

Comments on APERC's Energy Demand and Supply Outlook – 5th edition

Virtual Clean Car Race Scenario



Japan Automobile Importers Association

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February 26, 2013



The Challenging Economics of Alternative Vehicles

Thank you very much for sharing this Energy Demand and Supply Outlook with me and for inviting me to present here today an automotive view. In principle I very much support the forecast methods and results of this comprehensive and thoroughly investigated study! Please allow me the following comments:

- **Life Cycle Fuel Savings**

Result in US conventional vs. alternative zero energy is approximately 10.000\$ = potential price-up

“The extra amount that a consumer is willing to pay for an alternative vehicle is therefore not very large!” Yes I agree!

The Challenging Economics of Alternative Vehicles

- However I assume the potential lifecycle fuel savings in APEC countries differ widely depending on average miles/y, average fuel consumption and fuel price.
 - Potential for savings in most APEC economies might be much less than in US and price increase for alternative vehicles even smaller than anticipated in this study.
- OEM's point of view: Price for Alternative vehicles must be comparable to conventional engine vehicles!



Alternative Urban Developments – Window of Opportunity

- **Tokyo shows that urban development and road policies have a considerable influence on car ownership and car usage**
 - **High expressway fees**
 - **Expensive and few parking spaces and strict control of illegal on-road parking**
 - **Preference given to public transport in various ways**
- **Road and traffic development in several big Asian cities indicate that those planning tools have not been applied rigorously in recent years.**



Alternative Urban Developments – Window of Opportunity

- A trend to lower density and sprawl type housing has been developed with affluence and car ownership
- Consequently surge in private car ownership and energy consumption can be observed
- Does the window of opportunity still exist in Beijing, Shanghai, Djakarta, Bangkok, New Delhi? If yes, it might be very short in my personal view.





Fuel/Energy Efficiency and CO2 Reduction (De-Carbonization)

- **Reduction of fuel consumption by 50% in 2035 seems to be feasible for EV, HFCV and Hyper Cars but less for NGV**
- **For CO2 reduction however Hyper Cars perform best with 30% reduction feasible**

For EV and HFCV the impact of the necessary battery pack should not be neglected. CO2 emission and energy consumption at the stage of production and recycling of high performance battery packs (e.g. Li-ion) should be considered. The CO2 reduction potential of EV and HFCV might be even smaller than anticipated on a well to wheel basis.

**Public procurement of clean and fuel efficient products
International standards for Life Cycle Assessment of
environmental impact of vehicles**

Bio-Fuels and other Emissions

- The outlook for 2035 in my view is quite a long term perspective
- Maybe the potential of bio-fuels should be added somehow more independently to the assessment of the “Hyper Car” scenario
- Also other emissions adjacent to the development and use of “Hyper Car” or alternative vehicles (e.g. NO_x, N₂O, HC, particulate matters PM smaller 2.5, etc.) might change the picture in the long run





Alternative Vehicles, EV and HFCV need new infrastructure for recharging and refueling

- **EV need smart grid with charging communication and high voltage battery safety standards**
- **HFCV need clean H2 production, network of H2 Fuel Stations and vehicle to fuel station communication**

The potential of developing the infrastructure EV and HFCV in Asian countries in coming years strongly influences the possible penetration ratio of those alternative vehicles

In contrary to these high hurdles for EV and HFCV the infrastructure for CNG/LPG gas vehicles are already used and in place (increased chances for NGV)

Some Conclusions from Automobile Manufacturers and Importers Point of View

EV, HFCV as alternative vehicles have specific environmental features (low emission, low noise, etc.) which combined with their potential to reduce dependency on crude oil, save fuel in transportation and reduce CO2 as GHG are attractive options for several individual transport needs. Many OEMs offer already vehicles with good performance and usability. Although the short travel distance and long charging times are a drawback for EV.

