Automotive Council

Automotive Council Technology Group

Energy and Infrastructure Work-stream

Proposed Aim, Objectives and Initial Actions

15th April 2010, v1.0

Introduction

This paper presents the proposed aim, objectives and initial actions for the Energy and Infrastructure Work-stream. The content of this paper is draft, and is presented to the Automotive Council Technology Group for comment.

The paper includes a proposal for broadening participation in the Work-stream and the frequency of Work-stream meetings.

Two appendices provide a summary of the background context and an overview of the current situation.

Action Requested

The Automotive Council Technology Group is invited to:

- Comment on the proposed aim, objectives and initial actions.
- Endorse the proposed approach to broadening participation in the Work-stream.
- Consider whether additional participants in the Work-stream should become Members of the Automotive Council Technology Group and, if so, the rules that should be applied.

Proposed Aim of the Energy and Infrastructure Work-stream

The business case for introducing new energy vectors for vehicle propulsion is interdependent with the business case for introducing the associated energy system infrastructure.

The proposed aim of the Energy and Infrastructure Work-stream is to produce and actively support a joint roadmap between the automotive industry and energy system infrastructure providers to facilitate aligned development and deployment.

The drivers for strategic market transition to 'new' energy vectors will need to be defined by the Work-stream, including the aspects related to sustainability, security and affordability.

Proposed Objectives for the Energy and Infrastructure Work-stream

The proposed objectives for the Energy and Infrastructure Work-stream are split into three themes.

1. **Technology**

    1.1. To support the development of a range of energy system infrastructure technologies within UK industry ready for mass market deployment.

    1.2. To support the widespread adoption of standards by industry, facilitated by UK/EU regulations as required; i.e. enabling infrastructure compatibility at an early stage.

2. **Consumer and Societal Acceptance**

    2.1. To support the development of a quantified and robust understanding of the consumer response to 'new' energy vectors, and the associated vehicles and energy system infrastructures.

3. **Business Case**

    3.1. To support the development of a quantified and evidence backed understanding of the scenarios under which the interrelated business cases for vehicle supply and energy system infrastructure provision would be viable.

    3.2. To realise a joint vehicle and energy industry derived, and Government backed, roadmap to 2050 for strategic market transition; i.e. creating sufficient certainty for substantial long-term private sector investment.

