

accenture

THE ELECTRIC VEHICLE

**Why manufacturers need to rethink
their ecosystems, the customer
journey, and the entire value chain**



Mobility's next stop: Electric vehicles

The mobility industry has been responding to a global demand for higher sustainability for many years. The electric vehicle (EV) is one answer. The acceleration toward EV production is shaking up the automotive industry in ways no one could have predicted. How manufacturers respond could mark an industry revolution not seen in decades.

Original equipment manufacturers (OEMs) face growing pressure to address a dramatically shifting industry and customer landscape:



SUSTAINABILITY NEEDS are growing and maturing, especially among young people, and particularly where mobility is concerned.



NEW CUSTOMERS—who are living in urban areas and are more likely to use multi-modal urban transportation—are inclined to use digital channels to stay updated on the latest technology developments.



THE CIRCULAR ECONOMY is pushing the automotive industry to make environmentally friendly vehicles along their whole lifecycle—from green production using renewable energies to responsible battery disposal and chemical recycling.



FAST EVOLVING TECHNOLOGIES are reshaping the passenger vehicle through Connectivity, Autonomous, Sharing and Electrification (CASE) trends.

Pushing the e-revolution along, EVs are becoming increasingly sophisticated. For example, Tesla Inc. pioneered the concept of selling wirelessly updatable vehicles, demonstrating that it is possible to transfer updates and new features to the vehicle much in the same way consumers download new software to their smartphones. Today other traditional automotive manufacturers are following suit.¹

EVs are clearly emerging largely as a result of global demand for greener mobility solutions. And over the next decade, battery-powered electric vehicles (BEVs) will be more prominent and gain significant market share. How OEMs respond will steer the industry in new, uncharted directions, driven largely by new customers (and a new customer experience), an evolving value chain evolution and a new essential ecosystem.

Electrification is at the center of the mobility revolution

While e-mobility is a huge game-changer, electrification is not the only factor shaking up the automotive industry. Together, CASE megatrends are revolutionizing the mobility status quo.

Electrification is accelerating the mobility revolution, and is benefiting from connectivity, shared mobility and autonomous vehicle partnerships (see next page).

DID YOU KNOW?

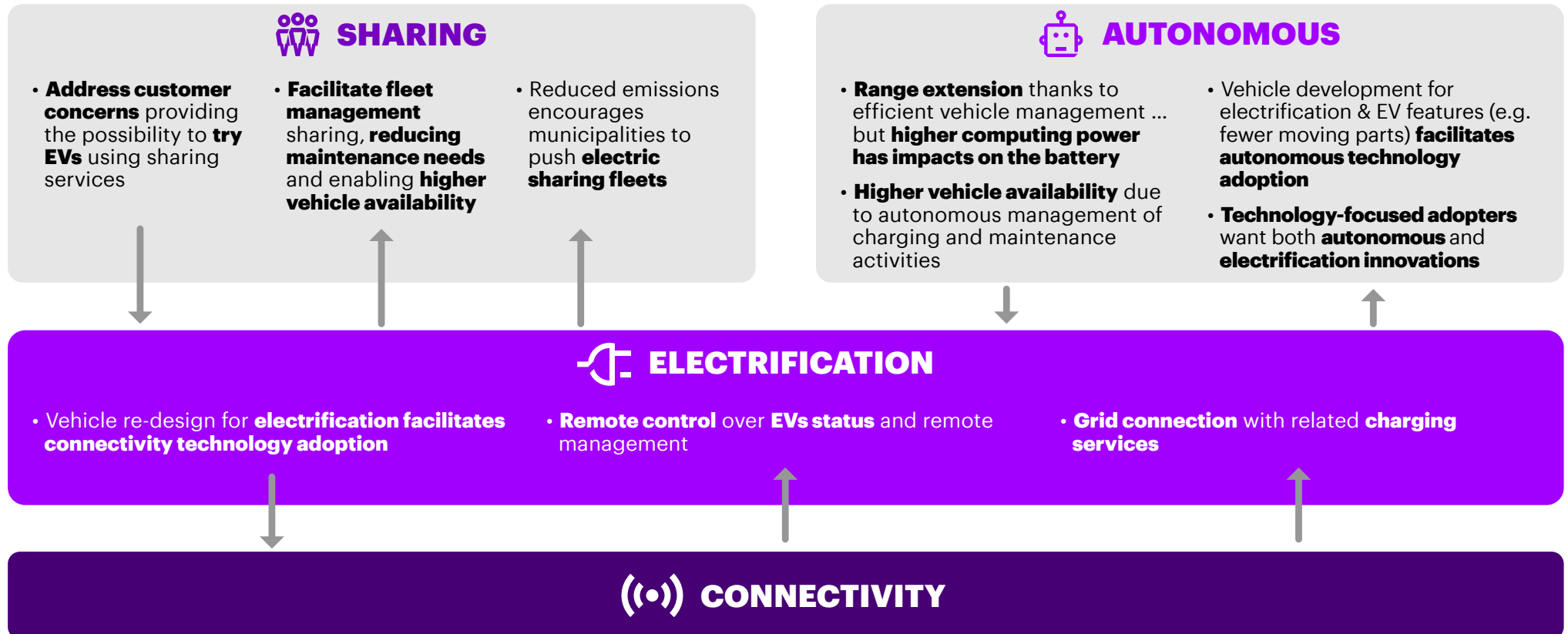
- By 2025, all new vehicles are expected to be connected, and by 2030, 30% will likely be electric³
- 58% of autonomous, light-duty vehicle retrofits and models are built over an electric powertrain⁴
- 45% of car-sharing providers in Europe already operate a 100% electric fleet⁵

