Fuel Economy in Major Car markets
Technology and policy drivers 2005-2017

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Report content

• Bi-annual analysis of the global light-duty vehicle (LDV) market to track progress towards the 2030/2050 GFEI targets

• Main trends 2005-17, 2015-17 and 2017

• Country-by-country comparison and 2005-17 trends for key technical parameters

• Segment, powertrain, power, displacement, weight, footprint, and price

• Special focus chapter 1: Role of electrification

• Special focus chapter 2: Compliance & Enforcement (ICCT)
Average fuel consumption of LDV sales at a country level ranges from 5.2 to 8.9 Lge/100 km. Countries can be grouped based on their average fuel consumption, income level and fuel price, and fuel economy is better in countries with higher fuel prices.
### Tracking progress

**Fuel economy improvements by category, 2005-17 and GFEI 2030 target**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2017</th>
<th>2030</th>
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</thead>
<tbody>
<tr>
<td><strong>Advanced</strong></td>
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<tr>
<td>(Gasoline price ≥ USD 1/L)</td>
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<tr>
<td>Average fuel economy (Lge/100km)</td>
<td>7.4</td>
<td>6.5</td>
<td>5.8</td>
<td>5.8</td>
<td>5.8</td>
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<tr>
<td>Annual improvement rate (% per year)</td>
<td>-2.4%</td>
<td>-2.5%</td>
<td>-0.1%</td>
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<td>4.4</td>
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<tr>
<td><strong>Advanced</strong></td>
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<td>(Gasoline price &lt; USD 1/L)</td>
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<tr>
<td>Average fuel economy (Lge/100km)</td>
<td>11.0</td>
<td>9.5</td>
<td>8.6</td>
<td>8.6</td>
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<tr>
<td>Annual improvement rate (% per year)</td>
<td>-2.9%</td>
<td>-1.9%</td>
<td>-0.4%</td>
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<td><strong>Emerging</strong></td>
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<tr>
<td>Average fuel economy (Lge/100km)</td>
<td>8.6</td>
<td>8.5</td>
<td>7.8</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Annual improvement rate (% per year)</td>
<td>-0.2%</td>
<td>-1.6%</td>
<td>-2.3%</td>
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<td><strong>Global average</strong></td>
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<tr>
<td>Average fuel economy (Lge/100km)</td>
<td>8.8</td>
<td>8.0</td>
<td>7.4</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>Annual improvement rate (% per year)</td>
<td>-2.0%</td>
<td>-1.5%</td>
<td>-1.4%</td>
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<tr>
<td><strong>GFEI target</strong></td>
<td>2005 base year</td>
<td>2017 base year</td>
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<td>Required annual improvement rate (% per year)</td>
<td>-2.8%</td>
<td>-3.7%</td>
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</table>

Annual fuel efficiency gains are slowing in advanced economies and accelerating in emerging economies. Both rates are below those needed to achieve the GFEI 2030 target.
Key driver 1: Structural shifts

As their share in overall LDV sales grows, global average fuel consumption is increasingly influenced by trends in emerging economies.
Key driver 2: Growing appetite for larger vehicles

Fuel economy in each size class improved, but the overall average fell as market shares of larger and less fuel-efficient vehicles grew. The market share of sport-utility vehicles (SUVs) and pick-ups has grown by 11 percentage points since 2014. These vehicle types represented nearly 40% of the market in 2017.
Key driver 3: Diesel losing market share in various key markets

In countries where sales shares of diesel vehicles have fallen, average fuel consumption has gotten worse.
The biggest fuel economy benefits from electrified vehicles were in Japan, the United States and China. The contribution of conventional hybrids versus plug-in and battery electric vehicles varies across countries.
Policies bring benefit, though not enough to align with GFEI target

Average annual fuel economy improvement rates for countries with and without fuel economy regulations/incentives, 2012-17

Annual fuel economy improvement rates are higher in countries with regulations and/or incentives, yet no country group is on track to meet the GFEI 2030 target.
Future policies raise the expectations

Various fuel economy regulations have the potential to help meet the GFEI 2030 target if stringency levels continue to improve at similar rates until 2030.
In all major vehicle markets, except for the United States, there is an increasing gap between real-driving CO₂ emissions and tested emissions, from 10% to as high as 50%.
Moving towards well-to-wheel performance

Well-to-wheel emissions of different powertrains in the New Policies Scenario and the Sustainable Development Scenario

As sales shares of alternative powertrains grow, it will be important to assess their WTW GHG emissions. GHG emissions from electric vehicles depend on the carbon intensity of the electricity grid.
Conclusions

• Recent developments point to a slowdown fuel economy improvement
  - Changes in market structure, with emerging economies growing in importance
  - Changes in relevance of different vehicle segments (move towards crossovers)
  - Loss of popularity of diesel

• Policy action is crucial to deliver energy efficiency improvements and GHG emission reductions

• Policy coverage needs to expand to 2030 in many countries and regions

• Electrified vehicles (HEVs, PHEVs and BEVs) will play a growing role in ensuring that fuel economy will improve and GHG emissions will decline
  - Tight linkages between fuel economy policy and policy to support electrified powertrains
  - Implications for industrial competitiveness

• Real-driving gap and well-to-wheel emissions also need to be targeted
Online country reports:  [https://www.iea.org/topics/transport/gfei/report/](https://www.iea.org/topics/transport/gfei/report/)