PwC Autofacts®
E-Mobility Sales Review

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Contradictory market trends in 2019 could not derail the Electric Vehicle trend – breakthroughs expected 2020

Despite the decrease in the overall Chinese car market and numerous subsidy cuts in 2019, global sales of electrified vehicles in analysed key markets grew about 12.5% in total (YoY). In 2020, a host of new EV products by established manufacturers and growing charging infrastructure are expected to propel markets.

158.2% **Increase of Battery-Electric Vehicle sales in Netherlands: 2019 vs. 2018**

Overall development in key markets

In the year 2019, fully electric and electrified vehicles (EVs) – mild, full and plug-in hybrid as well as battery electric vehicles – registered a total growth of +12.5% (to 3,204,038 units) compared to 2018. This growth was mainly driven by increasing sales of battery electric (+13.8%, to 1,391,252 units) and hybrid cars (+23.2%, to 1,363,126 units). Plug-in hybrid vehicles are falling behind with an overall decline of -13.2% (to 449,660 units) versus 2018.

In terms of total market shares, Battery-electric vehicles (BEVs) have the highest market share in China at 3.8%, while EU-Top 5 and the United States (US) are roughly on par with 1.5% and 1.4%.

Overall hybrids, however, have reached 5.5% market share in EU-Top 5, topping the US at 2.3% and China at marginal 0.9%.

EU - Top 5

Electrified car registrations show consistent high growth throughout the year with closing at a total increase of 43% (33.6%, ‘18) to 893,335 units in 2019 (624,628 units, ’18). An analysis of the growth rates reveals that BEVs are the strongest-growing segment in 2019 (+77.9%). PHEVs had negative growth rates until Q3 ’19, however, a very strong Q4 (+81.3%) turned the overall growth of 2019 into positive (+11.9%). The reason for the strong last quarter is to be found in the increasing product supply as new model launches are available yet. Hybrids increased by 42.8% to 617,259 units in 2019, continuing on their path to become the “new normal” in high-tech combustion engines. Highlight markets with high EV shares such as Norway and the Netherlands continued to deliver strong growth during 2019. In December, for example, Netherlands almost tripled its sales of BEVs (+276.9%, 6,080 units) compared to the same month last year.

United States

Sales of BEVs increased by +1.3% to 241,912 units by the end of last year, mainly due to the improved availability of high-tech and best-selling vehicles like the Tesla Model 3. Hybrid sales were boosted with an increase of 16.8% in Q4 2019 compared to 2018 which amounts to a total plus of 16.8% in 2019 (401,081 units). However, a closer review reveals that PHEVs continued their negative trend with a decline of -36.1% to 22,591 units in Q4 2019, leading to a decline of -30.8% to 84,732 units in 2019 compared to 2018.

China

China was the market with the highest total sales volume for electric vehicles in 2019 – despite heavy subsidy cuts. While total EVs sales are decreased by -0.7% to 1,247,450 units in 2019 compared to the previous year, BEVs were able to increase its performance to +4.2% growth (825,527 units) in 2019 – only due to strong first two quarter of 2019. PHEVs are following the overall market slow-down with a decrease of -49.4% in Q4, leading to an overall decrease of -15.3% to 224,339 units in 2019. However, Hybrids only marginal decreased by -0.7% to 61,041 units in 2019 due to a strong Q4 (+15.1%). Summarized, the sales figures showing an ongoing gap in growth trend whereby BEVs and PHEVs following the overall market slow-down and Hybrids not.

Other Asia

Electric vehicles sales data for the high-tech countries South Korea and Japan are showing a positive picture. In South Korea, 142,622 (+16.4%, 2018 Vs. 2019) electrified vehicles were sold while Japan reached a total of 1,137,647 units.

News and highlights

Many EVs still very expensive, Governments make use of financial support

The challenge to convince car buyers worldwide to transit to electric mobility goes on. Many countries offer new incentives programs or extend existing ones. Germany, for example, extended the preferential company car tax treatment for EVs. From 2022 to 2024, only EVs with a minimum electric range of 60 km (and max. 50 gr CO_2/km) are eligible. In the next five years until 2030, the minimum electric range extends to 80 km. Furthermore, the company car tax is to be reduced from 0.5% to 0.25% for purely electric vehicles up to a price of 40 thousand euro. Looking at France, the government has revised its bonus-malus system with the aim of increasing EVs sales five-fold by 2022, compared to 2017. Therefore, new modalities for the environmental bonus are introduced and in particular the so-called environmental malus will be increased up to 20.000 € (> 212 gr CO_2/km).

