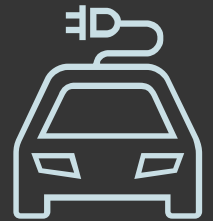


AlixPartners Automotive- Electrification Index

Q3 2018



AlixPartners Automotive Electrification Index - Executive Summary

E-Range

- Globally about **69 mio miles e-Range** sold in Q3 2018 – growth continues strongly with an **increase by 30%** compared to Q2 2018 (52 mio miles)
- **Last twelve months numbers almost tripled in North America** (e-Range increase by 182%) mainly driven by the introduction of Tesla's Model 3 – strong growth in Japan/Korea (+162%), continuous strong growth in China (+85%); **Europe growth on a low level and even slowing down** (+27%)
- China, USA and Norway leading the country ranking with ~80% share of total e-Range
- OEM ranking led by Tesla contributing to c. 33% to the total e-Range, BYD and Renault/Nissan following; BMW (#5 → #12) and VW (#9 → #15) losing ground in OEM ranking, **NEXTEV entering Top 20 after launching the Nio ES8**

ICE-eq. share

- Norway still #1 in country ranking, **United States overtaking China** by increasing ICE-eq. share from 0.66% in Q2 to 1.60% in Q3, China share increased slightly (Q2 1.27% vs Q3 1.47%), South Korea making a great leap forward by increase from 0.97% in Q2 to 1.40% in Q3
- Besides Tesla, **no more European, US or Japanese player within OEM Top 20; NEXTEV jumped to #2** following Tesla

Others

- **Average range per vehicle increased** slightly from 115 miles to 133 miles
- Plug-In share within electrified cars sold around 33% - still **no trend observable for or against PHEVs vs BEVs**

AlixPartners Automotive Electrification Index

e-Range

E-RANGE =

Sum of electric range of all electric vehicles (EV) sold

- By automaker, segment, region and country
- Note: e-Range does not include range from internal-combustion-engine (ICE) sources in plug-in hybrids – Only the battery range is included
- The e-Range attempts to rank the electrically driven range, and as such, does not include non-plug-in hybrids (HEVs) such as the standard Toyota Prius

AlixPartners Automotive Electrification Index

ICE-vehicle equivalent market share

Using e-Range data, we can calculate an **ICE-vehicle equivalent market share**

Total number of full-ICE-equivalent-range EVs sold

Total number of vehicles sold (EV and ICE)

- By automaker, segment, region and country
- Full-ICE-equivalent EVs are defined as the electric range of the vehicle sold divided by 311 miles (500 km)
- Note: to make the EV equivalent to an internal combustion engine vehicle (ICE), the 311-mile (500-km) range approximates an equivalent range between fill-ups for ICE vehicles. Dividing by this factor results in a more illuminating view of overall electrification, as it counts vehicles with high-electric ranges as full alternatives to ICE vehicles and discounts small range city cars or compliance vehicles
- Note: range of the ICE vehicles are not normalized to 311 miles (500 km) – each ICE unit sold is counted as a full vehicle

AlixPartners Automotive Electrification Index

- **Goal:** 'e-Range' as a more meaningful measure than currently exists in the public domain for tracking the progress of electrification in the auto industry globally by region, country, segment and particularly by Automaker
- **Transparency:** Based on public available data and data validated directly by the Automakers
- **Sources:**
 - IHS Markit Ltd.: for total sales data (all vehicle types)
 - EV-volumes.com: for electric ranges for battery-electric vehicles (BEVs), plug-in hybrid vehicles (PHEVs), fuel-cell electric vehicles (FCEVs)
 - Automaker- and government-published websites: ditto the above
 - Discussions with Automakers to validate ranges, with several Automakers updating ranges beyond what was publicly available
- **Vehicle scope:** passenger cars and light trucks (GVW < 6 tons), which coincides with IHS Market's 'light vehicle' definition
- **Sales allocation by automaker:** based on IHS Markit's method for allocating vehicle sales to brands (including for joint ventures, upfitters, post-production customizations, etc.)

