

Overview and Status Quo of the NextHyLights Project

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Overview and Status Quo of the NextHyLights Project

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Project partners*

Participant organisation name	Country
AVL List GmbH	A
Bucher-Guyer AG	CH
Centro Ricerche Fiat SCPA	I
Daimler AG	D
Element Energy	UK
Energy Research Centre of the Netherlands	NL
Ludwig-Bölkow-Systemtechnik GmbH	D
Proton Motor Fuel Cell GmbH	D
Škoda Electric a.s.	CZ
Statoil ASA	N
Total Raffinage Marketing	F
Vattenfall Europe Business Services GmbH	D





1 Project Concept and Objectives

Together with industry stakeholders, the European Commission initiated the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) in 2008 to become the major instrument for coordinating and structuring the planning and implementation of hydrogen and fuel cell technologies in Europe. One of the major tasks of FCH JU is to develop a strategy for hydrogen transport applications. A first large-scale demonstration project for hydrogen powered vehicles (Lighthouse Project – H2moves Scandinavia) was therefore initiated within a first call. In parallel, this call sought for assistance to prepare the next consequent step, the planning and preparation of further large-scale demonstration projects for second-generation hydrogen vehicle fleets at further demo sites across Europe.

The Supporting Action NextHyLights works in close cooperation with and under supervision of FCH JU to develop a strategy (“Master Plan”) on how to bridge the gap between today’s

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hydrogen demonstration projects and the start of market introduction, including the early commercialisation phase.

The concept of this proposed project is to build upon the existing knowledge from various activities including

- HFP & FCH JU (implementation plans),
- concluded EC funded strategy projects such as HyWays, Roads2HyCom and HyLights (methods, instruments and databases) and
- concluded and ongoing European key demonstration projects HyFleet:CUTE, ZERO REGIO, HYCHAIN as well as other demo projects (hardware experience).

In continuity of the former EC hydrogen and fuel cells strategy formulation, the key partners of the former FP6-funded strategy projects HyWays and HyLights assure that the results, instruments and lessons learnt from these projects can be exploited at their best.

The “Master Plan” needs to be organized in timely steps comprising milestones regarding cost and performance targets for the advancement of hydrogen and fuel cell technologies for transport.

The proposed approach to develop the “Master Plan” requires a parallel preparation of detailed work plans and roll-out plans for the vehicle segments ‘hydrogen passenger cars’, ‘hydrogen buses’ and ‘other hydrogen vehicles’. The vehicle segment specific work plans cover the time span including the large-scale demonstration projects under preparation. The roll-out plans cover the phase towards market introduction.

All plans will be checked against each other for coherence and synergies (milestones, infrastructure, and costs) and then be integrated in the overall plan.

For the sake of full transparency on “expectation management”, the project partnership decided to invite the European Regions and Municipalities Partnership on Hydrogen and Fuel Cells (HyRaMP) into the project with liaison partner status. HyRaMP was identified as the relevant body representing the European regions’ interest in hydrogen and fuel cells as their interest in individual regions is unbiased.

In case of the hydrogen bus segment a close relationship with the Hydrogen Bus Alliance (HBA) was established via the partner Element Energy which is already in charge of the Alliance’s secretariat. The work plan for the bus segment will be based on previous HBA activities such as the “Strategy for 2010 – 2015 Alliance activities on hydrogen fuelled public transit buses”. Both HBA and HyRaMP confirmed their commitment in helping to develop a FCV commercialisation roadmap via letters of support to the project.

In addition, a broader roll-out strategy has to consider a number of non-technical issues connected with the introduction of a large number of hydrogen-powered vehicles on the road as well as hydrogen production, storage and distribution. What is more, the development of a “Master Plan” also highlights and analyses the expected social and environmental impacts that a significant number of hydrogen vehicles on the roads will have. Beyond that, it is foreseen that a number of regulatory requirements have to be dealt with in order to allow for a successful large-scale introduction such as building and permission guidelines for refuelling stations, spatial planning, hydrogen metering and licensing of vehicles.

