

www.autofacts.com

Autofacts®

European Automotive Industry Update ECG Conference, Mainz

*Strictly private
and confidential*

October 2018



Von Kandschwar, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=2679005>

pwc

Agenda

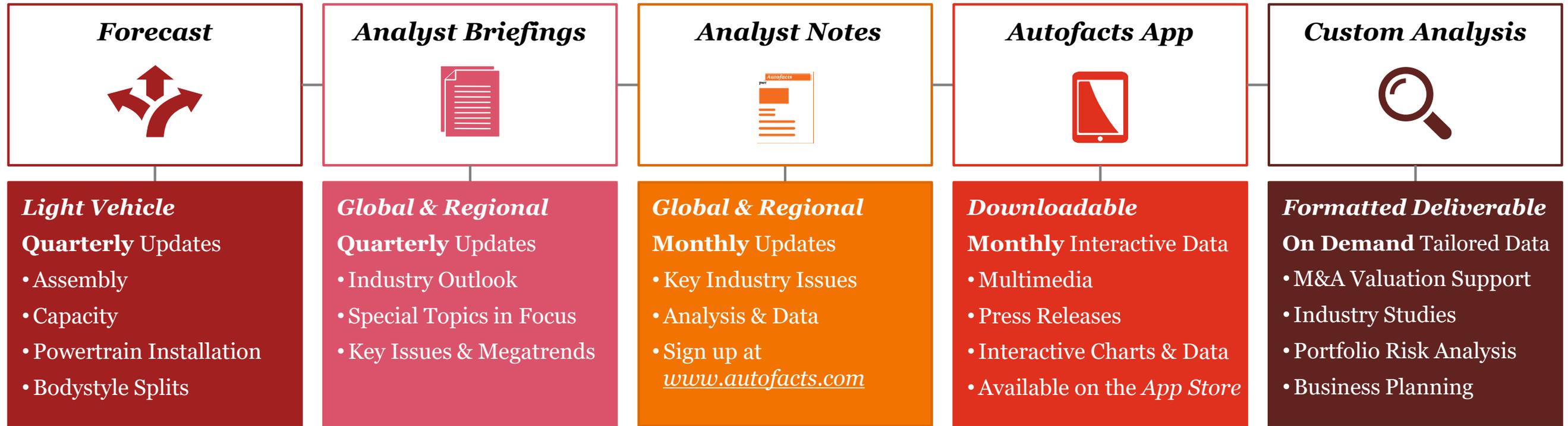
Page

- | | | |
|---|---------------------------|----|
| 1 | Why Autofacts? | 3 |
| 2 | European Industry Outlook | 6 |
| 3 | The Future of Trucking | 17 |

Why Autofacts?

Capabilities

A full suite of industry tools to meet real-life business challenges



Key Client Benefits

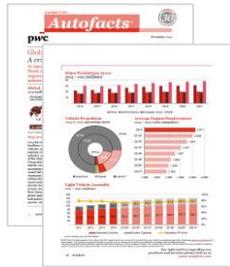
- An independent, unbiased global perspective
- Differentiating & refined industry viewpoints
- Proactive & informed dialogue with executives
- Access to industry specialists with deep expertise

For more information about Autofacts products and services, please contact:

autofacts@us.pwc.com

Risk Management and Business Audits

Forecasts provide an independent basis to evaluate plans and prospects

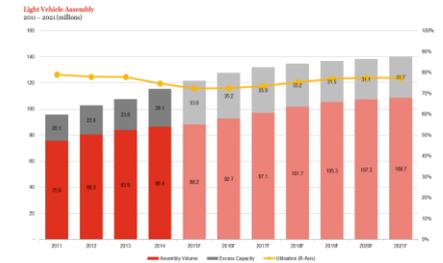


Industry Impacts

Our independent and steady trend analysis provides an overview of strategically important topics and evaluates relevant external risks

Top-Down Validation

Autofacts Forecasts provide an independent viewpoint for assessing and challenging operational planning assumptions

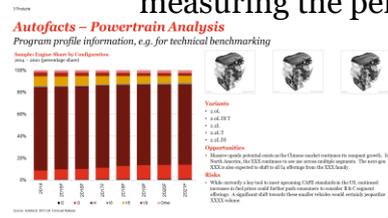


Autofacts®

Independent perspective to identify risks and opportunities

Bottom-Up Planning

The detailed Autofacts Forecast gives a precise map of business opportunities and pipeline targets for measuring the performance of sales and marketing



Global Expertise

The Autofacts forecasting experts and the global PwC network are available for detailed qualitative and quantitative assessment of market impact and risk factors



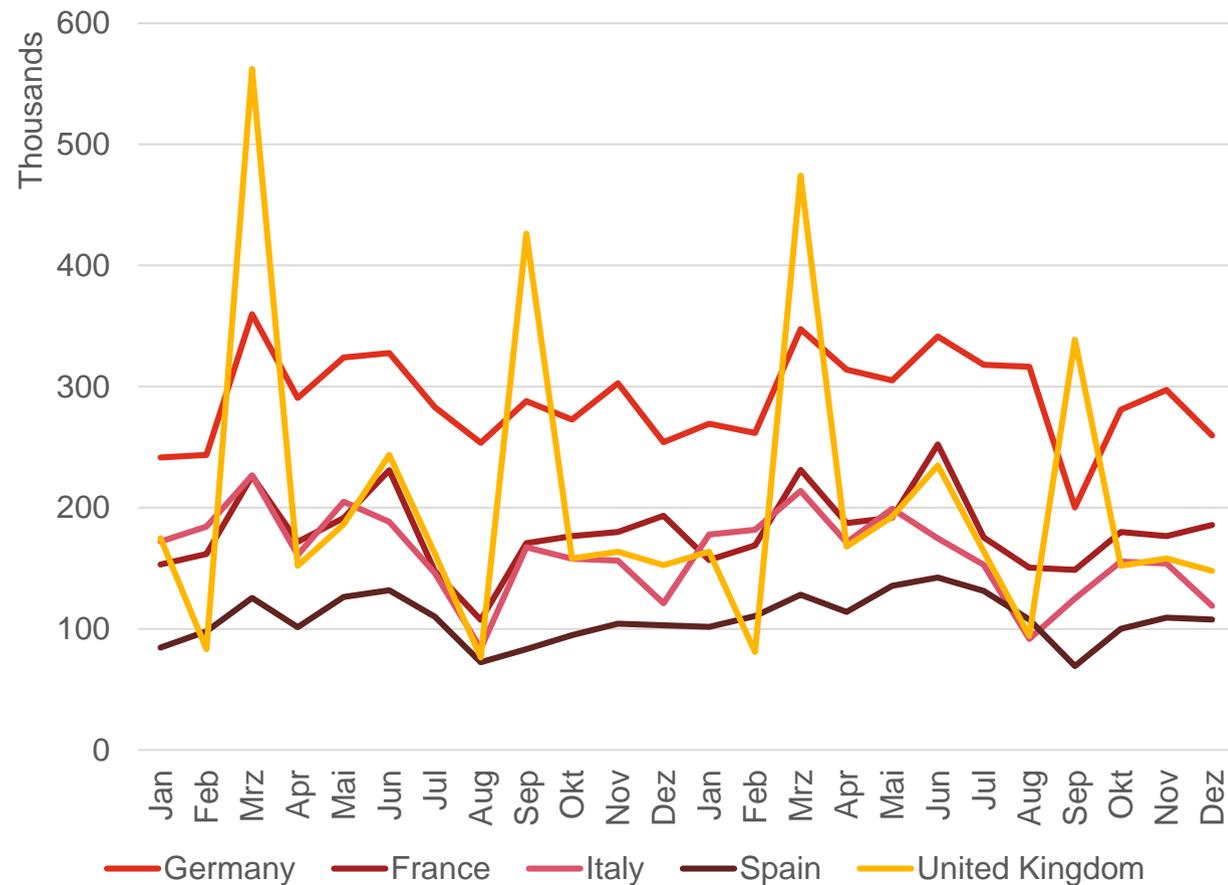
European Industry Outlook

August and September 2018 were impacted heavily by Pre-Registration effects

New car sales rose by a staggering average of 29.7% in August across all 28 European countries compared to the same month last year, as dealers and manufacturers rushed to register their vehicles with NEDC (New European Driving Cycle) certification in stock before September came. Since 1st September - with very limited exceptions - all new cars must be certified according to the WLTP test procedure.

