Japan

Country spotlight

Population (million) (World Bank, 2016a):	127
Urban population (% of total) (World Bank, 2016b):	94%
GDP per capita (2014 USD/year) (World Bank, 2016c):	32 500
Average price gasoline and diesel (USD cent per L, 2014) (GIZ, 2015):	138; 110

Fuel tax class (2014) (GIZ, 2015): taxed fuel price for petroleum fuels

In 2015, 4.8 million LDVs entered the Japanese vehicle fleet (IHS Markit, 2016), bringing its on-road LDV stock to 62 million vehicles (IEA, 2016a). LDV ownership was slightly below 0.49 LDVs per capita. Fuel economy standards have a long history in Japan. The first regulation was put in place in 1979, and applied first to 1985 vehicles. The Top Runner Program, introduced in 1999, required all vehicles in a given weight class to exceed the fuel economy of the best-performing model within three to ten years (TransportPolicy, 2016). Fuel economy labelling has also been mandatory since the year 2000 (ICCT, 2014c). Japanese fuel economy standards have resulted in ambitious improvement targets in the past. Recent regulatory targets (for 2020) are less aggressive than in Europe, despite the fact that average national new sales fuel economy in Europe and Japan in 2013 were similar in magnitude. In addition to fuel economy standards, tax incentives encourage consumers to buy lighter vehicles. Vehicles that perform significantly better than the target values are also eligible for tax reductions (TransportPolicy, 2016). This helps explain why Japanese vehicles met fuel consumption targets ahead of time.

Market profile and vehicle characteristics

Producing approximately 8.7 million LDVs in 2015, down 10% from 2013, Japan ranks as the third-largest LDV manufacturer globally after China and the United States (OICA, 2016). Japan produced many more vehicles than its domestic sales of 4.9 million LDVs in 2015, maintaining its position as premier global exporter (IHS Markit, 2016). Japanese cars remain popular around the world, with brands such as Toyota, Honda and Suzuki. Foreign OEMs struggle to gain market share in the Japanese market – Japanese OEMs account for more than 90% of domestic LDV sales.

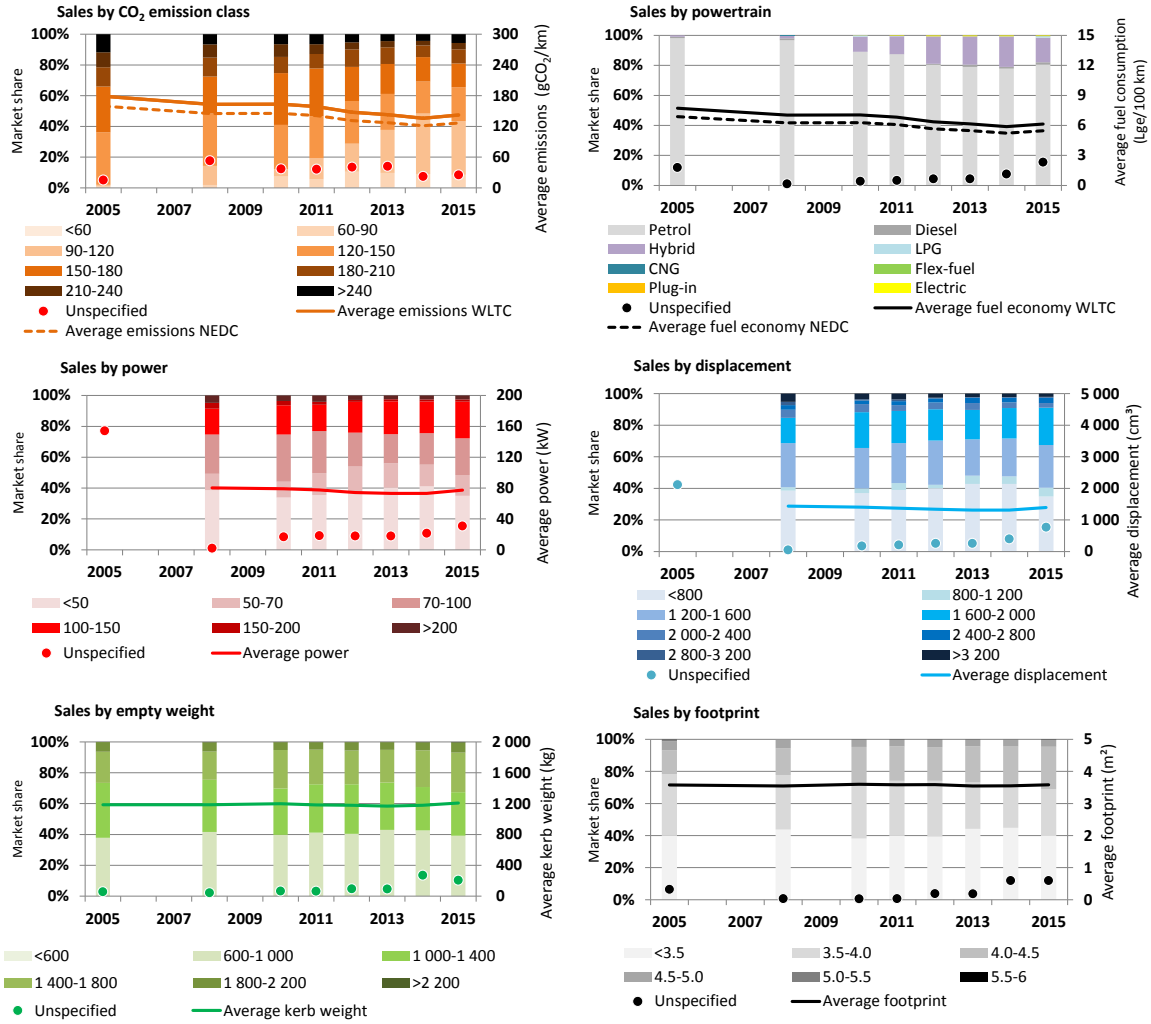
After nine consecutive years of decreasing CO_2 emissions per vehicle-kilometre, Japan's new LDVs emitted almost 5% more CO_2 per kilometre in 2015 compared with the previous year. In 2015, the most outstanding change was a surge in high-emission LDVs (more than 180 g CO_2/km), while lower emission LDVs (60-120 g CO_2/km) lost market share. Japan is still the only market with a double-digit market share of hybrid vehicles, although this dropped below 15% in 2015. Japan had almost no diesel registrations, leading to an average fuel consumption of 6.1 Lge/100 km.

