

HYLIGHTS

Hydrogen for Transport in Europe

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Deliverable 2.6

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Executive Summary

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A Coordination Action to Prepare European and Fuel Cell Demonstration Projects on Transport
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The European Commission is supporting the Coordination Action “HyLights” and the Integrated Project “Roads2HyCom” in the field of Hydrogen and Fuel Cells. The two projects support the Commission in the monitoring and coordination of ongoing activities of the HFP, and provide input to the HFP for the planning and preparation of future research and demonstration activities within an integrated EU strategy.

The two projects are complementary and are working in close coordination. HyLights focuses on the preparation of the large scale demonstration for transport applications, while Roads2Hycom focuses on identifying opportunities for research activities relative to the needs of industrial stakeholders and Hydrogen Communities that could contribute to the early adoption of hydrogen as a universal energy vector.

Further information on the projects and their partners is available on the project websites www.roads2hy.com and www.hylights.eu.

HYLIGHTS



Executive Summary

In the course of the HyLights project WP2 has assessed 9 European and 1 U.S. key demonstration projects on hydrogen for transport. Therefore interviews have been performed and documented in protocols. Aim was a better understanding of the project organisation, operational experience and lessons learned. A presentation showing the results, conclusions and recommendations of the interviews has been prepared. The outcome has then be used by the other WPs as input for their analyses and preparatory work for e.g. the gaps analysis, the establishment of the Demonstration Program Framework, etc., but could be relevant for other interested stakeholders as well.

The basis for the interviews was a set of 21 questions structured into 4 topics:

- General project information
- Experiences from setting up the project
- Results / lessons learned
- Recommendations

These were distributed to the HyLights institute partners prior to the interviews in order to ensure that the expected answers were suitable for doing the analysis work of the other WPs.

As the most important findings of this exercise can be named the limited availability of vehicles, the necessity to define the project follow-up already during the set-up phase, the need for clear responsibilities for the infrastructure installations, the missing of an integrated long-term funding scheme (EU, MS, regional) as well as the lack of vehicle and infrastructure performance data due to few vehicles and / or missing assessment and funding frameworks.

The coordinators of nine leading European demonstration projects and representatives of 1 U.S. demonstration project were interviewed:

- H2argemuc – The hydrogen project at Munich Airport
- ECTOS – Ecological City Transport System: Demonstration, Evaluation and Research Project of Hydrogen Fuel Cell Bus Transportation System of the Future
- CUTE – Clean Urban Transport for Europe
- ZERO REGIO – Lombardia & Rhine-Main towards Zero Emission: Development and Demonstration of Infrastructure Systems for Hydrogen as an Alternative Motor Fuel
- HyFLEET:CUTE – Hydrogen for Clean Urban Transport in Europe
- CEP – The Clean Energy Partnership Berlin

- HYCHAIN-MINITRANS – Deployment of innovative low power fuel cell vehicle fleets to initiate an early market for hydrogen as an alternative fuel in Europe
- HyNor – The Hydrogen Road of Norway
- LHTP – The London Hydrogen Transport Programme
- CaFCP – The California Fuel Cell Partnership

One of the most significant findings was that most projects have experienced problems in obtaining sufficient numbers of vehicles. (Early) commitment of vehicle industry and potentially bundling of resources are therefore key especially for future large-scale demonstration projects.

In case of hydrogen refuelling stations it has been recommended that one partner alone should take over the responsibility for the approval, erection and operation of a station in order to lower the complexity of the approval procedure and operations process.

Nearly all projects do some kind of project assessment, but the degree of detail differs significantly. Therefore the utilisation of a common tool, the HyLights Monitoring and Assessment Framework, may be a practical approach or at least a robust basis for future projects.

Beside the London Hydrogen Transport Programme, which is funded by 100% from public sources, all projects evaluated were/are various types of public-private-partnerships (PPP), but mostly without an own entity. The only exemption is the H2argemuc project, which operates as a German entity 'Arbeitsgemeinschaft – ARGE'.

It was recommended to select the project coordinator with particular regard to project management. A criteria catalogue for assisting the selection process, potentially developed within the preparation of the Demonstration Program Framework, could be a useful tool.

Furthermore, some interviewees have recommended subcontracting the project management to an external service provider.

If a project has installations (e.g. refuelling stations) at geographically separated locations, a separate local project coordinator for each location should be assigned.

In order to have a balanced partnership, it was advised to provide adequate funding for both the vehicles and for the hydrogen infrastructure.

For some projects the next steps after their finalisation are unclear. For future large-scale demo projects it should be clarified at the preparation phase as to how the project fits in the overall strategy towards a mass market roll-out.

The hurdles to be overcome during the set up and operation phase of the projects mentioned by the interviewees include financing (no adequate continuous funding available, difficulties in the identification of local funding resources), technology (incident requires redesign of refuelling station), authorisation / regulations, codes and standards issues (difficulties to receive authorisation for refuelling station, certification problems for vehicles) and others (long-lasting contract negotiations, lack of hydrogen vehicles, etc.).

