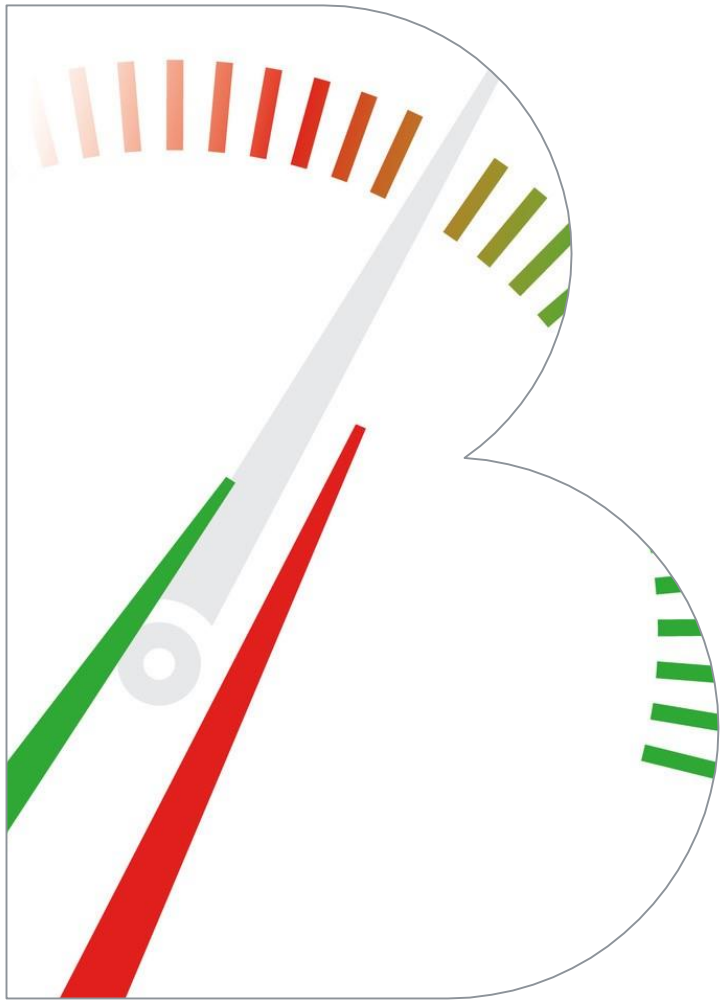
THE ROAD AHEAD
for Italian automotive suppliers – 2030 and beyond

Presentation



ANFIA Associazione Nazionale Filiera Industria Automobilistica

Roland Berger

November 16 2020

A

The Automotive industry is experiencing massive disruption

B

Electrification, autonomous driving and "digital soul" are key

C

Italian automotive suppliers must embrace change

This study aims to identify future opportunities for Italian automotive suppliers, through a strong involvement of the Auto community

Focus and methodology of the study

Perimeter: light vehicles

Output of the study

- Overview of ongoing trends in global automotive industry
- Presentation of technology trends associated with xEV, AD & connectivity
- Mapping of Italian components market AS-IS & analysis of readiness on emerging modules
- Identification of future opportunities for Italian suppliers
- Suggest industrial policy to support the Italian suppliers

Methodology

30+ interviews to top decision makers

- **15** OEMs and suppliers
  - Aggregated sales: > EUR 100 Bn
  - Full coverage of car component domains
- **3** Foreign associations
- **2** Universities (Politecnico Milano 1863, Politecnico di Torino)
- **5** Senior Executives (ANFIA)
- **10** Senior Experts (Roland Berger)

Benchmark analyses

- **Top 100** National automotive suppliers
- **Last 10y** Automotive industrial policies

Source: Roland Berger

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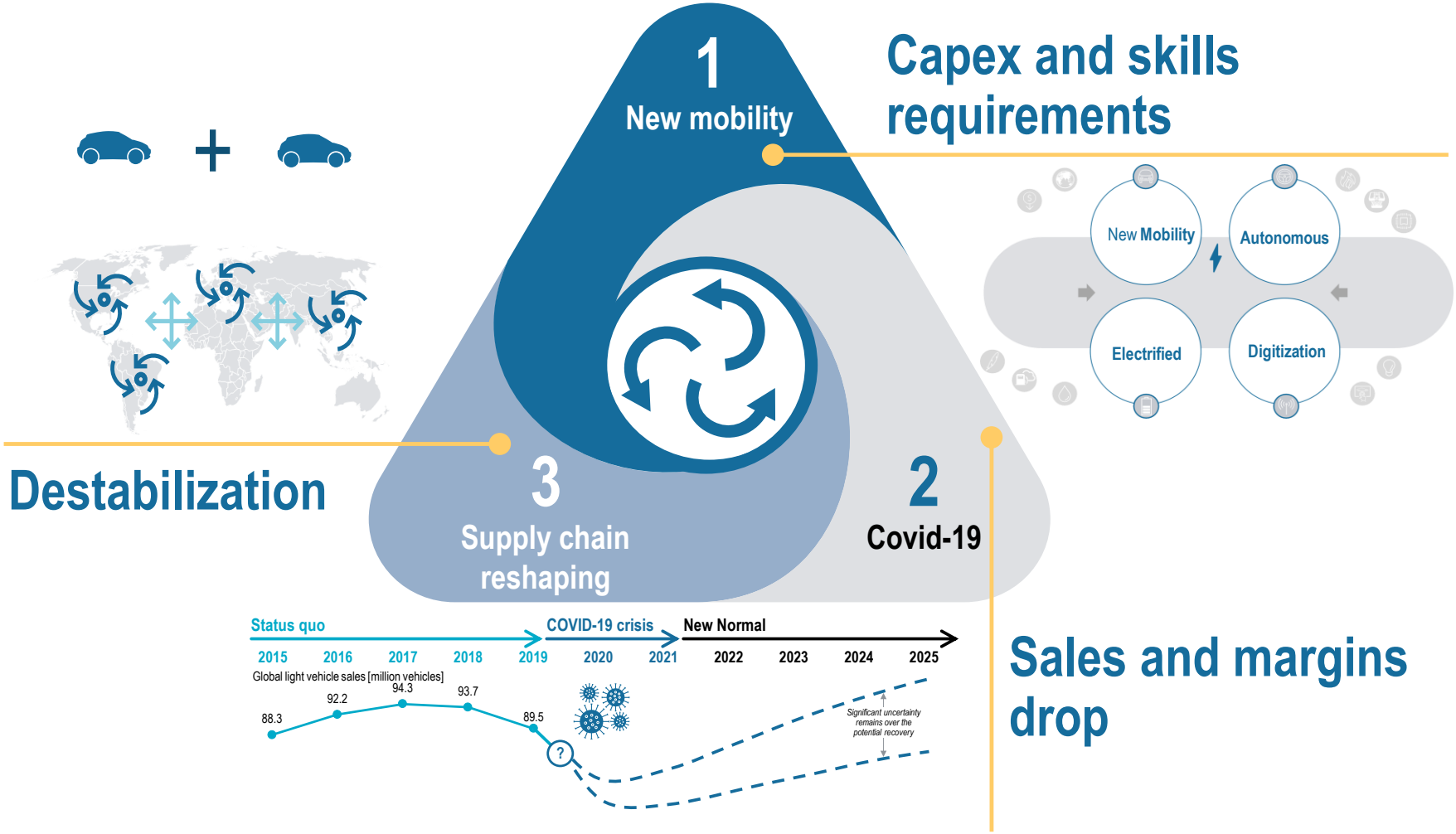
The Automotive is tackling a perfect storm resulting in additional pressure on suppliers

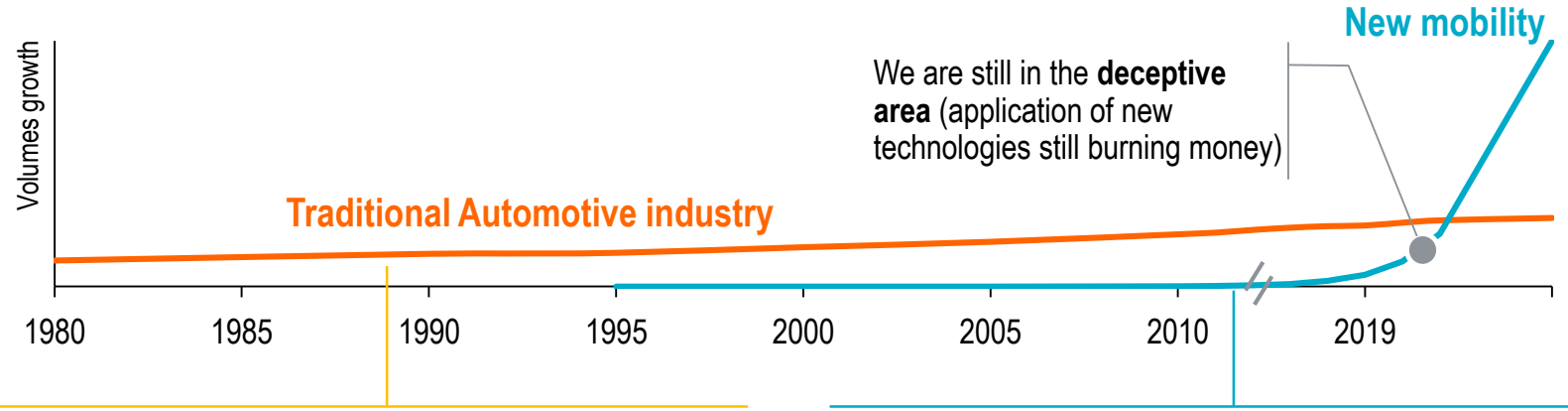


Source: Roland Berger

For decades, the Automotive industry followed a "linear paradigm": Exponential acceleration? We are still in the deceptive area

Traditional Automotive industry growth compared to new mobility development

Illustrative



Linear paradigm

> **Time to reinvest** Enterprise Value: ≈ **4.1 years for Auto** Industry vs ≈ 20 years for other Industries
> **Capex development** for auto industry: ≈ **10-12% CAGR** ('10-'14)
> Up to **50% development costs undiscernible** to customers
> **Platform convergence** (e.g. MQB architecture)
> **Industry consolidation**