EU Top-5: Cyclicity

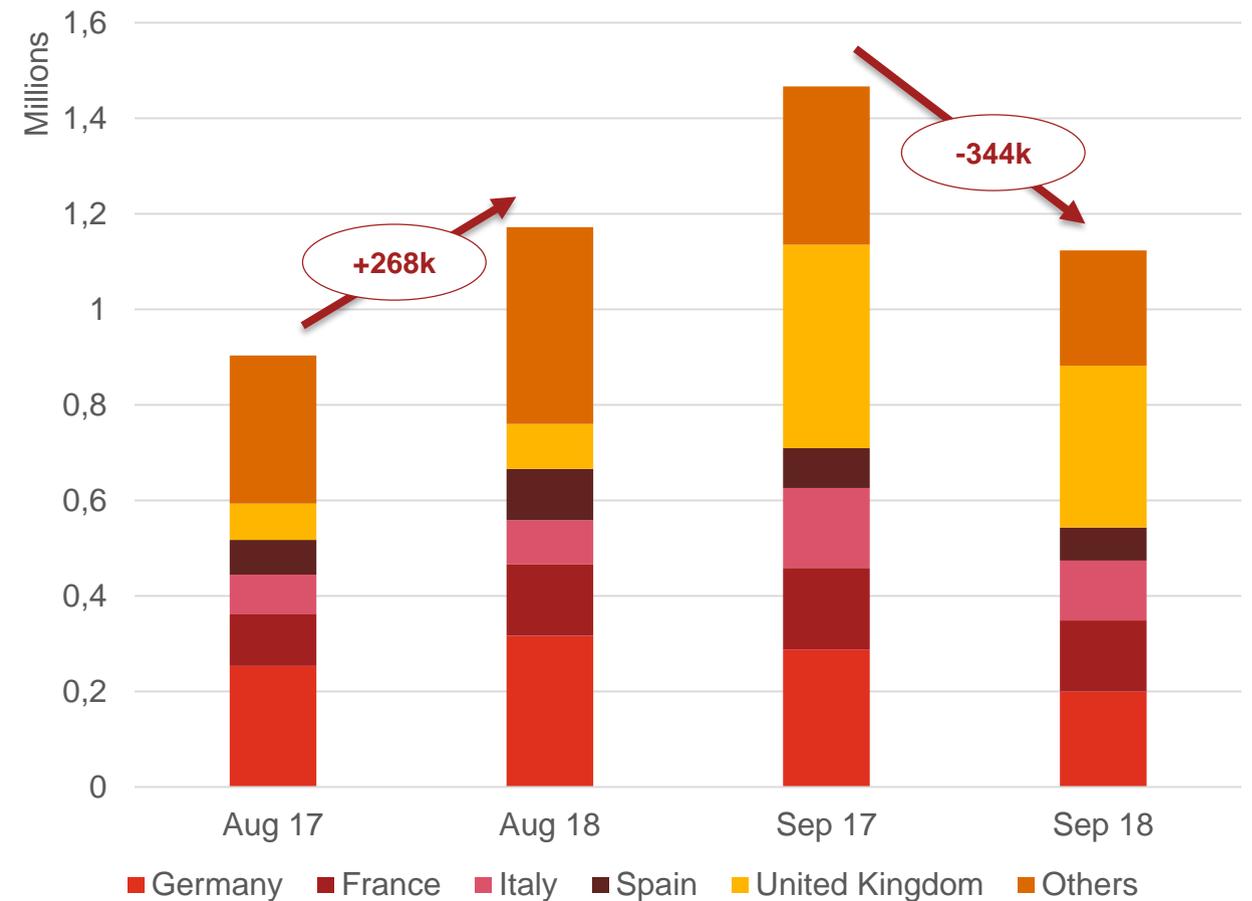
2017 – 20148F (monthly registrations)



Source: IHS Markit, European Commission (October 2018)

EU + EFTA: WLTP Impact

Aug, Sep 2017 vs. 2018 (monthly registrations)

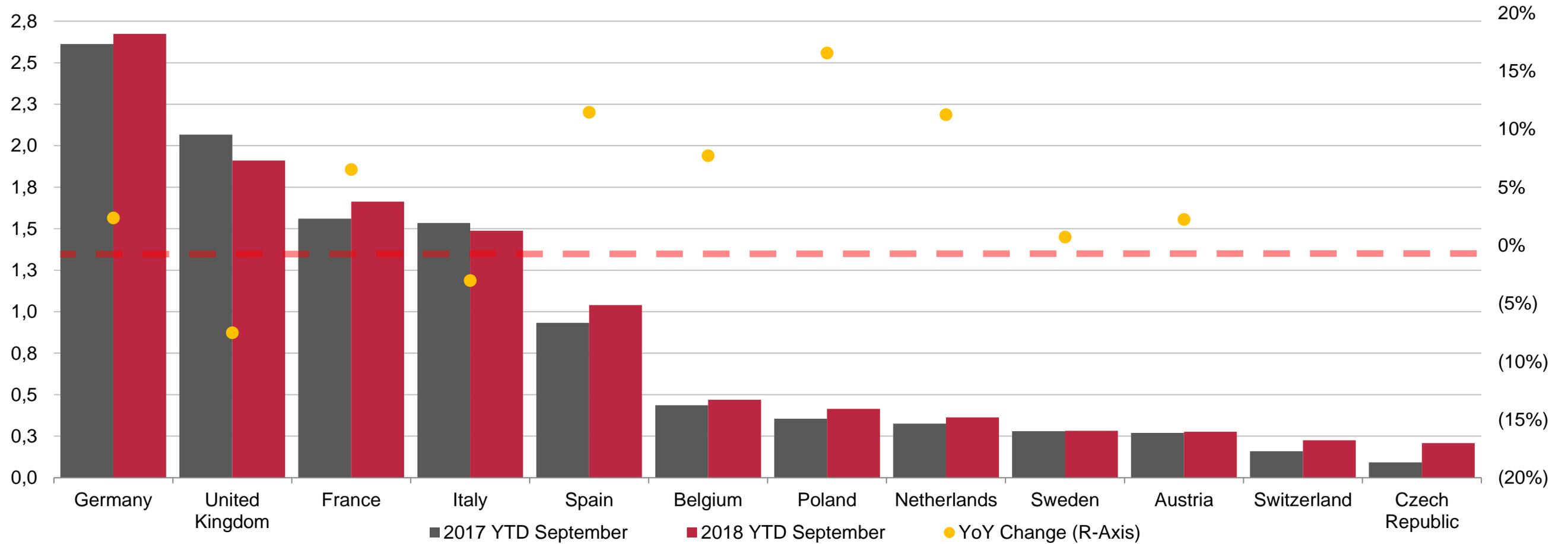


Growth of new car registrations is continuing, though expected to slow down in 2018

WLTP certifications lead to a jump in registrations for August and an even sharper decline in September. For the first nine months of 2018, EU Top 5 markets showed growth rates of up to 11.5% YTD Sep (Spain). UK sales worsened and plummeted -7.5%, while German sales normalized after strong scrappage scheme-driven sales increase in Q1 with +2.4% YTD. Italy has recovered slightly and shows a +5% growth.

