

HYLIGHTS

Hydrogen for Transport in Europe

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Comparative Analysis of JTI Programme Management Structures and US Benchmarking

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Disclaimer

This document is the result of a collaborative work between HyLights Industry and Institute partners. The results of the research were subsequently elaborated and presented in a coherent manner, which involved extensive stakeholder consultation in locations around the world as well as feedback from the “HyLights” Industry Partners.

The ideas presented in this document were reviewed by certain "HyLights" project partners to ensure broad general agreement with its principal findings and perspectives. However, while a commendable level of consensus has been achieved, this does not mean that every consulted stakeholder or "HyLights" Industry Partner necessarily endorses or agrees with every finding in the document. The producer of this document is the sole responsible for its content and recommendations.

Contents

1. Introduction	4
2. Methodology.....	5
3. Main Analysis	5
<i>What is a JTI? : A Brief Overview.....</i>	5
<i>JTI Benchmarking Analysis.....</i>	5
The Governing Board	6
The Executive Director	7
The Stakeholder and/or General Forum – IMI JTI, Clean Sky JTI, FCH JTI, ENIAC.....	7
The (National) States Representatives Group – FCH JTI, Clean Sky JTI, and IMI JTI.....	7
The Public Authorities Board – ARTEMIS and ENIAC	7
The Scientific Committee – FCH JTI and IMI JTI.....	8
The Industry and Research Committee – ARTEMIS and ENIAC	8
Working Committees – Clean Sky.....	8
<i>Hydrogen Specific Programme Management Comparison – EU vs. U.S.....</i>	9
<i>Implementing PGIs in a European Programme Management Structure.....</i>	9
Programme Management:.....	10
Applied Research and Technology Development.....	10
Safety, Codes and Standards.....	10
Education	10
4. Conclusions	10
Annex I - Programme Management Structure of ENIAC and ARTEMIS.....	12
Annex II – FCH JTI Programme Management Structure	12
Annex III - Clean Sky JTI Programme Management Structure	13
Annex IV – DOE Hydrogen Program Organization	13
Annex V – Activities of the US DOE Hydrogen Program	14

1. Introduction

Programme Management is fundamental to the coordination of the activities undertaken by project partners. Programme Management also ensures that the outcomes of projects can be achieved and that those outcomes are in line with the main targets of the programme. Therefore a good structure is needed whereby the aspirations of the leaders and the realities of the work ahead are communicated and a common approach be developed and monitored. A programme is a major undertaking for most organisations, meaning significant funding and substantial change for the organisations and individuals involved.

According to the “Managing Successful Programmes” (MSP) theory, programme management is the action of undertaking a portfolio of projects in a coordinated manner so as to achieve outcomes and realise benefits of strategic importance. There exist three critical elements that are “synchronised” within the Programme Management implementation:

- Corporate Strategy;
- Delivery mechanisms of change;
- Business-as-usual environment.

The complexity, risk and many interferences to be managed, and conflicts to be resolved essentially render the implementation of a sound programme management structure. Practice has demonstrated that success might not be guaranteed in terms of change managements should there be¹:

- Insufficient board-level support;
- Lack of leadership;
- The expectations of the organisational capacity and capability are unrealistic;
- The expected outcomes and vision are not well identified;
- The future capabilities are not clearly identified;
- There is insufficient engagement of stakeholders.

A Programme Management strategy should include the following elements accompanied by the respective plans:

- Resource management;
- Monitoring and Control;
- Information Management;
- Quality Management;
- Risk Management (accompanied by a Risk Register);
- Issue Resolution (accompanied by an Issue Log);
- Stakeholder Engagement (accompanied by a Stakeholder Profiles and Programme Communications Plan);
- Benefits/Outcomes Management (accompanied by a Benefits/Outcomes Realisation Plan).

Looking at the current situation with the Fuel Cell and Hydrogen industry in Europe, industry and the European Commission (EC) are undertaking the process that will define the programme management of the Joint Technology Initiative (JTI) on Fuel Cells and Hydrogen (FCH). This Joint Undertaking FCH JTI that is being created will issue calls for tender for projects aimed at advancing European technology towards commercialisation.

The purpose of this document is to consider what are the comparative programme management practices in both similar JTI projects as well as and other hydrogen-based programmes such as that of the US DoE’s Hydrogen Program.

