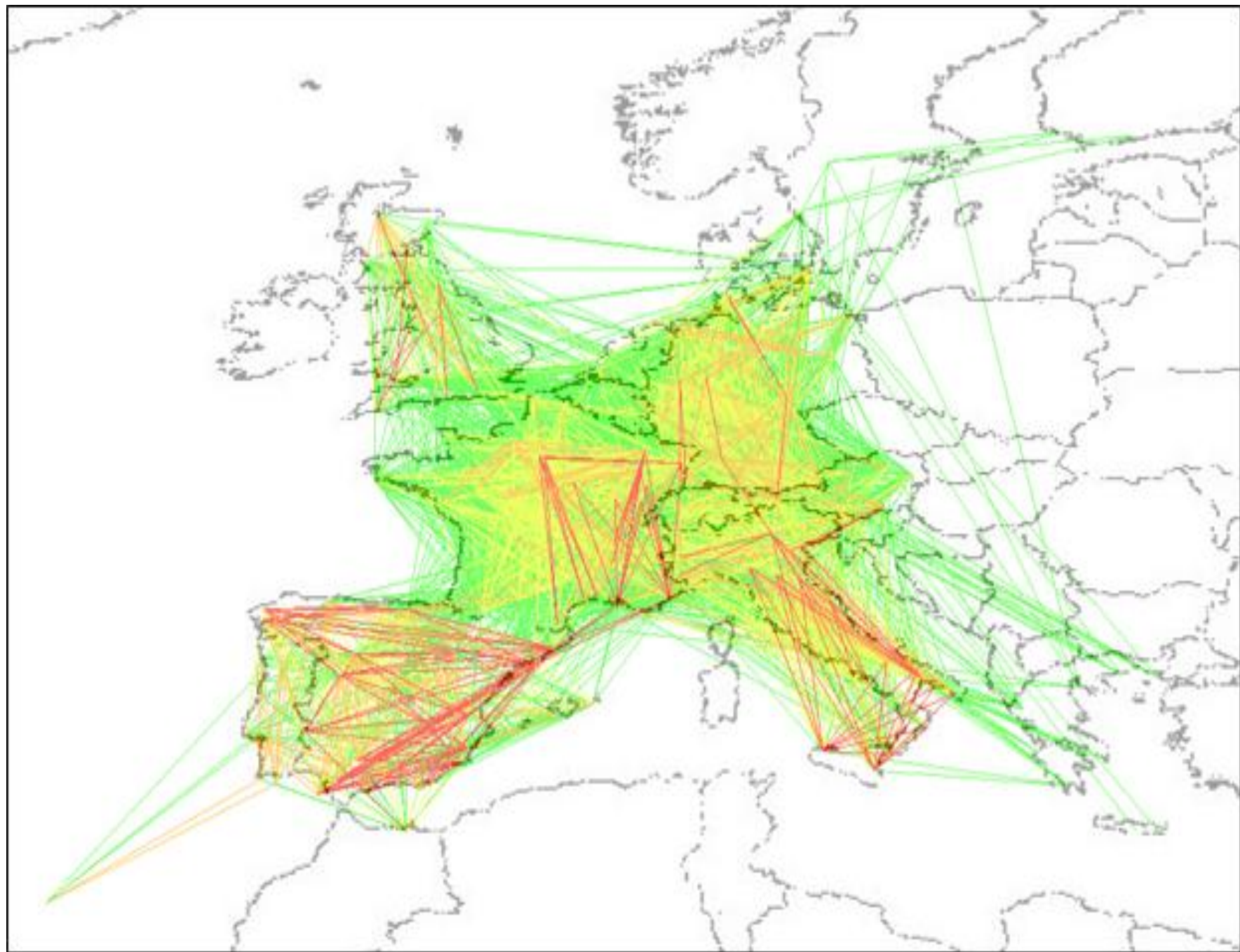
“General aviation is an essential R&D laboratory for commercial air transport and industry in Europe; therefore, at a time where the European strategy for R&D is being defined for the next 7 years, its voice should be taken into account by EU”.