NextHyLights aims to support the planning of the second generation of hydrogen demonstration projects. In the short term, the growing number of demonstration sites will be limited. Only locations providing optimum conditions in an economic, strategic and technical way should be selected at this stage. For an objective comparison in a subsequent selection of sites it is necessary to apply an appropriate tool. The project HyLights developed such a tool called the “Regions Eligibility Assessment Tool” to be used by FCH JU in order to identify regions / municipalities which are suitable hydrogen cluster regions. In particular the tool allows assessing to which extent a region already inherits features that could allow a further sustainable ramp-up of planned demonstration projects. As the current version of the tool has been tailored for early demonstration projects, it needs to be modified to be also applied for later stage demonstration projects. NextHyLights will advertise the tool to FCH JU and promote its application.

It is foreseen to interconnect the early model regions via hydrogen corridors at a later stage and add further hydrogen clusters to eventually establish a widespread and interlinked hydrogen infrastructure.

NextHyLights has been called for to contribute to the FCH JU activities in the preparation of the next calls and is prepared to react flexibly on its requirements. It uses the Multi Annual Implementation Plan (MAIP) as the basis and adds to it in detail to develop the next Annual Implementation Plans (AIPs) taking the ambitions and opportunities of all stakeholders into account.

Overall Strategy and General Description

The project NextHyLights deals with all vehicle segments for which near- or medium-term market introduction is to be expected. As the various segments require different strategy frameworks, the project layout foresees a specific work package for each vehicle segment as shown in Figure 1.

Each of these work packages also deals with specific hydrogen infrastructure requirements for the vehicle segment. The identification of synergies regarding the hydrogen infrastructure is the main task of WP 5 “Exploring synergies of hydrogen infrastructure”.

In WP 6 social and environmental impacts of the introduction of hydrogen powered vehicles and of the required infrastructure will be assessed at an integral level for all vehicles. Regulatory requirements will also be considered.

A key element of the project is the development of the assessment framework for additional hydrogen demo sites. The results of this WP 7 effort can be directly used for drafting the next FCH JU calls.

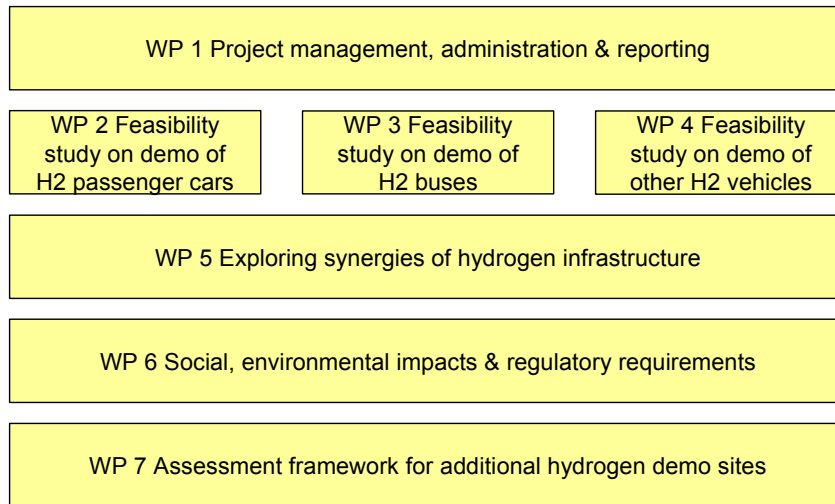


Figure 1: Work package structure of NextHyLights.

