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COMMISSION STAFF WORKING DOCUMENT

Part II

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Annual Progress Report on the activities of the Joint Technology Initiatives Joint Undertakings (JTI JUs) in 2011

{COM(2012) 758 final}

5. PROGRESS ACHIEVED BY THE ENIAC JU

1.1. Introduction to the ENIAC JU

The ENIAC Joint Undertaking (hereinafter referred to as "ENIAC JU") was established by Council Regulation (EC) 72/2008 of 20 December 2007 as a public-private partnership between the European Commission, the participating Member and Associated States (by now 22 countries)[1] and AENEAS[2], a non-profit industrial association of R&D actors in the field of semiconductors.

The ENIAC JU has been set up for a period up to 31 December 2017 with the main objective to tackle the research and innovation in nanoelectronics technologies and their integration in smart systems. The goal is to define and implement a Strategic Research Agenda (SRA) on Nanoelectronics-Based Systems in Europe. ENIAC JU aims to help European industry consolidate and reinforce its position in nanoelectronics technologies and systems.

The nanoelectronics industry is the provider of all integrated circuits found in all devices and equipment requiring either standalone computational capacity or interaction with human beings or their environment. Progress of the past decades in work efficiency was largely driven by such smart systems and devices. It is evident that personal computers, cell phones and related personal devices improved the life quality of people overall. These devices however are only the visible part of the applications of integrated circuits. The embedded systems cover the whole field of exploiting the advances of nanoelectronics to embed smart capability in more and more systems, vehicles, traffic management, sensors, lighting just to mention a few examples surrounding us.

The strategic importance of nanoelectronics and embedded systems was recognized and triggered the establishment of ENIAC and ARTEMIS JUs as a way to improve European competitiveness in these enabling fields. First of all, they allow for a concerted effort at the European level through the funding of R&D projects where the industry is a major actor. This is done through Strategic Research Agendas established by the related ETPs, i.e. AENEAS in the case of ENIAC. The vision was to reduce duplication and improve the cooperation between the R&D public and private actors in Europe. Furthermore this helped to cope with the fast increasing R&D costs in nanoelectronics due to extreme miniaturization. Funding down to innovation is increasingly necessary to help this field address the innovation gap and bridge R&D to market. This is helped to keep innovation capability in Europe instead of producing high class research further industrialized elsewhere.

In 2011, the impact of strong initiatives such as the High-Level Group on Key Enabling Technologies (KET) produced a positive influx on the activities of the ENIAC JU. Increased support by Member States allowed the ENIAC JU to successfully execute 2 calls. As a result the previous down-going trend in funding has been reversed. Moreover, the provision for a KET-related call in the Annual Work Programme 2012 was approved at the end of 2011. By

[1] Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden and the United Kingdom.

[2] The Association for European Nanoelectronics Activities (AENEAS) is a non-profit industrial association established on 30 November 2006 to represent the R&D performers in the ENIAC Joint Undertaking.

this approval, the partnership acknowledged that higher levels of Technological Readiness must be included and should get the appropriate attention. A further preparation for the 2012 KET call was the launch of a KET Expression of Interest enquiry, which triggered a very good response and shows opportunities for further significant increases in the future budget execution of the JU.

It coordinates research activities through competitive calls for proposals to enhance the further integration and miniaturization of devices, and increase their functionalities while delivering new materials, equipment and processes, new architectures, innovative manufacturing processes, disruptive design methodologies, new packaging and 'systemising' methods. It will drive and be driven by innovative high-tech applications in communication and computing, transport, health care and wellness, energy and environmental management, security and safety, and entertainment.

1.1.1. Budget

The maximum EU contribution to the ENIAC JU covering running costs and R&D activities is set to € 450 million paid from the appropriations in the general budget of the European Union allocated to the theme "Information and Communication Technologies" of the Specific Programme "Cooperation" under the FP7. The research activities of the entity are supported also through financial contributions from the ENIAC member States amounting to at least 1.8 times the EU contribution (i.e. at least € 810 million for a total EU contribution of € 440 million) and through in-kind contributions by research and development organisations participating in projects, which at least match the contribution of the public authorities.

1.1.2. Governing structure

The ENIAC JU is managed by an Executive Director. Its governance structure comprises a Governing Board (GB), a Public Authorities Board (PAB) and an Industry and Research Committee (IRC).

1.2. Outline of the main activities and achievements in 2011

1.2.1. Key milestones

A decline in effective commitments to funding by the ENIAC member States occurred in previous years. 2011 was the first year of reversed trend. This trend is expected to continue in 2012.

In 2011 ENIAC JU:

Launched 2 calls for proposals (4th and 5th);

Launched a call for Expression of Interest in pilot lines;

Tuned the selection procedures to quantify the synergy of project proposals with national and European priorities; and

Addressed the 1.8 factor included in the Council regulation setting up the ENIAC JU, to correct the deviating trend noticed over the first 4 years.

1.2.2. Organisation of the team in ENIAC JU

The composition of the ENIAC JU executive team developed significantly in 2011, with the recruitment of additional staff. On 31 December, the team is composed of 6 Temporary agents and 7 contract agents (against 5 and 5 in 2010), as foreseen in ENIAC multi annual staff policy plan.

1.2.3. Address the 1.8 ratio

The decision was taken by the Public Authority Board to reduce the ENIAC JU's participation to 15% of the total of the eligible costs and up to 52% of the ENIAC member State contributions granted to the calls for proposals. This is resulting from the observation that the 1.8 ratio between the ENIAC JU and the member States grants to the projects would likely not be achieved at the life end of ENIAC JU, in the present trend of a lowering ratio.

This decision should result in a (close to) 1.8 ratio, under the two following assumptions; first, ENIAC JU will consume the maximum EU contribution in the Council Regulation; second, the ENIAC member States will fund their participants at similar funding rates as in the past (i.e. achieving a total ENIAC member States and ENIAC funding rate of around 44%).

1.2.4. Progress in the implementation of the Strategic Research Agenda

The Annual Work Programme 2011 is based on the "Vision, Mission and Strategy for European Micro- and Nanoelectronics", jointly set out with CATRENE. The topics are shown in the table below.

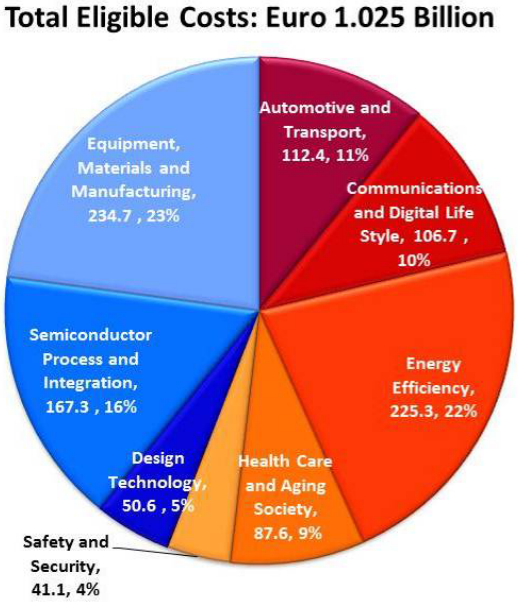
<table>
<tr><th colspan="2">APPLICATIONS</th><th colspan="2">TECHNOLOGY</th></tr>
<tr><td rowspan="3">Automotive and Transport</td><td>Intelligent Electric Vehicle</td><td rowspan="3">Design Technology</td><td>Managing Complexity</td></tr>
<tr><td>Safety in Traffic</td><td>Managing Diversity</td></tr>
<tr><td>Co-operative Traffic Management</td><td>Designing for Reliability and Yield</td></tr>
<tr><td rowspan="4">Communication and Digital Lifestyle</td><td>Internet Multimedia Services</td><td rowspan="3">Semiconductor Process and Integration</td><td>Know-how on Advanced and Emerging Semiconductor Processes</td></tr>
<tr><td>Evolution to a Digital Lifestyle</td><td>Competitiveness through Semicond. Process Differentiation</td></tr>
<tr><td>Self-organizing Networks</td><td>Opportunities in System in Package</td></tr>
<tr><td>Short-range Convergence</td><td rowspan="3">Equipment, Materials and Manufacturing</td><td>Advanced CMOS - 1Xnm & 450mm</td></tr>
<tr><td rowspan="2">Energy Efficiency</td><td>Sustainable and Efficient Energy Generation</td><td>More than Moore</td></tr>
<tr><td>Energy Distribution and Management - Smart Grid</td><td>Manufacturing</td></tr>
<tr><td>Reduction of energy consumption</td><td colspan="2" rowspan="6">The Multi Annual Strategy Plan of the ENIAC Joint Undertaking

(MASP 2010)

Note: Grand Challenges in bold letters on white background are selected in the AWP2011 to be included in the call(s) to be launched in 2011.</td></tr>
<tr><td rowspan="3">Health Care and Aging Society</td><td>Home Healthcare</td></tr>
<tr><td>Hospital Healthcare</td></tr>
<tr><td>Heuristic Healthcare</td></tr>
<tr><td rowspan="3">Safety and Security</td><td>Consumer and Citizen Security</td></tr>
<tr><td>Securing the European Challenging Applications</td></tr>
<tr><td>Enabling Technologies for Trust, Security and Safety</td></tr>
</table>

In bold letters on white background are the topics which were open for proposals, while the ones that have not been selected are on grey background. In 2011, all the technology fields and 9 of the 16 application fields were called for (same as in 2010), which may raise the question of the full implementation of the SRA. However it has been decided that for the 2012 calls, all applications and technology fields will be included.

The situation on the 40 projects already selected over the first 4 years is illustrated by the following chart.



1.2.5. Governance - Major decisions taken by the Governing Board and other JU bodies

2011 was the first full year of implementation of the ENIAC JU under its own management and related bodies (Governing Board, Public Authorities Board, Executive Director and Industry and Research Committee).

In 2011, the European Court of Auditors gave a qualified opinion on the reliability of the JU annual accounts 2010 because the Budgetary Outturn Account and its reconciliation to the Economic Outturn Account, required by EC Accounting Rule 16 'Presentation of budget information in the annual accounts', had not been included in the accounts. This issue was the consequence of a difference of opinion between the ENIAC JU and the Commission about the effective date of autonomy of the ENIAC JU. The European Court of Auditors set the date of autonomy at 26 July 2010. Furthermore, the European Court of Auditors raised a number of comments (e.g. on the internal control systems of the ENIAC JU) which the Governing Board will follow up with the Executive Director, as stated in the assessment accompanying the Annual Activity Report for 2011 of the Executive Director.

The running of the Governing Board (GB) and the Public Authority Board (PAB)was smooth in 2011. The Governing Board held 3 meetings in 2011, while the Public Authority Board met 5 times.

The main decisions taken by the **Governing Board** during the year were related to *Annual Implementation Plan 2012* and *Annual Budget Plan 2012*. Besides, the ENIAC GB had 12 written procedures:

1. Adoption of the Multi-annual Staff Policy Plan (MSPP) for years 2012-2014
2. Approval of the preliminary draft Annual Budget Plan (ABP) 2012 including ENIAC-GB-109A-11

3. Draft Annual Implementation Plan (AIP) 2012
4. Adoption of the Annual Activity Report 2010 and its analysis and assessment
5. Amendment to the AIP 2011
6. Adoption of the 2010 Annual Accounts
7. Amendment to the AIP 2011, ABP 2011 and MSPP 2012-2014
8. Delegation of the Staff Regulation Implementing Rules to the Executive Director
9. Approval of the amended annual accounts
10. Amendment to the AIP 2011 and ABP 2011
11. Annual Audit Report
12. Adoption of the AIP 2012 and ABP 2012

Important decisions of the **Public Authority Board** included the launch of 2 calls, the work programme of 2012 and the launch of a call for Expression of Interests on pilot lines related to Key Enabling Technologies (KET). Nanoelectronics is one the 6 fields identified as KET by the report of the related High Level Group[3] for which the implementation of pilot lines is an essential means to support to innovation. Moreover the ENIAC PAB had 7 written procedures:

1. Adoption of the decision to launch the fourth Call for proposals
2. Amendment of the Annual Work Programme 2011
3. Adoption of the decision to launch the fifth Call for proposals
4. Mandate to the Executive Director to enter negotiations for Call 2011-1
5. Mandate to the Executive Director to enter negotiations for Call 2011-2
6. Adoption of the Annual Work Programme 2012
7. Projects Selection and Funding

1.2.6. Outcome of 1st interim evaluation

In accordance with Article 11.2 the Commission had to carry out an interim evaluation of the ARTEMIS and ENIAC JU with the assistance of independent experts by the end of 2010. A panel of 8 independent experts was invited by the Commission to simultaneously evaluate both ARTEMIS and ENIAC JUs as they were set up using an identical design. Please refer to ARTEMIS - section 4.2 to see the outcome of the first interim evaluation.

1.2.7. Main communication activities

The ENIAC JU executes a communication plan through a contract with AENEAS in the name of its stakeholders. The main actions reported by ENIAC for 2011 were:

Publication of the **Annual Activity Report** for 2010;

[3] http://ec.europa.eu/enterprise/sectors/ict/files/kets/hlg_report_final_en.pdf

Issue of **quarterly reports to the GB** showing progress versus plan;

Organization of a **National Funding Authorities day**;

Face to face meetings with public authorities, notably with France, Germany, Netherlands, Romania, Spain, U.K., the Czech republic, Hungary, Poland, Ireland;

Co-organization with the other Joint Undertakings of the "**Innovation in Action**" event at the European Parliament;

4 press releases with satisfactory impact;

Co-organization of the **European Nanoelectronic Forum**

Introduction of the "ENIAC JU Innovation Award" to recognize the projects approaching completion or recently completed that produced the most impactful innovations;

Participation in several events in Germany, Austria, Italy, Romania, sponsored events in France and Germany;

Presentation at several **conferences** including at the Seventh International Nanotechnology Conference on Communication and Cooperation (INC7) in Albany, New York, the opening address at ESSCIRC/ESSDERS conference (Helsinki), presentation at SEMATECH Forum (Dresden), EuroSimE conference in Linz, and at the Nanolectronics days in Rome and NanoVeneto in Mestre.

1.2.8. Success story

The project **E^{3}Car** started in February 2008 with the aim to tackle the main challenges in the management of electrical vehicle power train as well as reducing the energy lost in the intermediate stages of the power chain. This project was given an innovation award in November 2011 for its major achievements in many developments on several key components, in particular: the improvement of the power conversion and distribution by 10% and the increase of the energy efficiency by 35% overall.

The project achieved 28 demonstrators and generated an architectural view of the electrical vehicle. The project dynamics generated 7 more collaborative projects on electric mobility mobilizing more than 100 partners with a total budget of €180 M, thereby ensuring the future of European capability to roll out full electrical vehicle technology.

1.3. Call implementation

The ENIAC JU supports R&D activities through open and competitive calls for proposals published on a yearly basis, to attract the best European research ideas and capacities in the field of nanoelectronics. The programme is open to organisations in the EU Member States and Associated Countries. Selected projects are co-financed by the ENIAC JU and the countries that have joined ENIAC. The ENIAC JU implements significant parts of the above referred Strategic Research Agenda.

Funding decisions under the ENIAC JU Annual Work Programme are made on the basis of proposals submitted upon a call. Proposals describe planned research activities and give information on the applicants and the costs. The ENIAC JU evaluates all eligible proposals, using independent experts in order to rank the proposals on the basis of pre-established evaluation criteria.

Following the evaluation, the Public Authority Board of the ENIAC JU decides on the selection of proposals and the allocation of funding (ENIAC JU and national funding).

The ENIAC JU then negotiates with selected proposals taking into account the maximum public funding allocated and the recommendations for changes, if any. If negotiations are successfully concluded, grant agreements are signed with ENIAC JU. Participants from ENIAC member States also conclude national grant agreements with their own national funding authorities as they normally also receive a national financial contribution.

In 2011, the ENIAC JU implemented **2 calls for proposals**. This significantly helped in closing the gap with the intended total spending of the ENIAC JU by the end of its lifetime. The first call was a 2 steps procedure, with a project outline submission phase. The second call was implemented as a single step one, due to limited available time. The evaluation procedures were both based on consensus panel meetings.

Each full project proposal (FPP) was initially evaluated by four individual external experts. For each FPP, a consensus meeting between these experts was subsequently organised and following all the consensus meetings, a panel meeting of external experts under the chairmanship of the ED was held. The panel thus produced the final evaluation result for each proposal after an in-depth discussion on the basis of the 4 individual reports from the experts.

The 5 **evaluation criteria** used were:

№	Evaluation criterion	Score	Weight	Threshold
1.	Relevance and contributions to the objectives of the call	/10	1	6
2.	R&D innovation and technical excellence	/10	1	6
3.	S&T approach and work plan	/10	1	6
4.	Market innovation and market impact	/10	2	6
5.	Quality of consortium and management	/10	1	-
	Total	/60		30/60

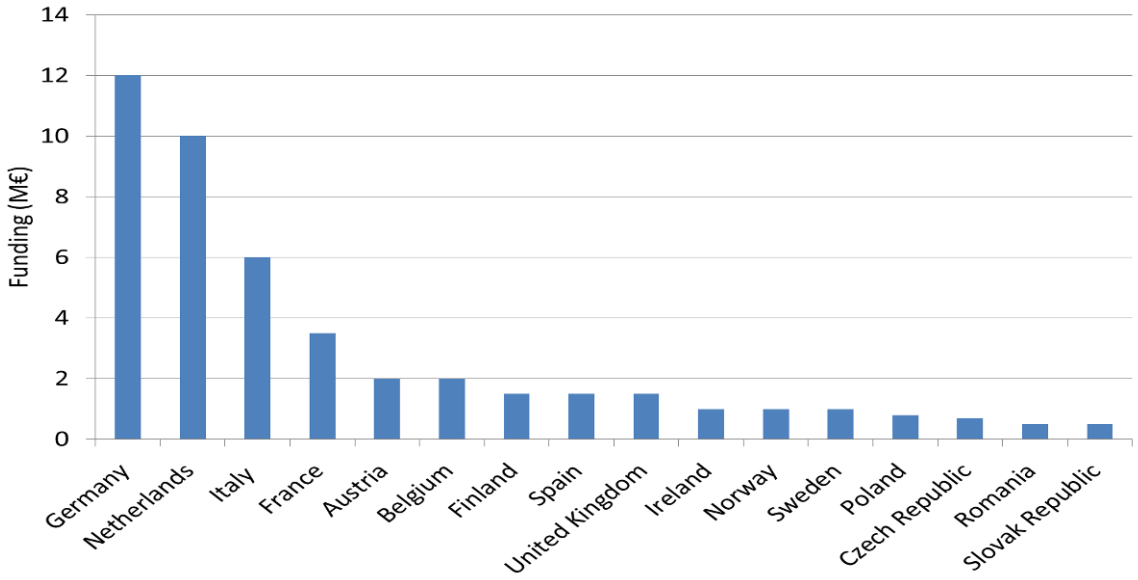
Furthermore a **call for Expression of Interest** for pilot lines on nanoelectronics in the framework of KET's was conducted at the end of 2011. Since the outcome of the submission was planned for February 2012, the Commission shall present the outcome of this activity in its next year's report on the progress achieved by the ENIAC JU.

1.4. Call 4 ENIAC-2011-1

1.4.1. Summary information

Call Identifier	ENIAC-2011-1
Publication date	23 February 2011
Deadline for submission of Project Outlines (POs) - Stage 1	21 April 2011
Evaluation of Project Outlines - Stage 1	April/May 2011
Feedback on PO assessment	06 May 2011
Deadline for submission of Full Project Proposals (FPP) - Stage 2	16 June 2011
Evaluation of Full Project Proposals - Stage 2	July 2011
Closing of negotiations for the selected proposals	October 2011
Funding approval	From December 2011
Indicative Total budget (in €)	€ 70.5 millions
EU contribution after evaluation	€ 20.1 millions
In-kind contribution after evaluation	€ 67.2 millions
Where relevant, the contribution from the Member States or National funding, or other contributions	€ 33.0 millions
Reference to call topics	See the section "SRA implementation".

