

Julius Bär

SETTING THE SCENE: FORECASTING OF ROAD TRANSPORT TRENDS

Norbert Rücker, Head Macro & Commodities Research
United Nations Economic Commission for Europe, 5 April 2018



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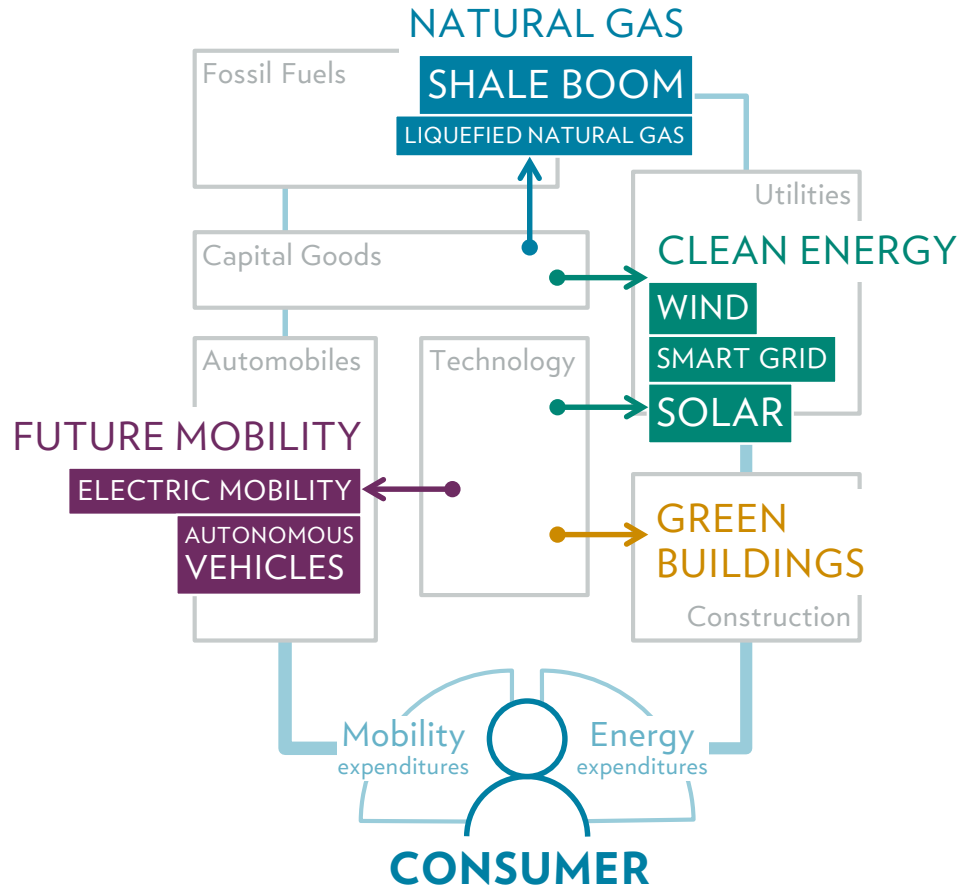
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THE ENERGY TRANSITION