It is important to note that this document only deals with Programme Management and the bodies that will implement the Programme. No mention is made here of the Project Management level, except in the last chapter which identifies the Programme Management bodies and the data that they will monitor from project level.

¹ “Managing Successful Programmes”, Office of Government and Commerce, TSO

2. Methodology

Each of the JTIs must first be identified and certain characteristics brought out so that one understands the composition and purpose of each JTI before looking more in depth at its programme management structure.

From that point a benchmark will be made that considers the management structures (as detailed in each JTI's Regulation) and the roles of each body within these structures. Conclusions shall be developed to identify the strengths or weaknesses of the FCH JTI structure (as it currently stands). Finally a benchmark analysis shall be made between the FCH JTI model and the US DoE Hydrogen Programme.

3. Main Analysis

What is a JTI? : A Brief Overview

A Joint Technology Initiative (JTI) is a public-private partnership and is foreseen in Article 171 of the EC Treaty. Each JTI consists of industry on the private side, and the European Commission on the public side. It can therefore be considered as a Joint Undertaking (JU) and takes the form of a Community Body. The JTI Joint Undertakings' raison d'être is to "efficiently execute [European] Community research, technological development and demonstration programmes".

The establishment of each Joint Undertaking is the result of an EU Regulation bringing each JTI legally into force and dictating its structure and functions. It is these Regulations that shall be the focus of this report and on which comparisons made, with the additional input of interviews with persons in each JTI as deemed necessary.

JTI Benchmarking Analysis

Currently there are five JTIs, which have either been established or are in the process of establishment.

Project ²	Sector	Budget	Interest Group
Clean Sky JTI ³	Environmental impact of European Air Transport	€1.6 billion over seven years	Aircraft manufacturers, Component manufacturers, etc.
ARTEMIS JTI ⁴	Embedded Systems	€2.7 billion over seven years	Networked and Electronic Media, Software, Mobile and Communication industries etc.
IMI JTI ⁵	Biopharmaceuticals	€2 billion to invest over seven years ⁶	Pharmaceutical companies research institutes etc.
ENIAC JTI ⁷	Nanoelectronics	€3 billion over a ten year period	Nanoelectronic companies, including semiconductor industry, equipment and materials suppliers, research centres etc.
FCH JTI ⁸	Fuel Cells and Hydrogen	€3.2 billion over seven years	Energy, automotive, stationary application companies etc.

It is clear that there is much diversity in the membership of each JTI due to their focus on rather broad and different sectors. However, in the programme management structure, there are two bodies, which are common to all JTIs; a Governing Board and an Executive Director.

The Governing Board

The Governing Board has overall responsibility for the operations of the Joint Undertaking and oversees the implementation of its activities in line with its Strategic Agenda. The Governing Board is representative of the JTI's members. The Governing Board approves the key documentation for the functioning of the Joint Undertaking, namely the multi-annual strategic plans, budgets, forecast expenses, and the plans of sub-committees or working groups. Its most important role however is the approval of project proposals to receive funding.

At the Governing Board meetings, which will take place biannually, observers are allowed to take part in the meetings. Observer status is granted to the (National) States Representative Groups in Clean Sky, IMI and FCH JTIs.

² For more information about these JTIs, please see this website

http://cordis.europa.eu/fp7/jtis/ind_jti_en.html

³ http://www.cleansky.eu/index.php?arbo_id=83&set_language=en

Additional information on Clean Sky came from telephone conversations with Marco Brusati, European Commission RTD, Clean Sky JTI. March 2008

⁴ <http://www.artemis-office.org/DotNetNuke/WhatisARTEMIS/tabid/97/Default.aspx>

Additional information on ARTEMIS came from telephone conversations with Ad Burgmans, ARTEMISIA Association. March 2008

⁵ http://imi.europa.eu/index_en.html

⁶

<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/190&format=HTML&aged=0&language=EN>

⁷ <http://www.eniac.eu/web/aeneas/jti.php>

Additional information on ENICA came from telephone conversations with Michel Hordies European Commission RTD, ENIAC. April 2008

⁸ <http://www.fchindustry-jti.eu/>

Of the JTIs, the Clean Sky JTI has the most unique Governing Board structure in which the European Commission is present but may not chair or vice-chair the Board. In addition it is not expressly stated that the Board represents all the members, or founding-members, but instead have one leader and one associate from working groups (Clean Sky calls them ITD Committees) representing one of the six technical areas of aircraft research. The reason for this is due to Clean Sky strictly aiming to avoid a conflict of interests and therefore allows the EC to hold veto rights on any proposal put forward in order to protect the EU's interest.

