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ROUTE 2030 – A REGIONAL VIEW OF TRUCK INDUSTRY PROFIT POOLS

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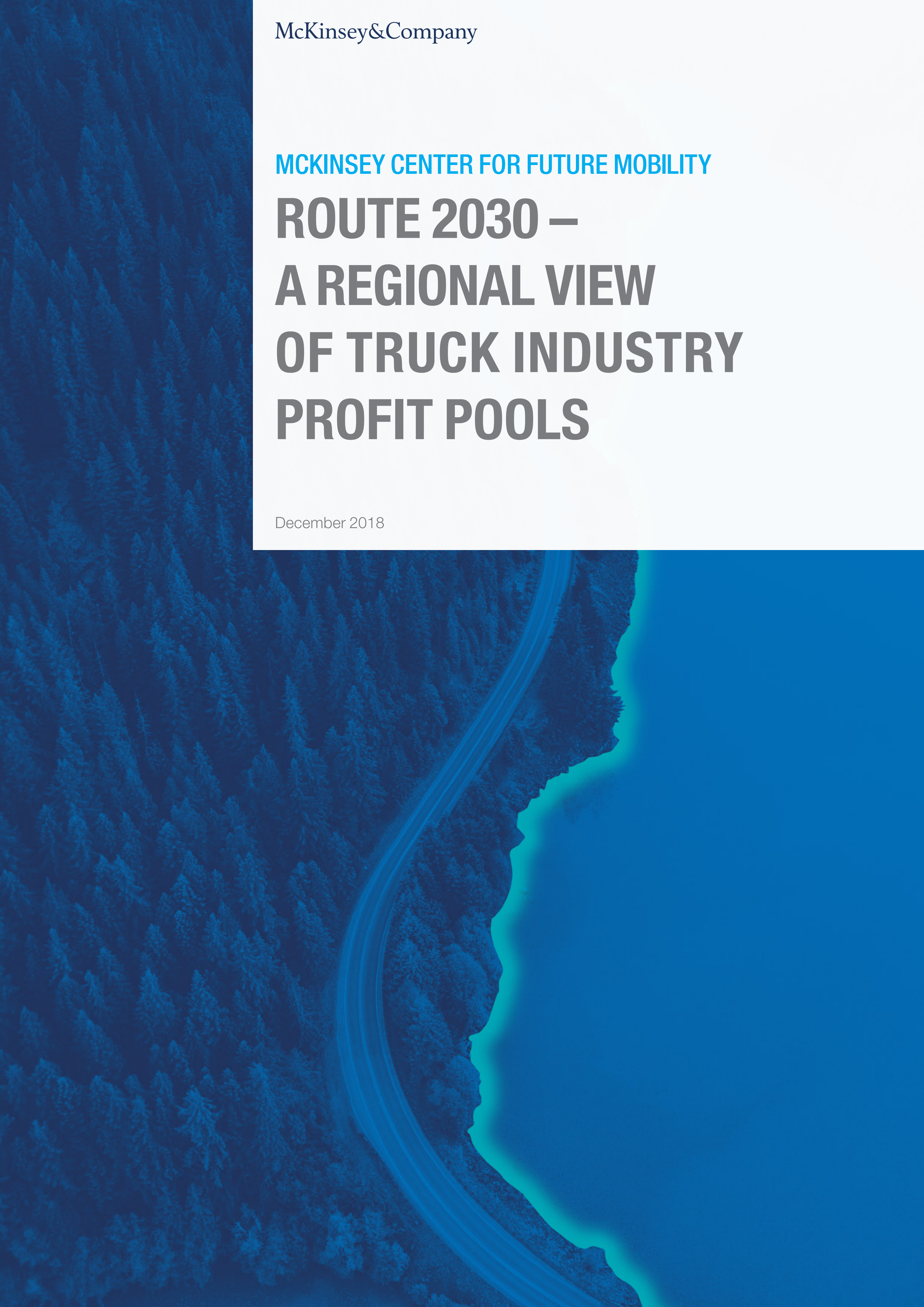

ROUTE 2030 – A REGIONAL VIEW OF TRUCK INDUSTRY PROFIT POOLS

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EXECUTIVE SUMMARY

The road ahead for the global truck industry will likely be profitable but more competitive. Our analysis through 2030 reveals that mature, high-margin markets will remain major profit pools for the medium- and heavy-duty truck sector (trucks > 6t), and that industry trends are expected to further increase the importance of the aftersales business for OEMs (Exhibit 1).

Overall, new truck profits are expected to increase by EUR 4.9 billion to EUR 16.1 billion in 2030. Aftersales profits and profitability in terms of return on sales (RoS) are expected to expand to EUR 7.1 billion and 21.1 percent respectively, thus accounting for almost half the global OEM profit pool by 2030. In fact, our research reveals that advanced markets already exhibit greater profitability in aftersales than in new truck sales.

Regionally, NAFTA and Western Europe remain the most profitable markets, contributing approximately 65 percent to the overall profit pool. Emerging markets will likely experience below-average profitability, especially those in South America (although Brazil is showing signs of a market recovery), India and the Asia-Pacific (APAC) region. Central and Eastern Europe (CEE) will probably be the only region to combine relatively strong profitability (6.2 percent RoS in 2030) with above-average unit volume growth at a compound annual growth rate (CAGR) of 3.8 percent through 2030. The expected strong recovery in Russia will mainly drive this performance.

China's truck market is expected to expand its profit pool from EUR 1.6 billion in 2017 to EUR 1.8-2.4 billion in 2030, driven by the attractive "upper-budget" segment, while the share of premium imports in the Chinese truck market will largely stagnate. Global truck makers are expected to localize products in China and compete for the upper-budget market, which includes "localized premium" trucks.

