The Fuel Economy State of play

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Fuel economy in major car markets – GFEI working paper 19

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- 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 foci on
  - the role of electrification
  - compliance & enforcement (ICCT)

Setting the scene for diverse car markets

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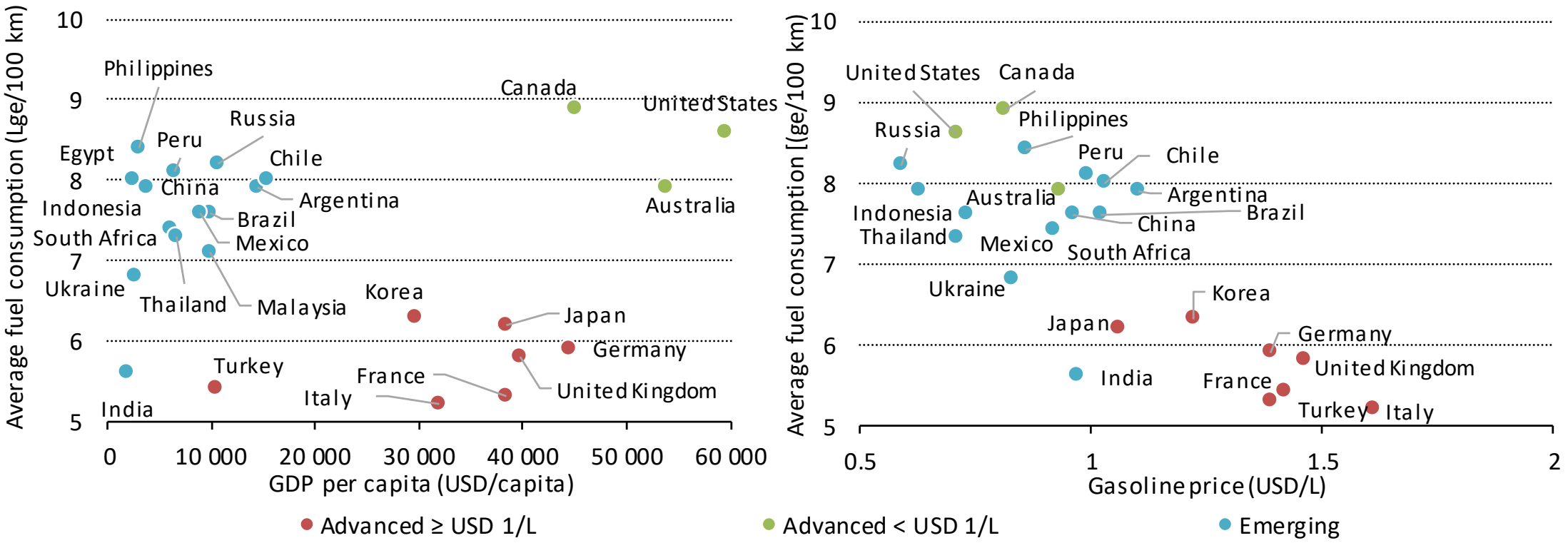
Fuel consumption relative to GDP and gasoline price (2016) for selected countries, 2017



Countries can be grouped based on their average fuel consumption, income level and fuel price
Fuel economy is better in country groups subject to higher-than-average fuel prices

Tracking progress

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

			2005	2010	2015	2017	2030
Advanced (Gasoline price ≥ USD 1/L)	average fuel economy (Lge/100km)		7.4	6.5	5.8	5.8	
	annual improvement rate (% per year)		-2.4%	-2.5%	-0.1%		
			-2.0%				
Advanced (Gasoline price < USD 1/L)	average fuel economy (Lge/100km)		11.0	9.5	8.6	8.6	
	annual improvement rate (% per year)		-2.9%	-1.9%	-0.4%		
			-2.0%				**4.4**
Emerging	average fuel economy (Lge/100km)		8.6	8.5	7.8	7.5	
	annual improvement rate (% per year)		-0.2%	-1.6%	-2.3%		
			-1.2%				
Global average	average fuel economy (Lge/100km)		8.8	8.0	7.4	7.2	
	annual improvement rate (% per year)		-2.0%	-1.5%	-1.4%		
			-1.7%				
GFEI target	Required annual improvement rate (% per year)	2005 base year	**-2.8%**				
		2017 base year				**-3.7%**	

