Fuel Cells and Hydrogen Joint Undertaking (FCH JU)
Annual Activity Report 2011

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EXECUTIVE SUMMARY

The year 2011 was the first full year for the FCH JU as an autonomous legal entity. Significant results were achieved both in the operational area and in the administrative area.

The main operational objectives concerned the negotiation of the call 2010 proposals and the signature of the related grant agreements, the evaluation of the call 2011 and the revision of the Multi-Annual Implementation Plan (MAIP) 2008-2017. This was carried out successfully with (1) the signature of 26 grant agreements for an amount of 83.8 M € (2) the evaluation of the 80 eligible proposals submitted for the call 2011 of which 53 passed the threshold at the evaluation stage leading to the approval by the Governing Board on 22 November 2011 of a list ranked in priority order of 30 proposals (and a reserve list of an additional 23 proposals) to start negotiations in view of concluding grant agreements and (3) the update of programme targets and priorities defined in the revised MAIP 2008-2017 adopted by the Governing Board on 22 November 2011.

An important event was the first Programme Review day organised on 22 November 2011 in conjunction with the 2011 Stakeholders General Assembly enabling a public assessment of the progress of the programme towards its objectives (see Chapter 1.3.9).

The year saw also the first interim evaluation of the FCH JU[1] carried out by the Commission with the assistance of a group of independent experts who concluded that the FCH JU represents a valuable instrument for the EU and made a number of recommendations to improve its effectiveness.

Another key achievement in 2011 was the adoption of Council Regulation 1183/2011 on 14 November 2011 amending the FCH JU founding regulation in order to take into consideration the in-kind contributions from all legal entities participating (and not only the industry) in the activities in the matching of the contribution of the Union and which will result in improved funding rates.

In the field of administration and finance important milestones were reached. The Establishment Plan (18 temporary agents and 2 contract agents) is fully filled with 8 new staff members taking up duties during the year. New procedures to complete and strengthen the internal control system were adopted, in particular for review and acceptance of periodic reports and cost claims and for ex-post audit of beneficiaries and were implemented as the first cost claims were received and the first audits were launched (see Chapter 4.3). The accounting system was validated by the Accountant on 21 November 2011.

Finally, the actions implemented to mitigate the two critical risks identified in the frame of the Risk Management process early 2011 enabled to remove the critical risk linked to the impact of funding rates on attractiveness of the programme as indicated above and to significantly reduce the risk level of IT in the organization in 2011 as confirmed by the risk management exercise carried out in October 2011 (see Chapter 2.1.4). This annual exercise resulted in the identification of one critical risk namely the risk of nonperformance or non-achievement of objectives due to staff overload. Further analysis of the workload and its impact on resources is on-going to determine how to mitigate this risk.

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[1] The report published on 20 May is available on the web (**http://www.fch-ju.eu/sites/default/files/EvalFuelCellHydroReport2011_ALLBROCHURE_WEB.pdf**)

1. POLICY ACHIEVEMENTS

The Fuel Cells and Hydrogen Joint Undertaking (FCH JU) represents a public-private research partnership at European level. Its members are the European Union represented by the European Commission as public representative, the 'New Energy World Industry Grouping Fuel Cell and Hydrogen for Sustainability – NEW-IG' (hereafter "the IG"), representing European companies and the 'New European Research Grouping on Fuel Cells and Hydrogen - N.ERGHY' (hereafter "the RG"), representing European research organisations and universities.

Fuel cell and hydrogen technologies have a huge potential to contribute to a number of Europe's key policy goals, including the reduction of CO_2 emissions of the energy system and particularly transport, improving energy security and promoting innovation-driven growth and employment. The European Strategic Energy Technology (SET) Plan has identified fuel cells and hydrogen among the technologies needed for Europe to achieve the targets for 2020 – 20% reduction in greenhouse gas emissions; 20% share of renewable energy sources in the energy mix and 20% reduction in primary energy use – as well as to achieve the long-term vision for 2050 towards decarbonisation. This is in line with the Commission's Communication "Energy for a Changing World – An Energy Policy for Europe", the goals of the Lisbon Strategy and the European Strategic Transport Technology Plan.

In order to realise these public benefits, the FCH JU brings public and private interests together in a new, industry-led implementation structure, ensuring that the jointly defined research programme better matches industry's needs and expectations, with the objective of accelerating the commercialisation of hydrogen and fuel cell technologies. FCH JU is a Joint Technology Initiative (JTI) within the Seventh Framework Programme 2007 – 2013 (FP7) and implemented as a Joint Undertaking set up by the Council Regulation N° 521/2008 of 30 May 2008 for a period up to 31 December 2017.

This Council Regulation was amended on 14 November 2011 (Council Regulation N° 1183/2011 of 14 November 2011 – OJ L 302, 19.112011, p.3) in order to take into consideration the in-kind contributions from other legal entities participating in its activities (mainly research organisations including universities and research centres) in the matching of the Union's contribution.

The FCH JU has a total financing of 947 EUR million for the whole period. The Union contributes with a maximum of 470 EUR million covering operational and running costs. The operational costs of the JU shall be covered through the financial contribution of the Union and through in-kind contributions from the legal entities participating in the activities. The contribution from the participating legal entities shall at least match the financial contribution of the Union.

The mission of the FCH JU is to support long-term and breakthrough-orientated research, research and technological development, as well as demonstration and support actions, including pre-normative research, following open and competitive calls for project proposals, independent evaluation and the conclusion of a Consortium Agreement and a Grant Agreement. In addition, the FCH JU pursues support activities such as communication and dissemination of information on the technologies and its projects.

1.1 KEY OBJECTIVES 2011

The key operational objectives for the autonomous FCH JU in 2011 are related to two Calls for Proposals, those of 2010 and 2011. As regards the 2010 call, the negotiation stage took place in 2011 with the aim of concluding grant agreements for selected projects by the year end. The negotiations were closed successfully. More details on the outcome are shown below in Chapters 1.3.1 and 1.3.3. Concerning the 2011 call, the objective was to complete the evaluation stage in 2011. The evaluation was carried out in September. Chapters 1.3.4 – 1.3.6 describe the process and the results in detail. As regards communication activities, the main objectives in 2011 were the efficient dissemination of information to potential participants on the opportunities offered by the Calls for Proposals, making the programme known to stakeholders and raising political awareness on the technology readiness and commercialisation prospects of the technologies. See Chapter 2.2 for details.

In addition to the operational objectives, tenders were launched in order to produce comparative studies on the benefits of fuel cells and hydrogen in different application areas.

1.2 RESEARCH ACTIVITIES

In 2011, Grant Agreements were concluded for the Call for Proposals 2010 and the Call for Proposals 2011 was launched. The evaluation of 2011 proposals was completed and lists of projects to start negotiation with were approved by the Governing Board.

1.2.1 FCH JU Multi-Annual Implementation Plan

The research agenda outlining the research and demonstration activities to be supported by the FCH JU is set out in the Multi-Annual Implementation Plan (MAIP) of the FCH JU. The MAIP was adopted by the Governing Board on 15 May 2009.

The MAIP was foreseen to be a living document, revised and updated regularly to respond to technological and market developments when deemed appropriate by the Governing Board. Accordingly, the process for the first revision of the MAIP was initiated in November 2010 with the focus on updating programme targets and priorities to correspond to technological and market developments; development of strategy for regulations, codes and standards; and elaboration of strategy for collaboration with Member States and Regions. This process was completed in 2011 and a revised MAIP was adopted by the Governing Board on 22 November 2011.

The MAIP is translated into annual research priorities each year in an Annual Implementation Plan (AIP) which sets out the topics for the Call for Proposals.

1.2.2 FCH JU Scientific Priorities 2011 and 2012

The RTD Priorities and Objectives included in the 2011 Annual Implementation Plan (AIP) served as the basis for the topics included in the Call for Proposals 2011, the fourth for the FCH JU.

The topics in the 2011 Call cover all the five application areas defined in the AIP 2011: Transport & Refuelling Infrastructure; Hydrogen Production & Distribution; Stationary Power Generation & Combined Heat & Power (CHP); Early Markets; and Cross-Cutting Activities. See Chapter 6.1 for a complete list of topics.

As regards the process for drafting the RTD priorities for 2011 as well as the topics for the call, they were initially formulated by the Application Area Working Groups led by representatives of the member companies of the IG. They were further elaborated in consultations with the relevant services of the Commission and the RG. The RTD Priorities and call topics were subsequently put forward for consultation of the Scientific Committee and the FCH JU States Representatives Group and their comments were considered for the final draft put forward for decision of the Governing Board.

The drafting of the RTD Priorities and call topics for 2012 was initiated during the second quarter of 2011 by the Application Area Working Groups. In considering the topics, account was taken of the response to the 2011 call. The drafting process was similar to that followed for the AIP 2011.

1.3 CALLS FOR PROPOSALS

During 2011 the FCH JU finalised the selection process for the Call for Proposals 2010 by signing Grant Agreements for 26 projects. In addition, a new Call for 2011 was published on 03 May 2011 and closed on 18 August 2011. The evaluation of the 2011 proposals was carried out in September 2011. A list of 30 proposals to start negotiations with was approved by the Governing Board on 22 November 2011.

The Calls for Proposals are managed under the responsibility of the Executive Director based on the principles of excellence, transparency, fairness and impartiality, confidentiality, efficiency, speed and ethical considerations. In managing the Call process, he has been supported by the Programme Office staff.

1.3.1 Call for Proposals 2010: Selection of projects

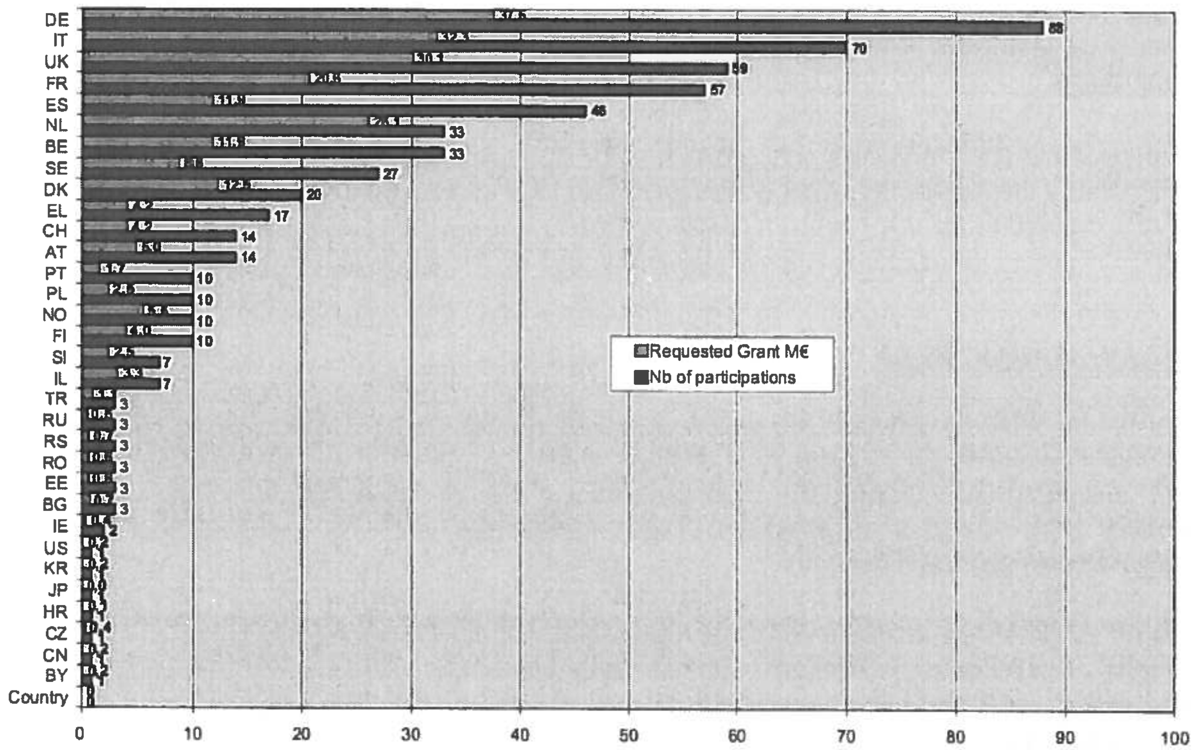
The Call for Proposals 2010 was published on 18 June 2010 with an indicative budget of € 89.1 million. The submission deadline for the Call was 13 October 2010. The evaluation of submitted projects was carried out from 1-19 November 2010[2] by 32 independent experts. In addition, a Chairperson oversaw the consensus phase and two independent observers were invited to monitor that the evaluation procedure was carried out in a fair, impartial and confidential manner. The Independent Observer's Reports were issued by the end of 2010.

Out of 71 proposals submitted, 2 were deemed ineligible. Of the rest, 43 proposals passed the thresholds at the evaluation stage.

Graphs 1.3.1(a)-(c) below provide statistics on the call participation and the evaluation process.

[2] The individual (remote) evaluation took place from 1-10 November 2010. The Consensus Meetings were held from 15-17 November and the panel meeting was held on 18-19 November 2010.

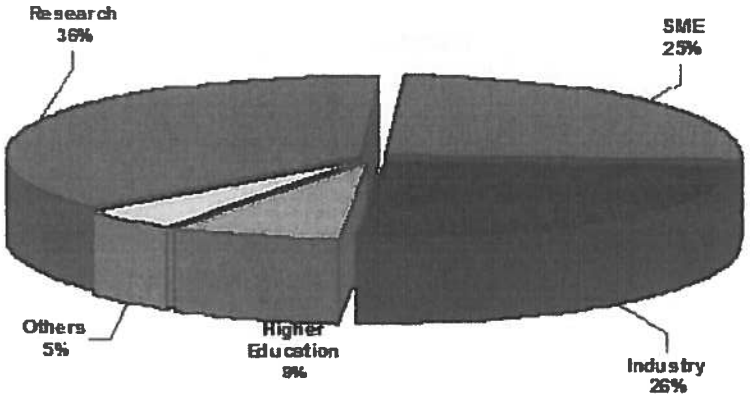
Graph 1.3.1(a): Call for Proposals 2010:
Participation in project proposals by country[3]



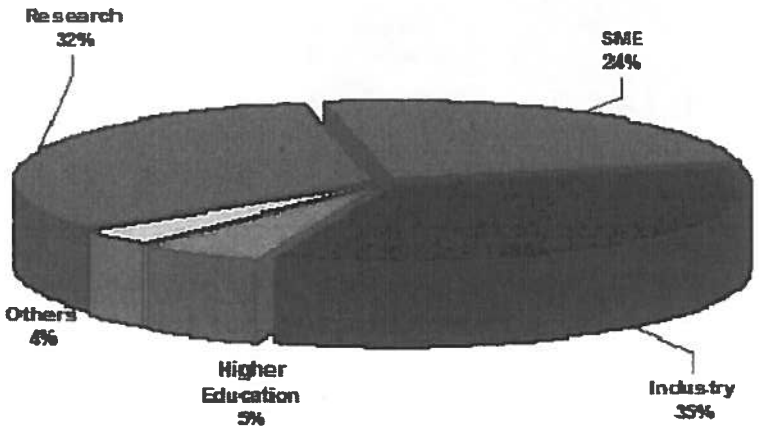
[3] Includes all project proposals submitted by the deadline before evaluations.

Graph 1.3.1(b): Call for Proposals 2010:
Participation in project proposals by participant type[4]

By project participant number (total participants: 559)

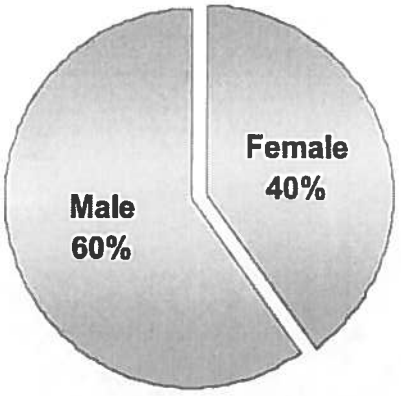


By requested contribution breakdown (total funding requested: €230.5 M)

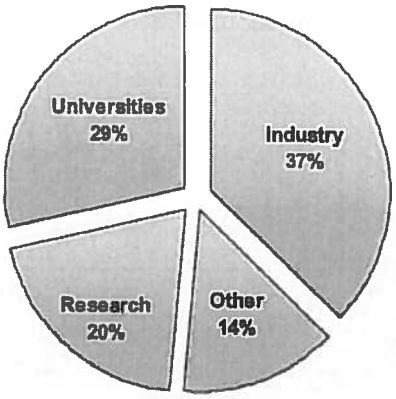


[4] Includes all project proposals submitted by the deadline before evaluations.