To promote EV, HFCV penetration in the markets the following aspects are considered to be key factors:





Some Conclusions from Automobile Manufacturers and Importers Point of View

- 1. International standardization of the infrastructure including vehicle to infra communication (hard & software for recharging and refueling including gas tanks)**
- 2. Global standards for clean fuel (H₂, bio-fuels, electricity) and stable supply with cross country trade in a liberalized competitive energy market**
- 3. Long term balanced approach and openness towards all alternative fuels and vehicle technologies (incl. bio fuels)**
- 4. Despite some initial governmental support for e.g. market introduction periods free consumer choice and market competition between all alternative vehicles should prevail.**

Currently the outcome of the Clean Car Race is not clear and the rules of the game are changing constantly (shale oil exploration in US, new battery development in Japan etc.)

Outlook

I fully support the conclusions of this study:

“The best all-round option for reducing both oil dependence and CO2 emissions ... seems to be Hyper Cars”.

Most OEM project a high market share for conventional combustion-engines long way beyond 2020.

Unfortunately recharging infra for EV has currently different standards applied in Japan, EU and US. Not only are the communication software and lines different even the plugs at the cars are not universal.

The next opportunity to harmonize these features are some years away as the current systems have to run for at least one life cycle of the current EV world.

国際標準化の動向

Status of the International Standardization

IEC61851	CHAdeMO (Annex AA)	Combo (Annex CC)	GB (Annex BB)
Proposed by	Japan	Germany / US	China
Coupler			
Communication	CAN	PLC	CAN
Installation	40,000 EVs 1,400 chargers	0 0	NA NA

Outlook

The race for Hyper Cars has already started with aluminum parts/bodies and carbon fiber reinforced parts/bodies gaining a small foothold in some car segments (high priced sporty, luxury...).



Outlook

The diesel technology vs gasoline engines race in EU (currently about 50%/50%) is a constant push for innovations. As the refinery of crude oil delivers both gasoline and diesel the usage has to be balanced to derive at the best level of energy and cost effectiveness. Next Generation Clean Diesel vehicles can be as energy efficient and as clean as PHEV and other alternative vehicles but do not need any additional infrastructure, although they are still more expensive than gasoline. One reason for such current expensiveness is because their aftertreatment of emissions is very complex.

Outlook

National Renewable Energy Action Plan (NREAP) in EU

The EU has the target of generating 20% of its energy consumption from renewable sources by 2020. Member States each have different individual targets to allow this overall target to be met, and they are obliged to provide detailed roadmaps describing how they will meet their legally binding target. The roadmaps contain sector targets, the technology mix they expect to use and the trajectory they will follow.

HVO (Hydro Treated Vegetable Oil) as a Renewable Diesel Fuel) and BTL have not shown much progress till today. The lack of a convincing support policy while avoiding conflicts with raw materials supply and food/fodder supply might be the main reason.

Outlook

However, fuel quality and supply must be very stable over long periods as they affect engine performance very much. OEM's engine development simply cannot cope with rapidly changing fuel quality. A transparent and well designed transition period for APEC countries to reach the highest possible level of fuel quality is a key factor for F/E and emission reduction.

Regarding H2 Fuel Cell Vehicles several OEM have reached the development level of small series production (TOYOTA, Mercedes Benz, GM etc.). The safety and usability of H2 fuel stations has been proven in major markets like EU, US and Japan.

In a next step vehicle cost has to be brought down into the vicinity of conventional cars. However, the biggest obstacle to a wider use is still the need of a complete new infrastructure and a production base for “green” and very clean H2 on an international scale.

Outlook

In order to promote the new H2 technology at consumer levels test drive opportunities and dedicated customer schemes with small series cars should be supported. Unfortunately the not harmonized regulations for high pressure gas tanks have prevented the introduction of latest HFCV of foreign brands and the participation in such marketing schemes in Japan.

All OEM are making huge efforts towards introducing alternative vehicles with zero emissions. Only the customers in the various markets will decide which technology will become dominant in future.

Thank you



for your kind attention!