strategy\&

## E-Mobility Sales Review Q4 2020

## Favorable conditions unleash EV potential

Europe has confirmed its position as the leading market in the global electric vehicle (EV) market, boasting both the highest growth and the highest market share in the third quarter 2020. As customer interest and demand for electric and hybrid vehicles is spurred by numerous local and national incentive programs, manufacturers are struggling to increase production and advance product launches. Technical issues and supply limitations are creating operational challenges for automotive companies.

Despite the overall market decline earlier in 2020, sales of battery electric vehicles (BEVs) in the European top 5 markets have more than doubled for the year to date compared to the same period last year ( $+120 \%$ ). While conventional powertrains have felt the full brunt of the market downturn, customers have flocked to electric vehicles due to increasingly attractive products and higher battery capacity, efficient sales processes, and more affordable prices.

More plug-in hybrid vehicles (PHEVs) have become available from premium brands in Q3, further boosting overall EV sales in Europe. As these products become rolled out globally, the segment is expected to expand in other regions as well.

While there is increasing demand for better products; automotive manufacturers face numerous and complex challenges from the rapid growth of EV markets.


1. News and highlights I

## Regulation stimulates demand ...

## California sets date of transition

California, USA's most populous state, has decreed that it will halt sales of purely gasolinepowered passenger cars and trucks by 2035. The state government believes that this move will cut greenhouse emissions by more than a third. California thus becomes the first US state to launch such a move, sparking expectations that others will follow its lead. ${ }^{1}$

In a similar move, the UK government plans to bring forward the ban on fossil fuel vehicles from 2040 to 2030 to accelerate the expansion of the electric car market. Other countries have announced similar plans in order to meet the 2050 decarbonisation targets. ${ }^{2}$

The European Commission has proposed that by 2030 the average $\mathrm{CO}_{2}$ emissions from new cars should be $50 \%$ below 2021 levels. This would represent an increase from the current target of a $37.5 \%$ reduction over the same period. ${ }^{3}$

From 2021, China will adapt its subsidy policy so that it no longer primarily promotes BEVs, but will now focus on a broader range of environmentally friendly drive systems, potentially including plug-in hybrids and also hydrogen-powered fuel-cell vehicles. ${ }^{4}$

## Germany: Tax reforms

From 2021, motor vehicle tax will rise in Germany for new cars with high fuel consumption. This is to encourage citizens to buy more fuel-efficient cars. Already registered cars are not affected. In future, the motor vehicle tax will be more strongly oriented towards how much $\mathrm{CO}_{2}$ a vehicle emits.

Starting 2021, a charge of $€ 25$ will be added to each 374.5 liters of diesel, which will contribute to 1 ton of carbon dioxide emissions. ${ }^{5}$ This means a price increase of about 7 cents per liters in 2021 and 15 cents in 2025.

## Sources

${ }^{1}$ CNBC, 23 September 2020
${ }^{2}$ The Guardian, 21 September 2020
${ }^{3}$ Reuters, 11 September 2020
${ }^{4}$ Automobilwoche, 20 July 2020
${ }^{5}$ Clean Energy Wire, 15 June 2020


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## Battery developments

Chinese battery manufacturer CATL is developing new technology that will allow battery cells to be integrated with an EV chassis, so that more cells can be loaded onto the car to increase driving range to more than $800 \mathrm{~km} .^{1}$
Meanwhile, Blackstone has made major progress in its 3D-printing technology to print lithium ion solid-state batteries ${ }^{2}$, which promise significantly lower costs, more production flexibility and a $20 \%$ increase in energy density.

