

Improving vehicle fuel economy to save money, reduce carbon emissions, and reliance on oil

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The transport sector accounted for 27 % of final energy use and 23% (6.7 Gt CO₂) of direct emissions in 2010, with baseline CO₂ emissions projected to approximately double by 2050 (IPCC, 2014).

The IEA's Energy Technology Perspectives indicates that the number of vehicles in 2030 is likely to be double 2005 levels, and treble by 2050 (IEA, 2015). Without action to make vehicles more efficient, carbon emissions and environmental impacts would rise significantly.

The Global Fuel Economy Initiative (GFEI) brings together technical and policy experts to address this challenge. GFEI is a partnership of six organisations, each of which has published extensively on the issue; the FIA Foundation, the United Nations Environment Programme (UNEP), the International Transport Forum of the OECD (ITF), the International Energy Agency (IEA), the International Council on Clean Transportation (ICCT), and the University of California at Davis (UC Davis).

The GFEI has shown that by using existing cost-effective technologies it is possible to improve average vehicle fuel economy by 50% by 2050 (Eads, 2011; IEA, 2012). GFEI has therefore set targets to double the average fuel economy of passenger vehicles globally by 2050, and by 2030 for new vehicles. This is backed up by the Transport chapter of the IPCC's fifth assessment report, which suggests that "energy efficiency and vehicle performance improvements range from 30 – 50 % relative to 2010 depending on mode and vehicle type. Realizing this efficiency potential will depend on large investments by vehicle manufacturers, which may require strong incentives and regulatory policies in order to achieve GHG emissions reduction goals" (Sims et al, 2014). The GFEI estimate that

achieving the 50% target would account for around a third of the CO₂ reductions needed to achieve a 2 degrees emission trajectory (GFEI, 2015b), and therefore can make a significant contribution alongside other 'avoid-shift' measures.

Improving vehicle fuel economy would mean lower CO₂ emissions, estimated at 0.5 Gt/year by 2025 and 1.5Gt/year by 2050, with total savings of 33Gt by 2050. Achieving the GFEI target of doubling fuel economy would result in annual fuel savings worth \$400 billion in 2050, with total net savings of \$8 trillion (GFEI, 2015b). Such savings could help fund sustainable transport including a transition to electric vehicles (Fulton, 2013).

However, improved fuel economy is also beneficial for the economy and society too. When fuel economy policies are introduced to improve fuel economy, there is also the opportunity to complementary standards or incentives to reduce particulate emissions and improve urban air quality. Many countries are dependent on imported oil, which negatively impacts their balance of payments and makes them vulnerable to changes in commodity prices. Achieving the GFEI goals would save 3 billion barrels of oil by 2050. These savings could be invested in health education and increased productivity, helping countries ensure that no-one is left behind. (GFEI, 2015b).

Since 2011, GFEI has produced biannual reports tracking global progress towards the GFEI target of doubling the fuel economy of new light duty vehicles by 2030. The latest report, led by the IEA (GFEI, 2015a) showcases the sales-weighted average fuel economy for the years 2005 to 2013. The paper draws on data for 26 countries, of which 14 are non-OECD

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countries. The report shows that while the global average fuel economy is improving, more needs to be done to meet the GFEI target.

The global average annual improvement rate of fuel economy has remained close to 2.0% per year since 2005. Fuel economy in OECD countries is improving at a much higher rate than in non-OECD countries. OECD countries are improving at a rate of 2.6% on average per year, with more than half of the OECD countries included in the analysis showing improvement rates well above 3.0%. Fuel economy improvement rates in non-OECD countries remain low, with an average improvement of 0.2%. The non-OECD passenger car market is now bigger than the OECD market, and has been since 2011. (GFEI, 2015a)

In 2014, 83% of new light-duty vehicles (LDVs) worldwide were sold in markets that have adopted regulations to improve LDV efficiency. Such standards require vehicle manufacturers to meet targets for new vehicle fleets based on CO₂, GHG emissions, fuel consumption, or fuel economy. As of September 2015, ten major markets have adopted LDV efficiency regulations. While some countries are on track to reach a 50% reduction in new LDV fuel consumption by 2030, others would need up to 10 years of continuous improvement in order to reach a 50% reduction. Among those regions that have adopted LDV efficiency standards, the sales-weighted average fuel consumption is forecast to be 34% lower in 2030 than in 2005 (without additional standards). Reaching the global GFEI target would require further improvements in regions with existing policies and expansion of these policies to cover the remaining 21% of worldwide new LDV sales forecast in 2030. It is vital that both developed and developing countries take action to extend and introduce ambitious targets and policies to reduce emissions.

The Global Fuel Economy Initiative is working to support the introduction of fuel economy policies in new countries around the world. By 2015, it was supporting 27 developing countries

to understand their vehicle fleets and develop and implement appropriate policy options. These include a carbon tax in Chile, vehicle labelling schemes in Vietnam, and a tax on older second-hand vehicles in Kenya. At COP21 in Paris, the Global Fuel Economy Initiative announced 40 new countries had committed to working to develop fuel economy policies, which GFEI will support thanks to additional funding from the European Commission and FIA Foundation.

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