

**EUROPEAN STRATEGY ON CLEAN AND ENERGY-EFFICIENT VEHICLES
PUBLIC HEARING****RESPONSES FROM HONDA MOTOR EUROPE LTD.**

The first four questions aim to provide grounds for mapping and evaluating the technology and market potential of both conventional but increasingly fuel-efficient vehicles and of alternative powertrains (electric and hydrogen). In particular, the Commission wishes to identify the opportunities and risks associated with the development of the mass market for the electric and hydrogen vehicles. These questions are without prejudice to the ongoing work in preparing for the revision of Regulation (EC) No 443/2009 in accordance with Article 13(5) of that Regulation. Answers to these questions provide the rationale for public policy action that is tackled by the last two questions.

Honda is the world's largest provider of personal mobility products, with over 23 million customers each year and having globally sold 18.4 million mobility products in 2009 (cars and powered two wheelers). Across the EU Honda has manufacturing plants in UK, Belgium, France, Italy & Spain and R&D facilities in Germany, UK & Italy. Honda has a proven track record for our commitment to the environment and advanced technology research and development.

1. Should the vision agreed in the CARS 21 mid-term review be now adjusted? (i.e. 2020 perspective of improved combustion engine's market dominance combined with growing market penetration of electric and hydrogen vehicles and hybridisation conceived as the bridging technology and 2050 perspective of transport decarbonisation)

The vision in the CARS21 mid-term review still adequately reflects the (significant) remaining improvement potential of the internal combustion engine, the continued expansion of alternative powertrains and gradual penetration of electric and hydrogen fuel cell electric vehicles, with the decarbonisation of the transport sector as the ultimate goal.

2. What is the potential of different clean automotive propulsion technologies (improved fuel efficiency, hybridisation and alternative powertrains) for contributing to decarbonisation objective in the short, medium and long term?**Short Term:**

Today we aim to build the most fuel efficient, advanced internal combustion engines. Honda aims to maximise the fuel efficiency of mobility today ... while we work towards the goal of zero-emission mobility for tomorrow.

Hybrid is the most important and effective technology to cut CO2 emissions today.

As such, we are developing hybrid technology for larger vehicles and we are also expanding our current range of petrol-electric hybrids to make hybrids accessible to all. Current Honda hybrid models: *Civic Hybrid, Insight, CR-Z*.

The increasing hybridisation of cars will provide the automotive industry with valuable experience in the areas of electric powertrain design and on-board electricity management.

To make hybrids more attractive to consumers we want to make hybrids more affordable. We can contribute to the reduction of CO2 emissions by making hybrid vehicles with excellent environmental performance available to more people.

Medium Term Developments:

At this moment, considering the current limitations of battery performance, Honda is conducting research on battery electric vehicles as short-distance commuter vehicles. We are also engaging in solar cell development, researching biofuels and developing energy-saving technologies.

Long Term Future Transport Solutions:

We believe Fuel Cell Electric Vehicles are the ultimate solution to reduce CO2 emissions.

The Honda FCX Clarity has the driving range, speed of refuelling and comfort required by customers.

We are also working on our own refuelling solutions by developing compact, solar-powered hydrogen stations for the home. (See question 3 response also).

Battery electric and hydrogen fuel cell electric vehicles will develop “in sync” with their corresponding fuel infrastructure. Their decarbonisation potential depends on the degree to which, and the speed with which, the infrastructure and energy sources are made less carbon-intensive.

What is the decarbonisation potential of the complementary measures in the short, medium and long term (e.g. guidelines on eco-driving, application of Intelligent Transport Systems) and how reliable are these potentials?

Complementary measures such as eco-driving training programmes, in-vehicle eco-driving guidance systems and the use of ITS technology for ecological purposes, such as traffic management to avoid congestion, have already been proven in terms of their effectiveness and should continue to be supported and promoted as valuable tools to reduce fuel consumption.

For example, the Honda Insight hybrid car is equipped as standard with the Eco-Assist guidance and scoring function, which aims to teach the driver a more fuel efficient driving style over time.

This innovative system provides real-time fuel consumption information to the driver, as well as an overall score after each trip. The Japanese version of the Insight is optionally available with the HDD InternaviSystem, which allows the driver to access the full history of his scoring results and additional detailed scoring statistics.