The Executive Director

The Executive Director's role is to undertake the day-to-day operations of the JTI including managing the public and private funds and recommending project proposals to the Governing Board. The Executive Director prepares the key documentation for the functioning of the JTI, namely the multi-annual strategic plans, budgets, forecast expenses, and the plans of sub-committees or working groups. In addition the Executive Director must provide information that the Governing Board requires and set up meetings for other ad hoc bodies (such as States Representative Groups) to report and meet with the Governing Board, as well as prepare calls for proposals and be responsible for risk assessment of the Joint Undertaking.

A Joint Undertaking Directorate can be set up to help deal with the day-to-day management of the JU. In the case of Clean Sky, for example, the directorate can be up to 25 people who will perform various functions. It is not necessary that these people come from within the JTI itself, and may include companies with little or no relation to the aims of the JTI.

The Stakeholder and/or General Forum – IMI JTI, Clean Sky JTI, FCH JTI, ENIAC

This communication platform is to be convened once a year allowing all stakeholders both within the JTI and outside to learn about the ongoing activities of the JTI.

Specific Bodies for certain JTIs

The (National) States Representatives Group – FCH JTI, Clean Sky JTI, and IMI JTI

A States Representative Group is found in those JTIs whereby the membership of the Joint Undertaking does not already include Member States and/or regions. This separate group has, in Clean Sky's case, its own rules of procedure and decision-making but is not an association. It is composed of representatives of the countries associated with the Framework Programme and acts as an interface between the Governing Board and the relative stakeholders within the respective countries.⁹ The Group may issue its own recommendations on matters which concern national interest, to which the Joint Undertaking will report back on.

For the FCH JTI, there is currently a proposal to rename this group to FCH States & Regions Representatives Group, in order to increase the role of the regions in the programme management structure.

The Public Authorities Board – ARTEMIS and ENIAC

This Public Authorities Board has more power than the States Representative Group as the public authorities of Member States are direct financial paying members of the JTI. The public authorities may approve the rules of procedure for calls and approve the selection of project proposals to receive public funding. On funding local public authorities reserve the right to decide which projects to fund, and receive additional financing from the European Commission. In terms of structure, one-third of the Public Authorities Board will come from the European Community and there is a minimum of three Member States must be represented.

For ARTEMIS, the Public Authorities Board is seen to bring an increase in efficiency to the structure in that decisions are taken without the need for extensive consultation.

⁹ Wording taken from the IMI JTI Regulation

The Scientific Committee – FCH JTI and IMI JTI

A Scientific Committee has an advisory role to the Governing Board and will propose science-based recommendations to the Board. Its purpose is to provide scientific priorities to the annual implementation plan, and may invite non-member persons for more advice to be provided.

The Governing Board may choose the members of the Committee according to its own criteria. For IMI the Committee is limited to 15 members and must represent equally academia, patients, industry, and regulatory bodies while covering the whole drug development process. While for the FCH JTI proposed candidates may be put forward by the States Representative Group. All members act in their personal capacity and not on behalf of their relative organisations.

It must meet at least once a year and may invite non-members (as observers without voting rights) to meetings for providing advice to the Committee. FCH JTI's Scientific Committee will meet at least twice a year.

The Committee provides advice on:

- The relevance of the **Research Agenda** and propose **amendments**
- The **Annual and Multi-Annual Implementation Plan's** scientific priorities
- The composition of **peer review committees**

The Industry and Research Committee – ARTEMIS and ENIAC

This Committee is composed of corporate researchers, SMEs and academic partners who self-appoint members of the Committee. The role of the Committee is to provide advice on planning and operational practices, and promote partnership building to achieve the Joint Undertaking's aims. It may also improve proposals and input technological, research and innovation clauses for approval by the Governing Board. It helps to prepare the Annual and the Multi-Annual Research Plans which are publically available to all interested parties wanting to answer a call for proposal.

Working Committees – Clean Sky

The Clean Sky JTI, unlike the other JTIs is "objective driven". What this implies is that to attain a certain objective there needs to be coordination between many key industries. Therefore to ensure good coordination, the programme management structure allowed for 6 committees to be established.¹⁰ This coordination allows for better exploitation of results and assists project partners at project level achieve their goals. The other JTIs fund research directly along the industry lines and therefore coordination between industry sectors is not necessary.