The high-tech country South Korea will provide a total of approx. 630 million euros in 2020 to subsidize EVs and expand the network of charging stations in the country (increase of 60% in comparison to 2019). According to targets, in 2030, one third of all new registered vehicles should be electric.

New models drive market attractiveness

The annual CES (aka Consumer Electronic Show) took place from 7th to 10th January in Las Vegas, hosting presentations of new products and technologies in the user experience (UX) field. As a major surprise, the technology and entertainment group Sony developed and presented its own electric car 'Vision-S'. As of now, the electronics giant has remained silent on concrete production plans.

Besides, a large number of manufacturers announced and presented new EV models in the recent quarter. Tesla presented its first Pickup model with the highly controversial Cybertruck. The huge vehicle is tagged for a range of 500 miles and availability from late 2021, starting at prices around $ 40.000. In Turkey, the new state-supported automotive brand TOGG presented its first electric SUV. The vehicle is expected to be launched in 2022, with a range between 300 and 500 miles, and several additional variants.

Tesla builds Gigafactory 4 in Germany

In November 2019, Elon Musk announced the construction of the 4th Gigafactory in Germany on the occasion of the Golden Steering Wheel award. The production facility for electric vehicles is to be built in Gruenheide near the soon-to-be-finished Berlin Brandenburg Airport. Additionally, a design and development center is planned in central Berlin. The investment in Tesla's Brandenburg gigafactory is to amount to approx. 4 billion euros and 7.000 jobs are to be created there. According to Musk, Tesla will build batteries, powertrains and vehicles at the new plant. Starting in 2021, the Model Y could be the first Tesla model to be produced in Germany.

More battery cell production globally

The major German supplier, Webasto, has started the production of battery systems for a European bus maker and plans to start production of batteries for light commercial vehicles in 2020. Further, the company announced the entry into the Chinese market is in preparation. The development and manufacture of battery systems will be located at the new Webasto site in Jiaxing. Webasto planned to open this plan at the beginning of 2020.

Suzuki, Toshiba and Denso build India's first battery cell factory for electric vehicles. The joint venture (Automotive Electronics Power Pvt. Ltd., AEPPL) was established for this purpose and is owned to 50% by Suzuki, 40% by Toshiba and 10% by Denso. The target is to produce more than 1 GWh until 2025. The battery cells are used not only for EVs but also for electric two-wheelers.

Delivery times for EVs massively behind schedule

Although the last quarter has shown that OEMs have caught up on delivery times for EVs, there are still significant delays. The reason given is that suppliers have difficulties in supplying the parts needed to install the batteries (e.g. Audi E-Tron) or were not able to deliver batteries in sufficient quantities (e.g. Mercedes EQC).

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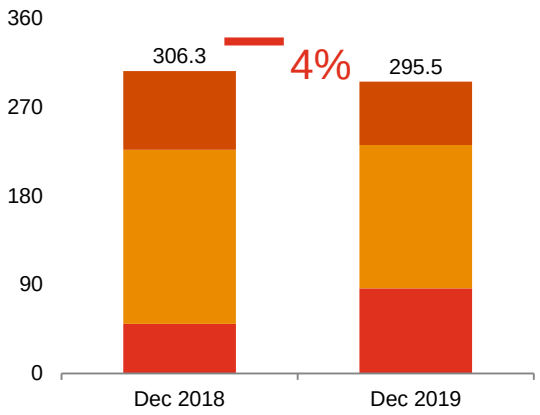
E-Mobility Sales Data – **Key Markets**

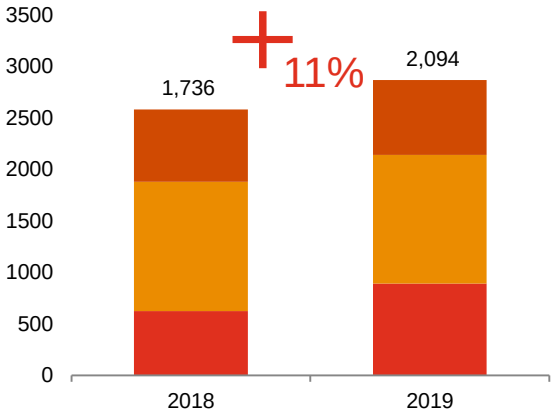
1 Electric Vehicles (EVs) Sales by Key Markets