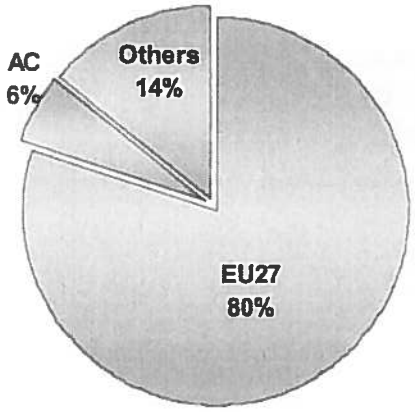
Graph 1.3.1(c): Call for Proposals 2010: Evaluators
A) By gender



B) By organisation



C) By nationality



1.3.2 Call for Proposals 2010: Grant Agreements

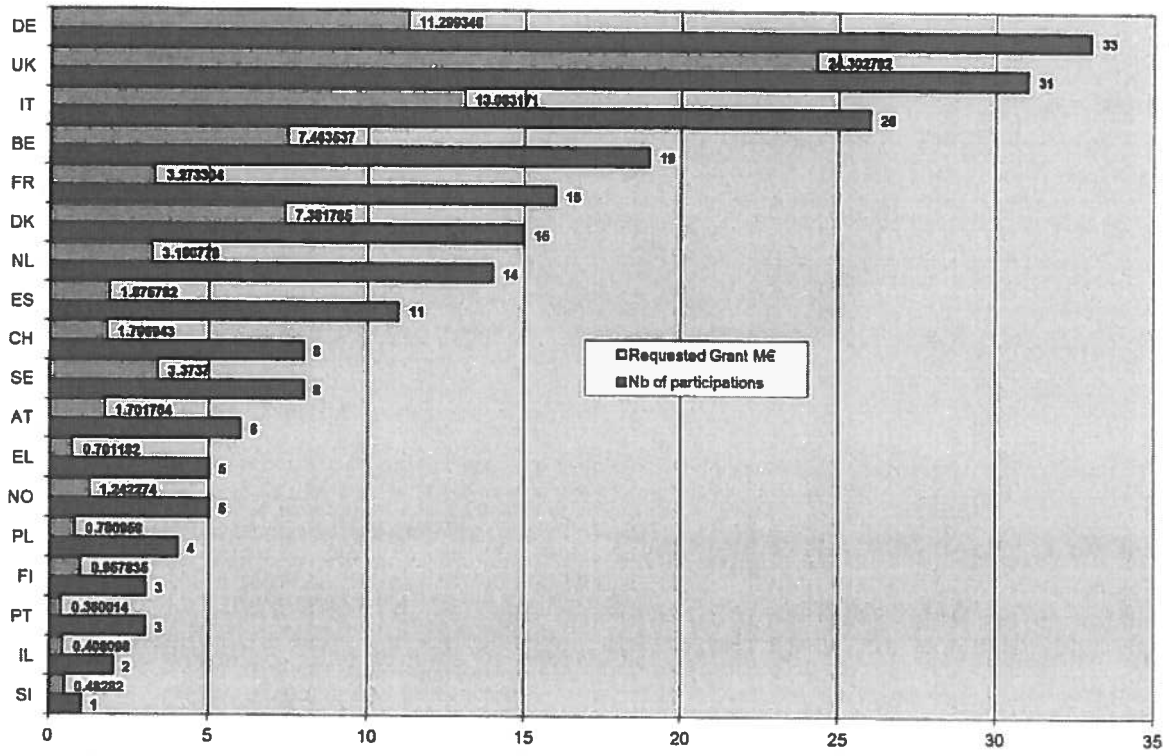
In the light of the available budget, the Governing Board approved on 10 March 2011 a list of 27 proposals with additional 16 on the reserve list, ranked in priority order according to the evaluation results, to start negotiations to conclude Grant Agreements with them.

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 negotiation and one proposal was selected from the reserve list). Grant agreements were concluded with all these projects by the end of 2011. First payments were also made to all project consortia before the year end.

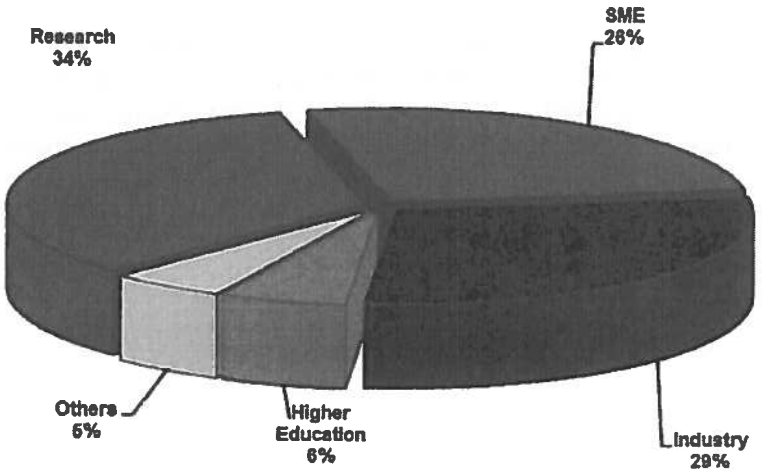
Graphs 1.3.2(a)-(c) below provide statistics on the distribution of funding by country and participant type, as well as by application area, as per the Grant Agreements concluded.

In graph 1.3.2 (b), the legal entities corresponding to the "other" category correspond to national or regional associations registered by the Commission (Regione Liguria, European Regions and Municipalities Partnership on Hydrogen and Fuel Cells, Kobenhavn Kommune, Greater London Authority, Health and Safety Executive, Aberdeen City Council, Vlaamse Vervoersmaatschappij De Lijn, WaterstofNet vzw).

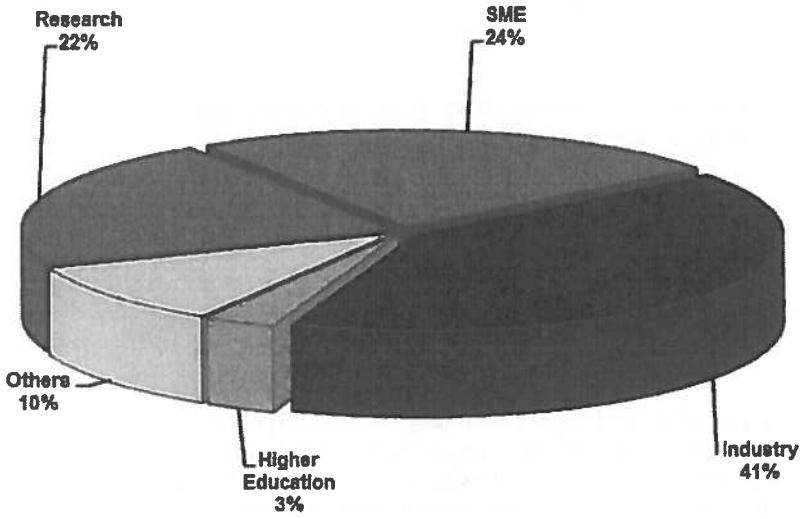
Graph 1.3.2(a): Call for Proposals 2010:
Projects granted funding by country



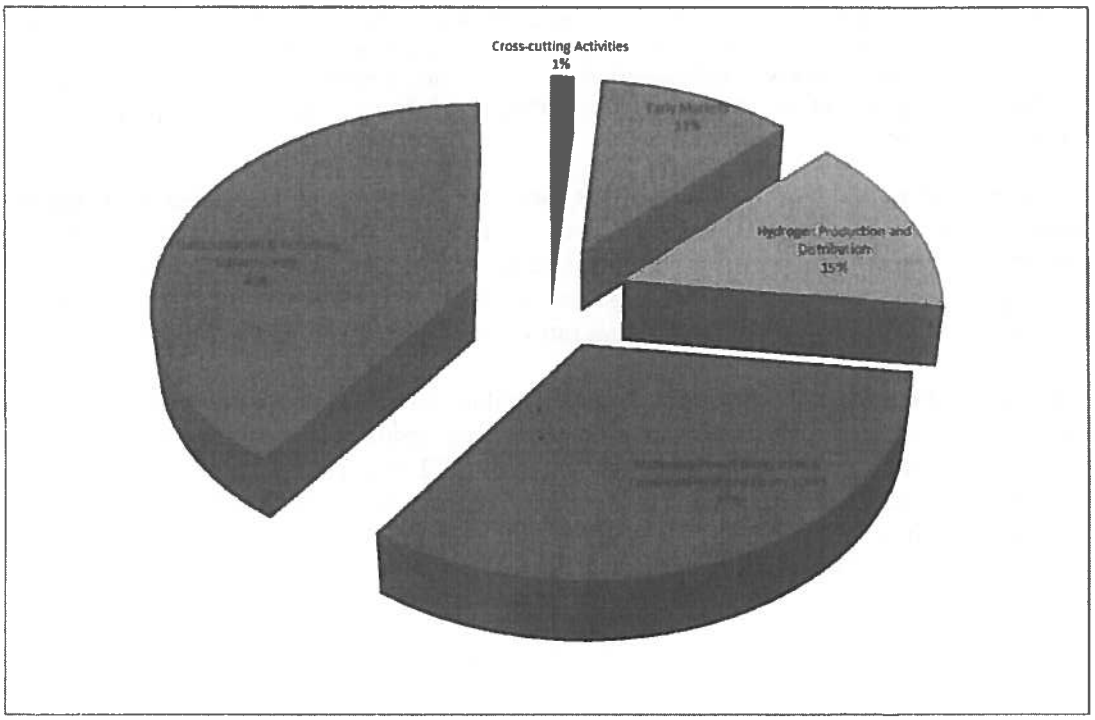
Graph 1.3.2(b): Call for Proposals 2010:
Projects granted funding by participant type
A) By project participant number (Total participants: 210)



B) By requested contribution breakdown (Total funding requested: €83.7M)



Graph 1.3.2 (c): Call for Proposals 2010:
Funding distribution by Application Area



Total funding granted: €83.7 million

1.3.3 Call for Proposals 2010: Funding rates

For the 2010 Call for Proposals, the application of the Amendment to the Council Regulation was not possible as this Amendment was not approved when the matching calculation took place.

The matching obligation and the funding rates were determined among others by Articles 2.2, 12.3 and 15.3 of the Statutes[5], which stipulate that

Article 2
Members

2. *The Industry Grouping shall:*

   -[...]

   - ensure that industry's contribution to the achievement of the RTD activities funded by the FCH Joint Undertaking at least matches the Community contribution,

Article 12
Sources of financing

3. *The operational costs of the FCH Joint Undertaking shall be covered through the financial contribution of the Community, and through in-kind contributions from the legal entities participating in the activities. The industry contribution shall at least match the Community's contribution. Other contributions to co-funding of activities will be considered as receipts in accordance with the Rules of Participation of the Seventh Framework Programme.*

Article 15
Funding of Activities

3. *The upper funding limits of the Community financial contribution in projects shall be aligned to comply with those laid down by the Rules for Participation of the Seventh Framework Programme. In case lower levels of funding will be necessary to comply with the matching principles referred to in Article 12(3), the decreases shall be fair and balanced proportionally with the above mentioned upper funding limits of the Rules of Participation of the Seventh Framework Programme for all categories of participants in each individual project.*

A large number of participants in the projects were research centres and other non-industry participants whose contribution to projects was currently not considered in the matching requirement. Therefore, the industry contribution alone had shown not to be sufficient to fulfil the matching requirement while maintaining funding rates that were in line with the nominal rates, set at a level corresponding to the funding rates in the Seventh Framework Programme.

In practice, it was necessary to reduce the nominal funding rates after the submissions of project proposals and evaluation in order to meet the matching requirement. In the 2010 Call for Proposals, funding rates were reduced by the factor of 0.72 producing rates of approximately 36% for industrial participants and 54% for other participants (eligible costs for RTD and demonstration activities), as opposed to initial nominal rates of 50% and 75%, respectively.

[5] Statutes annexed to the Council Regulation (EC) No 521/2008 of 30 May 2008 setting up the Fuel Cells and Hydrogen Joint Undertaking; O.J. L 153, 12.6.2008, p.1

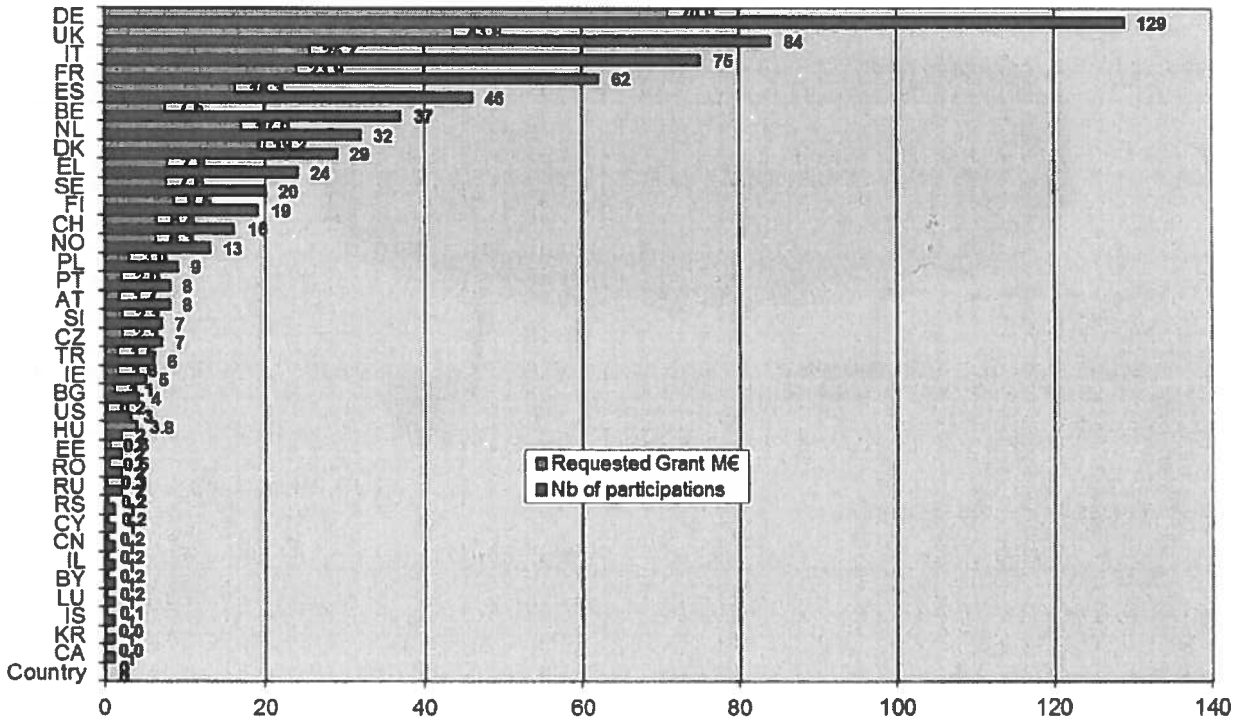
1.3.4 Call for Proposals 2011: Selection of projects

The Call for Proposals 2011 was published on 03 May 2011 with an indicative budget of € 109 million. The submission deadline for the Call was 18 August 2011. The evaluation of submitted projects was carried out from 2-23 September 2011[6] by 37 independent experts. In addition, two Chairpersons (one chair and one vice chair) oversaw the consensus phase and one independent observer was invited to monitor that the evaluation procedure was carried out in a fair, impartial and confidential manner. The Independent Observer's Reports were issued by the end of 2011.

Out of 82 proposals submitted, 2 were deemed ineligible. Of the rest, 53 proposals passed the thresholds at the evaluation stage.

Graphs 1.3.4(a)-(c) below provide statistics on the call participation and the evaluation process.

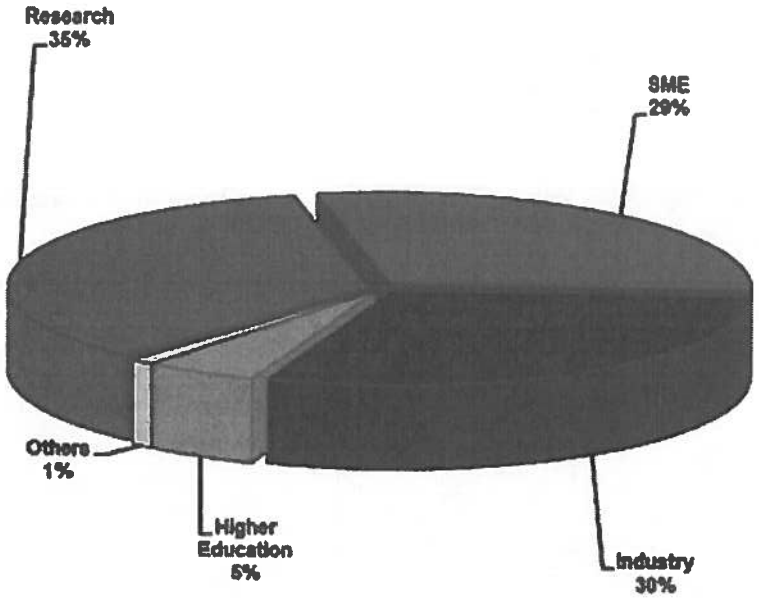
Graph 1.3.4(a): Call for Proposals 2011: Participation in project proposals by country[7]



[6] The individual (remote) evaluation took place from 2-16 September 2011. The Consensus Meetings were held from 19-22 September and the panel meeting was held on 22-23 September 2011.
[7] Includes all project proposals submitted by the deadline before evaluations.

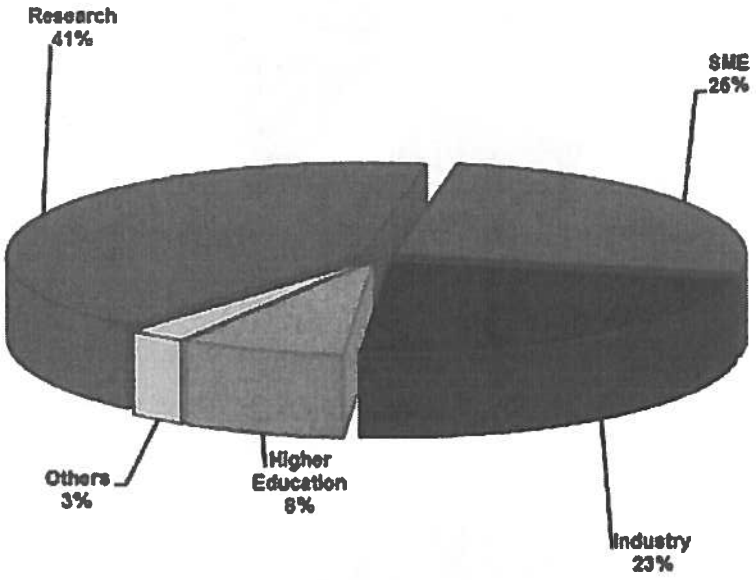
Graph 1.3.4(b): Call for Proposals 2011:
Participation in project proposals by participant type[8]

By project participant number (total participants: 660)



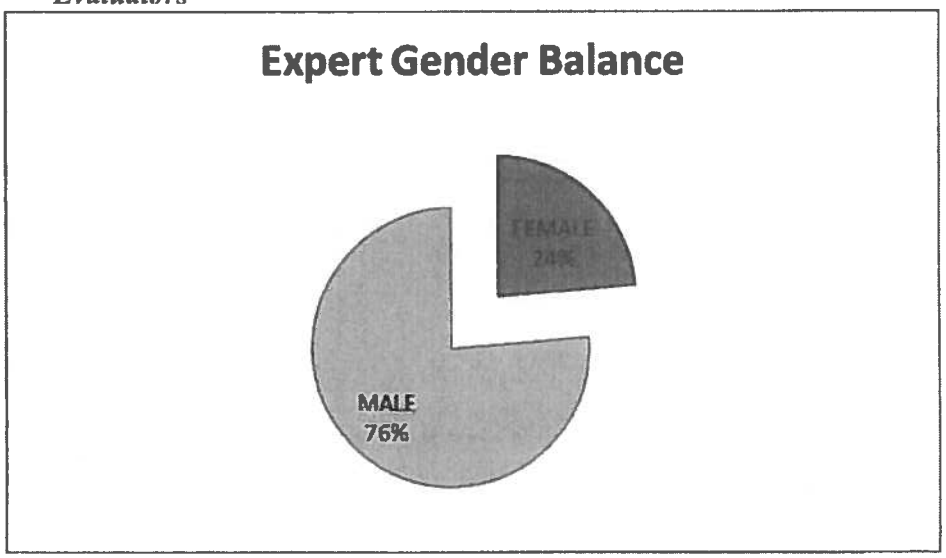
[8] Includes all project proposals submitted by the deadline before evaluations.