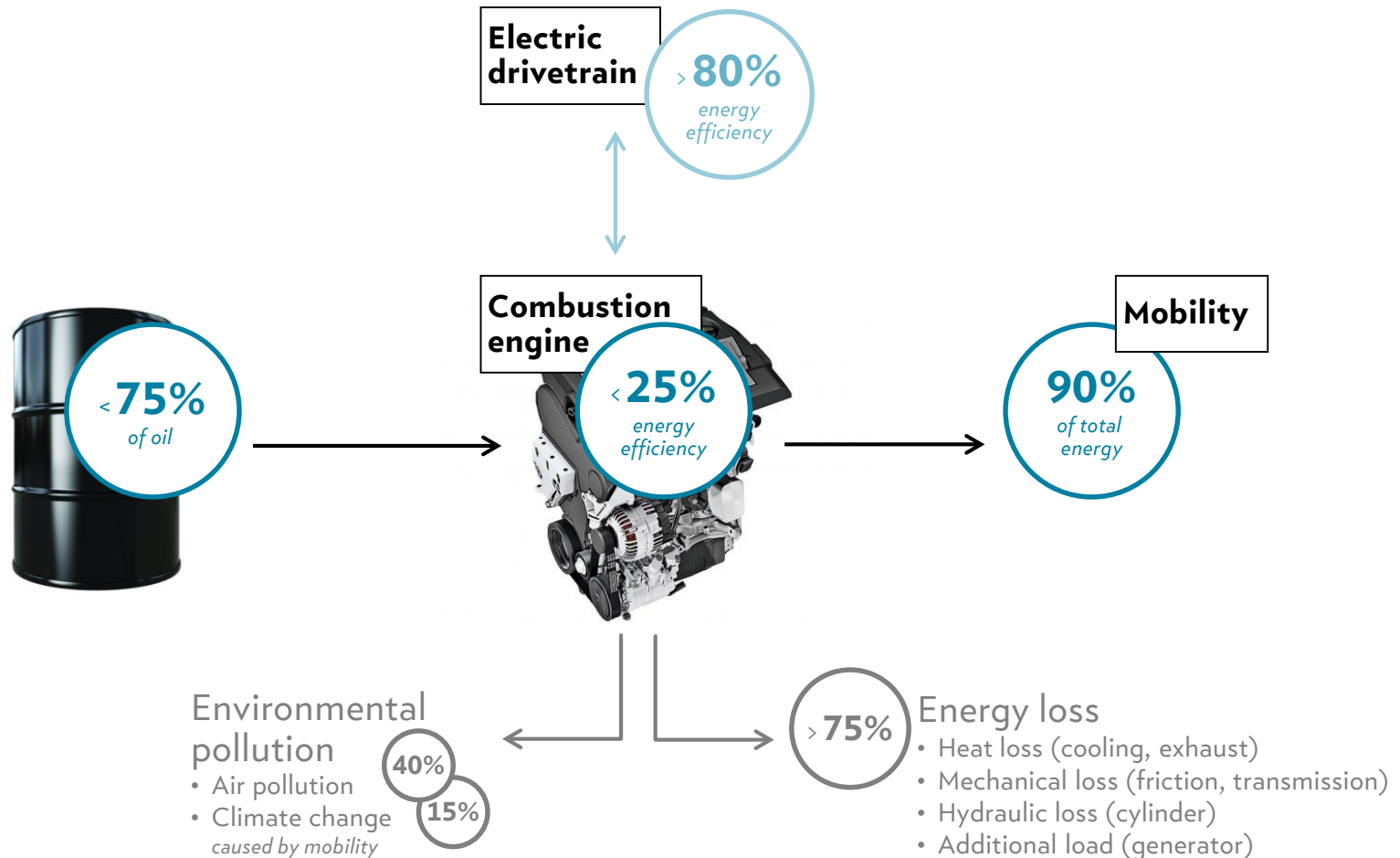
Technology, regulation and consumer attitudes reshape the energy landscape.



Source: Julius Baer

FUTURE MOBILITY

The poor efficiency of combustion engines paves the way for disruptive change.



Source: Julius Baer

FUTURE MOBILITY

A mesh of trends shapes the future path of mobility.

- **Rising Asian middle class**

Wealth and population growth support global car ownership and car sales, with Asia in the driving seat.

Cars account for 80% of passenger mileage in developed economies; buses and two-wheelers account for up to 50% of passenger mileage in developing economies.

- **Urbanisation**

City dwellers own less cars than sub-urban and rural residents.

- **Electrification**

Electric cars account for <2% of global sales. Auto makers significantly expand their offering towards 2020.

Auto makers add electric motors to combustion engines to raise performance and cut fuel use.

- **Autonomous driving**

Driving assistance systems enhance comfort and safety, supporting the long-term vision of self-driving cars.

On demand, driverless transport solutions are entering the market.

- **Sharing economy**

Ride hailing and bike sharing schemes expand around the globe. New mobility solutions emerge.

Consumer attitudes shift towards ‘using rather than owning’, not least as cost awareness grows.

- **Regulation**

Emission regulations tighten, in particular as air pollution cost awareness grows, supporting technology change.

Cities drive the global regulatory agenda in order to tackle their tangible congestion and pollution issues.