EU-5* China* USA*

Dec‘18 vs. Dec‘19 (in ‘000 units)

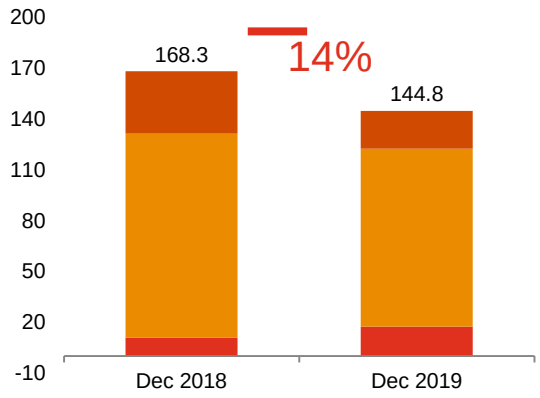


2018 vs. 2019 (in ‘000 units)

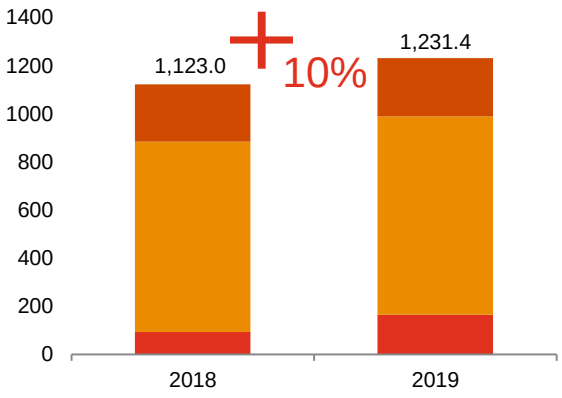


2 Battery Electric Vehicles

Dec‘18 vs. Dec‘19 (in ‘000 units)

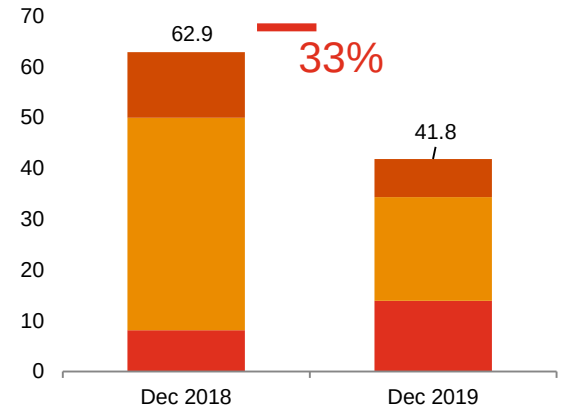


2018 vs. 2019 (in ‘000 units)

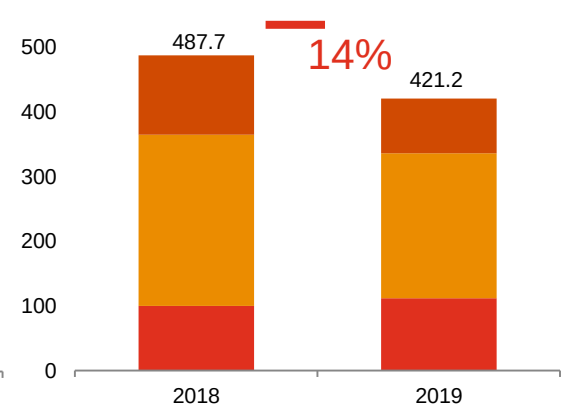


3 Plug-in Hybrids

Dec‘18 vs. Dec‘19 (in ‘000 units)



2018 vs. 2019 (in ‘000 units)