Hyundai Motor Group

In 2019, Hyundai launched the first rural carsharing service in Spain that uses 100% electric technology. By using the 'Carsharing Rural VIVE de Hyundai' mobile app—which was developed specifically for this service—users can manage their reservation, unlock the vehicle and locate the nearest charging station, thus highlighting an efficient solution for rural mobility.²



Megatrends shaping the mobility revolution



The battery: At the heart of the revolution

EVs depend in large part on battery power, which changes several components of the traditional OEM playbook.

A new energy tank that redefines the vehicle:

- **COSTS:** The battery represents a single component worth up to 35% of the vehicle's total value
- **PERFORMANCE:** Affects mileage range, charging time and engine power
- **EVOLUTION:** No longer just a standalone vehicle but an active part of the grid enabling effective energy management (vehicle-to-grid or vehicle-to-home solutions)

New materials driving a new supply chain:

- New suppliers and battery manufacturers become essential partners for EV development
- New raw materials—lithium, cobalt, nickel and other materials sourced from alternative countries, such as Democratic Republic of Congo and China, creating potential geopolitical and ethical issues

A new re-fuel concept driving a new customer experience:

- From refueling to re-charging
- From gas station to charging station or home charging
- From vehicle to integrated device, collaborating and exchanging energy with future smart home and cities

A component with a second life:

- Disposed batteries are becoming new energy storage packs enabling renewable energy sources for peak management, opening to new services (such as battery pack rental solutions) or to be used as new batteries for lower performing vehicles



Electrification at a glance

Electrification involves a lighter powertrain with a new energy tank (high voltage batteries), and an increasing emphasis on software. These changes to the vehicle accelerate the need for a new e-customer journey.

Specifically, EV drivers will have a very different charging experience that completely upends the concept of refueling. For example, an EV takes much longer to charge than a simple three-minute fill-up at the traditional gas pump.

Companies are already responding to this development. Volkswagen, for example, offers a new platform specifically for EVs—the Modular Electric Drive matrix.

DID YOU KNOW?