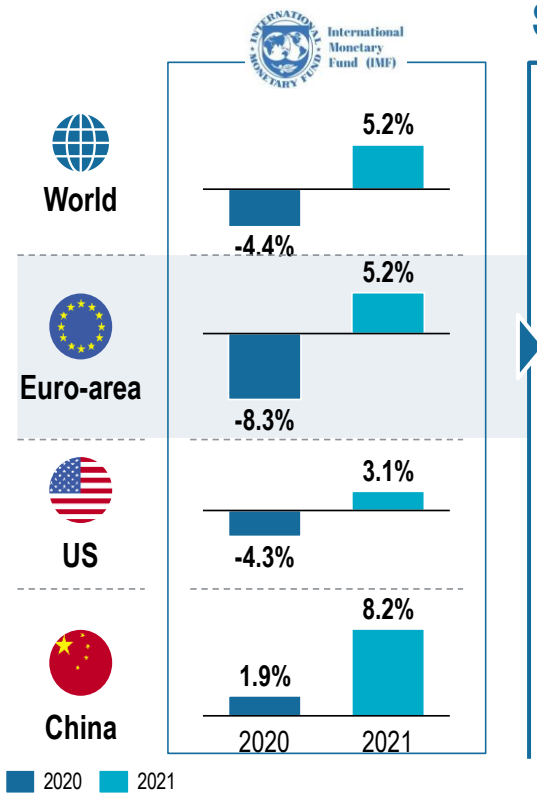
Exponential paradigm

> **New tech challengers**
> **Towards a frictions free state** (technology, regulations, habits)
> **Make-or-break** attitude
> Designing the future through **massive investments**
> **Preventive competition**:
  – Compared to **rival technologies** (e.g.: BEV vs. FC)
  – **Among OEMs**

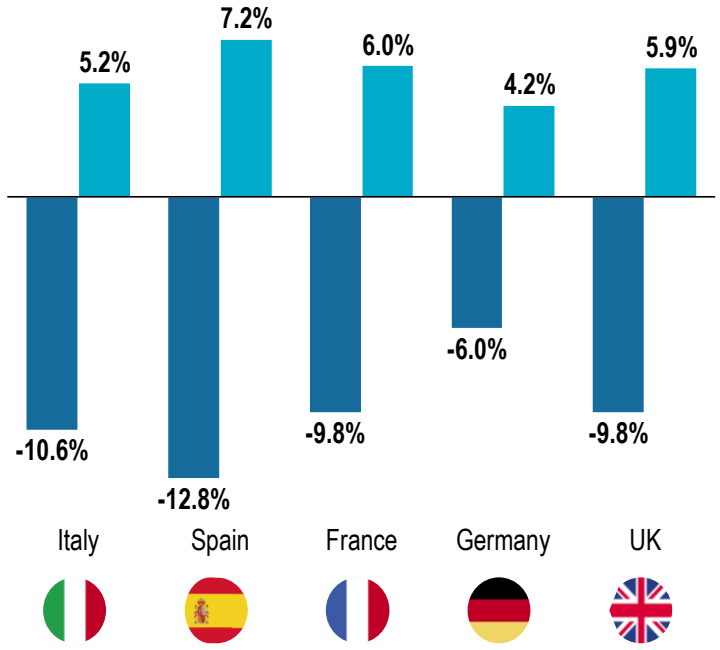
Source: FCA - Confessions of a Capital Junkie, Press research

Global economy heavily affected by Covid-19 in 2020 with expected partial recovery in 2021 – Italian GDP plunging by -11% this year

Covid-19 impact in world economies – Expected GDP growth [2020-2021; %]



Selection of European countries



VUCA world

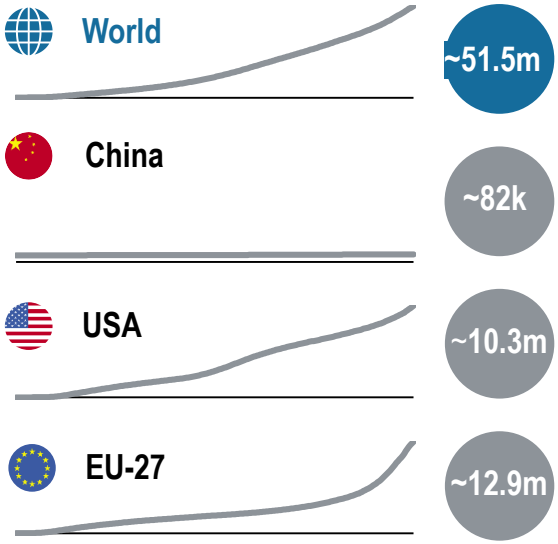
- Volatile
- Uncertain
- Complex
- Ambiguous

Source: IMF (October 2020), Roland Berger

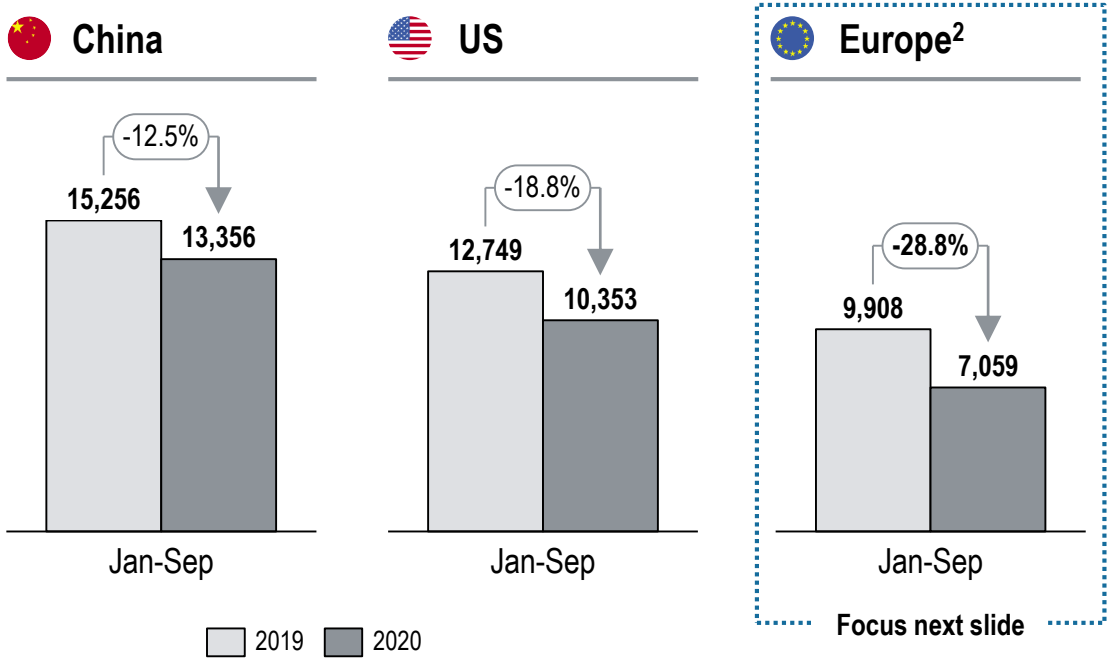
Europe shows the strongest negative impact for Covid-19 in the period Jan-Sep vs. 2019: -29%

Passenger car registrations [2020; units '000]

Development of Covid-19 infected[1]



Breakdown of registrations by area



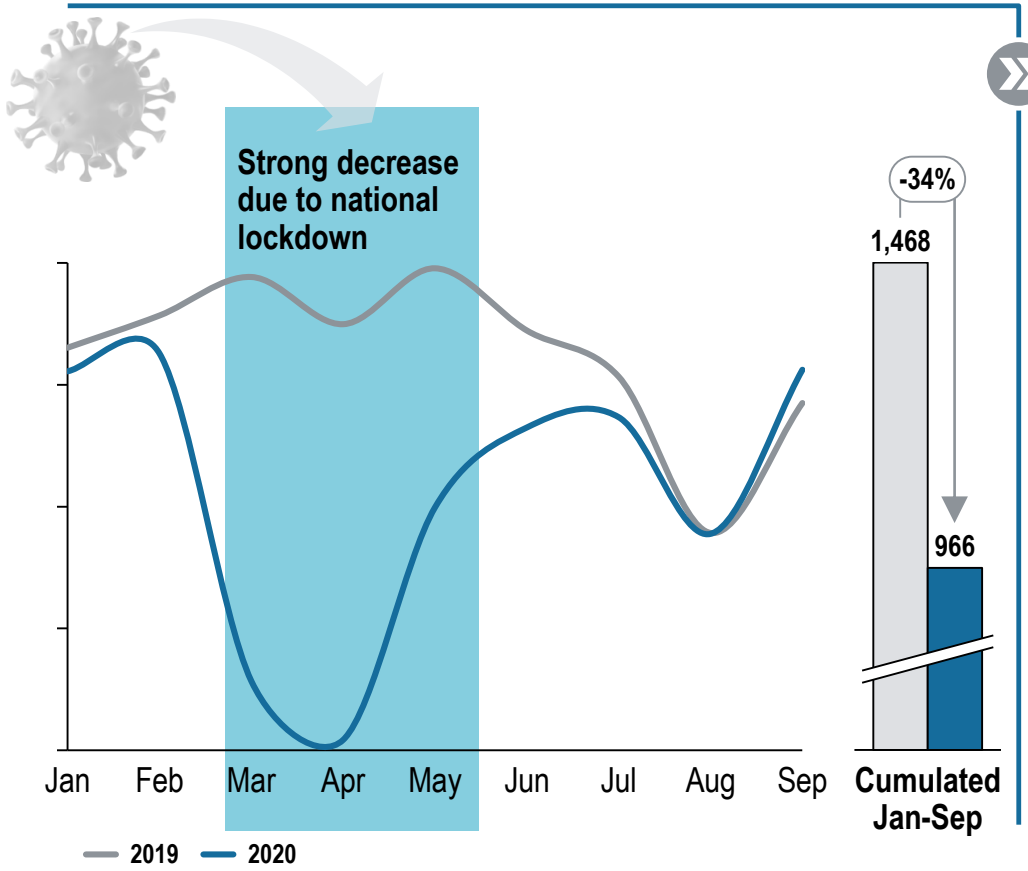
1) As of November 11th from 2nd of March 2020; 2) European Union