Looking more in depth, the six committees (called Integrated Technology Demonstrators (ITDs)) work on different technical and technological aspects of technologies and aim to help define the contents of the calls based on preliminary studies to be conducted by each ITD. Each ITD has its own chairman and an associated representative. In addition a Technology Evaluator platform will be launched to ensure the technologies are efficiently and economically focused towards the high level objectives, and will assess ITDs' work and coordinate their activities.¹¹

Clean Sky, as a further variation from other JTIs, also has an Independent Technology Evaluator which monitors the technological results coming out of the Committees. The Committees undertake their own research and may invite non-members in for consultation purposes.

¹⁰ SMART Fixed-Wing Aircraft, Green Regional Aircraft, Green Rotocraft, Sustainable & Green Engines, Systems for Green Operation, and Eco-Design

¹¹ <http://www.shephard.co.uk/Rotorhub/ShowReportItem.aspx?ID=f22b8d37-e417-4338-b6b1-607edff33bcb>

Within the FCH JTI there are currently four IDA Committees looking at the different application of FCH technology in much the same way as Clean Sky. The four Committees are Transportation, Hydrogen, Production and Distribution, Stationary Power Generation, and Early Markets. The first three are based on industry sectors, while Early Markets specifically addresses cross cutting issues affecting bringing products into the market. The research undertaken in these Committees will be used in the development of the calls for proposals, however it is not yet clear if these will become more formal in the final JTI structure.

Hydrogen Specific Programme Management Comparison – EU vs. U.S.

So far only the EU JTIs have been analysed as the FCH JTI has the same raison d'être in terms of advancing research. However, in the USA, the federal Department of Energy also funds research in the FCH industry. Here the US approach is considered and compared with the European approach to understand better what Europe can learn from the US approach.

Annex IV contains a diagram of the Programme Management structure from the U.S. Department of Energy. It, like the FCH JTI contains an Executive Director seen here as the "DoE Hydrogen Program Manager" and has a supporting office, the "Program Secretarial Officers". The Scientific Committee of the JTI is replaced with a Chief Engineer and a Technology Analyst.

However, there are a few key differences between the structures; the input of the regions and the role of national laboratories.

In the U.S. management structure the State and Local government enter at the project implementation level compared with the European programme which will allow Member States' authorities to input at both programme and project level. The European way provides a platform for both national and regional and local authorities to align both the JTI and their own policies. Based on the previous demonstration projects in Europe, there is also a mix of collaboration between regions; from city cooperation (i.e. HyFLEET:CUTE) to regional cooperation (i.e. Scandinavian Hydrogen Highway), therefore an increased input from Member States and their Regions is required.

By comparison, the U.S. Hydrogen Programme consults with other federal departments and ensures that the Programme is well coordinated with other federal activities in the following fields: Fossil Energy, Nuclear Energy, Science, Energy Efficiency and Renewable Energy. These federal departments are themselves broken into regional departments. The programme office contacts the regional departments regularly based on the specific expertise of each department to ask for input into the Programme Level. Once every year, all the national laboratories come together for a week in a Merit Review Meeting where the key research achievements are shared. Over the past five years, the overall budget¹² that that has been allocated to the US DoE Hydrogen Programme (including from all federal departments) has been €733m (or \$1.16bn¹³). The US therefore has a strongly coordinated role with all the key federal departments with a stake in the industry. This contrasts with the role of the Scientific Committee and the States Representative Group in the FCH JTI whereby the introduction of such technology is done more on an ad hoc basis with much depending on national governments' willingness to adopt the technology.

Implementing PGIs in a European Programme Management Structure

This analysis has found that there are few differences in the composition of European JTIs, largely due to them being part of the same FP7 programme, and yet they contain most of the bodies and functions of the DoE Hydrogen Programme of the U.S..

However, the FCH JTI structure does foresee the need for ad hoc committees in the programme management structure for the purposes of coordination between the projects and

¹² <http://www.hydrogen.energy.gov/budget.html>

¹³ Conversion as of 8th April 2008

to gather important information. To consider which ad hoc committees may be established, one may consider the U.S. DoE Hydrogen Programme Management functions to identify the key issues that the FCH JTI will have to address.