EU+EFTA: New Car Registrations by Top 12 Markets

YTD September 2017 vs. YTD September 2018 (millions)



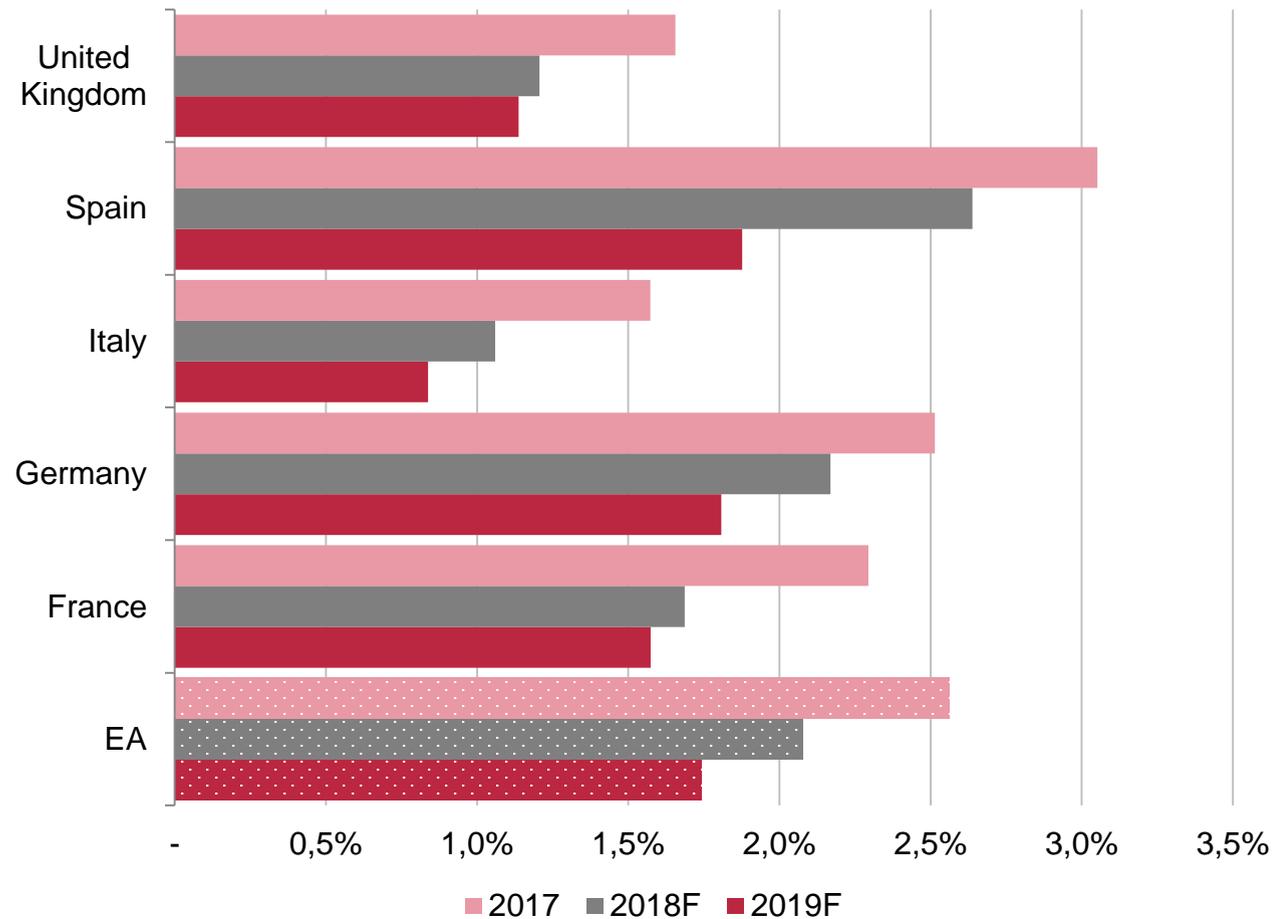
Source: ACEA (Actuals up to September 2018), Autofacts Analysis

Economic sentiment remains on a high level, despite cyclical downturn

While the economic sentiment indicator in the EU has recorded a drop for the ninth consecutive month, mainly driven by the decline of confidence in short-term industrial production, the ESI still remains at an elevated level. Uncertainty remains a risk factor that could undermine consumer and business confidence in the months ahead and adversely affect European market – reflected by lower real GDP annual growth assumptions for all Top five markets for 2018, including Germany.

EU & Top 5: Real GDP Annual Growth

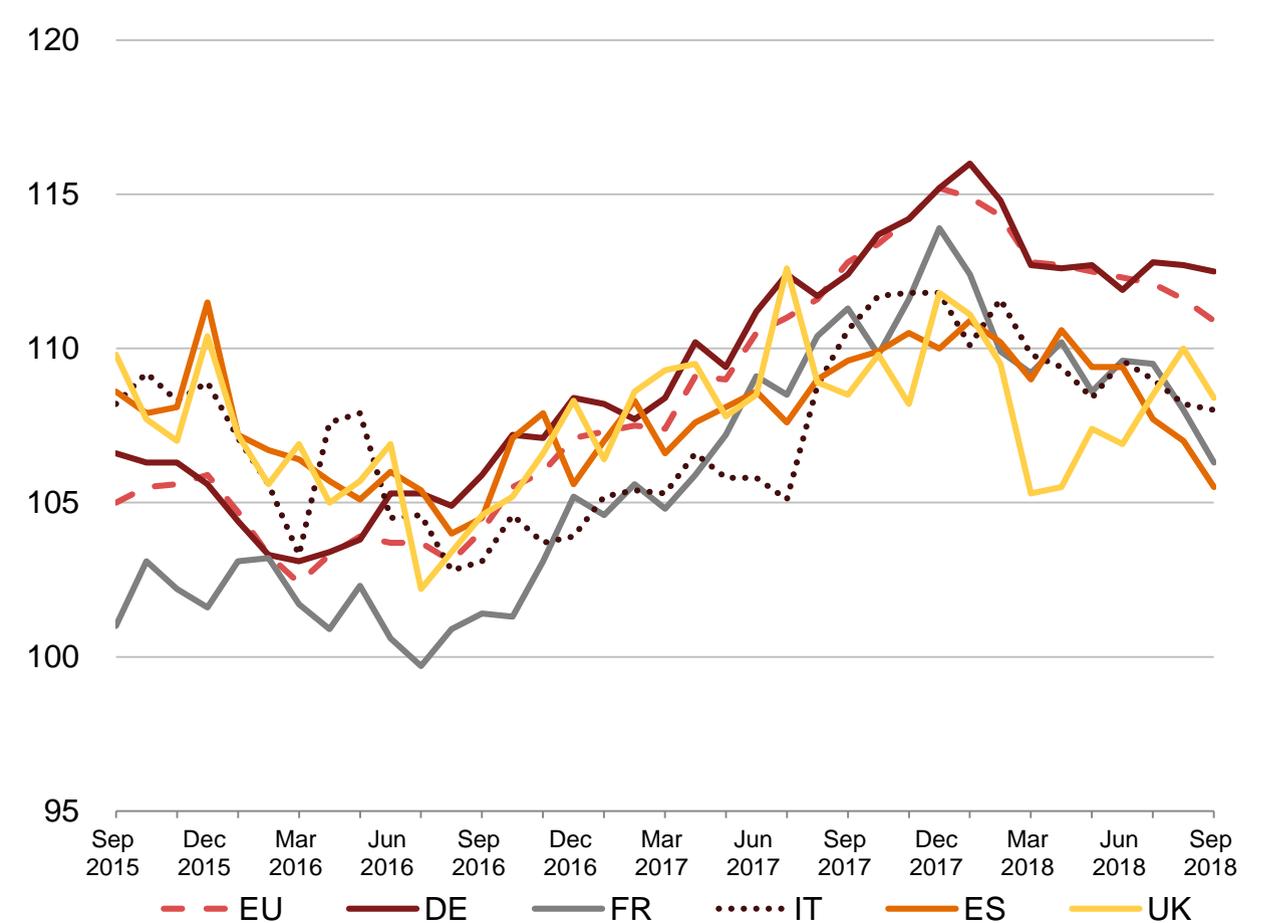
2017 – 2019F (percentage change)



Source: IHS Markit, European Commission (October 2018)

EU & Top 5: Economic Sentiment Indicator

September 2015 – September 2018 (101 = long run average)