Source: ECDC (European Centre for Disease Prevention and Control); ACEA; IHS; CAAM; Roland Berger

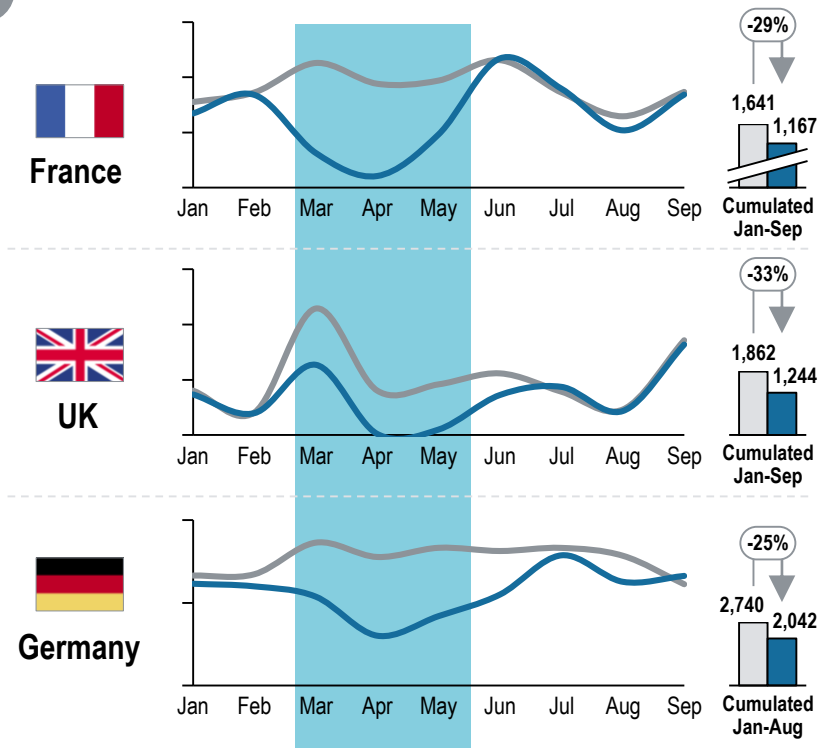
Italy has suffered from the lockdown on March and April with -85% and -97% vs. '19 respectively – Slight rebound in September 2020

Passenger car registrations – European countries [2020; units '000]

Italy



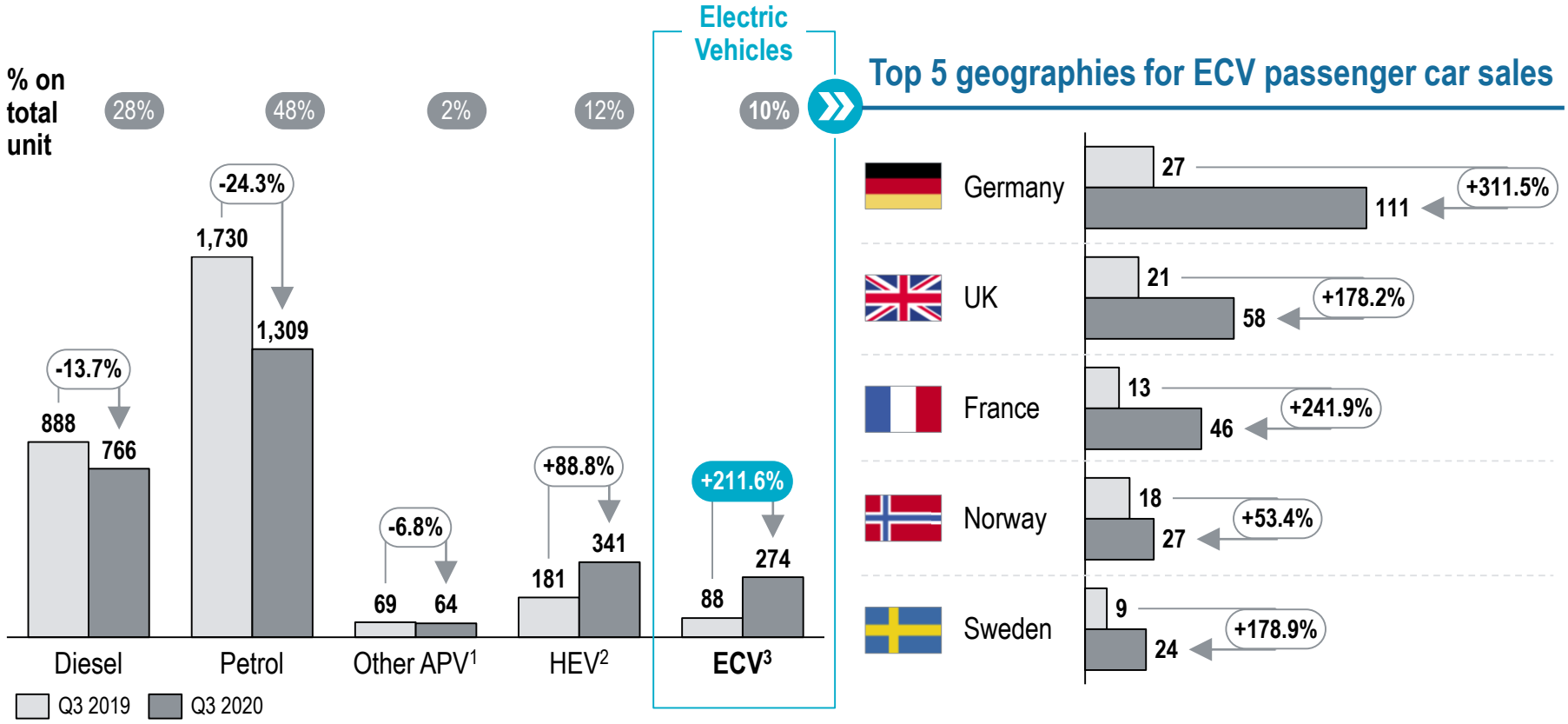
Other key geographies



Source: ACEA; Roland Berger

Despite a 10% weight in Q3 2020, ECV showed an inverse and positive trend displaying +212% in sales vs. Q3 2019

Passenger car registrations by type of fuel – Europe [Q3 2020; units '000]



1) Alternative Power Vehicles other than electric: includes Natural Gas Vehicles, LPG-fueled vehicles and ethanol (E85) vehicles; 2) Hybrid Electric Vehicles: includes full and mild hybrid
3) Electric Chargeable Vehicles: includes Battery Electric Vehicles (BEV), Fuel Cell Electric Vehicles (FCEV), Plug-In Hybrid Electric Vehicles (PHEV), Extended Range Electric (EREV) – Figures in chart related to the European Union (not including Iceland, Norway, Switzerland, UK)
Source: ACEA

Suppliers under pressure given OEMs' business combinations and the emerging production/logistics paradigm in the new normal