On the project coordinators' wish list there is also the request for clear, flexible long-term funding schemes reflecting the overall political strategy at all funding levels (EU-wide, national and regional).

A suggested future improvement was that financial support should be already available during the project preparation phase as already this phase is very time consuming and costly.

It was also mentioned that funding organisations should be able to adapt funding to changing project budget requirements during the course of a project.

A common approach to publish status, data, results and 'lessons learned' of future projects should be agreed on and each publicly funded project should be obligated to provide respective information.

With regard to performance of vehicles and infrastructure only very limited information could be gathered as either it was already published (CUTE, ECTOS) or it was confidential.

The question on synergies with other fields of technology (e.g. with stationary applications or other alternative fuels at the refuelling station) has been answered very inhomogeneously not allowing to draw any conclusions.

Last but not least some additional ideas for potential incentives could be collected (of course national or local specialties have to be considered) such as decreased or no import taxes for hydrogen vehicles, free parking, free use of toll roads, allowance to use public transport lanes, no VAT, etc.

In general, it can be said that the interview activity was a very successful exercise as a lot of insights into various demo projects were gained. The project coordinators were very proactive and cooperative and have shown huge interest in contributing to the preparation of the next logical step, the large-scale demonstration projects.

In the second phase of the project the focus was no longer on the views of the project coordinators but on the views of the representatives of the municipalities and regions involved in one of the above mentioned demonstration projects. Therefore a short questionnaire was prepared and distributed. Feedback from 7 regions / municipalities could be received and documented.

A presentation showing the results and recommendations of the questionnaire activity has been prepared. The outcome has then been used, together with those of the interviews with the project coordinators / managers, by the other WPs as input for their analyses and preparatory work.

The basis for the questionnaire activity was a small set of questions, which in total comprised 11 single questions, structured in the two topics:

- experiences and lessons learned and
- recommendations

The results: Asked with respect to their decisive motivation and the drivers to participate in the demonstration project most of the answers refer to superordinate issues such as improving energy security, climate and environment protection as well as gaining independence from fossil fuels.

With regard to the political support in one case it was mentioned that the 'support' was more a political pressure to deploy alternative fuels within the existing budgetary framework.

Especially the regions / municipalities participating in projects covering buses are very happy with the situation developed. As a result of the CUTE project the Hydrogen Bus Alliance (HBA) was established in which now a common strategy can be developed.

Very inhomogeneous feedback could be collected regarding the questions of next steps. Some answers reflect that no follow up will happen, some will pursue other technologies than hydrogen (e.g. Stockholm: electric hybrid ethanol Diesel buses), but most are clearly dedicated to hydrogen technology and are seeking for large-scale hydrogen demonstration projects.

The regions / municipalities dedicated to hydrogen technology all have a roadmap or strategy plan for the implementation or are currently working on it.

The expected benefit for the regions / municipalities can be summarized as environmental & societal and strategic benefits. The environmental & societal aspects cover emission reduction of public transport, operation in restricted areas, sticking to regulations (e.g. EURO 6), reduction of dependence on imports of fossil fuels. Strategic aspects include the gaining of various expertise in the region and germ cells for developing a hydrogen infrastructure as a basis for future large-scale hydrogen demonstration projects.

The availability of sufficient financial resources was mostly seen as the largest hurdle / showstopper for the various projects. But also missing (European) regulations, codes and standards as well as communication issues were named here. Even mentioned technical issues seemed to play an subordinate role. Here the capacity of the refuelling infrastructure as well as the driving range of the vehicles were in the focus.

Beside the contact person in Berlin, who is interested in buses only (BVG is a public transport organisation), all others would be interested in various vehicle segments (buses, cars, (garbage) trucks, light duty vehicles (vans), scooters, forklifts, specialty vehicles and some also in APUs for ships and aircrafts.

It was recommended for future demonstration projects to enlarge the number of vehicles involved, to enable the up-scaling of the hydrogen refuelling infrastructure, to develop safety issues, to have the long-term focus in mind, improve information exchange and to implement less complex structures with respect to accountability.

Further aspects were the discussion of driving range and liquid hydrogen storage systems (for buses), the improvement of hydrogen compression technology, the addressing of R&D efforts, the mitigation of bureaucracy as well as the implementation of large-scale demonstration projects.

The participating region / municipality representatives ask for framework conditions with regard to safety regulations and standards, political support for hydrogen technologies (like for photovoltaic) as well as for low emission vehicles.

They would propose subsidies for hydrogen production, liquefaction, etc., exemptions for low emission zones, higher support quota for demonstration activities and larger financial support in general.

In general it can be said that the questionnaire activity was a successful exercise as a lot of insights into various demonstration projects and the course of action of the participating regions / municipalities could be gained. Most of the people addressed were very proactive and cooperative and show huge interest in contributing to the preparation of the next logical step, the large-scale demonstration projects.