Source: Julius Baer

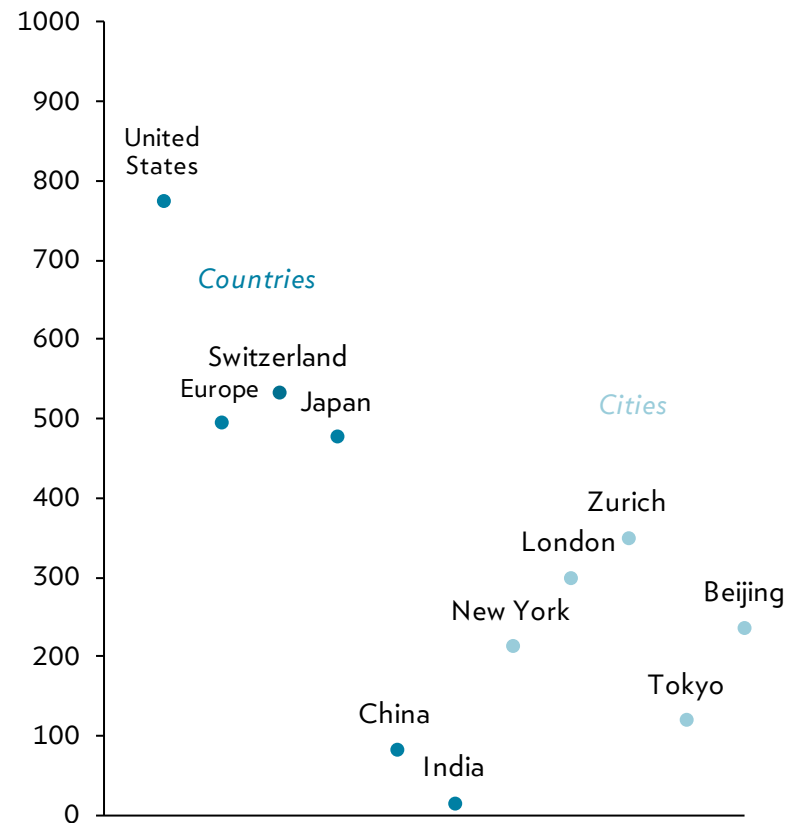
CAR USE

Urbanisation and the sharing economy undermine car dominance.

Car ownership and use

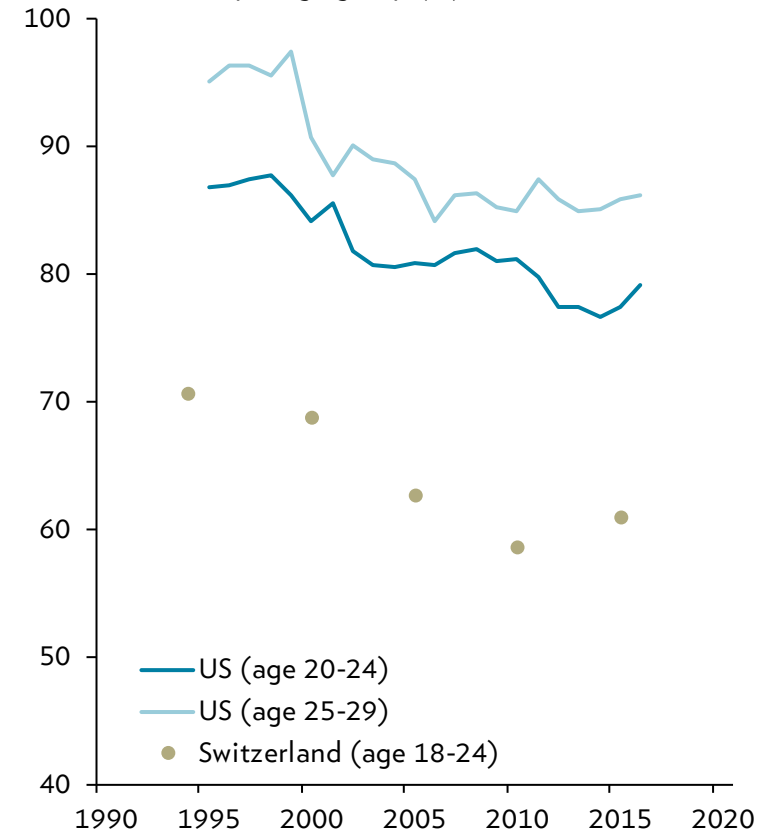
(2015)