Driven by stringent CO₂ emissions targets, European governments and automotive players in 2019 committed to €60 billion in investments to produce EVs and batteries—3.5 times higher than in China.¹²

Fiat Chrysler

Fiat Chrysler Automobiles is making buying an EV easier by offering at-home charging stations on popular consumer websites and including installation services for any branded EV charger.⁶



COVID-19 EFFECTS

The COVID-19 global pandemic, which introduced social distancing and other major lifestyle changes, redefined mobility. A global lockdown affected every aspect of the automotive sector—from parts suppliers to dealers.

But the push toward vehicle electrification continues unabated—COVID-19 will not stop the revolution. In fact, the number of EVs on the road is expected to reach almost 10 million this year, as sales grow despite the pandemic.⁷ And amid the crisis, EV sales could reach a record share of the overall vehicle market this year.⁸

While converging forces affected its speed differently by region, the e-revolution nevertheless will drive to more sustainable mobility.

The law of threes

Three motivating forces are pushing OEMs toward the EV market

Government regulations and incentives

More stringent CO₂ emission regulations are dovetailing with incentives and subsidies that support EV investment, promotion and sales.

Infrastructure and technology development

Widespread availability of charging stations and technological enhancements (such as higher battery capacity) will all but guarantee vehicle usability and increase customer acceptance.

Customer e-readiness

Consumer awareness of the direct impact their choices and behavior have on the environment are increasingly advancing e-mobility.

E-mobility is leading to a radical change of three key automotive elements

Adopting a new e-value chain

The standard value chain needs to evolve to deal with a new EV, not only from the engineering and manufacturing side, but also from the user perspective. It should include new suppliers and meet new customer needs and expectations.

Creating a new customer experience (for new customers)

A new customer experience is evolving based on charging time and needs. Customers are more attentive to the impact on the environment and the use of renewable energy and resources.

Discovering a new ecosystem

New players are gaining prominence as they disrupt the long-held automotive status quo. To be successful in this market, these new competitors are investing in developing a robust EV ecosystem and charging infrastructure.

Three geographies are leading the e-mobility trend

China

The Chinese government is driving mobility electrification with significant investments in infrastructure, supply chain development and purchase incentives, making China the biggest EV market in the world.

Europe

Europe is increasing efforts toward more sustainable mobility, multiplying investments in both EV production (led by German vehicle manufacturers) and battery supply chain development (European Battery Alliance) and penalizing OEMs exceeding emissions targets.

USA

In the U.S., many states are investing in EVs and adopting stronger regulations, targeting more sustainable mobility and emissions reduction.

Manufacturers face three additional hurdles

Traditional OEMs are facing new challenges related not only to a new product, but also to emerging customer expectations and skepticism toward EVs (see next page). They must address three main issues to reach the mass market:

1. Vehicle profitability

High investments—which are required for EV development and production—significantly impact OEMs’ profitability. This is at a time when sales volumes are still limited and purchasing prices must be contained to make EVs affordable and appealing to customers.

2. Vehicle usability

Customers’ concerns about EVs’ range and limited charging options remain despite major improvements in technology and infrastructure.

3. Environmental sustainability

EVs’ total sustainability is a significant challenge, forcing OEMs and all players to focus on vehicles’ entire lifecycle—not only tank-to-wheel but well-to-wheel emission reduction.

A new essential ecosystem is emerging

The electric revolution creates a new, evolving ecosystem that includes utilities, charging infrastructure developers, new mobility service providers and battery manufacturers, to name a few important categories. OEMs will have to work with new players and orchestrate the ecosystem to develop a consistent offering of vehicles, services and charging experience.