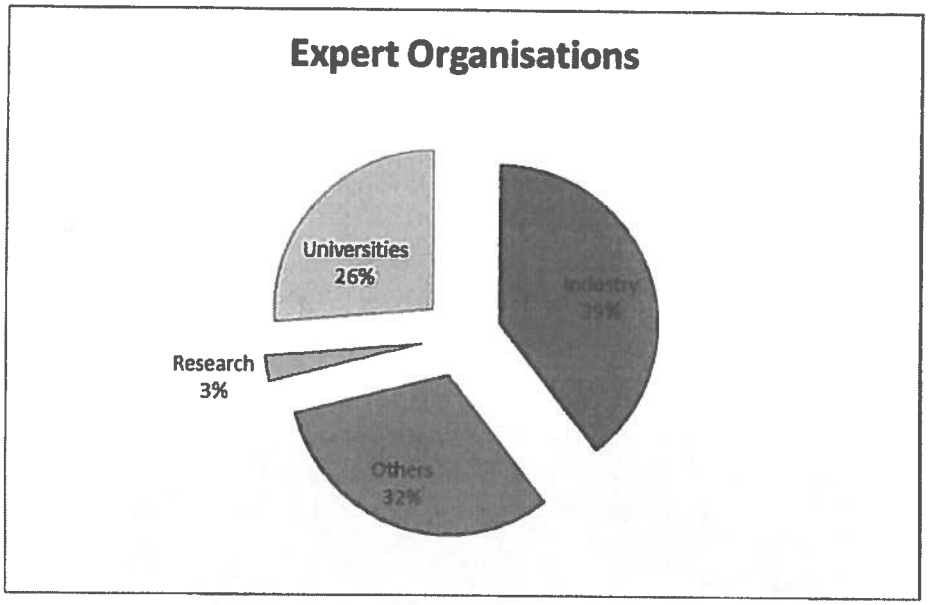
By requested contribution breakdown (total funding requested: €282.4 M)

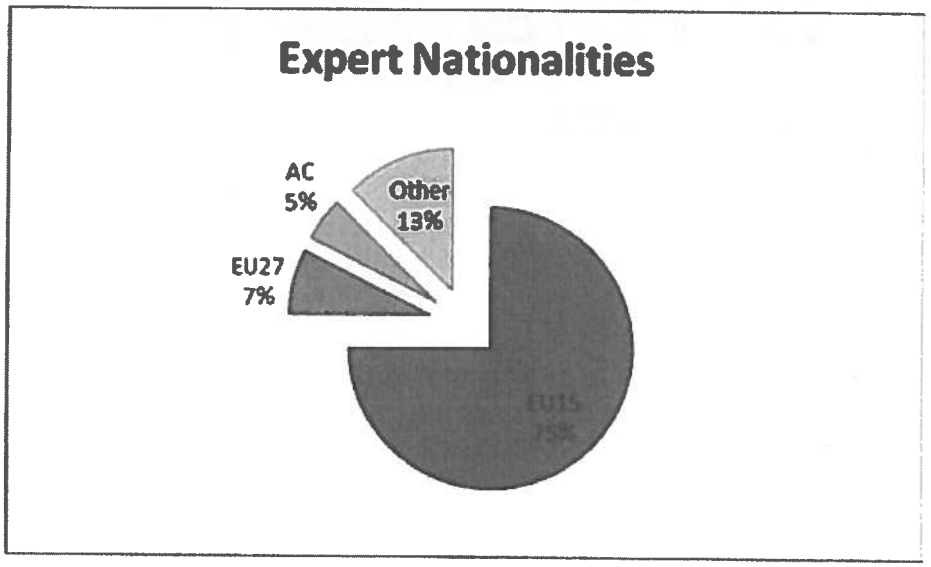


Graph 1.3.4(c): Call for Proposals 2011

Evaluators







1.3.5 Call for Proposals 2011: Grant Agreements

In the light of the available budget, the Governing Board approved on 22 November 2011 a list of 30 proposals with additional 23 on the reserve list, ranked in priority order according to the evaluation results, to start negotiations to conclude Grant Agreements with them.

The negotiations started on 28 November 2011. Grant agreements are expected to be concluded in Q2 2012.

1.3.6 Call for Proposals 2011: Funding rates

For the 2011 Call for Proposals, the Governing Board decided to take into consideration the Amendment to the Council Regulation (Council Regulation N° 1183/2011 of 14 November 2011) which amended Article 12 paragraph 3 of the Statutes of the Fuel Cells and Hydrogen Joint Undertaking as set out in the Annex to Regulation (EC) N° 521/2008 as follows:

'3. The operational costs of the FCH Joint Undertaking shall be covered through the financial contribution of the Union, and through in-kind contributions from the legal entities participating in the activities. The contribution from the participating legal entities shall at least match the financial contribution of the Union.

Receipts shall be dealt with in accordance with the Rules of Participation set out in the Decision No 1982/2006/EC.

This paragraph shall apply from the date on which the Research Grouping became member of the FCH Joint Undertaking.';

Nevertheless, the contribution from the legal entities participating in the activities of the 53 proposals above threshold had shown not to be sufficient to fulfil the matching requirement while maintaining funding rates that were in line with the nominal rates, set at a level corresponding to the funding rates in the Seventh Framework Programme.

In practice, it was necessary to reduce the nominal funding rates after the submissions of project proposals and evaluation in order to meet the matching requirement. In the 2011 Call for Proposals, funding rates were reduced by the factor of 0.80 producing rates of approximately 40% for industrial participants and 60% for other participants (eligible costs for RTD and demonstration activities), as opposed to initial nominal rates of 50% and 75%, respectively.

1.3.7 Call for Proposals 2012: Background

The Call will comprise 31 Topics based on the 2011 RTD Priorities and covering all five application areas described in the AIP 2012. The estimated FCH JU financial contribution to the Call is € 77.5 million. Please see Table 1.3.7 below for a complete list of topics and the planned budget distribution.

Table 1.3.7: Topics called for in the 2012 Call for Proposals and the corresponding indicative FCH JU funding

No.	Topic	Scope	Indicative FCH JU Funding Million €
Transportation & Refuelling Infrastructure			**26.0**
1	*Large-scale demonstration of road vehicles and refuelling infrastructure V*	Minimum of 5 buses and/or minimum of 10 passenger cars per site Station hydrogen production efficiency target 50 – 70% Potential to reduce cost of the vehicle by 25% for the next generation. Minimum operation: 12 months or 10,000 hours	
2	*Next Generation European Automotive Stack*	Development of automotive PEM stack Demonstration of durability of at least 2,000 hours; degradation to prove durability target of 5,000 hours Several technical targets given: power rating 95kW, max T of 95C, average cell voltage under specified conditions, etc…	
3	*Compressed hydrogen on-board storage (CGH2)*	Options: Type III or IV tanks Development/optimisation of fibre to improve load sharing between fibres System approach needed, including pressure regulators, valves, sealing, sensors, etc…	
4	*Development of peripheral components for automotive fuel cell systems*	Advanced research and development for next generation balance of plant components for PEM fuel cells in transportation applications. Air compressors, anode recirculation modules, air humidifiers, air processing units Improve lifetime and reliability, reduction of cost	
5	*New catalyst structures and concepts for automotive PEMFCs*	Catalysts and electrode layers to reduce loading; Pt loading < 0.1g/kW Robust and corrosion resistant catalyst supports, preferably for high T Lifetime >5,000 hours dynamic operation	

No.	Topic	Scope	Indicative FCH JU Funding Million €
6	*Fuel cell systems for airborne application*	The overall objective is to design, develop and flight test an aircraft related fuel cell system against flight / application specific requirements (TRL 6) Auxiliary subsystems optimization, covering air supply, water management, thermal and power management Evaluate current safety, codes and standards Demonstrator in the power range of 20-100kW, providing proof of concept for the application.	
7	*Recommendations for the measurement of the quantity of hydrogen delivered and associated regulatory requirements*	Development and testing of measurement system of the quantity transferred having a level of accuracy acceptable by weights and measure authorities. The work could either focus on improvement of existing technologies and/or on the development of new concepts The scope includes obtaining acceptance by regulatory bodies	
Hydrogen Production & Distribution			**8.75**
8	*Demonstration of MW capacity hydrogen production and storage for balancing the grid and supply to vehicle refuelling applications*	Definition of a standard optimised hydrogen production and storage system as a function of grid balancing constraints and local hydrogen fuel needs Installation and operation of a standalone forecourt size electrolyser (100 - 500 kg/day) with a hydrogen storage system Study of regulatory aspects	
9	*Demonstration of hydrogen production from biogas for supply to vehicle refuelling applications*	Show provision of hydrogen to transport applications from biogas as economically viable solution for reducing greenhouse gas emissions of transport. Installation and continuous operation of a standalone forecourt size hydrogen production unit from biogas (100 - 500 kg/day), associated to a hydrogen storage system Study of relevant regulatory aspects Evaluation of costs, efficiency, and availability based on actual operation.	
10	*Biogas reforming*	Scope of work comprises research and technological development activities on materials, catalysts and processes for chemical conversion Conception of low cost and energy efficient systems to produce hydrogen from biogas Economic assessment of performance Design and build a reactor for the continuous production of hydrogen at a pre- commercial scale (50-250 kg/day) Feasibility assessment of the process	

No.	Topic	Scope	Indicative FCH JU Funding Million €
11	*New generation of high temperature electrolyser*	Development of cells and stacks designed for high-temperature (700-1000 °C), high current density (>1 Acm-2) Manufacture of dedicated HTE cells and stacks for use in large systems for the conversion of electricity from renewable sources Demonstration of a HTE system of kW size under realistic conditions	
12	*Thermo-electrical-chemical processes with solar heat sources*	Materials and key components for efficient thermo-electrical-chemical water splitting cycles Modelling and simulation of plant and key components Field tests of prototype plant Benchmark against other high T production means	
13	*Pre-normative research on gaseous hydrogen transfer*	Identify, define and evaluate approaches for trans-filling procedures Evaluate influence of tank construction Recommendations for implementation in international standards	
Stationary Power Generation & CHP			**27.0**
14	*Cell and stack degradation mechanisms and methods to achieve cost reduction and lifetime enhancements*	Adjusted materials, manufacturing processes and/or operational/design strategies Robustness to cycling and transient operating conditions Longer service interval and lower total cost of ownership resulting from less frequent replacement of stack, filters or contaminant traps Max of 3M € for a maximum of 2 projects	
15	*Improved cell and stack design and manufacturability for application specific requirements*	Outcome will include a minimum of three of the following items: - Simplified design and manufacturing methods of cells, stacks, or stack modules - Adaptation of cell and/or stack designs to larger scale applications and system designs - Cell and stack design improvements - Improvement and validation of existing manufacturing methods to increase manufacturing yield and reduce product variation and manufacturing cost - Improved manufacturing methods supporting product robustness and cost reduction and eliminating failure modes in existing manufacturing processes Max of 6M € for a maximum of 2 projects	

No.	Topic	Scope	Indicative FCH JU Funding Million €
16	*Robust, reliable and cost effective diagnostic and control systems design for stationary power and CHP fuel cell systems*	Outcome will include most of the following items: - Development of advanced methods of diagnosing/predicting deviations in state-of-health - Development of advanced diagnostics methods - Development of system and BoP related sophisticated diagnostics methods; - Development of adaptive control algorithms - Control, monitoring and diagnostics oriented models for fuel cell CHP systems. - Implementation of developed methods in a real/simulated Max 2 projects	
17	*Component and sub-system cost and reliability improvement for critical path items in stationary power and CHP fuel cell systems*	Development activities to improve the performance of individual components of fuel cell systems (e.g. fuel cell units, reformer, heat exchangers, fuel management and power electronics); Testing and validation, novel designs, manufacturing processes and QC may be included Open to all fuel cell technologies. Max 3 projects	
18	*System level proof of concept for stationary power and CHP fuel cell systems at a representative scale*	Development of PoC prototype systems Integration and testing of PoC prototype systems Assessment of the fuel cell system's ability to successfully compete with existing technologies operating in the target application(s)/market(s) Novel system architectures, including new fuel processing and storage materials and processes The PoC system will be required to comply with all relevant CE regulations and international fuel cell system standards Max 3 projects	
19	*Validation of integrated full scale stationary power and CHP fuel cell systems*	Meeting the relevant application needs in representative environments Whole system validation, including build, supply chain, costs and end-of-life considerations Establishment of quality-control procedures and Integration into an anticipated real world environment Consideration of maintenance and repair issues Max 3 projects	

No.	Topic	Scope	Indicative FCH JU Funding Million €
20	*Field demonstration of large scale stationary power and CHP fuel cell systems*	One or more identical systems, >100kW, availability >95%, 15,000 hours Must address how this system will tackle potential reliability issues (redundancy in design, installation of multiple units etc.) Develop the potential for European businesses to realize supply chain opportunities Demonstrate integration into power, and where appropriate heat, and/or RES and/or smart grids Gain operating experience and identify improvement areas for future projects Estimate the full life cycle costs and revise periodically this estimate Show a strong commitment towards the running of the system by the operator after the end of the support phase. Note that stack changes can be sponsored as part of the project. Max 2 projects for a maximum of 12M €	
21	*Field demonstration of small scale stationary power and CHP fuel cell systems*	Install complete integrated systems (electrical power <100kW) in +25 identical units in the range 1-10 kWe, at least 3 identical units for units > 10 kWe Demonstrate integration into existing power, heat and smart grid infrastructures Show CHP with efficiency >85% Max 2 projects for a maximum of 12M €	
Early Markets			**10.25**
22	*Demonstration of fuel cell powered material handling equipment vehicles including infrastructure*	Demonstration shall comprise at least 200 or more fuel cell MHE vehicles at one or across several end-users sites and applications Demonstration should include supporting hydrogen supply infrastructure Clear TCO evaluations for each application Environmental sustainability: assessment by means of LCA	
23	*Demonstration of portable generators, back-up power and Uninterruptible Power Systems*	Demonstration up to 10 systems in the 1-3 kW range, 50 in the 6-10 kW range or 3 systems in the 11-50 kW range Technical requirements that the proposed systems should include: - Reliability >95% - Response time of less than 5 ms - Projected lifetimes of 3 to 5+ years - Target system cost: 3,500 €/kW (fuel cell system alone) - Projected number of start-stop cycles 2,000 Demonstrate a viable hydrogen supply solution for this application	

No.	Topic	Scope	Indicative FCH JU Funding Million €
24	*Research and development on fuel supply concepts for micro fuel cell systems*	Development of new fuelling systems that meet application targets and the integration of the new fuel supply concept in a complete fuel cell system Development of test procedures, including accelerated testing, and characterization protocols based on application specifications Integration of a demonstrator of the fuel supply system with a fuel cell Max 1 project for a maximum of 0.7M €	
25	*Demonstration of portable fuel cell systems for various applications*	Applications with electrical power output should be between 5 W and 500 We Proof of concept stacks, key components, fuel supply and complete systems meeting application specifications Demonstrate electrical efficiencies of 30%+ (based on a logistic fuel input) Implementation in high volume/low power unit applications such as portable, educational and/or electronic devices 1,000 h lifetime including 100 start-stop cycles and specific size and weight of less than 35 kg/kW and 50 l/kW (fuel amount excluded) System validation and demonstrating cost prediction for mass production of less than 5,000 €/kW A modular fuel cell technology capable of adaptation to other markets	
26	*Research and Development of 1-10kW fuel cell systems and hydrogen supply for early market applications*	Applications: stationary distributed power or forklifts Optimization of Balance of Plant components Optimal power management New innovative supply concepts Using renewable feedstock The following main elements should jointly be addressed within the same project: - Hydrogen supply including either distribution or onsite-production concepts - Fuel cell systems, balance of plant components and hybridisation / power management	
Cross-cutting Issues			**5.5**

No.	Topic	Scope	Indicative FCH JU Funding Million €
27	*Hydrogen safety sensors*	Assessment of (i) the SOA of hydrogen sensor technologies, (ii) recommendations for their effective deployment (including placement) for near-term applications and (iii) issues facing their cost-effective manufacture and barriers to commercialisation Implications and recommendations for sensor requirements (including placement) in RCS R&D and testing and validation in laboratory and field conditions as needed A compendium of existing applications and feedback on 'real-life' sensor performance, experiences and best practices Eligible only if coordinated with a US proposal submitted in parallel to the US DoE.	
28	*Computational Fluid Dynamics (CFD) model evaluation protocol for safety analysis of hydrogen and fuel cell technologies*	Modelling of: - Source term and mixing of hydrogen with air in release - Ignition - Hydrogen fires - Hydrogen deflagrations (explosions) - Hydrogen detonations (explosions) - Deflagrations to detonations transition DDT (explosions)	
29	*First responder educational and practical hydrogen safety training*	Provide educational and practical hydrogen safety training to fire services and site operators, who must know how to handle potential incidents. Develop and disseminate first-responder hydrogen safety educational materials in Europe Build and disseminate hydrogen safety response approach based on feedback and responders' best practices Develop and disseminate first-responder intervention guide	
30	*Pre-normative research on fire safety of pressure vessels in composite materials*	Development of an understanding of the evolution of the composite material when exposed to fire conditions Development of a model for predicting the loss of strength of the composite pressure vessel due to fire conditions and for identifying the conditions that need to be achieved to avoid burst. Validation of this model by an experimental programme	
31	*Assessment of safety issues related to fuel cells and hydrogen applications*	For each application, systematic mapping of the safety issues, explanation and assessment of how they are addressed, covering all the areas listed above Compilation of best practice, assimilating lessons already learned from past and on-going technology deployments Evaluation of the preparedness in the various application areas for commercial deployment with regards to addressing safety issues and concerns Identification of areas on which further efforts should be focused and recommendations for addressing these	
		Total indicative FCH JU Funding	**77.5**

1.3.8 Operational indicators

The operational indicators for the follow-up of the programme performance are defined in the Annual Implementation Plan 2011. The latest available results have been indicated in table 1.3.8 below. Please refer to the footnotes of the table for details of each indicator.