Cars per capita (1000 inhabitants)



Licensed drivers

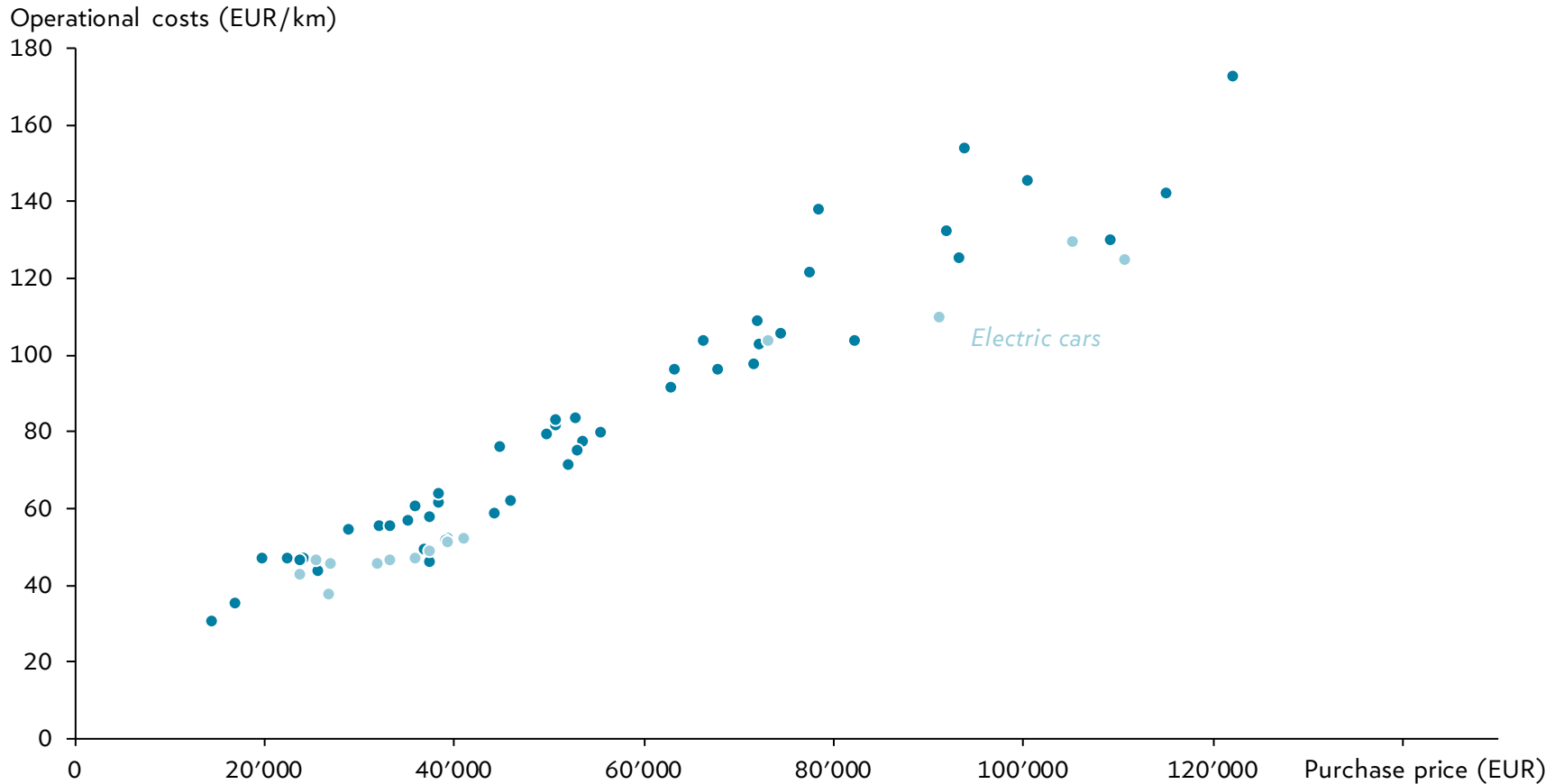
Licensed drivers per age group (%)



Sources: Organisation Internationale des Constructeurs d'Automobiles, CAAM, SIAM, US Federal Highway Administration, Bundesamt für Statistik, Julius Baer

MOBILITY COSTS

Consumers decide on convenience, coolness, not only costs.