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 vehicle market shifts

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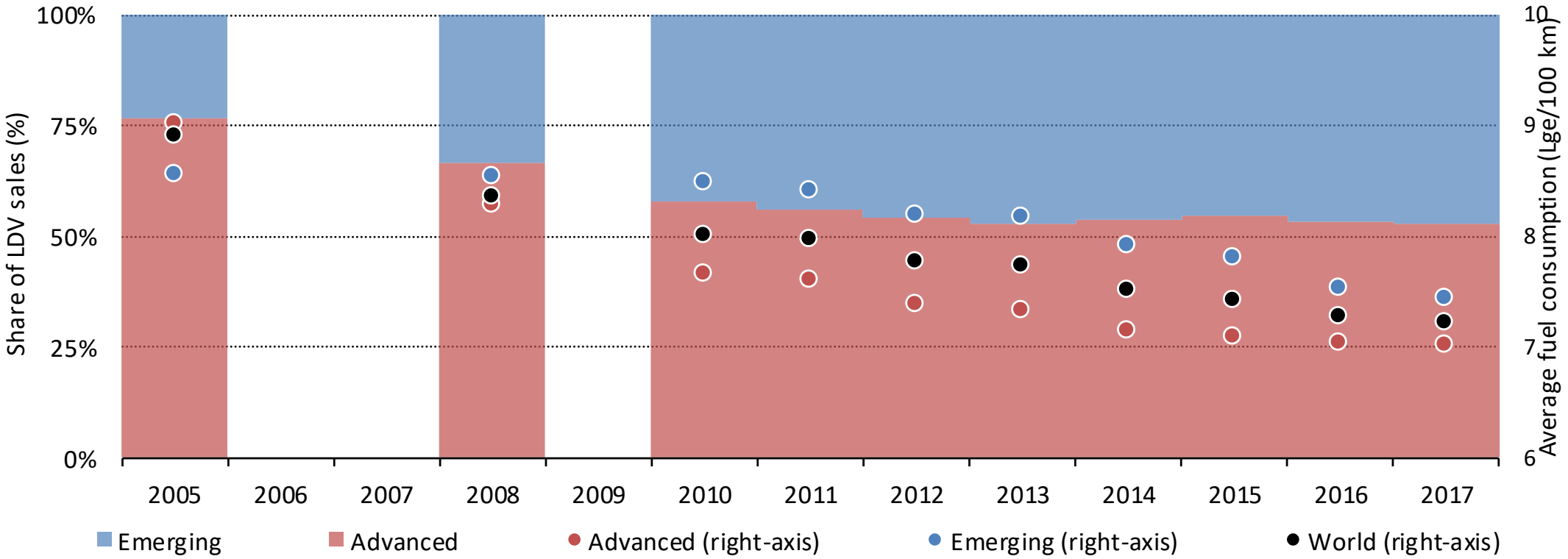
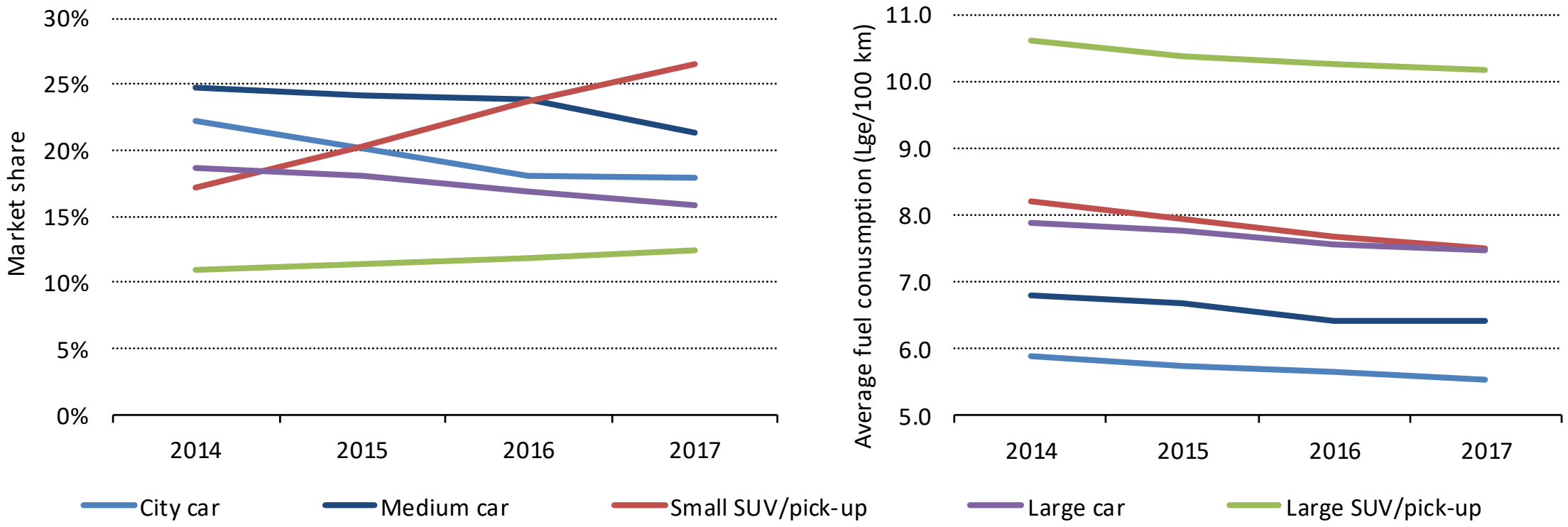
LDV sales and average fuel consumption in advanced and emerging economies, 2005-17