For example, Daimler has created a “live replacement parts store” for the fleet of third-generation EVs. The battery storage plant is available to the energy market to supply primary balancing power. Its modular design enables the system to continuously and automatically stabilize the power grid with balancing power. This solution is an example of how batteries could be turned into an opportunity for OEMs while supporting and integrating with utilities and grid operators.¹³

Main challenges affecting traditional OEM value chain

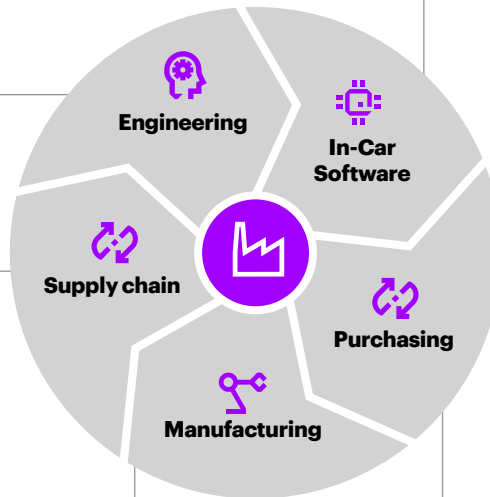
Manage EV technology evolution
(e.g. dedicated vs. mixed platform, solid state vs. lithium battery)

Revisit the Software architecture
to manage new electric and electronic components (e.g. battery management systems)

Manage Customer Anxiety
(e.g. battery range and reliability, charging infrastructure) and **new customer journey touchpoints**

Address **lower margins on EV sales** despite increase in price and meet **new customer expectations**

Monitor and integrate Internal Combustion Engine (ICE) and Battery Electric Vehicle (BEV) suppliers. Manage new component transportation and stocking constraints



Shift from ownership toward usership (e.g. sharing and subscription models)

Leverage EV data to develop new services to customers (e.g. software update, charging experience, proactive customer care) **and to monetize new opportunities**

Manage ICE and BEV assembly lines with opposite volumes trends and **update workforce skills**

Deal with new players coming from outside automotive while maintaining traditional ones

Manage battery pack life cycle from 2nd life (e.g. battery storage) to raw material reuse.

Respond to the **decrease of revenues** due to maintenance changes.

Collaboration with new ecosystem players (e.g. Charging Point Operator (CPO), Mobility Service Provider (MSP), Utilities, ...)



Value Chain Actions: A roadmap for a traditional OEM

Traditional OEMs need to evolve, following different steps along the entire value chain to stay competitive and effectively ride the wave of the electrification revolution. In particular, OEMs will need to focus on a number of key areas to stay competitive and manage in the era of the electric engine—from engineering to manufacturing to recycling.

1. Engineering

Define a clear technology evolution strategy (and develop a dedicated EV platform). Take advantage of engineering services to redesign products and seize new technologies to simulate component behavior such as long-term battery performance.

2. In-car Software

Rethink the vehicle information communications technology architecture with a holistic approach to simplify while simultaneously evolving software, enabling an efficient management of batteries and e-engines while integrating new services.

3. Supply Chain and Purchasing

Go beyond traditional closed systems with more collaborative Tier 1 thinking to create a new supply chain ensuring access to new technologies. Use new technologies to guarantee full visibility and transparency over the supply chain.

5. Marketing

Create awareness and desire for EVs providing clear information around product and services and developing new sales options. Redesign the customer journey to enhance EV-specific touchpoints.

4. Manufacturing

Take advantage of new digitized manufacturing solutions and simulation technologies to design flexible assembly lines and transform the workforce.

6. Sales and Mobility Services

Review sales strategies redesigning the retail network, integrating direct and indirect channels and using mobility platforms to facilitate EV usability. Introduce innovative mobility services to offer customers valuable alternatives to buy (such as car and/or fleet sharing, subscription models).

7. Connected Vehicle Services

Use vehicle and customer data and collaborate with partners to provide innovative and profitable e-digital services.

8. Aftersales

Re-evaluate OEM capabilities to effectively manage new EV and dedicated components (such as batteries) while offering new e-services.

9. Recycling

Take advantage of discarded batteries and partner with external players to manage the overall environmental impact of e-vehicle, opening new revenue streams.

Double-down now

The sustainability revolution is already underway, and the initial uncertainty over whether EVs will become a key part of the mainstream global vehicle market is over. The only uncertainty to manage now is over what role manufacturers will play in this revolution. Traditional OEMs that want to lead will need to double-down now.