*EV= Battery Electric Vehicles + Plug-in Hybrids + Hybrids

E-Mobility Sales Data

France	2019	Market Share	2018	YOY 19-18	19 Q4	QOY 19 Q4	Dec 19	MOY Dec 19	Nov 19	MOY Nov 19	Oct 19	MOY Oct 19
BEV	42,767	1.9%	31,060	37.7%	12,387	14.3%	4,803	8.3%	3,202	-9.6%	4,382	53.2%
PHEV	18,592	0.8%	14,529	28.0%	6,727	83.2%	2,349	96.1%	2,332	61.3%	2,046	99.2%
Hybrid	106,799	4.8%	91,815	16.3%	31,380	21.3%	11,659	44.4%	9,377	3.4%	10,344	18.7%
Total	168,158	7.6%	137,404	22.4%	50,494	25.1%	18,811	37.3%	14,911	6.1%	16,772	33.0%
Germany												
BEV	60,430	1.7%	34,328	76.0%	14,497	39.2%	5,748	80.6%	4,090	3.2%	4,659	42.4%
PHEV	44,517	1.2%	30,980	43.7%	18,655	227.5%	5,580	204.9%	6,251	225.6%	6,824	250.5%
Hybrid	193,107	5.4%	98,403	96.2%	56,807	110.8%	17,995	116.9%	19,473	102.4%	19,339	114.1%
Total	298,054	8.3%	163,711	82.1%	89,959	108.9%	29,323	120.3%	29,814	92.3%	30,822	116.3%
Italy												
BEV	10,652	0.6%	4,999	113.1%	2,877	102.9%	840	125.2%	1,088	136.0%	949	62.5%
PHEV	6,470	0.3%	4,780	35.4%	2,495	115.8%	689	302.9%	967	129.1%	839	49.0%
Hybrid	109,478	5.7%	81,989	33.5%	31,354	46.1%	8,993	61.8%	10,510	37.0%	11,851	43.9%
Total	126,600	6.6%	91,768	38.0%	36,726	52.8%	10,522	72.4%	12,565	46.9%	13,639	45.4%
Spain												
BEV	12,325	1.0%	6,321	95.0%	3,136	17.0%	1,144	-11.9%	955	28.0%	1,037	62.8%
PHEV	7,562	0.6%	5,520	37.0%	2,432	25.4%	812	-15.1%	837	64.8%	783	64.5%
Hybrid	109,795	8.7%	75,102	46.2%	33,499	75.1%	11,360	88.0%	11,791	87.2%	10,348	52.5%
Total	129,682	10.3%	86,943	49.2%	39,067	64.5%	13,316	60.5%	13,583	79.9%	12,168	54.1%
UK												
BEV	37,825	1.6%	15,475	144.4%	12,753	203.4%	4,939	222.0%	4,652	229.0%	3,162	151.8%
PHEV	34,945	1.5%	44,380	-21.3%	11,961	10.2%	4,480	13.0%	4,362	26.8%	3,119	-9.5%
Hybrid	98,071	4.2%	84,947	15.4%	19,929	31.1%	4,941	45.7%	7,038	19.0%	7,950	34.9%
Total	170,841	7.4%	144,802	18.0%	44,643	47.6%	14,360	61.5%	16,052	49.1%	14,231	34.3%
EU-5												
BEV	163,999	1.5%	92,183	77.9%	45,650	54.5%	17,474	61.5%	13,987	38.1%	14,189	64.8%
PHEV	112,086	1.0%	100,189	11.9%	42,270	81.3%	13,910	71.3%	14,749	90.6%	13,611	82.4%
Hybrid	617,250	5.5%	432,256	42.8%	172,969	59.3%	54,948	75.2%	58,189	50.9%	59,832	54.8%
Total	893,335	7.9%	624,628	43.0%	260,889	61.6%	86,332	71.6%	86,925	54.0%	87,632	60.1%
Netherlands												
BEV	62,004	13.9%	24,011	158.2%	32,089	194.3%	22,918	276.9%	6,855	122.8%	2,316	32.6%
PHEV	7,327	1.6%	3,193	129.5%	1,071	20.3%	198	31.1%	417	-1.9%	456	45.2%
Hybrid	28,839	6.5%	22,996	25.4%	7,169	69.8%	1,814	69.4%	2,634	63.5%	2,721	76.7%
Total	95,742	21.5%	50,200	90.7%	40,329	151.8%	24,930	241.4%	9,906	93.7%	5,493	52.5%