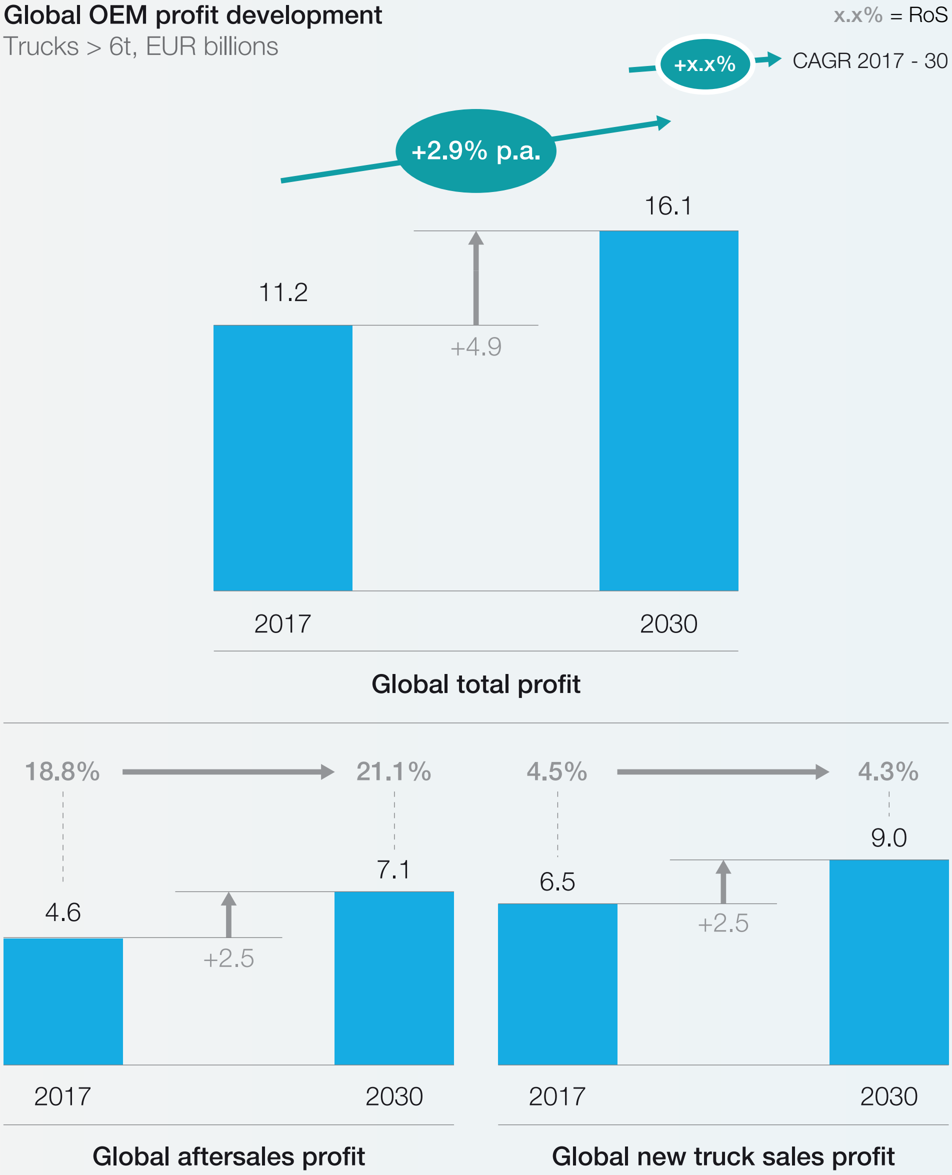
The strong showing of the global truck industry is attracting new players that are vying to enter this profitable industry with new technologies (e.g. alternative powertrains, autonomous vehicles, truck connectivity solutions). They could put unprepared incumbents at a disadvantage.

We believe global truck makers should focus on three activities:

- Capture earnings in mature markets and prepare for new opportunities in selected emerging markets and especially the upper budget segment in China
- Make a concerted effort to meet regulatory and market obligations with a strong focus on cost and operational excellence
- Overinvest today to build new opportunities and business models going forward

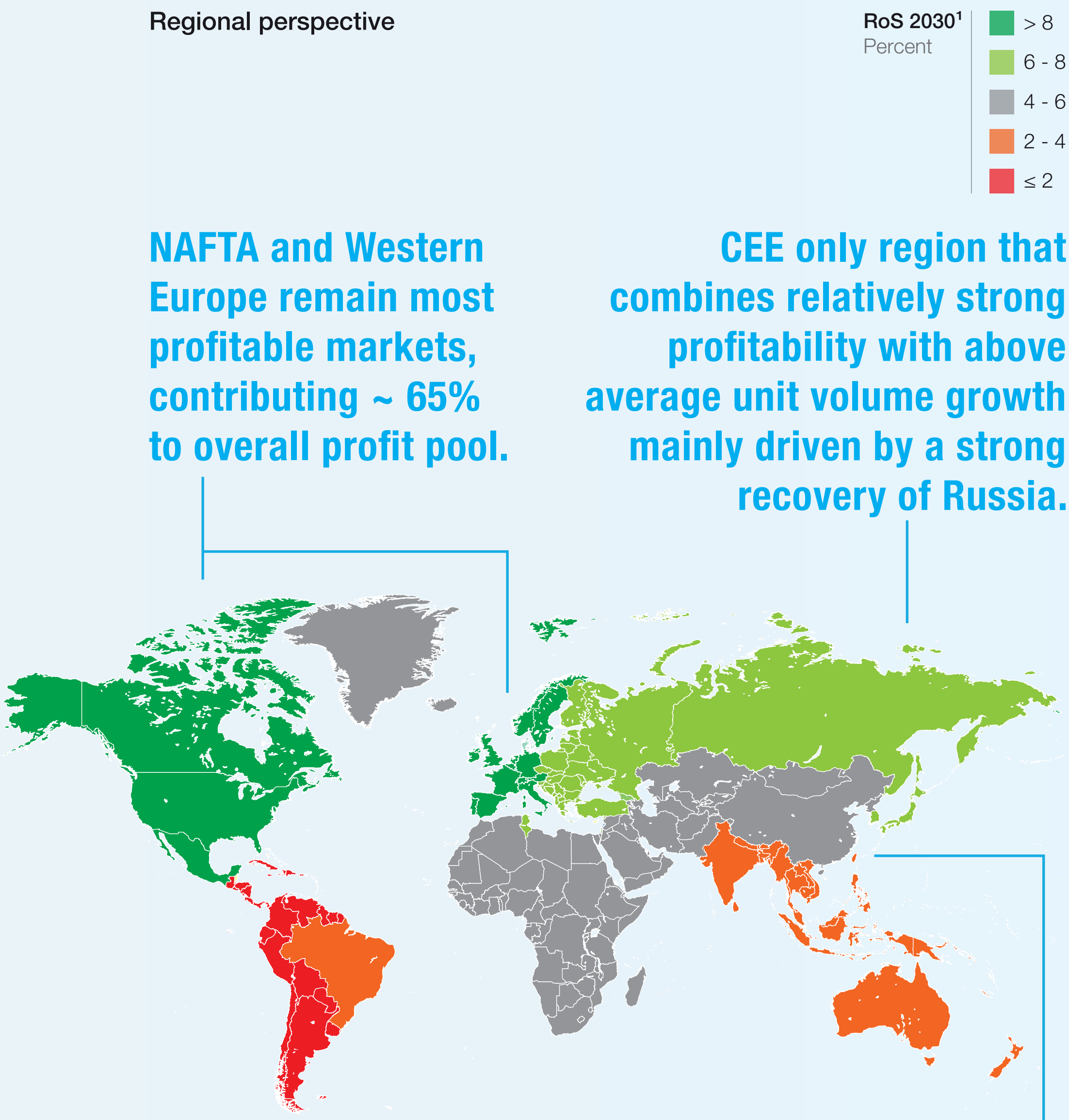
Exhibit 1

Global OEM profit development
Trucks > 6t, EUR billions



Aftersales profit and profitability further increase to EUR 7.1 billion and 21.1% respectively – thereby accounting for almost half of global OEM profit pool by 2030 (share in advanced markets already higher).

Regional perspective



NAFTA and Western Europe remain most profitable markets, contributing ~ 65% to overall profit pool.

CEE only region that combines relatively strong profitability with above average unit volume growth mainly driven by a strong recovery of Russia.

Emerging markets with below-average profitability

China with strong growth in attractive segments.