General Motors and LG Chem

General Motors and LG Chem announced plans to mass-produce battery cells for BEVs.¹⁴ According to the companies' announcement, the joint venture aims at developing a plant using the most advanced manufacturing processes all under one roof to produce cells efficiently, with little waste, and will benefit from strong economies of scale throughout the value chain. The plant will be extremely flexible and able to adapt to ongoing advances in technology and materials.

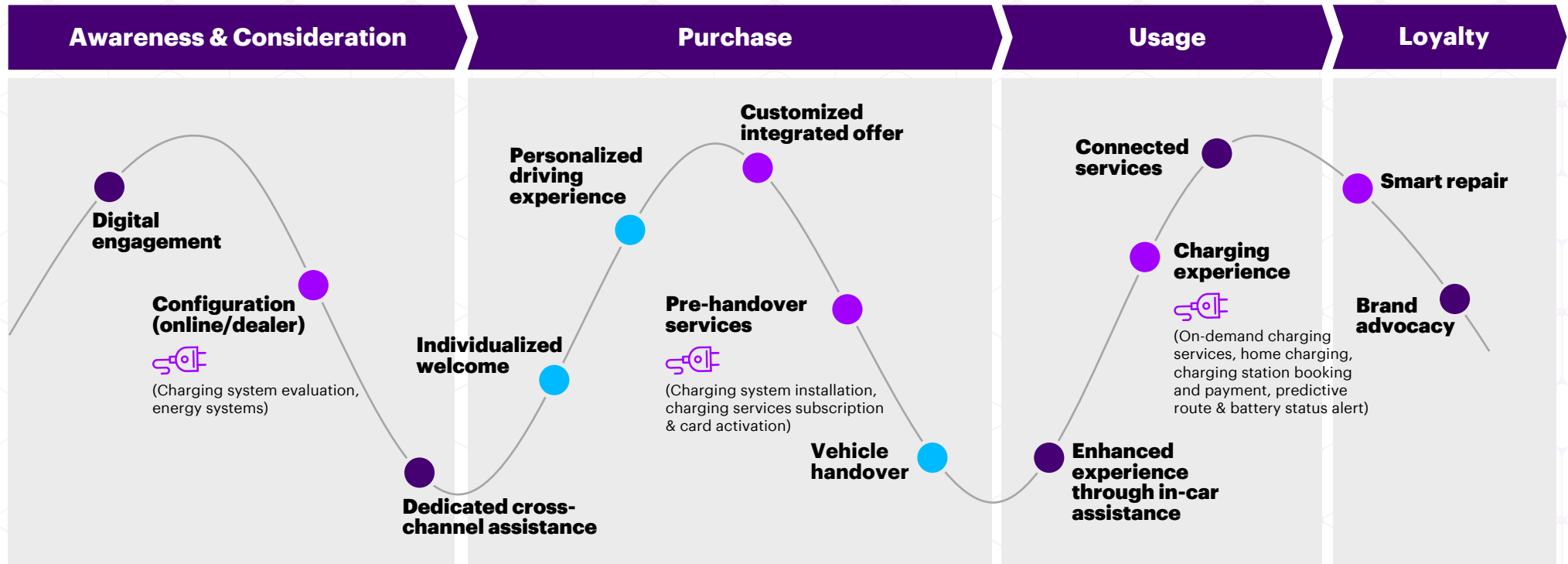
DID YOU KNOW?

By 2040, EV volume will put 10% to 15% of current OEMs after-sales revenues at risk due to changing maintenance activities (less wear and tear, for example).



The new e-customer journey

OEMs will have to redesign the customer journey, collaborating with new ecosystem players to define an e-customer journey with specific touchpoints and a new charging experience.



Physical

Physical/digital

Digital

EV specific touchpoints

While the electric vehicle market presents huge opportunities for manufacturers, they must also overcome significant hurdles—including profitability, usability and sustainability.



