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DRAFT VERSION

Mobility in the "new normal"

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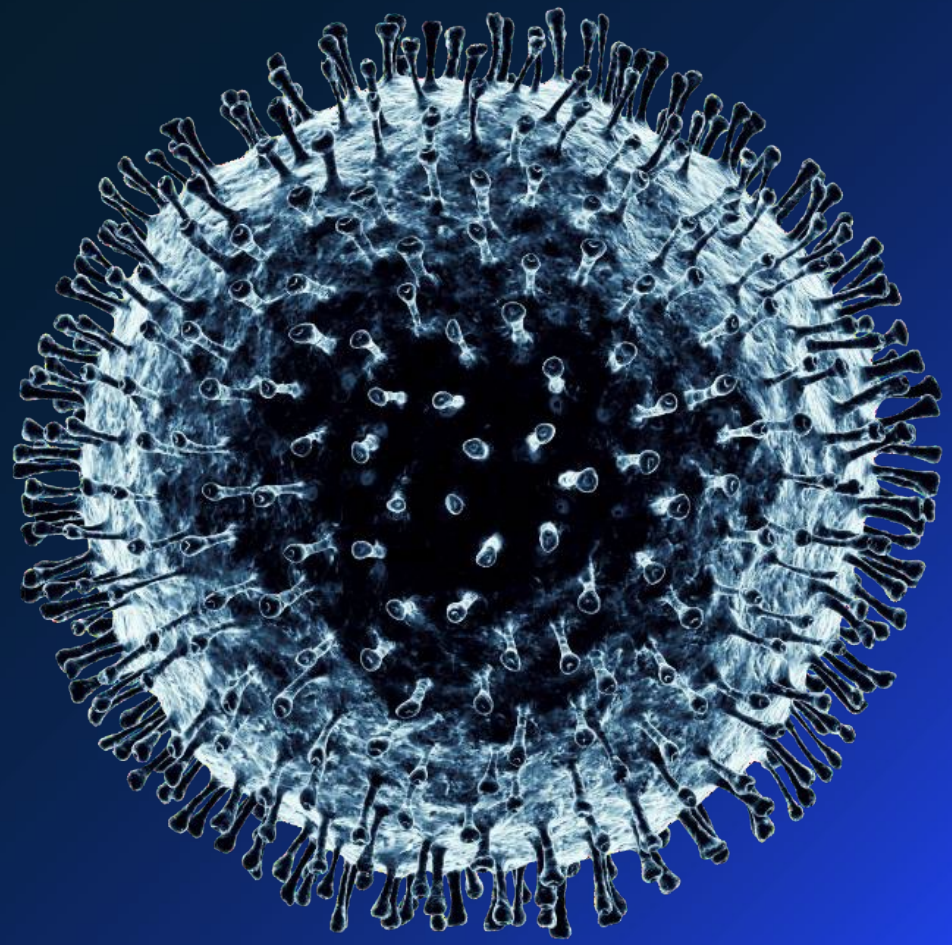
Topics today

Direct impact of COVID-19 crisis

Structural changes towards the "next normal"

Key moves for the industry



COVID-19 crisis with significant effects – but less than expected

Light vehicle sales loss, in % of pre-COVID-19 forecast



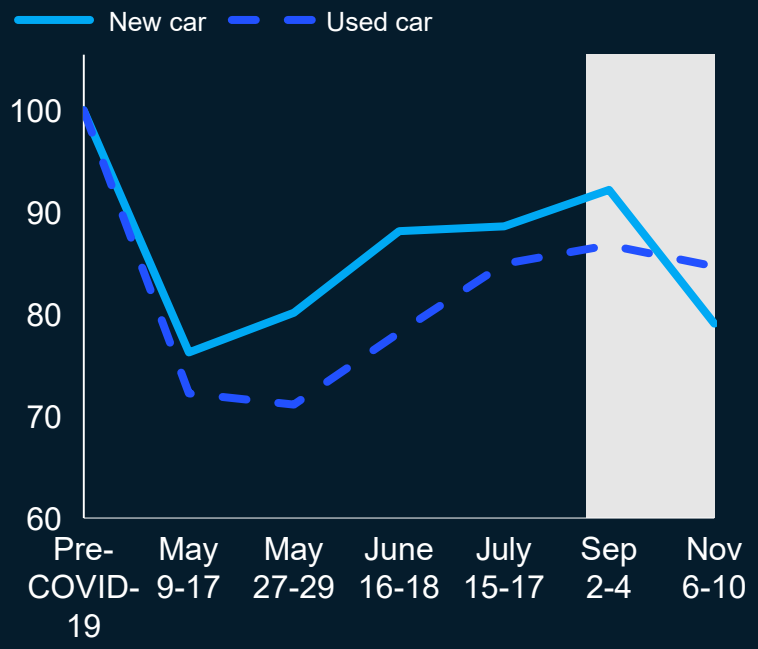
Scenarios 2020 from March	30-45%	25-45%	10-20%
Actuals 2020 current expectation	17%	22%	<10%
Outlook 2021 possible scenarios[1]	5-25%	5-25%	0-15%