Emerging economies gained relevance in comparison with the 2005 benchmark because of the dynamics of the vehicle sales growth

Key driver 2: Growing appetite for larger vehicles

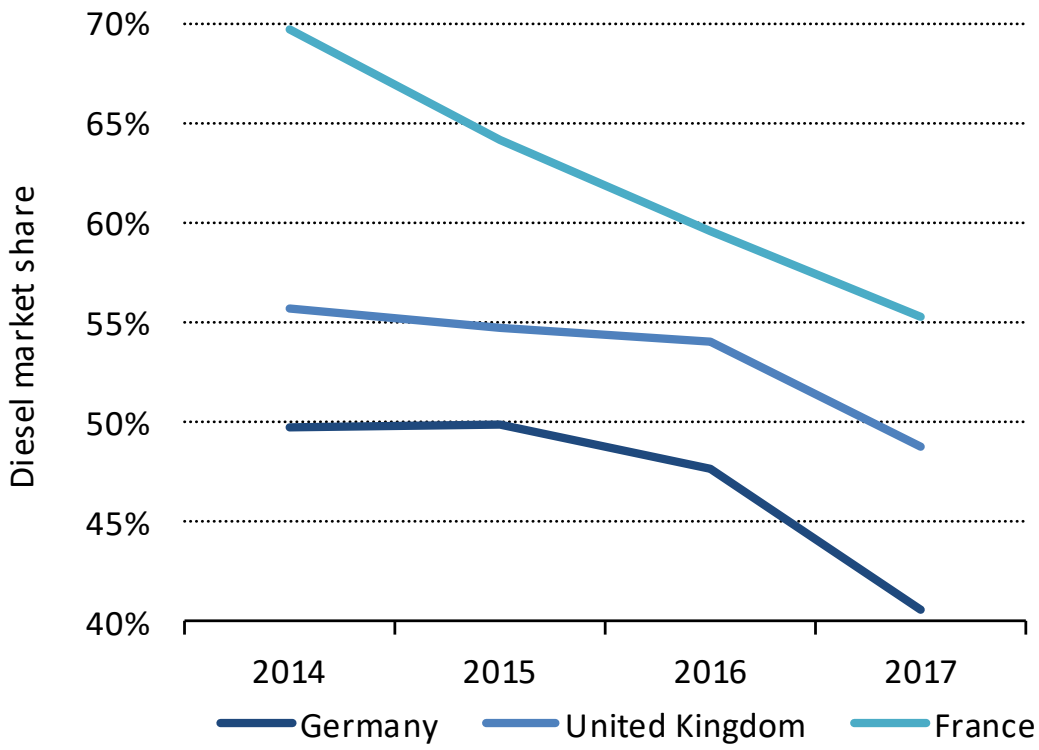
Global average market share per vehicle size segment and fuel consumption, 2014-17