At the same time, manufacturers will have to work with new players and orchestrate an ecosystem to develop consistent offerings, services and charging infrastructure.

The electric vehicle revolution is upon us, and any uncertainty over whether EVs will enter the global mainstream market is over. The only uncertainty now is over what role manufacturers will play in this revolution. There is no sure recipe for success. However, by properly reading the market signals and by acting quickly, OEMs can prepare for and help drive the electric revolution.

References

- 1 <https://www.wsj.com/articles/auto-makers-steer-in-teslas-direction-on-wireless-updates-11553083202>
- 2 <https://www.hyundai.news/eu/brand/hyundai-launches-the-first-100-electric-rural-carsharing-in-spain>
- 3 Accenture, AS Mobility Booklet Jan. 2020
- 4 <https://www.govtech.com/fs/Why-Autonomous-and-Electric-Vehicles-are-Inextricably-Linked.html>
- 5 <https://www.electrive.com/2020/03/08/trend-europe-electrification-in-car-sharing-fleets>
- 6 <https://www.prnewswire.com/news-releases/fca-improves-the-purchase-experience-for-electric-vehicles-300987281.html>
- 7 <https://www.iea.org/news/electric-car-sales-this-year-resist-covid-19-s-blow-to-global-car-market>
- 8 <https://www.iea.org/commentaries/as-the-covid-19-crisis-hammers-the-auto-industry-electric-cars-remain-a-bright-spot>
- 9 <https://www.iea.org/data-and-statistics/charts/global-electric-car-sales-by-key-markets-2010-2020>
- 10 California, Massachusetts, New Jersey, Oregon, and other states are all part of the Zero Emission Vehicle Alliance
- 11 <https://www.volkswagen-newsroom.com/en/stories/six-advantages-of-the-meb-4979>
- 12 <https://www.transportenvironment.org/press/record-%E2%82%AC60bn-investment-electric-cars-and-batteries-europe-secured-last-year>
- 13 <https://www.daimler.com/sustainability/resources/third-battery-storage.html>
- 14 <https://media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2019/dec/1205-lgchem.html>

Authors

AXEL SCHMIDT

Senior Managing Director, Global Industry Sector Lead Automotive
axel.schmidt@accenture.com

TEODORO LIO

Senior Managing Director, European Automotive Lead
teodoro.lio@accenture.com

JUERGEN REERS

Managing Director, Global Mobility X Lead
juergen.reers@accenture.com

ANDREA REGALIA

Managing Director, Italy and Central Europe (ICEG) Mobility X Lead
andrea.regalia@accenture.com

CONTRIBUTORS:

JD Sallee, Christian Kleikamp, Michal Przewdziek, Gerhard Strack,
Pierre Gerfaux, Han Tang, Marius Peters, Alessandro Dell'Elce,
Elisabetta Castagnetti

About Accenture

Accenture is a global professional services company with leading capabilities in digital, cloud and security. Combining unmatched experience and specialized skills across more than 40 industries, we offer Strategy and Consulting, Interactive, Technology and Operations services—all powered by the world's largest network of Advanced Technology and Intelligent Operations centers. Our 514,000 people deliver on the promise of technology and human ingenuity every day, serving clients in more than 120 countries. We embrace the power of change to create value and shared success for our clients, people, shareholders, partners and communities. Visit us at www.accenture.com.

This document is intended for general informational purposes only and does not take into account the reader's specific circumstances, and may not reflect the most current developments. Accenture disclaims, to the fullest extent permitted by applicable law, any and all liability for the accuracy and completeness of the information in this presentation and for any acts or omissions made based on such information. Accenture does not provide legal, regulatory, audit, or tax advice. Readers are responsible for obtaining such advice from their own legal counsel or other licensed professionals. This document may contain descriptive references to trademarks that may be owned by others. The use of such trademarks herein is not an assertion of ownership of such trademarks by Accenture and is not intended to represent or imply the existence of an association between Accenture and the lawful owners of such trademarks.