1. Based on A3 (virus contained) and A1 (muted recovery) scenarios

Consumer survey in EU indicates negative impact of 2nd lockdown

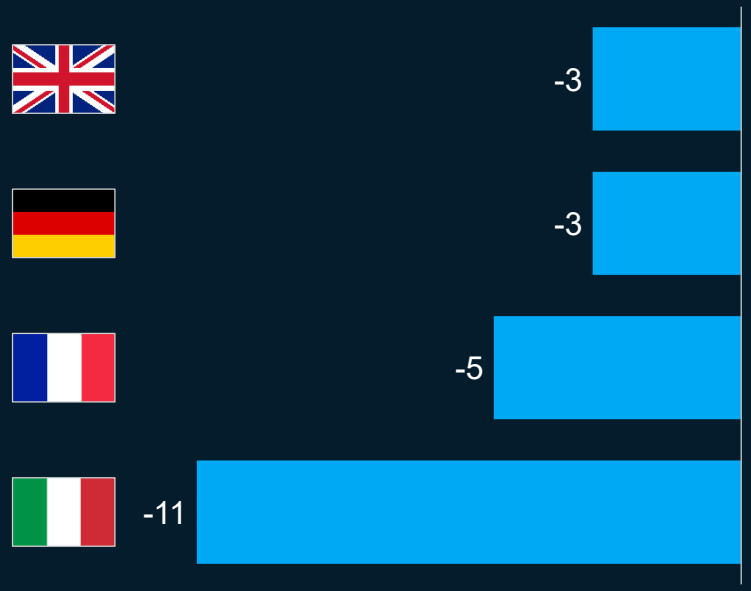
Car buying

Purchase intent new car vs. used car[1,2]
Percent of respondents



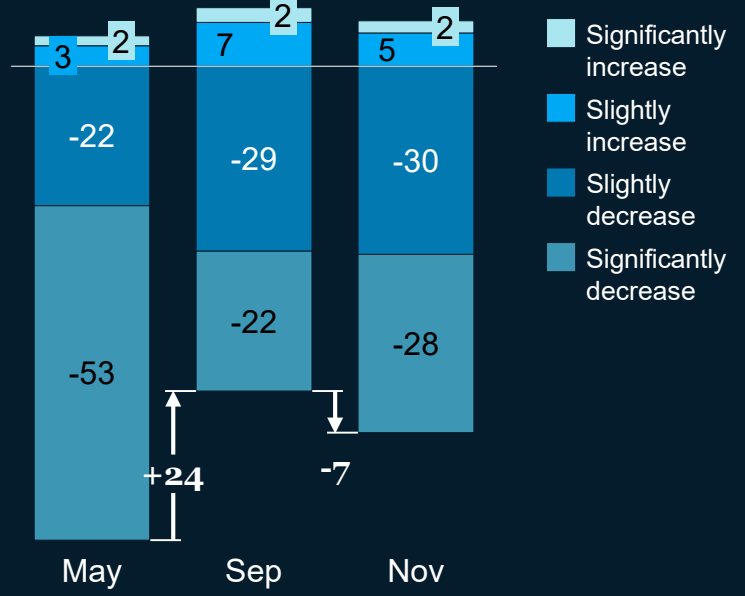
Aftermarket

Customer outlook on maintenance and repair in light of 2nd lock-down[3]
Net impact Sept. vs. Nov in "plan for next month"



Mobility

Mobility pattern change
Number of respondents, in percent



1. Q: Before the COVID-19 / COVID-19 crisis started, how likely were you to buy a new car?
2. Q: During or after the COVID-19 / COVID-19 crisis, how likely will you be to buy a new car?
3. Q: What type of maintenance, repair and improvement work have you delayed or done additionally?

Sampled to match gen pop 18+ years within markets; individual markets weighted based on 2019 car market size, figures may not sum to 100% because of rounding

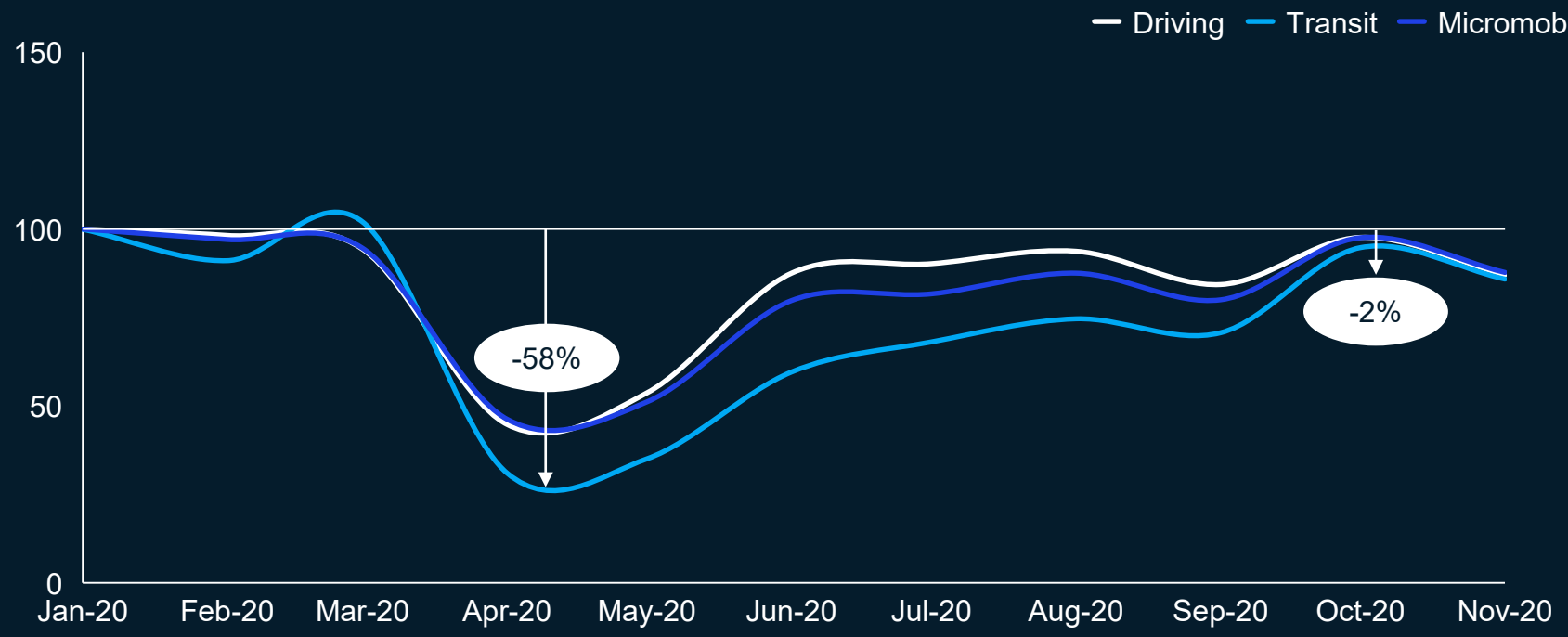
Source: McKinsey Global COVID-19 Automotive Consumer Survey