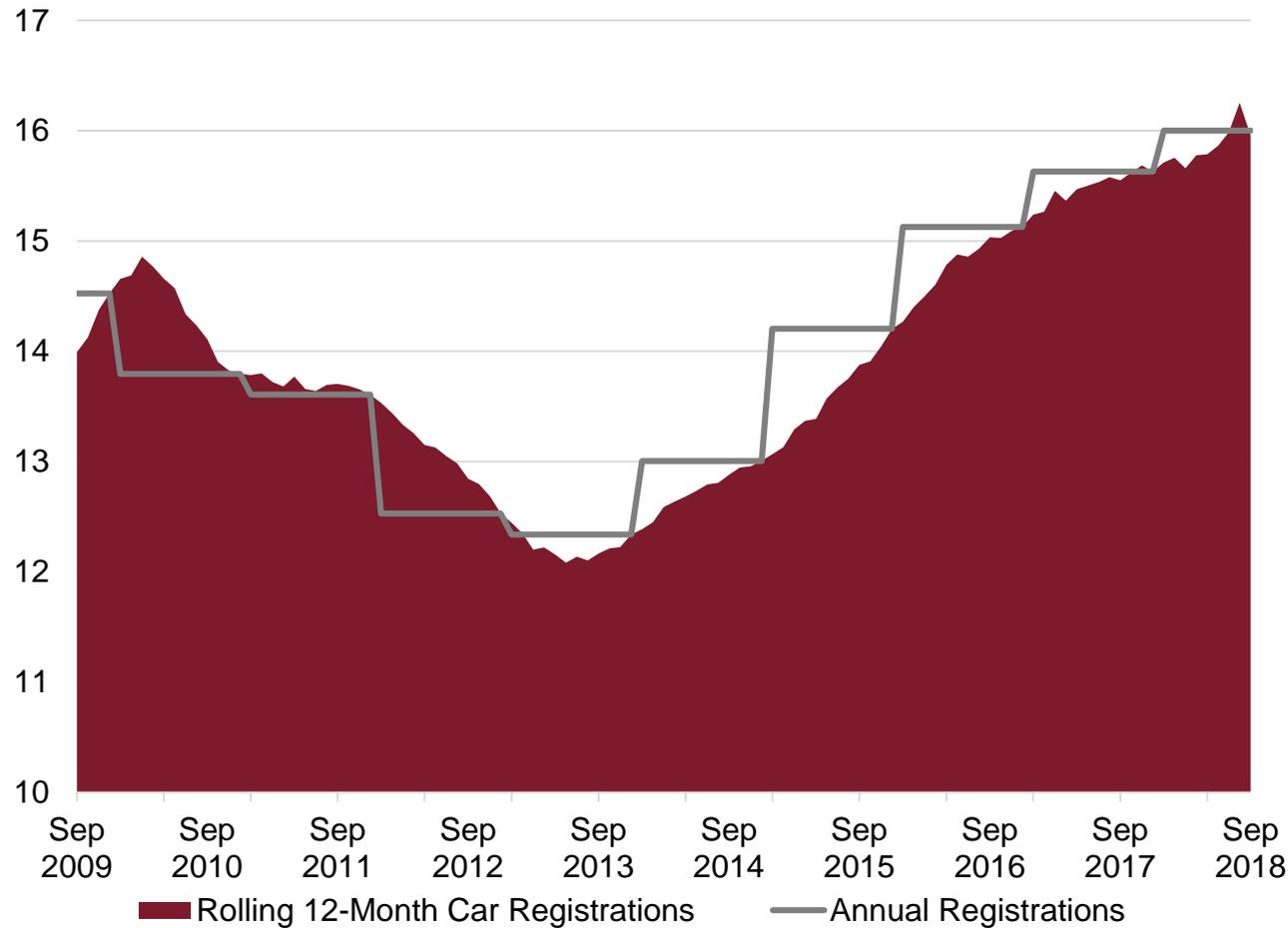


Europe's new passenger car market shows a further increasing slow-down in 2018

WLTP certification deadline lead to highly fluctuating vehicle registration numbers in the EU. It is expected that the market will hit its cyclical high within the next year and is moving towards a reversal of dynamics.

EU+EFTA: Rolling 12 Months Car Registrations

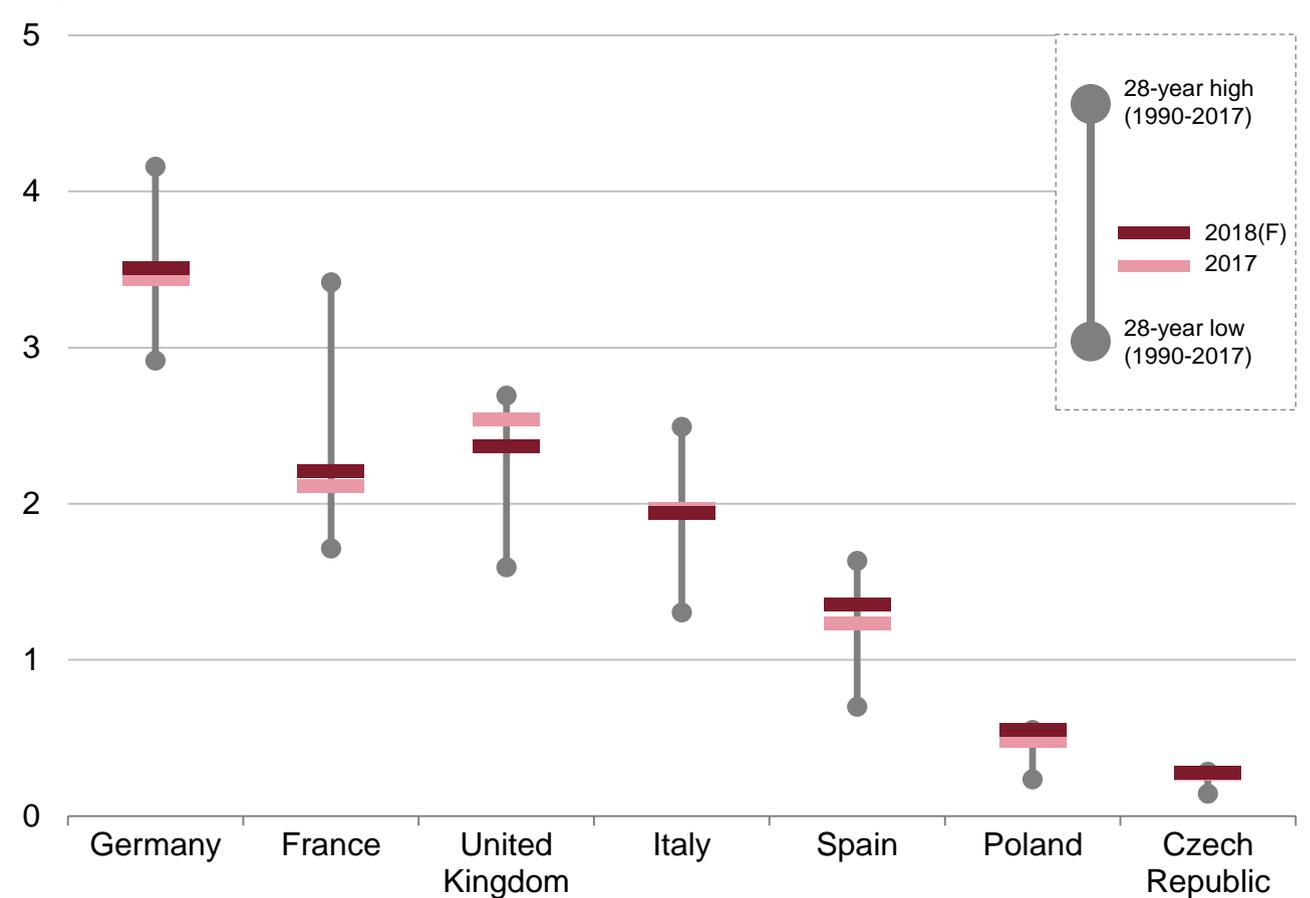
September 2009 – September 2018 (millions)



Source: ACEA (Actuals up to September 2018), Autofacts Analysis

EU+EFTA: New Car Registration Variance

1990 – 2018F (millions)