The figure below represents graphically the respective funding by Member State:



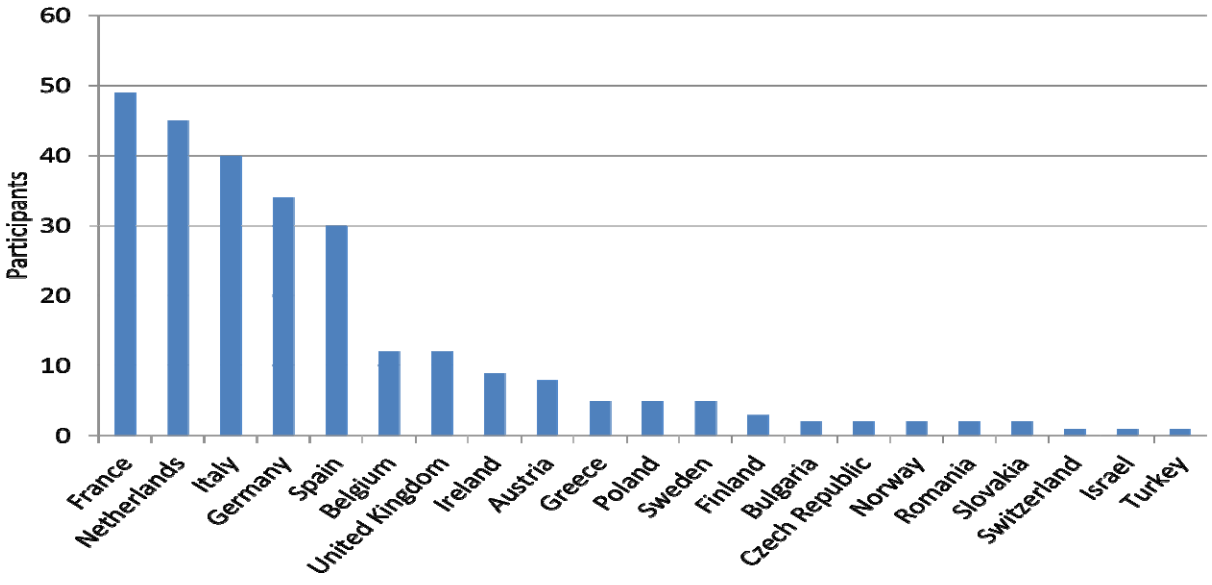
1.4.2. Analysis of proposals submitted

1.4.2.1. Stage 1 – Project Outlines

20 project outlines were submitted. The funding requested by participants reached a total of €348.1M (including the following contribution from the MS: €106.6M, and ENIAC JU: €58.3M).

Regarding typology of participants: 102 participants were Research organizations, 95 industrials and 73 SMEs. The funding requested by SMEs amounted to a total of €93.5M (National contribution: €16.9 M, and ENIAC JU contribution: €43.1 M).

The geographical distribution of participants is represented in the table below. France is well represented in terms of participants, before the Netherlands, Italy, Germany and Spain.



1.4.2.2. Stage 2 – Full Project Proposals

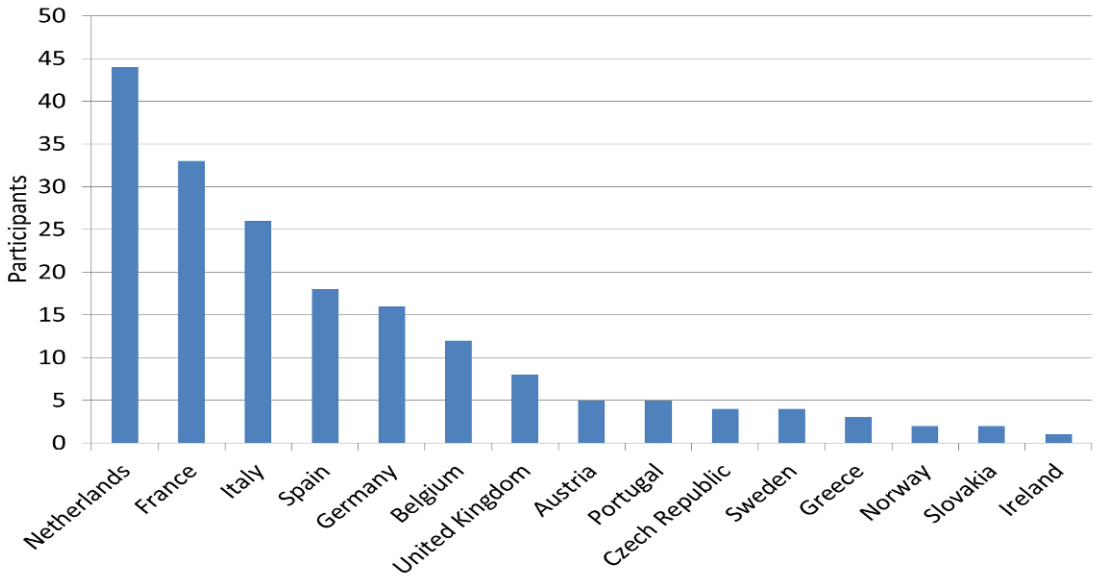
Out of the 20 POs, **9 FPPs** were successfully submitted by the deadline, all eligible for evaluation. The total funding requested amounted to €200.6 M, (National contribution €59.4 M, JU contribution: €33.5 M

As regards SMEs, the funding requested was: National contribution €13.6 M, JU contribution €7.2 M

The distribution of the participants in the FPPs by *participant type* is illustrated below:

Type participant	Nr of participants in the Project Outlines	Nr of participants in the Full Project Proposals	Nr of participants in the proposals selected for funding	Participants success rate
Public Bodies				
Research organisations	102	58	31	30,4%
Higher or secondary education				
Private for profit (excl. education)	95	59	38	40,0%
SMEs	**73**	**66**	**39**	**53,4%**
Others				
Total	**270**	**183**	**108**	**40,0%**

As for the geographical distribution of the participants in the FPPs, the Netherlands take the lead with more than 40 representatives, followed by France (30-35) and Italy (25-30).



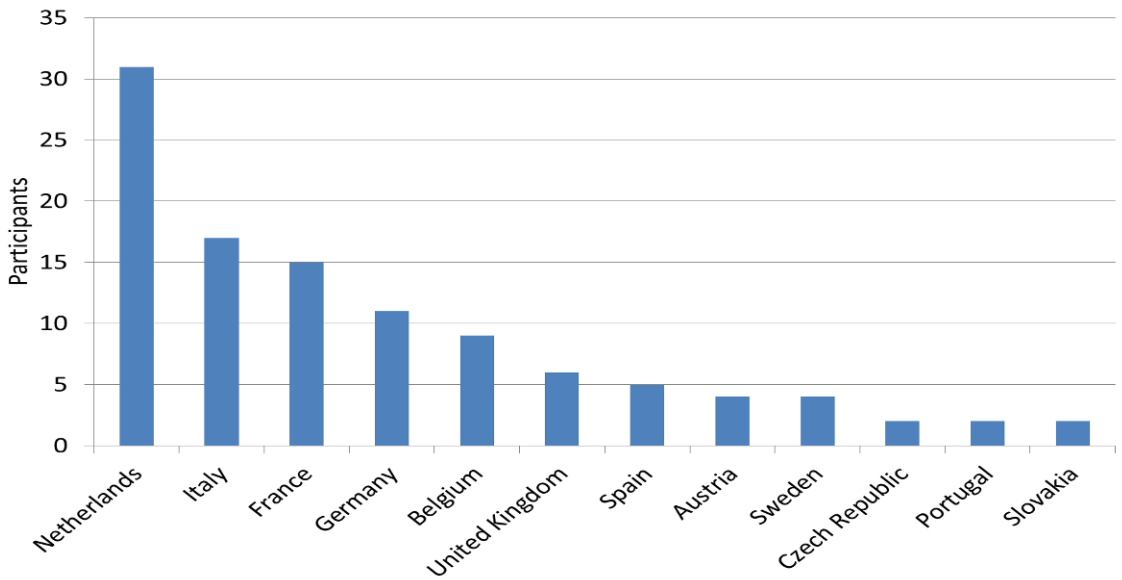
Evaluation results

9 Full Project Proposals (FPP) submitted for the Call 2011 were evaluated. All satisfied the eligibility criteria for FPP. The evaluation was conducted according to the methodology described in the previous chapter. **7 proposals** were evaluated **above threshold,** and **2 proposals below threshold.**

Following the evaluation, the Public Authority Board of the ENIAC JU decided to fund **6 proposals**. No proposal was put on the reserve list. The average success rate is 66.7%

Topic number	Submitted proposals			Evaluation results						
	Submitted FPPs	Eligible FPPs	% of retained	Above threshold			Selected FPPs for funding			Reserve list
				Number	MS (€)	JU (€)	Number	MS (€)	JU (€)	
1	1	1	100	1	11,284,200	5,438,049	0			0
2	1	1	100	0			0			0
3	3	3	100	3	20,345,101	10,822,472	3	20,345,101	10,822,472	0
4	1	1	100	0	31,629,301	16,260,521	0			0
Total	**6**	**6**	**100**	**4**			**3**	20,345,101	10,822,472	**0**
7	1	1	100	1	5,688,749	3,785,850	1	5,688,749	3,785,850	0
8	2	2	100	2	8,060,989	6,200,918	2	8,060,989	6,200,918	0
Total	3	3	100	3	13,749,738	9,986,768	3	13,749,738	9,986,768	0
TOTAL	**9**	**9**	**100**	**7**	**45,379,039**	**26,247,289**	**6**	**34,094,839**	**20,809,240**	**0**

The geographical distribution of the participants in the proposals selected for funding is illustrated below: the Netherlands keep the lead followed by Italy and France.



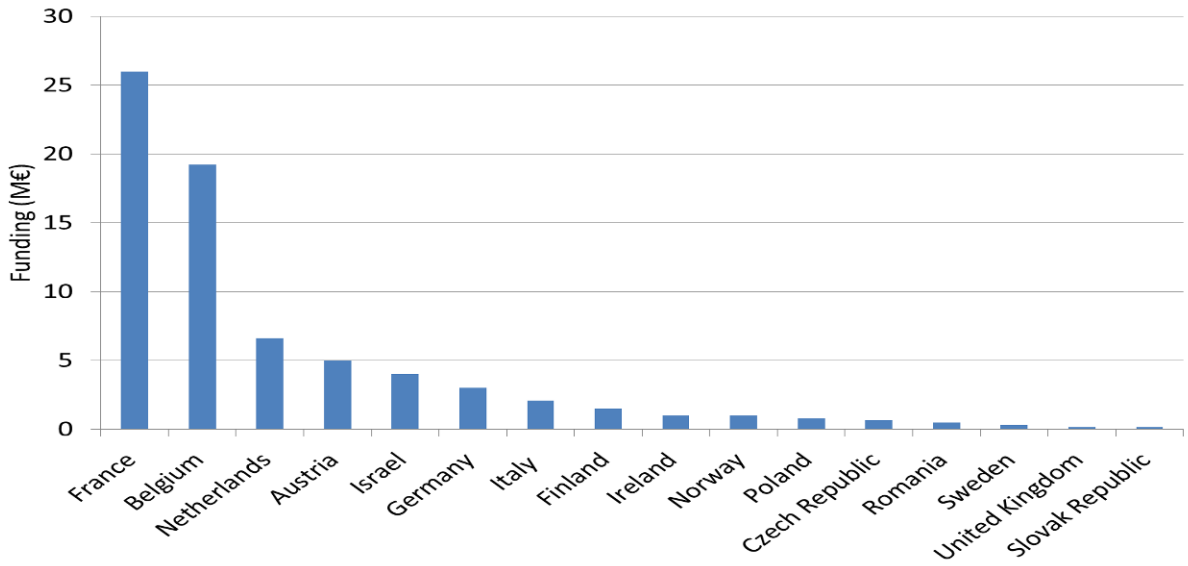
1.5. Call 5 ENIAC-2011-2

The ENIAC JU launched its fifth call for proposals in 2011. The negotiations were conducted towards the end of 2011 for the fifth call and the final results of the national grant agreements will be presented in the next year's report.

1.5.1. Summary information

Call Identifier	ENIAC-2011-2
Publication date	27 June 2011
Deadline for submission of Full Project Proposals (FPP)	15 September 2011
Evaluation of Full Project Proposals	October 2011
Closing of negotiations for the selected proposals	November 2011
Funding approval	From December 2011
Indicative Total budget (in €)	€ 95.5 millions
EU contribution after evaluation	€ 42.2 millions
In-kind contribution after evaluation	€ 159.2 millions
Where relevant, the contribution from the Member States or National funding, or other contributions	€ 51.2 millions
Reference to call topics	See the section "SRA implementation".

The figure below represents graphically the respective funding by Member State:



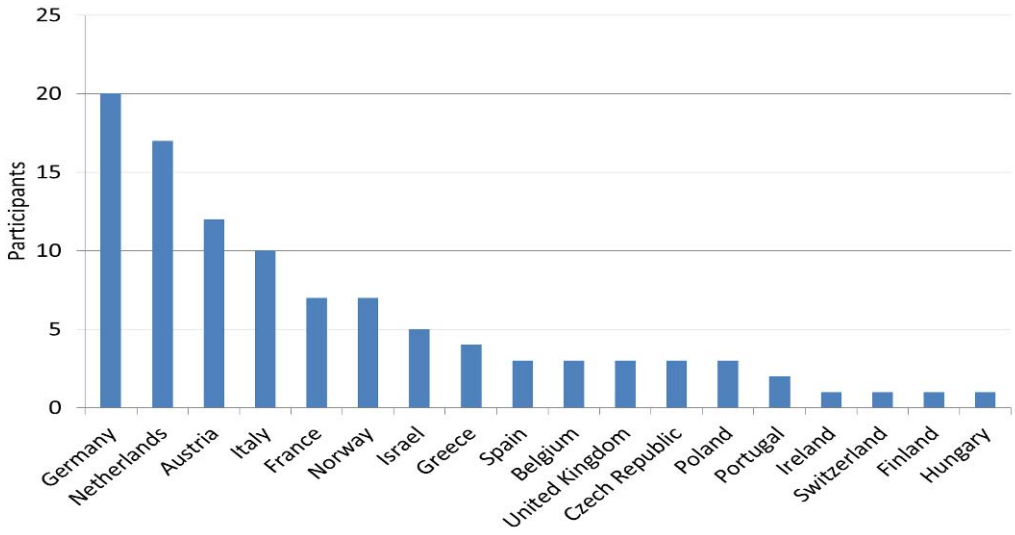
1.5.2. Analysis of proposals submitted

8 proposals were submitted and 7 met the eligibility criteria. The total Funding requested amounted to €267.7 M (among it: MS contribution of €76.6 M, JU contribution of €44.7 M). From the SME perspective: MS contributed by €11.7 M, and the JU by €6.6 M.

The distribution of the participants in the selected proposals *by participant type* is illustrated below:

Type participant	Nr of participants in the FPPS	Nr of participants in the funded Projects	Participants success rate
Public Bodies			
Research organisations	26	19	73.1%
Higher or secondary education			
Private for profit (excl. education)	34	33	97.1%
SMEs	**43**	**35**	**81.4%**
Others			
Total	**103**	**87**	**84.5%**

As for the geographical distribution of the participants in the FPPs, Germany takes the lead with 20 representatives, followed by the Netherlands (15-20); Austria (10-15). Italy, France and Norway (5-10).

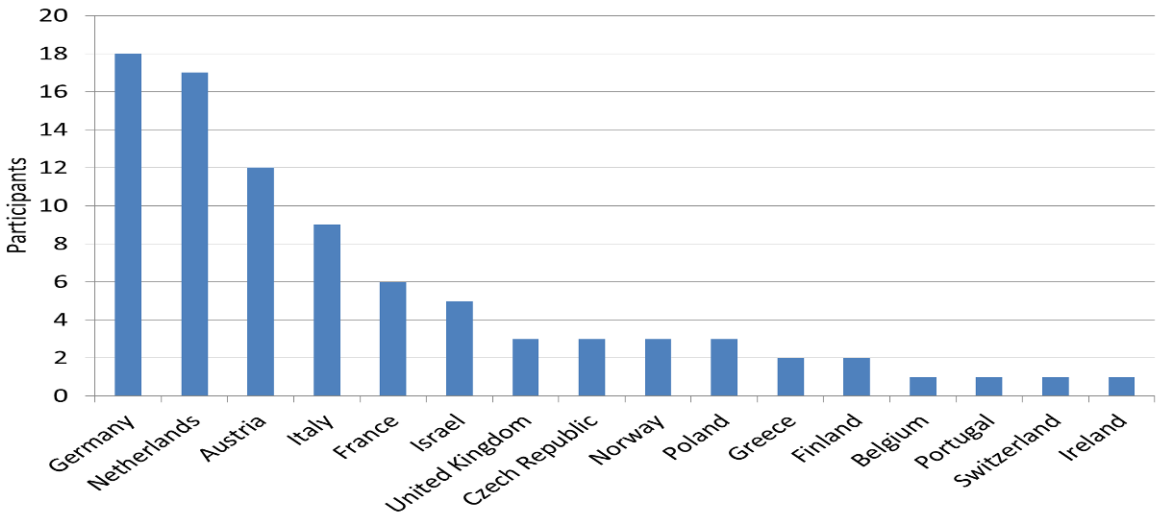


1.5.3. Evaluation results

Among the 7 proposals eligible for funding, **6 proposals have passed the thresholds**, 1 failed. They have all been **proposed for funding**, with a success rate of 85.7%.

Topic number	Submitted proposals			evaluation results				
	Submitted FPPs	Eligible FPPs	% of retained	Above threshold	Selected FPPs for funding			Reserve list
						MS (€)	JU (€)	
1	1	1	100	1	1	3,434,212	1,661,668	0
3	1	1	100	1	1	2,167,129	1,424,969	
Total	**2**	**2**	**100**	**2**	**2**	5,601,341	3,086,637	**0**
7	4	3	87.5	3	3	34,310,678	25,392,711	0
8	1	1	100	1	1	15,223,428	14,357,582	0
Total	5	4	80.0	4	4	49,534,106	39,750,293	0
TOTAL	**8**	**7**	**87.5**	**6**	**6**	**55,135,447**	**42,836,930**	**0**

The geographical distribution of the participants in the proposals selected for funding is illustrated below. Germany and Netherlands are leading, Austria follows, then Italy.



1.6. Grant agreements/project portfolio

This section provides an overview on signed grant agreements and on their implementation.

1.6.1. Grant agreements signed (commitment amounts)

ENIAC – Call 3 (2010)	Number	Total contribution (€)	Total national funding (€)	ENIAC JU contribution (€)	In kind contribution(€)
Sub-Total (signed GAPs)	10	N/A	N/A	33,195,414	N/A
Sub-Total (Proposals in Negotiation)	0	0	0	0	0
TOTAL	10	N/A	N/A	**33,195,414**	N/A

ENIAC – Calls 4 – 5 (2011)	Number	Total contribution (€)	Total national funding (€)	ENIAC JU contribution (€)	In kind contribution(€)
Sub-Total (signed GAPs) – Call 4	6	120,281,832	33,020,401	20,087,069	67,174,362
Sub-Total (signed GAPs) – Call 5	6	253,368,229	54,003,610	42,178,897	157,185,722
Sub-Total (Proposals in Negotiation)	0	0	0	0	0
TOTAL	12	**373,650,061**	**87,024,011**	**62,265,966**	**224,360,084**

10 grant agreements relating to the call 3, launched in 2010, have been signed during 2011. ENIAC JU contribution was amounting to a total € 33.2 million. The complete overview is detailed in Annex 19.

In 2011, 12 additional grants have been signed: 6 grants for call 4 and 6 other for call 5. ENIAC JU contribution was amounting to a total € 62.3 million The complete overview is detailed in annex 20.

1.6.2. Grant agreements for which activities have ended and/or final results are available

No grant agreement had activities which ended yet. The projects which started in 2008 will terminate in 2012. Projects from the subsequent calls launched of 2009 and 2010 are still running. The projects granted in 2011 will be starting in 2012.

TABLE OF ABBREVIATIONS

AA	Application Area
ABAC	Accrual Based Accounting System
ACARE	Advisory Council for Aeronautics Research in Europe
AENEAS	Association for European Nanoelectronics Activities
ARTEMIS-IA	ARTEMIS Industrial Association
ASP	ARTEMIS Sub-Programme
CATRENE	Cluster for Application and Technology Research in Europe on Nanoelectronics
CHP	Combined Heat & Power
CMOS	Complementary Metal Oxide Semiconductor
CS	Clean Sky
DG RTD	Directorate-General for Research and Innovation
EC	European Commission
ED	Eco-Design
EFPIA	European Federation of Pharmaceutical Industries Association
EFTA	European Free Trade Association
EoI	Expression of Interest
ESR	Evaluation Summary Report
ETP	European Technology Platform
EU	European Union
FCH	Fuel Cells and Hydrogen
FP7	Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)
FPP	Full Project Proposal
GA	Grant Agreement
GAM	Grant Agreement for Members
GAP	Grant Agreement for Partners
GB	Governing Board
GRA	Green Regional Aircraft
GRC	Green Rotorcraft
IAC	Internal Audit Capability
IAS	Internal Audit Service

ICAS	International Council of the Aeronautical Sciences
ICT	Information and Communications Technologies
IMI	Innovative Medicines Initiative
IRC	Industry and Research Committee
IT	Information Technologies
ITD	Integrated Technology Demonstrator
JTI	Joint Technology Initiative
JU	Joint Undertaking
MAIP	Multi Annual Implementation Plan
MS	Member States
NEW-IG	New Energy World Industry Grouping
NGA	National Grant Agreement
NGO	Non-Governmental Organisation
NSRG	National States Representatives Group
OJ	Official Journal of the European Union
PAB	Public Authorities Board
PO	Project Outline
PPP	Public-private partnership
PRO	Public Research Organisations
R&D	Research & Development
RTD	Research, Technological Development and Demonstration
S&T	Scientific & Technological Excellence
SAGE	Sustainable and Green Engines
SET-Plan	European Strategic Energy Technology Plan
SFWA	Smart Fixed Wing Aircraft
SGO	Systems for Green Operations
SME	Small and Medium-Sized Enterprise
SRA	Strategic Research Agenda
SRG	State Representative Group
STAB	Scientific and Technological Advisory Board
TE	Technology Evaluator
TRL	Technology Readiness Levels

2. ANNEXES

2.1. Clean Sky JU

2.1.1. Annex 1: Description of the 'Integrated Technology Demonstrators' (ITD) activities

2.1.1.1. SFWA – Smart Fixed Wing Aircraft ITD

In 2011 SFWA focussed on achieving progress on key SFWA target technologies. All activities conducted were aligned along the eight "SFWA Aircraft Concepts":

1. High Speed Demonstrator Passive (HSDP)
2. Low Speed Demonstrator (LSD)
3. Short Range Aircraft Concept (SRA)
4. Low Sweep Bizjet Concept (LSBJ)
5. High Speed Demonstrator Active (HSDA)
6. Long Range Aircraft Concept (LRA)
7. High Sweep Bizjet Concept (HSBJ)
8. CROR Engine Demo FTB

The currently estimated consumption of resources (including large subcontracting invoices) has been in the order of 82%. (This figure could prove pessimistic and will be revised for the final Annual Activity Report.) There are mainly two main reasons, why the budget was not fully used by the members:

a) Detailed preparation work of laminar wing took longer than expected; this caused a delay of real starting of the manufacturing of parts, which usually is the most costly part. The shift is presently not yet affecting the overall schedule.

b) A large amount of subcontracting have not yet been considered in 2011 because of financial deadlines (within AB mainly). The invoices arrived too late; nevertheless the work was performed.