1 Includes new truck sales and aftersales profit

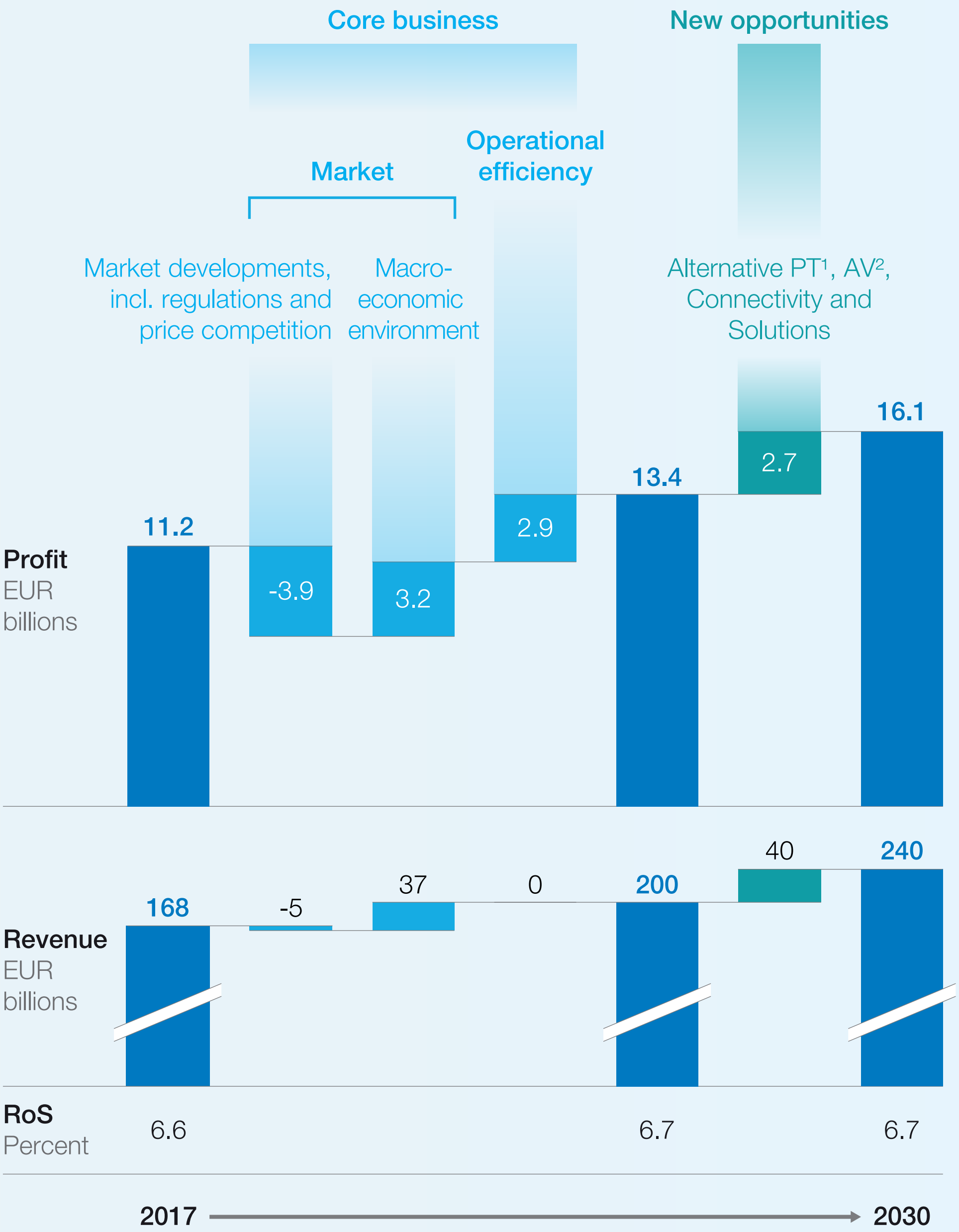
Overall, we expect total OEM operating profits to increase by EUR 4.9 billion to an estimated EUR 16.1. billion in 2030. A combination of macroeconomic advances, operational efficiency improvements in the core business and new opportunities will drive this improvement.

RECAP "ROUTE 2030 – THE FAST TRACK TO THE FUTURE OF THE COMMERCIAL VEHICLE INDUSTRY"

Exhibit 2

Global truck profit pools should reach EUR 16.1 billion in 2030

Trucks > 6t



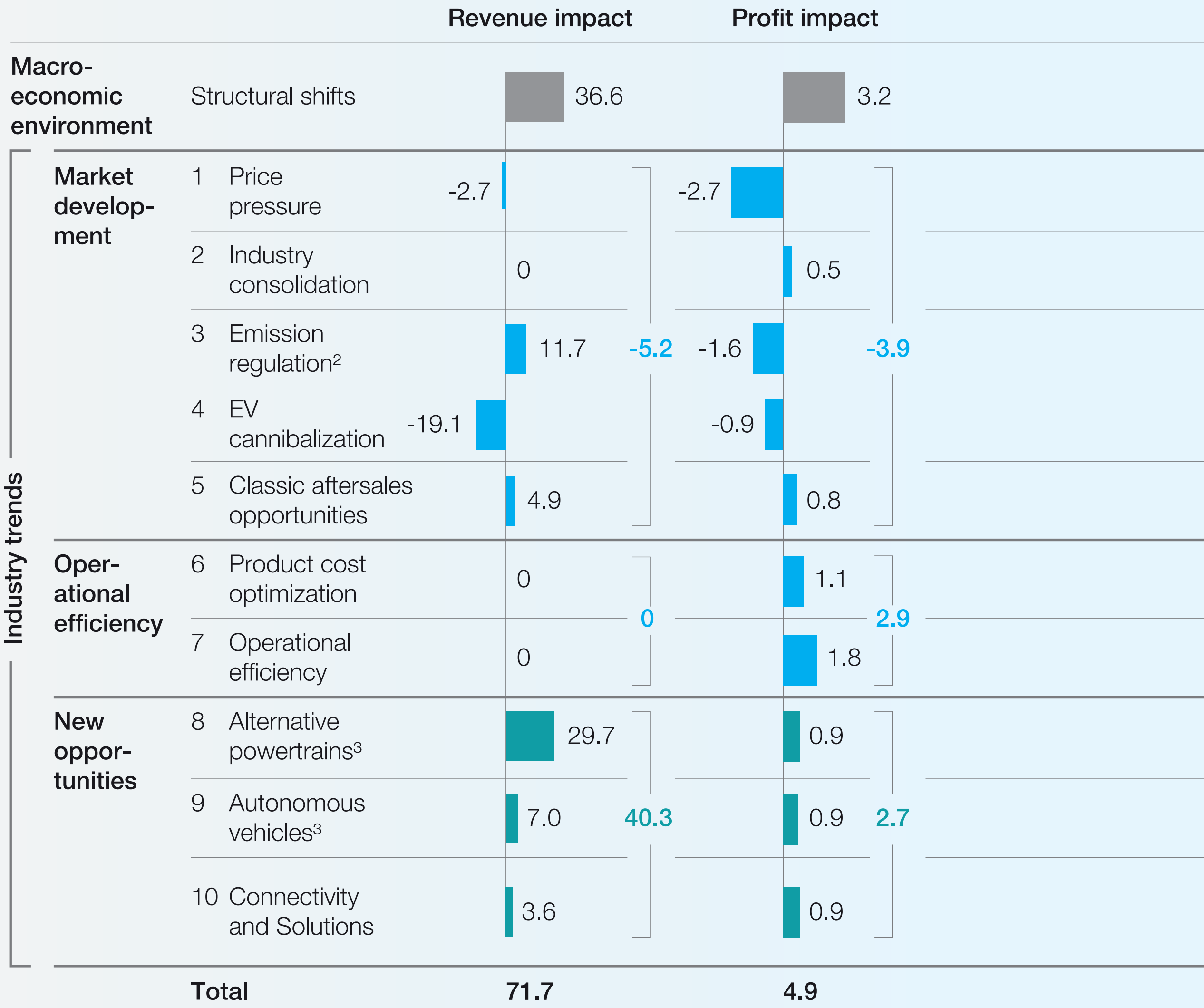
1 Powertrain

2 Autonomous vehicles

Overall, OEMs need to focus on operational efficiency programs and new opportunities to maintain their profitability levels

Exhibit 3 **Macroeconomic environment and 10 major industry trends to shape 2030 revenue and profit pools[1]**

Trucks > 6t, EUR billions



1 Excl. inflation

2 Incl. CO_2/fuel efficiency standards

3 Incl. aftersales effect of EVs (- EUR 0.2 million) and AVs (- EUR 0.1 million)

The expansion of total revenues and profits through 2030 (by EUR 71.7 billion and EUR 4.9 billion, respectively) will result primarily from ten major trends across three industry categories.