Table 1.3.8 Operational indicators in 2011

Fuel Cells and Hydrogen Joint Undertaking – RTD activities				
SPECIFIC OBJECTIVES		Result indicators		
		Indicator	Target	Latest known results
1	To address technological and non-technological barriers to commercialisation of FCH technologies as defined in the MAIP	Coverage of topics called for	100% by 2013	81%[9]
		Percentage of proposals which successfully address the criteria of scientific and/or technological excellence[10]	70% by 2013	86%[11]
		Percentage of projects which have fully achieved their objectives and technical goals and have even exceeded expectations	60%[12] by 2013	Data not yet available[13]
2	To promote the use and dissemination of research results with a view specifically to commercialising FCH technologies	Percentage of proposals which successfully addressed the criterion of dissemination and use of project results[14]	70% by 2013	85%[15]
		Percentage of projects showing evidence that they will produce significant scientific, technical, commercial, social or environmental impacts	60%[16] by 2013	Data not yet available
		Percentage of industrial participation in the projects of which SMEs	50% of industrial participation by 2013	65%[17]
			15% of SMEs participation by 2013[18]	24%[19]
		Percentage of projects which generate one or more patent applications	30% by 2013	Data not yet available

[9] Based on the evaluation results of the Call for Proposals 2011.
[10] Based on the Consensus report for research projects established by the evaluators to rank the proposals. The scoring used for this indicator is good to excellent
[11] Based on the evaluation results of the Call for Proposals 2011.
[12] On finished projects (not all projects will be finished by 2013).
[13] The number of finished projects in 2011 (5 finished projects) is not representative.
[14] Based on the Consensus report for research projects established by the evaluators to rank the proposals. The scoring used for this indicator is good to excellent
[15] Based on the evaluation results of the Call for Proposals 2011.
[16] On finished projects (not all projects will be finished by 2013).
[17] Based on the funding granted under the 2010 Call for Proposals, including SMEs.
[18] Based on funding granted to SMEs in projects
[19] Based on the projects funded under the 2010 Call for Proposals.

Fuel Cells and Hydrogen Joint Undertaking – RTD activities			
SPECIFIC OBJECTIVES	Result indicators		
	Indicator	Target	Latest known results
	Percentage of projects with publications in peer reviewed journals	55% by 2013	Data not yet available

1.3.9 Programme Review Day

A review day of the finished and running projects took place on 22 November 2011 in conjunction with the 2011 Stakeholders General Assembly. The presentations allow a public assessment of the progress of the programme towards its objectives and will lead, in Q1 2012, to the publication of a document summarising the conclusions of this review exercise. The Programme review day will take place annually. All presentations are published on the FCH JU web site.

1.3.10 Public procurements: Benchmark studies

The activities described in this section are implemented by call for tenders (i.e. public procurement) and fall outside of the call for proposals (i.e. grants, which is the main means of implementation of the Annual Implementation Plan.

As part of the AIP2010 and the AIP2011, four areas were identified. These public procurements referred to commercialisation studies for the following applications: (1) Fuel cell electric vehicles, (2) urban fuel cell bus, (3) fuel cell powered material handling, and (4) fuel cell stationary applications.

Studies in these four areas will actually be implemented or launched in 2012. In addition, a fifth horizontal thematic will be added on the impact of FCH technologies deployment on job creation in Europe.

These studies will be implemented via framework contracts. An open procedure for awarding up to three framework contracts to consultants able to conduct such studies has been launched in Q4 2011. For each study, a specific contract will be awarded after reopening competition between the three selected consultants.

Prior to the launch of each study, the FCH JU will work with coalitions of industrial stakeholders to identify more specifically the areas of interest for each study and to ensure they will support the study, notably by providing the necessary data. A small fraction of the budget foreseen for each study can be used to support the creation of a coalition of industrial stakeholders.

The following funds will be made available to support the activities:

Subject (Indicative title)	Indicative FCH JU Funding €
Development of a European Fuel Cell and Hydrogen Vehicles Roll Out Plan	0.6 million
Development of a European Urban Fuel Cell Bus Commercialisation Strategy	1.7 million
Commercialisation roadmap for hydrogen powered fuel cell material handling vehicles	0.5 million
Development of a European commercialisation strategy for fuel cell stationary applications	1.5 million
Jobs Creation Impact of Different Deployment Scenarios for Fuel Cells and Hydrogen Technologies	0.2 million
Total indicative FCH JU Funding	**4.5 million**

1.4 COOPERATION

1.4.1 International cooperation

Cooperation was continued during 2011 with key partner countries, particularly the US but also Japan and South Korea. The FCH JU's approach is to develop cooperation at practical level through projects and information exchange while policy cooperation with international partners remains the EC's prerogative.

As regards the US Department of Energy (DoE), FCH JU participated in the DoE's Annual Merit Review and DoE was in turn represented at the FCH JU's Stakeholders General Assembly and in conjunction bilateral cooperation meetings were held. Work programmes were shared in order to identify areas of interest for project level cooperation, and for a number of project topics in the Calls for Proposals 2010 and 2011 the consortia are invited to coordinate their work with the corresponding activities funded by the DoE. Two American experts proposed by the DoE participated in the evaluation of projects for the Call for Proposals 2010 and two for the Call 2011. For the 2012 Call for Proposals, one topic contains as eligibility criterion that any proposal submitted to the FCH JU will be eligible only if coordinated with a US proposal submitted in parallel to the US DoE. This coordination should be balanced in terms of the R&D efforts deployed by the EU and US respectively. In May 2011, the Programme Office participated to the US Merit Review and had exchanges with DOE, before taking part in the international hydrogen fuel cells conference in Vancouver.

The FCH JU pursued and developed its cooperation with Japan and Korea, respectively on one hand through participation to Japan Hydrogen Fuel Cells international Symposium, FC expo in parallel with meetings with NEDO (New Energy and Industrial Technology Development Organization) and METI in February 2011 and on the other hand through meetings with Korean Hydrogen Production organisations and companies. FCH JU participated also to the IPHE meeting in Japan, presenting the state of play of European support in stationary applications. Japan's NEDO was also represented in the Stakeholders General Assembly 2011. Links with the Republic of Korea were established through the participation of a representative from KETEP

(Korea Energy Technology Evaluation and Planning) at the Stakeholders General Assembly 2011.

In addition to cooperation with the relevant government programmes, connections were forged with companies in the US, Japan and Korea through their participation in the Stakeholders General Assembly as well as industry-led commercialisation plans.

1.4.2 Member States

Exchange of information with the Member States and countries associated to the 7th Framework Programme was continued and developed in 2011 through the FCH JU States' Representatives Group. The Group held three meetings, in January, May and October. Importantly, the representatives were consulted on the Annual Implementation Plan 2012 and MAIP revision. The State Representatives Group members were invited to participate and contribute, after the October meeting, to the conference debate in the European Parliament on the occasion of the **innovation in action event (http://www.fch-ju.eu/event/innovation-action-exhibition-fch-ju-european-parliament)** and exhibition and highlight key political issues in their respective countries regarding deployment or research on FCH technologies.

Other key issues on the agenda for discussion in 2011 included the modification of the FCH JU Regulation, commercialisation plans being produced together with the industry and the Stakeholders General Assembly. HyRaMP (European Regions and Municipalities Partnership on Hydrogen and Fuel Cells) was also represented in the meetings to provide information on regional developments. The Group also supported the FCH JU to launch contacts and plan and high –level meetings at governmental level, to explore political commitment to participate in a EU roll out plan for H2 refuelling infrastructure. It also helped FCH JU to disseminate the report "a portfolio of power-trains for Europe". High level meetings and contacts have been organised in Portugal and UK.

In addition to the formal cooperation through the States Representatives Group, an increased relationship has been developed with national contacts points for energy in all member states, which have regularly been informed about FCH JU activities, invited to our events, and received some of our information materials. The Executive Director participated to an information and training session of the Energy Programme Committee for the Seventh Framework Programme on 20 January 2011, where he informed the network about the programme developments and particularly the calls for proposals.

1.4.3 Regions

Cooperation with European regions was pursued at several levels. A number of joint actions were carried out with the HyRaMP organisation, bringing together regions interested in investing in fuel cell and hydrogen technologies, as the interlocutor. HyRaMP coordinated a consultation of the regions' priorities to be considered in the drafting of the Annual Implementation Plans 2011. FCH JU representatives participated in meetings of the Governing Board of HyRaMP to give an update on and discuss the FCH JU programme and modalities of cooperation. FCH JU was also represented in events by HyRaMP during the year. HyRaMP, broadened and renamed to HyER", Hydrogen Fuel Cells and Electromobility for European Regions, to facilitate the deployment of the full range of electric vehicles, battery electric vehicles as well as fuel cell

electric vehicles and their respective infrastructure, was also regularly invited as observer to participate to State Representatives Group meetings and Governing Board meetings.

A communication taskforce was established between the Programme Office, IG, RG and HyRaMP in order to align activities in this area and better benefit from synergies between the activities of the different parties.

At project level, a number of regions have shown interest to contribute considerable additional funding in the FCH JU activities, particularly in the large-scale bus demonstrations.

1.4.4 Joint Research Centre

The Joint Research Centre (JRC) of the European Commission continued to support FCH JU activities in 2011 under the Framework Agreement concluded between the two entities in 2009. A revised Framework Agreement is under discussion between the European Commission, the JRC and the FCH JU. It is intended to be adopted in 2012.

At programme level, the JRC provided the FCH JU inputs and technical data to the strategic planning (Annual Implementation Plans 2011 and 2012). The JRC also participated in the planning of international cooperation strategy and meetings with international partners. Finally, it provided a link between the FCH JU and other activities within the SET Plan, to bring the FCH JU programme under the policy umbrella tools such as SETIS and in contact with other relevant European Industrial Initiatives.

At project level, JRC is a consortium partner in 5 projects granted funding in the 2010 FCH JU Call for Proposals. It also maintains and updates databases and associated tools for public access to EC-funded and JTI-funded R&D on HFC: NESSHY-DB and HIAD.

The JRC also provided policy support to the European Commission in the field of FCH technologies, notably technical inputs to relevant legislation (type approval Regulation for H2 powered vehicles) and standardisation, support in international cooperation activities (IPHE, IEA) as well as executing activities particularly in pre-normative research and training initiatives.

2. SUPPORT ACTIVITIES

2.1 ADMINISTRATIVE FUNCTIONS

2.1.1. Legal and financial framework

In 2011, the key achievement with regards to the legal and financial framework of the FCH JU was the amendment of the founding regulation.

On 15 June 2010, the Governing Board had approved a request to the European Commission to examine the possibility to amend the regulation so that the contribution of the Union be matched no longer by the sole industry contribution but also by the other legal entities participating in its activities. This request was justified in particular by the importance of the research organisations

in the FCH JU programme and their representation in the Governing Board via the Research Grouping.

On 20 April 2011, the European Commission approved a legislative proposal in that sense.
On 14 November 2011, the Council approved Regulation 1183/2011 amending the FCH JU regulation as proposed by the Commission.

This amendment will not only better reflect the structure of the FCH JU programme; it will also enable it to increase the reimbursement rates offered to its beneficiaries which in its turn will improve the competitiveness of the programme.

2.1.2. Personnel

All selection procedures foreseen for 2011 were completed

- Financial Assistant AST7 (took up the duties on 01 April 2011)
- Secretary AST3 (took up the duties on 16 April 2011)
- Human Resources and General Administration Assistant AST7 (took up the duties on 16 May 2011)
- CA FG IV Project Manager (took up the duties on 01 June 2011)
- Project Manager AD8 (a reserve list has been established)

Besides that four more new staff members took up duties in the beginning of 2011 (from the recruitment procedures taking place in 2010)

- CA FG III IT Assistant (took up the duties on 01 January 2011)
- Head of Programme Unit AD11 (took up the duties on 16 January 2011)
- Stakeholder Relationships Manager AD7 (took up the duties on 16 January 2011)
- Head of Finance and Administration AD11 (took up duties on 01 March 2011)

The FCH JU Programme Office has been fully staffed with 18 Temporary Agents and 2 Contract Agents since June 2011.

The year saw also the adoption of the FCH rules governing trainees and their implementation with the hosting of the first two trainees each for 6 months.

2.1.3 Offices

The seat of the FCH JU is located in Brussels, Belgium.

After the completion of a public procurement procedure for the lease of offices in Q4 2010 (so-called 'Kallas procedure') together with the other four established Joint Undertakings, the FCH JU Programme Office moved to the selected location (Avenue de la Toison d'Or 56-60) in the second week of January 2011.

2.1.4. IT Infrastructure

The priority objectives for IT are to ensure a stable and secure IT system, provide IT support to staff in the use of IT applications and equipment and to cooperate with the other JUs to ensure synergy and efficient use of resources.

2011 was a busy year for IT infrastructure issues. Among others, the following items were dealt with:

- Following the move from COVE (Covent Garden) to TO56 (White Atrium) mid-January, the new IT infrastructure was stabilised and enhanced throughout the year. Equipment and service to users were developed or improved, all FCH staff desktops and laptops were upgraded to Windows-7 and to Office 2010 and the internet bandwidth was increased by a factor of 4 along with more robust redundancy. In collaboration with the Accountant the inventory database for IT equipment and furniture has been set up.

- The I.T. elements of the disaster recovery and business continuity plan were defined and negotiated with the I.T. service provider for implementation early in 2012.

As identified in the risk assessment at the beginning of the year a number of problems were experienced with the IT tools in the first half of the year, which had an impact on the operational performance of the JU for this period. These included notably delays in the configuration of project management tools for the FCH JU's specificities; slow response time of the sTESTA line providing the access to ABAC and the FP7 applications. Nevertheless in the second half of 2011 the situation improved and the internal processes for the call 2011 were handled swiftly with the tools being fully operational.

The stabilisation of the IT tool configuration and servers; the installation to the permanent premises, the recruitment of a full time IT assistant, timely reporting and monitoring of IT issues, a root-cause analysis of the problems and a close follow up of Service Level Agreements have also reduced significantly the risk level of IT in the organization in 2011 (from critical to medium/low) as confirmed by the risk management exercise carried out in October 2011.

2.2 COMMUNICATION ACTIVITIES

The focus of the 2011 communication activities was to raise awareness, notably towards EU policy makers, on the FCH technologies and their contribution to current energetic/environmental challenges as well as on the relevance of the public private partnership to deliver accelerates market entry of these technologies. RTD activities of the FCH JU and opportunities offered by the Calls for Proposals were also stressed as the call 2011 was the largest call issued by FCH JU. The finalisation of the FCH JU establishment, its autonomy since November 2010 and its operational perspectives were also highlighted towards policy makers, project participants and opinion leaders.

Communication messages on the prospects of the FCH technologies notably in transport were supported on by a major comparative study commissioned by a number of FCH JU industry partners and published in November 2010 on the technical, economic and environmental performance of different power train technologies for vehicles (http://www.fch-

ju.eu/sites/default/files/documents/Power_trains_for_Europe.pdf) and also by a report from the FCH sector on the financial and technology outlook for the period 2014-2020, published in November 2011 (http://www.fch-ju.eu/page/publications).

2.2.1 Advocacy and awareness raising

The FCH JU strengthened its relationships with policy makers, notably at European level, presenting the partnership and highlighting the contributions FCH technologies could make to current challenges. Meeting with more than 40 key relevant policy makers from the European Commission and MEPs were organised.

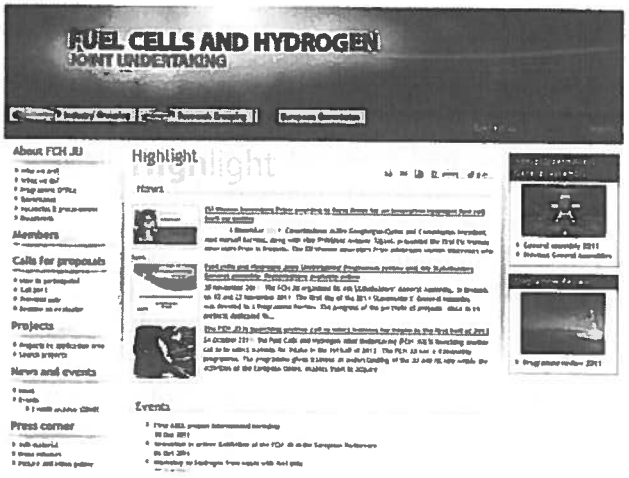
In addition, the FCH JU contributed to major public consultations, notably on the Strategic Transport Technology Plan, on Energy Roadmap and on the Green Paper on Common Strategic Framework; it also participated in several meetings of the expert group on future transport fuels coordinated by DG Move, European Commission and contributed to its report (http://ec.europa.eu/transport/urban/cts/future-transport-fuels_en.ht)

Contacts were also developed with national policy makers, in close cooperation with the State Representatives Group, with a view to pave the way for an EU roll out strategy for hydrogen refuelling infrastructure, following the dissemination of the fact-based study on different power trains for Europe and the development of H2 Mobility Plan, the leading initiative in Germany. Structured meetings were organised in particular in France, Portugal and UK.

Website and visual identity

The FCH JU developed a new web site, managed in-house, replacing the sub-site developed, hosted and maintained by DG Research. The new web site integrated new sections for projects, Stakeholders General Assembly, Programme Review and news and added some new interactive functionalities. It also adopted the new harmonised visual identity designed for the FCH JU, for application to all communications products and tools, with a view to create a clear branding for the Joint Undertaking. A professional graphical chart and guidelines have been developed.