Technology-focused OEM alliances

Global merger

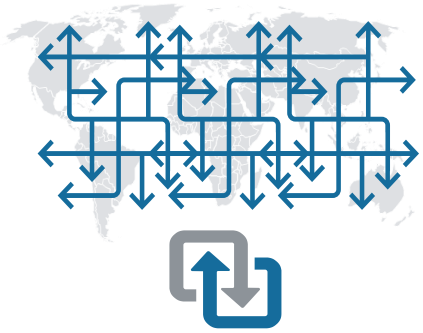
FCA PSA GROUPE STELLANTIS

xEV and Autonomous driving alliances

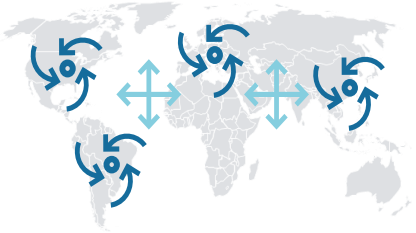
GEELY DAIMLER

Rethinking production and supply chains

Pre Covid-19 era – GLOBALization



Post Covid-19 era – GLOCALization

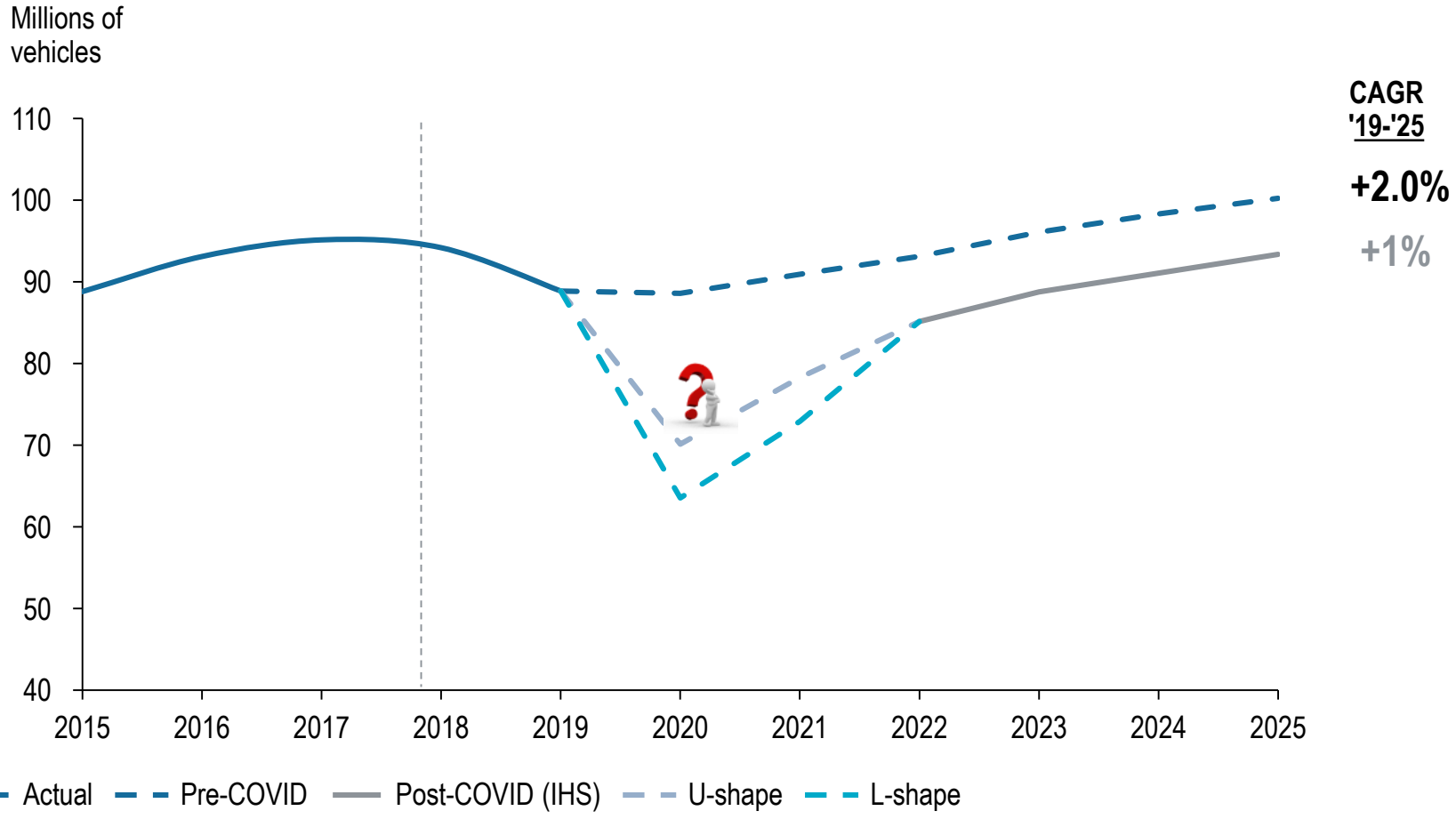


Further suppliers' destabilization

Source: Desk research, Roland Berger

In the medium term the industry is expected to grow at 1% p.a. (2% p.a. before Covid-19)

Global LV production [2015-2025; m units]

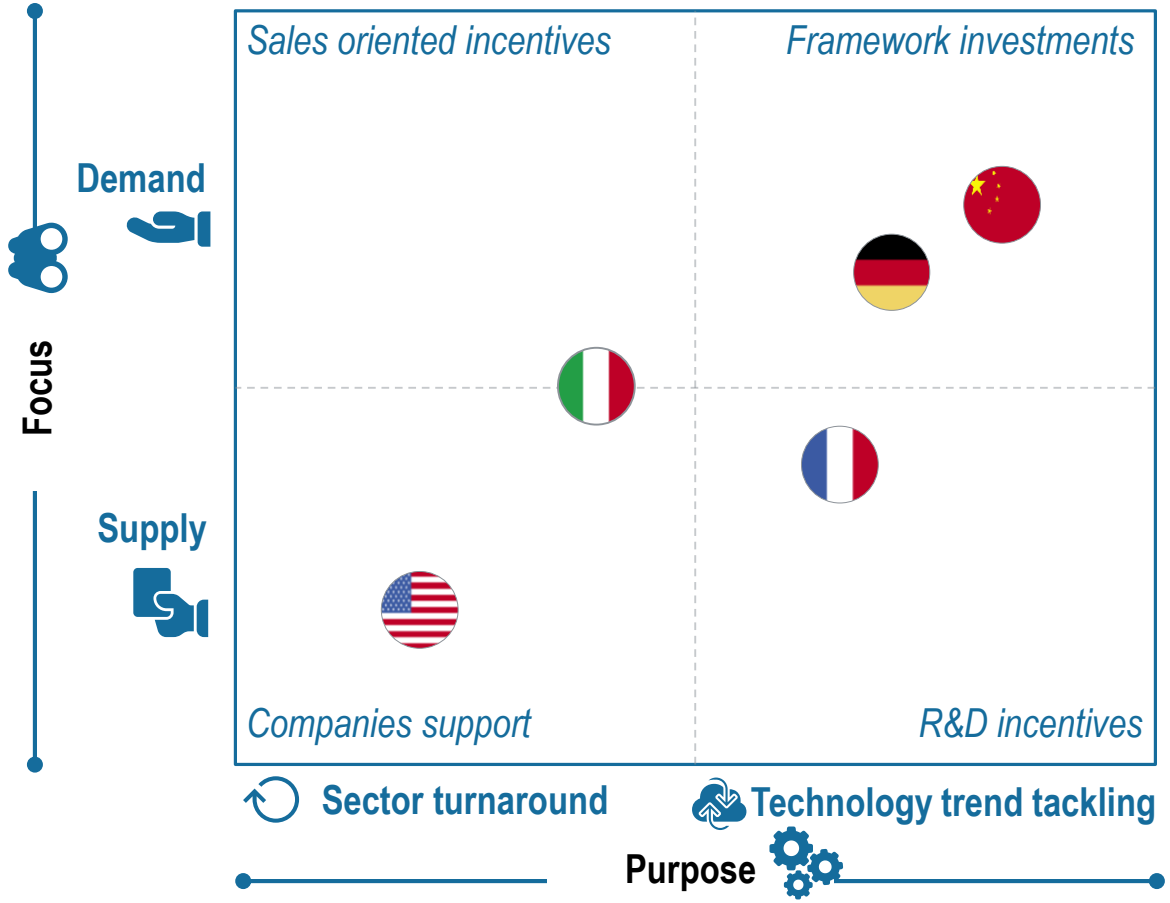


Source: IHS, Roland Berger

While GER, FRA, CHI have modelled their post Covid-19 measures on technology advance, ITA and US more focused on turnaround

Post Covid-19 recovery measures: main focus by country

Illustrative

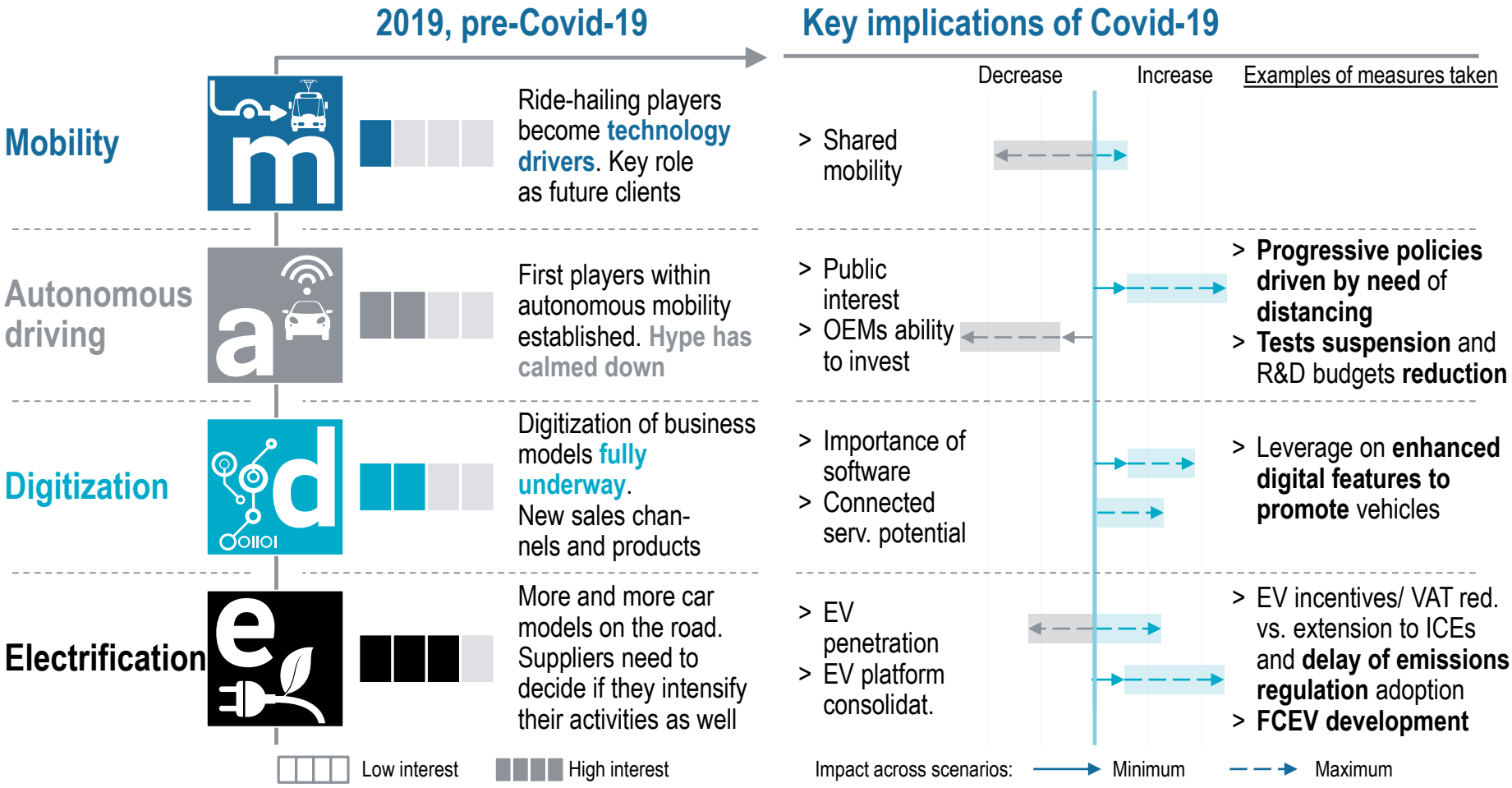


- > **Demand feeding** with emerging **technology perspective**
- > **Demand/supply turnaround support**
- > **Immediate supply reinforcement** while seeding for the **future**
- > Short-term **companies support** with potential bailout

Source: ACEA, Desk research, Roland Berger

Looking forward, Covid-19 accelerates/decelerates the impact of mega trends in the Automotive sector

MADE temperature check Covid-19 implications



Source: Roland Berger

Vehicles are becoming increasingly connected unlocking the possibility of using the data collected for many purposes

Pervasive connectivity: type of data that can be collected and their potential application

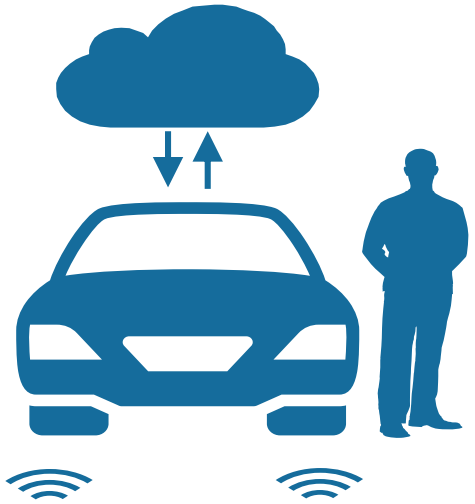
Static technical data

- Fuel consumption
- Mileage
- Engine power
- Tire pressure
- Tire wear
- Tire temperature

etc.