71 Countries in the Index

(where EV sales have taken place/are recordable to date)

AUSTRALIA	ESTONIA	MACEDONIA	SERBIA
AUSTRIA	FINLAND	MALAYSIA	SINGAPORE
BAHRAIN	FRANCE	MALTA	SLOVAKIA
BELGIUM	GERMANY	MEXICO	SLOVENIA
BERMUDAS	GREECE	MAROCCO	SOUTH AFRICA
BRAZIL	HONG KONG	NETHERLANDS	SOUTH KOREA
BULGARIA	HUNGARY	NEW ZEALAND	SPAIN
CANADA	ICELAND	NORWAY	SWEDEN
CHILE	INDIA	OMAN	SWITZERLAND
CHINA	INDONESIA	PANAMA	TAIWAN
COLOMBIA	IRELAND	PERU	THAILAND
COSTA RICA	ISRAEL	POLAND	TURKEY
CROATIA	ITALY	PORTUGAL	UKRAINE
CYPRUS	JAPAN	PUERTO RICO	UAE
CZECH REP.	JORDAN	QATAR	UK
DENMARK	LATVIA	ROMANIA	USA
ECUADOR	LITHUANIA	RUSSIA	URUGUAY
EGYPT	LUXEMBOURG	SAUDI ARABIA	

Sources: EV-volumes.com, Automaker responses

e-Range increase by 30% compared to Q2; average range breaking the 200km barrier

Q1 2013

AlixPartners Automotive-Electrification Index

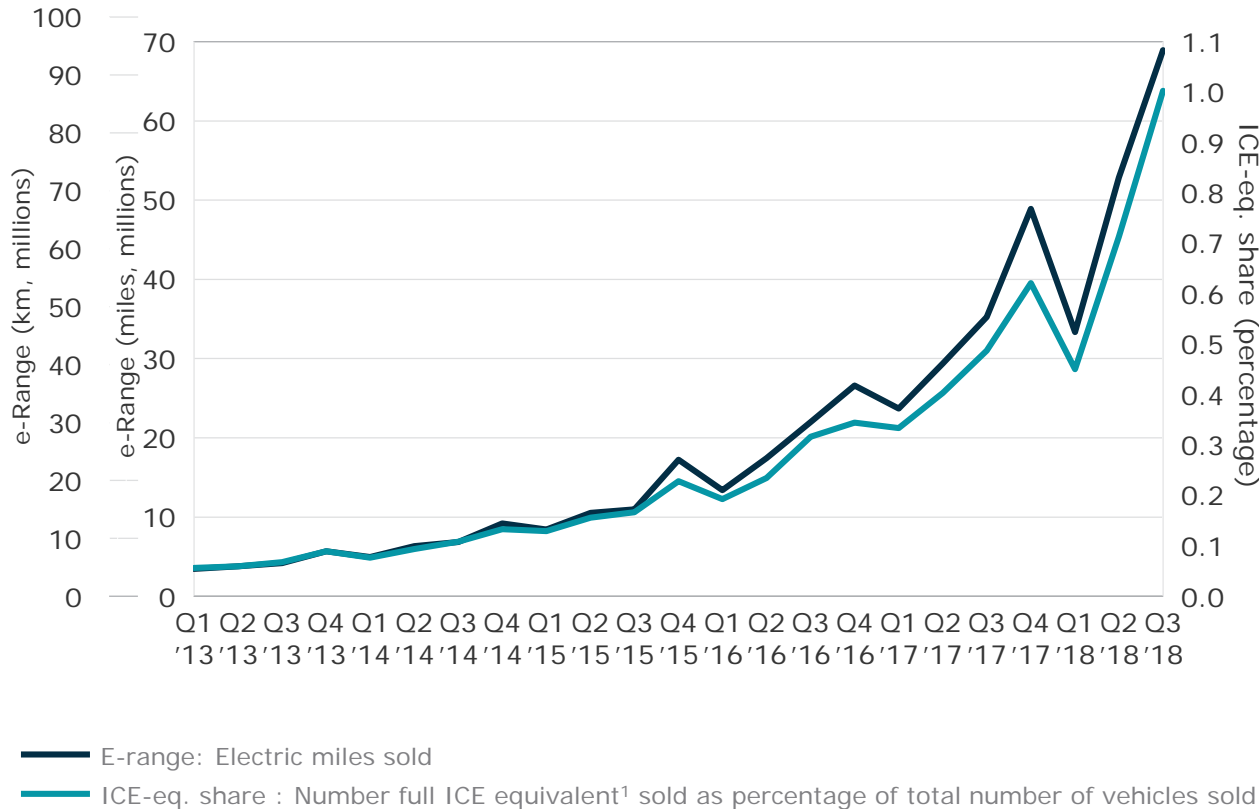
Q3 2018

Number of
BEV, PHEV,
FCEV sold:
41,023

ICE-eq.
share:
0.06%

Market
share:
0.21%

Average
range:
**84 miles
(136 km)**



Number of
BEV, PHEV,
FCEV sold:
519,237

ICE-eq.
share:
1.00%

Market
share:
2.43%

Average
range:
**133 miles
(214 km)**

¹ Electric range/311miles (500km) defining the equivalent full ICE vehicle share

Total market share of EVs increased from c. 2.0% in Q2 to 2.4%, PHEV share stabilizing at c. 33%