The web site is online since 15 March 2011, under its new own address www.fch-ju.eu

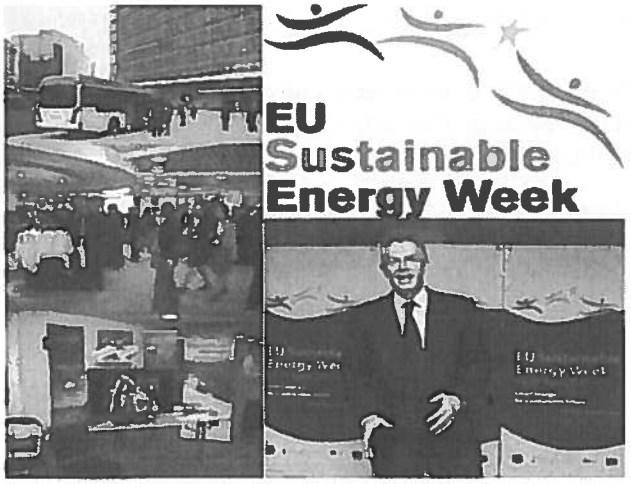


2.2.2 Public relations

Events

In addition to the organisation of own events, such as a public information session for the call 2011 (May 2011), the FCH JU participated to national information sessions related to the call 2011 (Denmark, UK, Spain), to the Challenge Bibendum Michelin (Berlin, May) and to the EU FP7 Information day (July).

It also had an exhibition stand in the framework of the ***EU Sustainable Energy Week,*** at the Charlemagne building from 10 to 14 April 2011, where it offered information on the Joint Undertaking and activities, and illustrated with some videos the FCH technologies.



A hydrogen bus was also displayed in front of the Berlaymont building during the week, accessible to the public.

Project dissemination initiatives were organised on this occasion in collaboration with the European Hydrogen Association (EHA) which organised presentations of FCH projects in the bus and opportunities to experience a tour in the bus.

In collaboration with the other 4 Joint Technology Initiatives (Artemis, Cleansky, Eniac and IMI), the FCH JU organised a joint exhibition in the European Parliament in Brussels, hosted by MEP Maria da Graça Carvalho, from 4 to 6 October 2011. In addition to the exhibition, a public conference was organised in the Parliament, where MEPS could exchange and debate on the contributions of FCH technologies to the EU energy and environmental challenges and discuss future support related to innovative energy technologies

The hydrogen-powered fuel cells car, leased by the FCH JU for demonstration purposes towards policy makers, was displayed in front of the European Parliament and available for test drives.. This opportunity was appreciated by a number of MEPs and some of their official drivers, who could experience the FCH JU car. .

A joint press conference in the European Parliament closed the joint exhibition.

Exhibition in the European Parliament and public debate

Stakeholders General Assembly and Programme review

The Stakeholders General Assembly[20] is an external advisory body to the FCH JU. It is to be organised annually, as a meeting open to all public and private stakeholders. The objective is to inform stakeholders about the FCH JU activities and invite them to provide comments.

The Stakeholders General Assembly 2011 was held at the Charlemagne building on 22 & 23 November 2011. This year, the first day was devoted to a Programme review, which objective is to assess the progress of the portfolio of fuel cells and hydrogen projects in relation to the targets of the Multi-annual Implementation Plan (MAIP) and of the annual implementation plan as well as with reference to international developments in the field. It fed also debates and exchanges of the Stakeholders General Assembly as such, the next day.

58 projects were presented and assessed during the Programme review (44 from FCH JU call 2008 & 2009 and 14 from FP7 calls).

Close to 400 people participated to the Programme Review and the Stakeholders General Assembly, the majority of which coming from industry, followed by the research community, Member States, Regions and EU public authorities. The event was web- streamed and all presentations are available at:

http://webcast.ec.europa.eu/eutv/portal/archive.html?viewConference=13475

An exhibition featuring 15 presenters from the industry and the research community was also organised in conjunction with the Programme review and SGA in addition to the Drive n'Ride event organised by Industry, where more than 120 participants had the opportunity to experience driving in one of the 8 fuel cell electric cars displayed and see a fully mobile and compact hydrogen station, which aimed to demonstrate the refuelling process.

A lunch debate took place in the European Parliament where industry representatives and MEPs could exchange on the technologies, its contributions to energy and transport policy orientations, the necessary support for the market entry of these technologies and competitiveness opportunities for Europe.

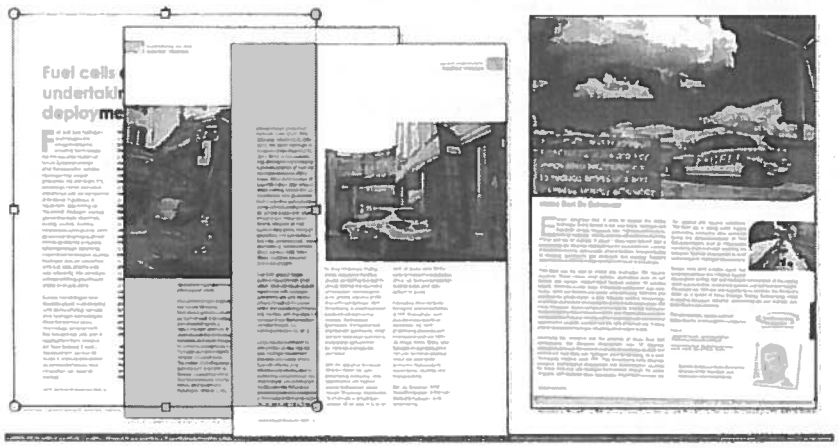
[20] Article 10 of the FCH JU Statutes

Conferences and other public speaking opportunities

FCH JU staff and/or Executive Director participated in some 25 external events and conferences in 2011 in different Member States and key non-European countries (US, Japan, Korea, China, Canada) to present the programme and FCH JU activities and developments.

2.2.3 Media relations

The FCH JU developed press relations at the occasion of events organised such as Exhibition in the Parliament, Programme review/Stakeholders General Assembly and launch of the 2011 call. 4 press releases were issued in 2011 and inputs were also provided to journalists upon request.
A partnership was developed with the Parliament magazine through advertorials (issue June and November 2011) and articles were contributed and published in Research Review, European Energy Innovation magazine, Utility week.



3. MANAGEMENT AND INTERNAL CONTROL SYSTEMS

This section of the AAR provides the reader with the overall picture of the implementation of sound management (not only financial) in FCH JU. It provides key information on the nature and characteristics of the JU's organisation to understand the context in which the JU operates (Chapter 3.1), its governance structure and accountability chain (Chapter 3.2), as well as the functioning of the JU's internal control system (Chapter 3.3).

3.1 NATURE AND CHARACTERISTICS OF THE FCH JU

As further detailed in Section 1, FCH JU is a public-private research partnership with three members (i.e. the European Commission, the 'NEW Industry Grouping' and the 'N.ERGHY Research Grouping').

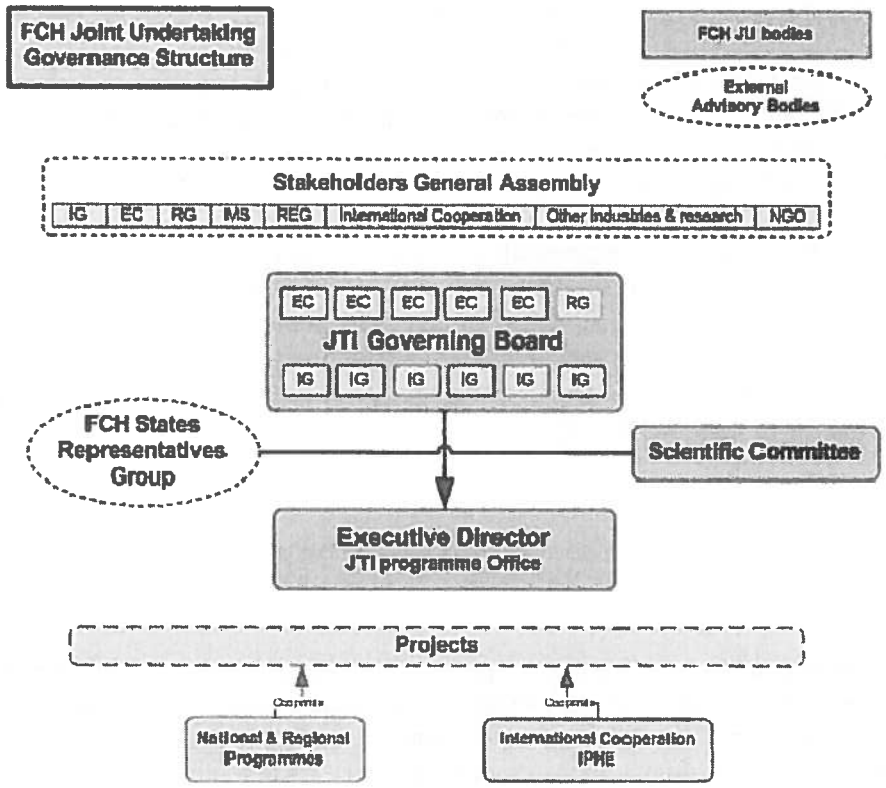
FCH JU was set up in 2008 for a period up to 31 December 2017 and its total financing is 947 EUR million for the whole period, consisting of contributions of all the members. The operational costs, which represent more than 90% of the total budget, shall be covered in roughly equal parts through the financial contribution of the Union and through in-kind contributions from the legal entities participating in the activities. The contribution from the participating legal entities shall at least match the financial contribution from the Union.

FCH JU as a legal entity is responsible for the correct implementation of its budget. FCH JU provides funds through grants to beneficiaries eligible to receive funds in order to support research activities selected following open and competitive calls for proposals. The general and specific legal, technical and financial terms for the grant procedures are stipulated in Grant Agreements signed with beneficiaries.

3.2 GOVERNANCE STRUCTURE

The governance structure of FCH JU is composed of two executive bodies (i.e. the Governing Board and the Executive Director assisted by the staff in the Programme Office) and three advisory bodies (i.e. the Scientific Committee, the FCH States Representatives Group and the Stakeholders' General Assembly). It provides a solid accountability chain and can be represented as shown in Graph 3.2 below.

Graph 3.2: FCH JU Governance Structure



3.2.1 Executive bodies

Governing Board

The Governing Board is the main decision-making body of the FCH JU. All three members of the FCH JU are represented on the Governing Board: the Industry Grouping has six seats, the Commission has five seats and the Research Grouping has one seat. The Governing Board has the overall responsibility for the operations of the Joint Undertaking including the implementation of activities, the approval of the annual implementation plan, budget and annual accounts and the approval of the list of selected project proposals.

The Board meets at least twice a year. Additional meetings may be organised at the request of one of the Members, or at the request of the Executive Director. Decisions of the Board may also be taken by written procedure on a proposal from the Chair.

In 2011 the Board met on three times respectively on 10 March, 24 June and 22 November. A new Chair was elected in June (also Chair of the IG) and some members of IG as well as EC representatives were replaced. Important decisions were taken at the meetings or by written procedure in particular the adoption of the annual implementation plans 2011 and 2012, the 2010 annual accounts, the 2012 budget and establishment plan.

Executive Director and Programme Office

The Executive Director is the legal representative of the FCH JU and is supported by the staff of the Programme Office. He is the chief executive responsible for the day-to-day management of the FCH JU, in accordance with the decisions of the Governing Board. The Executive Director as Authorising Officer is responsible for the proper management of the JU's budget and has to report and give assurance on the use of the budget in accordance with sound financial management principles (Chapter 5).

The Programme Office, under the responsibility of the Executive Director, is in charge of the daily management of the Joint Undertaking and execute all responsibilities of the FCH JU including, among other tasks, the launching of the calls for proposals, the evaluation and selection of projects; the monitoring and update the Multi-Annual and Annual Implementation Plans, the coordination with other relevant programmes at national and regional levels and communication and other support activities.

3.2.2 Advisory bodies

Scientific Committee

The Scientific Committee has nine members, appointed by the Governing Board on the basis of their scientific competencies and expertise to give their science-based recommendations on the priorities and the progress of the FCH JU. The members reflect a balanced representation of world class expertise from academia, industry and regulatory bodies and from different fields of expertise within fuel cell and hydrogen technologies.

The Scientific Committee's first priority is to advise on the R&D agenda set out in the Multi-Annual and Annual Implementation Plans of the FCH JU.

In 2011 the Scientific Committee met twice and contributed to the revision of the MAIP 2008-2017 and to the AIP 2012.

FCH States Representatives Group

The FCH States Representatives Group (SRG) consists of one representative of each Member State and of each country associated with the 7th Framework programme. The Chairperson of the FCH SRG attends the meetings of the Governing Board as an observer.

The SRG, which meets at least twice a year, has an advisory role to the JU and shall act as an interface between the JU and the relevant stakeholders within their respective countries. Its most important tasks comprise providing opinions on programme progress in the FCH JU, monitoring compliance and respect of targets and coordination with national programmes to avoid overlapping.

For information on the activity of the SRG in 2011 please refer to Chapter 1.4.2.

Stakeholders' General Assembly

The Stakeholders' General Assembly (SGA) has an advisory role to the FCH JU. It is open to all public and private stakeholders, international interest groups from Member States and Associated countries, as well as from third countries.

At the General Assembly, which is convened once a year, stakeholders are informed of the activities of the FCH JU and invited to provide comments. The Stakeholders ' General Assembly is an important communication channel to ensure transparency and openness of the FCH JU's activities with its stakeholders.

For information on the activity of the SRG in 2011 please refer to Chapter 2.2.2.

3.3 THE FUNCTIONING OF THE ENTIRE INTERNAL CONTROL SYSTEM

The foundation of the FCH JU's Internal Control Framework is provided by a set of 16 **Internal Control Standards** (ICS) which were adopted by the Governing Board on 15 June 2010. The Standards are inspired by the internationally recognised COSO framework[21] and are structured around six areas, namely: 1. Mission and Values, 2. Human Resources, 3. Planning and Risk Management Processes, 4. Operations and Control Activities, 5. Information and Financial Reporting, and 6. Evaluation and Audit.

To permit progressive implementation and allow measurement of the maturity of the JU's internal control systems, each standard is complemented by a list of **'Requirements'** defining the minimum features and specific practical actions (FCH JU Internal Control Standards in Annex 5).

3.3.1 Effectiveness of implementation of the control standards

FCH JU has established an **Action Plan** for the effective implementation of the standards. This Action Plan describes the requirements for each standard, the status of their implementation, the action owner within the JU and the related outstanding actions and time plan. A brief summary of the standards not fully or effectively implemented yet and their outstanding actions is as follows:

- *ICS 2 - Ethical and organisational values*. FCH JU applies the Commission guidelines in this field. An awareness session on ethical aspects amongst JU staff took place in July 2011; further training in particular specific to the R&D area is scheduled for Q1/2012.

- *ICS 3 – Staff allocation and flexibility*. Approval of JU's recruitment policy, templates and guidelines to be finalized in Q1 2012.

[21] http://www.coso.org/

- *ICS 4 – Staff evaluation and development.* Interviews with all staff are held yearly (February-March) to appraise staff performance (for previous year), define development needs and set the objectives (for current year). Commission guidelines for appraisal are followed and this will be formalised through adoption of the related implementing rule by the FCH JU Governing board (expected Q1/2012). Approval of JU's training policy to be done in Q1 2012.

- *ICS 5 – Objectives and performance indicators.* Link between objectives, activities, allocated resources and key performance indicators is included in the Annual Implementation Plan and the Multi-Annual Implementation Plan (MAIP 2008-2013) was updated in 2011 and reporting tools have been developed. Nevertheless there is room for improvement in the effective use of monitoring and reporting tools by management.

- *ICS 7 – Operational Structure.* AOD delegations and charters are in place. Governance of the IT (internal and external) structure to enable the efficient and secure functioning of the IT services has been established in Q1 2011 with regular meetings of IT officers of the Joint Undertakings and bi-monthly meetings with RTD IT. However, reporting and supervision on IT aspects still needs to be reinforced (Q2/2012).

- *ICS 8 – Processes and procedures.* Main FCH JU processes and procedures are documented; a few procedures need to be further formalised and those already documented will be continuously improved, when necessary.

- *ICS 9 – Management supervision.* The supervision system was established and includes regular verification of financial transactions (FiCis), progress review by Heads of Units (HoUs) through weekly unit meetings, progress review by ED through weekly and bi-weekly meetings with HoUs and the Internal Audit Capability (IAC), respectively; bi-annual management reports by HoUs and mid-term review of the calendar of activities. Adaptation of the calendar of activities for its effective use as a planning and monitoring tool will be considered (Q2/2012).

- *ICS 10 – Business Continuity.* A 'Handover procedure' and a back-up system for all staff to ensure continuity of the service were adopted. A draft 'Business Continuity Plan' with recovery arrangements in cases of major disruptions (Disaster Recovery Plan) and alternative site is under review and its finalisation and adoption is foreseen in Q1/2012.

- *ICS 11 – Document Management.* The electronic archiving system has been restructured with a system of access rights and the mail registration system has been reviewed and formalised. Effective implementation of the latter needs to be strengthened and the appropriateness of procuring a stable IT system for document management will be further analysed (Q2 2012).

- *ICS 12 – Information and Communication.* .The "FCH JU Communication Strategy" was adopted by the Governing Board on 7 February 2012 and its effective implementation will be monitored. Action plans were developed for implementation of the recommendations issued by the Internal Audit Capability following her assessment of users' access rights to ABAC and FP7 tools and their status will be monitored quarterly. An analysis of DG Budget Financial Systems requirements and of the MoU with DG HR&Security will be completed (Q2/2012).

- *ICS 13 – Accounting and Financial Reporting*. The validation of accounting systems was carried out by the Accountant of the FCH JU on 21/11/2011. A few weaknesses were identified (in particular relating to the document management system (mail registration, register of legal commitments), to the follow-up of amendments to grant agreements and to the inventory of fixed assets). Actions are on-going to address those issues.

- *ICS 14* – Evaluation of Activities. The first evaluation of the FCH JU was carried out by the Commission with the assistance of a group of independent Experts and the report issued on 20 May 2011. A follow-up on recommendations addressed to the FCH JU will be done in 2012

.

3.3.2 Conclusion

Based on the management's assessment of compliance and effectiveness of the internal control standards as stated above, the results of the risk management exercise, the outcome of the monitoring of action plans, the results of audit work by the FCH JU Internal Audit Capability and the European Court of Auditors (chapter 4.1.2) and the validation of the accounting system by the accountant, it can be concluded that the internal control system is working as intended and adequately mitigates the risks to the achievement of the FCH JU objectives.

There is nevertheless a need for further improvement in terms of compliance and effectiveness to address the weaknesses identified. A close follow-up of action plans on ICS, on mitigation of risks, on audit recommendations and on recommendations included in the report on validation of accounting system, will be carried out in 2012.