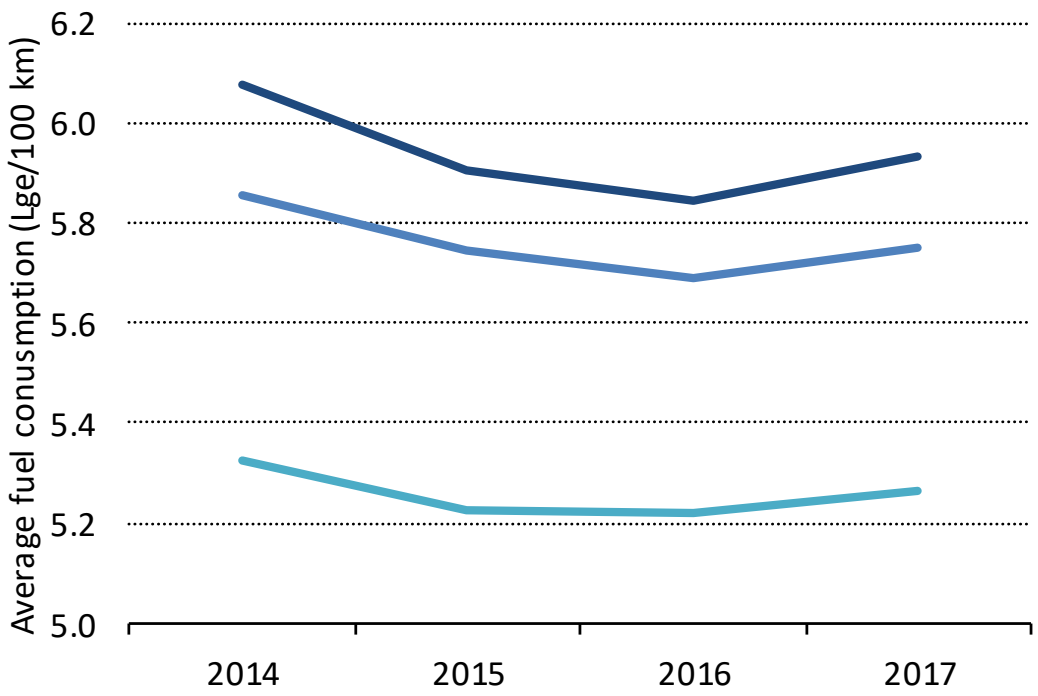


Average fuel economy in each vehicle size category improved, but the overall average fell due to increasing market shares of larger and less fuel-efficient vehicles

Key driver 3: Diesel losing market share in various key markets

Diesel market share and average fuel consumption trends in selected countries, 2014-17





In countries with relevant shares of diesels, falling shares of diesel powertrains due also contributed to an increase of the average fuel consumption