Use cases

> Predictive maintenance
> Remote diagnostics
> etc.



Personal data

- Motion profile
- Driving behavior
- Entertain-ment habits
- Parking positions

etc.

Use cases

> Cloud-streaming audio/ video
> Usage-based insurance
> etc.

Dynamic technical data

- Navigation
- Location
- Parking
- Road tolls

etc.

Use cases

> Car-sharing
> Park assist
> etc.

Safety systems/ADAS

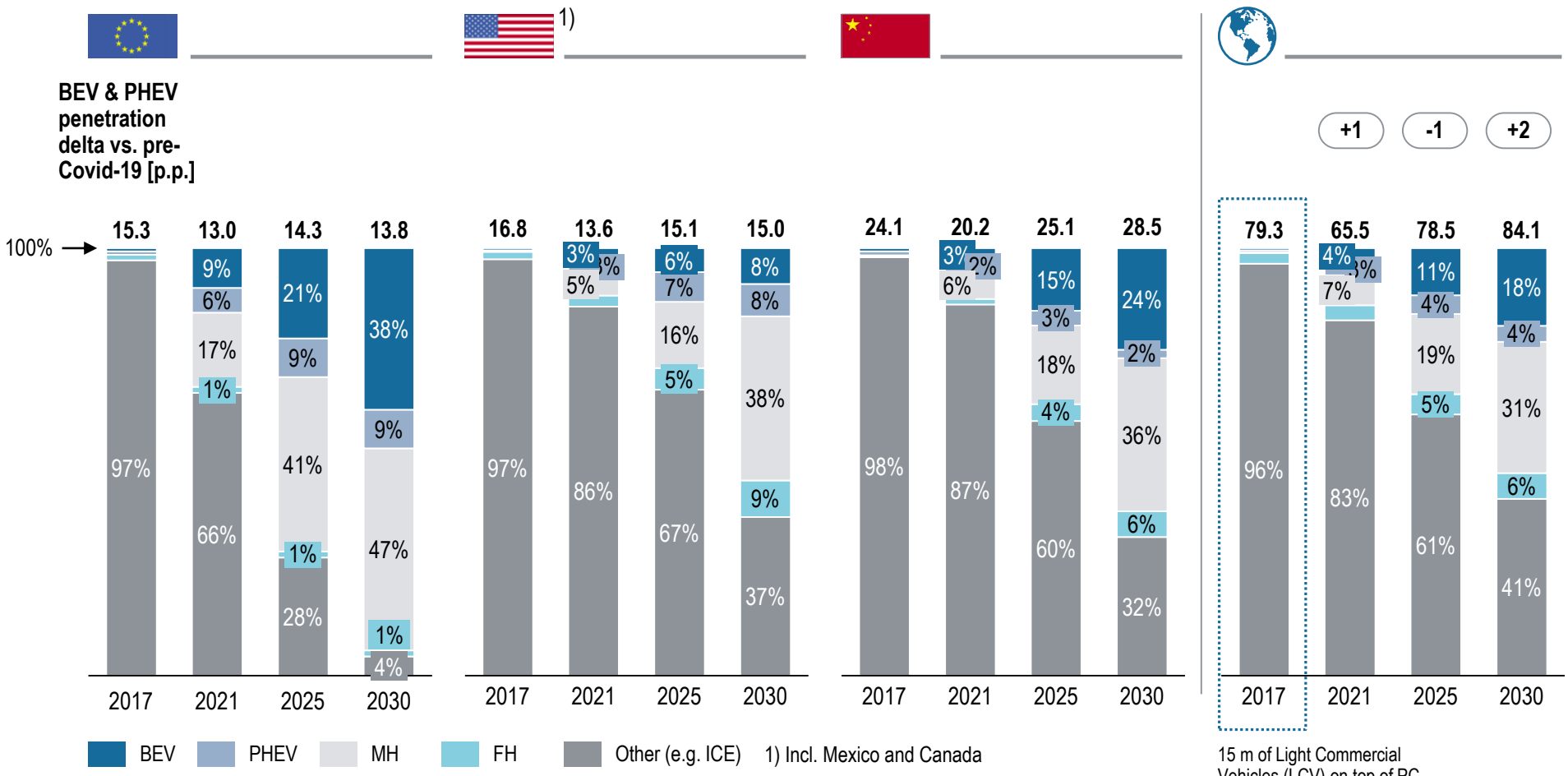
- Area map
- Seatbelt tightening
- Traffic assistant
- GPS position

etc.

Source: Roland Berger

PC sales to significantly shift towards xEV by 2030 with BEV and PHEV penetration to increase by 2 p.p.

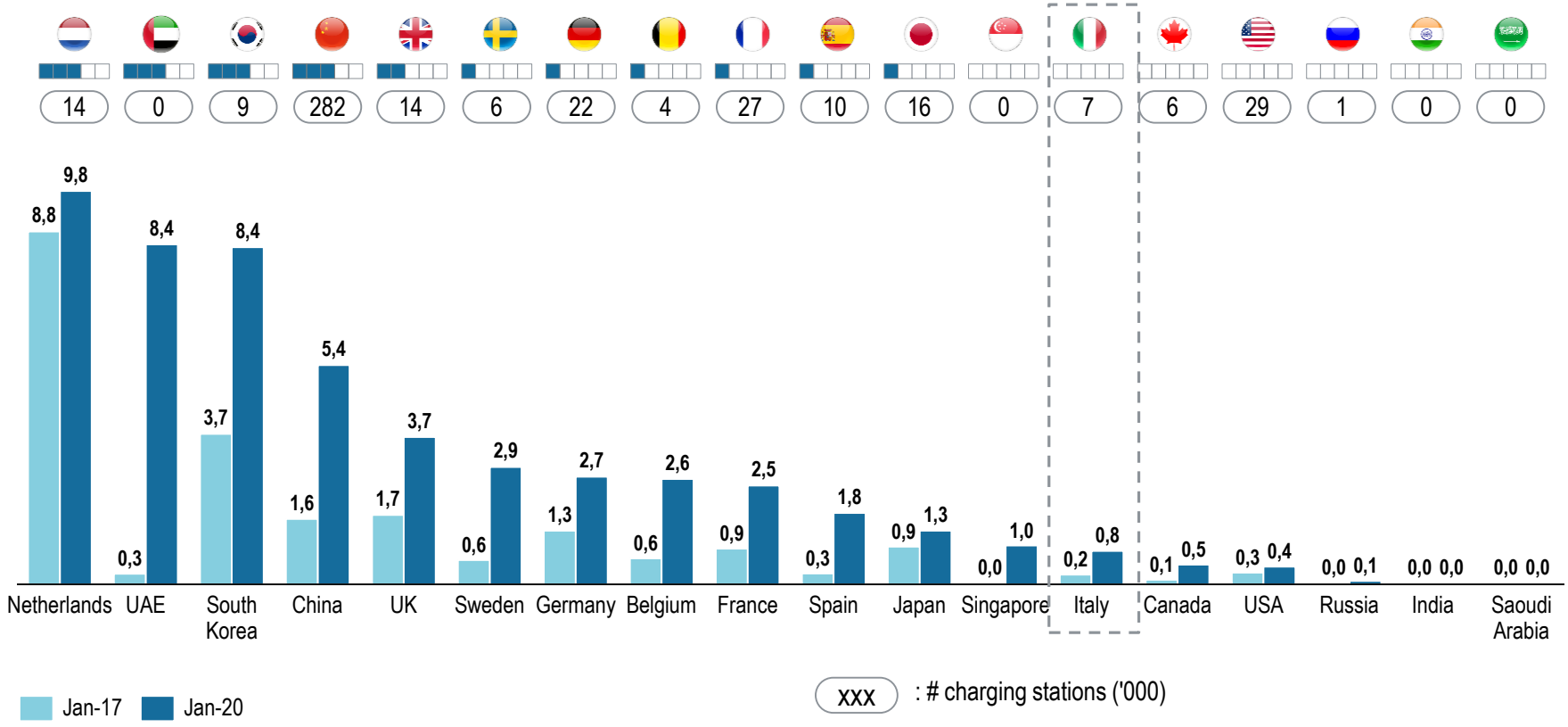
PC sales forecast by region and powertrain type [2017-2030; m units]



Source: IHS; Roland Berger

Netherlands has still by far the highest relative amount of charging stations, China leading in absolute figures

Charging infrastructure [charging location per 100 km roadways]



Source: EV Volumes, Desk research, Roland Berger

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The electrification creates discontinuity vs ICE, with traditional parts that need to be adapted and new opportunities (parts & services)

Overview of technological trends driven by vehicle electrification

1  Simplification of the vehicle architecture

2  Transformation of traditional components

3  Introduction of new components

4  New service offering

Sources: Expert interviews, Roland Berger

Vehicle digitization lays the foundations for the development of new mobility concepts, Autonomous Driving and new services