The majority of activities were dedicated to develop and design the final shape of the laminar "smart" wing aero-shape, to define the manufacturing criteria for surface quality with respect to roughness, waviness, steps and gaps and a large number of critical details. The related data has been transferred to the design of the smart wing flight tests articles for the Airbus A340-200 test bed. In alignment with the requirements and limitations to modify the datum test aircraft, all supplementary parts were predesigned and the "Preliminary Design Review" has been conclusively passed in all elements in April 2011. In the second half of 2011, the detailed design for many components like the principle laminar wing flight test articles, the "plastron", aerodynamic fairing, wing diffusion zone, and the wing tip device progressed mostly as planned, part of the design work could be completed. The principle design of the camera pod to be mounted on the aircraft fuselage is completed. A number of supplementary tests in wind tunnels to receive additional performance data were conducted. The preparation of the major ground test "feature" structural demonstrator was kicked off and is well in progress.

A second main field of activities regards the Counter-Rotating Open Rotor (CROR), for which important decisions, strengthening the target of the flight demonstration, were made

with the SAGE ITD and the Executive Director: this refined strategy is summarized in the SAGE paragraph below.

In 2011, the activities regarded in particular the conduct of a comprehensive study of the potential benefits and issues related to integrating a CROR propulsion system into a future large short and medium transport aircraft covering a large variety of principle configurations.

Major progress has been made in the blade design with respect to the robustness against impacts of debris: principle concepts of shielding for critical parts of the structure and systems are being developed and will be tested in 2012. Tools to adequately calculate the complex flow pattern are being developed. A major set of scaled test engines and test rigs have been designed and prepared for testing to exploit the aerodynamic performance, handling quality and noise in major wind tunnel test campaigns which started in 2011, to be continued in 2012.

Design activities for a new low sweep and high sweep business-jet design progressed well, the principle design for an innovative engine noise shielding tail for a low sweep business jet is completed. Related wind tunnel tests are under preparation to be conducted in 2012. Planning is underway for a large scale innovative rear end structural demonstrator.

In the area of low speed wing technologies, the technology plans have been reviewed, which led to a refocusing on a smart flap ground demonstrator with current preference to be adapted to a full scale Dassault Falcon F7X. Active load control high lift technologies shall be further pursued in ground tests, a major test has been conducted in November 2011 in the DNW-NWB. Besides, the development of innovative loads control functions for future wings led to another new focus towards a potential "low speed vibration control" application, which is considered to be proposed for a further dedicated flight test.

The contribution of SFWA vehicle ITD to the Technology Evaluator, by delivering reference aircraft models and concept aircraft models incorporating the innovative technologies developed in CleanSky, for the TE first assessment, was another subject of activities.

74 Topics for publication in Call for proposal have been defined by SFWA through the first **10 dedicated CleanSky calls**. At the end of 2011, almost 50 of them have operationally started or are about to be launched. Thus a lot of new partners joined SFWA-ITD, many of them becoming members of the SFWA consortium. A wide range of subjects was related to the manufacturing, treatment, and repair and testing of surfaces for laminar wing panels, the design and development of innovative sensors and actuators for control surfaces in laminar wings.

The 3 calls in 2011 also included major work packages to attribute to the design and build parts of the laminar wing flight test articles. Cross-cutting coordination has been established, in particular with the SAGE –ITD and to some extent, where appropriate, with the SGO-ITD and the Eco Design-ITD.

Major achievements of the year 2011:

- The completion of the aerodynamic definition of the laminar wing design. Several specific design items and technical details have been checked in order to ensure a flight worthy layout of the wing. Two structural laminar wing concepts have been frozen and passed the preliminary design review to be designed, and then manufactured to be tested on the Airbus A340-300 test aircraft.

- The Launch Gate design and manufacturing of the High Speed Demonstrator Passive flight test articles were conclusively passed in April 2011.

- Major structural parts of the laminar wing feature ground demonstrators entered the phase of detailed design, some already being in the phase of manufacturing.

- A flight test campaign with a number of surface coating samples that are candidates to be applied on "smart wings", was started with a CfP-partner.

- The feasibility phase for the CROR-engine integration and CROR demo-FTB including numerical simulation, and subscale ground testing, has progressed. The "pusher" configuration has been confirmed.

- Aircraft models for business-jets, small and medium range and long range transport aircraft have been prepared for the CleanSky Technology Evaluator to contribute to the first "CleanSky Technology Assessment". Parts of these were delivered at the end of 2011; aircraft models with fully implemented CROR engines and a laminar wing will follow in 2012.

- The second SFWA-ITD Annual Progress Review was performed, explaining the new approach by Technology Streams. The ITD has launched the actions deemed necessary to further improve the activities, following the Reviewers' recommendations.

- A detailed follow-on year 2012 work and budget plan, as well as a Consortium Plan 2012, has been issued.

As part of the CleanSky mid-year update it was decided to put a "SFWA corrective action package" in place in order to optimise the budget execution. As part of this package, additional activities to investigate structural solutions for a rear end fuselage explicitly tailored to carry CROR engines have been conducted in 2011.

2.1.1.2. Green Regional Aircraft ITD

The GRA work plan was executed at a level of 90%, according to the current estimate. It was focused on the following activities:

- Requirements for the definition of the generic future regional aircraft and for ground and flight Demonstration; structural definition of peculiar items of advanced aircraft configurations; test report for all developed technologies for multilayer materials has been completed.

- Analysis of methodologies for probabilistic structural real design: this is still on-going and will be completed in the first half of 2012; final evaluation of the analysis and tests results of developed nanomaterial. Selection of flat large panels with different

technologies: first down selection test article design has been performed, manufacturing commenced.

- Definition of technical solutions on empennage, wing, fuselage/cockpit of the future generic regional aircraft utilising the selected technologies.

- Definition of structure components to be tested in flight has been completed; engineering and manufacturing data to prepare the test article for flight test is started; the activities for providing lay out and installation of advanced components to be tested in flight and manufacturing; plan of advanced components and the definition of a preliminary flight test plan have also started. Design & Manufacturing preparation of test rig and test article is started.

- First down-selection of High-Lift Devices Technologies, tailored to Natural Laminar Flow (NLF) wing (130-seat rear-mounted engine Green Regional A/C) and Turbo Prop (90-seat) Regional A/C wing configurations, by taking into account high-lift performance, noise impact, actuation/ kinematics concepts. Both conventional architectures and innovative concepts, as well as active flow control and low-noise passive solutions have been assessed on a multi-disciplinary basis.

- Further development and assessment of Load Control & Alleviation (LC&A) Technologies, considering both conventional and innovative wing control movables, to reduce induced drag, through optimal wing load distribution (LC function), and wing structural loads (wing bending and torsion movement) from gust and manoeuvre (LA function).

- First part of aerodynamic and aero-acoustic Wind-Tunnel Tests campaign on Wing / High-Lift Devices 2D models in INCAS subsonic facility. Such testing activity is aimed at validating high-lift performance and low-noise solutions of HLD for NLF wing (130 seat A/C) and Turbo-Prop (90 seat A/C) configurations.

- Manufacturing of full-size test articles of NLF wing flap morphing structures is in progress. Relevant mechanical tests are going to validate the two actuation concepts addressed, respectively Deeply Embedded Smart Actuators and Smart Actuated Compliant Mechanisms.

- Definition of general requirements for the Wind-Tunnel Experimental Validation of NLF wing and LC&A integrated technologies through an innovative wing flexible scaled model, representative of the full-size wing structural deformation under aerodynamic loads. Such tests are aimed at validating wing aerodynamic design and steady aero-elastic performances of LC&A devices at transonic speed and high Reynolds number, close to in-flight conditions. This activity is planned to be performed through a project under CfP to be launched in 2012.

- Aerodynamic Design of a Transonic Natural Laminar Flow Wing, sized to a Green Regional rear-mounted engine 130-seat Aircraft, relying on experience and achievements of a NLF wing concept addressed in the technologies maturation phase.

Trade-off studies are on-going to optimise wing plan form (aspect ratio, sweep, ..) and wing profiles at specified design points (Mach, CL), looking for the best compromise between aerodynamic efficiency in cruise condition and low-speed performance, and to also account for impact on structural weight.

- All-electric aircraft (AEA) requirements & architectures: i) Final Updating of Integration requirements and Architecture of the On-Board Systems for Future Green Regional Aircraft and for ground and flight Demonstration; ii) final V&V plan for energy management demonstration into GRA; iii) AEA technologies for Systems (Methods & Tools): iv) implementation of the Level 1 (Architectural) and Level 2 (Functional) GRA AEA systems simulation and cabin thermal models and of the Shared Simulation Environment (SSE).

- Detailed Definition of the Systems modifications to be introduced on Demo a/c and preparation of Modification technical dossiers. Definition of the Preliminary Energy Management logics for the on-ground and in flight demonstration.

- Updating of MTM functionalities and scenario analysis document in case of relevant input coming from SESAR; finalization of avionics architecture and basic prototyping tool architecture definition.

- TLAR Requirements last definition phase and power plant specifications (Loop 2); Validation and verification strategy and plan finalization: planning of activities oriented to verify the feasibility; Preliminary GTF sizing under wing installation configuration definition; Green Power plant architecture, technology and modelling, performance and emission data started (2nd loop);.

- Power plant / Airframe integration: analysis has been performed in order to evaluate adopted architectures integrated solutions for Open Rotor (1st loop).

- Relevant data (trajectories, mission results, etc.), noise and engine emissions evaluation for the Technology Evaluator for Green A/C (main results of Loop 1 activities by means of proper tools).

2.1.1.3. GRC – Green Rotorcraft

The overall effort spent compared to the budget forecast is worth 77%, and main results achieved in 2011 for the seven domains are detailed below, as well as the areas where the activity has been behind plan.

GRC work performed in 2011 has been focused on preparatory activities such as technology selection and evaluation, requirements definition, work environment preparation (e.g. simulation models and tools development) and selection of new partners, through calls for proposals, to perform specific research tasks.

In 2011, 3 calls for proposals were launched and 8 topics were successful. In the meantime, 15 projects were kicked off. By end 2011, 30 projects were running or under negotiation.

1. **In GRC1 (Innovative rotor blade)**

Activities are organised around 5 main technology streams: active twist blades, Model rotor optimisation, Active Gurney Flap (AGF) systems for rotor blades, full-scale passive blade activities and laminar flow aerofoils.

The development of the active twist concept from project FRIENDCOPTER continued with the characterisation, evaluation and production of the piezocomposite materials. A set of piezocomposite arrays designed for integration into a full scale rotor blade segment was produced. Model rotor work has been affected by transfer of effort to full-scale passive blade activities.

In the meantime, work on Active Gurney Flap (AGF) systems for rotor blades has progressed well. In parallel, the task related to the benefit assessment in forward flight conditions has been started with the selection of the partner responsible for designing and developing the rotor model scale. The development of the open loop control algorithm, to control the AGF system, was achieved. After analysis, it was decided not to proceed to testing laminar flow aerofoils, because of the small benefits expected in hover and forward flight conditions.

2. **In GRC2 (Reduced drag of airframe and dynamic systems activities)**

Main tasks focused on the optimisation of the rotor hub, the fuselage and the engine installation. The drag breakdown over the different parts of the helicopter (hub, fuselage) was characterised and provided the results necessary to identify main areas of improvements.

Various numerical analyses performed to optimise the hub cap of various classes of helicopters have been validated (or still in progress) by Wind tunnel tests activities to confirm the design. Devices such as a remotely controlled horizontal stabiliser for the helicopter common platform were designed, while manufacturing is in progress, and steady blowing, pulsed and synthetic jets on a helicopter blunt fuselage were further numerically investigated and tested in Wind tunnel. TRL3 gate was passed for the latter device. The optimisation loop implemented on the specific nacelle component of ERICA, inlet and exhaust optimisation was completed within the frame of the TILTop project.

3. **In GRC3 (Integration of innovative electrical systems activities)**

The reference helicopter description was finalised, including the potential use of technologies per helicopter type, required to perform the overall benefit assessment.

The preliminary architecture analysis was deferred due to the lack of models available for some equipment. In the meantime, the Electrical Generation System architecture was postponed pending upon the finalisation of the negotiation with the partner appointed to support this activity. Results should be available in 2012. This didn’t prevent the continuation of the design requirements and to start the developments of subsystems.

Requirements with SGO were clarified for the "28V brushless starter generator"; PDR was completed early 2012 and TRL3 gate passed for the Electromechanical Actuators; the Electrical Rotor Brake was kicked off early November; the EMA for landing gear started early November; the Management of the Thermal Energy Recovery began in July and the Thermal Energy Recovery from Engine Exhaust passed the PDR and TRL3 gate in

November. Activities related to Power Supply for Piezo Actuators and Electric Tail Rotor progressed well according to the work plan.

4. **In GRC4 (Installation of a Diesel engine on a light helicopter)**

The "study of the future light helicopter generation powered with an advanced Diesel engine" started in November, with the University of Lublin. 1st results will be delivered in May 2012.

In parallel, another consortium was selected for the design and the development of the Diesel Power Pack to power an EC120 flight demonstrator. This activity started with delays as compared to the initial work plan due to the complexity of the project and some issues faced during the negotiation process with the partners. Available resources were not sufficient to catch up with the work plan and the PDR initially scheduled in September 2011 was postponed to February 2012.

5. **In GRC5 (Environment-friendly flight paths activities)**

Requirements of Simultaneous Non-Interfering Approach Operations have been released and works on procedures in the GARDEN project were performed to analyse how to implement SNI approach based on GNSS (PINs LPV) and their respective constraints. The characterisation of the pollutant emissions continued with the set-up of computational and measurement chains.

Activities were slowed down due to the delay in providing engine data to the selected partners. In the meantime, the measurement of different pollutant in flight on AW139 was postponed to 2012 due the unavailability of the test bed helicopter. The noise data acquired last year on EC155 were processed and results used to complete the noise models necessary to design and calibrate the optimised procedures (take-off, approach and landing). These results were uploaded in a behavioural model delivered to GRC7, to further improve the HELENA tool.

In parallel, enabling technologies such as the acoustic radar were further developed. In total, the GRC5 progress has been significantly behind the agenda, and recovery actions are needed in 2012.

6. **In GRC6 (Eco-Design Rotorcraft Demonstrators)**

The activity was kicked off in 2011. The effort was focused on writing up the requirements for the 4 different demonstrators and in selecting the main partners contributing to the design and manufacturing of the "door & floor" demonstrator and the structural parts. Unfortunately, no partners could be found to study the dismantling and recycling of the "door & floor" demonstrator and structural parts. This delayed the activity for 6 months. The number of case studies in the design of the structural parts was not underestimated and materials needed to start the study phase were not available. This lead to an additional delay of 6 months.

7. **In GRC7 (Technology Evaluator for Rotorcraft activities)**

The initial target set up for 2011 was to deliver the 6 behavioural models, fully representative of the various type of helicopters. The effort needed happened to be bigger than expected. In

agreement with the TE, the decision was made to stagger models delivery and to concentrate the effort in 2011 on one behavioural model: the Light Twin-engine model.

In addition, the coordination set up to get the right assessment of environmental benefits expected by the different technologies worked well. Finally this first model, encompassing the different technology characteristics was delivered during the last quarter of the year to the TE.

2.1.1.4. SAGE – Sustainable and Green Engine ITD

The activities for the 5 demonstrators of SAGE were further developed, with resources consumption close to 100% according to the end-of-year estimate, after the mid-year budget adjustment at the level of the JU.

Open Rotor strategy

Two Projects in SAGE address the Open Rotor in parallel. Both have been included in the analysis and optimisation of the roadmap up to the flight demonstration, in coordination with SFWA. The SAGE 2 leader, Snecma (Safran Group), has confirmed its commitment to test a full CROR demonstrator on the ground in 2015. Safran has agreed to expand its commitment in the Clean Sky time frame to deliver an engine in 2016 for the flight demonstration in a "pusher" configuration, provided the funding necessary to support this additional activity is identified.

By executing this demonstration plan, Clean Sky will deliver a substantial and visible engine and aircraft test programme to address the ACARE CO2 emission targets, in conjunction with the related noise targets and extending the technical programme beyond the original plan.

In parallel, it has been agreed that more effort is necessary to better address the NOx emissions reduction and to strongly contribute to the ambitious ACARE targets in this area. A new engine-level demonstrator has been committed by Rolls-Royce: the "Lean Burn" demonstrator (a modified Trent 1000 engine) will be tested in 2015/2016 to achieve Technology Readiness Level (TRL) 6. This will give birth to one more project: SAGE 6 (to be started not earlier than in 2012)[4].

In addition to both the Safran commitment regarding the CROR and the Rolls-Royce demonstrator on Lean burn technology, Rolls-Royce will continue the SAGE 1 Open Rotor programme over a slightly longer period of time. Strongly committed to the maturation of this promising concept through a full ground and flight demonstration, Rolls-Royce is now targeting 2017-2018, provided that suitable complementary funding source is available. Within the Clean Sky timescale (2016) and funding, Rolls-Royce / SAGE 1 will continue to mature the main enabling technologies and components, to prepare for full demonstration.

Having still two CROR designs running, with now slightly different timescales, will allow adherence to the risk mitigation policy which has been followed from the very beginning of Clean Sky, with a reduced total cost, the difference being allocated to the new NOx-focused "Lean Burn" demonstrator.

The technical activities are described more in detail below.

[4] The final definition of the output in this Clean Sky framework will be subject to an updated agreement between the SAGE ITD leaders and the Joint Undertaking Executive Director and this updated strategy will be subject to formal adoption by the Governing Board not later than March 2012.

1. **SAGE1 (Geared Counter Rotating Open Rotor 1)**

The project has progressed on development of key technologies required for technology demonstration, such as CROR aero and noise methods and prediction tool sets. High Speed CROR "next generation blade" tests have been carried out under SAGE1 (Rig145), to establish a validated basis for later confirmation of technology feasibility, able to achieve defined CO2 and Noise reduction goals. Activities on design, development and manufacturing of complex lightweight rotating structures have been completed in 2011, mainly related to manufacturing processes. Enabling technology definition such as a new booster required for the demonstrator engine has further progressed.

In addition, work was performed in the fields of A/C safety and certification feasibility, aerodynamics, acoustics and physical design, to establish understanding of technology implications on potential future product design and feasibility. This work addressed selection of pusher vs. puller configuration, with a decision of a pusher in September 2011.

Co-operation with SFWA regarding the feasibility and integration of the demonstrator with a flying test bed has continued mainly inside the SFWA project. Besides, under SAGE1, the feasibility and first top level concept of new technology demonstrator engine control and its integration with an existing flight test aircraft has been evaluated.

In collaboration with Green Regional Aircraft (GRA) SAGE 1 has defined the Regional aircraft open rotor engine requirements.

The environmental targets have been revised and transmitted to TE. Concerning the "Lean Burn" project addressed above in the Strategy paragraph, some activity started in 2011 under SAGE 1, before being able to agree on the full scope and to implement the SAGE 6 project.

2. **SAGE 2 (Geared Counter-Rotating Open Rotor 2)**

After a comprehensive study of the merits of both geared and direct drive open rotor, SNECMA selected the geared configuration for the demonstration in Clean Sky and redefined accordingly the demonstration programme with a ground test planned for the second half of 2015. A chief engineer role was created and an integrated team including the SAGE2 partners is in charge of developing the technologies necessary for the geared open rotor first demonstration.

Key technologies for the geared open rotor are:

- High speed propeller blades
- Pitch Control Mechanism (PCM)
- Gear box (reliability, oil and cooling system (risk of coaking of oil after engine stop), carcass distortion)
- Contra-rotating propeller module technology for noise and safety
- Pylon technology such as blowing for noise efficiency

A Preliminary Concept Review (PCoR) took place in December 2011 to review all critical technologies and propose trade-offs:

- Whole Power Plant Design, with several possibilities to integrate the gas generator and the open rotor
- Propellers blades design and manufacture

- Pitch Change Mechanisms systems, supported by several projects from CfP
- Reduction Gear Box developed by AVIO and supported by a CfP project. Several interfaces discussed, some trade off still to be performed
- Nacelle proposed by Alenia-Aermacchi and Aircelle.
- Power Turbine configuration developed by AVIO and its integration in the demonstrator discussed with Snecma
- Rotating Frames developed by Volvo
- Rotating aero ducts with in particular the design of contra rotating joints. A CfP will support this study.