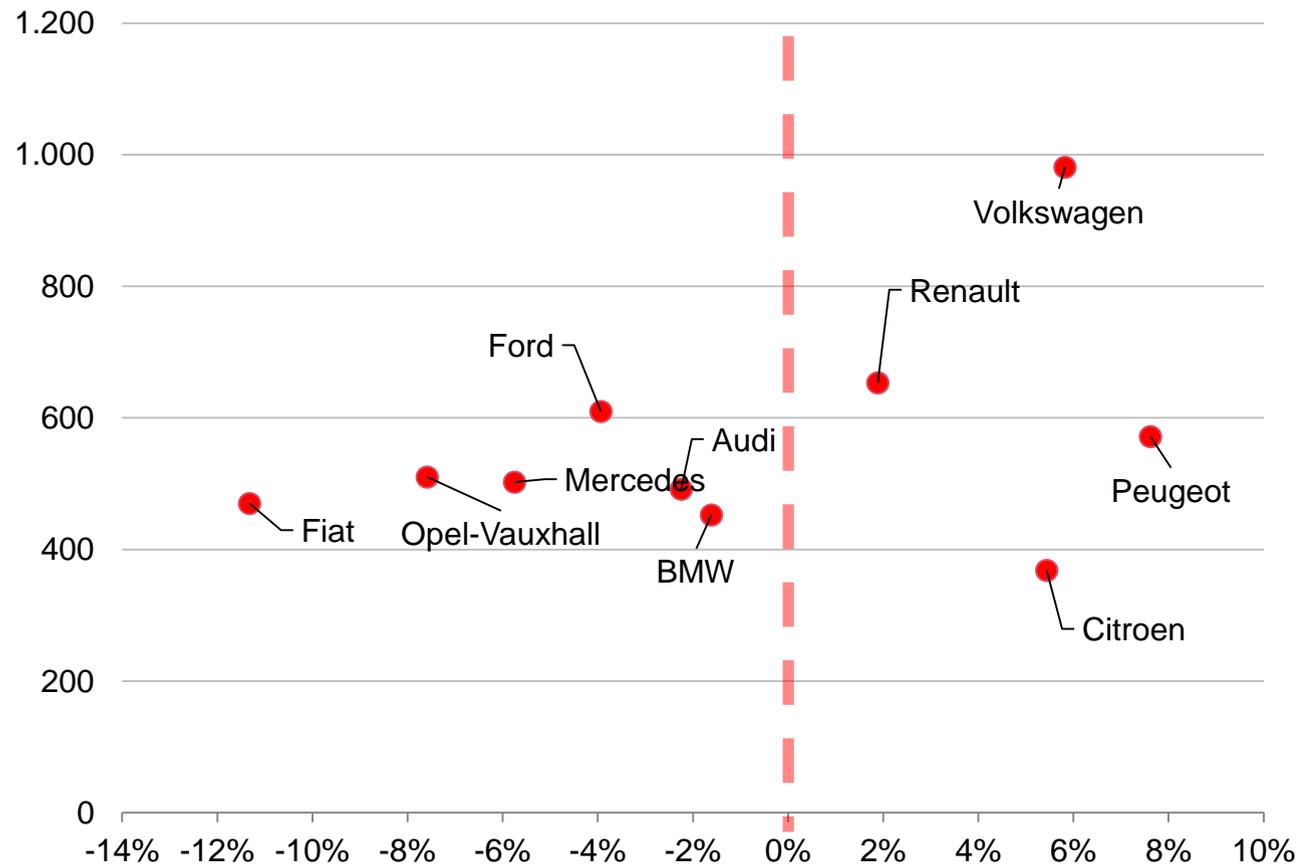


Volkswagen shows strong growth in EU

Volkswagen continues their dominance in the EU Top Five markets. Fiat and Opel both show significant sales decline, with a growth rate of -11.3% and -7.6% respectively. Ford is hit strongest by the UK sales decline and their EU market share drops by -0.4%.

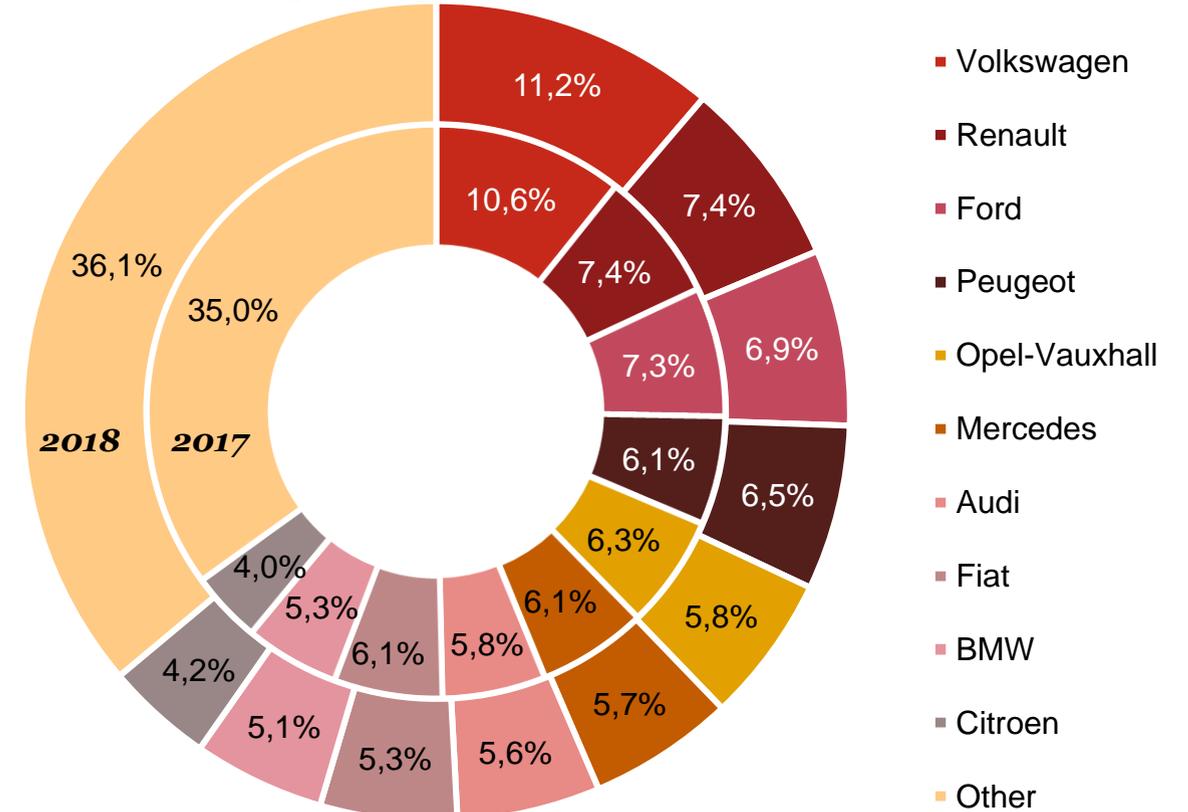
EU Top 5 Markets: Brands Sales Volume and Growth Rate*

YTD 2017 vs. YTD 2018 (thousands)



EU Top 5 Markets: Market Share*

YTD 2017 vs. YTD 2018 (percentage share)



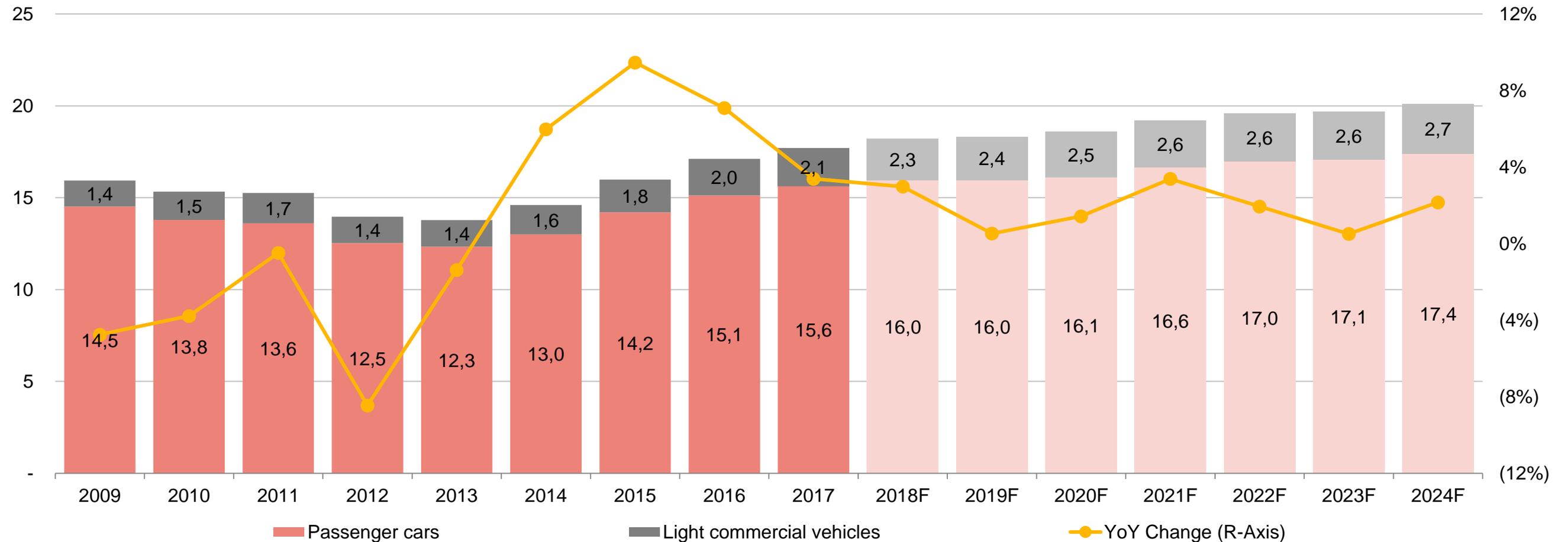
Source: ACEA (Actuals up to September 2018), Autofacts Analysis *Only brands with official sales data included, commercial vehicles not included

Light Vehicle registrations are expected to grow by +3.0% to 18.2m in 2018

After a stabilization of light vehicle demand in 2018, we expect a cyclical slowdown in the upcoming years, partially due to an increase in vehicle costs, as automakers adjust the fuel and powertrain mix and technical compliance to meet emissions targets. New energy vehicle sales will pickup in the mid-term, as economies of scale reduce costs and clean technologies are getting more affordable for customers.

