GFEI
GLOBAL FUEL ECONOMY INITIATIVE

# TARGETING HEAVY DUTY VEHICLE FUEL ECONOMY

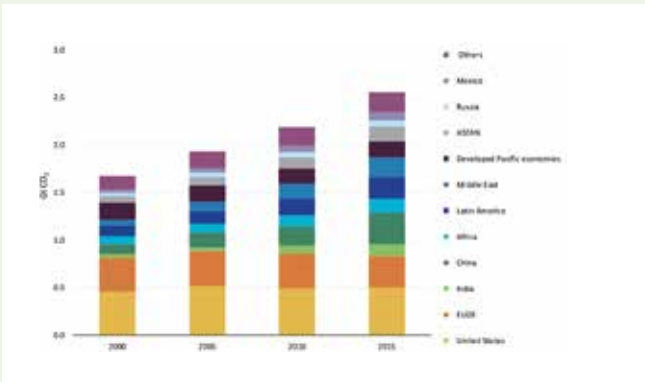
## Why we need fuel economy policies for Heavy Duty Vehicles

Global fuel consumption and associated $CO_2$ emissions from HDVs are increasing rapidly, particularly in emerging markets such as India, China, and Latin America (Figure 1). IEA analysis suggests that trucks are the fastest growing source of global oil demand, and could account for 40% of the oil demand growth to 2050 and 15% of the increase in global $CO_2$ emissions from energy production and use.

Without action, worldwide fuel consumption from HDVs is on track to overtake passenger vehicles in the next decade or two.

Implementing fuel economy policies makes economic and environmental sense, as fuel savings more than offset increases in technology costs. The Global Fuel Economy Initiative (GFEI) has an interest in promoting all forms of fuel efficiency, and has been supporting activities to promote HDV efficiency. Since it was launched in 2009, GFEI has undertaken research and in-country capacity building that has helped improve the efficiency of the Light Duty Vehicle fleet, and the partnership is now focused on also catalysing progress for trucks and road freight as well.

**FIGURE 1** $CO_2$ emissions from HDVs (2000-2015)



Source: IEA Future of Trucks report

# GFEI's HDV target: '35 by 35'

GFEI partners have agreed a target of a 35% reduction in average fuel consumption of new HDV vehicles globally by 2035. Modelling by the ICCT in GFEI Working Paper 14*, published in 2016, assessed the potential for HDV fuel economy improvements in major markets, and suggested that a high-level GFEI HDV target of a 35% global average reduction in fuel consumption of new Heavy Duty Vehicles from 2015 to 2035 would be ambitious but achievable. This rate of change was adopted for the IEA's Energy Technology Perspectives 2017 report.

Achieving the GFEI 35by35 HDV target could save millions of barrels of oil per day and avoid 1-2 billion tons of $CO_2$ emissions per year in 2035—an improvement of more than 20% compared to a business-as-usual scenario.

# Key areas for efficiency improvements

The IEA's Future of Trucks report examined potential areas for fuel economy improvements. The report identified a range of technology improvements to existing fleets (in the form of retrofits) and new truck sales. The potential for these technologies to deliver improved fuel efficiency varies across regions, depending on regional patterns in vehicle usage (e.g. speeds and payloads), and technology penetration (and hence the baseline level of vehicle efficiency). Areas such as engine efficiency and tyre resistance offer significant potential benefits.

**FIGURE 2** Potential efficiency improvements

| Area | Range of energy savings |
|---|---|
| Improved aerodynamics | 3-15% depending on region |
| Lower rolling resistance tyres | 3-8% of energy use |
| Light weighting | 1-3% in near term, 7% long-term |
| Transmission and drivetrain improvements | 1-5% from automated manual transmission |
| Engine efficiency | 4-18% (long haul) |
| Reducing idling | 2.5% |
| Hybridisation | 6-35%, depending on mission profile |

Source: Adapted from IEA Future of Trucks report

# A comprehensive approach

To achieve the overall emissions reductions needed to achieve the Paris Agreement, it is vital for countries to secure a comprehensive package of improvements in efficiency across their fleets – both LDV and HDV. Alongside national-level fuel consumption standards, a range of other policies and programs such as fiscal incentives and green freight programs can leverage additional fuel and emissions savings. The Global Fuel Economy Initiative supports these efforts through its fuel economy toolkit.

"Trucks are the fastest growing sector in terms of oil demand. At 17 million barrels per day, the road freight sector constitutes one-fifth of the global oil demand. But there has been little public attention paid and there are not enough policy measures [for road freight]," **Fatih Birol, executive director of the International Energy Agency (IEA)**

* https://www.globalfueleconomy.org/media/404893/gfei-wp14.pdf

# HDV standards globally

The Global Fuel Economy Initiative has provided technical advice and support for countries to develop Light Duty Vehicle fuel economy standards. Many of these have now moved on to develop policies for Heavy Duty Vehicles. Japan, US, Canada, China, and most recently India have HDV fuel economy programs while Mexico, Korea, and Europe are actively developing programs (Figure 2). The ICCT have been supporting this policy development, including through the G20's Transport Task Group (TTG).

**FIGURE 3** HDV fuel economy progress


Source: ICCT

Note: Hashed areas are ICCT projections

There is more diversity in HDV vehicle types and drive cycles compared to LDVs across countries and regions, which means that policies need to be tailored to each market. Although this is a challenge for HDV fuel economy policy, the low production volumes of heavy-duty vehicles and engines, and the global nature of many truck manufacturers, do also mean that there is some potential for moving towards more global alignment of standards. In addition, since key elements of HDV fuel economy standards have already been developed in the larger markets (e.g. regulatory design, test cycles and protocols, and simulation models) there is now potential for countries to adapt these to their own markets, paving the way for accelerated policy adoption. Lack of data is still a challenge, but this can be overcome. Data gathered by Green Freight Programmes, truck testing campaigns and fuel economy surveys, and other research that underpin existing fuel economy standards can all be supplemented by modelling of specific country-level fleet and usage conditions to close key data gaps.

## International trade in used trucks

As well as standards for new vehicles, there is also a need to focus on the international trade in used HDVs from their original country of sale into developing countries. This is significant as modern HDVs engine, powertrain and emissions control technologies may in many instances be unsuitable for many developing countries that lack the requisite fuel quality and maintenance infrastructure to ensure the durability and continued effectiveness of emissions control technologies. For example, the NOx emissions of used EURO IV compliant HDV imports could potentially increase if additives of urea aren't added. This is an area for further research.

# GFEI's approach: Research and analysis, capacity building, and global agenda-setting

**1. Research and Analysis**

GFEI partners will work towards a "policy pathway", setting out ways for countries to establish a policy framework. This could include a step-by-step "how to" guide to establishing (or improving on existing) HDV standards, including:

- policy approaches that could be adopted;
- information on the tools that would enable their adoption;
- information on the opportunities to adapt tools that already exist to local needs, including advice on the development of a market assessment and the segmentation of the HDV fleet;
- detailed technical advice on establishing a regulatory framework and certification procedures.

**2. In-country support**

GFEI plans to assist countries in establishing technically sound HDV efficiency policies and standards. This may include adapting an existing certification model (such as GEM or VECTO) for a given country, developing country specific tools, or conducting country-specific analyses.

**3. Global awareness**

GFEI will increasingly highlight the potential of HDV fuel economy programmes through global networks. GFEI and ICCT, support the work of the G20 Transport Task Group [TTG] of the International Partnership for Energy Efficiency Cooperation [IPEEC]. This is a potentially powerful platform for engaging G20 governments that could champion the development of HDV fuel economy policies in their countries.

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