Q1 2013

AlixPartners Automotive-Electrification Index

Q3 2018

Number vehicles sold

BEV 30,430
PHEV 10,593
FCEV -

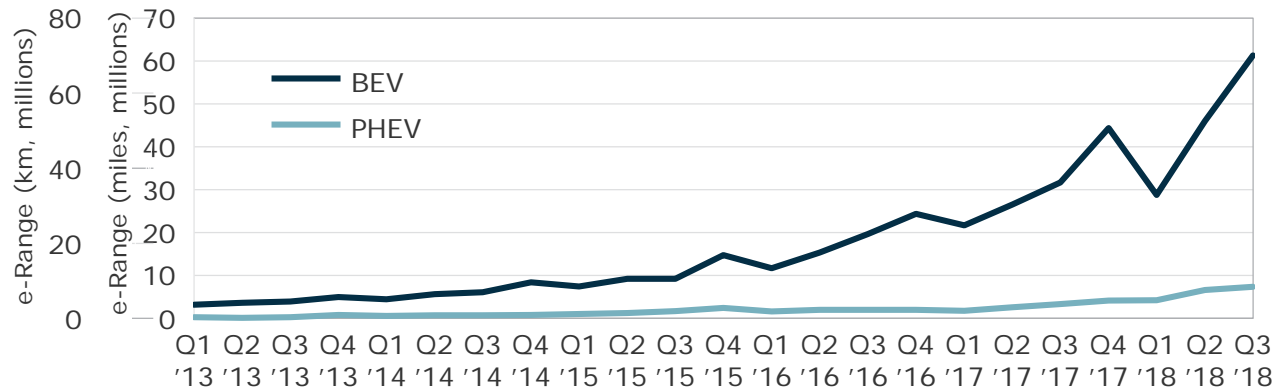
Market share:

BEV 0.16%
PHEV 0.05%

Average e-Range (miles):

BEV 105
PHEV 26

e-Range by propulsion



Number vehicles sold

BEV 347,436
PHEV 170,745
FCEV 1,056

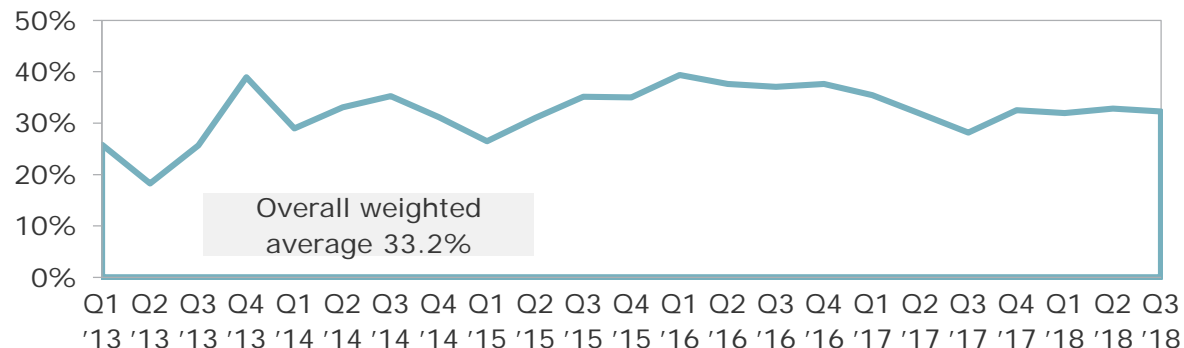
Market share:

BEV 1.62%
PHEV 0.80%

Average e-Range (miles):