COVID-19 shock to mobility as basis for projecting the impact of the virus resurgence in Q4 2020

x Reduction in total PMT, vs baseline

Apple routing requests by transport mode, example country[1]

Index 100 = December 2019, adjusted to remove season variation



1. Routing requests that are entered into Apple Maps on individual's phones

SOURCE: McKinsey Center for Future Mobility

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Key moves for the industry

3 structural changes

in the “next normal”

1

Customer: More individual, digital, and sustainable

A re-discovered appreciation of individual mobility

Digitization of demand

2

“Zero emissions,” but profitable

Regulators as the most-important catalyst for electro-mobility

3

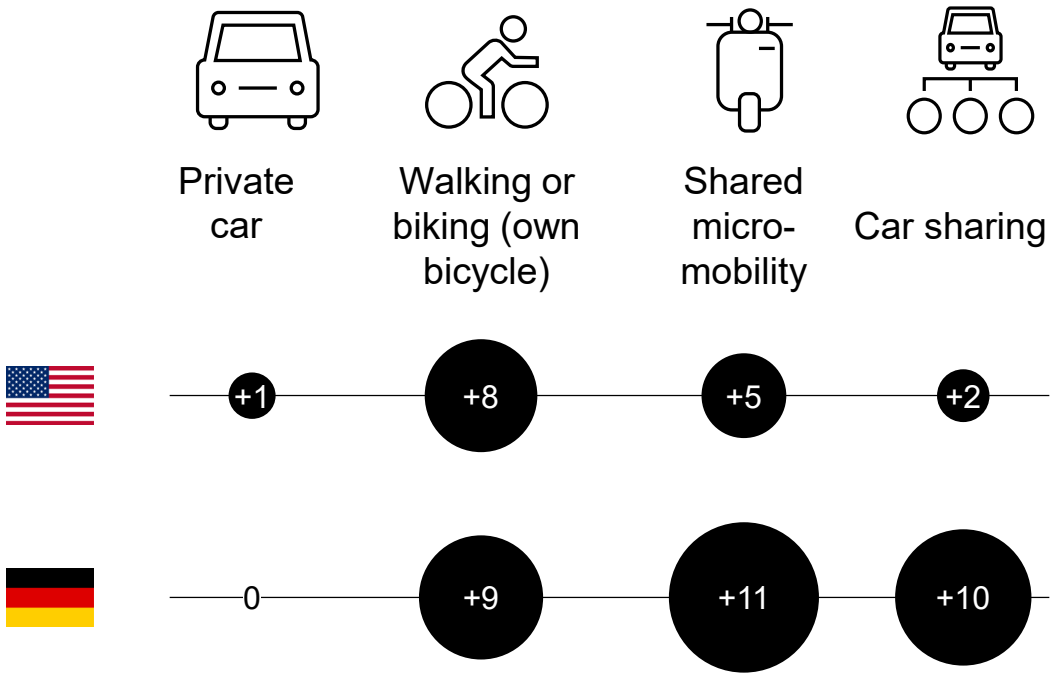
Disruption in the industry structure

Trends in ACES technologies are continually strong

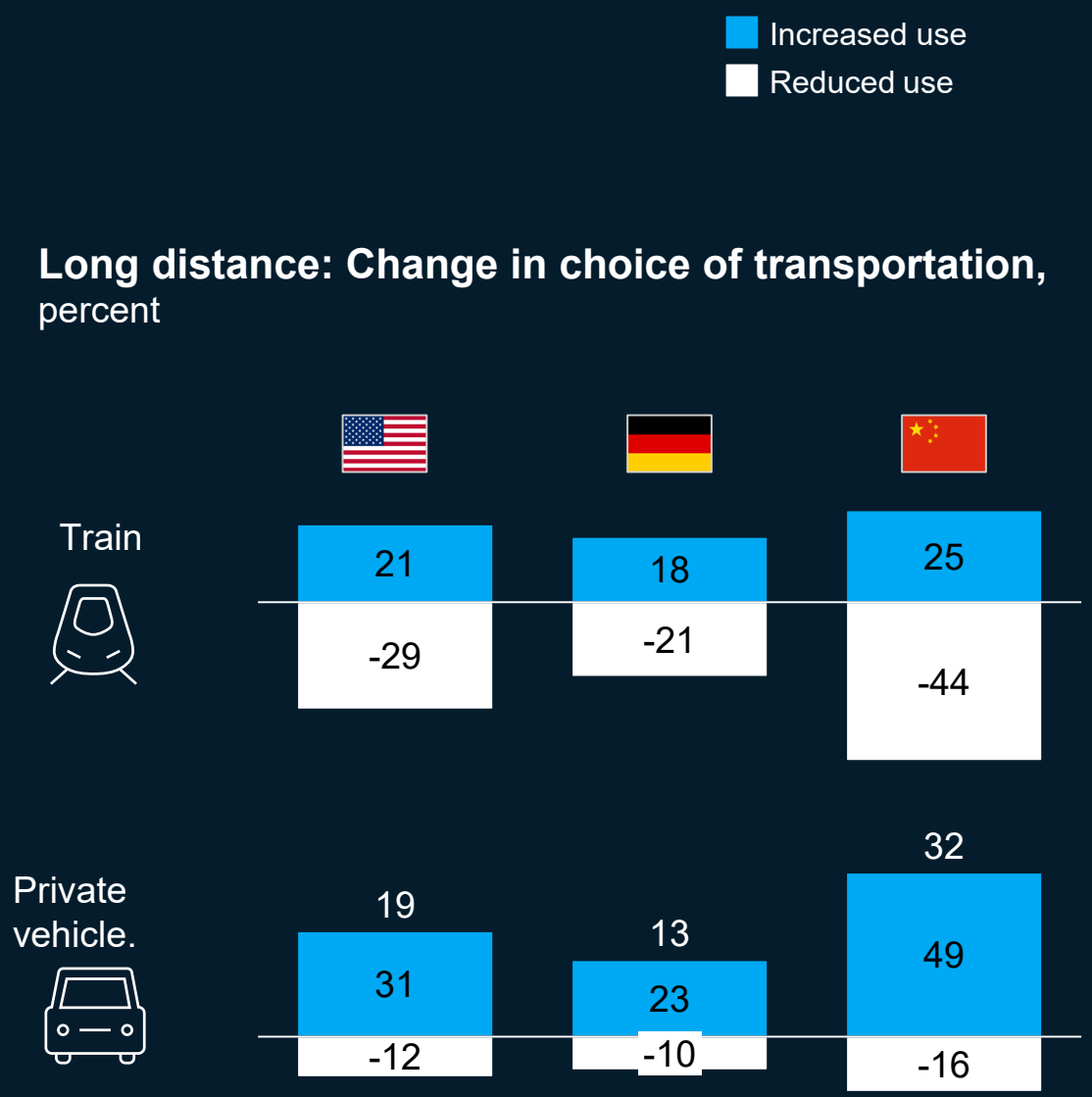
Cities as accelerators of the mobility transition

1 Altered customer behavior in the “next normal”

Inner-city area: Regular use of transportation modes, percent



Long distance: Change in choice of transportation, percent



SOURCE: McKinsey Center for Future Mobility

The online sales channel is becoming increasingly important

OEM

30%

of gross sales are now based on the conventional go-to-market/dealership model

Customers

Just 1%

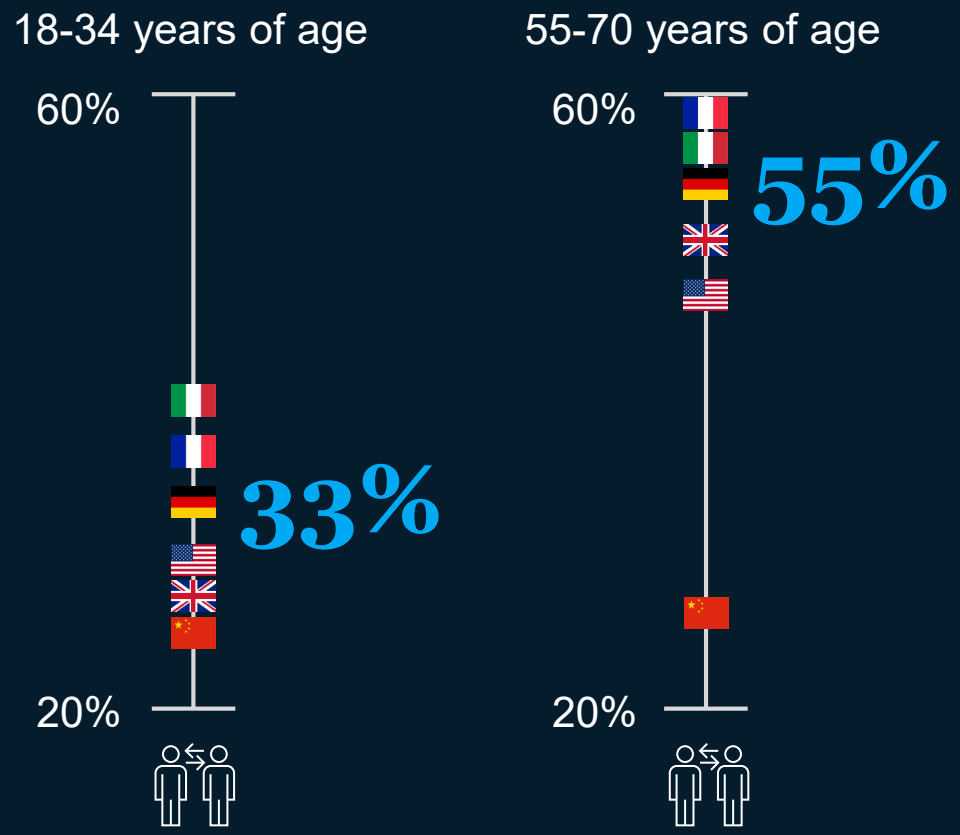
of customers are currently fully satisfied with their experiences in the conventional purchasing process

