Working Paper 18 Summary

THE ROLE OF PLUG-IN ELECTRIC VEHICLES TO IMPROVE FUEL ECONOMY

GFEI's view on electric vehicles

Significant benefits are offered by plug-in electric vehicles (PEVs) for energy efficiency, diversification, and the reduction of local pollution and GHG emissions as well as in facilitating the transition to a clean energy system. Thus, while the GFEI 2030 fuel economy target (of a 50% reduction in new car fuel consumption compared to 2005 levels) can be met even without electrification, **GFEI partners welcome the developments taking place on the electrification of transport and embrace a strong roll-out of PEVs in helping to improve vehicle efficiency, to reach the GFEI target and ultimately the climate change targets set in Paris in 2015.**

GFEI partners are also aware of the strong synergies between policies supporting improved fuel economy and policies favouring a successful deployment of PEVs. **GFEI partners will therefore work proactively to integrate policies stimulating the adoption of PEVs in their technical assistance and capacity building work.**

The GFEI Target

The GFEI has set the target to double the average fuel economy of new light duty vehicles (LDVs) globally by 2030 compared with 2005 (i.e. a 50% reduction of fuel consumption in litres per 100 km, and 50% reduction of carbon emissions in grams of CO_2 per kilometre). This target was set in 2010, building on analytical assessments showing that it could be met cost-effectively using technologies that do not require the full electrification of the powertrain.[1]

When benchmarked against average test values in 2005, many vehicles currently on the market already achieve the level of fuel economy required for the global target for GFEI for 2030. This includes hybrids and vehicles using non-hybridised internal combustion engines (ICEs) in small to medium vehicle classes, as well as PEVs – including both battery-electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). Many of the countries with both fuel economy standards and fiscal fuel economy policies in place are on track to reach the GFEI target.

The potential for PEVs to help meet the GFEI target

PEVs are a pivotal technology for the transition of transport to clean energy

PEVs clearly offer the best efficiency advantage over the conventional ICE powertrains. They also promote a shift from petroleum fuels to electricity, helping to diversify the transport energy mix. Overall, PEVs are best suited to enable a transition towards a greater reliance on low-carbon energy sources in transport, capitalising on the shift towards renewable energy taking place in the power sector.[2]

PEVs are the best option available to fully comply with the GFEI target

PEVs are about three times as efficient as conventional cars and almost twice as efficient as hybrids. Their large efficiency advantage clearly indicates that PEVs are currently the best option available to fully comply with the GFEI target.

[1] IEA (2009) Transport, Energy and CO_2: Moving towards Sustainability
[2] IEA (2017) Renewables

Prospects for future developments: Cost competitiveness

PEVs may achieve cost parity with ICEs, even with current mileage, as battery costs approach USD 100/kWh[3 and 4]

The actual achievement of parity also depends on mileage and fuel costs, and these parameters vary across different global regions.[5]

PEVs are already cost-competitive today in fleets with intensive usage

Given the average speed in urban environments and the profile of utilisation of taxis and vehicles providing ride-hailing services, it is also important to note that ranges exceeding 350km would be fully sufficient to enable a transition to PEVs for these fleets. Improvements in battery durability and low maintenance costs also align well with the increased appeal of PEVs for these solutions.

Policy Considerations

GFEI partners welcome policy measures that could help achieve a greater deployment and uptake of EVs, the improvement of fuel economy, and the facilitation of a transition to a clean energy system, such as:

- Vehicle taxation based on fuel economy or CO_2 emissions per kilometre (including feebate schemes), enhancing the short-term cost-competitiveness of PEVs.
- The continued tightening of fuel economy standards, ensuring that the ambition of the GFEI target for 2030 is fully met and mobilising investments in the private sector for the development of capacity to produce PEVs and diversify the offer of models available to consumers.
- The use of ZEV mandates or deployment incentives to crystallise the market deployment of PEVs in the next decade, warning about the need to avoid trade-offs between PEV uptake and the average improvement in fuel economy of the whole vehicle fleet (e.g. because of double counting of EVs).
- A coordinated approach on policy development across different administrative levels, given the need to ensure that the increase in the number of PEVs on the road is adequately accompanied by the deployment of charging infrastructure.

- Co-ordinated measures covering not only PEV market uptake and charger availability but also the integration of PEVs in the power grid. In this respect, GFEI partners welcome demand management practices and policies that capitalise on the availability of energy storage capacity from PEVs to enable the greater integration of variable renewable energy in the power generation mix.

GFEI partners will work proactively to integrate these policies in the context of their technical assistance and capacity building work for the development of fuel economy policies.

[3] This is calculated as the ratio between the purchase and usage costs of a vehicle and the kilometres driven. It considers the cost of the vehicle purchase, fuel, and maintenance and insurance costs, and takes into account the residual reselling price after a few years, typically three to six.
[4] Down from the estimate of roughly USD 250/kWh for high volume production.
[5] IEA (2017) Global EV Outlook 2017; Wolfram and Lutsey (2016) Electric vehicles: Literature review of technology costs and carbon emissions