4 BUILDING BLOCKS TOWARDS THE DECLARATION OF ASSURANCE

This section of the AAR describes the elements underpinning the Executive Director's declaration of assurance. It includes a presentation and assessment of the 'building blocks' supporting the assurance (chapter 4.1); an analysis on whether or not a reservation to declaration of the Executive Director is necessary based on the issues identified and the information available at the reporting date (chapter 4.2) and finally provides an overall conclusion of the impact on the declaration (chapter 4.3).

4.1 BUILDING BLOCKS TOWARDS REASONABLE ASSURANCE

Reasonable assurance is the personal judgement of the JU's Executive Director -as Authorising Officer of the JU at the date of signature of this Annual Activity Report- based on all information at his disposal. This information can be structured around three main pillars or 'building blocks', namely: (1) the assessment by the JU's management (2) results from audits during the reporting year and (3) the assurance received from the Heads of Unit in their management reports.

4.1.1 Building block 1: Assessment by JU's management

This building block describes the main elements underpinning the JU's control strategy and provides evidence, through indicators, of its solidness.

The JU's control strategy covers all activities of the JU. However, grant management being the core business of the JU and representing more than 90% of its operational budget, this chapter focuses on such process. As indicated in Chapter 3.1, FCH JU provides funds through grants to beneficiaries following open and competitive calls for proposals. FCH JU projects are implemented through Grant agreements signed with beneficiaries and co-financed by the JU. After signature of the Grant Agreement, pre-financing payment is made to make funds available and allow the starting of the project. During project implementation, grants are paid on the basis of the beneficiary's declaration of eligible costs (i.e. cost claims).

Since the setting up of FCH JU, four Calls have been launched (i.e. Calls 2008, 2009, 2010 and 2011). The key dates for each call are the following.

Table 4.1.1(a): FCH JU Calls – Key dates

	Call 2008	**Call 2009**	**Call 2010**	**Call 2011**
Publication	October 2008	July 2009	June 2010	May 2011
Signature of Grant Agreements	December 2009	October-December 2010	December 2011	Not yet. Negotiations on-going.
Payment of Pre-financings	December 2009, except 27.220 € in January 2010	December 2010, except 519.508 € in Q1 2011 at the request of the beneficiary.	December 2011	Not yet. Negotiations on-going.
Payments of experts	Q1-2 2009 (app.)	Q2 2010 (app.)	Q1 2011 (app.)	Q4 2011 (app.)
Cost claims received and validated	6* Cost Claims received in 2011 *44 beneficiaries	4** Cost Claims received in 2011 **33 beneficiaries	First Cost Claim expected in 2012	Not yet. Negotiations on-going.

Table 4.1.1(b): 2011 operational payments (amounts in €)

Pre-financings	**Payments against cost claims**	**Other operational payments**	**Total operational payments**
48,515,320*	4,626, 994	120,888	53,263,202

*of which 759,508 on calls 2008/2009 and 47,755,812 on call 2010

Therefore, the following main conclusions can be extracted from the tables 4.1.1 (a) and (b) above with an impact on the 2011 Annual Activity report:

- The large majority of 2011 operational payments relate to pre-financings, mainly for the Call 2010 projects.

- Following the reporting requirements established in the signed grant agreements, only 10 cost claims involving 77 beneficiaries and related to Calls 2008 and 2009 projects have been received and validated in 2011. These cost claims have led to payments against cost claims for an amount of 4,626,994 €.

The main elements of **FCH JU control strategy** are a combination of ex-ante and ex-post controls. The table below clarifies the main features of these controls:

Table 4.1.1 (c): 'Ex-ante' vs. 'Ex-post' controls

	'Ex-ante' Controls	'Ex-post' Controls
When?	Before the transaction is authorised	After the transaction is authorised
Frequency?	Obligatory on all transactions	Made on a sample basis
How?	Mainly desk review of supporting documents (e.g. beneficiaries' proposals and reports) but might also take place 'on-the-spot' at the beneficiary's premises, if deemed necessary and cost-effective.	Mainly On-the-spot checks at the beneficiary's premises.
Impact?	Errors detected should be corrected before the transaction is approved	Errors detected (e.g. ineligible expenditure) should be corrected through recovery orders or offsetting with future payments.
Assurance?	Primary means of ensuring sound financial management and legality and regularity of transactions but less 'evidence' (in particular for the eligibility of costs) as normally based on desk review.	Secondary means of ensuring sound financial management and legality and regularity of transactions but more robust as normally carried out 'on-the-spot'.

Concerning the **project lifecycle**, the JU's control strategy is divided into four distinct stages. Control objectives, key controls, main outputs and indicators have been defined for each stage as indicated in the table below. For more detailed information on the controls applied in each stage, reference is made to Annex 5.

Table 4.1.1(d): Stages in the Project Lifecycle: Objectives; Controls; Outputs & Indicators

	Stage 1 Evaluation	Stage 2 Negotiation & Selection	Stage 3 Project & Contract management	Stage 4 Ex-post controls: audits & recoveries
Objectives	Select projects to be financed according to their research credentials to ensure the achievement of the JU's operational objectives.	For each proposal: Clarify objectives and work to be carried out. Substantiate costs and determine its duration and JU's contribution.	Translation of each of the selected proposals into a legally binding instrument and making of pre-financing. Verification of (1) interim and final beneficiaries' payment requests and (2) achievement of key milestones.	Contribute to ensure the legality and regularity of the payments. Provide an indication of the effectiveness of previous ex-ante controls.
Controls	• Screening of submitted proposals for eligibility. • Choice of independent (i.e. no conflict of interest) expert evaluators. • Evaluation by a minimum of three independent experts. • Panel review for consistency, quality control and ranking of proposals.	• Use of 'Evaluation Summary Report' as starting point for the negotiation. • Requests for Budget clarifications, if deemed necessary. • Legal status verifications • Financial viability checks • Adoption of safeguarding measures (e.g. guarantees) • When deemed necessary, 'on the spot' control visits	<u>Contracting and pre-financing payment</u>: • JU Financial circuits in place ensuring all operational and financial aspects are checked by two independent members of JU staff before ***(i.e. ex-ante)*** authorisation. <u>Interim and final payments</u>: • Analysis of beneficiaries' technical and financial reports (intermediate and final) • Certificates on Financial Statements (i.e. cost claims)[22] by certifying auditor[23] and on the methodology used for the calculation of costs[24]. • Midterm reviews by external experts, when applicable in the Grant Agreement. • When deemed necessary, 'on the spot' control visits. • JU Financial circuits in place as for 'contracting and pre-financing payment' above.	Financial (representative and risk-based) and Technical audits after ***(i.e. ex-post)*** JU's authorisation of interim or final payments and up to 5 years after the end of the project[25].

[22] Mandatory if above thresholds (Model Grant Agreement , article II.4.4)
[23] Independent from the beneficiary and qualified to carry out statutory audits.
[24] Optional (Model Grant Agreement , articles II.4.4 and II.14.1)
[25] Model Grant Agreement , articles II.22 and II.23

	Stage 1 Evaluation	Stage 2 Negotiation & Selection	Stage 3 Project & Contract management	Stage 4 Ex-post controls: audits & recoveries
Outputs	• Evaluation Summary Report (ESR) for each proposal • Ranking list of proposals • Initial Information letter to applicants	• Final list of selected proposals	Financial transactions: • Budgetary and Legal Commitment. • Pre-financing, interim and final payments	Financial transaction: • Recovery order (e.g. in case of ineligible expenditure identified after ex-post audits) or offsetting with future payments
Indicator	• Redress procedure: Number of applicants' complaints / Total proposals	• Financial impact of the negotiation process: Difference between the total value of the JU contribution *'requested'* in project proposals, (1); *'recommended'* in the negotiation mandates (2) and *'agreed'* in the signed grant agreements.(3)	• Percentage of the number of payments made on time	• Representative error rate (i.e. average level of error in percentage detected by representative ex-post audits) • Residual error rate (i.e. error rate left in the population after the correction of (1) all detected errors and (2) extrapolation of systematic errors on the non-audited amounts of audited beneficiaries). • Audit coverage: Plan vs. actual volume of audits completed

The indicators defined above aim at providing an indication of the robustness of each stage and as such provide assurance on the sound financial management and the legality and regularity of the financial transactions (i.e. commitments and payments). An analysis of each indicator is the following:

Stage 1: Evaluation

A 'redress procedure' gives applicants the possibility to file a complaint in case they think that there were shortcomings in the handling of their proposal during the evaluation. A redress committee, working independently from the evaluation, analyses eligible complaints and, where suitable may recommend the re-evaluation of the proposal. The final decision on follow-up actions is taken by the Executive Director.

The indicator on 'redress procedure' shown in the table below provides an indication of the quality of the evaluation process which is a key element in the grant warding process.

Table 4.1.1(e): Redress procedure

	Call 2008	Call 2009	Call 2010	Call 2011
Number of proposals	32	50	71	82
Number of complaints received	0	4	6	4
% of complaints	0%	8%	8%	5%
Number of complaint cases which led to a re-evaluation	0	0	0	0
% of complaints which led to a re-evaluation	0 %	0 %	0%	0%

The low number of complaints in the different calls of which none led to a re-evaluation, (1) is an indication of the robustness of the evaluation and grant award process and (2) provides assurance on the legality and regularity of the commitments (i.e. signed Grant Agreements) in stage 3 below.

Stage 2: Negotiation and selection

The negotiation is the main process to ensure the efficient use of the JU's budget as it discards work which is not essential for the achievement of the scientific objectives of the project and ensures that the budgeted costs are commensurate with the planned work.

The financial impact of the negotiation process, as shown in the indicator below, is defined as the reduction (expressed as a percentage) in JU contribution to the grant agreements, as a result of the negotiation process.

Table 4.1.1(f): Financial impact of the negotiation process (in thousands EUR)

	Call 2008	Call 2009	Call 2010	Call 2011
Number of grant agreements	16	28	26	Negotiation on-going
JU contribution 'requested' in project proposals (1)	36.046	85.643	99.382	
JU contribution 'recommended' in Negotiation mandates (2)	29.076	75.202	84.907	
JU contribution 'agreed' in the signed grant agreements (3)	27.222	72.527	83.676	
Reduction in percentage from contribution 'requested' (1) – (3)	24%	15%	16%	
Reduction in percentage from contribution 'recommended' (2) – (3)	6%	4%	1.5%	

The total value of the JU contribution 'requested' in the project proposals (1), is reviewed by the JU due to several factors (e.g. comments on budget proposals by independent experts, budget clarification process, total JU budget available and matching requirements). This reviewed value is the value of the JU contribution 'recommended' in the 'Negotiation mandates' (2) and represents the starting point of the negotiation process. As a result of the negotiation process, the

value is/might be further reviewed. This third value represents the value of the JU contribution 'agreed' in the signed grant agreements (3).

The average reduction resulting from negotiations for calls 2008, 2009 and 2010 was 24% , 15% and 16%, respectively when considering the initial contribution requested in project proposals as starting point, and 6%, 4% and 1.5%, respectively if the starting point is the value as per the negotiation mandate. Whereas the average reduction (1) - (3) is mainly the result of budget available and matching requirements, the reduction (2) - (3) is mainly due to changes during negotiations to comply with experts recommendations made during the evaluation stage.

Stage 3: Project and contract management

The project and contract management stage starts with the signature of the grant agreement and ends with the final payment to the beneficiary.

As shown in table 4.1.1(a) and (b) a limited number of cost claims have been received from beneficiaries of projects from the 2008 and 2009 calls. Therefore, the financial transactions involved are mainly the contract signature (commitment) and the payments of either pre-financings or other expenditure linked with the project lifecycle (payment of experts).

The main legality and regularity indicator for the commitment is the percentage of complaints as indicated in stage 1 above. Concerning payments, an important indicator is the 'time to pay', which is defined as the percentage of payments made within the binding deadlines as shown in the table below.

Table 4.1.1(g): Percentage of the number of payments made on time

	Call 2008	Call 2009	Call 2010	Call 2011
Grants: payment of pre-financings and against cost claims	100%	100%	100%	Negotiations on-going
Payments of experts	71%	34%	53%	62%

The data shows that 100% of grant payments, which represent more than 90% of the total value of JU's payments, were done on time. This provides a good indication of both sound financial management and legality and regularity of the payments made.

Although they represent less than 10% of the JU's payments, it is worth mentioning that payments to experts related to the Call 2011 have suffered some delays (62% on time). Nevertheless the situation improved notwithstanding the additional workload linked to internalisation of the whole payment calculation and validation circuit (previously partly outsourced to the Commission) and action is on-going to address the problem.

Stage 4: Ex-post controls

Ex-post controls are the fourth and last stage of JU's control strategy in the project lifecycle as shown in Table 4.1.1(d). The FCH JU ex-post audit strategy is intended to ensure the legality and regularity of expenditure on a multiannual basis by detecting and correcting errors and to provide an indication on the effectiveness of the ex-ante controls. It was adopted by the Governing Board on 6 January 2011 and its implementation started in September 2011. Due to the limited number of cost claims received and validated in 2011 only a small number of audits could be launched and none was closed at the date of this report. It is consequently premature to draw any significant conclusion based on preliminary ex-post audit results.

Table 4.1.1(h): Indicators of coverage in 2011(amounts in €)

	Year 2011	Audits launched in 2011 (1st batch – Sept. 2011): 5 audits	Audits launched in 2011 (2nd batch – Dec. 2011): 7 audits	Total amount subject to audit	Coverage
Total costs accepted by FCH JU	**14,117,253**	4,097,233	3,415,185	7,512,418	53.2%
(FCH JU share)	**6,285,658**	1,700,147	1,673,877	3,374,024	

The first cost claims were received in the spring of 2011 and the first sample of "representative' audits was selected in September 2011 corresponding to 5 beneficiaries. A second batch of audits was selected in December 2011; the cumulative coverage reaches 53.2% of the validated cost claims as of 31 December 2011. The selection took into account potential 'clashes' with EC audits (the purpose is to avoid any over-auditing of beneficiaries and consequently not to launch an FCH audit where another audit by Research DGs and Executive Agencies is either on-going, planned or has been closed less than 6 months ago). Although the bulk of the audit work for the first 5 audits has been completed, final reports have not been issued yet and the number is too small to draw any valid conclusion. The audit fieldwork of the 7 audits of the second batch has not started yet.

In any case, based on the provisional ex-post audit results, the possibility of undetected errors going beyond the materiality level as defined in Annex 4 and consequently leading to the need to qualify the assurance with a reservation is assessed here below (Chapter 4.2) and it can be concluded that no reservation is warranted.

4.1.2 Building block 2: Results from audits during the reporting year

FCH JU Internal Audit Capability (IAC)

During 2011, the IAC of the Joint Undertaking carried out two assurance engagements ('Assessment of FCH JU users' access rights granted in ABAC' and 'Assessment of FCH JU users' access rights granted in FP7 IT systems'), provided consulting services on four distinct areas (Risk Management, AAR process, Management Reporting and Internal Control Standards) and was responsible of the setting up of the ex-post audit process. In addition, the IAC carried out jointly with the Commission's Internal Audit service (IAS) a risk assessment in order to establish a risk-based and coordinated audit plan for the period 2011-2013 which was approved by the Governing Board on 19 May 2011.

Regarding the *assurance* engagements (i.e. Agreed upon procedures), the most relevant audit findings concern the following issues:

- On the 'Assessment of FCH JU users' access rights granted in ABAC':
  - Access rights granted to some JU staff not in-line with the authorisations entrusted to them by the Executive Director.
  - Back-up system not formalised for some roles (e.g. Authorising Officer, Accountant and Operational Verifying agent).
  - Critical combinations of transactions in the accounting system assigned to only one person which entail a risk of improper segregation of duties.
  - Insufficient documentation/audit trail on decisions and/or authorisations.

- On the 'Assessment of FCH JU users' access rights granted in FP7 IT systems',
  - Unclear roles and responsibilities between FP7 IT system owners and FCH JU.
  - No consistent procedure for the request of access rights.
  - Differences between access rights granted by the system owner and requested by the FCH JU.
  - Unjustified inconsistencies in the access rights granted to JU users with the same Job Profile.
  - FCH JU request of access rights not linked with the roles and responsibilities of the JU users.
  - Some FP7 IT systems not fully in use.
  - Insufficient documentation/audit trail on decisions and/or authorisations.

To address the issues on ABAC and FP7 IT systems above, a total of 24 recommendations were issued by the IAC and accepted by the FCH JU. The respective action plans to address the accepted recommendations were approved by the Executive Director and actions are being implemented. According to the approved plans, all actions will be implemented by the first half of 2012.

Concerning the *consulting* services provided by the IAC, the following areas were covered. All of them aim at strengthening the Governance, Risk Management and Internal Control system of the JU and consequently at building the assurance of the Executive Director.

- *Risk Management*: the IAC coordinated (methodology, workshops and consolidation of results) the Risk Management activity of the JU in preparation of the AIP 2011. Two main outputs resulted from this activity, namely: a list of Objectives, indicators and targets linked with the JU's operational and horizontal activities and a 'Risk register' including actions to mitigate the main risks identified.

- *AAR process*: advice was provided by the IAC during the first quarter of 2011 in preparation of the 2010 AAR. In particular, for the identification of the relevant aspects to consider and report under the sections 'Management and Internal control system' and 'Building blocks towards the declaration of assurance'.

- *Bi-annual management reports*: Management reports from the Heads of Unit to the Executive Director are mandatory in accordance with the FCH JU Internal Control Framework and represent one of the main building blocks supporting the annual Declaration of Assurance of the Executive Director (see Chapter 4.1.3). In this context, the IAC defined the template (i.e. Table of Contents) to be used for such reports including detailed guidance on the aspects to be covered under each section.

- *Internal Control Standards (ICS)*: advice on ICS was provided on a regular basis, in particular to raise awareness on ICS and to assess their effective implementation.

As far as the *ex-post audit process* is concerned, the ex-post audit strategy was developed by the IAC in coordination with the Commission (DG RTD) and other two Joint Undertakings. It was adopted by the Governing Board in January of 2011. The ex-post audit strategy is a key control of the overall JU's internal control system and represents one of the main elements underpinning the Executive Director's statement of assurance (see Chapter 4.1.1.). Its purpose is to provide a systematic approach for the ex-post controls at the beneficiaries, aiming to detect on the spot errors on legality and regularity, to provide an adequate indication on the effectiveness of *ex-ante* controls and to provide the basis for corrective and recovery mechanisms.