Source: Allgemeiner Deutscher Automobil-Club (ADAC)

Calculation includes: purchase price write-down, fuels, insurance, taxes, maintenance, subsidies; mileage per year: 15'000 kilometers.

SCENARIOS

Evolution or revolution? The mobility business is up for a major shift of value pools.

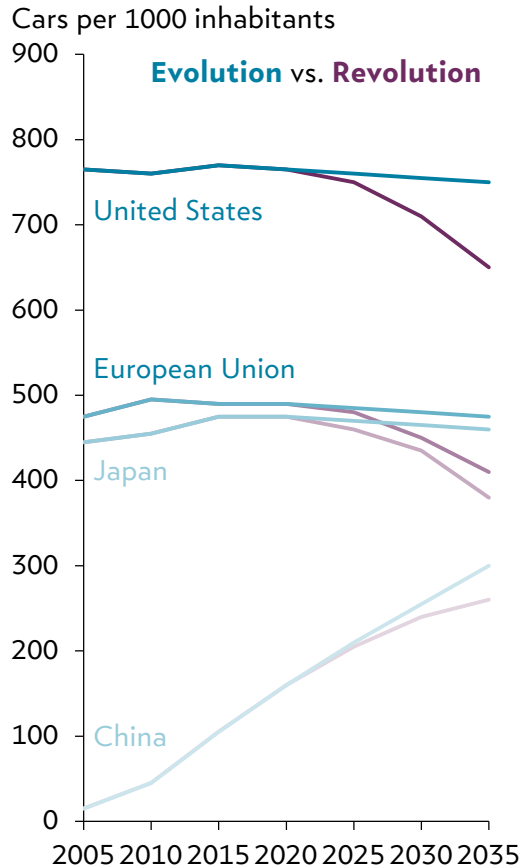
	Today Status quo	2015-2020 Trends	2020-2035 'Evolution'	2020-2035 'Revolution'	Impact Business	
	Car sales	72 million	82 million	105 million	90 million	<p>● low/negative</p> <p>●● high/positive</p>
	Plug-in sales / stock	0.8% / 0.1%	<4% / 1.0%	27.5% / 12%	45% / 19%	
	Battery cost	270 USD/kWh	160 USD/kWh	75 USD/kWh	70 USD/kWh	
Autos	Market size USD billion	1'800	2'100	2'700	2'300	●●●
Auto parts	Market size USD billion	450 (USD 6400)	625 (USD 7500)	800 (USD 7750)	700 (USD 7750)	●●●
Electronics	(car content)	40 (USD 550)	130 (USD 1500)	190 (USD 1750)	190 (USD 2000)	
Batteries		<5	20	100	170	
Fuel use	Million barrels/day	19.6	21.7	22.3	17.8	●●
Charging	Cars/total electricity use	0.0%	0.1%	<2.5%	<5.0%	●
Insurance	Trend	up	up	flat	down	●●
Mobility costs*	USD/km	0.55-0.60	0.50-0.60	0.35-0.45	0.20-0.40	

Source: Julius Baer, Bernstein, Goldman Sachs, UBS, Citigroup, Exane, McKinsey, KPMG (* includes other maintenance expenses of roughly USD 1'500 per annum for combustion cars and USD 1'000 per annum for electric vehicles)