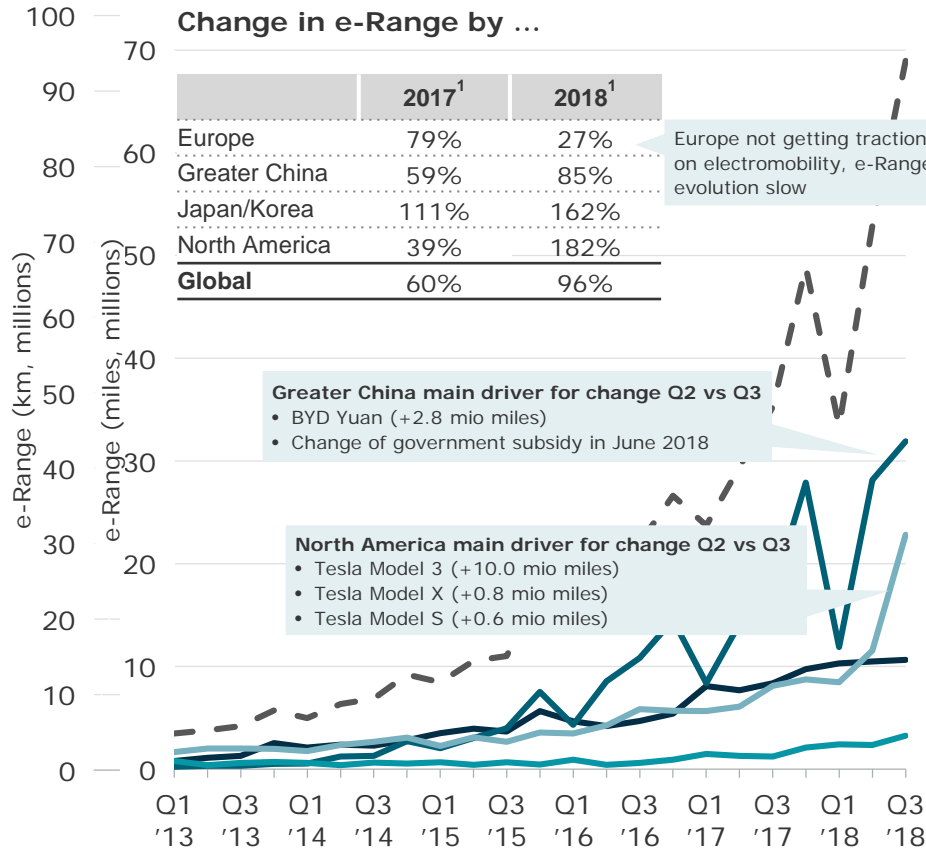
BEV 176
PHEV 43

Share of PHEVs within total number of electric vehicles sold

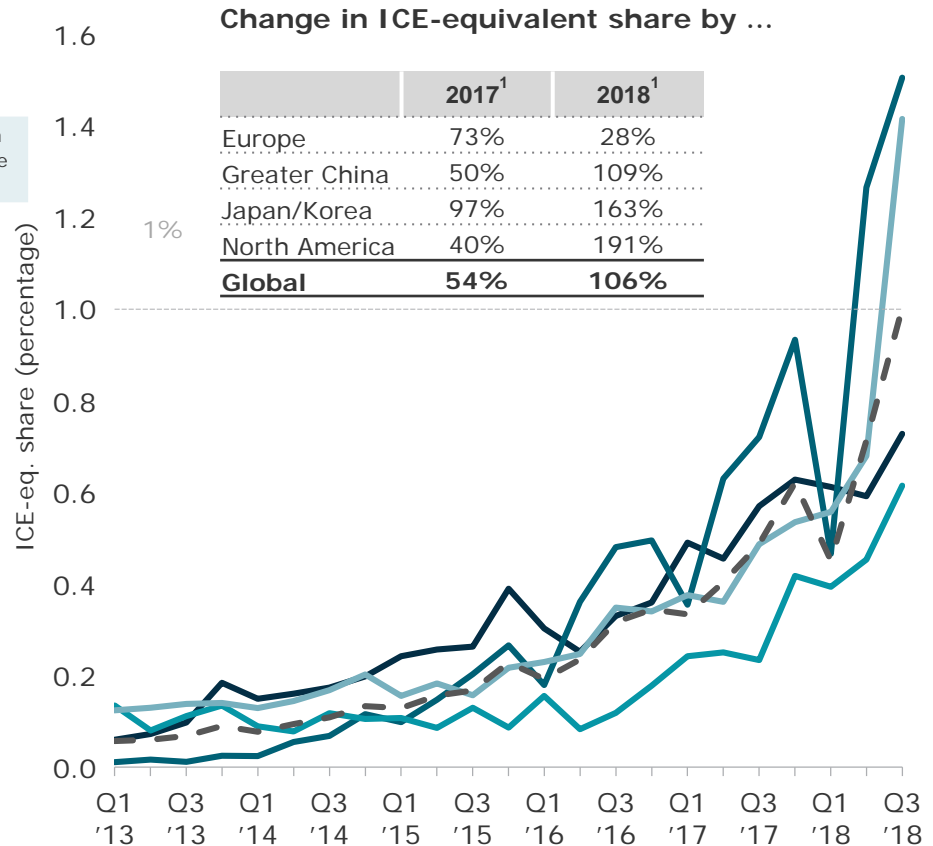


North America with significant e-Range increase attacking #1 Greater China

e-Range: regions by quarter (Q1 '13 to Q3 '18)



ICE-eq. share²: regions by quarter (Q1 '13 to Q3 '18)