Dealer

25%

potential share of online OEM sales by 2025

End customers who would prefer to buy their next vehicle at the dealership rather than online, percent



SOURCE: McKinsey

2 Legislation accelerates the "pathway to net zero emissions"

Sept 17
55%
Proposal on raising CO2 targets from the current 40% to 55% in 2030

Sept. 23
2035
Ban on the sale of new cars with combustion engines in California

Sept. 22
2060
Announcement by Xi Jinping that China will become CO2-free by 2060

Potential new 2030 targets for auto sales

Scenario	CO2 reduction Car traffic (2021-2030)	CO2 targets 2030 sales (g/km CO2)	BEV	PHEV	
Current legal situation	37.5%	59	33%	12%	45%
1 *Conservative scenario with regard to regulation*	50%	48	41%	15%	56%
2 *Medium scenario with regard to regulation*	55%	43	45%	16%	61%
3 *Aggressive scenario with regard to regulation*	60%	38	49%	17%	66%

SOURCE: McKinsey Center for Future Mobility; online research

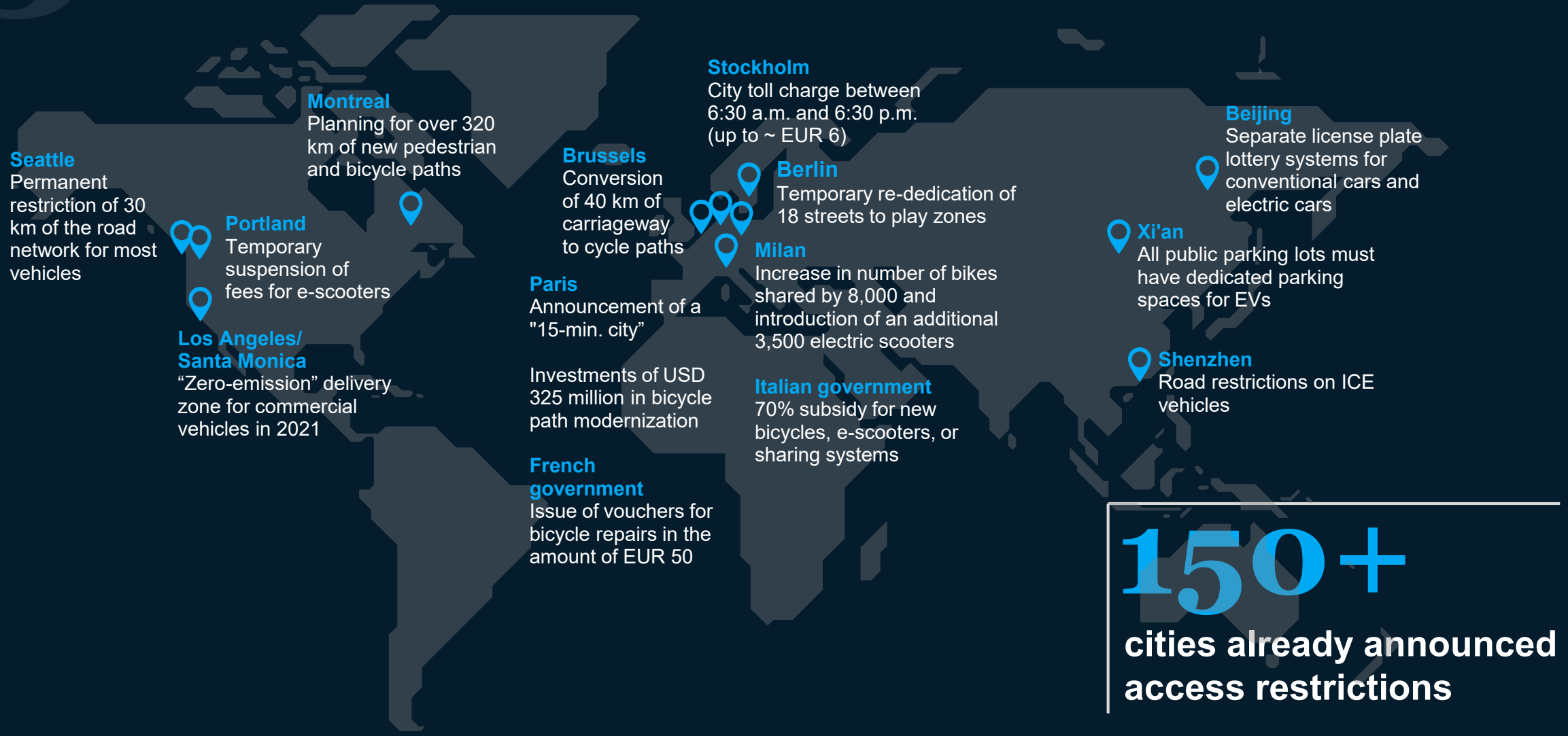
3 Different impact of COVID-19 on the ACES trends