Toyota and University of Kyoto are developing a new fluoride ion battery, which should offer around seven times the energy per unit weight as conventional lithium-ion batteries and could enable EVs to drive 1,000 kilometres on one charge. ${ }^{3}$

## Nio announces BaaS model

Chinese EV manufacturer Nio has launched a battery-as-a-service model, offering users to purchase electric vehicles and subscribe to the usage of battery packs separately. ${ }^{4}$

## Tesla sets new industry benchmarks

At its annual Battery Day, Tesla
announced moves towards eliminating cobalt in its batteries, a new Plaid powertrain for the Model S that could reach speeds of 200 mph , and a new cathode plant to streamline its battery production. The company also plans to manufacture its own "tabless" batteries to improve range and power in the new 4680 format, and set new goals for the reducing battery costs beyond previous industry ambitions. ${ }^{5}$


Sources
Automotive News, 12 August 2020
${ }^{2}$ Business Wire, 16 September 2020
${ }^{3}$ Nikkei Asia, 12 August 2020 ${ }^{4}$ Reuters, 20 August 2020
5. The Verge, 22 September 2020 6. Euractiv, 30 September 2020

## Fortune (finally) favors the brave

As sales rates continue to accelerate, companies which made an early and decisive entry into EV technology and innovative product concepts from charging plugs to battery systems and entire EVs, are now reaping their rewards for the first time.

Vehicles which emerge from dedicated e-mobility R\&D organizations have proven more compelling to customers. Nevertheless, a great deal more work is required after launch to integrate them into product marketing, sales and service processes.

Although BEVs rely on stand-alone technology, they need to remain fully aligned with core brand values to ensure market success. They could even serve to shape brands, such as the recently launched ID. 3 from Volkswagen, which seems to have become a successful extension of the VW Golf, the most popular car on German roads. The Polestar 2 is another flagship model, which even outsold the sector leader Tesla Model 3 in Sweden. Customers who simply wish to take advantage of incentives and lower operating costs have the option of switching to more conventional PHEVs.

Selected EV core technologies are only available from new technology providers, and require innovative collaboration models, such as longterm partnerships or joint ventures in battery technology and other areas. Additional investments for boosting production capacity and advancing product launches place a strain on financial resources, but are crucial for developing the EV market and increasing acceptance.

Manufacturers now need to focus their efforts on market expansion and set out their route to financial success. One step in this direction would be to question how the range of products and services can meet and exceed user expectations.

## 121\%

Increase in BEV sales in Western Europe $5+5$ markets: Q3 2020 vs. Q3 2019


## New models driving market growth <br> 4 New BEV models on European Markets in 2020 (domestic)



## High growth in spite of crisis Key Markets

Sep‘ 19 vs. Sep‘ 20 (in ‘000 units)



Electric Vehicles (EVs*)

YTD Sep‘ 19 vs. YTD Sep‘ 20 (in ‘000 units)


## 1 Million BEV sold in 2020

## Key Markets

Sep‘ 19 vs. Sep‘ 20 (in ‘000 units)



## Battery Electric Vehicles

YTD Sep‘ 19 vs. YTD Sep‘ 20 (in '000 units)


## What Plug-ins can do

## Key Markets

Sep‘ 19 vs. Sep‘ 20 (in ‘000 units)



## Plug-in Hybrids

YTD Sep‘ 19 vs. YTD Sep‘ 20 (in ‘000 units)


## Western Europe 5+5

EU Top 5: France, Germany, Italy, Spain, and UK

Sales have been growing rapidly in the EU top 5 markets since the temporary blip during the COVID-19 lockdown earlier in the year. There were 579,000 new EV registrations in Q3 alone, an increase of $146 \%$ compared to the equivalent quarter in 2019. This growth can be attributed to continually growing customer interest, the launch of new models by popular domestic brands and greatly expanded availability after the supply disruptions of the lockdown period. OEMs and suppliers are increasingly struggling to keep pace with demand.
Sales of PHEVs were up more than $400 \%$ in France and Germany compared to the same period last year, while BEV sales at least doubled in all five countries. The total EV market share for the EU top 5 for the year to date stands at $19 \%$.

## Other European markets (+5)

When including five smaller European EV markets (Austria, Netherlands, Norway, Switzerland and Sweden), the overall growth in EV sales compared to Q3 sales last year is $128 \%$. Norway's overall EV market share continues to outstrip the remainder of the region, at $82 \%$.