EU+EFTA: New Light Vehicle Registrations

2009 – 2024F (millions)



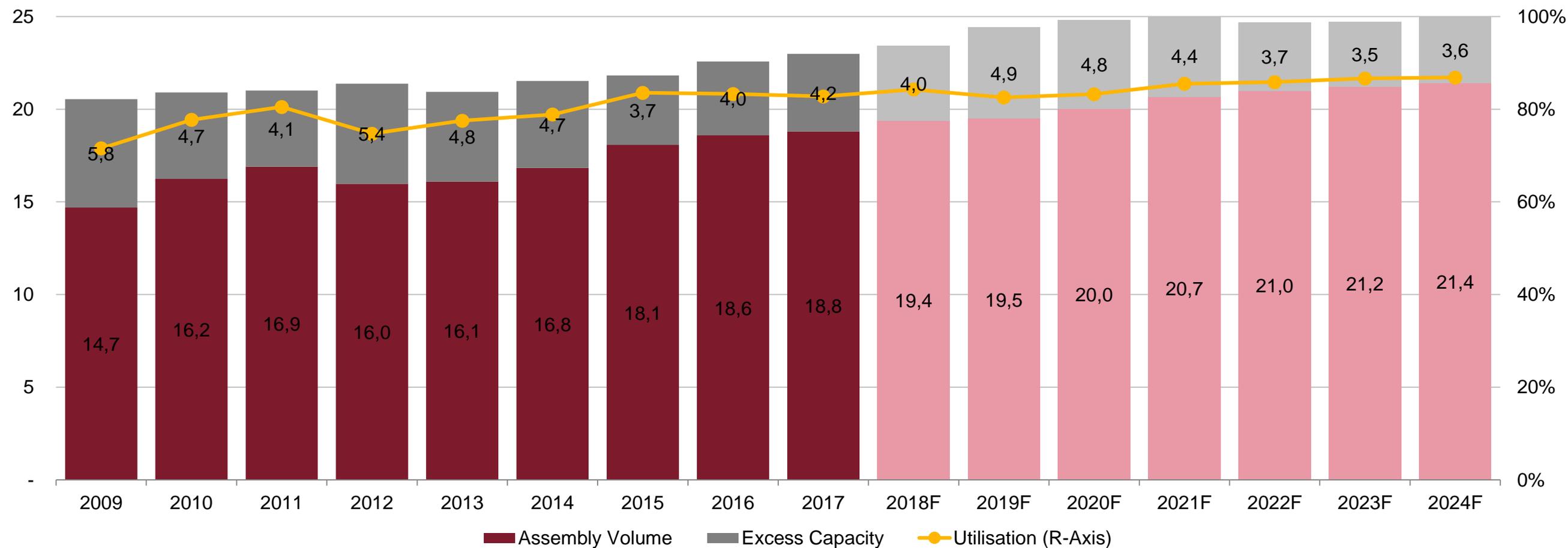
Source: ACEA (Actuals up to August 2018), Autofacts Analysis

New products and continuous investments in plants are expected to keep utilization above 80%

European light vehicle assembly is expected to remain strong as domestic and non-domestic OEMs launch new products and invest in plant upgrades and expansions, which could push volumes to around 20m units by 2020. In 2017, European light vehicle assembly stagnated with a growth of 1.1% to 19.4m units, but it is expected to grow by more than 550k units to 19.4m units in 2018, keeping overall plant utilization at a sustainable level of more than 80% in 2018 and for the foreseeable future.

EU: Light Vehicle Assembly

2009 – 2024F (millions)



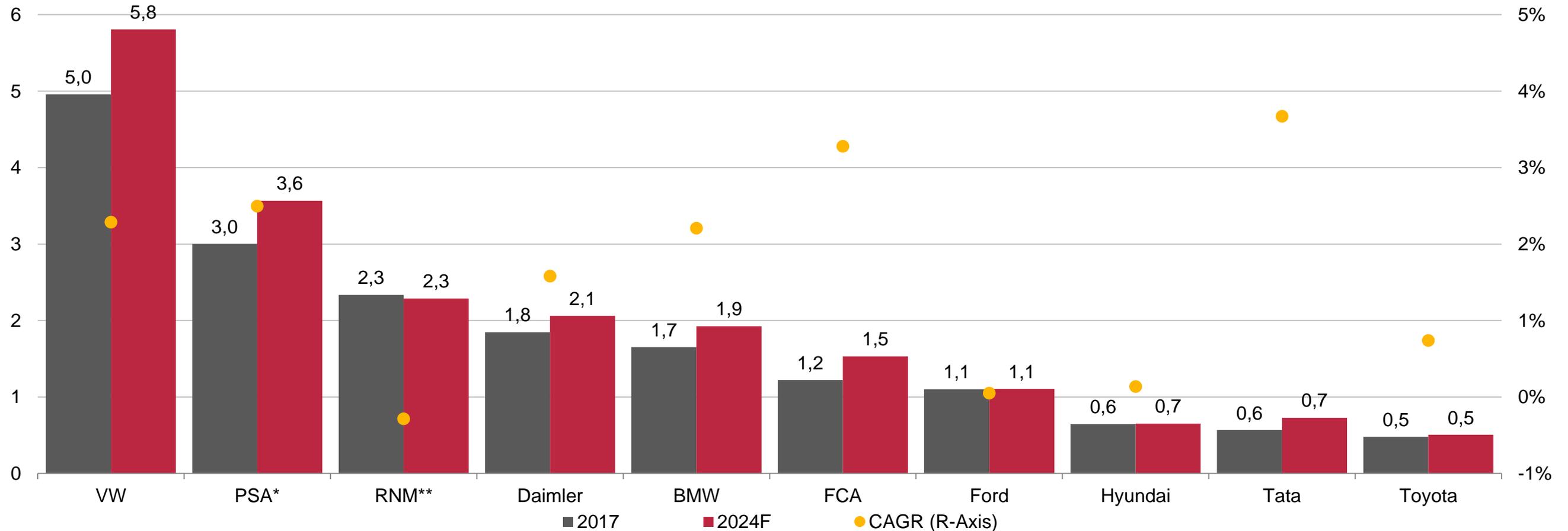
Source: Autofacts 2018 Q4 Forecast Release

The VW Group is primed to solidify top position in EU market growing 2.5% per annum

With steady growth over the next years, VW group is expected to produce 5.8 million units in 2024 in the European Union. RNM, Hyundai and Toyota are all likely to record neutral or negative growth over the next 7 years within Europe. Tata is poised to show the largest growth percentage of the smaller players, while BMW and Daimler are likely to go toe-to-toe throughout the forecast horizon.