↑ Positive trend ↓ Negative trend → Stable trend

		Short term	Mid term
Autonomous		↓ Tests temporarily suspended Slowed down investments	→ Increased cooperation New business models
Connectivity		↗ COVID-19 push to digital	↑ Access to talent or players through consolidation, „Buy“ more likely than „Build“
Electrification		↗ New incentives (EU, CN) Regional slow-down (US)	↑ Back to pre-crisis projections by 2022 (EU, CN)
Sharing		↓ Slow-down (e.g., social distancing) Financial pressure on start-ups	↗ Consolidation Cities might not take back all restrictions for private vehicles, opportunities to differentiate

Source: McKinsey Center for Future Mobility

Cities accelerate the transportation transformation



Seattle
Permanent restriction of 30 km of the road network for most vehicles

Montreal
Planning for over 320 km of new pedestrian and bicycle paths

Portland
Temporary suspension of fees for e-scooters

Los Angeles/ Santa Monica
"Zero-emission" delivery zone for commercial vehicles in 2021

Brussels
Conversion of 40 km of carriageway to cycle paths

Paris
Announcement of a "15-min. city"

Investments of USD 325 million in bicycle path modernization

French government
Issue of vouchers for bicycle repairs in the amount of EUR 50

Stockholm
City toll charge between 6:30 a.m. and 6:30 p.m. (up to ~ EUR 6)

Berlin
Temporary re-dedication of 18 streets to play zones

Milan
Increase in number of bikes shared by 8,000 and introduction of an additional 3,500 electric scooters

Italian government
70% subsidy for new bicycles, e-scooters, or sharing systems

Beijing
Separate license plate lottery systems for conventional cars and electric cars

Xi'an
All public parking lots must have dedicated parking spaces for EVs

Shenzhen
Road restrictions on ICE vehicles

150+
cities already announced access restrictions

SOURCE: McKinsey Center for Future Mobility; online research

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Key moves for the industry

Selected answers

in the “next normal”

1

Customer: More individual, digital, and sustainable

Disruptive go-to-market models

2

“Zero emissions,” but profitable

Profitability across segments

Subscription-based business models and monetization across the life cycle

3

Disruption in the industry structure

Innovation partnerships and the roles of financial investors

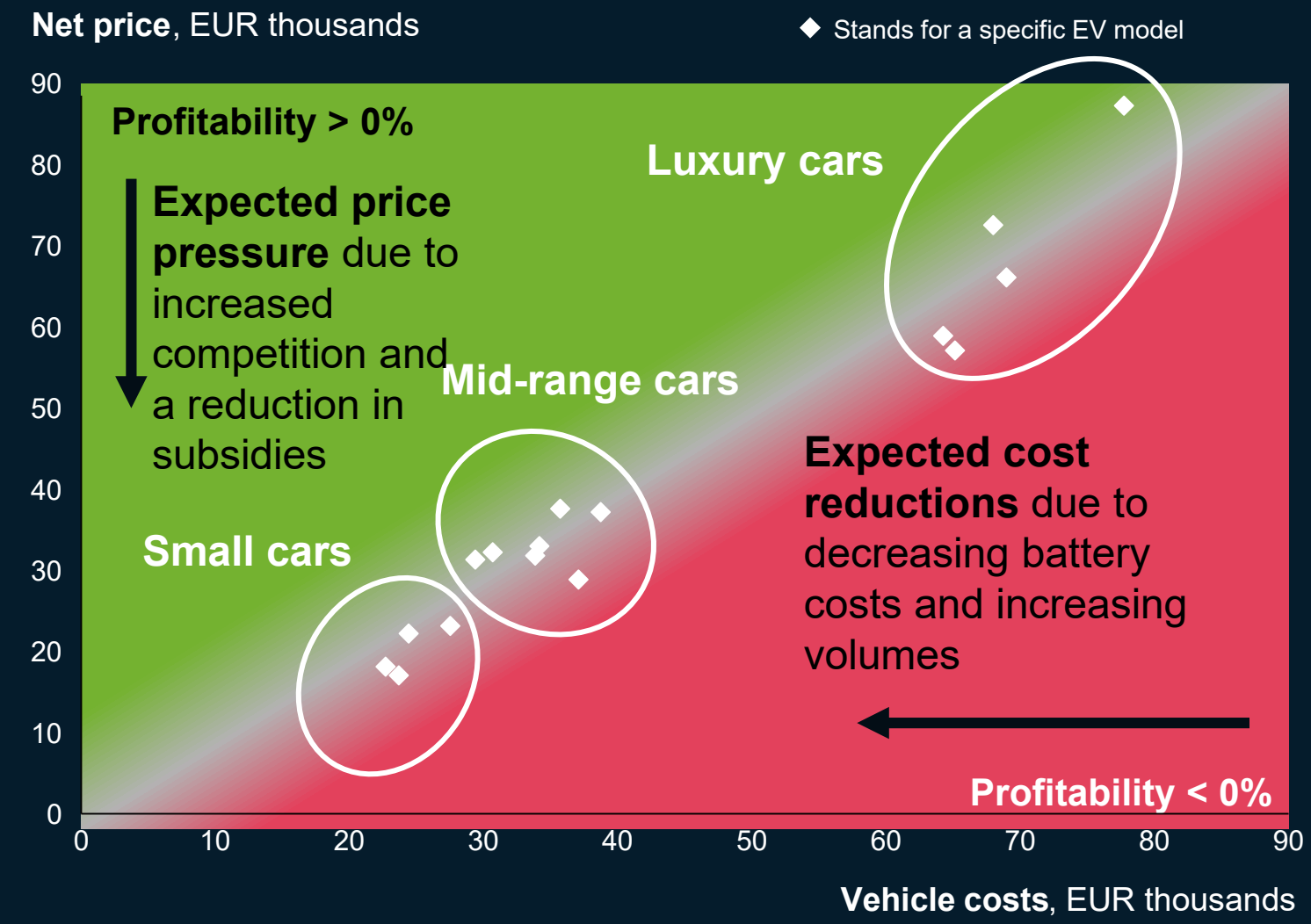
Re-skilling and dedicated talent management