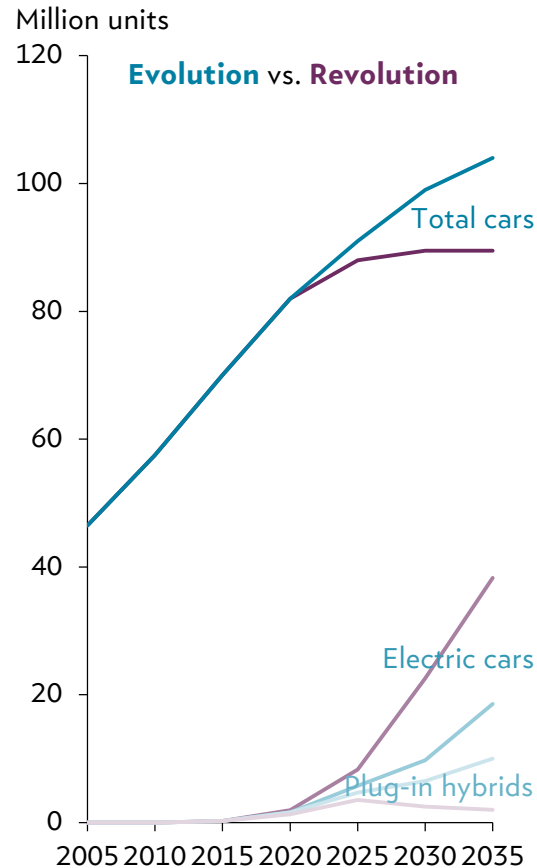
SCENARIOS

The debate about peak car, peak oil and fuel tax erosion.

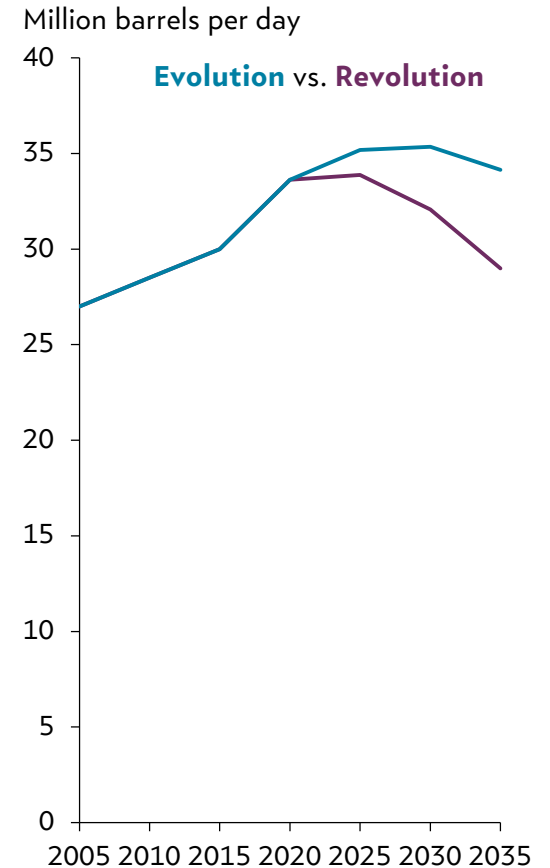
Passenger car ownership



Global passenger car sales



Passenger car fuel use

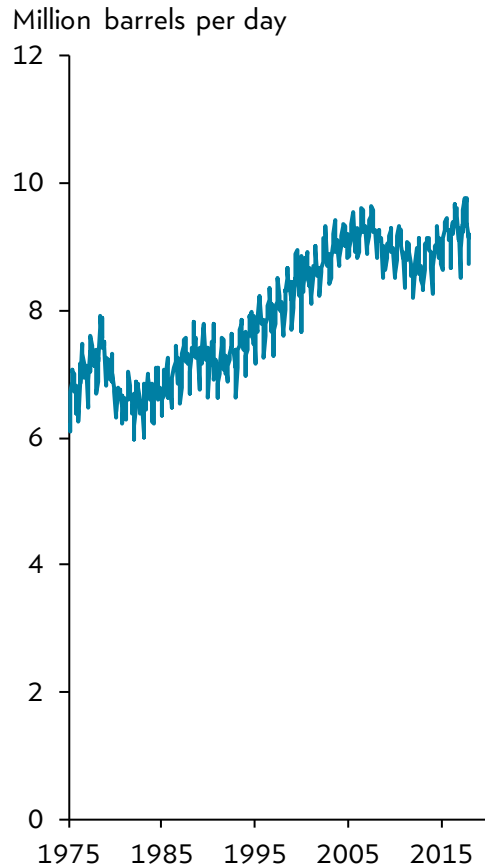


Sources: Organisation Internationale des Constructeurs d'Automobiles, World Bank, United Nations, Julius Baer