Contribution of electrified vehicles to improved fuel economy

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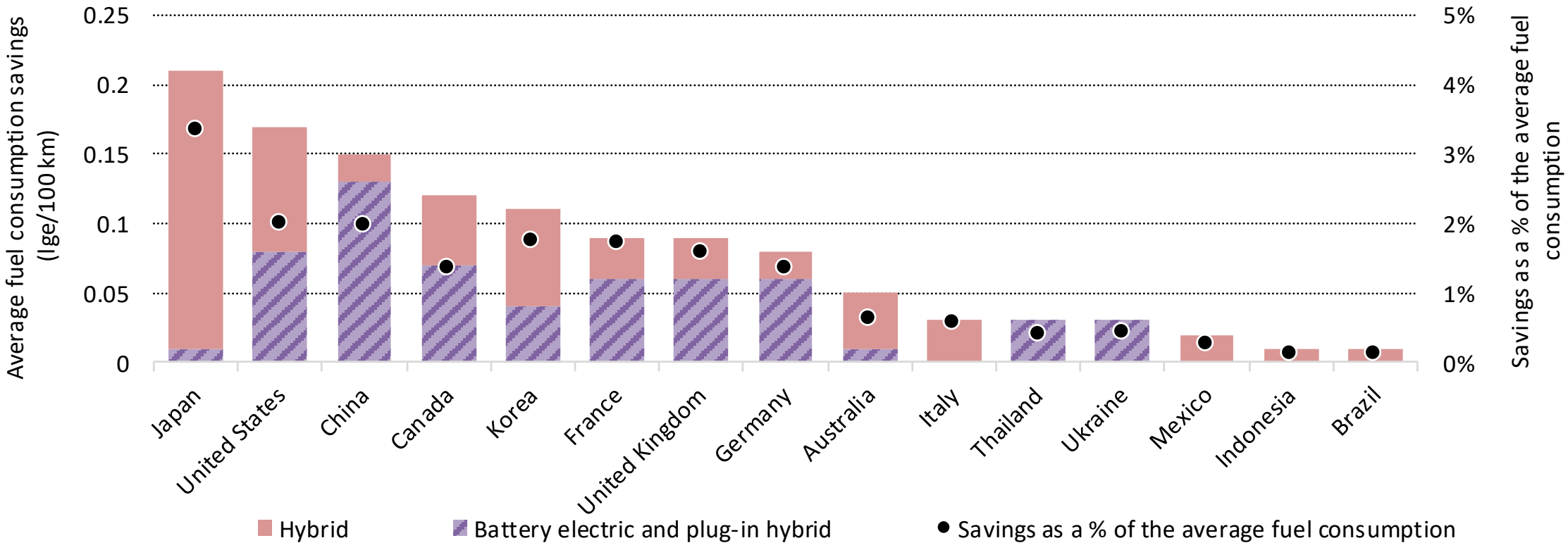
Electrified vehicles contribution to average fuel consumption savings, 2017



Electrified vehicles will be increasingly important for fuel economy improvements
The largest contributions so far were in Japan, the United States and China

Policies helped, but not enough to align with GFEI target

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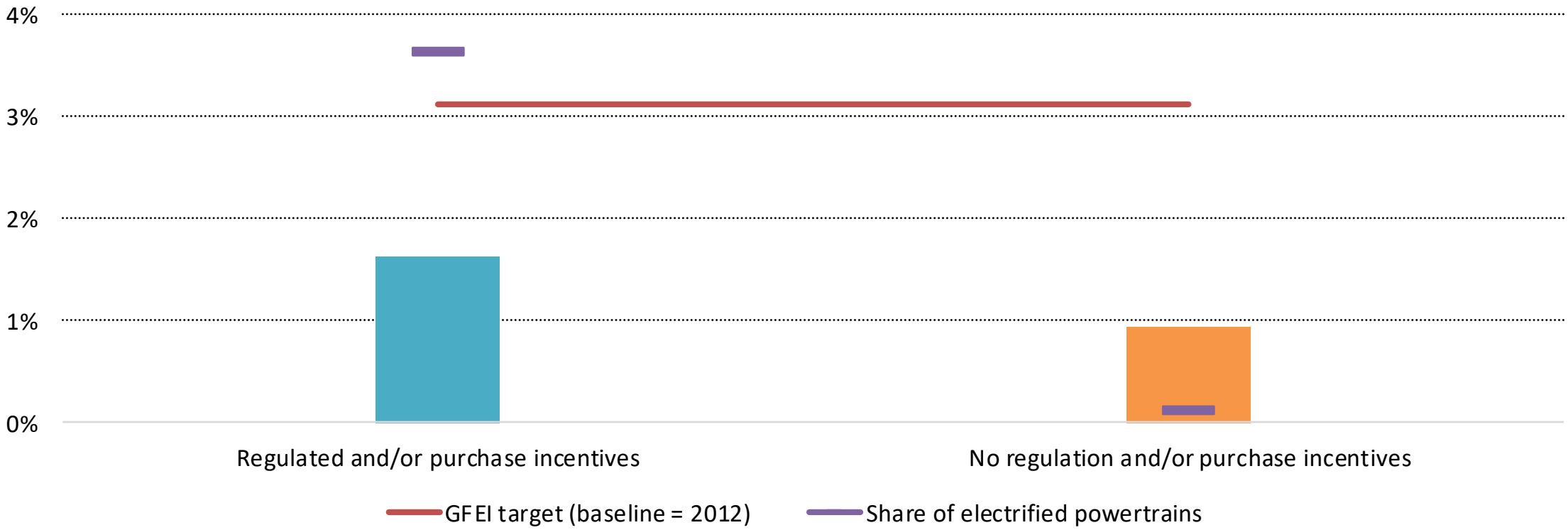
Average annual fuel economy improvement rates for countries with and without fuel economy regulations/incentives, 2012-17