Explanation/driver
Macroeconomic growth and demand for logistics services trigger demand for trucks
Reduced potential for price increases by 0 - 2.5% depending on region and new-truck sales/aftersales
Realization of cost synergies of 3% of M&A activities, likelihood of M&A differs by region
Migration costs to new emission and CO_2 norms ranging between EUR 2,000 and 7,000/truck
Loss of ICE volumes/margins through market share gain of BEVs
OEM market share gains of 10 - 15 percentage points at cost of third parties (depending on region); professionalization/digitization of aftersales
Share of modularized parts up by 10 percentage points across all regions reducing variable and R&D costs
Cost improvements across multiple cost types through digitization of operations ranging between 0% (e.g., raw material costs) and 30% (e.g., inventory costs)
Market penetration of alternative powertrains ranging between 5% (in low-profit regions) and 35% (in high-profit regions)
OEM participation in monetization of TCO potential for logistics providers with varying take rates by region and level of autonomy
OEMs profit from increasing connectivity penetration and rising market share vs. third parties capturing a fraction of TCO potential of 5 - 10% from connected services and solutions

Market developments (including structural shifts). We believe increased competition, industry consolidation, higher emission standards and the replacement of diesel trucks by battery electric vehicles (BEVs) will reduce the global truck profit pool by EUR 3.9 billion through 2030. Combined with the expected positive EUR 3.2 billion profit expansion due to volume increases and structural shifts, the net impact of the two market developments will shrink the global profit pool by EUR 0.6 billion in 2030.

Consequently, OEMs cannot rely on the market to "grow" their way to higher profitability. Instead, they need to focus on addressable action areas. These include:

Operational efficiency. This is the main course of action for OEMs seeking to increase profits. While cost programs have been a core element of the industry for a long time, new technologies like digitization, automation and artificial intelligence will enable even greater cost optimization along the full value chain. Besides raising profitability, a focus on operational efficiency will give companies the cash they need to finance new opportunities.

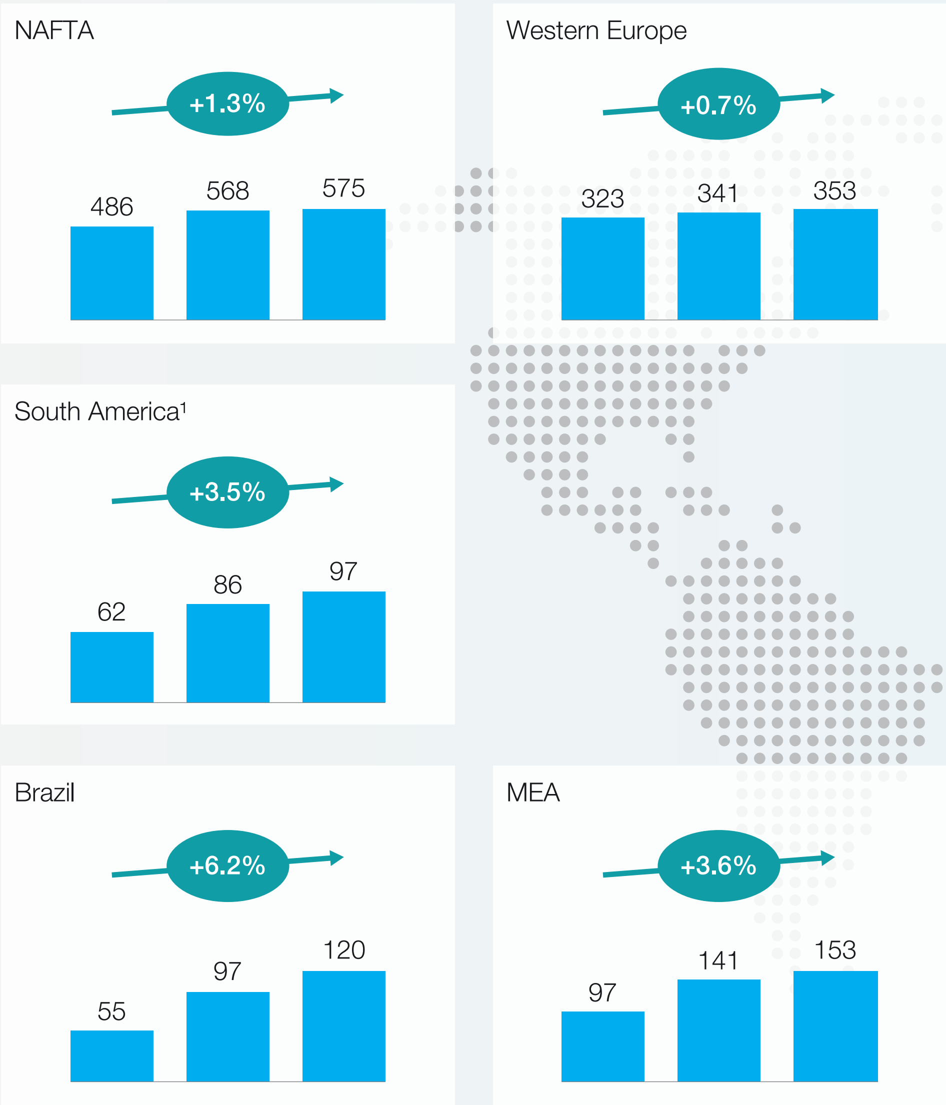
New opportunities. These represent the second major source of profit growth for OEMs. While the major trends are not new to the industry, their impact is slowly starting to percolate through the value chain due to increasing investments or product launches. Interestingly, the overall profit potential arises in equal parts from three major trends – alternative powertrains, autonomous vehicles (AVs) and connectivity-enabled solutions. This suggests OEMs should probably focus on more than a single "silver bullet" to manage risk and maintain their options.

Exhibit 3 analyzes the impact ten major trends could have in 2030 across market development, operational efficiency and new opportunities.