EGAMMA, Mr Nicolas Chabbert
Geneva, Switzerland, 16th May 2012

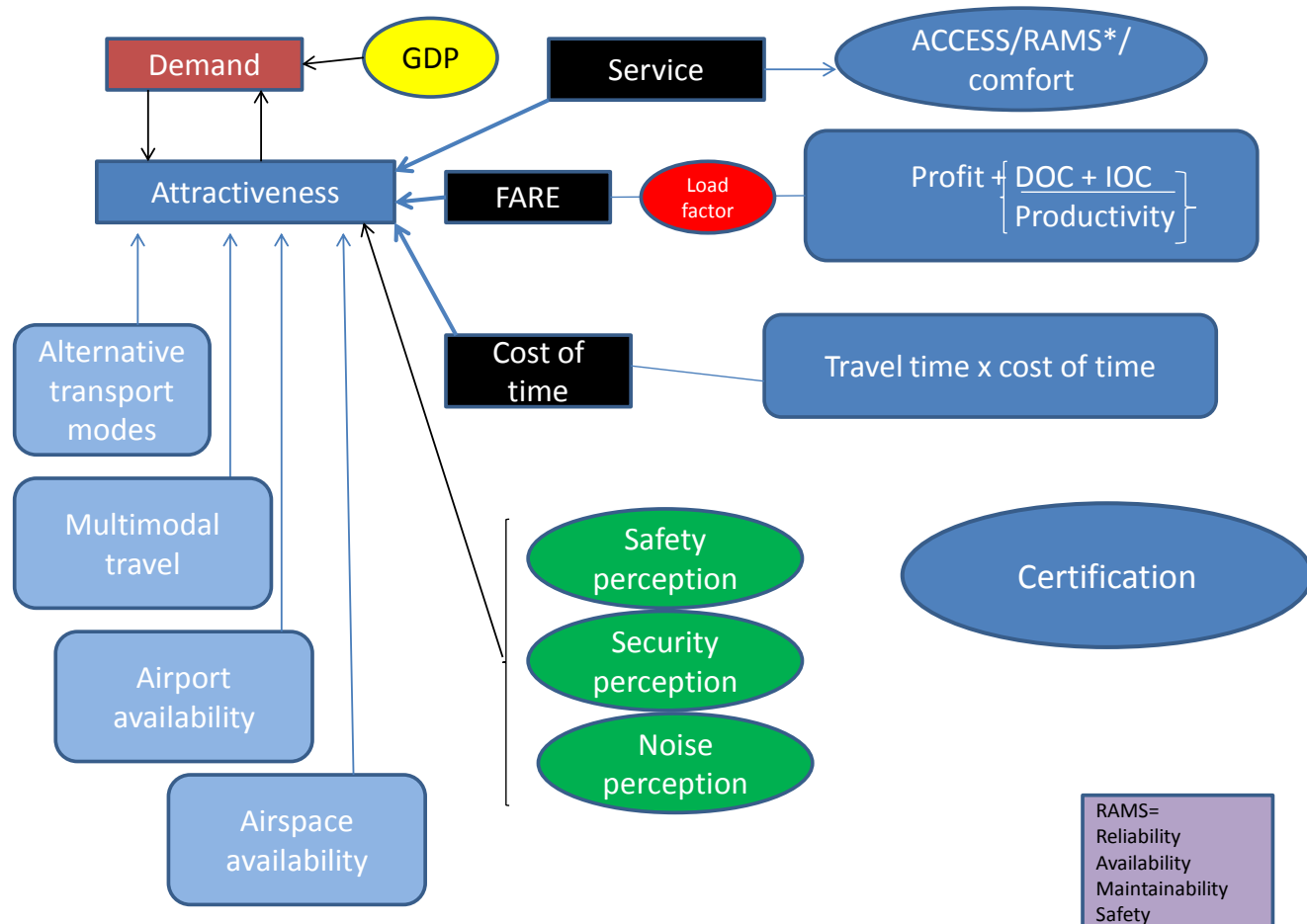


Wrap up of the presentations

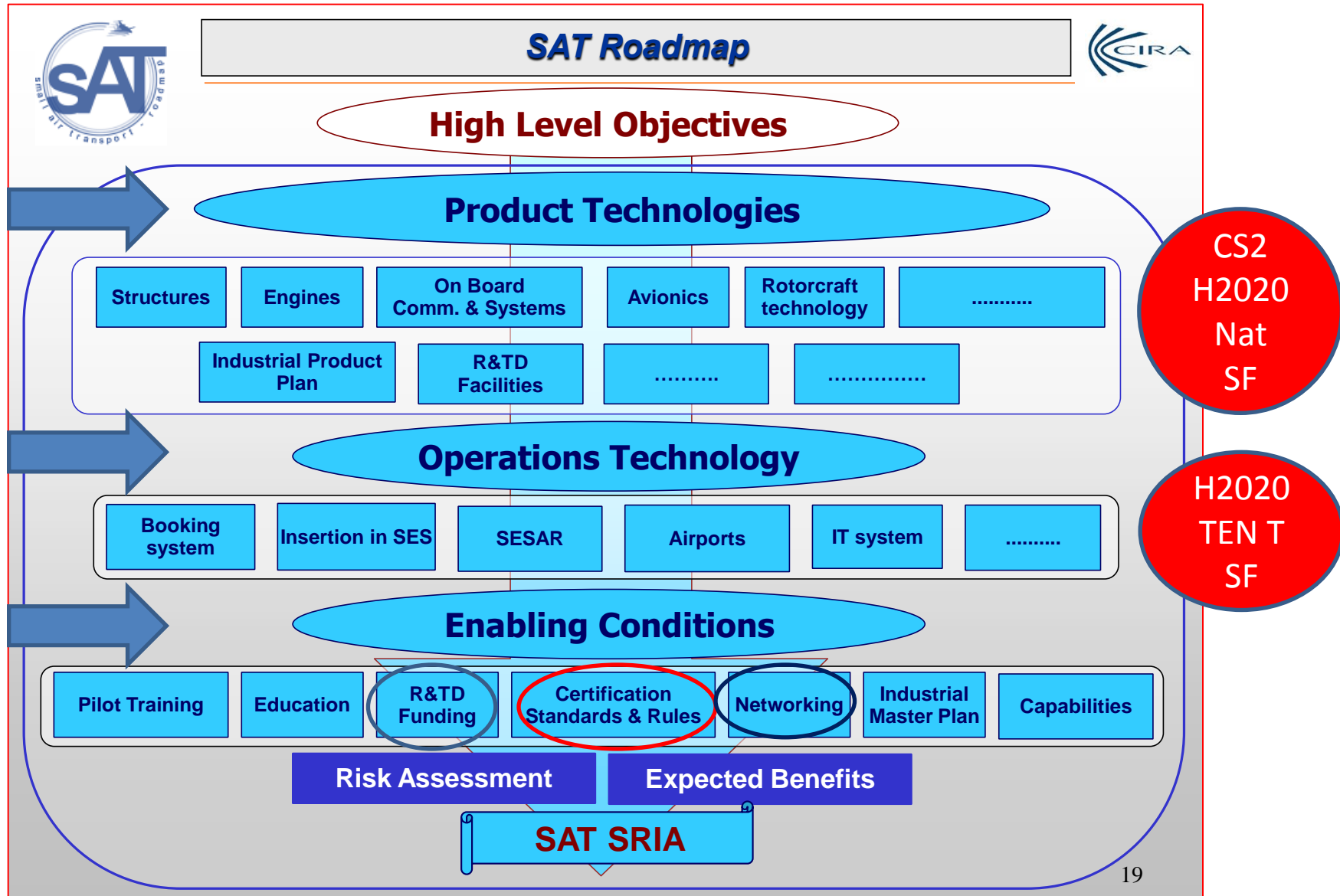




What determines the success of SATS?



Major issues for future SAT system



Questions and answers



- Do you agree with the conclusions presented today?



- Are you willing to help to make SATs a reality?



- Are you willing to participate in a network to develop SATs?

A network