Average power per new LDV went up by 6% to reach almost 80 kW between 2013 and 2015, after eight years of decreasing. Vehicles below 50 kW lost 5% market share between 2014 and 2015, indicating a trend reversal. Nevertheless, Japanese LDVs had a 20% lower average power than German LDVs while having the same average fuel economy, emphasising technological differences. Average displacement of newly registered LDVs also went up to 1.4 L between 2013 and 2015, being at least 7% smaller than the nearest OECD country. Most market growth has been observed in the 1.6-2.0 L segment. The demand for smaller engines of less than 0.8 L is decreasing.

The average weight of newly registered LDVs has hardly grown since 2005, with a small upward trend between 2013 and 2015. The second-largest segment of 1 800-2 200 kg has gained the most market share, while light vehicles of 600-1 000 kg became less popular. Average footprint also experienced almost no change over the years 2005-15, albeit rising a little in the latest two years.

This summary is taken from GFEI Working Paper 15. For more complete information and references, see https://www.globalfueleconomy.org/data-and-research/publications/gfei-working-paper-15

Figure 1 ● LDV market by g CO_2/km, powertrain, power, displacement, weight and footprint, Japan, 2005-15



Source: IEA elaboration and enhancement for broader coverage of IHS Markit database.

Analysis of fuel economy trends

In Japan, a significant gap exists between large vehicles and the other segments (Figure 2, left), and is larger than in European OECD countries. After a rapidly falling fuel consumption per km for large LDVs from 2011 to 2014, a trend reversal occurred in 2015. Due to high market share of hybrids, new medium LDVs were more fuel efficient than small vehicles between 2010 and 2014, converging after 2012. Segmentation by powertrain shows that gasoline-powered vehicles dictated Japan's total average fuel economy (Figure 2, right). Hybrids experienced a worsening specific fuel consumption between 2005 and 2013, which was reversed in the two years after. However, this was not enough to prevent total average fuel consumption from rising.