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: need for improvements and extension to 2030

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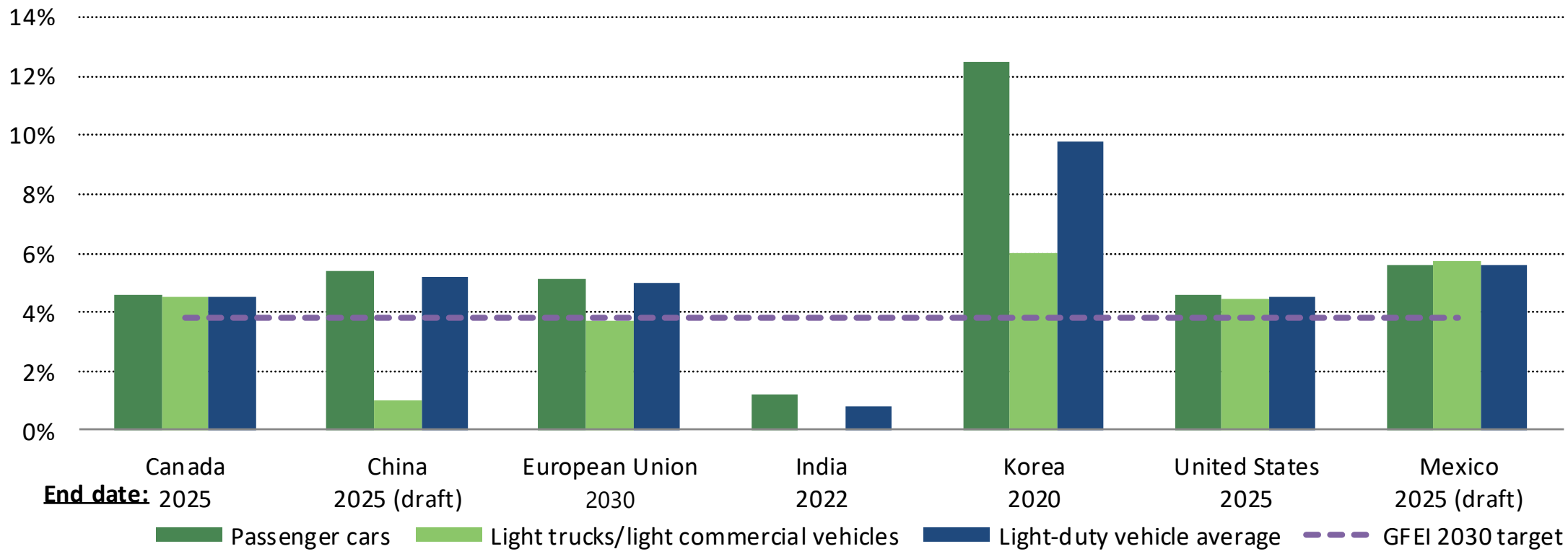
Fuel economy improvements of existing or draft standards relative to the GFEI 2030 target



The ambition of annual improvement in fuel economy regulations of major markets gives encouraging signs to achieving the GFEI 2030, but few of the regulatory frameworks reach out to 2030