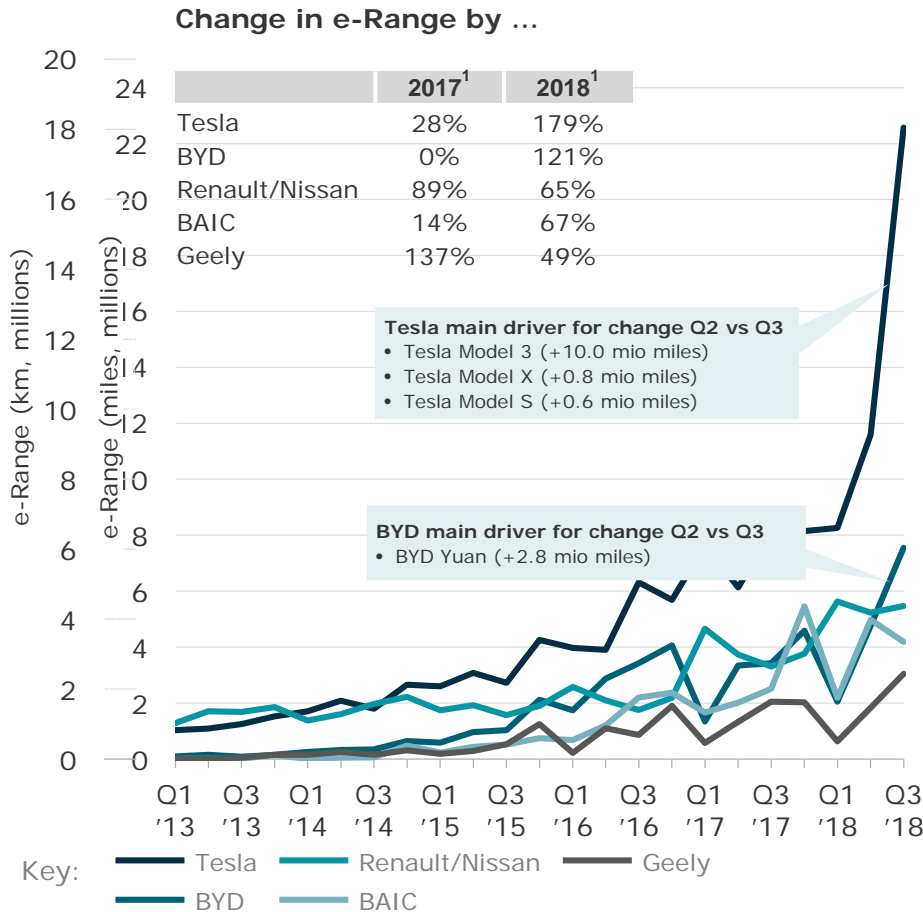
Key: — Europe — Greater China — Japan/Korea — North America — Global

¹ Change Q3 previous year to Q3 particular year

² Electric range/311miles (500km) defining the equivalent full ICE vehicle share

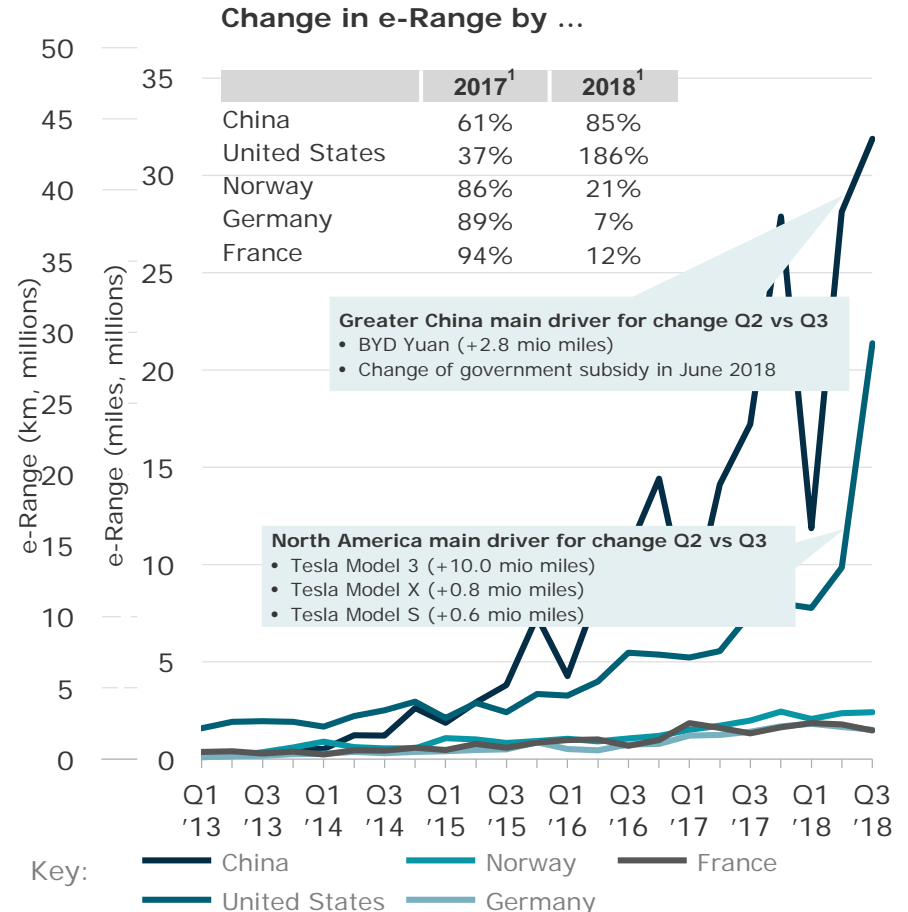
Tesla & BYD with strong growth last twelve months; growth of main European countries slow