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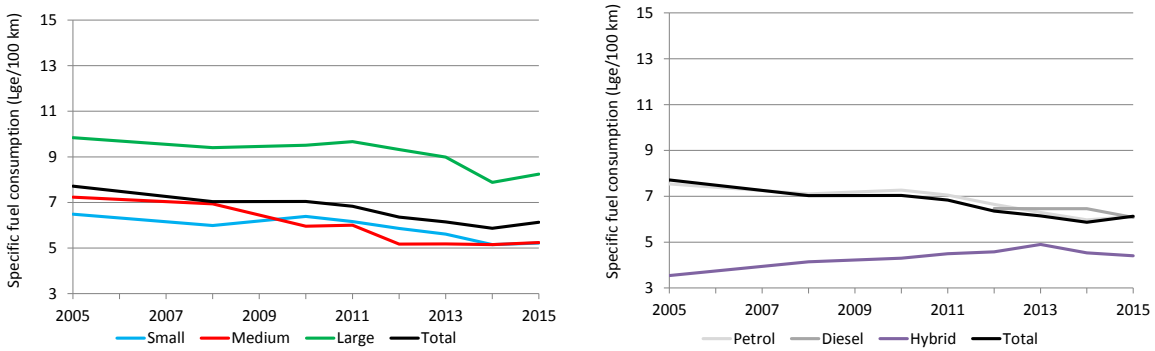
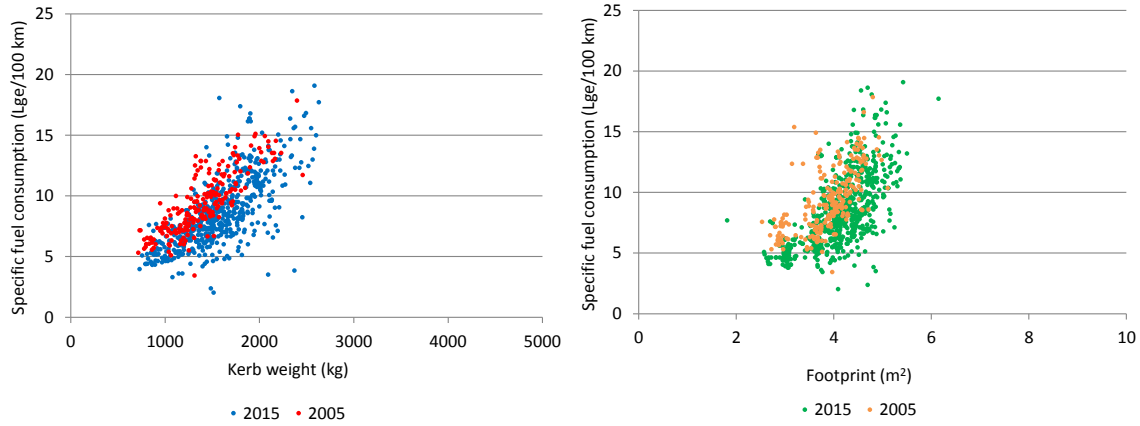
Figure 2 ● Average new LDV fuel consumption per km by vehicle segment and powertrain, Japan, 2005-15



Source: IEA elaboration and enhancement for broader coverage of IHS Markit database.

A neat reduction in specific fuel consumption was observed for most weight classes between 2005 and 2015 (Figure 3, left). The same trend was observed with regard to footprint (Figure 3, right). Like most markets in this study, more LDV models were available in 2015 compared with 2005, leading to a more diversified market.

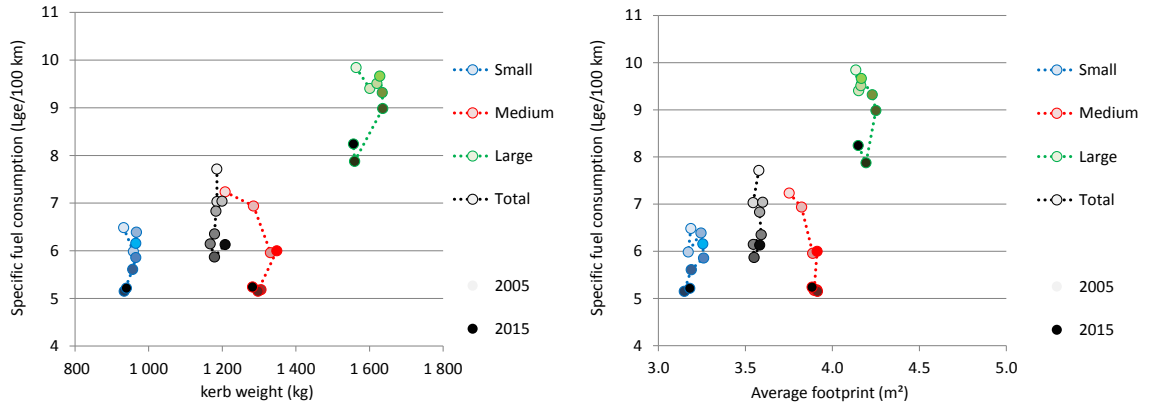
Figure 3 ● Fuel consumption per km of new LDVs plotted against vehicle weight and footprint, Japan, 2005 and 2015



Source: IEA elaboration and enhancement for broader coverage of IHS Markit database.

An overall downward trend in specific fuel consumption was seen for all vehicle segments (Figure 4), similar to other countries with extensive fuel economy policy regimes. Newly registered small LDVs became somewhat lighter over time, alongside positive progress in specific fuel economy. Medium-sized LDVs experienced several trends, first becoming heavier, then losing weight, accompanied by stagnating specific fuel consumption. Large vehicles lost weight as well, while becoming 10% more fuel efficient in between 2011 and 2015. Changes in footprint were much less pronounced than in the case of weight, for all segments (Figure 4, right).

Figure 4 ● Average new LDV fuel consumption per km by segment plotted against vehicle weight and footprint, Japan, 2005-15



Source: IEA elaboration and enhancement for broader coverage of IHS Markit database.

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