Source: Autofacts Analysis, Autoactu, KBA, ANFIA, ANFAC, SMMT, BOVAG

*Partially estimated

Legend: MOY = Month-on-Year, QOY = Quarter-on-Year, YOY = Year-on-year

E-Mobility Sales Data

Norway	2019	Market Share	2018	YOY 19-18	19 Q4	QOY 19 Q4	Dec 19	MOY Dec 19	Nov 19	MOY Nov 19	Oct 19	MOY Oct 19
BEV	60,327	42.4%	46,106	30.8%	10,862	-26.3%	3,423	-33.5%	3,697	-27.4%	3,742	-16.9%
PHEV	19,295	13.6%	26,546	-27.3%	7,231	22.3%	2,594	27.8%	2,273	18.8%	2,364	20.0%
Hybrid	17,542	12.3%	16,317	7.5%	3,984	15.9%	1,118	14.9%	1,337	18.1%	1,529	14.7%
Total	97,164	68.2%	88,969	9.2%	22,077	-8.4%	7,135	-12.4%	7,307	-10.2%	7,635	-2.2%
EU-5 + 2												
BEV	286,330	2.4%	162,300	76.4%	88,601	60.5%	43,815	98.7%	24,539	34.2%	20,247	36.3%
PHEV	136,280	1.1%	129,928	4.9%	50,572	67.9%	16,702	62.2%	17,439	73.1%	16,431	68.6%
Hybrid	663,631	5.6%	471,569	40.7%	184,122	58.4%	57,880	73.3%	62,160	50.4%	64,082	54.3%
Total	1,086,241	9.1%	763,797	42.2%	323,295	60.4%	118,397	80.1%	104,138	49.4%	100,760	52.3%
China												
BEV	825,527	3.8%	792,000	4.2%	217,877	-32.6%	105,026	-12.9%	62,968	-42.1%	49,883	-47.0%
PHEV	224,339	1.0%	265,000	-15.3%	50,140	-49.4%	20,394	-51.2%	13,511	-56.1%	16,235	-38.8%
Hybrid	197,584	0.9%	199,000	-0.7%	61,041	15.1%	19,608	40.2%	24,182	16.8%	17,251	-6.0%
Total	1,247,450	5.8%	1,256,000	-0.7%	329,058	-30.8%	145,028	-17.8%	100,661	-37.2%	83,369	-40.0%
USA												
BEV	241,912	1.4%	238,823	1.3%	66,276	-27.3%	22,341	-39.6%	19,429	-34.8%	24,506	0.4%
PHEV	84,732	0.5%	122,492	-30.8%	22,591	-36.1%	7,531	-41.8%	7,888	-38.2%	7,172	-25.8%
Hybrid	401,081	2.3%	343,285	16.8%	100,233	16.6%	34,271	15.2%	33,220	19.8%	32,742	15.0%
Total	727,725	4.3%	704,600	3.3%	189,100	-11.0%	64,143	-19.5%	60,537	-13.9%	64,420	3.0%
South Korea												
BEV	37,483	2.1%	29,687	26.3%	8,684	-8.4%	2,170	33.7%	3,563	-9.3%	2,951	-24.8%
PHEV	4,309	0.2%	672	541.2%	2,085	754.5%	1,164	1052.5%	810	1073.9%	111	50.0%
Hybrid	100,830	5.7%	92,195	9.4%	29,058	-8.5%	11,928	12.0%	8,393	-28.7%	8,737	-6.3%
Total	142,622	8.0%	122,554	16.4%	39,827	-4.0%	15,262	23.3%	12,766	-19.1%	11,799	-11.5%
Total (Analyzed Markets)												
BEV	1,391,252	2.7%	1,222,810	13.8%	381,438	-20.4%	173,352	-4.3%	110,499	-31.3%	97,587	-28.9%
PHEV	449,660	0.9%	518,092	-13.2%	125,388	-23.9%	45,791	-29.7%	39,648	-26.2%	39,949	-13.2%
Hybrid	1,363,126	2.6%	1,106,049	23.2%	374,454	30.5%	123,687	40.9%	127,955	26.0%	122,812	25.7%
Total	3,204,038	6.1%	2,846,951	12.5%	881,280	-5.4%	342,830	2.6%	278,102	-12.0%	260,348	-7.3%