There is a strong involvement of all SAGE2 Affiliates and the new partners through the CfPs.

3. SAGE 3 (Large Turbofan engine)

Design of the annulus fillers for a composite fan system has progressed, based on the work started in 2010.

A Partner for the structural surface cooler and intake liner has been selected through the Call for Proposal and the designs and manufacturing plans progressed through 2011, this work including impact analysis to achieve an integrated design and material selection that was optimised in conjunction with the manufacturing system.

The technologies to be integrated into the engine demonstrator require a detailed analysis and modelling work to fully understand the potential impact of inserting these technologies into an architecture not originally designed for the new hardware. This work has been conducted during 2011.

In parallel with progressing with the development of specific design and manufacturing technologies, the SAGE3 project has always been discussed together with the demonstrator vehicle, test programme and facilities. Reviews for first build of the engine demonstrator were conducted and preliminary design reviews have been hold for technologies, including the low pressure turbine, to be demonstrated on later builds.

Rig testing of the intercase features has started.

4. SAGE 4 (Geared Turbofan engine)

On full Geared Turbofan demonstrator level, the initial concept design was further detailed and planned on a level 1 & 2 during the concept definition phase. The General Arrangement of the Geared Fan Demonstrator and the preliminary Design specification were drafted.

This work was accompanied on a module level for the High Pressure Compressor, the High Speed LPT, the Fan Drive Gear System and the Turbine Exhaust Case. Further detail design for other engine modules was also executed.

Technology content was verified and integration studies were performed. A significant effort has been made to advance material and weight saving technology to a ready-to-test status in terms of blade design and stability of the forging and manufacturing process. Additionally, further effort has been made on the advanced casing design, featuring a new fixture design between the vane clusters and the casing shell, an optional material change and an altered cooling air system. A preliminary instrumentation plan for validation is available. Test stand preparation and adaptation work as part of WP 4.3 ensured to support demonstrator testing later in the program. Additionally, an associated risk assessment was conducted for the

SAGE4 demonstrator engine. All these aspects were considered to be in line with the requirements of the demonstrator program and passed the preliminary design review on May 2011.

Afterwards, the concept optimization phase was initiated. During this phase, integration studies have been further detailed, at the same time as advanced instrumentation plans were been drafted.

Due to the accelerated market introduction of future GTF engine applications, the work progress during the Concept Optimization Phase for the SAGE4 demonstrator in 2011 was slower than expected. A SAGE4 program update was necessary, to postpone the Critical Design Review which is now scheduled for May 2012 and start of the demo testing is now scheduled for October 2014.

Negotiations of the Topics published in 2010 via Calls for Proposals were continued. Four topics contracted with a total value of €2.8 M initiated their work during 2011 to support SAGE4 activities. During 2011, additional Topics with a total value of €6.2 M (including two topics from Volvo Aero) were published and partners were successful selected. Negotiations were initiated and some of these Partners already started working on these projects by the end of 2011.

The project leader has compiled and delivered to GRA a preliminary engine functional model of SAGE4 GTF propulsion system for GRA-130PAX regional application in order to support the 2011 TE assessment.

5. SAGE 5 (advanced turboshaft configuration)

The project leader conducted in June 2011 the Critical Design Review covering Core Study and the Whole engine study. It marked the end of the detailed design phase, and evidenced that the project is well on schedule.

All parts manufacturing have started and all the suppliers have been chosen for the demonstrator engine. Partial rig manufacturing has been completed for combustion chamber, compressor and LP turbine components.

Compressor and combustion chamber partial rig test has started late December and will continue in 2012. The various projects launched through the Call for Proposals are delivering promising results to be incorporated onto the demonstrator; where applicable the activities are redefined according to the actual availability and capabilities of the selected partners.

2.1.1.5. SGO - Systems for Green Operations

The SGO estimated consumption of resources in 2011 is 80%, i.e. a delay (and expected carry-over) of two months with respect to the 2011 schedule. Good progress has been made in 2011 in maturing the many technologies developed in SGO, both in the Management of Aircraft Energy (MAE) domain, and in the Management of Trajectory and Mission (MTM) domain. Most of the technologies and functions have now passed TRL3 at least. Nevertheless, due to individual difficulties in each technology stream, all initial expectations on milestones and deliverables were not fully realised. This is partly due to global issues (Ice Wind Tunnel testing facilities, partial withdrawal of some beneficiaries, updated high-level planning …) and partly to specific situations (R&T resources, availability of experts, etc.).

– In 2011, WP1 ("aircraft solutions") monitored the development and updated the architecture assessment thanks to the refined knowledge of the technologies developed in WP2 ("management of aircraft energy") and WP3 ("management of trajectory and mission"). A report on electrical and thermal architectures of the SGO large aircraft has been issued. The final technical priorities for MAE systems of regional aircraft have been defined. In WP2, work on technologies for energy management moved towards delivery of first components for demonstration. Throughout 2011, some equipment and systems specified during 2009 and 2010 went through in-house testing in order to ensure that they are ready for large-scale demonstrator testing in next years. The progress of these technologies is tracked by the TRL process installed in SGO.

– For electrical and thermal systems, large-scale demonstrations are planned to be assembled during 2012 and 2013, and WP2 has started to develop much of the equipment for these platforms. The preparation of the Wing Ice Protection Systems (WIPS) technology demonstrators have begun and after the selection of the Ice Wind tunnel test facility the test campaign has been scheduled for the 3rd quarter of 2012. Modified starter generator hardware has been delivered to the electrical test rig PROVEN to support WP4 demonstration campaign and architecture studies. The work on electrical ECS is heading towards TRL4 support by performance tests in altitude chamber which has been started mid-2011. In 2011 the work on electrical engine nacelle system was driven by preparation of the nacelle anti-ice and actuation technologies and adaptation of the COPPER Bird test. First test of nacelle actuation has been carried out end of 2011.

Parallel to the construction of equipment, the simulation use cases, which began to be examined in 2010, went through a refinement process, particularly in order to improve the fidelity and accuracy of the models being used. In 2011 good progress has been made on implementation of the use-cases as well as on development of the common interface library and common modelling standards.

A first assessment of 'The Electrical SGO Large Aircraft' was performed: compared to previous projects e.g. MOET, the overall system weights have been significantly reduced but the block fuel assessed on aircraft level remains almost neutral resulting in unchanged CO2 emissions. Several improvements on system level and integration have been recommended and will be studied in detail with the partners in the following months. Of course, this does not affect other significant environmental benefits of such electrical systems, in particular w.r.t. the chemical pollutants.

In 2011, activities concerning the Management of the Trajectory and Mission (MTM) resulted in a number of TRL3 gates passed, including the cruise Flight Management function (Multi Step in Cruise), Time and Energy Managed Operations (TEMO) for guidance in continuous descent phase, Advanced Weather Radar algorithms, On-board optimisation of trajectory and Smart Operation on Ground system (electrical motor integrated in the main landing gear). Partial mock-ups of these technologies and functions have been tested in order to support the feasibility and performance assessments at TRL3, and refine specifications for the development of demonstrators starting in 2012.

Significant progress has also been made in the specification and implementation of the FMS function Adaptive Increased Glide Slope covering the final approach phase. Pilot-in-the loop tests are planned for first quarter 2012, supporting a TRL3 by mid-2012.

A COTS product has been selected for integration of the Water Vapour sensor and Atmospheric Data Transmission system, with the target of flight-testing the concept in 2013. Nevertheless, difficulties in validating the business application led to a delay on the TRL3, now foreseen during first quarter 2012, with a risk to stop the development at this stage.

- Enhanced environmental models developed in WP3.1 have supported these milestones. An advanced version of the theoretical optimisation framework (GATAC) has been delivered, allowing for complete 2D optimisation of missions on selected test cases. This also allowed to refine the specification for future versions to be developed in 2012, 2013.

With regards to the link between Clean Sky and SESAR, progress has been made in the coordination between both programs. With results from the various TRL3 gates, MTM is now ready to present the various concepts in order to check with SESAR JU their compatibility with future ATM rules and to receive updates from SESAR to be taken into account at higher TRL. Specific coordination meeting are planned early 2012.

- WP4 (Large scale demonstrations) started preparing the demonstration means (ground physical or virtual test rigs, flight test aircraft). The demonstration strategic plan was issued in 2011.

Some tests have been conducted on the electrical test rig to contribute to architecture studies and refinement of electrical components specification.

The thermal test rig was prepared for further integration in 2012-2013. The demonstration campaigns related to icing wind tunnel testing of electrical wing ice protection systems for large aircraft – has been fully prepared. The selection of the supplier is completed and the slot themselves secured for 2012.

WP4 has continued the integration of mock-ups of green functions on large scale flight simulator for the evaluation of green functions in an operational environment all along the mission profile to consolidate the benefits from an environmental perspective.

The definition of the flight test plans, installation and instrumentation was continued on the targeted flight tests aircraft.

- WP5 (aircraft-level assessment) was kicked off in November 2011, preparing for the industrial exploitation of the more mature solutions, especially the ones concerning the Management of Aircraft Energy.

2.1.1.6. ED – EcoDesign

The Eco-Design ITD **used 94% of the resources planned for 2011**, according to the end-of-year estimate. It is organised in the two major areas:

- EDA (Eco-Design for Airframe) and
- EDS [Eco-Design for Systems (small aircraft)].

The Airframe Application of the Eco-Design ITD is meant to tackle the environmental issues by focusing on the **following challenges**:

- To identify and maturate environmentally sound ("green") materials and processes for /c production;
- To identify and maturate environmentally sound ("green") materials and processes for a/c maintenance and use processes;
- To improve the field of end-of-life a/c operations after several decades of operation, this includes reuse, recyclability and disposal ("elimination") issues;
- To provide means for an eco-design process on order to minimize the overall environmental impact of a/c production, use/maintenance, and disposal.

These areas are considered for significant parts of the aircraft: structure, cabin covering and furniture, vehicle systems components / equipment, engine components, electronics.

In 2011 work in the frame of the Eco-Design ITD – Airframe Application continued mainly in the **following Work Packages**:

- WP A.2 : Technology Development,
- WP A.3 : Application Studies.

In WP A.2, the work was focused on the most innovative technologies selected through the trade-off process performed during the second half of 2010. Ground Demonstrators to be manufactured, dismantled and recycled in WP A.6 were discussed in the frame of WP A.2.

In WP A.3, the work continued on the field on Life Cycle Analysis or LCA. A first version of the LCA data base – based on current processes - has been made available at T0+36 months i.e. in September 2011.

Among the most **significant objectives** of 2011, results from the partners' activities launched in 2010, on the analysis of existing LCA tools and associated databases, and standards like European Platform on Life Cycle Assessment (EPLCD) and the European Reference Life Cycle Data System (ELCD), have been reviewed, as long as further progress about usability of LCA tools in consideration of special requirements in aircraft industry.

In addition, activities on "Societal needs" have been completed, which results also in the closure of the overall WP A.1. With respect to exchange of data between EDA and TE, documents related to harmonized milestone planning between EDA and TE, and to the description of the scale-up methodology for LCA results from parts to entire a/c have been produced.

In 2011 in the frame of the Eco-Design ITD – Systems, work continued on the feasibility of an all-electrical aircraft, through the study of innovative energy management architectures, requiring joining effort to provide appropriate requirements to Systems ITD. The **general objective** of this part of the Eco-Design ITD is to make a significant step towards the concept of the all-electric vehicle systems aircraft, by removing of hydraulic fluid (with significant benefits in terms of aircraft maintenance and disposal environmental impact); by on-board power by wire. The use of electricity as only media offers a lot of possibility in terms of energy management (e.g.: Intelligent load shedding, power regeneration on actuators, sharing of Electrical Control Unit over actuators). For the purpose of the all-electric small a/c objective, **the existing work packages are completed with activities hosted by the GRA, GRC and SGO ITDs**.

The most significant milestones reached in 2011 were:

- The final definition of the Generic Architecture, which will serve as the basis for the tests to be conducted on the Electrical Test Bench;
- The completion of the definition of the subsystems requirements and the development follow-up, for the Generic Architecture and for the Business Jet architectures;
- The completion of the definition of the Electrical Bench and Thermal Bench;
- The first phases of test bench manufacturing;
- The completion of the definition of the electrical tests to be conducted on the Electrical Bench;
- The delivery of the process to use the selected generic simulation tools: Energy Management Model (EMM), Electrical Network Analysis Model (ENAM), Thermal Model (TM), Ecolonomic Model (EM) and the associated process to use them and interconnect them;
- The approval of the Electrical Test Bench Preliminary Design Review, conducted at the end of 2011, with participation of all involved actors.

2.1.1.7. 3.7 TE – Technology Evaluator

All TE Work Packages had activities and deliverables (or outputs) in 2011:

- WP0: TE Management and Coordination
- WP1: TE Requirements and Architecture
- WP2: Models Development and Validation
- WP3: Simulation Framework Development + IVV
- WP4: Assessment of impacts and Trade-off studies

1. **WP1: TE Requirements and Architecture**

In WP1, during 2011 the detailed definition of generic as well as 'real world' aircraft (fixed wing and rotary wing) missions were updated and finalised for the TE's 1st Assessment due by the end of 2011. The metrics for this Assessment were also refined, as well as the requirements for the 'Airport' and Air Transport System (ATS) evaluations. (Note that the 'Airport' level was previously referred to as 'Operational' level but this was changed during the refining of nomenclature as recommended by the External Evaluators during the TE 2010 Annual Review in March 2011.)

2. **WP2: Models Development and Validation**

In WP2 major obstacles needed to be overcome in the preparation and delivery of aircraft (conceptual) models by the vehicle ITDs (namely GRA, GRC and SFWA). Several Milestones as defined by the TE AIP 2011 for the delivery of the aircraft models to the TE were missed, with delays varying from 2 to 7 months. As a consequence, the scope of this 1st Assessment was reduced significantly in September. Moreover, it was necessary to delay the delivery of the 1st Assessment Report to the JU until February 2012.

These scope changes for 2011 included:

- Exclusion of the SFWA LR (Long Range) aircraft.
- Limiting the SFWA SMR (Short and Medium Range) /CROR evaluation to some standard missions and assessing fuel burn / CO2 only.
- Reverting to a simplified modelling for the noise assessment of SFWA concept and reference aircraft, deviating from the model specifications set (4D Trajectories).
- Limiting the evaluation of rotorcraft to one conceptual vehicle (TEL, Twin Engine Light).
- Limiting the number of airports used for the Airport Evaluation for fixed wing aircraft to 2.
- But conversely, adding up a first evaluation of the GTF-powered GRA130 for Fuel Burn / CO2 It must be noted that in WP2 the TE consortium operates as a de-facto supply chain manager: all the major component conceptual models are delivered by the 'aircraft ITDs'. In this respect, this first assessment of 2011 must also be considered as a learning phase – while its results will still be of utmost interest as such. Taking the lessons learnt into 2012, the interfaces with SFWA, GRA and GRC have accordingly been scrutinised and control documents defining the delivery of models (specification, content and timing) created. A tighter control cycle has been put in place to monitor the progress (including inputs from other ITDs). Performance is expected to improve dramatically in 2012.

3. WP3: Simulation Framework Development + IVV

In WP3, the Update of TE database structure definition and the description of the data transfer between TE platforms within the overall TE-IS were completed. It was agreed to postpone the integration, verification and validation of the simulation platforms (and the TE IS) to 2012 as too many aircraft conceptual models were undelivered, incomplete or delivered in preliminary ('de-scoped') form.

4. WP4: Assessment of impacts and Trade-off studies

WP4, or 'Assessment of Impacts and Trade-Off Studies', contains the key output from the TE to the JU: the 1st Assessment. Leading up to the actual Assessment, other key activities and deliverables included:

- Detailed specification report of the mission-level assessment ('use cases')
- Detailed specification report of the airport level assessment ('use cases')
- Detailed specification report of the ATS level assessment ('use cases')
- Detailed specification of the life-cycle analysis ('use cases') and a demonstration of the calculation using reference aircraft.

Overall, the execution of the 2011 plan has been a significant challenge for the TE. It must be noted that the late supply of crucial inputs was the overriding factor in the delivery performance. The supply chain issues originated in the SFWA, GRC and GRA ITDs (in this order in terms of contributing delays); noting that these ITDs also had interface challenges with 'transverse' ITDs, notably SAGE.

Despite the difficulties encountered in these first loops, the TE, with the support from the JU, managed to put in place reinforced planning and control mechanisms for 2012. The first assessment, whatever its limitations, plays also a role of "demonstrator" of the full process: this demonstration is encouraging. The quality and timeliness of deliveries should improve significantly in 2012. This will still be closely monitored by the JU, as a top-ranking priority.

2.2. Call 7 SP1-JTI-CS-2010-05

2.2.1. Annex 2: Topics overview CS JU call 7 (SP1-JTI-CS-2010-05)

IDENTIFICATION	ITD-Area-Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-ECO	**Clean Sky – Eco-Design**	**11**	**5,230,000**	**3,922,500**
JTI-CS-ECO-01	**Area-01 – EDA (Eco-Design for Airframe)**	**9**	**3,030,000**	
JTI-CS-2010-5-ECO-01-010	*Study of cyanate ester based composites in a high service temperature environment*		400,000	
JTI-CS-2010-5-ECO-01-011	*Bicarbonate media blasting for paint-varnish removal and dry surface treatment*		300,000	
JTI-CS-2010-5-ECO-01-012	*Development of more eco-efficient aluminium alloys for aircraft structures*		500,000	
JTI-CS-2010-5-ECO-01-013	*Development and implementation of conductive coating for Magnesium sheets in A/C*		160,000	
JTI-CS-2010-5-ECO-01-014	*Infusion system development for primary structure*		200,000	
JTI-CS-2010-5-ECO-01-015	*Development of advanced preforms for LCM technologies*		250,000	
JTI-CS-2010-5-ECO-01-016	*Surface mapping to improve reliability of dry treatment on metallic and organic surfaces*		250,000	
JTI-CS-2010-5-ECO-01-017	*Production of yarns and fabrics based on recycled carbon fibres (CFs)*		250,000	
JTI-CS-2010-5-ECO-01-018	*Environmental Data Models and Interface development*		720,000	
JTI-CS-ECO-02	**Area-02 – EDS (Eco-Design for Systems)**	**2**	**2,200,000**	
JTI-CS-2010-5-ECO-02-006	*Electrical Test Bench Power Center*		700,000	
JTI-CS-2010-5-ECO-02-007	*Electrical Test Bench Control System, Instrumentation and Cabling*		1,500,000	
JTI-CS-GRA	**Clean Sky – Green Regional Aircraft**	**2**	**620,000**	**465,000**
JTI-CS-GRA-01	**Area-01 – Low weight configurations**	**1**	**170,000**	
JTI-CS-2010-5-GRA-01-034	*Design, manufacturing and impact test on selected panels with advanced composite material*		170,000	
JTI-CS-GRA-02	**Area-02 – Low noise configurations**	**1**	**450,000**	
JTI-CS-2010-5-GRA-02-014	*Wing loads control/alleviation system design for advanced regional Turbo-Fan A/C configuration*		450,000	
JTI-CS-GRC	**Clean Sky - Green Rotorcraft**	**7**	**11,580,000**	**8,685,000**
JTI-CS-GRC-03	**Area-03 – Integration of innovative electrical systems**	**2**	**930,000**	
JTI-CS-2010-5-GRC-03-004	*Innovative management of energy recovery for reduction of electrical power consumption on*		500,000	

IDENTIFICATION	ITD-Area-Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
	fuel consumption			
JTI-CS-2010-5-GRC-03-005	*Adaptation kit design & manufacturing: APU Driving System*		430,000	
JTI-CS-GRC-04	**Area-04 – Installation of diesel engines on light helicopters**	**2**	**9,950,000**	
JTI-CS-2010-5-GRC-04-003	*Optimised Diesel engine design matching a new light helicopter architecture*		650,000	
JTI-CS-2010-5-GRC-04-004	*Diesel Power-pack Integration on a light helicopter demonstrator*		9,300,000	
JTI-CS-GRC-05	**Area-05 – Environmentally friendly flight paths**	**1**	**300,000**	
JTI-CS-2010-5-GRC-05-004	*Tuning of simplified rotorcraft noise models, preliminary acoustic measurement test campaign*		300,000	
JTI-CS-GRC-06	**Area-06 – Eco-Design for Rotorcraft**	**2**	**400,000**	
JTI-CS-2010-5-GRC-06-001	*Manufacturing of a Thermoplastic Composite Feasibility Article for a Helicopter Door*		200,000	
JTI-CS-2010-5-GRC-06-002	*Manufacturing of thermoplastic structural demonstrators*		200,000	
JTI-CS-SAGE	**Clean Sky – Sustainable and Green Engines**	**4**	**5,400,000**	**4,050,000**
JTI-CS-SAGE-03	**Area-03 – Large 3-shaft turbofan**	**2**	**2,600,000**	
JTI-CS-2010-5-SAGE-03-007	*Large 3-shaft Demonstrator – Core Turbomachinery – High Temperature Flexible PCB*		600,000	
JTI-CS-2010-5-SAGE-03-008	*Large 3-shaft Demonstrator – Structural Surface Cooler development*		2,000,000	
JTI-CS-SAGE-04	**Area-04 – Geared Turbofan**	**2**	**2,800,000**	
JTI-CS-2010-5-SAGE-04-002	*Development of Innovative SLM-Machinery for High Temperature Aero Engine Applications*		1,800,000	
JTI-CS-2010-5-SAGE-04-007	*Development of Selective Laser Melting (SLM) Simulation tool for Aero Engine applications*		1,000,000	
JTI-CS-SFWA	**Clean Sky - Smart Fixed Wing Aircraft**	**8**	**3,999,000**	**2,999,250**
JTI-CS-SFWA-01	**Area-01 – Smart Wing Technology**	**6**	**1,842,000**	
JTI-CS-2010-5-SFWA-01-007	*In field surface inspection tool for contamination detection before bonded composite repair*		250,000	
JTI-CS-2010-5-SFWA-01-014	*Final design and manufacturing of a test set up for the investigation of gust load alleviation*		400,000	
JTI-CS-2010-5-SFWA-01-030	*Quantification of the degradation of microstructured coatings*		200,000	
JTI-CS-2010-5-SFWA-01-031	*Assessment of the interaction of a passive and an active load alleviation scheme for a transport aircraft*		200,000	