Addressing the real-driving gap key for real-world efficiency

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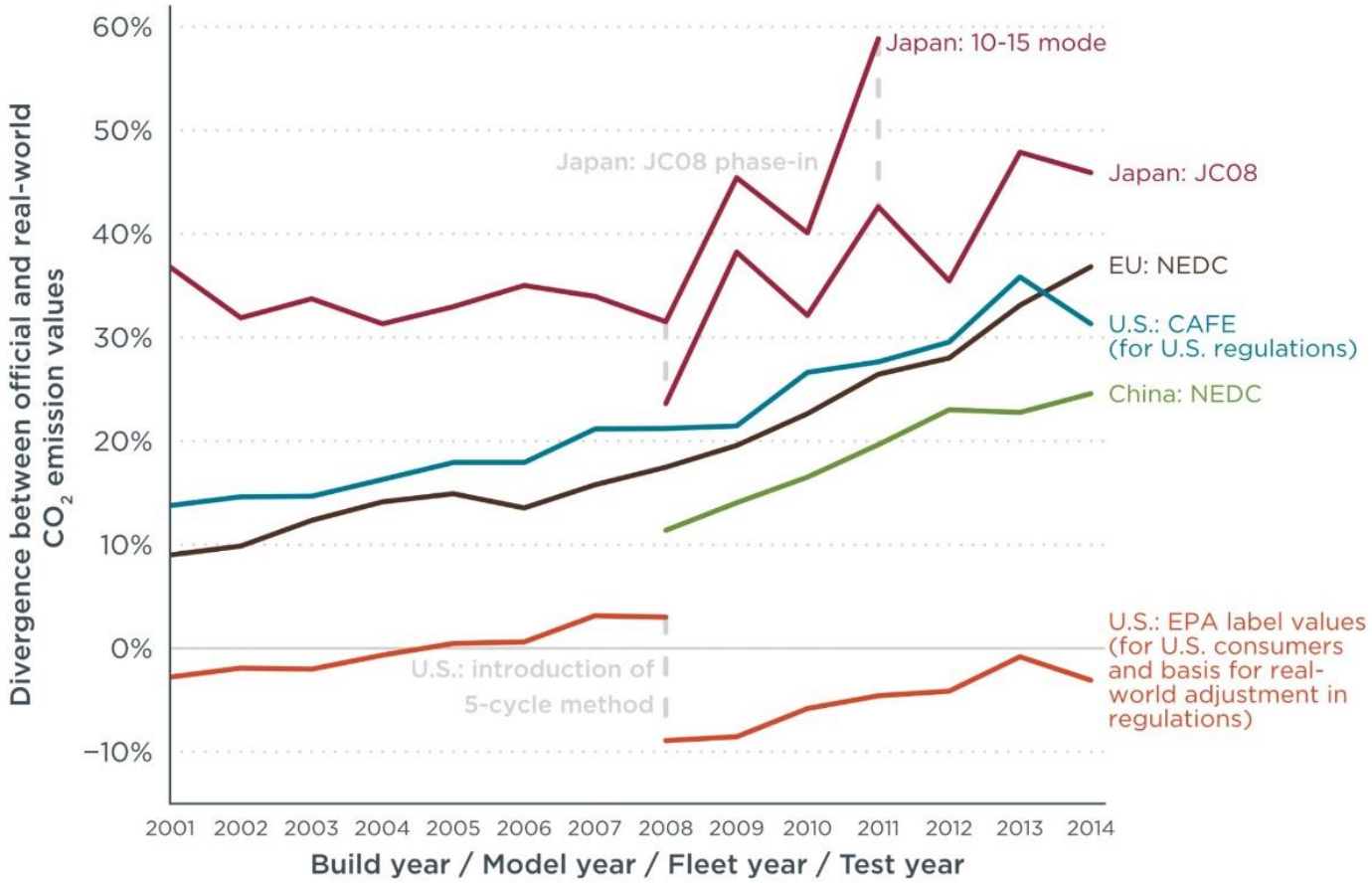
Gap between real driving and tested CO2 emissions values for select countries, 2001-14



Key vehicle markets except for the United States show an increasing gap between real driving and tested results of more than 10%, diverging to as high as 50%

Conclusions

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- 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 a broad range of geographies
- Electrified vehicles (HEVs, PHEVs and BEVs) will have a growing importance to ensure that fuel economy will improve and GHG emissions will decline
  - Thigh links between fuel economy policy and electrification
  - Implications for industrial competitiveness
- Real-driving gap also needs to be targeted