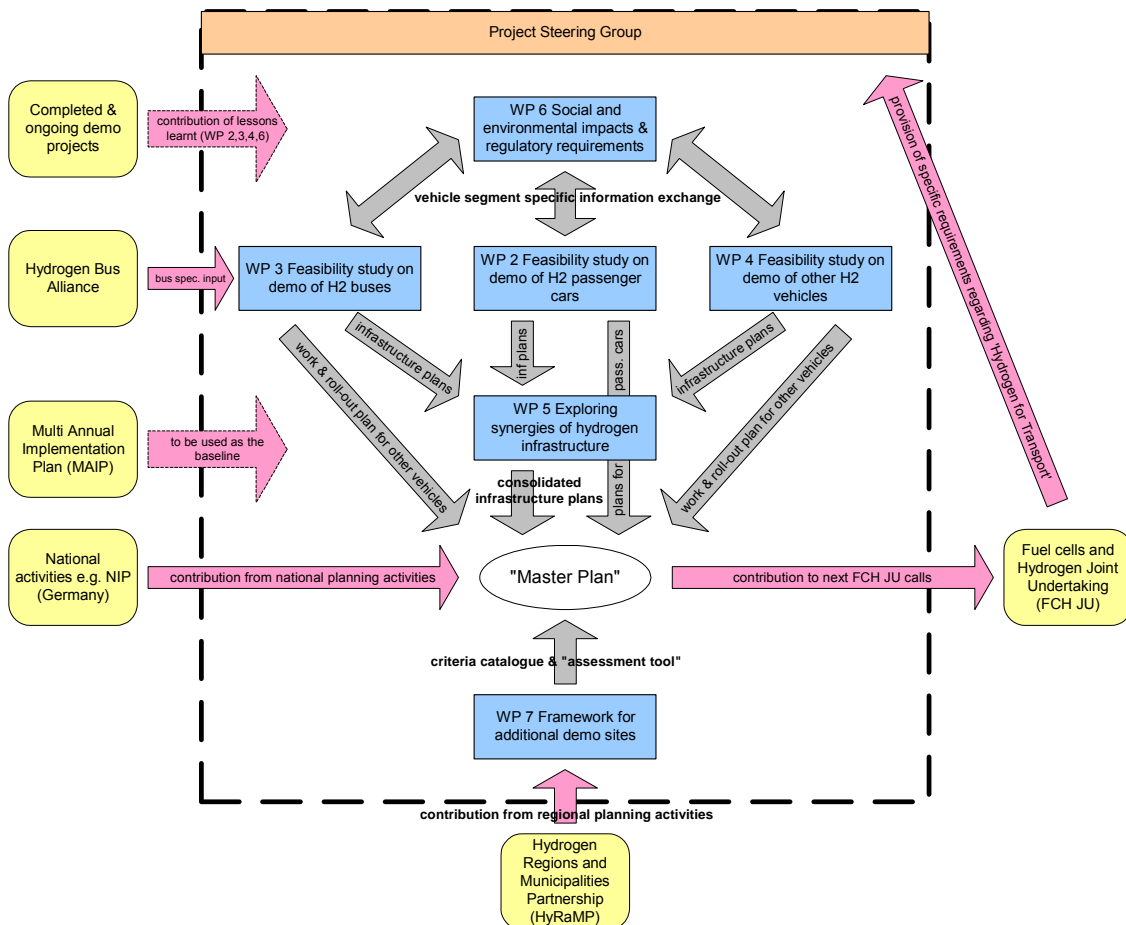


Figure 2: Interfaces between work packages and to the FCH-JU environment.

2 Strategic Impact

Feasibility studies are performed for three different hydrogen vehicle segments – for passenger cars, buses and other vehicles. This differentiation has been chosen as the requirements for each of these segments differ significantly, not only regarding the required infrastructure but also in the required concept of the demo projects and the expected timeline towards market introduction.

These feasibility studies result in work plans to propose the configuration of large-scale demonstration projects for second generation vehicle fleets. The project takes key factors such as performance of the vehicles (improved durability, robustness, reliability, efficiency, etc.) and of the infrastructure (daily usage, subsequent refuelling, etc.) into account. Furthermore, roll-out plans for each vehicle segment which are based on the work plans provide advice on the path from large scale demonstration projects to market introduction.

A separate work package assesses the environmental as well as the social impacts resulting from the implementation of the above mentioned work and roll-out plans. Regarding environmental impacts the reduction of noise and local pollutants in city centres as well as the impact on GHG emissions are assessed, taking into account a large-scale demonstration setting as well as the further up-scaling of the whole system into an (early) commercialization environment. Regarding social impacts, the project evaluates potential obstacles from the societal perspective and develops strategies which foster a positive attitude within the public towards large-scale hydrogen demonstration projects. Issues are how acceptance for hydrogen demonstration projects can be actively pursued in the public, how a positive image of the projects can be created and how NIMBY (not in my backyard) effects can be avoided (important especially for hydrogen refuelling stations). This work package assesses the importance of stakeholder involvement by applying the EESTEM tool, one of the main results of the FP6 project Create Acceptance. This tool could be used to improve the engagement of stakeholders in multi-stakeholder environments.