ROAD FUEL USE

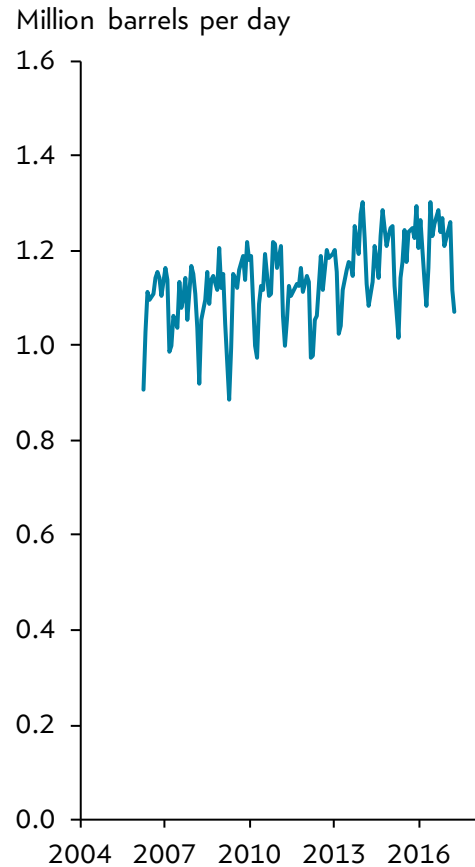
Economic effects mask fuel efficiency gains.

US gasoline consumption



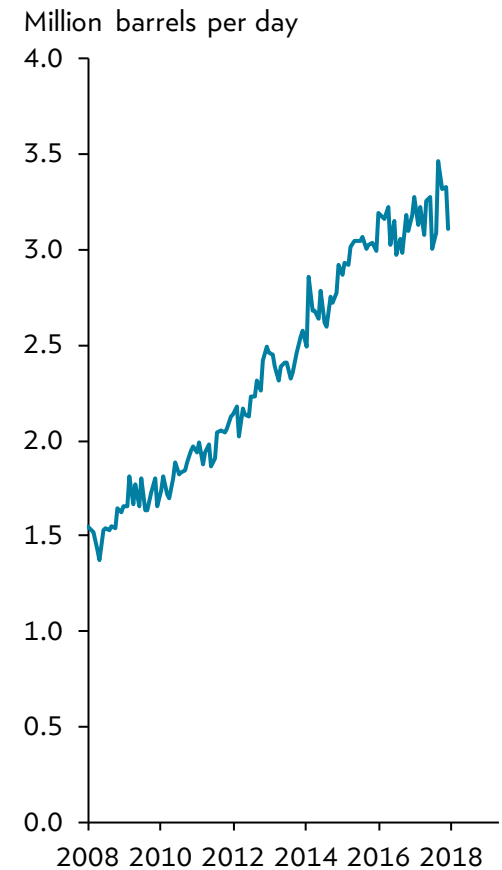
Source: Bloomberg Finance L.P.

Germany road fuel sales



Source: Bundesamt für Wirtschaft und Ausfuhrkontrolle

China gasoline demand



Source: National Bureau of Statistics

FUTURE MOBILITY

Some observations on key challenges and opportunities.

- **(Asia) cities shape the mobility future.**

The dense, urban environment is a breeding ground for new mobility solutions.

Pollution, congestion and consumers willing to leap-frog technology, Asian cities will shape the mobility future.

- **The mobility business is prone to shifts in value pools.**

Electrification and autonomous driving level the playing field of the auto business and raise competitive threats.

Public transport is most at risk from rising on-demand and pooled-mobility solutions.

- **The future of mobility looks clean and affordable.**

Households are set to spend less on mobility, more elsewhere, which entails broader economic impacts.

Mobility should become more accessible and affordable, which will shape social interactions.

Less pollution and easier commutes could make cities more attractive, reinforcing urbanisation.

- **Infrastructure funding and congestion remain challenges.**

As fuel tax income erodes, politics can no longer shy away from mobility pricing to guarantee fair road funding.

With affordability comes more demand, congestion is set to remain a challenge.

- **The future mobility adds to the democratisation of energy.**

Energy use shifts from resources to technology, from trade to self-reliance, from big to small.

Electric cars and clean energy are self-reinforcing technologies, heralding global political power shifts.

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