e-Range: Major 5 OEMs by quarter (Q1 '13 to Q3 '18)



¹ Change Q3 previous year to Q3 particular year

e-Range: Major 5 countries by quarter (Q1 '13 to Q3 '18)



China & USA still dominating, covering ~77% of total e-Range; South Korea with a big step

e-Range by country: Q3 2018

South Korea main driver for change Q2 vs Q3

- Hyundai Kona (+0.5 mio miles)
- Kia Niro (+0.4 mio miles)

Rank Q3 '18	Rank Q3 '16	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q3 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
1	1	China	31.871	51.291	272,982	21	Finland	0.068	0.109	1,251
2	2	United States	21.366	34.385	111,060	22	Malaysia	0.060	0.096	2,236
3	3	Norway	2.398	3.860	16,822	23	Iceland	0.054	0.087	968
4	13	South Korea	1.847	2.973	9,285	24	New Zealand	0.053	0.085	423
5	5	Germany	1.495	2.405	16,082	25	Ukraine	0.048	0.078	268
6	6	France	1.469	2.363	11,106	26	Hungary	0.046	0.073	448
7	8	Canada	1.436	2.310	12,766	27	Israel	0.038	0.062	635
8	7	Japan	1.381	2.222	13,331	28	Czech Republic	0.033	0.052	223
9	9	Netherlands	1.280	2.059	6,141	29	Poland	0.028	0.046	279
10	4	United Kingdom	1.238	1.992	15,942	30	Thailand	0.025	0.040	248
11	10	Sweden	0.584	0.941	7,343	31	Hong Kong	0.024	0.039	114
12	11	Switzerland	0.286	0.461	2,141	32	Slovenia	0.021	0.034	162
13	16	Italy	0.284	0.457	2,996	33	Romania	0.021	0.034	140
14	12	Austria	0.282	0.453	1,866	34	Luxembourg	0.018	0.029	204
15	18	Spain	0.261	0.420	2,574	35	India	0.015	0.023	183
16	14	Belgium	0.216	0.347	2,988	36	Singapore	0.013	0.021	95
17	20	Portugal	0.211	0.340	1,959	37	United Arab Emirates	0.012	0.019	44
18	19	Australia	0.125	0.201	697	38	Colombia	0.011	0.018	162
19	24	Ireland	0.121	0.194	899	39	Mexico	0.011	0.018	82
20	17	Denmark	0.112	0.180	1,410	40	Bulgaria	0.009	0.014	59

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

China & USA still dominating, covering ~77% of total e-Range; South Korea with a big step

e-Range by country: Q3 2018

Rank Q3 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
41	Croatia	0.009	0.014	49
42	Brazil	0.007	0.012	49
43	Estonia	0.007	0.011	54
44	Latvia	0.006	0.009	44
45	Turkey	0.005	0.008	28
46	Jordan	0.005	0.007	24
47	Taiwan	0.005	0.007	47
48	Lithuania	0.004	0.007	35
49	Slovakia	0.004	0.007	76
50	Cyprus	0.004	0.006	22
51	Greece	0.003	0.006	63
52	Russia	0.003	0.004	19
53	South Africa	0.003	0.004	22
54	Costa Rica	0.002	0.003	24
55	Chile	0.002	0.003	19
56	Indonesia	0.002	0.003	5
57	Uruguay	0.001	0.001	12
58	Malta	0.001	0.001	5
59	Serbia	0.001	0.001	6
60	Ecuador	0.001	0.001	8