Overview of technological trends driven by digitization

1  Connectivity as the enabler

2  Consolidation of ECUs

3  Boom in ADAS sensors

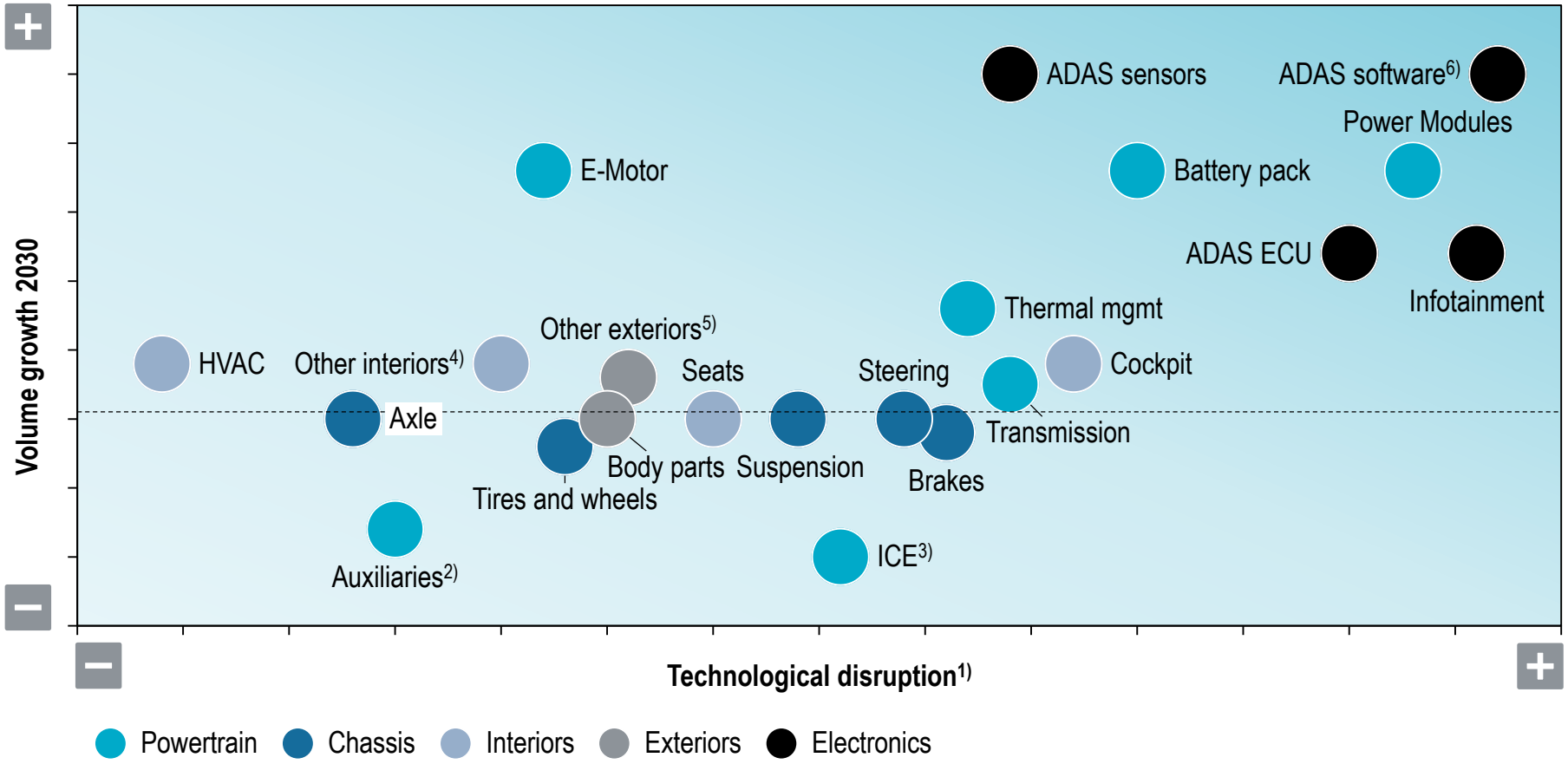
4  Growing importance of software

5  Redesign of the onboard experience

Sources: Expert interviews, Roland Berger

Modules impacted by technological change represent an opportunity – EV & Digitization trends affect both traditional and new modules

Market opportunities – Classification by growth & level of technology disruption



1) Opportunities generated by the technological innovation: 2) Incl. air intake, auxiliary drive, fan, fuel delivery, oil filter, oil pump, other, piping, radiator; 3) Incl. Engine, Exhaust, Injection, Ignition/Glow system and Valve train; 4) Incl. vehicles security, carpets, trim, trunk mgmt., window lifter and wiring; 5) Incl. BiW, lighting, lock system and windows; 6) Includes cybersecurity

Source: Expert interviews, Roland Berger

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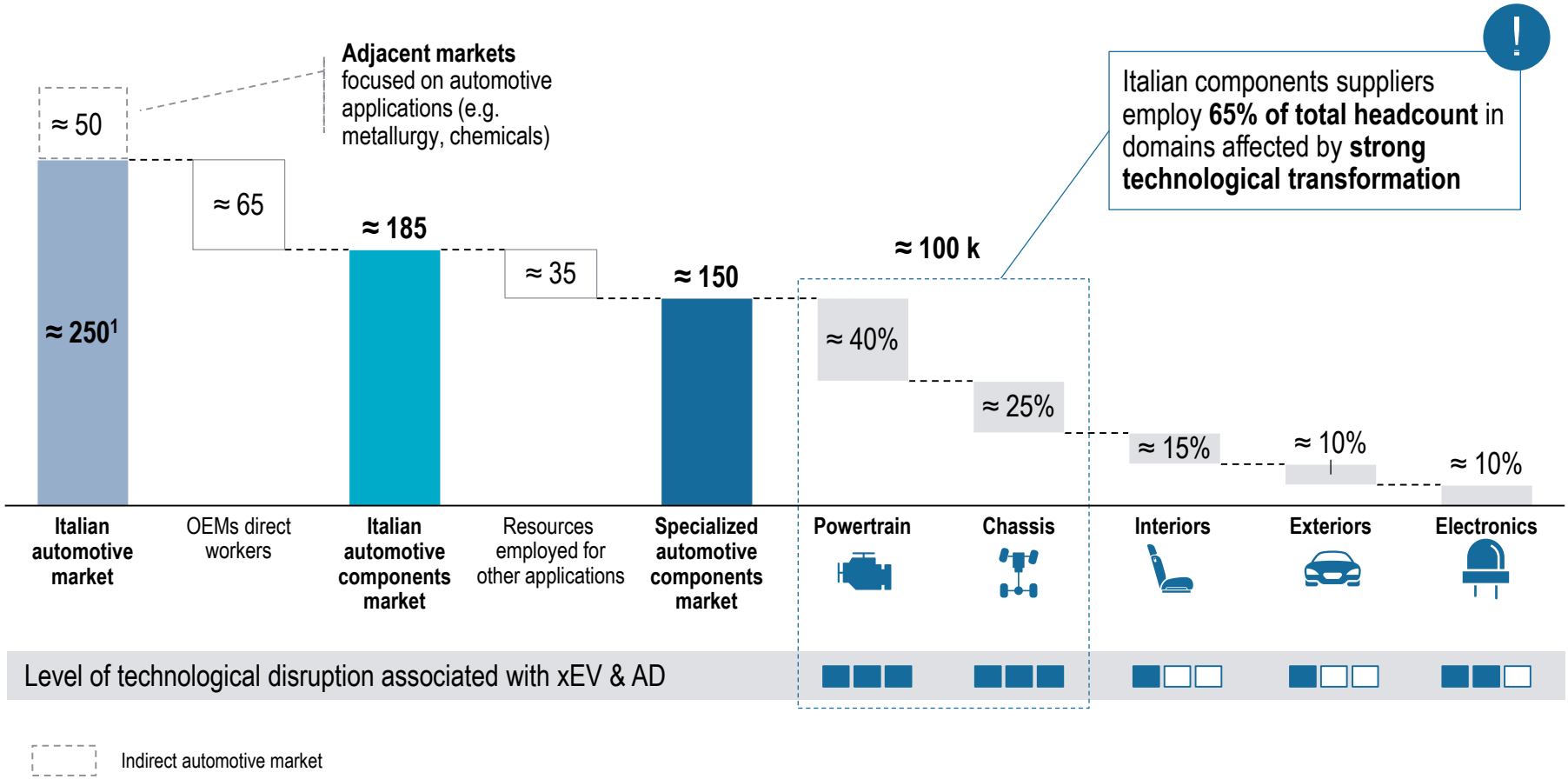
Most impacted domains by electrification and autonomous driving account for ≈65% of employees (≈ 100k)

Automotive workers breakdown by domain in Italy [2018; k workers]



1) Osservatorio Componentistica ANFIA

Source: ANFIA, Companies financial statements, Roland Berger

In order to avoid job losses, Italy needs to update skill sets – Increasing demand for IT & software engineering skills

Importance of necessary skill-sets and change in job vacancies

Mechanical engineering

Software engineering

2000

- > **Milestones** in mechanical engineering
- > Electronics limited to **simpler**, not differentiating applications
- > Unique characteristics for differentiation mainly in the domains of **handling** and **engine performance**

2018

- > Mechanical parts start to offer **limited or less potential** for further improvement
- > Advanced driving assistants implemented with **scattered software solutions**
- > Unique characteristics for differentiation split across the domains of **eco-friendliness**, **individualization** and **infotainment**

2025+

- > Mechanical parts and engine performance have become **commodities**
- > **Fully integrated software solutions** offer unique driving experiences, including autonomous driving
- > Differentiation by **comfort**, **autonomy** and **additional services**

Change in job vacancies in Europe[1)]