IDENTIFICATION	ITD-Area-Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-2010-5-SFWA-01-032	*Technology evaluation and manufacturing of microtechnology-based Active Flow Control actuators*		300,000	
JTI-CS-2010-5-SFWA-01-033	*Numerical Simulation of the Assembly Tolerances for NLF Wings*		492,000	
JTI-CS-SFWA-03	**Area-03 – Flight Demonstrators**	**2**	**2,157,000**	
JTI-CS-2010-5-SFWA-03-004	*A340 Outer Wing Metrology*		1,457,000	
JTI-CS-2010-5-SFWA-03-005	*Surface quality measurement in flight*		700,000	
JTI-CS-SGO	**Clean Sky – Systems for Green Operations**	**6**	**3,700,000**	**2,775,000**
JTI-CS-SGO-02	**Area-02 – Management of Aircraft Energy**	**2**	**550,000**	
JTI-CS-2010-5-SGO-02-027	*Simulation and Analysis Tool Development Part I*		400,000	
JTI-CS-2010-5-SGO-02-031	*Qualification of insulation materials to engine oils*		150,000	
JTI-CS-SGO-03	**Area-03 – Management of Trajectory and Mission**	**3**	**1,150,000**	
JTI-CS-2010-5-SGO-03-011	*Recruitment of qualified flight crew (test, airline) and expenses for tests*		250,000	
JTI-CS-2010-5-SGO-03-012	*SOG Wheel Actuator development for existing aircraft*		650,000	
JTI-CS-2010-5-SGO-03-013	*Economic analysis according to business jets operators profile*		250,000	
JTI-CS-SGO-04	**Area-04 – Aircraft Demonstrators**	**1**	**2,000,000**	
JTI-CS-2010-5-SGO-04-001	*Design and manufacture of an aircraft tractor compliant with specifications for Smart Operations on ground*		2,000,000	
TOTAL (M€)		**38**	**30,529,000**	**22,896,750**

2.2.2. Annex 3: Grant agreements signed and proposals under negotiation (Call 7 SP1-JTI-CS-2010-05)

The following table provides the list of GAP signed or in negotiation for the Clean Sky call 7.

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	287101	SPECIMEN	STUDY ON THE PROCESSING AND THE PERFORMANCE OF CYANATE ESTER COMPOSITES TOWARDS THE OPTIMIZATION FOR HARSH SERVICE ENVIRONMENTS.	285,189	95,063	380,252
2	287071	BiMed	Bicarbonate media blasting for paint-varnish removal and dry surface treatment	213,639	71,213	284,852
3	286963	ECEFA	Eco-efficient aluminium for Aircraft	236,500	236,500	473,000
4	287074	CoSPI	Composite Stiffened Panels Infusion	149,670	49,890	199,560
5	287129	APRIL	Advanced Preformmanufacturing for industrial LCM-Processes	187,495	62,498	249,993
6	287099	PlasmaClean	Surface mapping and control during atmospheric plasma treatments	142,389	47,463	189,852
7	287098	SEPDC	Smart electrical power distribution centre	509,151	189,705	698,856
8	287127	HighPMAAC	High Performance Modular Architecture of Acquisition and Control command system dedicated to test Electrical systems for Aeronautics	785,285	699,743	1,485,028
9	287078	CLAReT	Control and Alleviation of Loads in Advanced Regional Turbo Fan Configurations	337,783	112,596	450,379
10	287076	RENERGISE	Innovative management of energy recovery for reduction of electrical power consumption on fuel consumption	344,736	130,306	475,042
11	284848	DELILAH	Diesel engine matching the ideal light platform of the helicopter	462,989	154,331	617,320
12	285842	HIPE AE 440	Diesel Powerpack for a Light Helicopter Demonstrator	5,447,225	3,836,228	9,283,453
13	287094	ANCORA	ANotec-COmoti Rotorcraft Acoustics initiative for preliminary acoustic flight tests for the tuning of simplified rotorcraft noise models	213,150	71,050	284,200
14	287103	DEfcodoor	Development of an Ecological friendly final consolidation step using Thermoplastic Fibre Placement for a helicopter door	149,553	49,854	199,407
15	286576	ECO-Fairs	ECO-design and manufacturing of thermoplastic structural fairings for helicopters	145,787	53,763	199,550
16	286030	windtunnel	DESIGN AND MANUFACTURE OF A WIND TUNNEL TEST HARDWARE	291,225	97,075	388,300
17	287069	microcoat	Quantification of the degradation of microstructured coatings	149,496	50,332	199,828
18	287020	PALAST	Assessment of the interaction of a passive and an active load alleviation scheme	142,020	47,340	189,360
19	287100	µSAM	Micro Synthetic Jet Actuator Manufacturing	224,420	74,806	299,226
20	284961	SATCAS	SIMULATION OF THE ASSEMBLY TOLERANCES FOR COMPOSITE AIRCRAFT STRUCTURES	368,531	122,844	491,375
21	286745	WiMo	Outer Wing Metrology	1,054,452	401,584	1,456,036
22	287120	Wing Reflectometry	In-Flight Monitoring of Wing Surface with Quasi tangential Reflectometry and Shadow Casting	482,100	160,700	642,800

23	287110	MODELSSA	Modelica Electrical System Simulation and Analysis	223,978	175,638	399,616
No	**Project Number**	**Project Acronym**	**Project Title**	**CS JU contribution (€)**	**In-kind contribution (€)**	**Total contributions (€)**
24	285758	QUALIFY	Qualification of insulation materials to engine oils	75,000	75,000	150,000
25	287122	BASE	Business Aviation for Sustainable Economy	177,728	59,242	236,970
26	285152	DTV	DTV : Dispatch Towing Vehicle, for "Engines Stopped" Aircraft Taxiing	950,952	958,250	1,909,202
Sub-Total (signed GAPs)				€ 13,750,443	€ 8,083,014	€ 21,833,457
27	287087	AeroSim	Development of a Selective Laser Melting (SLM) Simulation tool for Aero Engine applications	700,290	268,114	968,404
28	286786	ICARO	In-field CFRP surfaces Contamination Assessment by aRtificial Olfaction tool	177,778	59,259	237,037
29	287112	AHEAD SOG	Smart Operation on Ground Wheel Actuator	324,626	324,626	649,252
Sub-Total (Proposals in Negotiation)				€ 1,202,694	€ 651,999	€ 1,854,693
TOTAL				€ 14,953,137	€ 8,735,013	€ 23,688,150

2.3. Call 8 SP1-JTI-CS-2011-01

2.3.1. Annex 4: Topics overview CS JU call 8 (SP1-JTI-CS-2011-01).

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-ECO	**Clean Sky – Eco-Design**	**12**	**6,410,000**	**4,807,500**
JTI-CS-ECO-01	**Area-01 - EDA (Eco-Design for Airframe)**		**2,050,000**	
JTI-CS-2011-1-ECO-01-018	*Environmental Data Models and Interface development*		720,000	
JTI-CS-2011-1-ECO-01-019	*Borate-free cleaners used in anodizing processes*		100,000	
JTI-CS-2011-1-ECO-01-020	*Chromate-free sealing of TSA*		100,000	
JTI-CS-2011-1-ECO-01-021	*Industrialisation Set-Up of Thermoplastics «In situ » Consolidation Process*		290,000	
JTI-CS-2011-1-ECO-01-022	*Development of flexible inductive thin sheet heating device for FRP repair applications*		200,000	
JTI-CS-2011-1-ECO-01-023	*To develop recycling technologies of aeronautical composite materials through mechano-physical approaches*		140,000	
JTI-CS-2011-1-ECO-01-024	*Simplified LCA Tool development*		250,000	
JTI-CS-2011-1-ECO-01-025	*Production of yarns and fabrics based on recycled carbon fibres (CFs)*		250,000	
JTI-CS-ECO-02	**Area-02 - EDS (Eco-Design for Systems)**		**4,360,000**	
JTI-CS-2011-1-ECO-02-008	*Electrical Model of Generic Architecture Electrical Power Distribution*		300,000	
JTI-CS-2011-1-ECO-02-009	*Alternator with active power rectification and health monitoring*		1,700,000	
JTI-CS-2011-1-ECO-02-010	*Development, Construction and Integration of Systems for Ground Thermal Test Bench*		2,000,000	
JTI-CS-2011-1-ECO-02-011	*Heat pipe for critical applications*		360,000	
JTI-CS-GRA	**Clean Sky - Green Regional Aircraft**	**6**	**1,330,000**	**997,500**
JTI-CS-GRA-01	**Area-01 - Low weight configurations**		**770,000**	
JTI-CS-2011-1-GRA-01-035	*Smart maintenance technologies*		220,000	
JTI-CS-2011-1-GRA-01-036	*Development of methodology for selection and integration of sensors in fuselage stiffened panels. Testing scheme, testing of sensorised fuselage stiffened panels and data processing.*		100,000	
JTI-CS-2011-1-GRA-01-037	*Advanced fuselage and wing structure based on innovative alumiunium lithium alloy - numerical trade off study and experimental stiffened panel validation.*		450,000	

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-GRA-02	**Area-02 - Low noise configurations**		**460,000**	
JTI-CS-2011-1-GRA-02-015	*Advanced concepts for trailing edge morphing wings - Design and Manufacturing of test rig and test samples - Test Execution*		210,000	
JTI-CS-2011-1-GRA-02-016	*Novel nose wheel evolution for noise reduction*		250,000	
JTI-CS-GRA-05	**Area-05 - New configurations**		**100,000**	
JTI-CS-2011-1-GRA-05-006	*Updated Regional traffic scenario to upgrade Requirements for "Future Regional Aircraft".*		100,000	
JTI-CS-GRC	**Clean Sky - Green Rotorcraft**	**5**	**3,150,000**	**2,362,500**
JTI-CS-GRC-03	**Area-03 - Integration of innovative electrical systems**		**2,150,000**	
JTI-CS-2011-1-GRC-03-006	*EMA for utility consumer systems: EMA for Landing Gear*		1,000,000	
JTI-CS-2011-1-GRC-03-007	*Innovative Dynamic Rotor Brake*		700,000	
JTI-CS-2011-1-GRC-03-008	*Innovative High Voltage Energy Storage System for Advanced Rotorcraft Integration.*		450,000	
JTI-CS-GRC-05	**Area-05 - Environmentally friendly flight paths**		**800,000**	
JTI-CS-2011-1-GRC-05-005	*Integrated ATC/tiltrotor simulation of low-noise procedures and evaluation of the impact on operators*		800,000	
JTI-CS-GRC-06	**Area-06 - Eco Design for Rotorcraft**		**200,000**	
JTI-CS-2011-1-GRC-06-003	*Dismantling and recycling of ecodesigned helicopter demonstrators*		200,000	
JTI-CS-SAGE	**Clean Sky - Sustainable and Green Engines**	**18**	**20,000,000**	**15,000,000**
JTI-CS-SAGE-01	**Area-01 - Geared Open Rotor**		**1,000,000**	
JTI-CS-2011-1-SAGE-01-001	*Lean Burn Control System Verification Rig*		1,000,000	
JTI-CS-SAGE-02	**Area-02 - Direct Drive Open Rotor**		**4,500,000**	
JTI-CS-2011-1-SAGE-02-006	*Pitch Change Mechanism key technologies maturation*		2,000,000	
JTI-CS-2011-1-SAGE-02-007	*PCM kinematic demonstration*		2,200,000	
JTI-CS-2011-1-SAGE-02-008	*Propellers electrical de-icing system: reliability assessment of key technologies for high temperature electrical machines*		300,000	
JTI-CS-SAGE-03	**Area-03 - Large 3-shaft turbofan**		**6,900,000**	
JTI-CS-2011-1-SAGE-03-007	*Large 3-shaft Demonstrator – Core Turbomachinery – High Temperature Flexible PCB*		600,000	

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-2011-1-SAGE-03-009	*Large 3-shaft Demonstrator – Aeroengine intake acoustic liner technology development*		5,000,000	
JTI-CS-2011-1-SAGE-03-010	*Steel casting process advancement*		800,000	
JTI-CS-2011-1-SAGE-03-011	*Advanced press forming and hardening of high strength steels*		500,000	
JTI-CS-SAGE-04	**Area-04 - Geared Turbofan**		**5,300,000**	
JTI-CS-2011-1-SAGE-04-008	*Casting process optimization and validation of hollow multivane clusters with thin walls and trailing edges*		600,000	
JTI-CS-2011-1-SAGE-04-009	*Integrating forging- and process-simulation into SAGE4 GTF LPT rotor design*		400,000	
JTI-CS-2011-1-SAGE-04-010	*Total Measurement System for Geometry and Surface Inspection of bladed Disks (TOMMI)*		1,300,000	
JTI-CS-2011-1-SAGE-04-011	*Implementation of Carbon-Nanotube Rein-forced Aluminum for Aerospace Heat Ex-changer Applications*		1,000,000	
JTI-CS-2011-1-SAGE-04-012	*Electric Smart Engine Actuator*		1,000,000	
JTI-CS-2011-1-SAGE-04-013	*High temperature Ni-based alloy forging process advancement*		500,000	
JTI-CS-2011-1-SAGE-04-014	*High temperature Ni-based super alloy casting process advancement*		500,000	
JTI-CS-SAGE-05	**Area-05 - Turboshaft**		**2,300,000**	
JTI-CS-2011-1-SAGE-05-013	*Feasibility study and prototypes manufacturing of oil tank in thermoplastic for Helicopter Engine*		450,000	
JTI-CS-2011-1-SAGE-05-014	*Hot environment unsteady pressure sensors*		750,000	
JTI-CS-2011-1-SAGE-05-015	*Development of Quiet exhaust noise attenuation technologies*		1,100,000	
JTI-CS-SFWA	**Clean Sky - Smart Fixed Wing Aircraft**	**12**	**9,900,000**	**7,425,000**
JTI-CS-SFWA-01	**Area01 – Smart Wing Technology**		**2,100,000**	
JTI-CS-2011-01-SFWA-01-034	*Analysis of sensitivity/robustness of distributed micron-sized roughness elements (MSR) for transition delay*		500,000	
JTI-CS-2011-01-SFWA-01-035	*Grooved paint surface manufacturing and aerodynamic testing*		350,000	
JTI-CS-2011-01-SFWA-01-036	*Automated riblet application on relevant aircraft parts*		550,000	
JTI-CS-2011-01-SFWA-01-037	*Basic wind tunnel investigation to explore the use of Active Flow Control technology for aerodynamic load control*		250,000	

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-2011-01-SFWA-01-038	*High Voltage amplifier for MEMS-based Active Flow Control (AFC) actuators*		450,000	
JTI-CS-SFWA-02	**Area02 – New Configuration**		**3,150,000**	
JTI-CS-2011-01-SFWA-02-012	*Design and manufacturing of an innovative shield - A*		70,000	
JTI-CS-2011-01-SFWA-02-013	*Design and manufacturing of an innovative shield - B*		90,000	
JTI-CS-2011-01-SFWA-02-014	*Design and manufacturing of an innovative shield - C*		90,000	
JTI-CS-2011-01-SFWA-02-015	*Ground Based Structural and Systems Demonstrator Phase 3 – Component and sub-system manufacture*		2,900,000	
JTI-CS-SFWA-03	**Area03 – Flight Demonstrators**		**4,650,000**	
JTI-CS-2011-1-SFWA-03-006	*Outer wing assembly for tooling manufacturing*		3,000,000	
JTI-CS-2011-1-SFWA-03-007	*Low drag wing foam cover for flight test*		900,000	
JTI-CS-2011-1-SFWA-03-008	*Acoustic Inlet Lip panel large scale endurance demonstrator*		750,000	
JTI-CS-SGO	**Clean Sky - Systems for Green Operations**	**5**	**1,700,000**	**1,275,000**
JTI-CS-SGO-02	**Area-02 - Management of Aircraft Energy**		**1,450,000**	
JTI-CS-2011-1-SGO-02-014	*Construction of evaluation Power Modules to a given design*		250,000	
JTI-CS-2011-1-SGO-02-026	*Modelica Model Library Development Part I*		300,000	
JTI-CS-2011-1-SGO-02-032	*Current return simulation (methodology & tool)*		400,000	
JTI-CS-2011-1-SGO-02-033	*Optimisation of coating for low pressure operation of power electronics and identification of pass and fail criteria for respective corona testing*		500,000	
JTI-CS-SGO-03	**Area-03 - Management of Trajectory and Mission**		**250,000**	
JTI-CS-2011-1-SGO-03-011	*Flight operations for novel Continous Descent Operations*		250,000	
TOTAL (€)		**58**	**42,490,000**	**31,867,500**

2.3.2. Annex 5: Grant agreements signed or under negotiation. CS JU call 8 (SP1-JTI-CS-2011-01).

Due to the timing of this call, the negotiation of GAPs was completed at the end of the year; as a consequence, few GAPs were finalised in 2011. The following table provides the list of GAP signed or in negotiation for this call 8.

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	296698	ENDAMI	Environmental Data Models and Interface development in Aviation	539,979	180,018	719,997
2	296631	TARTASEAL	Chromate free and energy efficient sealing of TSA anodic films for corrosion protection	75,000	25,000	100,000
3	296501	CONDUCTOR	Flexible Conductive Composite Repair Heaters	128,999	43,001	172,000
4	296546	SUSRAC	Sustainable recycling of aircrafts composites	104,717	34,909	139,626
5	296714	BIO_LCA_TOOL	SIMPLIFIED LIFE CYCLE ASSESSMENT TOOL	181,875	60,624	242,499
6	296472	SUPREMAE	A Supervised Power Regulation for Energy Management of Aeronautical Equipment	225,000	75,000	300,000
7	296090	AEGART	AIRCRAFT ELECTRICAL GENERATION SYSTEM WITH ACTIVE RECTIFICATION AND HEALTH MONITORING	809,165	809,166	1,618,331
8	296570	AeroL-HP	Development, construction, integration, and progress toward to heat pipes monitoring and qualification on aircrafts	269,932	89,978	359,910
9	296489	RIFPA	Grooved paint surface manufacturing for aerodynamic drag reduction testing	262,310	87,437	349,747
10	296482	RETAX	Rotorcraft Electric Taxiing	472,689	472,689	945,378
11	296369	MoMoLib	Modelica Model Library Development for Media, Magnetic Systems and Wavelets	218,919	72,973	291,892
12	296536	GENIAL	optimizinG Electrical Network In AirpLane composite structures	223,924	174,742	398,666
13	296658	NOCONDES	Novel Continuous Descent Simulation Test Support	187,121	62,376	249,497
Sub-Total (signed GAPs)				€ 3,699,630	€ 2,187,913	€ 5,887,543
14	296687	BFCleaner	Borate Free Cleaners for Aluminium Alloys	64,470	31,910	96,380
15	296549	ISINTHER	Industrialization setup of Thermoplastics in situ consolidation process	195,540	88,900	284,440
16	296722	HVRCFM	The Conversion of Recycled Carbon Fibre Yarn and Tape Into High Value Fabrics and Materials	187,500	62,500	250,000
17	296700	BESTT	Development, Construction and Integration of Bench Systems for Ground Thermal Tests	1,495,853	498,617	1,994,470
18	296138	MAGNASENSE	Magnetostrictive sensor applications for self-sensing of composite structures	165,000	55,000	220,000
19	296514	STRAINMON	Strain Monitoring in Composite Stiffened Panels Using Sensors	74,940	24,980	99,920