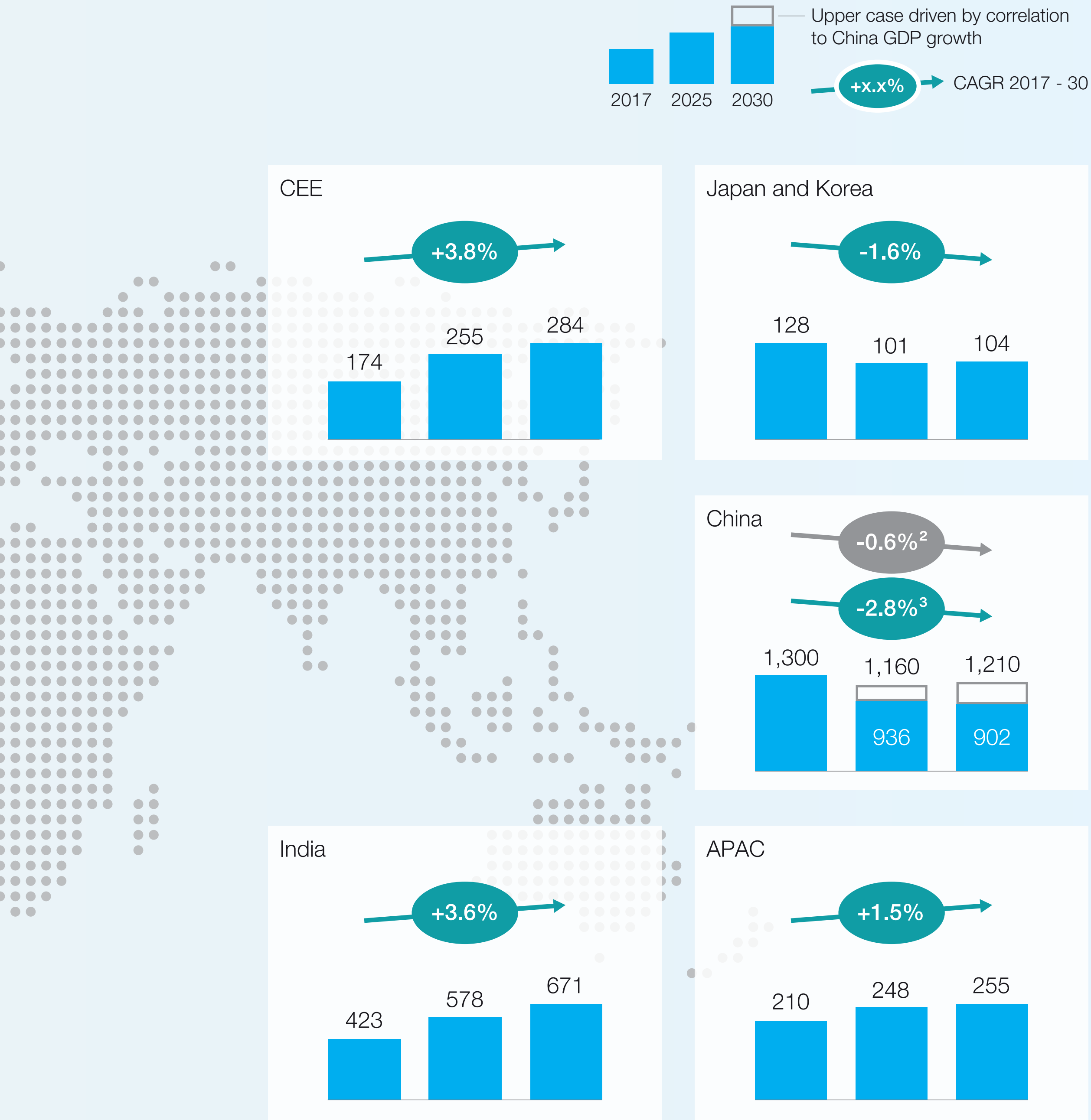
A REGIONAL PERSPECTIVE

Exhibit 4 **Emerging markets will drive most volume growth**

New truck sales volume, thousand units, trucks >6t



Volume growth largely driven by emerging markets – mature NAFTA and Western European markets with medium growth and China with decline

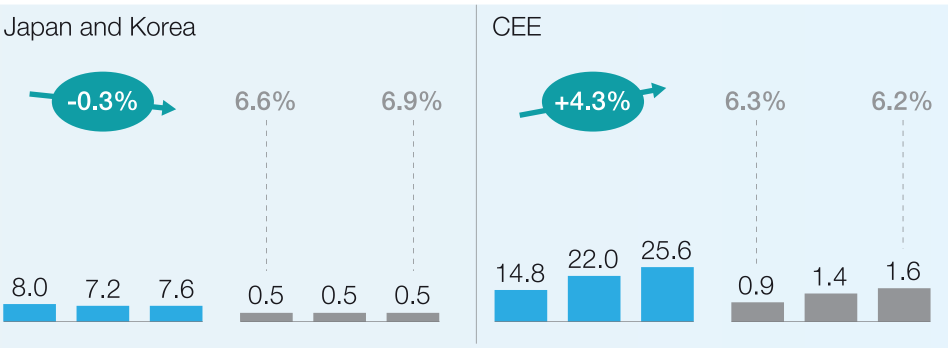


1 Excl. Brazil

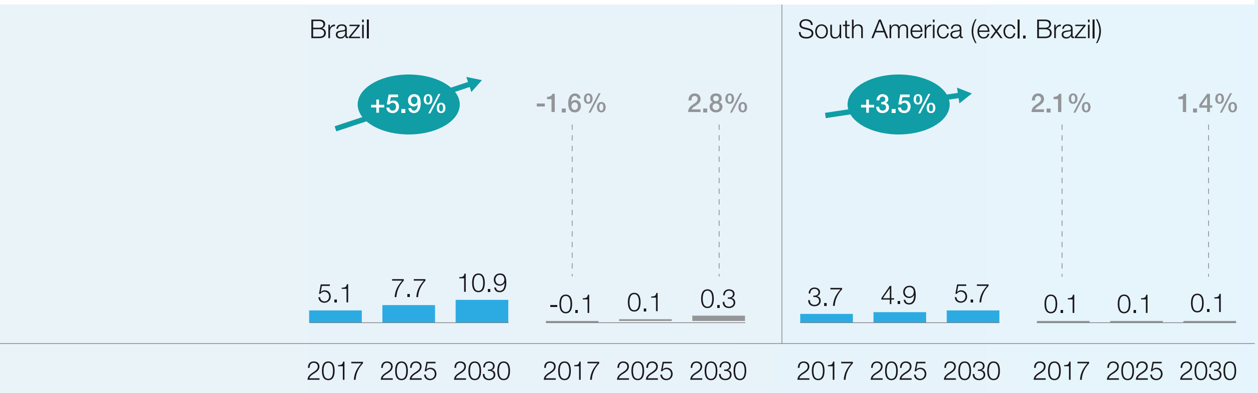
2 China upper case driven by correlation to GDP growth with upside potential (~ 300,000 more units in 2030 vs. base case)

3 China base case for 2030

Exhibit 5 **Profitability by regions**
Trucks > 6t, EUR billion



NAFTA and Europe remain most profitable markets, accounting for ~ 65% of global profit pool in 2030, while growth markets show below-average profitability



1 Base case for 2030; Grey line indicates upper case driven by correlation to China GDP growth in 2030 (additional EUR 14.1 billion in revenue, and additional EUR 0.6 billion in profits); 2025 values for China based on McKinsey expert estimates