The implementation of the ex-post audits at the beneficiaries is outsourced to three external audit firms through an audit framework contract signed with other two Joint Undertakings. .

Finally, regarding the *risk assessment exercise* jointly carried out by the IAS and the IAC in the second quarter of 2011, the following high risk areas were identified as requiring further management intervention: monitoring of operational and administrative activities, data protection, IT development and management, document management, business continuity, matching assessment and ex-post controls. To address these high risk areas, the management of the JU has defined appropriate actions of which the large majority are already implemented (e.g. Identification of Key performance indicators and their monitoring through bi-annual management reports, data protection system, timely reporting of IT issues, follow up of FCH-FP7 IT tools, assessment by the IAC of users' access rights granted in ABAC and FPT IT systems, business continuity measures (e.g. handover procedure), signature of a framework contract for ex-post audits and launching of the first audits) and others are still on-going (i.e.

establishment and monitoring of IT SLAs, document management system, business continuity plan, methodology for and assessment of in-kind contributions).

Commission's Internal Audit Service (IAS)

During 2011, the IAS carried out the risk assessment exercise jointly with the IAC which results are indicated above. The IAS did not carry out any other assurance or consulting engagement in 2011.

European Court of Auditors (ECA)

The first and unique annual report of ECA on FCH JU relates to the financial year ended 31 December 2010 (i.e. the first year after the JU's autonomy on 15th November 2010).

In its 2010 annual report, the ECA provided a 'clean opinion' on legality and regularity aspects. It stated that *'In the Court's Opinion, the transactions underlying the annual accounts of the Joint Undertaking for the year ended 31 December 2010 are, in all material aspects, legal and regular'.*
Without calling into question the Court's opinion, the ECA provided some comments on budgetary and financial management and other horizontal matters for which actions have been developed by management and are (being) implemented.

4.1.3 Building block 3: Assurance from Heads of Unit

The FCH JU Internal Control Framework provides for bi-annual management reports from the Heads of Unit to the Executive Director including a declaration of assurance.

Based on their review, the Heads of Unit consider that given the scope of the Statement of Assurance and taking into account the controls and monitoring system in place, the weaknesses they identified do not call in question the reasonable assurance as to the use of resources for their intended purpose, respect of the principles of sound financial management, and the fact that the implemented control procedures give the necessary guarantees concerning the legality and regularity of the underlying transactions.

4.1.4 Completeness and reliability of the information reported in the building blocks

As mentioned under Section 4.1, the information reported in Sections 4.1.1 to 4.1.3 stems from the results of management monitoring and auditors' work which is reflected in the reports listed here before. These reports result from analysis of evidence available. This approach provides sufficient guarantee as of the completeness and reliability of the information reported and result in complete coverage of the FCH JU budget.

4.2 RESERVATIONS

As indicated in section 4.1.1, so far, none of the audits launched in 2011 have been closed. This is not due to any weakness in the implementation of the JU's control strategy but simply due to the fact that only few cost claims were received in 2011, the first cost claims were validated in the summer and therefore the first audits could not be launched before September 2011. The implementation of the ex-post audit strategy is therefore still at an early stage.

Although only provisional audit results were received and although these are not representative due to the small number of audits (5), information s provided in this Annual Activity Report on the provisional average error rate detected which amounts to 5.8%.

However this is not confirmed yet and as shown in Table *4.1.1 (b)* the major part of operational payments in 2011 was dedicated to pre-financings. Out of the 53.3 M € operational payments, 48.5 M € concerned pre-financings and 4.6 M € were payments against cost claims. As shown in the table below, by applying the provisional average error rate of 5.8% to the non-audited population, the 'amount at risk' amounts to 265,960 € representing 0.5% of the 2011 operational payments.

Total costs accepted by FCH JU as of 31.12.2011 – FCH share *(A)*	**6,285,658 €**
Total subject to audit – FCH share *(B)*	1,700,147 €
Unchecked population *(A)-(B)*	***4,585,511€***
Amount at risk {(A)-(B)}*5.8%	***265,960€***

In addition, it has to be considered that the calculated 'amount at risk' will be further reduced in the future when final audit results are available. This is due to the fact that systematic errors detected in the audited beneficiaries will be extrapolated to non-audited cost claims of the same audited beneficiaries leading to additional corrections and therefore to a reduction in the amount of the 'unchecked population'.

In light of the above elements, in particular the estimated 'amount at risk' and considering the materiality criteria described in Annex 4, the declaration of assurance in respect of 2011 operational payments is not qualified.

4.3 OVERALL CONCLUSION

It is important to note that only material weaknesses/risks lead to a reservation to the assurance in Section 5. The concept of **'materiality'** provides the Executive Director with a basis for assessing the importance of the weaknesses/risks identified. Deciding whether something is material involves making a judgement in both qualitative and quantitative terms. See details on the 'Materiality criteria' in Annex 4.

Based on the positive conclusions of the analysis in Chapter 4.2, the assessment by management (building block 1), the results from audits and JU's action plans in place to implement the related recommendations (building block 2) and the assurance provided by the Heads of Unit (building block 3), the Executive Director of the FCH JU is of the opinion that there is sufficient evidence to provide a reasonable assurance as expressed in Chapter 5.

5 DECLARATION OF ASSURANCE

I, the undersigned, Mr Bert De Colvenaer, Executive Director of FCH JU in my capacity as authorising officer:

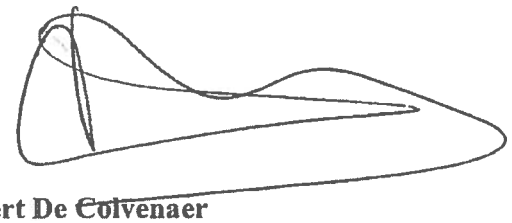
Declare that the information contained in this report gives a true and fair view[26].

State that I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.

This reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, the results from internal and external audits during the reporting year and the assurance provided by the Heads of Unit in their management reports.

Confirm that I am not aware of anything not reported here which could harm the interests of the Joint Undertaking.

Brussels, 15 February 2012



Bert De Colvenaer
Executive Director

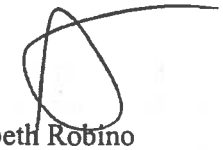
[26] True and fair in this context means a reliable, complete and correct view on the state of affairs in the JU.

ANNEX 1: STATEMENT OF THE INTERNAL CONTROL COORDINATOR

I declare that in accordance with the Commission's communication on clarification of the responsibilities of the key actors in the domain of internal audit and internal control in the Commission[27] *which is used as a reference by the FCH JU, I have reported my advice and recommendations to the Executive Director on the overall state of internal control in the FCH JU.*

I hereby certify that the information provided in Parts 3 and 4 of the present AAR and in its annexes 2 to 5 is, to the best of my knowledge, accurate and exhaustive

Brussels, 15 February 2012



Elisabeth Robino
Internal Control Coordinator

[27] SEC(2003)59 of 21.01.2003.

ANNEX 2: HUMAN RESOURCES

Establishment plan posts

Category and grade	Establishment plan 2011		Posts actually filled at 31.12.2010		Posts filled in by external publication in 2011		Promotion / reclassification in 2011		Departures 2011		Posts actually filled at 31.12.2011	
	perm	temp	perm	temp	perm[28]	temp[29]	perm	temp	perm	temp	perm	temp
AD 16												
AD 15												
AD 14		1		1								1
AD 13												
AD 12												
AD 11		3		1		2						3
AD 10												
AD 9		1		1								1
AD 8		4		4								4
AD 7		2		1		1						2
AD 6												
AD 5												
Total AD		11		8		3					0	11
AST 11												
AST 10												
AST 9												
AST 8		1		1								1
AST 7		3		3		2				2		3
AST 6												
AST 5												
AST 4		1		1								1
AST 3		2		1		1						2
AST 2												
AST 1												
Total AST		7		6		3				2		7
Total		18		14		6				2		18

In addition the FCH JU employs 2 contract agents of FG III and FG IV.

[28] Recruitment + transfer

[29] All new contracts, including the inter-agency job market

ANNEX 3: FINANCIAL INFORMATION

In accordance with the Council Regulation 521/2008 setting up the Fuel Cells and Hydrogen Joint Undertaking (article 12 of its Statutes), the FCH JU is financed through contributions from its Members, including cash contributions from the Union and the Industry and Research Groupings for its running costs and a cash contribution from the Union for its operational activities.

2011 was the first full-year that the FCH JU has implemented its budget for the entire year as an autonomous EU body (the FCH JU became autonomous on 15.11.2010)

Budget structure

The budget of the FCH JU is divided into 3 titles as follows:

TITLE 1 Staff expenses
TITLE 2 Administrative expenses
TITLE 3 Operational expenses

Budget Revenue

The funding of the FCH JU budget 2011 was as follows (in €):

Heading	CA	PA
Union contribution* for operational expenditure	113 145 257	56 209 324
Union Contribution* for administrative expenditure	1 073 889	1 073 889
Industry Grouping	2 570 667	2 570 667
Research Grouping	428 444	428 444
Other revenues	pm	pm
Carry-over of appropriations		3 321 609
TOTAL	**117 218 257**	**63 603 933**

- Includes EFTA contribution

For Title 1 and 2 appropriations are non-differentiated: commitment and payment appropriations are of equal amount. For Title 3 appropriations are differentiated. Commitments are paid over several years in accordance with contractual obligations.

Budget expenditure

Budget execution at year end reached 99.8 % in terms of commitment appropriations and 87.9% in terms of payment execution.

Below is an overview of the budget implementation (execution on commitments and payments) by fund source:

2011- C1

(amounts in €)

	Commitment Appropriations	Committed	% committed	Payment Appropriations	Paid	% paid	Carry over to 2012 (automatic C8)	To be cancelled/ reactivated
Title 1	2 390 000.00	2 278 235.00	95.3%	2 390 000.00	2 162 083.60	90.5%	53 962.71	173 953.69
Title 2	1 683 000.00	1 528 825.00	90.8%	1 683 000.00	866 617.16	51.5%	662 207.84	154 175.00
Subtotal	*4 073 000.00*	*3 807 060.00*	*93.5%*	*4 073 000.00*	*3 028 700.76*	*74.4%*	*716 170.55*	*328 128.69*
Title 3	113 145 257.00	113 145 257.00	100.0%	56 209 324.00	49 941 593.22	88.8%	0.00	6 267 730.78
Total	**117 218 257.00**	**116 952 317.47**	**99.8%**	**60 282 324.00**	**52 970 293.98**	**87.9%**	**716 170.55**	**6 595 859.47**

NOTE:Percentage of payment execution for Title 3 is calculated on the basis of the amount of payment appropriations instead of commitment appropriations because of differentiated appropriations

2011 – C 2

(amounts in €)

	Payment appropriations	Paid	% paid
Title 3	3 321 609.00	3 321 609.00	100.0%

The unused payment appropriations from operations 2010 were carried over to 2011 by decision of the GB (budget amendment n°2) at its meeting of 22 November 2011 and were used for payments of call 2010.

Total operational payments made in 2011 amounted to 53,263,202 € (o/w 49,941,593 € C1 and 3,321,609 € C2).

2011 – C 4

(amounts in €)

	Appropriations	Committed	%	Paid	%	Carry-over
Title 1	814.10	0	0	0	0	814.10
Title 2	5 733.34	0	0	0	0	5 733.34
Sub-total	6 547.44	0	0	0	0	6 547.44
Title 3	296 111.20	0	0	0	0	296 111.20
Total	**302 658.64**	**0**	**0**	**0**	**0**	**302 658.64**

The funds relate to recovery of amounts due by third parties. The main item is a recovery order on a project. These amounts are carried over automatically to 2012 (C5) and will be used for the FCH JU activity.

2011 – C 8

(amounts in €)

	Appropriations	Committed	% committed	Payment Appropriations	Paid	% paid	To be cancelled /reactivated
Title 1	58 407.07	10 687.58	18.3%	10 687.58	10 687.58	18.3%	47 719.49
Title 2	747 798.12	417 125.51	55.8%	417 125.51	417 125.51	63.0%	330 672.61
Subtotal	806 205.19	427 813.09	53.1%	427 813.09	427 813.09	53.1%	378 392.10
Title 3	137 247 603.40	136 804 009.40	99.7%	0.00	0.00		443 594.00
Total	**138 053 808.59**	**137 231 822.49**	**99.4%**	**427 813.09**	**427 813.09**	**53.1%**	**821 986.10**

ANNEX 4: MATERIALITY CRITERIA

The **'materiality'** concept provides the Executive Director with a basis for assessing the importance of the weaknesses/risks identified and thus whether those weaknesses should be subject to a formal reservation to his declaration.

When deciding whether something is material **qualitative and quantitative** terms have been considered:

In **qualitative** terms, when assessing the significance of any weakness, the following factors have been taken into account:

- the nature and scope of the weakness;
- the duration of the weakness;
- the existence of compensatory measures (mitigating controls which reduce the impact of the weakness) and
- the existence of effective corrective actions to correct the weaknesses (action plans and financial corrections) which have had a measurable impact.

In **quantitative** terms, in order to make a judgement on the significance of a weakness, the potential financial impact is quantified.

Whereas the FCH JU control strategy is of a multiannual nature (i.e. the effectiveness of the JU's control strategy can only be assessed at the end of the programme when the strategy has been fully implemented and errors detected have been corrected), the Executive Director is required to sign a declaration of assurance for each financial year. In order to determine whether to qualify his declaration of assurance with a reservation, the effectiveness of the JU's control system has to be assessed not only for the year of reference but also with a multiannual perspective. Considering the crucial role of ex-post audits defined in the FCH JU control strategy the assessment of the effectiveness of the control systems needs to check whether the scope and results of the ex-post audits carried out are sufficient and adequate to meet the control objectives.

Effectiveness of controls

The level of error rate (representative error rate) expressed as a percentage of errors in favor of the FCH JU detected by ex-post audits measured with respect to the amounts accepted after ex-ante controls is used to determine the effectiveness of the controls in place.

According to the FCH JU ex-post audit strategy approved by the Governing Board, the representative error rate is calculated as the average error rate (AER) according to the following formula:

$$AER\% = \frac{\Sigma(err)}{n} = RepER\%$$

Where:

Σ **(err)** = sum of all individual error rates of the sample (in %). Only the errors in favour of the JU will be taken into consideration.

n = sample size

Where no sufficient audit results are available (for instance only provisional results are available or results are not representative), an analysis is nevertheless carried out to assess the potential financial impact of provisional errors detected. This is done by:

- determining the 'provisional average error rate of the sample' following the formula above
- determining the amount of the 'unchecked population' (accepted cost claims less cost claims subject to audit)
- determining the "amount at risk" (provisional average error rate of the sample * unchecked population)
- determining the 'potential financial impact' (ratio 'amount at risk' compared to the relevant budget line (i.e. total operational payments)).

The materiality threshold is defined at 2% and the following approach is followed for the analysis on whether or not a reservation in the declaration of assurance is needed:.

- If the 'potential financial impact' is less than 2%, no reservation would be made.
- If the 'potential financial impact' is between 2 and 5% an additional evaluation needs to be made of both quantitative (e.g. significance of the results) and qualitative (e.g. measures in place to reduce the probability of the same error occurring) elements before any decision is taken on the need for a reservation.
- If the 'potential financial impact' is higher than 5%, a reservation would be made and an additional action plan should be drawn up.

Adequacy of the audit scope

The quantity and adequacy of the audit effort carried out is to be measured by comparing the actual audits to the target audit coverage referred to in the strategy (currently 40%).

ANNEX 5: FCH JU INTERNAL CONTROL STRATEGY

The table below provides a narrative description of the key controls in each stage of the project lifecycle, including two horizontal processes, namely: Planning & Programming and Communication & Information.

Horizontal process: **Planning & Programming**	The Council regulation 521/2008 setting up FCH JU is the primary element from which the objectives of the JU derive for the preparation of the Multi-Annual (MAIP) and annual (AIP) implementation planning. The AIP is developed on the basis of an internal dialogue in order to ensure it is understood and owned and after having taken into consideration stakeholders' feedback to ensure alignment with their priorities.
Project Lifecycle **Stage 1 - Evaluation**	Proposals are evaluated and selected according to their research credentials (i.e. best value for public money). Key controls include the screening of submitted proposals for eligibility; the choice of independent expert evaluators, the evaluation by a minimum of three experts; and a panel review for quality control and ranking of proposals.
Project Lifecycle **Stage 2 – Negotiation & selection**	Based on the ranking list, the JU establishes the final list of proposals and proceeds to negotiate the grant agreements with the successful applicants. The purpose of the negotiation is to clarify and adapt the work to be carried out and the operational objectives of the project, substantiate its costs and determine its duration and the maximum contribution from the FCH budget which is of key importance for the JU in order to respect the 'matching principle'[30]. The JU seeks to implement the advice of the independent expert evaluators. This negotiation generates significant efficiencies in the use of JU funds by discarding work which is not essential for the achievement of the scientific objectives of the project and ensuring that the budgeted costs are commensurate to the work to be carried out. Negotiation results are put forward to the Governing Board which approves the final list of selected proposals. This phase includes legal and financial verifications (the legal status of the beneficiary, its possible inclusion in the Early Warning System (EWS)[31], its financial viability and its capacity to co-fund the project) as well as safeguarding measures (e.g. bank guarantees, reduced level of pre-financing

[30] Council Regulation 521/2008 as amended by Regulation 1183/2011, FCH Statues, article 12(3): *"The operational costs of the FCH JU shall be covered through the financial contribution of the Union and through in-kind contributions from the legal entities participating in the activities. The contribution from the participating legal entities shall at least match the financial contribution of the Union Receipts shall be dealt with in accordance with the Rules of Participation set out in the Decision No 1982/2006/EC.*

[31] So far, access to the EWS by FCH is limited to some EWS levels.

	and shorter reporting periods).
Project Lifecycle **Stage 3 – Project & contract management**	Contracting and pre-financing After final approval of proposals for funding, the **grant agreements** are prepared for signature based on a model. Before the commitment is authorised and the pre-financing is paid, financial circuits are in place ensuring that all relevant operational and financial aspects are verified by at least two independent members of staff. Interim and final payments For beneficiaries' payment requests (i.e. cost claims), the JU relies on two main sources: (1) Beneficiaries' technical and financial progress reports (intermediate and final). (2) Audit certificates by certifying auditor who must be independent from the beneficiary and qualified to carry out statutory audits of accounting documents. In particular: a. *'Certificates on the beneficiaries' financial statements'* issued by independent, professional auditors on the compliance with the contractual and regulatory requirements and on the accuracy of the cost statements submitted in order to detect and correct errors before the payments are made. b. *'Certificate on the methodology':* the beneficiary may submit a 'Certificate on the methodology' for the calculation of costs which it uses to prepare its claims with regard to both personnel and indirect costs. The approval of interim and final payments to beneficiaries is subject to the ex-ante financial circuit indicated above. Indeed, before a payment is authorised, all relevant operational and financial aspects are verified by at least two independent members of staff. Project managers verify that the work carried out by the beneficiary is in all respects in compliance with the grant agreement by evaluating the project reports and deliverables. To do so, they may seek the advice of independent experts. Financial assistants carry out financial and arithmetical checks to ensure financial statements and auditor's certificates have been submitted in accordance with the provisions of the grant agreement. The authorising officer ascertains that these checks on the supporting documents have been done and validates the expenditure. When deemed necessary, ex-ante 'on the spot' control visits and/or ex-ante 'in depth' desk checks may be carried out during project implementation. They include the verification of individual cost items against other sources of information (reconciliations, authorisation) based on third-party invoices or payslips provided by the beneficiary. Basic deficiencies in beneficiaries' understanding of the contract provisions can be detected and improved this way, with a resulting corrective effect on future claims.
Project Lifecycle **Stage 4 – Ex-post controls: audits**	Ex-post audits are one of the main elements for the provision of assurance because many errors can only be detected by ex-post audits 'on the spot'. This control is intended to (1) contribute to ensure the legality and regularity

and recoveries	of the financial transactions; and (2) to provide an indication of the effectiveness of ex-ante controls. The JU has developed an ex-post audit strategy which is harmonised with the Commission's strategy as requested by the General Financing Agreement signed between the Commission and the JU. Audit results will be implemented by the Executive Director as authorising officer by issuing recovery orders or deducing amounts wrongly paid from future payments to the same beneficiary.
<u>Horizontal process:</u> **Communication & Information**	Communication and information channels with beneficiaries and auditors provide preventive and directive measures to improve the quality of beneficiaries' financial management and of their data. This aims at ensuring that both beneficiaries and the certifying auditors fully understand the contract requirements and provisions, in order to reduce the number of errors and omissions in the cost claims submitted. In this respect, FCH JU has developed some guidance notes which are available through the *'Participant's Portal'* and the FCH JU webpage. The JU will continue developing guidance in line with the needs of the project cycle and will liaise with the units responsible for ex-post audits in the Commission in order to spread their best practices across JU's beneficiaries and auditors and ensure a common understanding of similar critical issues and harmonised methodology.