Internal tests with more than 120 Insight drivers in Japan have shown an average fuel economy improvement of 6%, which remains stable over time (measured up to 200 drives).

Members of the InterNavi system in Japan who own an Insight hybrid car can participate in an online Eco Grand Prix, where they can see their fuel consumption performance, and their ranking. In the same tests, those who participate to the Eco Grand Prix can achieve an average improvement of 11%.

This best practice example indicates that driving behaviour can be addressed to some extent, and that a state-of-the-art in-vehicle Eco assistance system with a Human Machine Interface is able to improve drivers' eco driving skills and therefore the vehicle's fuel consumption.

3. What are the implications of new propulsion technologies in a lifecycle analysis perspective as regards vehicles, and in a well-to-wheel perspective as regards energy supply chains?

What are the resource implications in introducing innovative propulsion technologies?

Various international and EU studies such as EEA's ETC/ACC Technical Paper 2009/4 issued in July 2009 (1) have demonstrated that the carbon-intensiveness of the energy mix is the most determining factor in the assessment of the benefit of new propulsion technologies in comparison with conventional powertrains.

In answer to the question of how to provide a sustainable and renewable source of hydrogen, Honda has developed a solar powered hydrogen station, which is compact enough for use in the home. The pictured station below is installed at the Los Angeles Center of Honda R&D Americas.



Compatible with a “Smart Grid” energy system, the Honda Solar Hydrogen Station would enable users to refill their vehicle overnight without the requirement of hydrogen storage, which would lower CO2 emissions by using less expensive off-peak electrical power. During daytime peak power times, the Solar Hydrogen Station can export renewable electricity to the grid, providing a cost benefit to the customer, while remaining energy neutral.

For more information visit:

http://www.hondanews.eu/en/news/index.pmode/modul_detail,0,1391-DEFAULT,21,text,1/index.pmode

4. What are the state of play and the future scenarios of technological developments in alternative powertrains (electric and hydrogen) and their market penetration?

What are major risks and opportunities associated for different stakeholders?

What will be the economic, societal, employment and environmental impacts brought by these developments?

Various forms of powerplant electrification will help decrease CO2 emissions. The key to future progress will be driving range capabilities in line with decreasing CO2 emissions to ultimately reach zero emission vehicles.

¹ http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2009_4_electromobility.pdf

Current consumer demands can be met by advanced internal combustion engine-powered and hybrid vehicles. Both types of cars offer a very long driving range as well as offering the necessary quick refuelling capabilities.

Battery electric vehicles (BEVs), although they emit no tailpipe CO₂ emissions, are limited at present, by their short driving range. To extend their range, there are now many ideas being publically considered, from quick charging to battery swap, which may be a solution to the range problems faced by BEVs.

At the present time, both battery EVs and hydrogen fuel cell electric vehicles are currently more expensive to build than conventional vehicles but hydrogen fuel cell vehicles maintain the practicality of combining a long driving range and quick refuelling with no CO₂ emissions at the tail pipe.

With the development of the required electric and hydrogen station infrastructure, mobility as we know it today can become fully sustainable.

5. How can a trade-off situation be avoided where electrifying the power train would reduce or reverse improvements made in conventional technologies in the framework of existing and upcoming legislation on the CO₂ emissions of road vehicles?

Resulting from customer demand, their expectations and requirements, it is certain that conventional internal combustion engine technologies will continue to dominate the automobile market for several subsequent decades. In this context, manufacturers will be required by legislation to continue to invest in the most advanced technologies (including hybridisation) to lower CO₂ emissions from conventional vehicles. However, legislation should not become so stringent that manufacturers overlook these conventional technology advancements to quickly achieve zero tailpipe CO₂ emissions for over-ambitious legislation.

6. What actions should be best taken at regional/ national /European or international level to promote technology development and market uptake of alternative powertrains (electric and hydrogen)?

Any initiatives foreseen at the regional, national or international level need to be co-ordinated to ensure compatibility of infrastructure systems. Any regional or national incentives or taxation based schemes to promote cleaner vehicles must remain technology neutral by placing the focus on performance-based requirements, such as reducing CO₂ and other harmful tailpipe emissions.