Source: Autofacts Analysis, Autoactu, KBA, ANFIA, ANFAC, SMMT, BOVAG

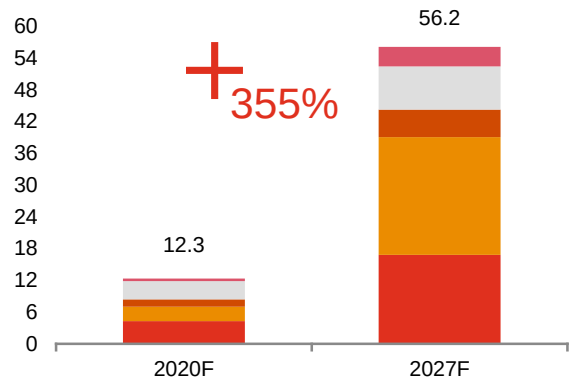
*Partially estimated

Legend: MOY = Month-on-Year, QOY = Quarter-on-Year, YOY = Year-on-year

Electrified Vehicle Assembly Forecast – **Global**

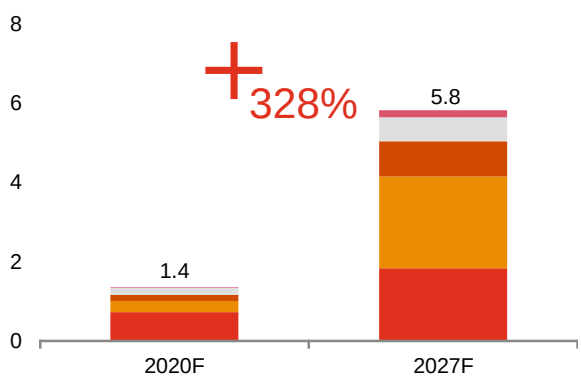
1 EV Assembly by Region

2020F vs. 2027F (in million units)



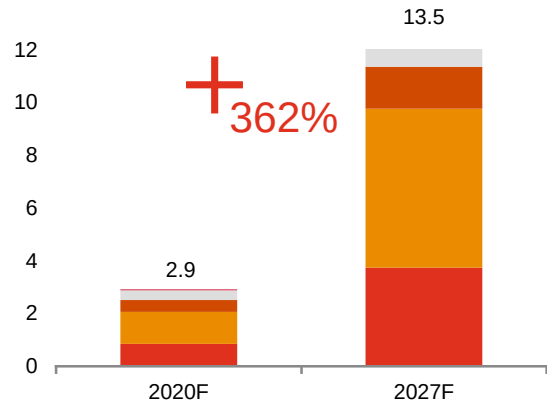
2 Plug-in Hybrid Vehicle Assembly

2020F vs. 2027F (in million units)



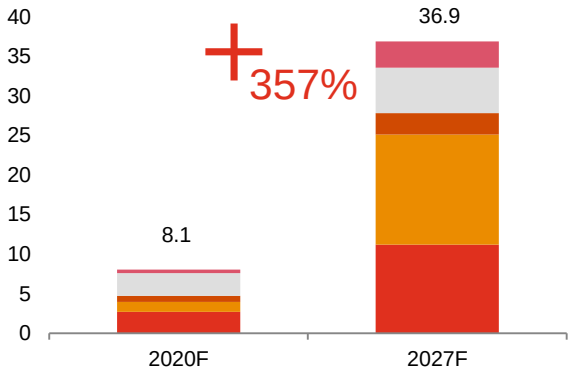
3 BEV Vehicle Assembly

2020F vs. 2027F (in million units)