ANNEX 6: FCH JU INTERNAL CONTROL STANDARDS

MISSION AND VALUES

ICS 1: Mission
The FCH JU's 'raison d'être' is clearly defined in up-to-date and concise mission statements developed from the perspective of its customers.

Requirements
- The JU have up-to-date mission statements which are linked across all hierarchical levels.
- These mission statements have been explained to staff and are readily accessible.

ICS 2: Ethical and Organisational values
Management and staff are aware of and share appropriate ethical and organisational values and uphold these through their own behaviour and decision-making.

Requirements
- The JU has procedures in place to ensure that all staff is aware of relevant ethical and organisational values, in particular ethical conduct, avoidance of conflicts of interest, fraud prevention and reporting of irregularities.

HUMAN RESOURCES

ICS 3: Staff allocation and flexibility
The allocation and recruitment of staff is based on the FCH-JU's objectives and priorities. Flexibility is promoted to strike the right balance between ownership and continuity.

Requirements
- Whenever necessary - at least once a year - management aligns the organisational structures and staff allocations with priorities and workload.
- Staff job descriptions are consistent with relevant mission statements
- According to its scope and size, the JU has a policy to promote flexibility in order to ensure that the right person is in the right job at the right time and, where feasible, can provide multilevel support.
- Necessary support is defined and delivered to new staff to facilitate their integration in the team;

ICS 4: Staff Evaluation and Development

Staff performance is evaluated against individual annual objectives, which fit with the FCH-JU's overall objectives. Adequate measures are taken to develop the skills necessary to achieve the objectives.

Requirements

- In the context of the evaluation process, discussions are held individually with all staff to establish their annual objectives, which fit with the JU's objectives.
- Staff performance is evaluated according to standards set by the JU.
- Appropriate measures to develop the necessary skills (e.g. training, coaching...) are defined and management ensure their implementation.

PLANNING AND RISK MANAGEMENT PROCESSES

ICS 5: Objectives and Performance Indicators

The FCH-JU's objectives are clearly defined and updated when necessary. These are formulated in a way that makes it possible to monitor their achievement. Key performance indicators are established to help management evaluate and report on progress made in relation to their objectives.

Requirements

- The JU's Annual Implementation Plan (AIP) is developed in accordance with applicable guidance and on the basis of (1) an internal dialogue in order to ensure it is understood and owned and (2) stakeholders' feedback to ensure alignment with their priorities.
- The AIP clearly sets out how the planned activities will contribute to the achievement of objectives set, taking into account the allocated resources and the risk identified.
- To the extent possible, the AIP objectives are established in line with the SMART criteria, i.e. they are Specific, Measurable or verifiable, discussed and Accepted, realistic and Timed.
- Whenever necessary, the objectives are updated to take account of significant changes in activities and priorities.
- Where appropriate, the JU establishes road-maps of on-going multi-annual activities (i.e. MAIP), setting out critical milestones for the actions that need to be taken before the budget appropriations can be implemented for the whole period of the activity.
- In the AIP, there is at least one performance indicator per objective to monitor and report on achievements. To the extent possible, the performance indicators are established according to the RACER criteria, i.e. they are Relevant, discussed and Accepted, Credible, Easy and Robust.
- Measures are defined to alert management when indicators show that the achievement of the objectives is at risk.

ICS 6: Risk Management Process

A risk management process that is in line with applicable provisions and guidelines is integrated into the Annual Implementation Plan (AIP).

Requirements

- A risk management exercise (i.e. risk identification, risk assessment and action plan) at JU level is conducted at least once a year as part of the AIP process and whenever management considers it necessary (typically in the event of major modifications to the JU's activities occurring during the year). Risk management is performed in line with applicable provisions and guidelines.
- Risks considered "critical" from an overall JU perspective are indicated in the JU's Annual Implementation Plan and followed-up in the Annual Activity Report.

OPERATIONS AND CONTROL ACTIVITIES

ICS 7: Operational Structure

The FCH-JU's operational structure supports effective decision-making by suitable delegation of powers. Risks associated with the FCH-JU's sensitive functions are managed through mitigating controls. Adequate IT governance structures are in place.

Requirements

- Delegation of authority is clearly defined, assigned and communicated in writing, conforms to legislative requirements and is appropriate to the importance of decisions to be taken and risks involved.
- All delegated and sub-delegated authorising officers have received and acknowledged the Charters and specific delegation instruments.
- As regards financial transactions, delegation of powers (including both "passed for payment" and "certified correct") is defined, assigned and communicated in writing.
- The JU's sensitive functions are identified and relevant mitigating controls are established e.g. robust Financial Circuits, management of exceptions, use of independent experts when necessary and other control procedures (ref. ICS 8).
- Governance of the IT structure is established to enable the efficient and secure functioning of the IT services.

ICS 8: Processes and Procedures

The FCH-JU's processes and procedures used for the implementation and control of its activities are effective and efficient, adequately documented and compliant with applicable provisions. They include arrangements to ensure segregation of duties and to track and give prior approval to control overrides or deviations from policies and procedures.

Requirements

- The JU's main operational and financial processes and procedures and IT systems are adequately documented.
- The JU's processes and procedures ensure appropriate segregation of duties (including for non-financial activities).
- The JU's processes and procedures comply with applicable provisions, in particular the Financial Rules (e.g. ex-ante and ex-post verifications).
- A method is in place to ensure that all instances of overriding of controls or deviations from established processes and procedures are documented in exception reports, justified, duly approved before action is taken and logged centrally in the JU.

ICS 9: Management supervision:

Management supervision is performed to ensure that the implementation of activities is running efficiently and effectively while complying with applicable provisions.

Requirements

- Management supervises the activities they are responsible for and keep track of main issues identified. Management supervision covers both legality and regularity aspects and operational performance (i.e. achievement of AIP objectives).
- The supervision of activities involving potentially critical risks is adequately documented[32].
- Management monitors the implementation of accepted audit recommendations and related action plans.
- At least annually in the Annual Activity Report (AAR) as stipulated in Article 6 of the JU's Statutes and Article 10 of the General Financing agreement , and at any time deemed appropriate, the Executive Director informs the Governing Board of any potentially significant issues related to internal control, audit and OLAF investigations as well as material budgetary and financial issues which might have an impact on the sound management of appropriations or which could hamper the attainment of the objectives set.

[32] Depending on the nature of the work performed, the documentation of supervision can, for example, be constituted of minutes of meetings, notes explaining key decisions, signature of authorising officer in IT systems, or documents explaining the scope, methods, results and conclusions of the supervisory activities

ICS 10: Business Continuity:
Adequate measures are in place to ensure continuity of service in case of "business-as-usual" interruption. Business Continuity Plans (BCP) are in place to ensure that the FCH JU is able to continue operating to the extent possible whatever the nature of a major disruption.

Requirements

- Adequate measures - including handover files and deputising arrangements for relevant operational activities and financial transactions - are in place to ensure the continuity of all service during "business-as-usual" interruptions (such as sick leave, staff mobility, migration to new IT systems, incidents, etc.).
- Business Continuity Plans cover the crisis response and recovery arrangements with respect to major disruptions (such as pandemic diseases, terrorist attacks, natural disasters, etc.). They identify the functions, services and infrastructure which need to be restored within certain time-limits and the resources necessary for this purpose (key staff, buildings, IT, documents and other).

ICS 11: Document Management:
Appropriate processes and procedures are in place to ensure that the FCH JU's document management is secure, efficient (in particular as regards retrieving appropriate information) and complies with applicable legislation.

Requirements

- Document management systems comply with relevant security measures, provisions on document management and rules on protection of personal data.
- A document management system is established for registration, filing, classification and archiving of documents.

INFORMATION AND FINANCIAL REPORTING

ICS 12: Information and Communication:
Internal communication enables management and staff to fulfil their responsibilities effectively and efficiently, including in the domain of internal control. The FCH JU has an external communication strategy to ensure that its external communication is effective, coherent and in line with the JU's key political messages. IT systems used and/or managed by the JU (where the JU is the system owner) are adequately protected against threats to their confidentiality and integrity.

Requirements

- Internal and external communications comply with relevant copyright provisions.
- Appropriate Internal Communication is in place to ensure that management and staff are appropriately informed of decisions, projects or initiatives that concern their work assignments and environment.
- All personnel are encouraged to communicate potential internal control weaknesses, if judged significant or systemic, to the appropriate management level.
- A documented general strategy for external communication, including clearly defined target audiences, messages and action plans is in place. The communication strategy is devised from the beginning of policy formulation and is discussed with the relevant stakeholders.

- The IT systems support adequate data management, including database administration and data quality assurance. Data management systems and related procedures comply with relevant Information Systems Policy, compulsory security measures and rules on protection of personal data.

ICS 13: Accounting and Financial Reporting:
Adequate procedures and controls are in place to ensure that accounting data and related information used for preparing the organisation's annual accounts and financial reports are accurate, complete and timely.

Requirements

- The Authorising Officer (i.e. Executive Director) has responsibility for ensuring the reliability and completeness of the accounting information under his/her control necessary to the Accounting Officer for the production of accounts which give a true image of the JU' assets and of budgetary implementation.
- The JU's accounting procedures and controls are adequately documented.
- Financial and management information produced by the FCH JU, including financial information provided in the Annual Activity Report, is in conformity with applicable accounting rules and instructions.

EVALUATION AND AUDIT

ICS 14: Evaluation of activities:
Evaluations of expenditure programmes, and other non-spending activities are performed to assess the results, impacts and needs that these activities aim to achieve and satisfy.

Requirements

- N/A: The evaluation of the Programme is up to the Commission.

ICS 15: Assessment of Internal Control Systems:
Management assess the effectiveness of the FCH JU's key internal control systems, including the processes carried out with external assistance and/or outsourced, at least once a year.

Requirements

- Management assess the effectiveness of the FCH JU's key internal control systems, including the processes carried out with external assistance and/or outsourced at least annually. Such self-assessments can, for example, be based on staff surveys or interviews combined with management reviews of supervisory reports, results of evaluation and ex-ante/ex-post verifications, audit recommendations and other sources that provide relevant information about the JU's internal control effectiveness.
- On an annual basis – as part of the Annual Activity Report – the Internal Control Coordinator signs a statement, to the best of his/her knowledge, on the accuracy and exhaustiveness of the information on management and internal control systems provided in the Annual Activity Report.

ICS 16: Internal Audit Capability:
The FCH JU has an Internal Audit Capability (IAC), which provides independent, objective assurance and consulting services designed to add value and improve the operations of the JU.

Requirements

- The role and responsibilities of the FCH JU's Internal Audit Capability (IAC) are formally defined in an audit charter.
- The annual audit work plan is risk-based; and is approved by the Executive Director and the Governing Board.
- The Executive Director ensures that the IAC is independent of the activities they audit.
- The Executive Director ensures that the IAC has sufficient and adequate resources to perform the audit work plan.

Analysis and assessment of the Fuel Cells and Hydrogen Joint Undertaking Annual Activity Report 2011 (FCH JU AAR) by the FCH JU Governing Board

Legal basis

Article 40 (2) of the FCH Financial Rules states that *'by no later than 15 June each year, the Governing Board shall send to the budgetary authority and the Court of Auditors an analysis and assessment of theAuthorising officer's annual report on the previous financial year. This analysis and assessment shall be included in the Annual Activity Report of the FCH Joint Undertaking, in accordance with the provisions of Article 21of the Statutes'.*

Analysis

The Fuel Cells and Hydrogen Annual Activity Report 2011 (Authorising Officer's report) was presented to the FCH JU Governing Board on March 7th 2012 and it was approved by the Governing Board in June 2012.

The Governing Board is of the opinion that the FCH AAR 2011 covers the main achievements of the FCH JU in 2011 in relation to the objectives set; clearly identifies the risks associated with the FCH JU operations; duly reports on the use made of the FCH JU resources provided; and indicates the efficiency and effectiveness of the FCH JU internal control system.

The Governing Board recognises the progress made by the FCH JU and the achieved results in 2011 and notes in particular that:

- The FCH JU successfully completed the selection and signature of all Grant Agreements of 26 research projects from the third Call for Proposals (published in 2010) with a total FCH JU contribution of 83.7 M€, with the participation of 210 legal entities and with 24% FCH JU funding being granted to SMEs.
- The FCH JU published the fourth Call for Proposals with an indicative FCH JU budget of 109 M€. For this call, 80 proposals were evaluated with the assistance of independent experts, in which 660 legal entities participated and in which 26% of the FCH JU funding was requested by SMEs. The Governing Board approved on November 22nd 2011 a list of 30 proposals (and a reserve list of an additional set of 23 proposals) for opening negotiations in view of concluding grant agreements.
- The Multi-Annual Implementation Plan 2008-2013 was duly revised and key performance indicators adopted.
- The first programme review day took place enabling the public assessment of the progress of the programme towards its objectives.
- The low number of complaints from coordinators of proposals not retained for negotiations is considered as an indication of the robustness of the evaluation process.

- Regarding time to payment, it is noted that 100% of payments for grants were paid on time. However, the Governing Board is of the opinion that the time to payment for the experts should be improved (62% for the call 2011).

The Governing Board recognised that actions have been taken by the FCH JU to implement the remarks provided by the European Court of Auditors in its report on the FCH JU Annual Accounts 2010.

Risk management process

Concerning the "Risk Management process", the Governing Board notes that:

(i) Actions have been implemented to address the critical risks identified in the FCH JU Annual Activity Report 2010, namely (a) the adoption on November 14th 2011 of the amendment of the Council Regulation setting up the FCH JU that will result in improved funding levels and (b) the establishment of a timely reporting and monitoring system for IT issues.

(ii) A new critical risk has been identified in 2011, namely the non-performance or non-achievement of objectives due to staff overload. In this respect, the Governing Board underlines that mitigation actions for the identified risk shall be defined and undertaken further to the analysis of the FCH JU staff workload.

The Governing Board also acknowledges that the management of the FCH JU has taken actions to tackle the risk areas identified in the risk assessment exercise, jointly carried out by the Internal Audit Service and the Internal Audit Capability.

Human resources

In relation to the use of Human Resources, the Governing Board notes that the FCH JU resources assigned to the activities carried out in 2011 have been used for their intended purpose and in accordance with the principles of sound financial management. It is also noted that the Staff Establishment Plan has been fully filed in 2011.

Internal control system

The Governing Board remarks that the internal control system is working and adequately mitigates the critical risks which could hamper the achievement of the FCH JU objectives and activities. However, it is noted that further improvement is needed in terms of compliance and effectiveness to address the weaknesses identified.

Furthermore, the Governing Board also acknowledges that new procedures have been put in place to complete and strengthen the internal control system of the FCH JU, in particular for the review and acceptance of periodic reports and for the ex-post audit of beneficiaries.

Ex-post audits

The Governing Board positively notes that the ex-post audit strategy intended to ensure the legality and regularity of the expenditure has been adopted and that, even though a limited number of cost claims were validated in 2011, it started to be implemented with the launch of some audits in the year. The provisional average error rate is above the materiality threshold defined in Annex 4 (2%). Being only provisional and not representative (due to the small number of audits), this error rate does not call for a reservation. The Governing Board takes note that the Executive Director has

addressed this issue by pointing out possible actions regarding ex ante and ex-post controls, including training sessions to beneficiaries.

Assessment

The declaration of the Executive Director's and the FCH Annual Activity Report 2011 gives a good assessment of operational and financial management in relation to the achievement of objectives, and adequately supports a reasonable assurance on the legality and regularity of the financial operations of the FCH JU in year 2011. Based on the information provided, the FCH JU key objectives set up for 2011 have been met in compliance with legality, regularity and sound financial management.

The FCH JU Governing Board hereby adopts this analysis and assessment of the FCH Annual Activity Report 2011. This assessment will be included into the FCH Annual Activity Report 2011.