EU: Top 10 Alliance Groups

2017 vs. 2024F (millions)



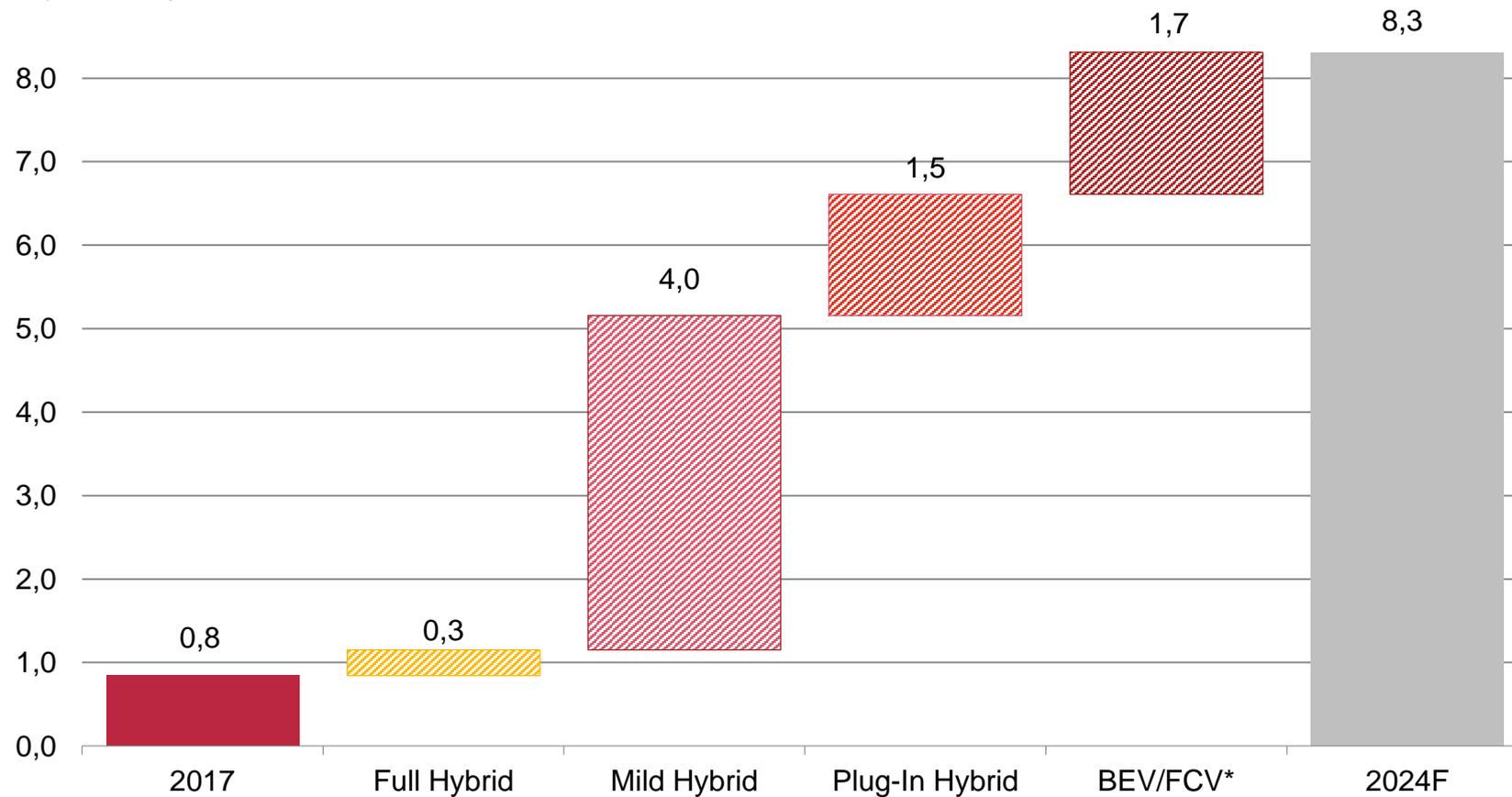
Source: Autofacts 2018 Q4 Forecast Release *PSA incl. GM Europe (Opel-Vauxhall) **Renault-Nissan-Mitsubishi

With stricter efficiency targets, alternative drivetrains will be even more important in the near future

As the EU has proposed stricter fuel consumption past 2021, fully electric and hybrid powertrains are regarded as necessary to achieve those goals - especially as declining diesel sales and increasing crossover sales make the challenge even more difficult. The installation of alternative drivetrains in light vehicles that are manufactured in the EU is forecasted to grow more than 8-fold, summing up to around 8.3m confirmed units by 2024.

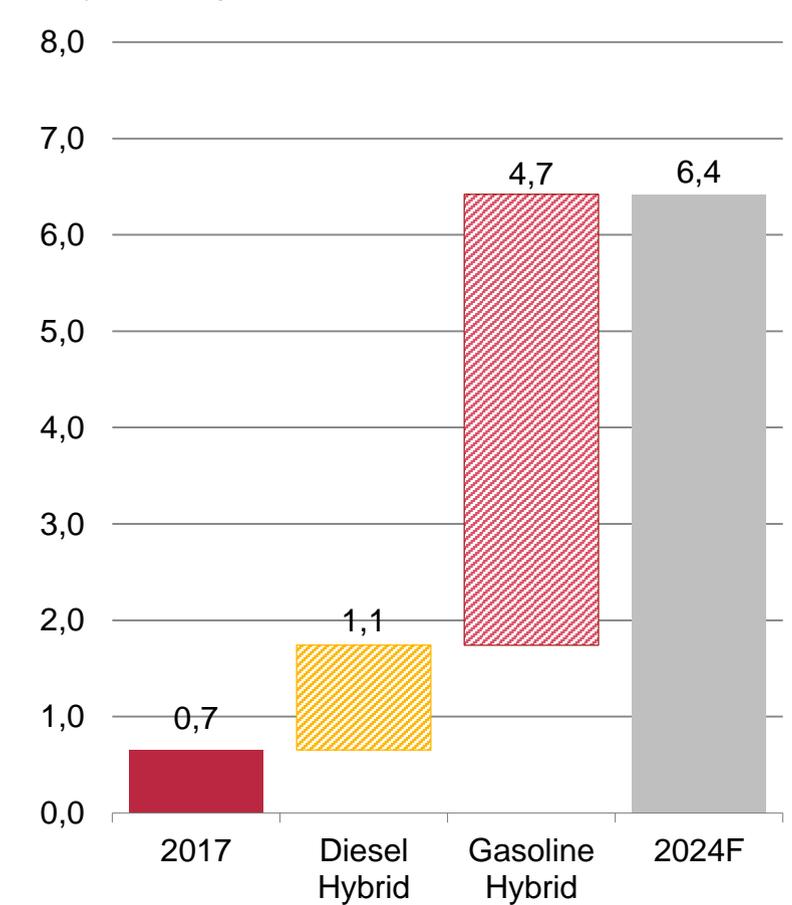
EU Powertrain: Alternative Engine Type Distribution

2017 vs. 2024F (millions)



EU Powertrain: Hybrid Distribution**

2017 vs. 2024F (millions)