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
20	296595	AFSIAL	Advanced fuselage and wing structure based on innovative Al-Li alloys	271,837	173,063	444,900
21	296617	SMyTE	Advanced concepts for trailing edge morphing wings - Design and manufacturing of test rig and test samples - Test execution	158,540	50,731	209,271
22	296636	MEFGRA	A Model for the Evaluation of Future Green Regional Aircrafts	62,000	23,750	85,750
23	296693	HERRB	Helicopter Electric Regenerative Rotor Brake	523,835	174,494	698,329
24	296648	TRAVEL	Tilt Rotor ATM Integrated Validation of Environmental Low Noise Procedures	573,640	222,760	796,400
25	296671	LeVeR	Lean Burn Control System Verification Rig	535,693	415,137	950,830
26	296515	OREAT II	Open Rotor Engines Advanced Technologies II	940,371	940,372	1,880,743
27	296503	HT° Motor windings	Reliability assessment of key technologies for high temperature electrical machines	219,733	73,245	292,978
28	296701	LHTFPCB	Demonstration of a large, high temperature, flexible printed circuit board	357,852	238,202	596,054
29	296115	ALTD	Large 3-shaft Demonstrator - Aeroengine intake acoustic liner technology development	2,484,620	2,289,343	4,773,963
30	296585	LEAN	Development of light-weight steel castings for efficient aircraft engines	596,965	164,370	761,335
31	296543	ViMaQ	Hot sheet metal forming of aerospace materials - Virtual manufacturing and enhanced quality	290,750	207,250	498,000
32	296526	INTFOP	Integrating Forging and Process Simulation for turbine disks	182,500	182,500	365,000
33	296541	AMI4BLISK	Automated Geometrical Measurement and Visual Inspection for Blisks	765,493	527,870	1,293,363
34	296656	CNTHex	Carbon-Nanotube Reinforced Aluminium Aerospace Heat Exchanger	296,187	296,192	592,379
35	296474	E-SEMA	Development of Electric Smart Actuator for gas turbine engines	588,664	379,136	967,800
36	296540	HiTNiFo	Development of an advanced design and production process of High Temperature Ni-based Alloy Forgings	260,875	194,125	455,000
37	296250	HITECAST	High temperature Ni-based super alloy casting process advancement	325,000	175,000	500,000
38	296587	LIGHT-TANK	Feasibility study and prototypes manufacturing of oil tank in thermoplastic for Helicopter Engine	307,887	141,989	449,876
39	296551	HEXENOR	Development of Helicopter EXhaust Engine NOise Reduction technologies	666,647	417,182	1,083,829
40	296507	RODTRAC	Robustness of distributed micron-sized roughness-element for transition control	375,000	125,000	500,000
41	296613	INARAS	Automated Riblets Application on Aircraft Parts	412,469	137,489	549,958

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
42	296345	STARLET	Basic Wind Tunnel Investigation to Explore the Use of Active Flow Control Technology for Aerodynamic Load Control	190,140	59,711	249,851
43	296681	HIVOLA	High Voltage amplifier for MEMS-based Active Flow Control (AFC) Actuators	334,499	111,499	445,998
44	296688	IMPSHIELDA	Impact Shield A	51,000	17,000	68,000
45	296692	HAGTIS	Hybrid Armid Glass Titanium Innovative Shields	66,600	22,200	88,800
46	296516	DEMAIN	Design and MAnufacturing of INnovative shields	67,208	22,402	89,610
47	296092	GBSSD(3)	Ground Based Structural & Systems Demonstrator Phase 3 - Component and sub-system manufacture	1,448,175	1,448,175	2,896,350
48	296588	PROUD	PRECISSION OUTER WING ASSEMBLY DEVICES	2,923,000	0	2,923,000[5]
49	296093	ALEAP	Acoustic Inlet Lip panel large scale endurance demonstrator	374,778	374,779	749,557
				CS JU contribution (€)	**In-kind contribution (€)**	**Total contributions (€)**
Sub-Total (Proposals in Negotiation)				€ 18,835,261	€ 10,366,873	€ 29,202,134
TOTAL				**€ 22,534,891**	**€ 12,554,786**	**€ 35,089,677**

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[5] Based on submitted proposal; during negotiation in 2012 the funding is reduced to €2.1 M, as eligible.

2.4. Call 9 SP1-JTI-CS-2011-02

2.4.1. Annex 6: Topics overview. CS JU call 9 (SP1-JTI-CS-2011-02).

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (€)	Maximum funding (€)
JTI-CS-ECO	**Clean Sky - EcoDesign**	**6**	**1,530,000**	**1,147,500**
JTI-CS-ECO-01	**Area-01 - EDA (Eco-Design for Airframe)**		**1,530,000**	
JTI-CS-2011-2-ECO-01-026	*Development of a bamboo fiber process suitable for aeronautical composites applications*		150,000	
JTI-CS-2011-2-ECO-01-027	*Development of an innovative bio resin for structural aeronautical structures*		350,000	
JTI-CS-2011-2-ECO-01-028	*Development and implementation of conductive coating for Magnesium sheets in a/c*		160,000	
JTI-CS-2011-2-ECO-01-029	*Application of selective laser melting and electron beam melting for direct manufacturing of titanium stator vanes*		150,000	
JTI-CS-2011-2-ECO-01-030	*Industrialisation of an ecolonomic out of autoclave polymerization for LRI demonstrator*		520,000	
JTI-CS-2011-2-ECO-01-031	*Green integrated polyurethane foams with improved fire resistance for airliner seat cushions*		200,000	
JTI-CS-GRA	**Clean Sky - Green Regional Aircraft**	**3**	**1,835,000**	**1,376,250**
JTI-CS-GRA-01	**Area-01 - Low weight configurations**		**185,000**	
JTI-CS-2011-2-GRA-01-038	*Design, manufacturing and impact test on selected panels with advanced composite material*		185,000	
JTI-CS-GRA-03	**Area-03 - All electric aircraft**		**1,650,000**	
JTI-CS-2011-2-GRA-03-004	*Advanced Flight Control System – Design, Development and Manufacturing of an Electro Mechanical Actuator with associated Electronic Control Unit and dedicated Test Bench*		900,000	
JTI-CS-2011-2-GRA-03-005	*Design, development and manufacturing of EMA and Test Set-up for advanced Landing Gear System actuation*		750,000	
JTI-CS-GRC	**Clean Sky - Green Rotorcraft**	**3**	**1,230,000**	**922,500**
JTI-CS-GRC-01	**Area-01 - Innovative Rotor Blades**		**800,000**	
JTI-CS-2011-2-GRC-01-006	*Wind Tunnel Testing of Active Rotor*		500,000	
JTI-CS-2011-2-GRC-01-007	*Gurney flap actuator, mechanism and control electronics for a Model scale helicopter rotor blade (Develop and supply the actuation system for integration into the active model rotor blade)*		300,000	
JTI-CS-GRC-03	**Area-03 - Integration of innovative electrical systems**		**430,000**	
JTI-CS-2011-2-GRC-03-009	*Adaptation kit design & manufacturing : APU drive*		430,000	
JTI-CS-SAGE	**Clean Sky - Sustainable and Green Engines**	**3**	**4,300,000**	**3,225,000**
JTI-CS-SAGE-	**Area-03 - Large 3-shaft turbofan**		**1,800,000**	

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Identification	**ITD - Area - Topic**	**Nr of topics**	**Indicative budget (€)**	**Maximum funding (€)**
JTI-CS-2011-2-SAGE-03-012	*Non-metallic Pipes for Aeroengine Dressings*		1,800,000	
JTI-CS-SAGE-04	**Area-04 - Geared Turbofan**		**2,500,000**	
JTI-CS-2011-2-SAGE-04-015	*Development of Innovative SLM-Machinery for High Temperature Aero Engine Applications*		1,500,000	
JTI-CS-2011-2-SAGE-04-016	*Low Pressure Turbine Surface Temperature Measurement for Geared Turbo Fan Turbine Application*		1,000,000	
JTI-CS-SFWA	**Clean Sky - Smart Fixed Wing Aircraft**	**6**	**7,200,000**	**5,400,000**
JTI-CS-SFWA-01	**Area01 – Smart Wing Technology**		**600,000**	
JTI-CS-2011-2-SFWA-01-039	*Pattern measurements using laser scattering*		200,000	
JTI-CS-2011-2-SFWA-01-040	*Morphing Skin Design Tools and Demonstration*		400,000	
JTI-CS-SFWA-02	**Area02 – New Configuration**		**4,600,000**	
JTI-CS-2011-2-SFWA-02-016	*Design and Manufacture of a High Speed Wind Tunnel Model for the ONERA S1MA Facility*		2,500,000	
JTI-CS-2011-2-SFWA-02-017	*Advanced Pylon Noise Reduction Design and Characterisation through flight worthy PIV*		600,000	
JTI-CS-2011-2-SFWA-02-018	*CROR Partial propeller blade release design solution*		1,500,000	
JTI-CS-SFWA-03	**Area03 – Flight Demonstrators**		**2,000,000**	
JTI-CS-2011-2-SFWA-03-009	*Final Assembly Line Assembly Jigs and Fixtures for flight test demonstrator*		2,000,000	
JTI-CS-SGO	**Clean Sky - Systems for Green Operations**	**2**	**850,000**	**637,500**
JTI-CS-SGO-02	**Area-02 - Management of Aircraft Energy**		**600,000**	
JTI-CS-2011-2-SGO-02-034	*EWIS safety analysis tool*		600,000	
JTI-CS-SGO-04	**Area-04 - Aircraft Demonstrators**		**250,000**	
JTI-CS-2011-2-SGO-04-003	*Solid State Power Controllers test benches*		250,000	
TOTAL (€)		**23**	**16,945,000**	**12,708,750**

2.4.2. *Annex 7: Grant agreements signed or under negotiation. CS JU call 9 (SP1-JTI-CS-2011-02)*

Due to the timing of this call, **no negotiation of GAPs was completed** at the end of the year; as a consequence, all 16 GAPs will be finalised in 2012. The following table provides the list of GAP in negotiation for this call 9.

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	298037	BIFTTEC	Bamboo Innovative Fiber for Technical Textile and Environment Conservation	107,536	40,691	148,227
2	298090	BME Clean Sky 027	Development of an innovative bio-based resin for aeronautical applications	262,500	87,500	350,000
3	297173	COMAG	Development and Implementation of Conductive coating for Magnesium sheets in A/C	120,000	40,000	160,000
4	298131	IRIDA	Industrialisation of Out-of-Autoclave Manufacturing for Integrated Aerostructures	371,250	123,750	495,000
5	298171	FIBIOSEAT	FIre resistant BIObased polyurethane foam for aircraft SEATing cushions	140,778	57,902	198,680
6	298013	IMPANECS	Design, manufacturing and impact test on advanced composite panels	138,152	46,051	184,203
7	298176	ARMLIGHT	Design, development and manufacturing of an electro-mechanical actuator and test rig for AiRcrafts Main LandIng Gear acTuation systems.	473,693	274,338	748,031
8	298192	GUM	Active GUrney on Main Rotor blades	341,550	141,850	483,400
9	298182	AGF	Active Gurney Flap	197,422	102,155	299,577
10	298161	MARMELT	New innovative system for additive manufacturing of high temperature nickel superalloys for aero engine applications	746,500	746,500	1,493,000
11	298106	Riblet Sensor	Light Scattering on Micro Structured Surface Coatings	149,958	49,986	199,944
12	298147	STARTGENSYS	ADAPTATION KIT DESIGN & MANUFACTURING: APU DRIVING SYSTEM	301,125	101,475	402,600
13	298164	MOSKIN	Morphing Skin with a Tailored Non-conventional Laminate	298,500	101,500	400,000
14	298187	ACcTIOM	Advanced Pylon Noise Reduction Design and Characterization through flight worthy PIV	390,860	179,300	570,160
15	298120	PBR Design Solution	CROR Partial propeller blade release design solution	1,039,347	454,880	1,494,227
16	298114	JIF4FLIGHT	Final Assembly Line Assembly Jigs and Fixtures for flight test demonstrator	1,049,610	949,710	1,999,320
TOTAL (Proposals in Negotiation)				€ 6,128,781	€ 3,497,588	€ 9,626,369

2.5. Call 10 SP1-JTI-CS-2011-03

2.5.1. Annex 8: CS JU call 10 (SP1-JTI-CS-2011-03). Topics overview

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (K€)	Maximum funding (K€)
JTI-CS-ECO	**Clean Sky - EcoDesign**	**10**	**2,735**	**2051.25**
JTI-CS-ECO-01	**Area-01 - EDA (Eco-Design for Airframe)**	**9**	**2,485**	
JTI-CS-2011-3-ECO-01-032	*Formulation and characterisation of new aluminium alloys for high temperature applications (250°C)*		450	
JTI-CS-2011-3-ECO-01-033	*Corrosion protection of aluminium unpainted parts: development of an appropriated Cr free sealing*		240	
JTI-CS-2011-3-ECO-01-034	*Metal recycling from a/c sources: Recycling routes screening and metallurgical approaches*		200	
JTI-CS-2011-3-ECO-01-035	*Environmental friendly ancillary materials development: Bio-sourced material, Recycled sourced mat.*		160	
JTI-CS-2011-3-ECO-01-036	*Development of fungi growth inhibition coating for fuel tank*		300	
JTI-CS-2011-3-ECO-01-037	*Disintegration of Fiber Reinforced Composites by electrodynamic fragmentation technique*		435	
JTI-CS-2011-3-ECO-01-038	*Aircraft insulation recycling routes and experiments*		200	
JTI-CS-2011-3-ECO-01-039	*Development of a chromate 6+ free chemical surface treatment for cast magnesium alloys protection*		200	
JTI-CS-2011-3-ECO-01-040	*Devel. of a fully automated preforming process for 3-D shaped composite dry fiber*		300	
JTI-CS-ECO-02	**Area-02 - EDS (Eco-Design for Systems)**	**1**	**250**	
JTI-CS-2011-3-ECO-02-012	*Intelligent Load Power Management Rig Module*		250	
JTI-CS-GRA	**Clean Sky - Green Regional Aircraft**	**8**	**3,400**	**2,550**
JTI-CS-GRA-01	**Area-01 - Low weight configurations**	**3**	**750**	
JTI-CS-2011-3-GRA-01-039	*Hybrid laminates Industrialization for a/c nose fuselage/cockpit*		300	
JTI-CS-2011-3-GRA-01-040	*Nose Fuselage/Cockpit dynamic characterization for internal noise attenuation*		200	

Identification	ITD - Area - Topic	Nr of topics	Indicative budget (K€)	Maximum funding (K€)
JTI-CS-2011-3-GRA-01-041	*Optimal tooling system for design for large composite parts*		250	
JTI-CS-GRA-02	**Area-02 - Low noise configurations**	**2**	**2,150**	
JTI-CS-2011-3-GRA-02-017	*Advanced low noise Main and Nose Landing Gears for Regional Aircraft -Trade off concept studies*		2,000	
JTI-CS-2011-3-GRA-02-018	*Low Noise Devices aeroacoustics numerical Simulation*		150	
JTI-CS-GRA-03	**Area-03 - All electric aircraft**	**3**	**500**	
JTI-CS-2011-3-GRA-03-006	*Development and manufacturing of Programmable Electrical Loads and advanced Power Supply Modulation for Electrical Energy Management testing in Flight Demo*		100	
JTI-CS-2011-3-GRA-03-007	*Improvement of numerical models for JTI/GRA Shared Simulation Environment*		150	
JTI-CS-2011-3-GRA-03-008	*Control Console and Electrical Power Center for In-Flight Demo*		250	
JTI-CS-GRC	**Clean Sky - Green Rotorcraft**	**3**	**1,322**	**991.5.**
JTI-CS-GRC-03	**Area-03 - Integration of innovative electrical systems**	**2**	**1,122**	
JTI-CS-2011-3-GRC-03-010	*Advanced programmable Loads for Electrical Test Bench*		210	
JTI-CS-2011-3-GRC-03-011	*Multi-source regenerative systems power conversion*		912	
JTI-CS-GRC-06	**Area-06 - Eco Design for Rotorcraft**	**1**	**200**	
JTI-CS-2011-3-GRC-06-004	*Dismantling and recycling of ecodesigned helicopter demonstrators*		200	
JTI-CS-SAGE	**Clean Sky - Sustainable and Green Engines**	**4**	**7,400**	**5,550**
JTI-CS-SAGE-02	**Area-02 - Direct Drive Open Rotor**	**2**	**6,200**	
JTI-CS-2011-3-SAGE-02-009	*CROR Propeller blades*		4,000	
JTI-CS-2011-3-SAGE-02-010	*Contra-Rotating Open Rotor (CROR) Propeller barrels*		2,200	
Identification	**ITD - Area - Topic**	**Nr of topics**	**Indicative budget (K€)**	**Maximum funding (K€)**

JTI-CS-SAGE-04	**Area-04 - Geared Turbofan**	**2**	**1,200**	
JTI-CS-2011-3-SAGE-04-017	*Integration of an Acoustic Absorber into the Turbine Exit Casing (TEC)*		500	
JTI-CS-2011-3-SAGE-04-018	*Development of a Microwave Clearance Measurement System for Low Pressure Turbines*		700	
JTI-CS-SFWA	**Clean Sky - Smart Fixed Wing Aircraft**	**5**	**5,650**	**4,237.5.**
JTI-CS-SFWA-02	**Area02 - New Configuration**	**5**	**5,650**	
JTI-CS-2011-3-SFWA-02-019	*Investigation of Bird Strike criteria for Natural Laminar Flow wings*		800	
JTI-CS-2011-3-SFWA-02-020	*Development of an automated gap filler device*		550	
JTI-CS-2011-3-SFWA-02-021	*Fixed Leading Edge Structure and Systems Demonstrator for a Business Jet laminar wing*		1,500	
JTI-CS-2011-3-SFWA-02-022	*Design and manufacturing of an innovative cryogenic wind tunnel model with motorized empennage*		1,300	
JTI-CS-2011-3-SFWA-02-023	*Development, manufacturing and testing of two different High Load Small Space Rotary Gear Types*		1,500	
JTI-CS-SGO	**Clean Sky - Systems for Green Operations**	**10**	**5,690**	**4,267.5.**
JTI-CS-SGO-02	**Area-02 - Management of Aircraft Energy**	**6**	**2,400**	
JTI-CS-2011-3-SGO-02-014	*Construction of bespoke evaluation Power Modules*		250	
JTI-CS-2011-3-SGO-02-021	*Development of key technology components for high-power density power converters for rotorcraft swashplate actuators*		250	
JTI-CS-2011-3-SGO-02-033	*Optimisation of coating for the operation of power electronics with "open box" -housing in high altitude and identification of pass and fail criteria for respective corona testing*		500	
JTI-CS-2011-3-SGO-02-035	*Disconnect device for jam tolerant linear actuators*		600	
JTI-CS-2011-3-SGO-02-036	*Design and optimisation of locally reacting acoustic material*		300	

Identification	**ITD - Area - Topic**	**Nr of topics**	**Indicative budget (K€)**	**Maximum funding (K€)**
JTI-CS-2011-3-SGO-02-037	*Feasibility study of full SiC High Integrated Power Electronic Module (HIPEM) for Aeronautic Application*		500	

JTI-CS-SGO-03	**Area-03 - Management of Trajectory and Mission**	**3**	**2,540**	
JTI-CS-2011-3-SGO-03-014	*Smart Operations on Ground power electronic with energy recycling system*		1,390	
JTI-CS-2011-3-SGO-03-015	*Simplified noise models for real time on-board applications*		400	
JTI-CS-2011-3-SGO-03-016	*Development of an Electronic Flight Bag platform with integrated A-WXR and Q-AI Agents SW*		750	
JTI-CS-SGO-04	**Area-04 - Aircraft Demonstrators**	**1**	**750**	
JTI-CS-2011-3-SGO-04-004	*Design and manufacturing of a flight worthy intake system (scoop/NACA divergent intake)*		750	
TOTAL (K€)		**40**	**26,197**	**19,647.75**

2.5.2. Annex 9: Grant agreements signed or under negotiation. CS JU call 10 (SP1-JTI-CS-2011-03).

Due to the timing of this call, **no negotiation of GAPs was completed** at the end of the year; as a consequence, all 24 GAPs will be finalised in 2012. The following table provides the list of GAP in negotiation for this call 10.