1 Go-to-market disruption in the competitive landscape comes from both established OEMs and new players

VOLVO CARE BY VOLVO LYNK&CO	**Monthly subscription and new brand**	95% of new customers on the “Care by Volvo” platform via a monthly subscription model
CAZOO	**Unicorn for used vehicles online**	EUR 2.2 billion valuation, purchase and overhaul of all vehicles, home delivery within 72 hours
CARVANA	**“Auto vending machines”**	Bypassing the traditional dealer infrastructure, with sales of ~180,000 vehicles in 2019
BREITLING 1884	**Direct-to-customer**	Moving away from the classic dealer model/licensed sales
adidas	**Top 100 cities**	Concentration of marketing outlay on the world’s top 100 cities

SOURCE: McKinsey Center for Future Mobility

EVs on the path to profitability in all segments



Examples for identified profitability levers

Monetization across the entire life cycle

Overarching OEM EV platforms

Limited vehicle individualization

Residual-value management, and a radical EV after-sales model

Vehicle-to-grid applications

SOURCE: McKinsey Center for Future Mobility; EV teardown 2020

Radical new business models to shake up the EV industry and reach new dimensions in profitability

1 Battery-as-a-service

Maximize battery residual value through prediction, re-use and second life applications

2 "Generation 2.0" Electric Vehicles

Achieving ICE cost parity through extreme modularization, design for manufacturing, and use-case based design choices

3 Maximization of TCO advantage

Focus on TCO reduction by offering shared vehicle concepts with subscription-based usage for private users and fleets

4 Radical focus on EV online sales

Pursue aggressive sales cost reduction of Sales organization layers via online-first sales approach

5 Full focus on major EV cities

Concentrate marketing budget only on top EV cities and focus on urban car segment only

6 Smart charging service offering

Develop vehicle-to-grid technology and offer infrastructure for two-way charging and billing

7 Radical EV after sales service approach

Launch digital maintenance and repair organization: 24/7 remote service with service points in certain cities

8 Native EV platform sales to other OEM

Increase scale of EV platform through extension to other OEMs (e.g., similar to VW/Ford cooperation)

9 Focus on specs and highlights that matter

Tailor specs of core EV modules to customer needs (e.g., battery specifications, durability, etc.) and dare to be average on other features

10 Variance reduction and fast delivery

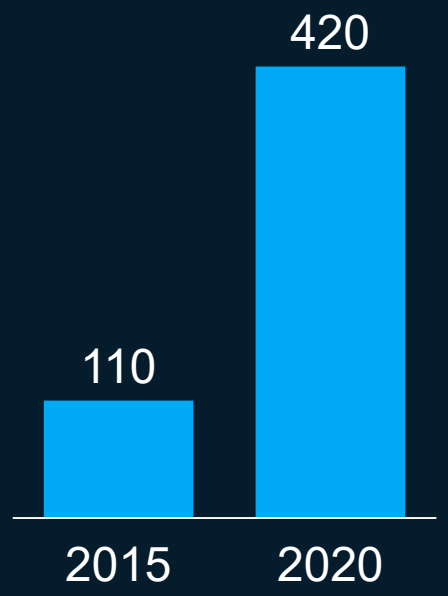
Focus on few variants only to limit complexity and increase speed in delivery while benefitting from “acceleration markup”

Source: McKinsey

An increasing number of partnerships: Other tech players and investors make large investments

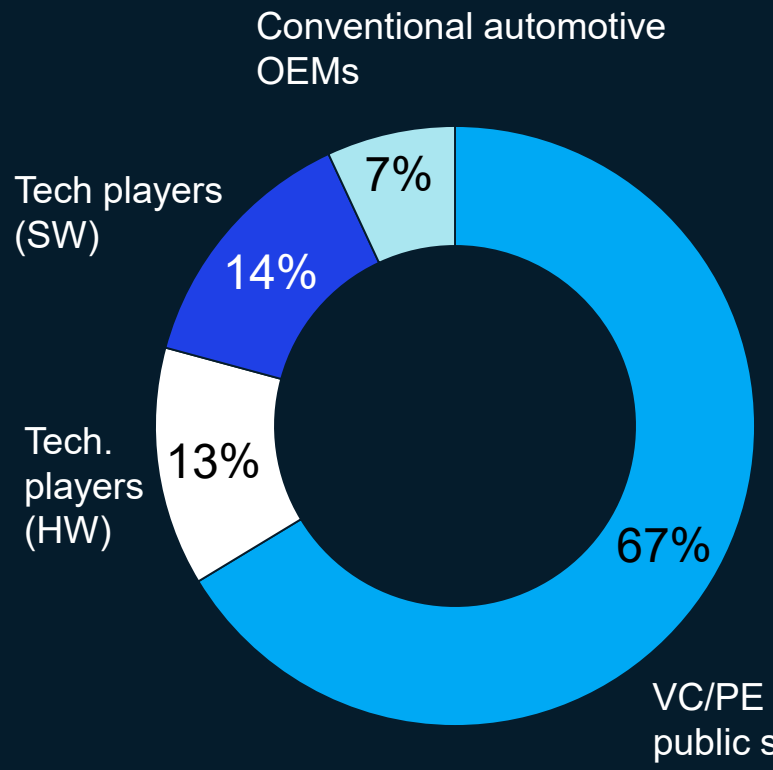
ACES[1] partnerships at top-13 OEMs and suppliers worldwide