Combining the activities that can be seen in the U.S. DoE Hydrogen Programme (see Annex IV) with the key project governance indicators identified by the HyLights project, it is possible to build the framework for the reporting between a Steering Group representative/Project Manager at project level, to the Executive Director (or his Programme Office) at Programme Level. Below each of the categories highlighted in Annex V shall be linked to the recommended PGIs.

Programme Management:

This function of the Joint Undertaking (to be undertaken by the Executive Director) would evaluate the common elements in the projects such as Consortium Agreements, Confidentiality Agreements and data protection provisions in a contract to build best practices and ensure an improvement in project management. It would also evaluate the reports submitted by the Steering Group/Project Manager of the individual projects and look for the potential linkages between projects in order to improve both efficiency and help advance the industry overall.

Applied Research and Technology Development

Under this function progress of both the Mobility & Infrastructure Groups and the Quality Assurance Groups would be monitored so that the JU can measure the advancement of the technology and gradually build best practices. This may be combined with the Scientific Committee undertaking the Basic Research function.

Safety, Codes and Standards

This function would consider the risk assessments undertaken on both infrastructure and vehicles, the projects' risk mitigation plans and their safety training programmes. Insurance would also be analysed especially third party liability coverage for infrastructure providers.

Education

Information should address industry with regular reports and learnings to be communicated effectively to key stakeholders. Information such as manuals, progress reports etc. are all types of publications which bring value to the industry and help knowledge sharing across continents.

The FCH JTI structure's inclusion of a General Stakeholder meeting will address all the key stakeholders and implements the forum at a programme level, not precluding of course a similar forum at a project level. It is important to note that dissemination of information should come from programme partners as they are fully aware of the market and the activities being undertaken.

4. Conclusions

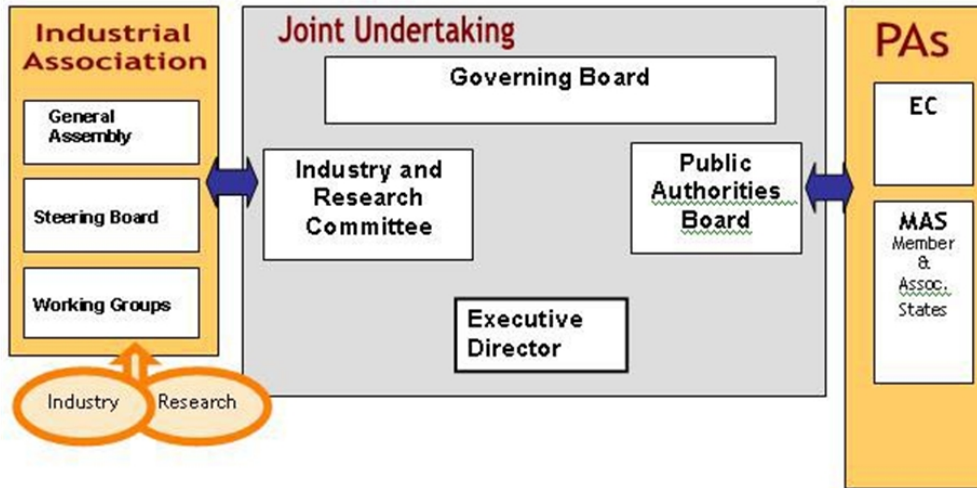
There does not seem to be any link between the complexity of the programme management structure and the amount of funding available, but the objectives and history do determine the shape of the programme management structure. On the whole, the JTI structures are fairly similar in their structures and operations, apart from a few differentiating bodies. The main two are the bodies concerning research and regions' representation. The use of a Scientific Committee over Industry and Research is due to the JTI requiring broader input than only from industry members. While the regions' representation is dependant upon the Industry Grouping's structure; those such as ARTEMIS and ENIAC have a more formal role for the public authorities, as they are full members of their respective Industry Groupings.