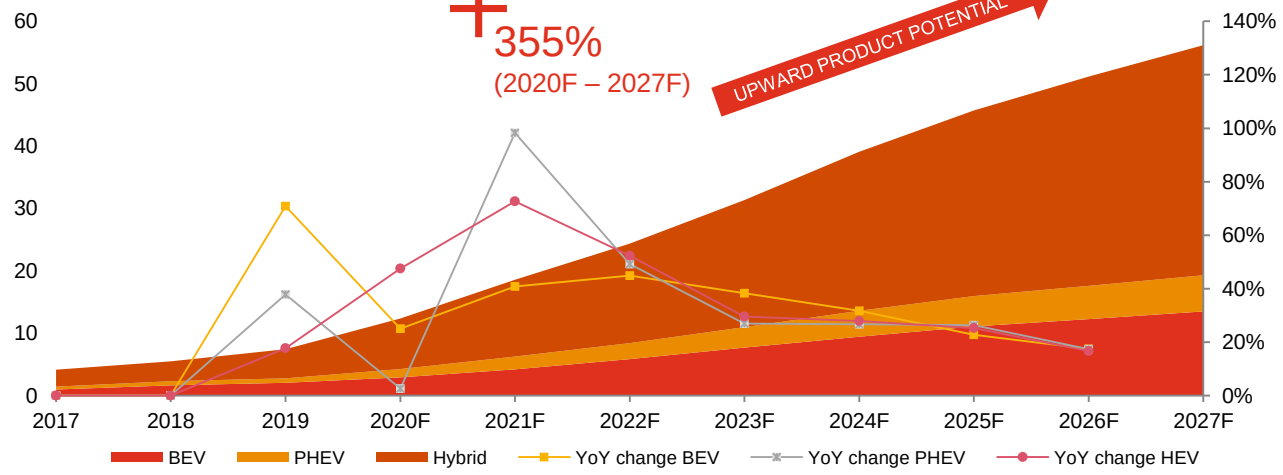
4 Full and Mild Hybrid Vehicle Assembly

2020F vs. 2027F (in million units)



5 EV Assembly by Powertrain Type

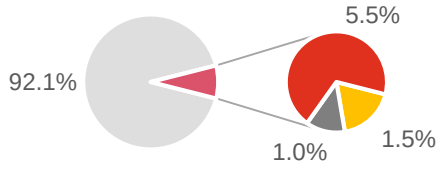
2017 – 2027F (in million units, percent)



Rankings

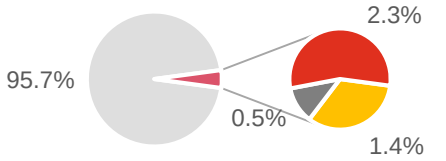
EV Registrations 2019

EU-5	893,335*
of which BEV	163,999*
of which PHEV	112,086*
of which Hybrid	617,250*



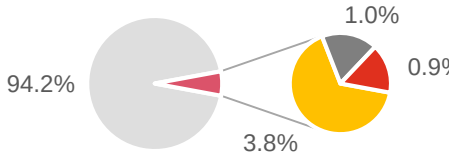
of 11,307,257 registrations

USA	727,725*
of which BEV	241,912*
of which PHEV	84,732*
of which Hybrid	401,082*



of 17,108,156 registrations

China	1,247,450*
of which BEV	825,527*
of which PHEV	224,339*
of which Hybrid	197,584*



of 21,444,180 registrations

EU Top 3 Models 2019

BEV	
Tesla Model 3	79,681*
Renault Zoe	46,591*
Nissan Leaf	33,073*
PHEV	
Mitsubishi Outlander PHEV	35,139*
Mini Countryman PHEV	15,595*
BMW 530e	13,889*

Source: EV Sales Blog

USA Top 3 Models 2019

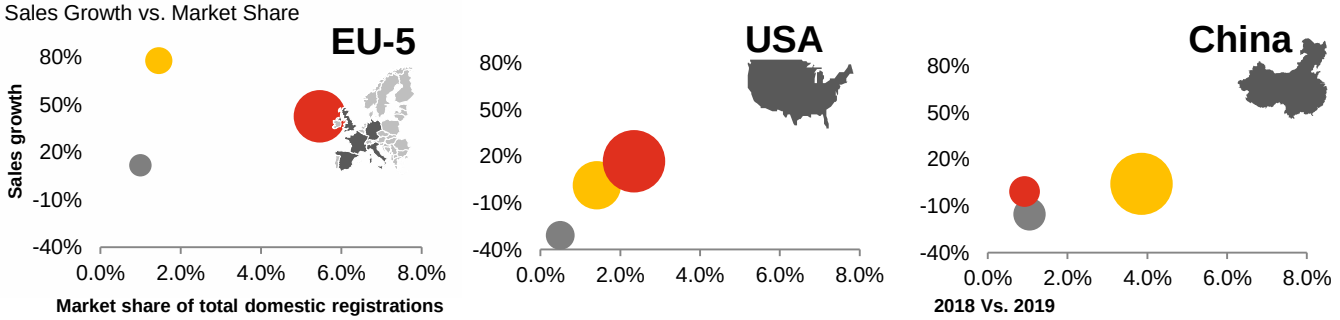
BEV	
Tesla Model 3	158,925*
Tesla Model X	19,225*
Chevrolet Bolt EV	16,418*
PHEV	
Toyota Prius Prime	23,630*
Honda Clarity PHEV	10,728*
Ford Fusion Energi	7,524*

Source: insideevs.com – Monthly Plug-In Sales Scorecard

BEV PHEV Hybrids

Portfolio

Sales Growth vs. Market Share



*Partially estimated

Thank you

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