WE 5+5
2020 Q3
Comparison to 2019 Q3


| BEV | 179,000 | $+121 \%$ |
| :--- | :---: | :---: |
| PHEV | 146,000 | $+316 \%$ |
| Hybrid | 386,000 | $+97 \%$ |
| Total | $\mathbf{7 1 1 , 0 0 0}$ | $\mathbf{+ 1 2 8 \%}$ |

## United States

EV registrations in USA have not enjoyed the same growth witnessed in other regions. Although hybrid sales grew by $17 \%$ compared to Q3 last year, BEVs only grew by $2 \%$ and PHEV sales even fell by $16 \%$. Total EV sales amounted to 216,000, an increase of $8 \%$, while overall market share for the year to date stands at $5 \%$.
Consumer surveys consistently demonstrate considerable interest in EVs within the US market. However, a pause of new product entries has dampened market growth. The resulting lack of market penetration in turn discourages domestic manufacturers from making the necessary investments to up their game in the EV field.


USA
2020 Q3
Comparison to 2019 Q3


| BEV | 70,000 | $+2 \%$ |
| :--- | :---: | :---: |
| PHEV | 18,000 | $-16 \%$ |
| Hybrid | 128,000 | $+17 \%$ |
| Total | 216,000 | $\mathbf{+ 8 \%}$ |

## China and rest of Asia

## China

Overall EV sales grew by $49 \%$ in Q3 over the same quarter last year, with the market powered by an extension of tax breaks announced in June 2020. Sales of BEVs amounted to 279,000 , an increase of $66 \%$, while PHEV sales reached 66,000, an increase of $29 \%$. Overall EV market share for the year to date stands at $6 \%$.

## Japan

Overall, Japan is struggling with an economic downturn and there has been limited focus on BEVs. This is reflected in the sales data. Overall EV sales fell by 19\% in Q3 from the same quarter last year. Sales of BEVs amounted to 3,300 a decrease of $46 \%$, while PHEV sales reached 3,000 , a fall of $48 \%$. However, the total EV market share stands at $25 \%$, as hybrids are hugely popular.

## Other Asian countries

South Korea recorded a marked increase of EV registrations over the same quarter last year, up by $56 \%$ to 48,000 units. The South Korean government has announced a multi-billion dollar investment in subsidies and charging stations with the aim of increasing the number of electric cars tenfold by 2025.


## China

2020 Q3
Comparison to 2019 Q3


## Shares of EV registrations

| EV registrations YTD Sep 2020 |  |  |  |
| :---: | :---: | :---: | :---: |
| WE 5+5 <br> of which BEV <br> of which PHEV <br> of which Hybrid | $\begin{array}{r} 1,465,395 \\ 378,361 \\ 294,940 \\ 792,094 \end{array}$ |  | of 6,357,113 registrations |
| USA <br> of which BEV <br> of which PHEV <br> of which Hybrid | $\begin{array}{r} 482,991 \\ 163,891 \\ 48,624 \\ 270,476 \end{array}$ |  | of 10,340,541 registrations |
| China <br> of which BEV <br> of which PHEV <br> of which Hybrid | $\begin{aligned} & 822,113 \\ & 544,257 \\ & 152,197 \\ & 125,659 \end{aligned}$ |  | of $13,936,580$ registrations |
| PwC Autofacts ${ }^{\text {® }}$ \| Strategy \& |  | $\square$ ICE $\square$ BEV $\square$ PHEV $\square$ Hybrid | 13 |

## Electrified vehicle assembly forecast by region

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1 EV Assembly by Region
2020F vs. 2025F (in million units)
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2
Plug-in Hybrid Vehicle Assembly 2020F vs. 2025F (in million units)