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	306513	ALT	Formulation and characterization of new aluminium alloys produced by ingot metallurgy for high temperature applications (250ºC)	311,447	128,931	440,378
2	307834	SAA-Seal	Corrosion protection of Aluminium unpainted parts: development of an appropriated Cr free sealing process on thin SAA layer (≤5 µm)	179,985	59,995	239,980
3	307111	AMICOAT	Development of new antimicrobial nanostructured durable coatings for fuel tanks	213,660	71,220	284,880
4	307659	MAGNOLYA	Advanced environmentally friendly chemical surface treatments for cast magnesium helicopter transmission alloys preservation	149,790	49,929	199,719
5	306648	I-PRIMES	I-PRIMES: an Intelligent Power Regulation using Innovative Modules for Energy Supervision	187,200	62,400	249,600
6	306681	HYBRIA	Hybrid laminates. Industrialization for aircraft nose fuselage.	216,362	66,633	282,995
7	307767	DynaPit	Nose Fuselage/Cockpit Dynamic Characterization for Internal Noise Attenuation	149,900	49,967	199,867
8	308225	ALLEGRA	Advanced Low Noise Landing (Main and Nose) Gear For Regional Aircraft	1,309,221	679,740	1,988,961
9	306928	CALAS	Computational Aero-acoustic Analysis of Low-noise Airframe Devices with the Aid of Stochastic Method	112,500	37,500	150,000
10	306880	DSOT300-125S	development and manufacturing of programmable electrical load and advanced PSM for electrical energy management testing in flight demo	73,350	24,450	97,800
11	307707	iSSE	Improvement of numerical models for JTI/GRA Shared Simulation Environment	112,455	37,485	149,940
12	307727	SPLS	Smart programmable load and source	155,475	51,825	207,300
13	308129	REGENESYS	Multi-source regenerative systems power conversion - REGENESYS	683,426	227,809	911,235
14	306997	GREENBARRELS	Contra-Rotating Open Rotor (CROR) Propeller barrels	1,323,351	441,117	1,764,468
15	308265	HOSTEL	Integration of a HOt STrEam Liner into the Turbine Exit Casing (TEC)	357,750	119,250	477,000
16	307866	MICMEST	Microwave Clearance Measurement System for Low Pressure Turbines	349,993	349,993	699,986
17	307612	BirdStrike	Investigation of Bird Strike criteria for Natural Laminar Flow wings	599,360	198,120	797,480
18	307869	ELWIPS	Electro-thermal Laminar Wing Ice Protection System Demonstrator	738,857	571,033	1,309,890

19	304851	MATPLAN	CONSTRUCTION OF BESPOKE EVALUATION POWER MODULES~(MATPLAN)	150,694	95,731	246,425

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
20	307309	PECOAT	Novel Coating Systems For Power Electronics In Aerospace Environments	363,176	121,058	484,234
21	307397	HYPOTHESIS	Feasibility study of intelligent High Integrated Power Electronic Module (HIPEM) for Aeronautic Application	374,460	124,820	499,280
22	307526	ARMONEA	Anotec Real-time MOdel for Noise Exposure of Aircraft	215,562	71,854	287,416
23	306927	KLEAN	Knowledge-based EFB for green flight trajectory decision aid	559,492	186,496	745,988
24	308183	SANDIT	Design and manufacture of a flight worthy intake system (scoop/NACA divergent intake) SCOOP AND NACA DIVERGENT INTAKE TRIAL (SANDIT)	466,355	281,381	747,736
TOTAL (Proposals in Negotiation)				**€ 9,353,821**	**€ 4,108,737**	**€ 13,462,558**

2.6. Grant agreements/project portfolio of Clean Sky JU

2.6.1. Annex 10: Grant agreements signed (commitment amounts) for calls launched in previous years

80 GAPs relating to Calls 1 to 6 were signed in 2011. They are listed below:

- *SP1-JTI-CS-2009-01*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	255811	EMAS	Electric Motor And Sensor design and manufacture	138,900	50,700	189,600
Total (signed GAPs)				**€ 138,900**	**€ 50,700**	**€ 189,600**

- *SP1-JTI-CS-2009-02*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	267322	ELETAD	Electrical Tail Drive - Modelling, Simulation and Rig Prototype Development	1,858,826	619,609	2,478,435
2	267651	LUBEST	Performance and qualification tests of lubrication system equipment	179,640	59,921	239,561
3	267522	FATIGUETEST	Fatigue Test	74,805	24,936	99,741
4	267571	CARD	Contribution to Analysis of Rotor Hub Drag Reduction	374,997	125,001	499,998
5	267525	TIALBLADE	(BLADES INTO) HIGH TEMPERATURE MATERIAL	172,477	60,628	233,105
Total (signed GAPs)				**€ 2,660,745**	**€ 890,095**	**€ 3,550,840**

- *SP1-JTI-CS-2010-01*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	270563	ADHERO	Aerodynamic Design Optimisation of a Helicopter Fuselage including a Rotating Rotor Head	618,750	206,250	825,000
2	270644	CLEANLE	Concept Study of a cleaning device for wing leading edges	29,955	9,985	39,940
3	270669	COMPARE	COMPArative evaluation of NDT techniques for high-quality bonded composite REpairs	112,497	37,503	150,000
4	270647	ICE-TRACK	Support of Icing Tests (Runback-Ice behaviour of surfaces) and Icing Mechanisms	172,100	57,367	229,467
5	270629	MORALI	Multi-Objective Robust Assessment of heLicopter Improvements	275,880	123,960	399,840
6	270624	POTRA	Parametric optimisation software package for trajectory shaping under constraints	158,288	138,711	296,999

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
7	270589	CO-PROCLAM	COrrosion PROtective Coating on Light Alloys by Micro-arc oxidation	291,675	107,545	399,220
8	270658	STRAINWISE	Hardware & Software Development of Wireless Sensor Network Nodes for Measurement of Strain in Airborne Environment	552,048	243,345	795,393
9	270526	DT-FA-AFC	Development and Test of Fluidic Actuators for Active Flow Control Applications	194,595	65,165	259,760
10	270666	ESCRITP	Electrical Simulation Criteria & Tool Performances	100,000	100,000	200,000
11	270577	MEMFAC	A Microfabricated Actuator for Active Flow Control on Aircraft	94,988	94,988	189,976
12	270597	FLOWSENSYS	Flow sensor system for the separation detection at low speed in view of flight	76,500	25,500	102,000
13	270593	AWAHL	Advanced Wing And High-Lift Design	319,544	130,456	450,000
14	270609	CODE-TILT	Contribution to design optimization of tiltrotor components for drag reduction	670,500	223,500	894,000
15	270539	EASYPATCH	Prefabricated CFRP Parts	112,050	37,350	149,400
16	270531	FLOCOSYS	Efficient System for Flow Control Actuation	45,450	15,150	60,600
17	270571	MISPA	Proposal for the Development of an Applicator for Microstructured Paint Coatings Resulting in Significant Drag Reduction of Treated Surfaces	182,608	70,265	252,873
18	270625	MACOTECH	Design and manufacturing of smart composite panels for wing applications and development of structural health monitoring techniques	89,955	29,985	119,940
19	270535	CLEANCOMPFIELD	Construction and Assembly of a Prototype Surface Pre-treatment Tool for In-filed use	112,500	37,500	150,000
20	270598	ARCANGEL-ALPHA	ARCING AND NEXT GENERATION ELECTRICAL AIRPLANE POWER HAZARD ABATEMENT	593,407	593,409	1,186,816
21	270586	WINGTECH_EVALUATION	WING BOX TECHNOLOGY EVALUATION - TRADE-OFF STUDY FOR THE RANKING OF NEW TECHNOLOGIES BEST FITTING WING	89,765	29,922	119,687
22	270612	E-CFD-GPU	Efficient CFD Multi-physics programming research	112,500	37,500	150,000
23	270641	DARGOS	Definition of ATM Requirements for GRA Operations and Simulations	112,065	37,355	149,420
24	270588	AFCIN	Structural designs and tests for integration of active flow control concepts on a trailing edge high lift device	321,599	108,401	430,000
25	270601	GBSSD(2)	Design & Manufacture of a ground based structural/systems demonstrators	249,807	249,808	499,615
26	270587	RIBLET ROBOTICS	Concept for automated riblet application (robot-concept)	130,000	130,000	260,000

27	270561	TEMPO	Thermal Exchange Modelling and Power Optimization	374,835	124,945	499,780

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
28	270584	ELTESTSYS	Versatile and Eco-efficient Direct Drive Systems for Testing the Starters/Generators of Aircraft Engines	440,675	205,325	646,000
29	270591	SIEDIT	Development of a Slat with Integrated Electrical Deicers for Icing Wind Tunnel Tests	185,000	185,000	370,000
30	270616	COMPASS	Functional laminates development. Components compatibility and feasibility assessment. Industrialization	149,997	50,000	199,997
31	270640	MAWS	Modelling of Adaptive Wing Structures.	150,000	49,999	199,999
Total (signed GAPs)				**€ 7,119,533**	**€ 3,556,189**	**€ 10,675,722**

- *SP1-JTI-CS-2010-02*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	271494	CS-GYRO	MEMS gyrometer for wing behaviour measurement	600,000	200,000	800,000
2	271492	WINGACCS	Wing Dynamics Acceleration Sensor	450,000	150,000	600,000
3	271498	NLFFD	NLF Starboard Leading edge & Upper cover design & manufacture	1,850,000	1,850,000	3,700,000
4	271496	DEAMAK	Design And Manufacture of Krueger Flaps	379,920	379,920	759,840
Total (signed GAPs)				**€ 3,279,920**	**€ 2,579,920**	**€ 5,859,840**

- *SP1-JTI-CS-2010-03*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	271874	WISMOS	Wireless/Integrated Strain Monitoring and Simulation System	183,125	66,835	249,960
2	271858	DIMAG	Development and Implementation of Magnesium sheets in A/C	52,500	17,500	70,000
3	271691	ADVANCED	Advanced heating system and control mode for homogeneous high temperature curing of large composite repairs	165,000	55,000	220,000
4	271882	FATIMA	Fatigue testing of CFRP materials	149,995	49,999	199,994
5	271829	NURMSYS	Original design & manufacturing of a New Upstream Rotating Measurement System for gas turbine exhaust gases studies	144,210	58,070	202,280
6	271847	CLEOPATRA	CLEaner OPerations Attained Through Radars' Advance	447,644	296,713	744,357

7	271813	SAFEPEM	Safe Fieldbus dEvelopment for Power Electronic Module	357,100	140,000	497,100
8	271843	NEXTWING	Numerical and EXperimental shock conTrol on laminar Wing	262,274	87,425	349,699
No	**Project Number**	**Project Acronym**	**Project Title**	**CS JU contribution (€)**	**In-kind contribution (€)**	**Total contributions (€)**
9	271872	PPSMPAB	Piezo Power Supply Module for Piezo Actuator Bench	320,513	106,838	427,350
10	271881	ADAVES	Advanced avionics equipment simulation	185,000	145,120	330,120
11	271875	AERTECVTI	Test bench for endurance test and reliability prediction of avionics power electronic modules	564,900	188,300	753,200
12	271838	LH-LHT-RFT	Flight-tests with multi-functional coatings	58,350	58,350	116,700
13	271816	NEELEFFEC TINTHESKY	Magnetic Sensors with No Remanence for Aircraft Application	428,750	171,250	600,000
14	271753	VOCAL-FAN	VIRTUAL OPTIMIZATION CFD PLATFORM ALLOWING FAN NOISE REDUCTION	149,335	49,780	199,115
15	271880	WHEXPERS	Study and manufacturing of a Wasted Heat Exchanger and a hot air Piston Engine Recuperation System	899,986	299,995	1,199,981
16	271855	ROSIC	Robust Silicon-Carbide Technology for Aerospace DC-DC Conversion	303,426	175,883	479,309
17	271788	PEMREL	Sample power electronic module construction for testing, characterisation and manufacturability assessment	337,141	162,431	499,571
18	271765	NAA-CROR	Numerical aero-acoustic assessment of installed Counter Rotating Open Rotor (CROR) power plant	150,000	50,000	200,000
19	271866	CLFCWTE	Development of a Closed Loop Flow Control Algorithm for Wing Trailing Edge Flow Control Including Experimental Validation in Two Low Speed Wind Tunnel Tests	419,393	139,798	559,191
20	271853	FOS3D	Fiber Optic System for Deflection and Damage Detection	448,669	149,557	598,226
21	271861	LEATOP	Leading Edge Actuation Topology Design and Demonstration	106,456	41,486	147,942
Total (signed GAPs)				**€ 6,133,766**	**€ 2,510,329**	**€ 8,644,095**

- *SP1-JTI-CS-2010-04*

No	Project Number	Project Acronym	Project Title	CS JU contribution (€)	In-kind contribution (€)	Total contributions (€)
1	278144	SUPERBLEND	Development of Thermoplastic Polymer blend with Low Melting Point and with Similar Properties than PEEK	149,628	49,876	199,504

2	278415	HELIDES	Helicopter Drag Prediction using Detached-Eddy Simulation	110,463	36,821	147,284
3	278416	HEAVYcOPTer	Contribution to optimisation of heavy helicopter engine installation design	329,400	109,800	439,200
No	**Project Number**	**Project Acronym**	**Project Title**	**CS JU contribution (€)**	**In-kind contribution (€)**	**Total contributions (€)**
4	278393	PT656	GURNEY FLAP ACTUATOR AND MECHANISM FOR A FULL SCALE HELICOPTER ROTOR BLADE	371,063	289,553	660,616
5	277927	iMAPC	Development and validation of an integrated methodology in order to establish adapted production concepts for efficient turbofan engines	720,000	240,000	960,000
6	277796	E-Bird	Development of numerical models for aircraft systems to be used within the JTI/GRA Shared Simulation Environment	112,500	37,500	150,000
7	278419	WENEMOR	WIND TUNNEL TESTS FOR THE EVALUATION OF THE INSTALLATION EFFECTS OF NOISE EMISSIONS OF AN OPEN ROTOR ADVANCED REGIONAL AIRCRAFT	1,374,993	578,334	1,953,327
8	278483	HICOMP	Development and Manufacture of High Temperature Composite Aero Engine Parts	376,555	376,557	753,112
9	277975	ATTESI	Active Flow Control Technique on Trailing Edge Shroud for Improved High Lift Configurations	344,834	114,946	459,780
10	278407	SIMEAD	Suite of integrated models for electrical aircraft drives	261,452	87,150	348,602
11	278365	HiTME	High Temperature Electronics	901,200	584,890	1,486,090
12	278366	CASE	Fuel Control System Sensors and Effectors	688,400	611,600	1,300,000
13	278228	AdEPT	High Efficiency Fuel Pumping	711,607	711,609	1,423,216
14	277580	Flight-Noise-II	Turboprop and Propfan-Equipped Aircraft Noise Emission Model	261,652	87,218	348,870
15	278268	ESTERA	Multi-level Embedded Closed-Loop Control System for Fluidic Active Flow Control Actuation Applied in High-Lift and High-Speed Aircraft Operations	187,470	62,510	249,980
16	278170	Neural	Neural network computation for fast trajectory prediction	112,316	37,439	149,755
17	278156	CF-THREAD	Composites under Fatigue: Temperature and Humidity Related Environmental Ageing Damage	224,749	74,916	299,665
18	278084	DAFNE	Development of gamma-TiAl forgings in a low-cost near conventional hot-die process and process evaluation	326,250	313,650	639,900
Total (signed GAPs)				**€ 7,564,532**	**€ 4,404,369**	**€ 11,968,901**

2.6.2. Annex 11: Grant agreements for which activities have ended and/or final results are available

№	GA №	Project acronym	Project Title	Call Identifier	CS JU contribution (€)	In-kind contribution (€)	Total contribution (€)
1	255656	SLD_SCOOP	SLD and Icing tests on an Ice Protected Scoop Intake and Channel	**SP1-JTI-CS-2009-01**	129,769	43,260	**173,029**
2	255689	FRARS	Future Regional Aircraft Requirements Study	**SP1-JTI-CS-2009-01**	37,395	12,465	**49,860**
3	255711	AU-BB/EMI SENSOR NOD	Concept, design and prototyping of compact sensor nodes using electromechanical impedance and broad band acousto-ultrasonic method for structural health monitoring	**SP1-JTI-CS-2009-01**	43,759	14,586	**58,345**
4	255718	COMET	Collaborative Meteorological Concept Validation (COMET)	**SP1-JTI-CS-2009-01**	74,889	24,964	**99,853**
5	255755	THERMOCS	Thermosetting resin for Clean Sky	**SP1-JTI-CS-2009-01**	74,250	24,750	**99,000**
6	255760	ORGANOCS	Organic-modification tailored to promote the correct interaction between the polymer and the filler	**SP1-JTI-CS-2009-01**	44,999	15,000	**59,999**
7	255866	EHWAZ	Electrical Harness and Wires Analysis and optimiZation	**SP1-JTI-CS-2009-01**	199,194	199,194	**398,388**

2.7. IMI JU

2.7.1. Annex 12: Grant agreements signed (commitment amounts)

In 2011, 13 grants agreements were signed, 8 relating to the 2nd Call and 5 to the 3rd Call.

NR	GA number	Project Acronym	Call Identifier	IMI JU financial contribution to beneficiaries eligible for IMI JU funding	In-kind contributions from industry companies members of EFPIA	Additional own resources of beneficiaries eligible for IMI JU funding	Member States contribution (Not applicable)	Total contributions
1	115188	PREDECT	Call 2 - 2009	8.100.509	7.066.607	2.532.789	N/A	17.699.905
2	115234	OncoTrack	Call 2 - 2009	16.050.282	9.726.557	4.915.508	N/A	30.692.347
3	115151	QuIC-ConCePT	Call 2 - 2009	7.000.000	8.053.206	2.062.174	N/A	17.115.380
4	115153	RAPP-ID	Call 2 - 2009	6.828.438	5.848.470	1.771.853	N/A	14.448.761
5	115139	BTCure	Call 2 - 2009	16.137.872	14.172.302	7.807.923	N/A	38.118.097
6	115156	DDMoRe	Call 2 - 2009	9.615.058	9.820.120	1.729.883	N/A	21.165.061
7	115191	Open PHACTS	Call 2 - 2009	9.988.867	4.142.649	2.265.938	N/A	16.397.454
8	115189	EHR4CR	Call 2 - 2009	7.019.046	7.042.616	2.008.898	N/A	16.070.560
Total Call 2				**80.740.072**	**65.872.527**	**25.094.966**	**0**	**171.707.565**
1	116001	MIP-DILI	Call 3 - 2010	15.335.538	11.774.487	4.391.050	N/A	31.501.075
2	116003	BIOVACSAFE	Call 3 - 2010	17.425.666	6.608.489	5.141.484	N/A	29.175.639
3	116005	EU-AIMS	Call 3 - 2010	19.467.207	9.333.336	7.403.880	N/A	36.204.423
4	116006	DIRECT	Call 3 - 2010	21.388.645	17.558.788	6.310.454	N/A	45.257.887
5	116007	EUPATI	Call 3 - 2010	5.250.000	4.131.163	1.010.268	N/A	10.391.431
Total Call 3				**78.867.056**	**49.406.263**	**24.257.136**	**0**	**152.530.455**
TOTAL				**159.607.128**	**115.278.790**	**49.352.102**	**0**	**324.238.020**

Grant agreements for 2 projects of Call 3 will be signed early in 2012.

6	115303	ABIRISK	Call 3 - 2010	18.170.400	10.962.026	5.469.973	N/A	34.602.399
7	115337	PREDICT-TB	Call 3 - 2010	14.778.856	8.516.153	4.931.636	N/A	28.226.645
Total				**32.949.256**	**19.478.179**	**10.401.609**	**0**	**62.829.044**

2.8. FCH JU

2.8.1. Annex 13: Topics and respective FCH JU funding for Call FCH-JU-2011-1

Application Area/ Topics called	**Indicative FCH JU Funding** **Million €**
Area SP1-JTI-FCH.1: *Transportation & Refuelling Infrastructure*	**36.0**
SP1-JTI-FCH.2011.1.1 Large-scale demonstration of road vehicles and refuelling infrastructure IV	
SP1-JTI-FCH.2011.1.2 In-situ characterization and diagnostic techniques for optimisation of water management and state of health determination of PEMFC	
SP1-JTI-FCH.2011.1.3 Improvement of PEMFC performance and durability through multi-scale modelling and numerical simulation	
SP1-JTI-FCH.2011.1.4 Periphery – FC-System Components	
SP1-JTI-FCH.2011.1.5 Next generation European MEAs for transportation applications	
SP1-JTI-FCH.2011.1.6 Investigation of degradation phenomena	
SP1-JTI-FCH.2011.1.7 Research & development on Bipolar Plates	
SP1-JTI-FCH.2011.1.8 Research & Development of 700 bar refuelling concepts & technologies	
SP1-JTI-FCH.2011.1.9 Fuel cell systems for airborne application	
SP1-JTI-FCH.2011.1.10 Pre-normative research on fast refuelling	
Area SP1-JTI-FCH.2: *Hydrogen Production & Distribution*	**16.0**
SP1-JTI-FCH.2011.2.1 Demonstration of MW capacity hydrogen production and storage for balancing the grid and supply to a hydrogen refuelling station	
SP1-JTI-FCH.2011.2.2 Demonstration of hydrogen production from biogas for supply to a hydrogen refuelling station	
SP1-JTI-FCH.2011.2.3 Biomass-to-hydrogen (BTH) thermal conversion process	
SP1-JTI-FCH.2011.2.4 Novel H2 storage materials for stationary and portable applications	
SP1-JTI-FCH.2011.2.5 New generation of high temperature electrolyser	
SP1-JTI-FCH.2011.2.6 Low-temperature H2 production processes	
SP1-JTI-FCH.2011.2.7 Innovative Materials and Components for PEM electrolysers	
SP1-JTI-FCH.2011.2.8 Pre-normative research on design and testing requirements for metallic components exposed to H2 enhanced fatigue	
SP1-JTI-FCH.2011.2.9 Measurement of the quantity of hydrogen delivered to a vehicle	
Area SP1-JTI-FCH.3: *Stationary Power Generation & CHP*	**38.0**
SP1-JTI-FCH.2011.3.1 Next generation stack and cell design	
SP1-JTI-FCH.2011.3.2 Advanced control for stationary power applications	
SP1-JTI-FCH.2011.3.3 Component improvement for stationary power applications	
SP1-JTI-FCH.2011.3.4 Proof-of-concept fuel cell systems	
SP1-JTI-FCH.2011.3.5 Validation of integrated fuel cell system readiness	
SP1-JTI-FCH.2011.3.6 Field demonstration of large stationary fuel cell systems for distributed generation and other relevant commercial or industrial applications	

Application Area/ Topics called	Indicative FCH JU Funding Million €
SP1-JTI-FCH.2011.3.7 Field demonstration of small stationary fuel cell systems for residential and commercial applications	
SP1-JTI-FCH.2011.3.8 Pre-normative research on power grid integration and management of fuel cells for small residential, commercial and industrial applications	
Area SP1-JTI-FCH.4: *Early Markets*	**15.0**
SP1-JTI-FCH.2011.4.1 Demonstration of fuel cell-powered Material Handling vehicles including infrastructure	
SP1-JTI-FCH.2011.4.2 Demonstration of application readiness of Back-Up Power and Uninterruptible Power Systems	
SP1-JTI-FCH.2011.4.3 Research and development of 1-10kW fuel cell systems and hydrogen supply for early market applications	
SP1-JTI-FCH.2011.4.4 Research, development and demonstration of new portable Fuel Cell systems	
SP1-JTI-FCH.2011.4.5 Research and development of Balance of Plant items for small portable and other fuel cell devices	
Area SP1-JTI-FCH.5: *Cross-cutting Issues*	**4.0**
SP1-JTI-FCH.2011.5.1 Assessment of benefits of H2 for energy storage and integration in energy markets	
SP1-JTI-FCH.2011.5.2 Study of Financing Options to accelerate commercialisation of hydrogen and fuel cell technologies	
SP1-JTI-FCH.2011.5.3 First responder educational and practical hydrogen safety training	
SP1-JTI-FCH.2011.5.4 Development of EU-wide uniform performance test schemes for PEM fuel cell stacks	
Total indicative FCH JU Funding[6].	**109.0**

[6] The funding includes the FCH JU's own budget only. The final total funding for projects is to be increased by EFTA contributions (up to 2.3 M€).