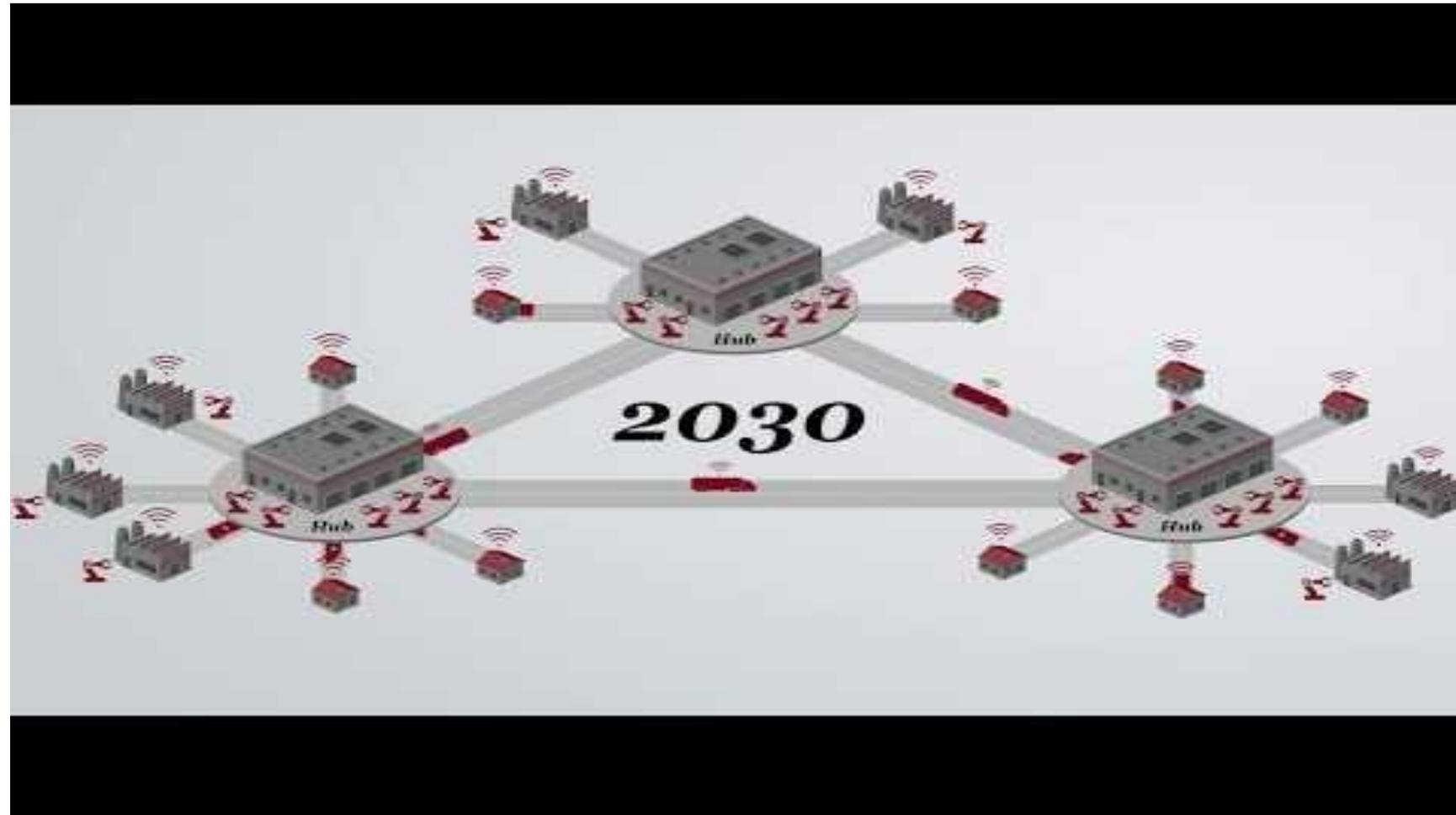


Source: Autofacts 2018 Q4 Forecast Release *BEV = Battery Electric Vehicle, FCV = Fuel Cell Vehicle **excl. BEV/FCV

The Future of Trucking

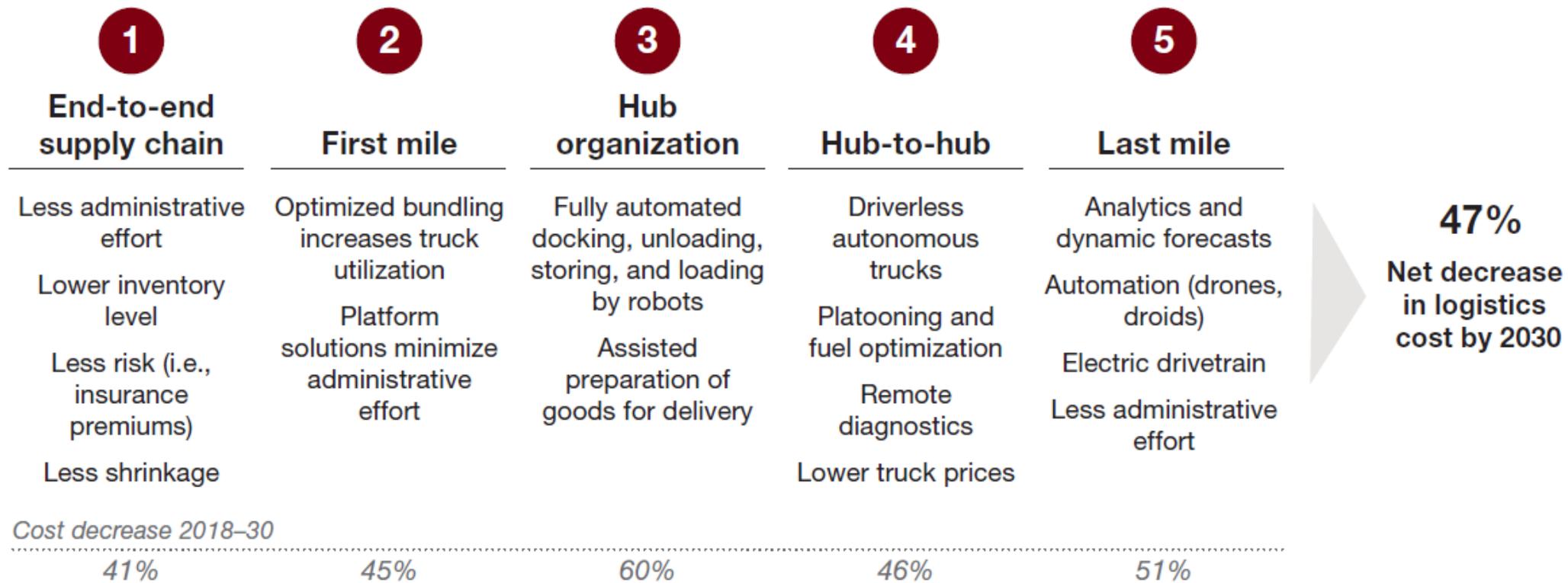
The era of digitized trucking: Charting your transformation to a new business model

Significant stakeholders in the current system, such as long-distance truck drivers and freight-forwarding companies, will disappear; the process of matching the goods to be delivered and the available trucks will be fully automated. To stay competitive, original equipment manufacturers need to expand their product portfolios to include new powertrains and focus production on autonomous long-haul trucks. Large tech companies will become a bigger feature in the delivery market, with new technologies.



Automation will reduce logistics costs throughout the supply chain by 47% by 2030

Add up the various incremental technological changes throughout all the steps of delivery from the first mile to the last, and the logistics business will be fundamentally altered. The far higher degree of automation will in turn drive logistics costs down by 47 percent by 2030. Notably, about 80 percent of those cost savings will come from a reduction in the labor required



Source: Strategy& analysis

Roadmap of how new technologies will create a more cost-efficient logistics supply chain by 2030

Truck manufacturers may be aware of these imminent changes but likely find it very challenging to publicly embrace them, because they threaten not only the business model of the truck manufacturers themselves, but also their customers, the leasing and logistics companies. Yet it is essential that the industry acknowledges and works to keep pace with the incremental disruptive changes in technology and automation over the coming years — a transformation that will create a new and more cost-efficient supply chain by 2030.

Current technology	By 2020 -5%	By 2025 -20%	By 2030 -47%
Virtual platforms	Logistics mobility-as-a-service (MaaS) introduced	Nearly all hub-to-hub logistics done by MaaS	All hub-to-hub logistics done by MaaS
Warehouse robots	Drone-automated inventory taking	Processes (except commissioning) automated	Processes for standard delivery 100% automated
Partially automated trucking	Platooning begins	Partially autonomous trucks, requiring driver	Fully autonomous trucks without driver
Electric vans	Significant share of electric vans	Commercial delivery drones	Synchronized, heterogenous delivery fleet

Source: Strategy& analysis

Prepared by Autofacts. For additional information, please contact:



Felix Kuhnert
Global Automotive Leader

PwC Germany

Tel. +49 711 25034-3309

felix.kuhnert@pwc.com



Christoph Stürmer
Autofacts Global Lead Analyst

PwC Germany

Tel. +49 69 9585-6269

christoph.stuermer@pwc.com

The information contained in this report represents the culmination of proprietary research conducted by Autofacts, an analytical group within the PwC Research & Analysis Organisation. All material contained in this report was developed independently of any PwC client relationship and does not represent the firm's view as an auditor to any legal business entity. While every effort has been made to ensure the quality of information provided, no representation or warranty of any kind (whether expressed or implied) is given by PwC as to the accuracy, completeness or fitness for any purpose of this document. As such, this document does not constitute the giving of investment advice, nor a part of any advice on investment decisions. Accordingly, regardless of the form of action, whether in contract, tort or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind and disclaims all responsibility for the consequences of any person acting or refraining from acting in reliance on this document.

© 2018 PwC. All rights reserved. "PwC" refers to PricewaterhouseCoopers LLP (a Delaware limited liability partnership) or, as the context requires, other member firms of PricewaterhouseCoopers International Ltd., each of which is a separate and independent legal entity.