2 Base case; Upper case driven by correlation to China GDP growth with CAGR of 3.5%

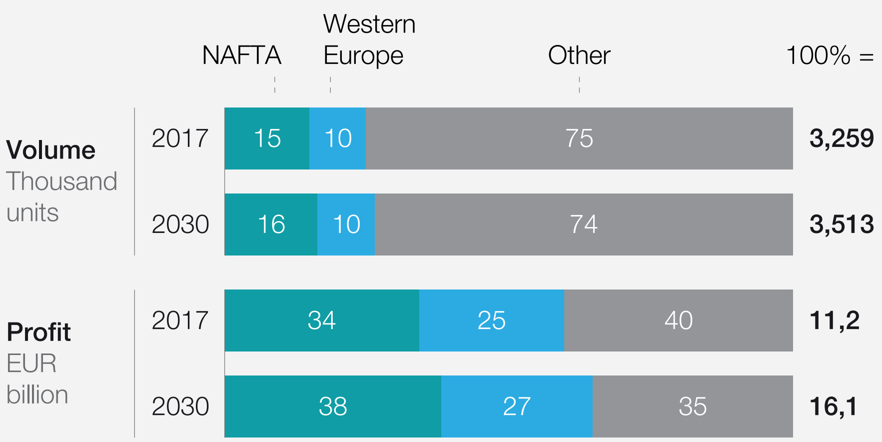
NAFTA & Western Europe: Still the most profitable market

From a very strong 2015 base, NAFTA experienced an approximate 60,000-unit decline from 2015 to 2017. This drop affected profitability, which declined from 9.6 to 8.6 percent RoS. However, the region, ultimately slated to fall under the new United States-Mexico-Canada Agreement (USMCA) that will supersede NAFTA, remains the most profitable truck market worldwide. We believe overall profitability will bounce back to 9.6 percent by 2030. From a volume perspective, the region should experience limited structural growth through 2030 (about 1.3 percent a year), while revenues grow moderately (2.8 percent annually).

In Western Europe profitability has significantly risen, from 7.0 percent in 2015 to 8.4 percent in 2017, effectively reaching NAFTA levels. Driven by a strong focus on operational excellence, profitability is expected to increase even further to 9.3 percent in 2030. From a volume perspective, Western Europe shows limited structural growth potential through 2030 (about 0.7 percent per year). Furthermore, revenues should also grow only moderately (roughly 2.3 percent per year). In a nutshell, Western Europe will flourish by continuing to optimize on the cost side of the equation, not by boosting sales volumes.

The key drivers of the continued high profitability of these two markets include their largely consolidated markets, a strong focus on cost and operational excellence among key players, and the emergence of new opportunities. Given these realities, OEMs quickly need to acquire the new competencies necessary to deliver such innovation, since new entrants from the high-tech sector and elsewhere with unique skill sets will compete for these valuable profit pools.

Exhibit 6 **Distribution of volume and profit pool**
Percent, trucks > 6t



Brazil: A market recovery at last

The Brazilian truck industry went through a challenging few years due to the country's economic crisis. Profitability remained negative in 2017 with a RoS of -1.6 percent, while medium- and heavy-duty truck sales volumes decreased by 11.1 percent. However, profitability in Brazil is finally turning positive, with expectations of a 2.8 percent RoS by 2030. So far, the market appears to be on track, with leading players already crossing the break-even mark during the first half of 2018. The industry achieved this revival by rigorously focusing on costs and successfully executing turnaround programs. However, the truck market's expected upturn depends largely on the continued recovery of the overall Brazilian economy. From a volume perspective, Brazil should cross the 100,000-unit threshold by about 2025 and reach about 120,000 units by 2030 – good progress, but still significantly below pre-crisis levels, which exceeded 170,000 units in 2013.

China: Profitable growth in upper-budget segment

The Chinese market for medium- and heavy-duty trucks experienced an all-time high in 2017 with 1.3 million units sold; easily enabling it to remain the world's largest national truck market by volume (it contributes 40 percent of the global total). The key drivers of this exceptional performance include regulatory changes, tighter rules on vehicle overloading and the pre-buying effects caused by the introduction of new China V emission standards. This large unit volume increase translated to a profit pool of EUR 1.6 billion in 2017, an increase of more than 100 percent compared to a weak 2015, when 714,000 units were sold in China and EUR 0.7 billion profit was registered.

China's profit pool is expected to reach EUR 1.8 to 2.4 billion by 2030, depending on the outlook on volumes. We modeled two unit-sales scenarios for China: a base case with a sales volume of 900,000 units and an upper case of 1.2 million units driven by a correlation to GDP growth. This GDP case uses historic correlations between unit sales growth and real GDP growth in China. This scenario also reflects the weaker connection between sales and GDP increases that occurs as economic growth becomes more services driven, thus resulting in fewer links to truck sales. This phenomenon is well-known in mature markets such as Germany, Japan and the United States.

Both scenarios generate lower volumes compared to the all-time high in 2017 for several reasons (Exhibit 7). New regulations concerning overloading and stricter emission standards increased sales and lead to pre-buying activities in 2017, thus artificially boosting volumes. Likewise, efficiency improvements and the shift to higher-quality trucks due to an increased focus on total cost of ownership (TCO) and more sophisticated fleet purchasing strategies mean trucks are staying on the road longer than before, thus reducing the need for new replacement vehicles. Finally, increasing rail competition is affecting truck sales demand, especially for bulk carriers. The Chinese government recently introduced a three-year action plan that envisages a roughly 30 percent, or 1.1 billion ton, increase in rail freight by 2020.

Exhibit 7 **Total new unit truck sales in China**[1]