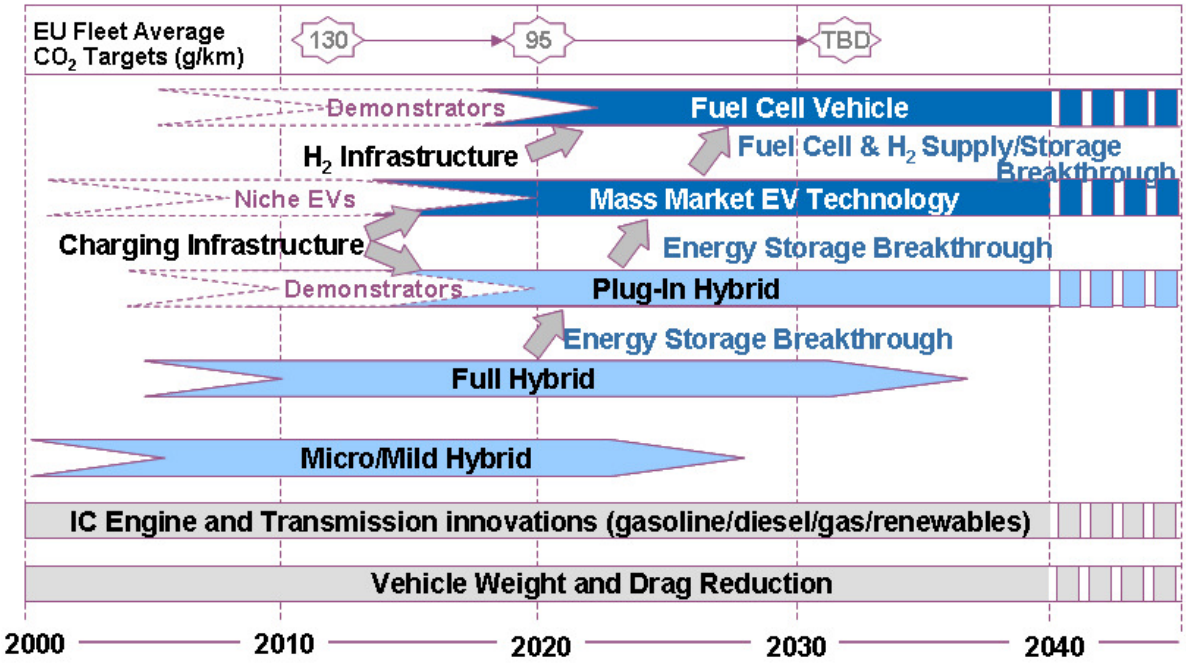
Proposed Initial Actions

1. Broaden participation in the Work-stream by inviting vehicle manufacturers, energy system infrastructure providers and other key stakeholders. It is proposed that participation is at the discretion of the Work-stream 'Pilots', and may include those outside the current membership of the Automotive Council Technology Group.
    - **Output:** Balanced representation in the Work-stream from vehicle manufacturers, energy system infrastructure providers and other key stakeholders. Meetings will then be held on a 6 to 8 week cycle.
    - **When:** End Qtr. 2 2010.
2. Identify, define and prioritise the drivers for strategic market transition to 'new' energy vectors, including the aspects related to sustainability, security and affordability.
    - **Output:** Prioritised definition of the drivers for strategic market transition.
    - **When:** By Qtr. 3 2010.
3. Review, assimilate into an overarching UK roadmap and analyse the gaps for the various investments and initiatives currently underway for the 'new' energy vectors. Propose opportunities for future UK investments.

    There may be an Automotive Council Technology Group funding requirement for external consultancy.
    - **Output:** A high-level overarching UK roadmap, including opportunities for future UK investments.
    - **When:** By Qtr. 4 2010.
4. For electrification, review the different system architecture and standards activities currently underway, conduct a gap analysis and define the engagement plan for those activities the Work-stream will actively support.
    - **Output:** An overview of the system architecture and standards landscape, an assessment of the gaps and an engagement plan.
    - **When:** By Qtr. 3 2010.
5. For electrification, review the various UK demonstration and evaluation activities currently underway and being planned. Conduct a gap analysis against the objectives defined above. Define the engagement plan.
    - **Output:** An overview of the UK demonstration and evaluation activities for electrification, an assessment of the gaps and an engagement plan.
    - **When:** By Qtr. 3 2010.
6. For electrification, define the action plan for the Automotive Council Technology Group in support of strategic market transition in Phase 3 (Market Consolidation, as defined in Appendix B).
    - **Output:** A long-term action plan for the Automotive Council Technology Group for electrification.
    - **When:** By Qtr. 1 2011.

Appendix A: Background Context

The 2009 New Automotive Innovation and Growth Team (NAIGT) product roadmap presented a consensus view amongst automotive manufacturers of the range of vehicle architectures planned for market introduction in the coming years.



Hence, vehicles may in future be powered by a range of energy vectors including:

- Petrol
- Diesel
- Liquid Petroleum Gas (LPG)
- Biofuels (of which there are a range of technologies)
- Synthetic fuels (of which there are a range of technologies)
- Electrification
- Hydrogen

Liquid fuels are likely to remain the predominant energy vector for heavy-duty applications in the long-term due to the high energy density requirement.

Any ‘new’ energy vector for vehicle propulsion will need to compete in an open market alongside the incumbent technologies (predominantly petrol and diesel). Petrol and diesel are therefore likely to remain the predominant energy vectors for the foreseeable future.

There is not currently an industry consensus roadmap for the energy system infrastructure providers comparable to the NAIGT roadmap summarised above.

The UK currently has an extensive infrastructure to support petrol and diesel vehicles, delivered by a highly competitive market.

Bio-fuels are currently blended within the UK market at rates of around 5% (rising to 10%) with conventional petrol fuels. This requirement is imposed by the Renewable Transport Fuels Obligation (RTFO).

Liquid Petroleum Gas (LPG) is also available within the UK market. An incentive is provided by the Government, which is currently renewed on an annual basis. The UK market uptake has, to date, been limited.