Compared with the US the European JTI structure is composed of many similar bodies as the current ongoing U.S. approach. However the JTIs appear more open to the regions' representation than the US model (although this is generally a requirement in Europe due to the complex collaboration and knowledge sharing practices that have already begun and will

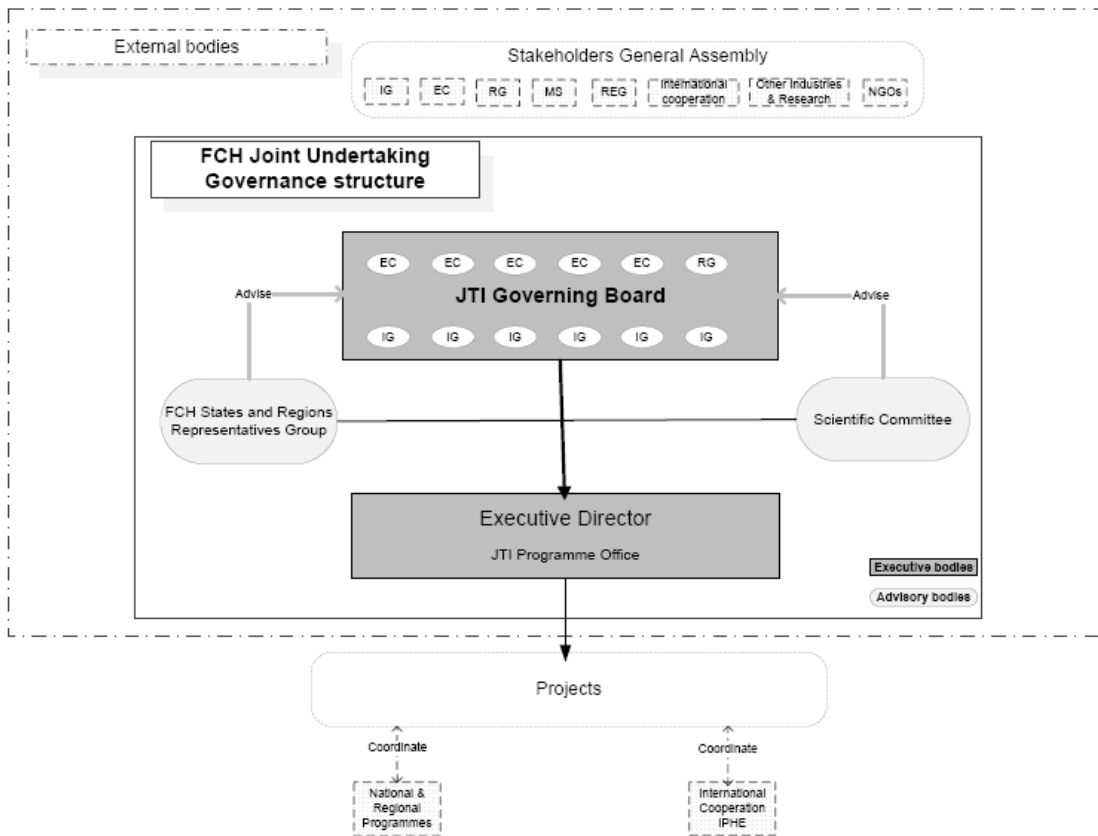
continue further under a JTI) and there is a more formalised approach in the US allowing for coherent work across the 300m people bloc despite the programme receiving less funding.

ANNEXES

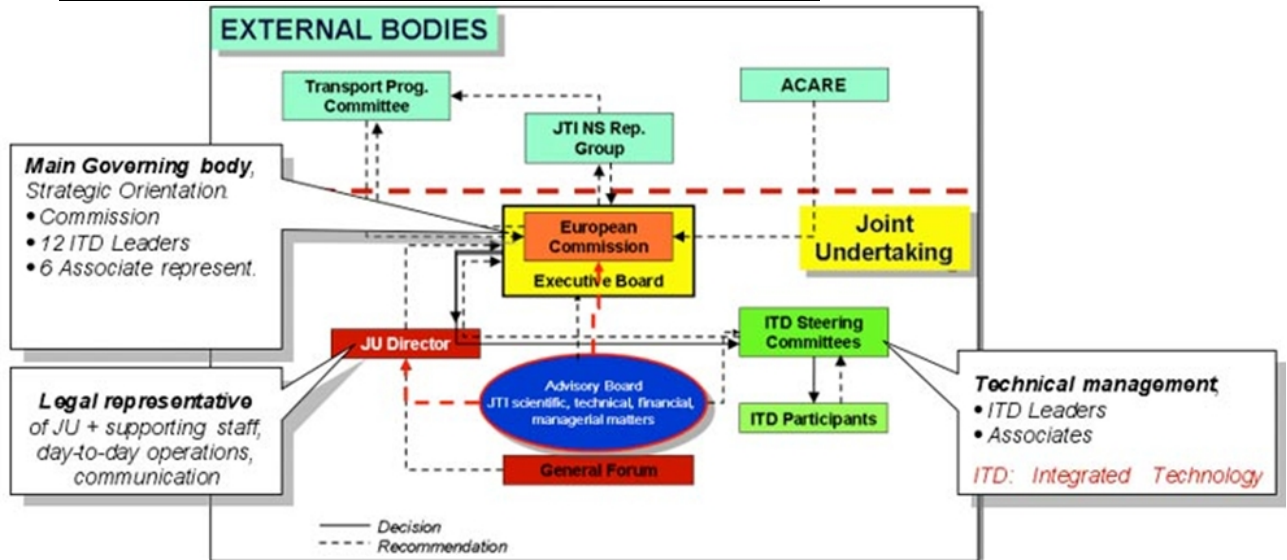
Annex I - Programme Management Structure of ENIAC and ARTEMIS