2.8.2. Annex 14: Grant agreements/project portfolio FCH JU

Grant agreements signed (commitment amounts) in 2011 (Call FCH-JU-2010-1)

The Governing Board approved on 10 March 2011 a list of **27 proposals with additional 16 on the reserve list**, ranked in priority order according to the evaluation results, to start negotiations to conclude Grant Agreements.

The negotiations started on 18 March 2011 and were concluded during December 2011 with the approval of the Governing Board for funding of **26 projects** (from the initial 27 proposals, two failed during the negotiation phase, and one proposal was selected from the reserve list). The negotiations were concluded with the signature of the following Grants Agreements (all before end 2011).

The complete list is provided with further details below:

№	GA №	Project acronym	Project title	A	B	C
				JU contribut-tion (€)	In-kind contribu-tion (€)	Total contribution A+B (€)
1	277844	FCGEN	Fuel Cell Based On-board Power Generation	4.342.854	5.995.560	10.338.414
2	277916	METPROCELL	Innovative fabrication routes and materials for METal and anode supported PROton conducting fuel CELLs	1.822.255	1.613.837	3.436.092
3	278054	DURAMET	Improved Durability and Cost-effective Components for New Generation Solid Polymer Electrolyte Direct Methanol Fuel Cells	1.496.617	1.460.257	2.956.874
4	278138	NEMESIS2+	New Method for Superior Integrated Hydrogen Generation System 2+	1.614.944	1.778.397	3.393.341
5	278177	IDEALHY	Integrated Design for Efficient Advanced Liquefaction of Hydrogen	1.295.541	821.989	2.117.530
6	278192	HIGH V.LO-CITY	Cities speeding up the integration of hydrogen buses in public fleets	13.491.724	18.094.947	31.586.671
7	278195	C3SOFC	Cost Competitive Component integration for StatiOnary Fuel Cell power	4.001.529	3.867.247	7.868.776
8	278257	METSAPP	Metal supported SOFC technology for stationary and mobile applications	3.396.469	4.568.898	7.965.367
9	278525	MMLRC=SOFC	Working towards Mass Manufactured, Low Cost and Robust SOFC stacks	2.067.975	2.426.421	4.494.396
10	278534	HYINDOOR	Pre-normative research on safe indoor use of fuel cells and hydrogen systems	1.528.974	2.128.786	3.657.760
11	278538	HY2SEPS-2	Hybrid Membrane - Pressure Swing Adsorption (PSA) Hydrogen Purification Systems	825.321	780.958	1.606.279
12	278629	SUAV	Microtubular Solid Oxide Fuel Cell Power System developement and integration into a Mini-UAV	2.109.518	2.077.582	4.187.100
13	278674	LASER-CELL	INNOVATIVE CELL AND STACK DESIGN FOR STATIONARY INDUSTRIAL APPLICATIONS USING NOVEL LASER PROCESSING TECHNIQUES	1.421.757	1.455.333	2.877.090

14	278727	HYTEC	Hydrogen Transport in European Cities	11.948.532	17.582.150	29.530.682
15	278732	RESELYSER	Hydrogen from RES: pressurised alkaline electrolyser with high efficiency and wide operating range	1.484.358	1.404.599	2.888.957
16	278796	DELIVERHY	Optimisation of Transport Solutions for Compressed Hydrogen	719.502	528.271	1.247.773
17	278798	SOFCOM	SOFC CCHP WITH POLY-FUEL: OPERATION AND MAINTENANCE	2.937.753	3.281.860	6.219.613
18	278804	SOFT-PACT	Solid Oxide Fuel Cell micro-CHP Field Trials	3.950.893	6.361.810	10.312.703
19	278824	ELYGRID	Improvements to Integrate High Pressure Alkaline Electrolysers for Electricity/H2 production from Renewable Energies to Balance the Grid.	2.105.017	1.647.744	3.752.761
20	278855	HYTIME	Low temperature hydrogen production from second generation biomass	1.609.026	1.314.792	2.923.818
21	278862	TEMONAS	TEchnology MONitoring and ASsessment	1.132.046	668.556	1.800.602
22	278899	DESTA	Demonstration of 1st European SOFC Truck APU	3.874.272	5.966.735	9.841.007
23	278921	FCPOWEREDRBS	Demonstration Project for Power Supply to Telecom Stations through FC technology	4.221.270	6.370.379	10.591.649
24	278997	REFORCELL	Advanced Multi-Fuel Reformer for Fuel Cell CHP Systems	2.857.211	2.733.551	5.590.762
25	279075	COMETHY	Compact Multifuel-Energy To Hydrogen converter	2.484.095	2.443.790	4.927.885
26	279190	TOWERPOWER	Demonstration of FC-Based integrated generator systems to power off-grid cell phone towers, using ammonia fuel	4.936.631	4.466.475	9.403.106
TOTAL				**€ 83,676,084**	**€ 101,840.924**	**€ 185,517,008**

2.8.3. Annex 15: FCH JU Grant agreements for which activities have ended and/or final results are available

Activities related to 5 grant agreement have already ended in 2011. The complete list is provided with further details below:

GA №	Date GA started	Date GA ended	Project acronym	Initial requested funding (€)	Total costs (€)	Financial contributions[7]		
						JU contribution (€)	In-kind contribution (excluding JRC) (€)	Total contribution (€)
245133	01/01/2010	31/12/2010	Next HyLights	**499,303**	**1,138,522**	481,769	518,264	1,000,033
245142	01/01/2010	30/09/2011	Auto-Stack	**1,193,016**	**1,304,459**	N/A	N/A	N/A
245332	01/01/2010	30/06/2011	Prepar-H2	**257,075**	**563,870**	N/A	N/A	N/A
256328	01/10/2010	30/09/2011	HyGuide	**366,318**	**524,793**	N/A	N/A	N/A
256850	01/10/2010	30/09/2011	H2FC-LCA	**311,957**	**386,863**	N/A	N/A	N/A

[7] When no final payment has been made it is marked as "not available".

2.9. ARTEMIS JU

2.9.1. Annex 16: Grant agreements signed (ARTEMIS JU 2010 - call 3)

№	GA number	Project acronym	Project title	Total costs (€)	Total national funding (€)	Artemis JU contribution (€)	Additional own resources (€)	Actual date
1.	269334	ASTUTE	Pro-active decision support for data-intensive environments	**13,784,026.85**	5,362,482.07	2,301,932.48	6,119,612.30	19/12/ 2011
2.	269336	D3CoS	Designing Dynamic Distributed Cooperative Human-Machine Systems	**14,548,703.65**	5,193,398.75	2,429,633.51	6,925,671.39	14/12/ 2011
3.	269354	ENCOURAGE	Embedded Intelligent Controls for Buildings with Renewable Generation and Storage	**6,368,737.60**	1,756,412.94	1,063,579.18	3,548,745.48	21/12/ 2011
4.	269356	HIGH PROFILE	High-throughput Production of FunctIonal 3D images of the brain	**16,920,598.00**	5,017,647.04	2,825,739.87	9,077,211.09	21/12/ 2011
5.	269374	IoE	Internet of Energy for Electric Mobility	**45,432,229.11**	14,370,762.28	7,587,182.26	23,474,284.57	21/12/ 2011
6.	269335	MBAT	Combined Model-based Analysis and Testing of Embedded Systems	**34,498,427.00**	11,398,412.00	5,761,237.31	17,338,777.69	22/12/ 2011
7.	269317	nSHIELD	New embedded Systems arcHItecturE for multi-Layer Dependable solutions	**13,469,296.50**	5,091,894.30	2,249,372.43	6,128,029.77	22/12/ 2011
8.	269362	PRESTO	ImProvements of industrial Real Time Embedded SysTems devel0pment process	**8,662,934.00**	2,540,068.00	1,446,709.98	4,676,156.02	14/12/ 2011
9.	269265	pSAFECER	Safety Certification of Software-intensive Systems with Reusable Components	**10,419,109.00**	2,599,302.68	1,739,991.20	6,079,815.12	14/12/ 2011
10.	269389	WSN DPCM	WSN Development, Planning and Commissioning & Maintenance ToolSet	**3,347,685.00**	1,607,670.00	559,063.40	1,180,951.60	19/12/ 2011
TOTAL				**167,451,747**	**54,938,050**	**27,964,442**	**84,549,255**	

2.9.2. Annex 17: Grant agreements to be signed[8] (Call 4 ARTEMIS-2011-1).

The decision giving the Executive Director the mandate to negotiate the top-8 ranked projects was adopted at the PAB meeting of 7 December 2011. The consortia were invited to negotiate the signature of the grant agreements.

№	GA number	Project acronym	Project title	Total costs (€)	Total national funding (€)	Artemis JU contribution (€)	Additional own resources(€)	Expected signature date
1.	295378	e-GOTHAM	Sustainable-Smart Grid Open System for the Aggregated Control, Monitoring and Management of Energy	**6,840,821.00**	2,535,138.00	1,142,417.10	3,163,265.90	Q3 2012
2.	295311	VeTeSS	Verification and Testing to Support Functional Safety Standards	**19,235,769.00**	6,254,977.38	3,212,373.42	9,768,418.20	Q3 2012
3.	295371	CRAFTERS	ConstRaint and Application driven Framework for Tailoring Embedded Real-time Systems	**17,591,554.00**	6,162,910.45	2,937,789.51	8,490,854.04	Q2 2012
4.	295372	DEMANES	Design, Monitoring and Operation of Adaptive Networked Embedded Systems	**20,539,440.00**	6,721,708.00	3,430,086.46	10,387,645.54	Q4 2012
5.	295373	nSAFECER	nSafety Certification of Software-Intensive Systems with Reusable Components	**16,304,267.00**	4,620,783.75	2,722,812.59	8,960,670.66	Q3 2012
6.	295364	DESERVE	DEvelopment platform for Safe and Efficient dRiVE	**25,916,285.82**	7,513,016.06	4,328,019.73	14,075,250.03	Q4 2012
7.	295354	SESAMO	Security and Safety Modelling	**12,013,116.40**	3,220,723.82	1,968,114.42	6,824,278.16	Q2 2012
8.	295397	VARIES	VARiability In safety critical Embedded Systems	**13,173,272.56**	5,147,833.25	2,199,936.49	5,825,502.82	Q2 2012
9.	295440	PaPP	Portable and Predictable Performance on Heterogeneous Embedded Manycores	**10,497,246.60**	3,017,760.00	1,727,322.25	5,752,164.35	Q3 2012

[8] Concerning the ARTEMIS JU, DG RTD will also update the information on the ARTEMIS-2011-1 call in the next year's Commission's report, in case there are changes in the list of the proposals selected for funding under that call

№	GA number	Project acronym	Project title	Total costs (€)	Total national funding (€)	Artemis JU contribution (€)	Additional own resources(€)	Expected signature date
TOTAL				**142,111,772.38**	**45,194,850.71**	**23,668,871.97**	**73,248,049.70**	

2.9.3. Annex 18: Project reviews of ARTEMIS past calls:

- Project reviews – Call 2009

Project		Review date	Outcome
1	pSHIELD	22/03/2011	Red light. Poor quality deliverables, management by the coordinator is seriously lacking.
		29/09/2011	Coordinator changed Recovering from major delays. Extended till 31/12/2011
2	SMECY	24/03/2011	Good progress. Project recovered from long delay in contracts.
3	SMARCOS	7/04/2011	Good progress but consortium cohesion needs to be improved ("islands")
4	eSONIA	12/04/2011	Minor issues with deliverables. Interim review requested by the consortium
		14/11/2011	Interim (informal = no external experts) review requested by the consortium to address issues raised in last annual review. The consortium has addressed these issues well. Project now fully on track (green light).
5	ACROSS	26/05/2011	Project has made good progress.
6	CHIRON	08/06/2011	Project is on track. An intermediate review is planned to check readiness for clinical trial.
		11/11/2011	Interim review to check readiness for clinical trial. Good progress reported. Change from clinical trial to observational study.
7	iFEST	30/06/2011	Project has made good progress.
8	R3-COP	30/06/2011	Good progress, though ambition is very high (=risk); being addressed
9	RECOMP	28/07/2011	Good progress
10	POLLUX	27/5/2011	Good progress
		26/09/2011	Good progress
11	ME3GAS	01/07/2011	Good progress. Link with eDIANA to be studied.
12	SIMPLE	13/07/2011	Good progress

- Project reviews – Call 2008

Project		Review date	Outcome
1	CAMMI	27/04/2011	Project has made good progress, but still has a lot to do in a short time frame. Very strict monitoring needed
		23/11/2011	Final review meeting showed good results. Final reports by 15/02/2012
2	CHARTER	10/06/2011	Excellent progress
3	eDIANA	15/03/2011	Generally good. Good progress on all activities, though thermal modelling task remains weak (over-simplified models used). Consortium advised to contact expert in more advanced thermal models (done, in the meantime).
4	SYSMODEL	09/03/2011	Generally good. Good progress and all of the previous comments and recommendations were addressed. Some deliverables require more detail (specifically, references to academic courses should contain at least an abstract – the course content itself is copyright).
5	iLAND	01/06/2011	Good progress
6	INDEXYS	12/7/2011	Good progress, 6 months extension.
7	SCALOPES	28/03/2011	Final review with good demonstrations.
8	CHESS	15/04/2011	Good progress, but some delay. Will ask for 3 month extension.
9	SMART	22/09/2011	Concern: big delay in national contracts. Request for 9 months extension.
10	CESAR	7+8/7/2011	Excellent progress
		20/10/2011	IT cluster: proved good progress in the rail sector
11	EMMON	21/06/2011	Good progress
12	SOFIA	none	Final review: Q1 2012 (project extended till 31/03/2012)

2.10. ENIAC JU

2.10.1. Annex 19: Grant agreements signed in 2011 (call 3, launched in 2010)

10 grant agreements relating to call 3, launched in 2010, have been signed during 2011. The complete overview is detailed below:

№	GA N°	Project acronym	Project title	Call ID	JU contribution (€)	In-kind contribution (€)	National funding (€)	Total contribution	Date of GA signature
1.	270683	ARTEMOS	Agile RF Transceivers and Front-Ends for Future Smart Multi-Standard Communications Applications	3	6,642,026.50				08/11/2011
2.	270707	EnLight	Energy Efficient and Intelligent Lighting Systems	3	6,899,794.00				30/11/2011
3.	270692	EPAMO	Energy-efficient piezo-MEMS tunable RF front-end antenna systems for mobile devices	3	2,224,524.00				18/05/2011
4.	270722	ERG	Energy for a green society	3	4,293,852.00				07/12/2011
5.	270716	HEECS	High Efficiency Electronics Cooking Systems	3	833,894.00				05/10/2011
6.	270693	MotorBrain	Nanoelectronics for Electric Vehicle Intelligent Failsafe Drive Train	3	6,112,614.00				20/09/2011
7.	270701	NANOCOM	Reconfigurable Microsystem Based on Miniaturized and Nanostructured RF-MEMS	3	930,284.00				07/12/2011
8.	270689	NanoTEG	Nanostructured ThermoElectric Systems for Green Transport Applications	3	1,016,910.00				07/12/2011
9.	270687	PARSIMO	Partitioning and Modeling of SiP	3	814,244.00				18/10/2011
10.	282557	TOISE	Trusted Computing for European Embedded Systems	3	3,491,271.00				12/07/2011
Total					**33,195,414.00**				

№	GA N°	Project acronym	Project title	Call ID	JU contribution (€)	In-kind contribution (€) *	National funding (€) *	Total contribution *	Date of GA signature
1.	270683	ARTEMOS	Agile RF Transceivers and Front-Ends for Future Smart Multi-Standard Communications Applications	3	6,642,026.50	25,554,478	8,543,956	40,740,460.50	08/11/2011
2.	270707	EnLight	Energy Efficient and Intelligent Lighting Systems	3	6,899,794.00	23,582,899	10,833,438	41,316,131.00	30/11/2011
3.	270692	EPAMO	Energy-efficient piezo-MEMS tunable RF front-end antenna systems for mobile devices	3	2,224,524.00	5,826,370	5,269,609	13,320,503.00	18/05/2011
4.	270722	ERG	Energy for a green society	3	4,293,852.00	13,279,305	8,138,528	25,711,685.00	07/12/2011
5.	270716	HEECS	High Efficiency Electronics Cooking Systems	3	833,894.00	4,009,515	899,690	5,743,099.00	05/10/2011

№	GA N°	Project acronym	Project title	Call ID	JU contribution (€)	In-kind contribution (€) *	National funding (€) *	Total contribution *	Date of GA signature
6.	270693	MotorBrain	Nanoelectronics for Electric Vehicle Intelligent Failsafe Drive Train	3	6,112,614.00	19,468,130	11,021,728	36,602,472.00	20/09/2011
7.	270701	NANOCOM	Reconfigurable Microsystem Based on Miniaturized and Nanostructured RF-MEMS	3	930,284.00	3,418,736	1,221,550	5,570,570.00	07/12/2011
8.	270689	NanoTEG	Nanostructured ThermoElectric Systems for Green Transport Applications	3	1,016,910.00	3,931,502	1,140,869	6,089,281.00	07/12/2011
9.	270687	PARSIMO	Partitioning and Modeling of SiP	3	814,244.00	2,214,294	1,847,175	4,875,713.00	18/10/2011
10.	282557	TOISE	Trusted Computing for European Embedded Systems	3	3,491,271.00	12,995,835	5,048,449	21,535,555.00	12/07/2011
Total					**33,259,413.50**	**114,281,064**	**53,964,992**	**201,505,469.50**	

* Amounts after negotiation

2.10.2. Annex 20: Grant agreements signed in 2011 (calls 4 and 5, launched in 2011)

12 grant agreements relating to calls 4 and 5, both launched in 2011, have been signed during 2011. The complete overview is detailed below:

№	GA N°	Project acronym	Project title	Call ID	JU contribution (€)	In-kind contribution (€)	National funding (€)	Total contribution	Date of GA signature
1.	296108	DCC+G	DC components and grid	4	3,075,756	9,543,817	5,798,122	18,417,695	End of 2012
2.	296132	E2SG	Energy to smart grid	4	5,683,465	17,016,933	11,332,316	34,032,714	End of 2012
3.	296212	ELESIS	European library-based flow of embedded silicon test instruments	4	4,005,340	15,120,090	4,858,644	23,984,074	End of 2012
4.	296127	GreenElec	Green electronics – sustainable product manufacturing	4	1,729,014	5,886,768	2,737,602	10,353,384	End of 2012
5.	296104	PANORAMA	Ultra wide context aware imaging	4	3,807,394	13,358,210	5,633,156	22,798,760	End of 2012
6.	296102	SILVER	Semiconductor industry leading towards viable energy recovery	4	1,786,100	6,248,544	2,660,561	10,695,205	End of 2012
Sub total (Call 4)					**20,087,069**	**67,174,362**	**33,020,401**	**120,281,832**	
7.	304725	BATTMAN	Battery management with solar powered devices	5	964,176	3,507,437	1,301,891	5,773,504	End of 2012
8.	304712	EEM450PR	European equipment and materials 450mm pilot line readiness	5	14,048,060	54,803,830	15,268,234	84,120,124	End of 2012
9.	304668	EPT300	Enabling power technologies on 300mm wafers	5	7,290,356	27,467,751	8,896,712	43,654,819	End of 2012
10.	304683	HIPER3	Heterogeneous integration process for emerging 3D/SiP	5	14,074,453	50,780,857	19,422,848	84,278,158	End of 2012
11.	304603	IDEAS	Interactive power devices for efficiency in automotive with increased reliability and safety	5	1,661,669	4,854,229	3,434,211	9,950,109	End of 2012
12.	304653	MIRTIC	Micro retina thermal infrared	5	4,140,183	15,771,618	5,679,714	24,791,515	End of 2012
Sub total (Call 5)					**42,178,897**	**157,185,722**	**54,003,610**	**253,368,229**	
Grand Total - 2011					**62,265,966**	**224,360,084**	**87,024,011**	**373,650,061**	