Trucks > 6t

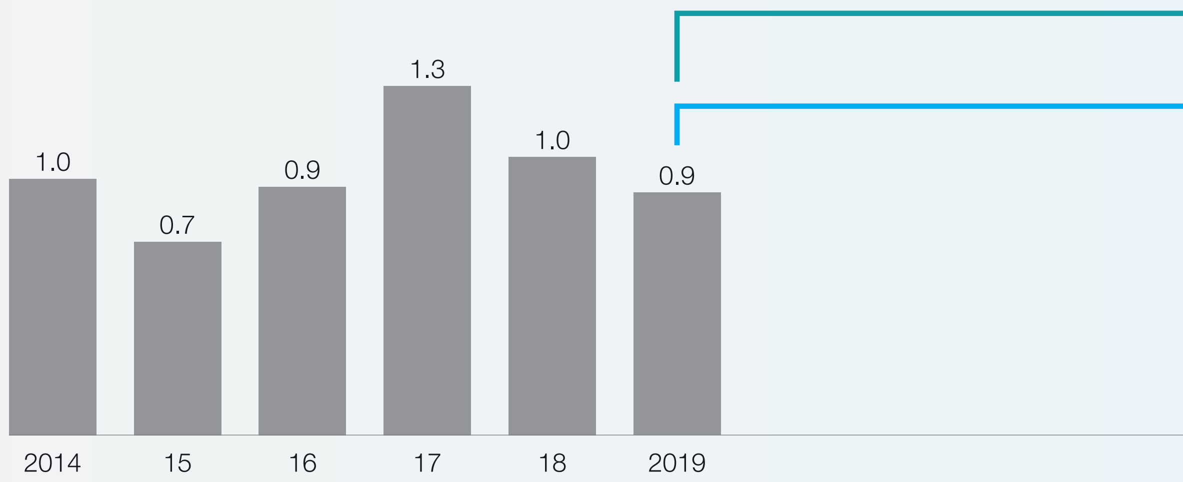
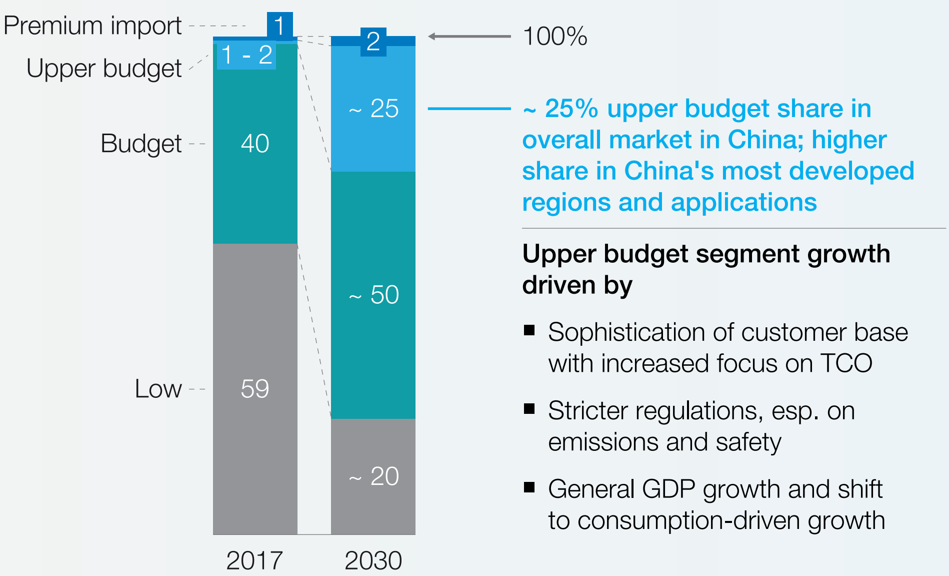
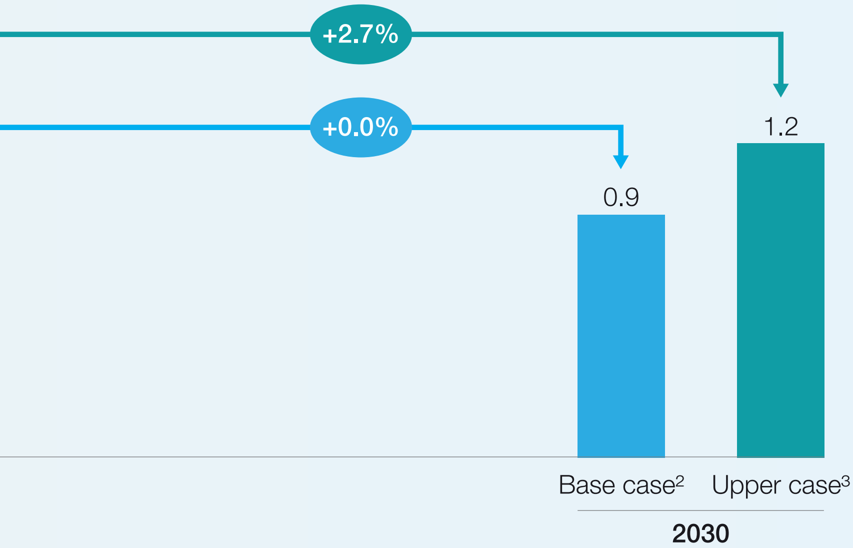


Exhibit 8 **Truck volume composition per price segment**

Percent, trucks > 15t





1 Compared to 2019 as 2017 peak year and general consensus for adjustment in 2018 and 2019

2 Based on IHS sales volume data

3 Based on correlation to China GDP growth

Price segment	Description	Price range RMB thousand
Premium import	Premium trucks imported from foreign OEMS	> 700
Upper budget	High quality and price segment, mostly local OEMs based on foreign technology	400 - 700
Budget	Value trucks from local OEMs	270 - 400
Low	Low cost trucks from local OEMs	270

Recently, Chinese truck makers have dramatically improved product quality and as a result continue to catch up rapidly with European manufacturers. Especially in terms of fuel efficiency, top local truck models now achieve fuel consumption performance of around 28 to 29 liters per 100 kilometers (L/100km), based on 400,000-km mileage. That puts them nearly on par with imported trucks. Another example: China once depended solely on imported chassis for building concrete mixer trucks. However, in just a few years, Chinese truck players completely took over this sector as they managed to build reliable products at far more competitive prices. China's progress in this area will have increasingly significant implications regarding the addressable market for foreign players (Exhibit 8).

We expect the heavy-duty truck segment sales volumes to develop as follows through 2030:

- **Premium import:** Likely to remain relatively small, at about 2 percent of the market in 2030. Viewed by customers as the highest quality products overall, this segment focuses on special applications (e.g., concrete pumps) and legacy relationships

- **Upper-budget:** Expected to grow strongly to a 25 percent market share by 2030, with additional sales coming from the lower-price segments

- **Budget:** Likely to grow from a 40 percent share in 2017 to roughly 50 percent in 2030, as it steals share from the disappearing low segment

- **Low:** Will probably drop from 59 percent in 2017 to about 20 percent in 2030. The segment could disappear altogether due to increasingly sophisticated customers, tougher regulations and the resulting shift toward higher quality trucks

Still, the addressable market in China for foreign players will likely continue to increase significantly, from about 2 - 3 percent today to about 25 percent by 2030. This growth will not come from the premium import segment but from the growing upper budget segment. The premium (imported) segment will probably remain relatively small at around 2 percent of the market in 2030 for three main reasons:

1. **"Value for money" and import substitution:** The prices of imported trucks are too high, especially given the performance improvements of local products, as the above fuel efficiency example shows. This improvement makes it harder for truck importers to claim performance their products deliver superior TCO performance while carrying higher initial prices.

2. **Limited sales and service networks:** Foreign premium players typically have very limited sales networks; a fact that tends to undercut any potential quality advantages they may offer. Thus, while these trucks may break down less often, when they do, it usually takes much longer to get them back on the road compared to a quality local truck.

3. **New technologies:** Chinese players are aggressively entering disruptive technology areas such as electric powertrains and autonomous driving, and they are making progress. Consequently, if these technologies figure prominently in the future truck market, local players may be at an overall technology advantage versus international manufacturers.

Thus, the real opportunity in the Chinese market lays within the upper-budget (local premium) segment. This segment is especially attractive for localized trucks from global players and high-quality domestic trucks. For foreign players, the key to winning in this attractive market involves a thorough localization effort to reduce costs significantly.

We expect the upper-budget segment to achieve an estimated 25 percent market share by 2030. The main drivers of this increase are expected to include:

- **The increasingly sophisticated customer base** and its focus on TCO. Historically, very small fleets and owner-operators dominated China's truck market. Now, it is shifting toward more sophisticated fleet operators.

- **Stricter regulations,** especially regarding emissions and safety, are causing purchasers to buy the most cost-effective and durable solutions. For example, emission standards should receive an upgrade to National VI level by 2021 at the latest. Because current proposals include particle number standards, which can require special technologies, fleets need to ensure that they are buying reliable solutions for both gasoline and diesel vehicles. Thus, more buyers will consider TCO instead of initial cost only and opt for effective solutions that may cost somewhat more at the time of the purchase.

- **General GDP increases and the shift to consumption-driven growth.** The trucking industry continues to shift from investment- to consumption-driven demand, transporting more sophisticated and expensive goods while leaving bulk commodities to the railways. This move will further increase the importance of the safety and quality of a truck, compelling fleets to upgrade their vehicle base.