Annex II – FCH JTI Programme Management Structure

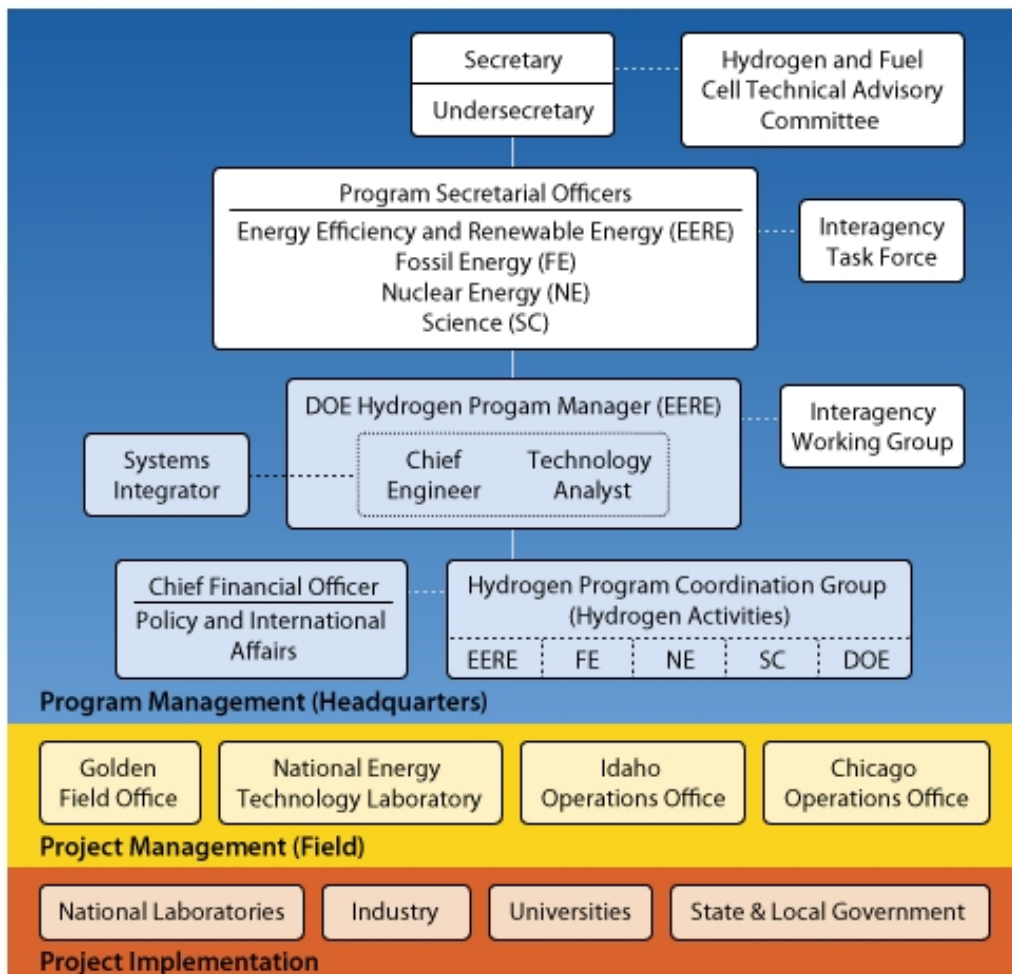


Annex III - Clean Sky JTI Programme Management Structure



Annex IV – DOE Hydrogen Program Organization

DOE Hydrogen Program Organization



Annex V – Activities of the US DOE Hydrogen Program