Rank Q3 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
61	Morocco	0.000	0.001	2
62	Saudi Arabia	0.000	0.000	6
63	Oman	0.000	0.000	3
64	Bahrain	0.000	0.000	1
65	Egypt	0.000	0.000	0
66	Macedonia	0.000	0.000	0
67	Qatar	0.000	0.000	0
68	Bermuda	0.000	0.000	0
69	Panama	0.000	0.000	0
70	Peru	0.000	0.000	0
71	Puerto Rico	0.000	0.000	0
	Global	68.941	110.950	519,237

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

ICE-equivalent share by country: Norway keeps on growing from 14.0% in Q2 to 17.5% in Q3

ICE-eq. share¹ by country: Q3 2018

Rank Q3 '18	Rank Q3 '16	Country	ICE-eq. share (%)	Number EV sold	Rank Q3 '18	Country	ICE-eq. share (%)	Number EV sold	Rank Q3 '18	Country	ICE-eq. share (%)	Number EV sold
1	1	Norway	17.53	16,822	26	Slovenia	0.34	162	51	India	0.00	183
2	3	Iceland	3.84	968	27	Estonia	0.29	54	52	Morocco	0.00	2
3	4	Netherlands	3.32	6,141	28	Bulgaria	0.26	59	53	Mexico	0.00	82
4	5	Sweden	3.06	7,343	29	Spain	0.24	2,574	54	Brazil	0.00	49
5	10	United States	1.60	111,060	30	Italy	0.22	2,996	55	Russia	0.00	19
6	8	China	1.47	272,982	31	Singapore	0.21	95	56	Bahrain	0.00	1
7	20	South Korea	1.40	9,285	32	Croatia	0.20	49	57	Oman	0.00	3
8	6	Switzerland	1.22	2,141	33	Israel	0.19	635	58	Saudi Arabia	0.00	6
9	16	Portugal	1.19	1,959	34	Czech Republic	0.15	223	59	Cyprus	0.00	22
10	7	Austria	0.97	1,866	35	Australia	0.15	697	60	Costa Rica	0.00	24
11	25	Ireland	0.90	899	36	Lithuania	0.15	35	61	Malta	0.00	5
12	17	Canada	0.87	12,766	37	Romania	0.13	140	62	Indonesia	0.00	5
13	9	France	0.83	11,106	38	Malaysia	0.12	2,236	63	Bermuda	0.00	0
14	2	Hong Kong	0.77	114	39	Poland	0.06	279	64	Macedonia	0.00	0
15	22	Ukraine	0.75	268	40	Colombia	0.06	162	65	Puerto Rico	0.00	0
16	18	Finland	0.69	1,251	41	UA Emirates	0.06	44	66	Jordan	0.00	24
17	11	Denmark	0.63	1,410	42	Slovakia	0.05	76	67	Egypt	0.00	0
18	14	United Kingdom	0.57	15,942	43	Greece	0.05	63	68	Peru	0.00	0
19	15	Germany	0.53	16,082	44	Thailand	0.03	248	69	Qatar	0.00	0
20	12	Belgium	0.49	2,988	45	Serbia	0.03	6	70	Panama	0.00	0
21	13	Luxembourg	0.45	204	46	Uruguay	0.02	12	71	Ecuador	0.00	8
22	24	New Zealand	0.44	423	47	Taiwan	0.02	47		Global	1.00	519,237
23	69	Latvia	0.40	44	48	Turkey	0.01	28				
24	23	Hungary	0.37	448	49	Chile	0.01	19				
25	21	Japan	0.35	13,331	50	South Africa	0.01	22				

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

¹ Electric range/311miles (500km) defining the equivalent full ICE vehicle share

e-Range by automaker: Tesla (+100%) and BYD (+58%) improved significantly compared to Q2