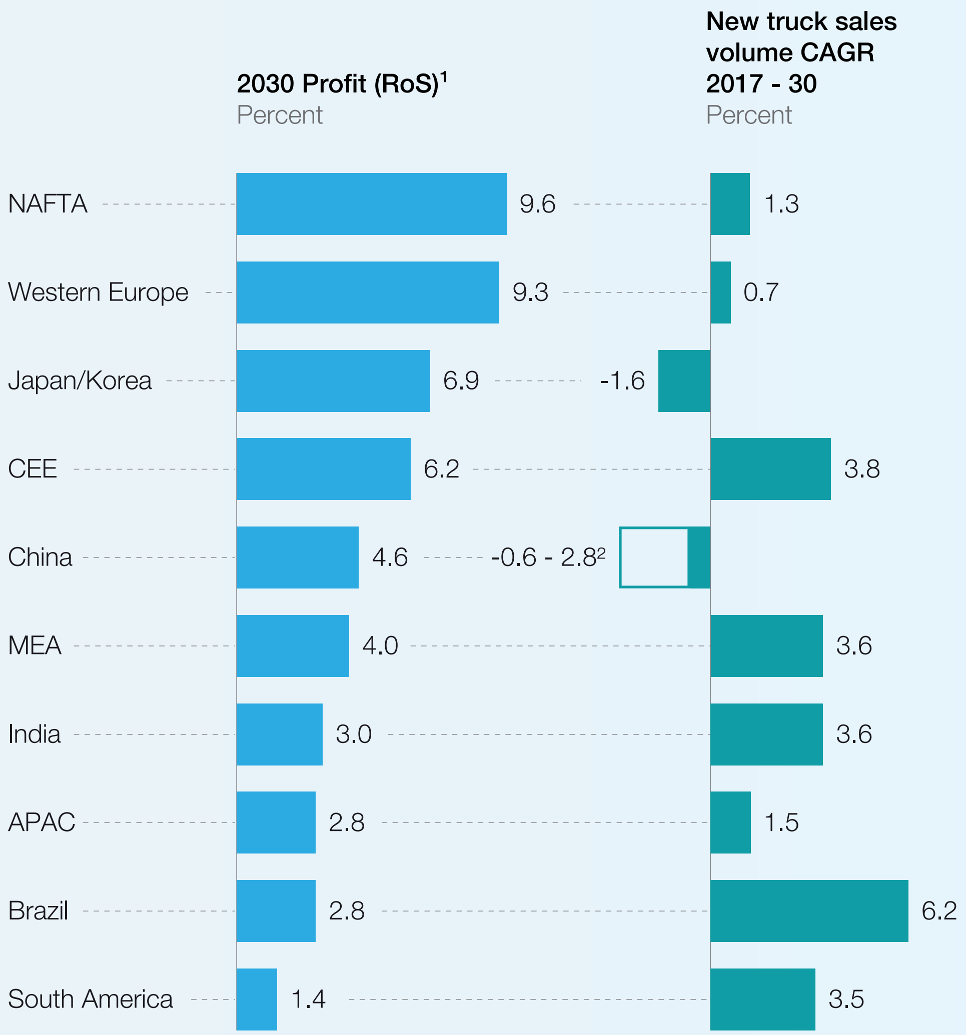
Buyers of upper-budget trucks have a higher focus on TCO than past buyers generally focused on the budget and low-cost segments. Given the relatively limited relevance of driver costs in China, providing the best fuel efficiency is the key to winning in the upper-budget segment. Uptime, efficiency gains from technology and connectivity advances, the safety of the truck and the price and availability of spare parts will also play important roles in the upper-budget market.

CEE – Gaining relevance

Truck OEM profitability in the CEE region should reach 6.4 percent RoS by 2030, resulting in a profit pool of EUR 1.6 billion. Consequently, we expect the region to be the most profitable behind the mature markets of NAFTA, Western Europe and Japan/Korea (Exhibit 9).

From a volume perspective, the CEE region will likely reach 284,000 units by 2030 – over 100,000 units more than levels in 2017 – resulting in a 13-year CAGR of 3.8 percent. The forces behind this upswing include a strong macro-economic environment throughout the region with an emphasis on the expected rebound in Russia when the sanctions-driven slowdown ends. We believe unit sales in Russia will expand from 85,000 in 2017 to 130,000 in 2030 – that is a 53 percent growth, or a 3.3 percent CAGR. However, regulatory hurdles remain for global OEMs seeking to enter the Russian market, as import tariff levels and local content requirements may increase. The CEE region is the only one globally that we expect to combine above-average profitability and above-average volume growth.

Exhibit 9 **Profitability vs. new truck sales volume growth**
Trucks > 6t



1 Including sales and aftersales

2 -2.9% referring to base case and -0.6 to upper case driven by correlation to China GDP growth

High margin regions with lowest sales growth – presence in emerging countries helps OEMs to achieve economies of scale

OUTLOOK

The medium- and heavy-duty truck industry appears destined to reap a strong harvest of profitable growth, but several challenges could potentially impact that landscape for the worse. For players in the mature markets of NAFTA and Western Europe, which generate 65 percent of total global profits, the message is simple: secure earnings in both truck sales and the aftermarket while preparing for new opportunities in China and other selected emerging markets.

Since only limited structural growth exists in mature markets, to drive volumes, OEMs also need to meet the new regulatory and market obligations these other markets will impose, putting a strong emphasis on cost and operational excellence. We believe they should also overinvest now in building new opportunities and business models around three types of innovations: alternative powertrains, autonomous vehicles and connectivity solutions.

One further thought: while a strong presence and volume growth in emerging markets can help companies to achieve economies of scale, it will also put pressure on a truck maker's overall profitability. Having appropriate strategies to mitigate those issues is required to ensure the company's long-term sustainability.

APPENDIX: OUR APPROACH

With this publication, McKinsey has set out to give truck OEMs guidance in defining their journey toward a prosperous future. From a global perspective, we have looked very deeply into worldwide truck market volume, revenue, and profit pool developments for medium- and heavy-duty trucks (MDT/HDT) in all price segments (premium, value, and low) in ten regions – Asia Pacific (APAC, excluding China, Japan/Korea, India), China, Japan/Korea, South America (excluding Brazil), Brazil, Central and Eastern Europe (CEE), India, Middle East and Africa (MEA), NAFTA countries, and Western Europe (WE) – to form our hypotheses and quantitative insights on the commercial vehicle industry in 2030.

For our 2030 global profit pool estimate, we have analyzed market data and annual reports of major truck OEMs covering about 80 percent of the global sales volume in medium- and heavy-duty trucks and assessed the impact of ten key industry trends.

CONTRIBUTORS

Authors

Bernd Heid, Senior Partner, Cologne

Dago Diedrich, Senior Partner, Düsseldorf

Paul Gao, Senior Partner, Hong Kong

Matthias Kässer, Partner, Munich

Sebastian Küchler, Associate Partner, Munich

Friedrich Kley, Engagement Manager, Hamburg

Content contributors

In addition to the authors, the following group of people significantly contributed to this publication:

Christian Begon, Hannes Herrmann, Maximilian Orgonyi, Daniel Höflinger.

The authors would like to thank them for their valuable contributions to this report.

Editing and layout

Jörg Hanebrink, Senior Communication Specialist, Düsseldorf

Birgit Ansorge, Senior Copy Editor, Berlin

Viktoria Maria Werner, Senior Media Designer, Berlin

Julie Zemanek, Media Designer, Berlin

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Contact for content-related requests

Sebastian Küchler
Associate Partner, Munich
+49 (89) 5594 8094
sebastian_kuechler@mckinsey.com

Media contact

Martin Hattrup-Silberberg
Senior Communication Specialist, Düsseldorf
+49 (211) 136 4516
martin_hattrup-silberberg@mckinsey.com

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Design contact Visual Media Europe
www.mckinsey.com