Mechanical engineer

2017 2018 **-21%**

Software engineer

2017 2018 **+56%**

IT specialist

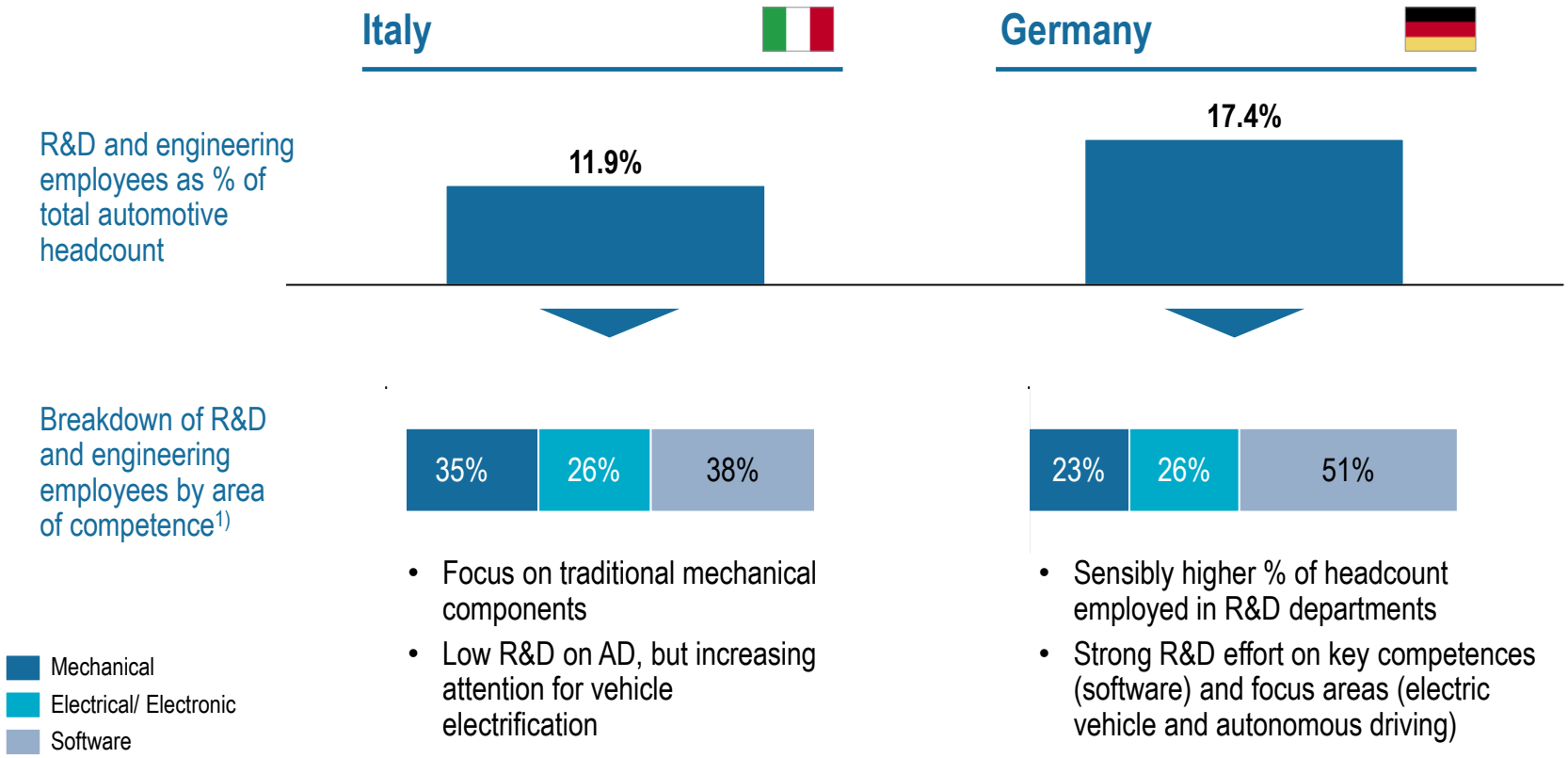
2017 2018 **+14%**

1) Based on engineering jobs on Linkedin

Source: Roland Berger , Verband Deutscher Ingenieure, absolventa, karriere.de

Italian suppliers employs sensibly less R&D people compared to Germany – R&D in Italy still very focused on mechanical parts

R&D headcount benchmark



- Focus on traditional mechanical components
- Low R&D on AD, but increasing attention for vehicle electrification

- Sensibly higher % of headcount employed in R&D departments
- Strong R&D effort on key competences (software) and focus areas (electric vehicle and autonomous driving)

1) Other areas/ focus not included in the analysis

Sources: Linkedin; Roland Berger analysis

There is an Italian competence pool in innovative modules even if still very fragmented – Need for collaboration & aggregation

Innovative modules – Competence pool in Italy

Exemplary

Autonomous driving[1]

- Hercules[2]
- VisLab
- Rob.y[3]
- Pitom
- Next
- TUC technologies

Connectivity and data analytics

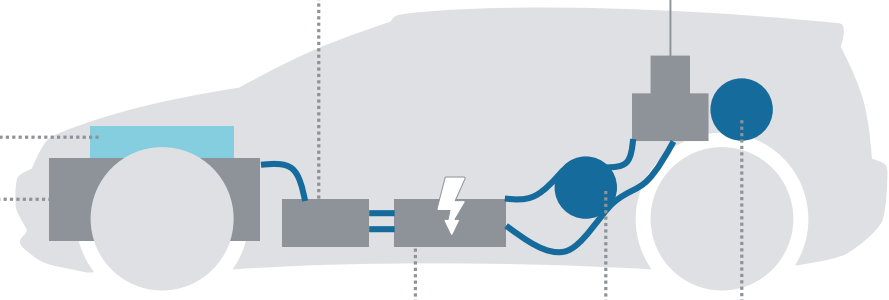
- Targa telematics
- Vodafone automotive
- Telepass
- Octo telematics
- ART group
- Digicom
- Tierra

Battery packs

- Midac
- Seri industrial
- Green energy storage
- Aptiv
- Bettery
- Sovema group
- Tawaki
- Flash battery[4]
- Podium engineering
- FIAMM

Services

- Fleetmatica
- Enel X
- Driwe
- Kiunsys
- Be Charge
- Dianché
- Daze Technology
- Fimer
- E-Gap



Electric motors

- Askoll
- Eurogroup
- Bonani motori elettrici
- Bonfiglioli
- Mavel EDT
- Atop
- Lafert

Electronics

- ST
- Eldor corporation
- Zapi
- Marelli
- Eurotech

Fuel cells

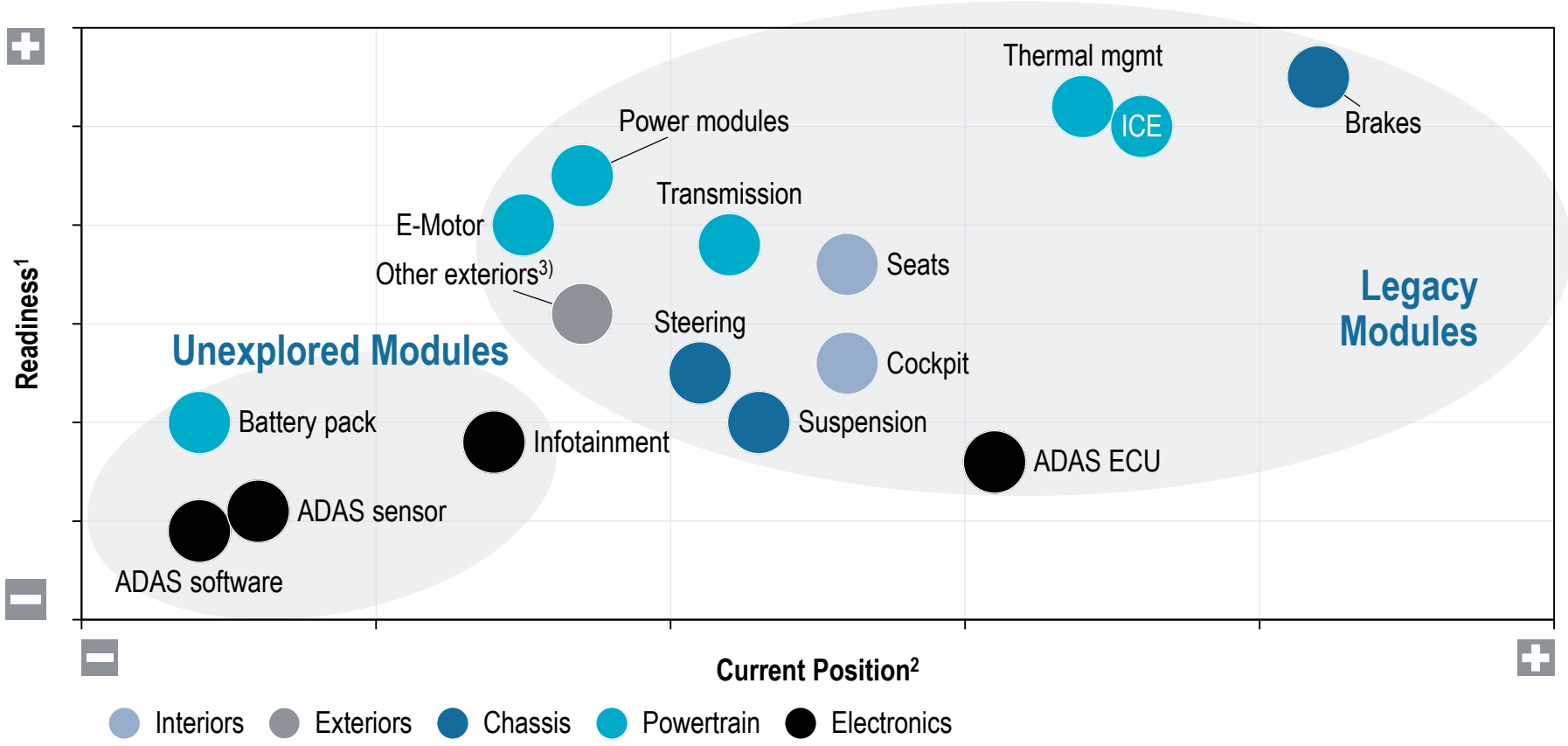
- Hydro2Power
- Iveco
- SASA
- OMB Saleri
- Solid Power
- Adler group
- HydroMoving
- Landirenzo