Currently the number of demonstration projects on hydrogen for transport in Europe is limited. The most important ones are HyFLEET:CUTE, ZERO REGIO, HyCHAIN, ZEMSHIPS, CEP and HyNor, some of which have already been terminated or will end in the near future. At the moment, the first demonstration project of the FCH JU (H2moves Scandinavia) which has been started recently is the only new large-scale demonstration project. For this reason a framework to establish a cluster of European demonstration projects organically evolving from and building on the existing projects needs to be developed. NextHyLights's ambition is to develop this framework by providing adequate instruments and tools as outlined above.

NextHyLights will provide a criteria catalogue and a framework for the selection of appropriate candidate regions / municipalities to become cluster regions / municipalities for a future large-scale hydrogen demonstration project. The criteria catalogue will cover a number of technical and socio-economic indicators (e.g. available infrastructure, regulatory conditions, governmental support, potential renewable hydrogen production, availability of by-product hydrogen, preparedness for interconnection with other hydrogen cluster regions / municipalities, etc.). In particular, the assessment framework in particular addresses the potential for further growth around a cluster region / municipality. This includes the

investigation of connectivity with other cluster regions / municipalities, the profiles of local stakeholders that could become early market adopters (e.g. continuation of HyLights gaps analysis) and the potential to increase the numbers of vehicles applied (10 → 100 → 1,000 → 10,000 → 100,000).

NextHyLights also performs an assessment of the regulatory requirements for the hydrogen clusters in EU regions / municipalities. In some countries (e.g. France) institutional barriers for the operation of hydrogen powered vehicles on public roads, the installation and operation of hydrogen refuelling stations, or the distribution of hydrogen fuel may be serious hurdles regarding the smooth implementation of large-scale hydrogen demonstration projects. In order to attain reliable information, permitting guidelines and previous demonstration projects are consulted and the outcome is reflected in the near-term planning activities which potentially have to take place by spatial planning. Furthermore, the planning activities will take into account national, regional or local policy incentives for hydrogen vehicles and / or infrastructure which support the implementation of these technologies. Also, stakeholders' experiences from previous demonstration or planning projects are taken into account (e.g. HyLights, HyApproval, etc.).

Within the course of the HyLights project the European initiative on hydrogen for transport - H2moves.eu was created. In the context of H2moves.eu a close liaison with all relevant demonstration projects on hydrogen for transport in Europe has been established. The continuity of the same coordinator is an asset of NextHyLights helping to rapidly link with the existing demo project network.

Furthermore, the NextHyLights consortium is prepared to contribute to the preparation of the next FCH JU calls regarding demonstration projects on hydrogen for transport. As the consortium comprises many of the major industrial players in this field and as it established a liaison to the European Regions and Municipalities Partnership for Hydrogen and Fuel Cells (HyRaMP), the contributions provided by the project may be well balanced, receive serious industrial backing and cover a sound expectation management.

As all of the work is performed in close collaboration with the FCH JU bodies, especially with the JTI Governing Board and the JTI Programme Office, the NextHyLights partnership can react flexibly on FCH JU requirements and therefore can be seen as its prolonged workbench.

3 Integration of National and International Activities

The consideration and integration of national activities is of great importance for the NextHyLights project since close coordination between national strategies for the implementation of hydrogen for transport and the EU-wide approach can save resources and optimise the formation of cluster regions and hydrogen corridors. NextHyLights therefore liaises with national programmes such as the German NIP programme,

As long as national and regional demonstration projects are prepared to share information with other projects and programmes, NextHyLights welcomes the opportunity to learn from these demonstration projects and / or to perform an assessment in order to broaden its data base. As liaisons with national projects such as CEP or HyNor have already been

established by HyLights these liaisons are further exploited for collecting valuable inputs for the NextHyLights project.

Internationally, NextHyLights collaborates with the International Partnership for the Hydrogen Economy (IPHE). Furthermore, NextHyLights is prepared to review and cross-check plans and activities of IPHE in order to ensure that strategic plans are aligned, especially with the “Master Plan”.

Acknowledgement

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