4 Full and Mild Hybrid Vehicle Assembly 2020F vs. 2025F (in million units)


## Electrified vehicle assembly forecast




|  | Model | Launch |
| :--- | :--- | :--- |

6. Electrified vehicle model launches

| Len | Model | Launch | Quarter |
| :--- | :--- | :--- | :--- | :--- |

[^0]| Overview: | OEM | Model | Launch |
| :---: | :---: | :---: | :---: |
|  | Audi | "Landjet" | 2024 |
|  | Audi | B-CUV e-tron | 2025 |
|  | Audi | E6 e-tron | 2022 |
| - | Audi | Q6 e-tron | 2022 |
| nonecin | Audi | Q8 e-tron | 2026 |
|  | Audi | Q8 e-tron Sportback | 2027 |
|  | Audi | Q9 e-tron | 2027 |
| from 2022 onward not exhaustive <br> Source: www.electrive.net/2020/01/02/unser-blick-voraus-diese-elektroautos-kommen-2020, Automobilwoche Datencenter (Modellvorschau), JPMorgan, IHS (information Quarter, when available) | BMW | $i 7$ | 2022 |
|  | BMW | iX1 | 2022 |
|  | Honda | City-SUV (E-Auto) | 2022 |
|  | Polestar | Polestar 3 | 2022 |
|  | Polestar | Precept | 2023 |
|  | Porsche | Macan EV | 2022 |
|  | Smart | SUV | 2022 |
|  | Tesla | Roadster 2 | 2023 |
|  | Volkswagen | ID Vizzion | 2022 |

[^1]
## Authors



Felix Kuhnert
Partner, Global Automotive
Leader, PwC Germany
Phone: +49 711 25034-3309
felix.kuhnert@pwc.com


Annabelle Kliesing Senior PR Lead,
Strategy\& Germany
Phone: +49 89 54525-613
annabelle.kliesing
@strategyand.de.pwc.com