1) Includes modules with mostly AD purposes (e.g. modular vehicle platforms like the ones from Next, Rob.y or TUC technology); 2) Project carried on by European Union; 3) Technology developed by e-shock which is part of e-novia; 4) Product developed by Kaitek

Sources: Roland Berger

Italy is well equipped to take advantage of opportunities in modules with established presence, but not ready to enter the emerging ones

High potential modules – Current fit for the Italian industry

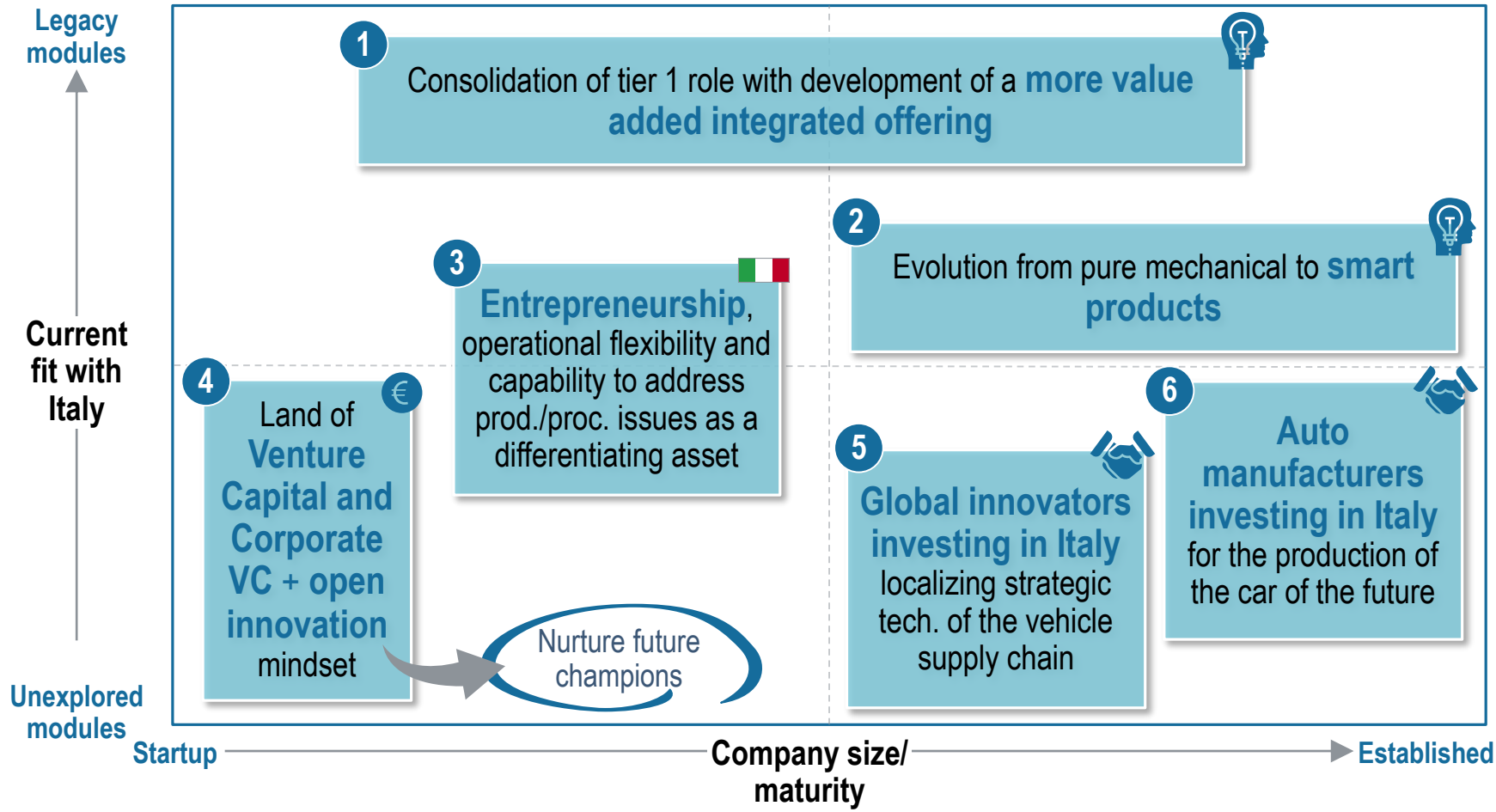


1) Based on investments in the module (e.g. R&D) and availability of skills; 2) Based on current production and Italian market share in Europe: 3) Incl. BiW, lighting, lock system and windows

Source: Expert interviews, Roland Berger

Companies in legacy modules should enrich their offering, evolve their business model and embrace radical innovation

Playfield: opportunities for Italy by company maturity and type of module



Source: Roland Berger

Global battery manufacturers have opened European plants outside Italy – opportunities for Italy to capture FDI

Global producers of innovative modules

Battery

Country	Company	Plants in Europe
	A123 Systems	
	AESC	
	BYD	
	CATL	
	GS Yuasa	
	Inzi Controls	
	LG Chem	
	Northvolt	
	Panasonic	
	Samsung SDI	
	SK Innovation	
	Tesla	

Lidar

Country	Company	Plants in Europe
	Aeye	
	Baraja	
	Blackmore	
	Cepton	
	Hesai	
	Innoviz	
	Luminar	
	Omron	
	Ouster	
	Pioneer	
	Robosense	
	Velodyne	

xEV

Country	Company	Plants in Europe
	BAIC[1]	
	BYD	
	Canoo	
	Chery	
	FAW[2]	
	Geely	
	JAC[3]	
	Leap Motor	
	Lucid Motor	
	NIO	
	Rivian	
	Tesla	

1) Present in Italy with R&D center; 2) MoU for production in Motor Valley;
3) Present in Italy with Design center

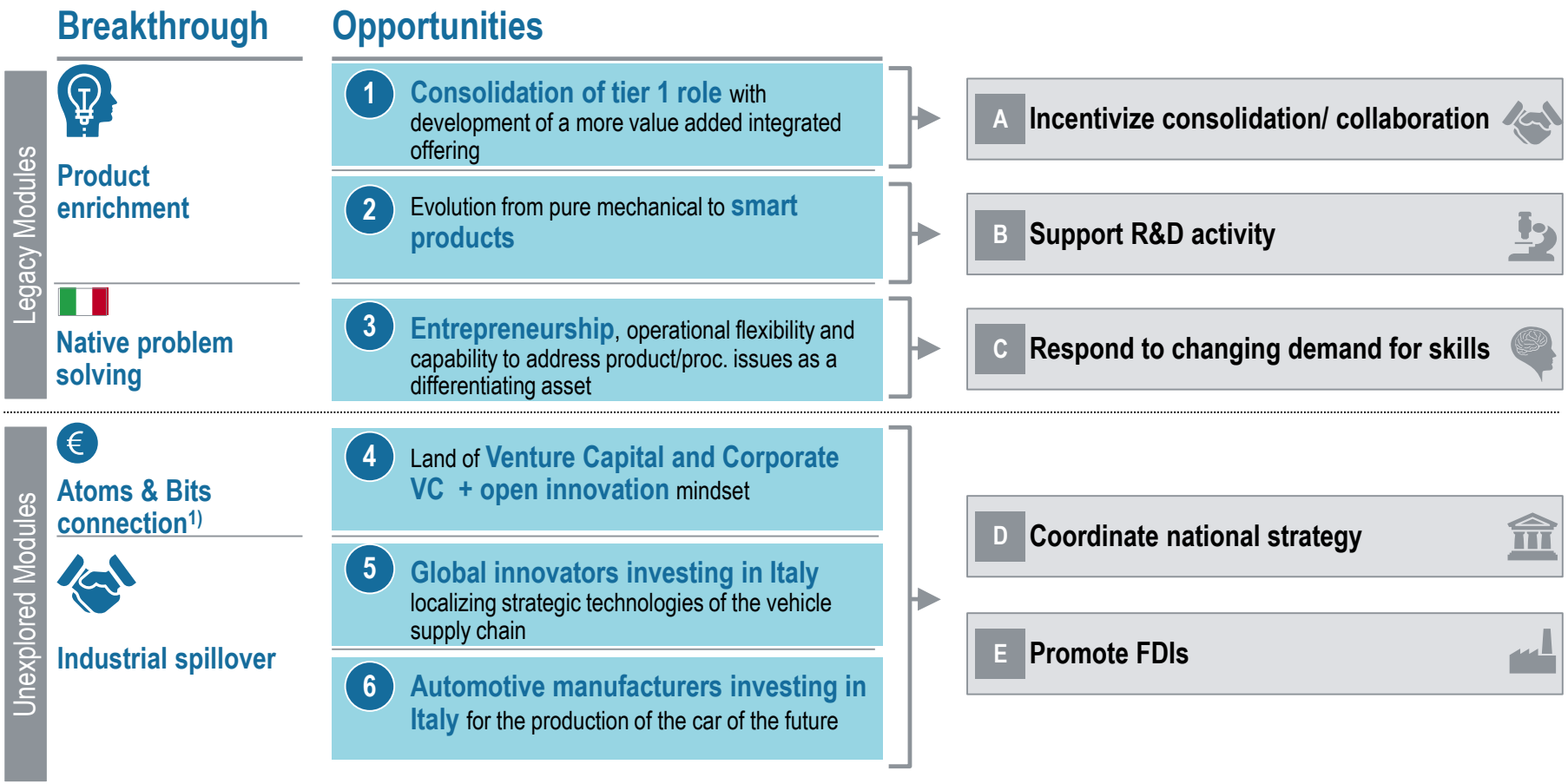
No presence in Europe

Planning to open European plant

Source: desk research, expert interviews, Roland Berger

Industrial policies are essential to succeed: government should play an active role in order to take full advantage of industrial opportunities

Guidelines for Industrial policies



1) Atoms stand for well-established companies, Bits stand for start-ups

Source: Expert interviews, Roland Berger

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