There are a number of Research, Development and Demonstration (RD&D) activities underway for the other energy vectors identified above. Besides private company RD&D, the primary UK funding organisations responsible include:

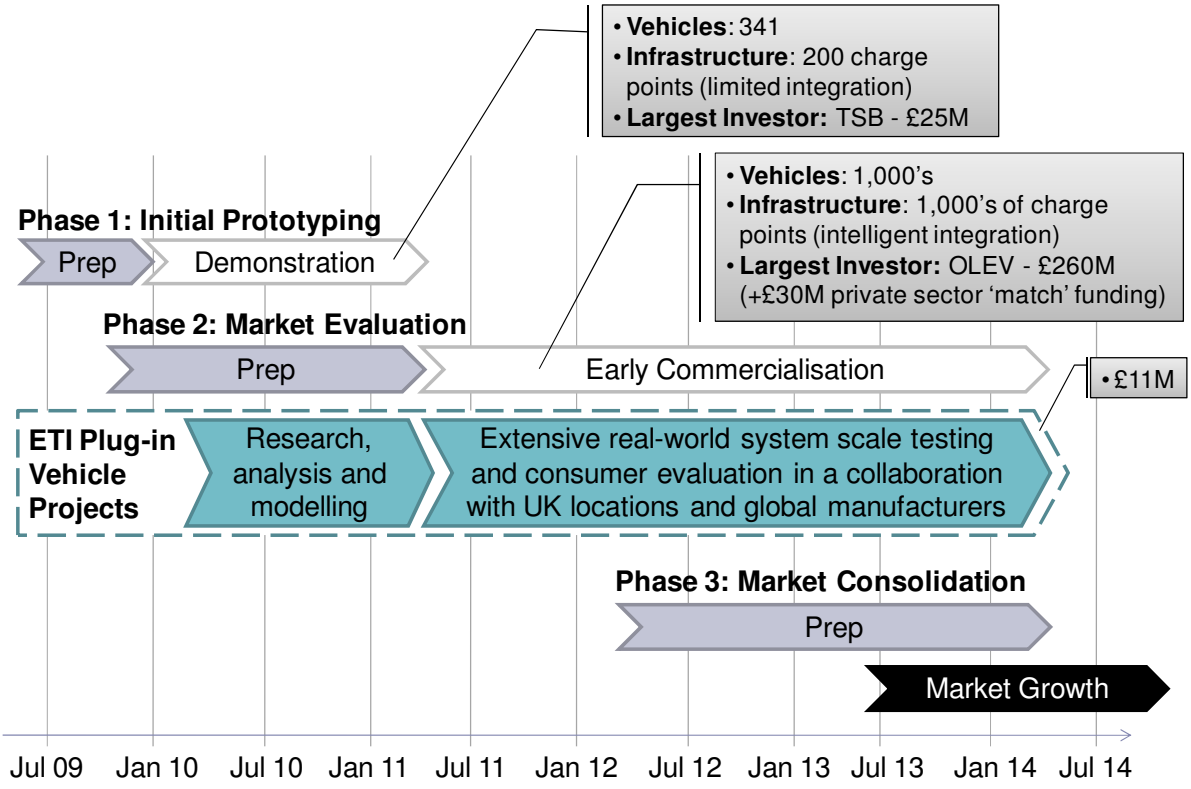
- Office for Low Emission Vehicles
- Energy Technologies Institute
- Technology Strategy Board

Appendix B: Overview of the Current Situation

The energy vectors identified in Appendix A are currently at differing states of technology maturity. Petrol and diesel are the predominant incumbent technologies. LPG is also a mature technology, but the commercial environment remains unfavourable without long-term government support.

The remainder of this appendix will concentrate on electrification (i.e. 'plug-in') as a 'new' energy vector. A similar approach will be needed for the other 'new' energy vectors. However, due to their lower states of technology maturity, the current emphasis will be biased towards Proposed Objective 1.1 defined above.

Within the technology demonstration and commercialisation pathway, three broad phases have been identified for electrification in the UK. There are substantial investments from the Technology Strategy Board [TSB] (£25M), the Energy Technologies Institute [ETI] (£11M) and the Office for Low Emission Vehicles [OLEV] (£260M). There are a significant number of smaller investments and initiatives underway, but for the purposes of simplicity and clarity these have not been referenced here.



The ETI investment is focused on developing and testing the pathways to a self-sustaining mass market, leveraging the parallel investments of TSB and OLEV. It will therefore act as a link between Phase 2 and Phase 3.

Successful Market Consolidation during Phase 3 will require aligned action from the automotive industry, energy system infrastructure providers, Government and the finance industry.