No. of partnerships



Sources of investment in ACES companies

Percent



93% comes from non-automotive manufacturers

2/3 comes from financial investors

1 Autonomous driving, connectivity, electro-mobility

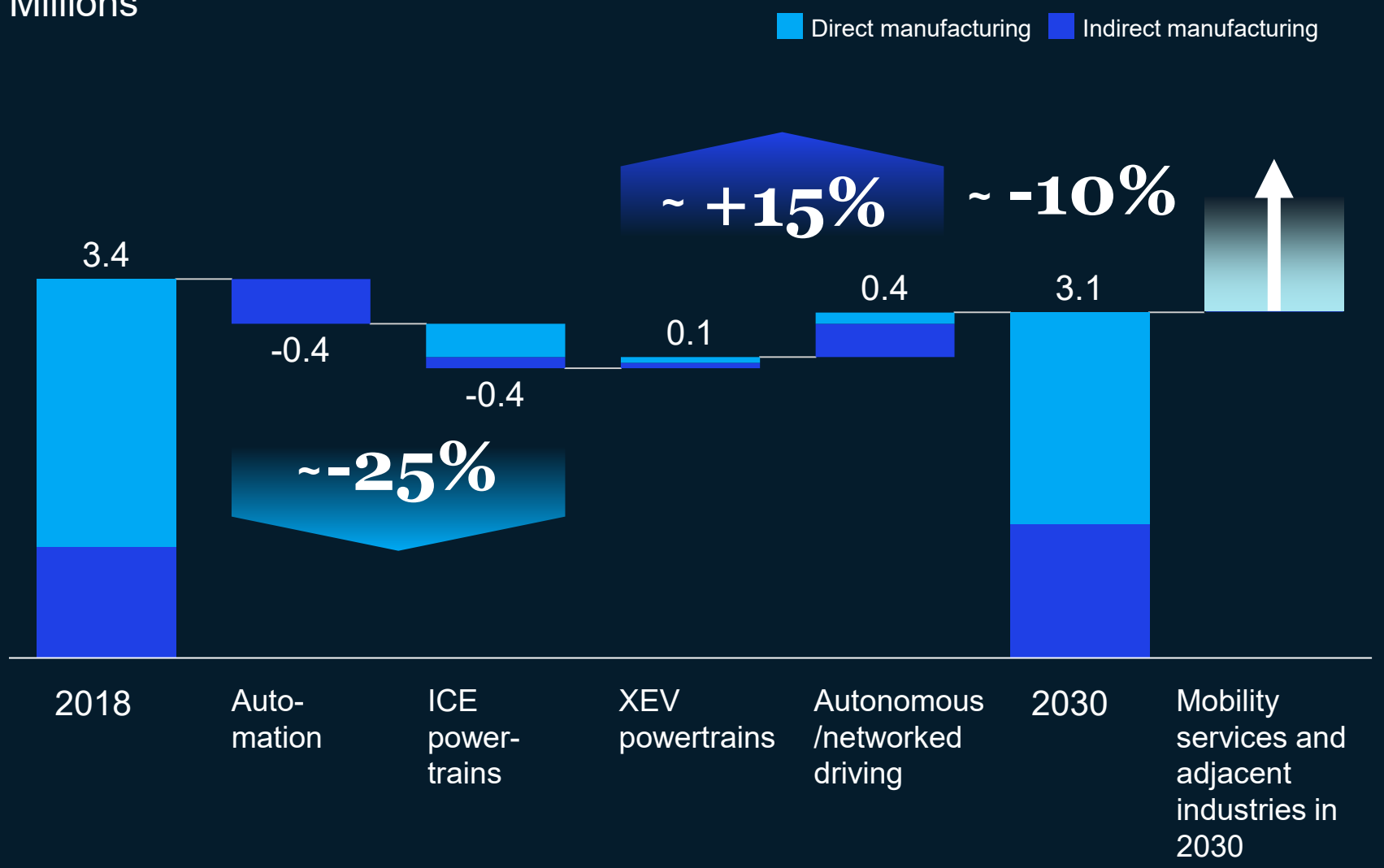
SOURCE: McKinsey Growth Analytics – Horizon Scan; CapitalIQ; Pitchbook

3

Re-skilling in the automotive industry for the period from 2018-2030 can already be quantified today

Manufacturing jobs in the EU automotive industry

Millions



SOURCE: McKinsey Center for Future Mobility

1 Energy, infrastructure, chemicals, etc.