[^2]Part of the PwC network

## Thank you

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| E-Mobility |  |  | $\begin{aligned} & \text { YTD } \\ & 2020 \end{aligned}$ | Market Share | $\begin{aligned} & \text { YTD } \\ & 2019 \end{aligned}$ | $\begin{aligned} & \text { YoY } \\ & \text { YTD } \end{aligned}$ | 20 Q3 | $\begin{gathered} \text { QoY } \\ 20 \text { Q3 } \end{gathered}$ | $\begin{aligned} & \text { Sep } \\ & 20 \end{aligned}$ | $\begin{gathered} \text { MoY } \\ \text { Sep } 20 \end{gathered}$ | $\begin{gathered} \text { Aug } \\ 20 \end{gathered}$ | MoY <br> Aug 20 | $\begin{aligned} & \text { Jul } \\ & 20 \end{aligned}$ | $\begin{gathered} \text { MoY } \\ \text { Jul } 20 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | BEV |  | 16,415 | 7.8\% | 12,254 | 34.0\% | 7,105 | 86.1\% | 3,678 | 108.5\% | 2,120 | 118.3\% | 1,307 | 20.7\% |
|  |  | PHEV | 40,361 | 19.1\% | 15,732 | 156.6\% | 16,948 | 249.5\% | 6,233 | 232.6\% | 5,301 | 217.8\% | 5,414 | 314.2\% |
| Na] |  | Hybrid | 28,250 | 13.3\% | 20,678 | 36.6\% | 12,573 | 44.3\% | 5,291 | 77.9\% | 4,291 | 37.8\% | 2,991 | 13.8\% |
|  | Sweden | Total EV | 85,026 | 40.2\% | 48,664 | 74.7\% | 36,626 | 110.7\% | 15,202 | 129.9\% | 11,712 | 103.6\% | 9,712 | 93.5\% |
|  |  | BEV | 48,175 | 50.5\% | 49,465 | -2.6\% | 19,672 | 37.7\% | 9,560 | 57.1\% | 5,704 | 21.0\% | 4,408 | 26.5\% |
| Sweden, Norway, | PHEV |  | 19,357 | 20.3\% | 12,064 | 60.5\% | 7,288 | 121.7\% | 3,129 | 174.7\% | 1,881 | 56.0\% | 2,278 | 141.6\% |
| Netherlands, | Hybrid |  | 11,109 | 11.7\% | 13,558 | -18.1\% | 5,169 | 20.2\% | 1,130 | -19.5\% | 950 | -38.9\% | 3,089 | 130.2\% |
| Switzerland, | Norway | Total EV | 78,641 | 82.5\% | 75,087 | 4.7\% | 32,129 | 46.9\% | 13,819 | 60.2\% | 8,535 | 14.2\% | 9,775 | 69.4\% |
| Austria, WE 5+5 |  | BEV | 29,533 | 11.9\% | 30,757 | -4.0\% | 14,588 | 13.2\% | 6,260 | -19.1\% | 4,388 | 48.8\% | 3,940 | 79.3\% |
|  |  | PHEV | 10,392 | 4.2\% | 3,830 | 171.3\% | 4,773 | 383.6\% | 1,665 | 289.0\% | 1,349 | 355.7\% | 1,759 | 568.8\% |
| Legend | Netherlands | Hybrid | 31,768 | 12.8\% | 21,662 | 46.7\% | 13,355 | 81.6\% | 5,092 | 95.2\% | 3,864 | 61.7\% | 4,399 | 86.8\% |
| MoY = Month-on-Year <br> QoY = Quarter-on-Year <br> YoY = Year-on-Year <br> YTD = Year-to-Date |  | Total EV | 71,693 | 28.8\% | 56,249 | 27.5\% | 32,716 | 54.1\% | 13,017 | 20.8\% | 9,601 | 70.4\% | 10,098 | 109.7\% |
|  | Switzerland | BEV | 11,169 | 6.8\% | 8,831 | 26.5\% | 5,481 | 89.8\% | 2,869 | 87.5\% | 1,608 | 162.3\% | 1,004 | 34.8\% |
|  |  | PHEV | 8,029 | 4.9\% | 2,373 | 238.3\% | 3,619 | 325.8\% | 1,462 | 344.4\% | 938 | 294.1\% | 1,219 | 330.7\% |
|  |  | Hybrid | 19,757 | 12.1\% | 14,156 | 39.6\% | 7,954 | 46.2\% | 3,131 | 64.8\% | 2,131 | 29.0\% | 2,692 | 42.4\% |
|  |  | Total EV | 38,955 | 23.8\% | 25,360 | 53.6\% | 17,054 | 85.8\% | 7,462 | 98.5\% | 4,677 | 86.9\% | 4,915 | 68.4\% |
| Source: Autofacts Analysis, Autoactu, ANFAC, ANFIA, BOVAG, Fourin, KBA, SMMT, Marklines |  | BEV | 8,942 | 5.0\% | 7,383 | 21.1\% | 4,137 | 66.9\% | 1,946 | 100.8\% | 1,127 | 41.1\% | 1,064 | 49.6\% |
|  |  | PHEV | 4,429 | 2.5\% | 1,264 | 250.4\% | 1,854 | 406.6\% | 485 | 199.4\% | 635 | 516.5\% | 734 | 626.7\% |
|  |  | Hybrid | 16,737 | 9.3\% | 9,808 | 70.6\% | 7,213 | 89.2\% | 2,608 | 115.4\% | 2,112 | 52.3\% | 2,493 | 105.4\% |
|  | Austria | Total EV | 30,108 | 16.7\% | 18,455 | 63.1\% | 13,204 | 98.3\% | 5,039 | 115.2\% | 3,874 | 69.2\% | 4,291 | 111.8\% |
|  |  | BEV | 378,361 | 6.0\% | 229,009 | 65.2\% | 179,149 | 121.4\% | 83,852 | 120.2\% | 45,440 | 111.8\% | 49,857 | 133.1\% |
|  |  | PHEV | 294,940 | 4.6\% | 105,704 | 179.0\% | 146,066 | 316.3\% | 58,251 | 279.2\% | 38,351 | 294.7\% | 49,464 | 394.1\% |
|  |  | Hybrid | 792,094 | 12.5\% | 539,894 | 46.7\% | 385,945 | 97.0\% | 174,250 | 115.1\% | 87,895 | 75.2\% | 123,800 | 91.4\% |
|  | WE 5+5 | Total EV | 1,465,395 | 23.1\% | 874,607 | 67.5\% | 711,160 | 128.0\% | 316,353 | 135.3\% | 171,686 | 111.1\% | 223,121 | 132.2\% |




[^0]:    PwC Autofacts ${ }^{\text {® }}$ | Strategy\&

[^1]:    PwC Autofacts ${ }^{\text {® }}$ | Strategy\&

[^2]:    PwC Autofacts ${ }^{\circledR}$ | Strategy\&