e-Range by automaker: Q3 2018

Rank Q3 '18	Rank Q3 '16	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q3 '18	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	
1	1	Tesla	22.57	36.33	84,160	21	Mitsubishi	0.38	0.62	11,110	
2	2	BYD	7.55	12.15	65,489	22	Honda	0.36	0.58	5,946	
3	4	Renault/Nissan	5.47	8.80	35,366	23	Daimler	0.35	0.57	6,552	
4	3	BAIC	4.19	6.74	29,599	24	Great Wall	0.28	0.44	3,042	
5	7	Geely	3.05	4.90	28,984	25	Sichuan Yema	0.27	0.43	1,636	
6	12	Hyundai	2.63	4.23	20,543	26	TATA	0.24	0.38	2,858	
7	32	Hawtai	2.47	3.97	17,950	27	Fujian Motor Industry	0.20	0.32	2,071	
8	16	SAIC	2.45	3.94	30,951	28	Lifan	0.14	0.23	1,268	
9	11	General Motors	2.28	3.68	16,629	29	PSA	0.14	0.22	1,448	
10	13	Chery	2.14	3.45	18,730	30	Hanteng Autos	0.12	0.20	899	
11	19	Dongfeng	2.04	3.28	10,234	31	FCA	0.10	0.17	2,560	
12	5	BMW	1.91	3.07	35,974	32	Ford	0.08	0.12	2,544	
13	10	Jianghuai	1.40	2.25	13,030	33	Zhidou	0.07	0.12	729	
14	27	Changan	1.31	2.11	9,017	34	Hainan Automobile	0.06	0.09	396	
15	9	Volkswagen	1.27	2.05	21,634	35	FAW	0.04	0.06	325	
16	15	Jiangling	0.87	1.40	9,373	36	Xpeng EV	0.03	0.06	159	
17	8	Zotye	0.75	1.21	8,023	37	Other	0.05	0.08	482	
18	14	Toyota	0.66	1.06	10,931	Global			68.94	110.95	519,237
19	23	Guangzhou Auto	0.50	0.81	5,327	<p>NEXTEV entering Top 20 after launching the Nio ES8 (+0.5 mio miles)</p>					
20	36	NEXTEV	0.50	0.81	3,268						

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

ICE-equivalent share of OEMs: Ranking lead by Tesla and Chinese OEMs; NEXTEV jumped to #2

ICE-eq. share¹ by automaker: Q3 2018

NEXTEV jumped to #2 after launching the Nio ES8

Rank Q3 '18	Rank Q3 '16	OEM	ICE-eq. share (%)	Number EV sold	Average range (miles)	Rank Q3 '18	OEM	ICE-eq. share (%)	Number EV sold	Average range (miles)	
1	1	Tesla	116.4	84,160	268	21	BMW	1.0	35,974	53	
2	44	NEXTEV	34.4	3,268	154	22	Renault/Nissan	0.9	35,366	155	
3	2	Zhidou	31.9	729	99	23	Soueast	0.6	256	106	
4	33	Fujian Motor Industry	27.8	2,071	96	24	Hyundai	0.5	20,543	128	
5	28	Hawtai	23.1	17,950	138	25	Mitsubishi	0.4	11,110	34	
6	3	BYD	20.0	65,489	115	26	Great Wall	0.4	3,042	91	
7	10	Sichuan Yema	12.7	1,636	164	27	General Motors	0.4	16,629	137	
8	4	BAIC	10.0	29,599	142	28	TATA	0.3	2,858	83	
9	5	Zotye	6.7	8,023	94	29	FAW	0.2	325	114	
10	31	Jianghuai	5.8	13,030	107	30	Daimler	0.2	6,552	54	
11	41	Jiangling	5.5	9,373	93	31	Volkswagen	0.2	21,634	59	
12	7	Chery	4.6	18,730	114	32	Honda	0.1	5,946	60	
13	6	SAIC	4.5	30,951	79	33	Toyota	0.1	10,931	60	
14	14	Dongfeng	4.5	10,234	199	34	PSA	0.1	1,448	95	
15	15	Lifan	4.3	1,268	112	36	FCA	0.0	2,560	41	
16	45	Hanteng Autos	2.8	899	139	37	Ford	0.0	2,544	30	
17	12	Hainan Automobile	2.3	396	147	36	Mahindra & Mahindra	0.0	83	78	
18	24	Changan	2.1	9,017	146	37	Other	0.0	200	218	
19	8	Geely	1.9	28,984	105						
20	17	Guangzhou Auto	1.3	5,327	95						
								Global	1.00	519,237	133

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

¹ Electric range/311miles (500km) defining the equivalent full ICE vehicle share

Tesla Model 3 by far best selling EV contributing 21.5% to the Global e-Range

Sales by EV model Q3 2018

Rank Q3 '18	Model	Segment	Number EV sold	% of e-range
1	Tesla Model 3	D	56,374	21.5
2	Nissan Leaf	C	23,584	4.7
3	BYD Tang	SUV-C	14,613	1.0
4	Tesla Model S	E	14,577	6.5
5	BYD Yuan	SUV-B	13,669	3.8
6	Chery eQ	A	13,588	1.8
7	Tesla Model X	SUV-E	13,209	4.8
8	BYD Qin	D	13,031	0.9
9	Hawtai EV160	A	12,084	1.7
10	JAC iEV6E	A	11,424	1.8
11	BYD e5	D	11,354	3.1
12	Mitsubishi Outlander	SUV-C	10,929	0.5
13	SAIC Roewe i6	C	10,914	0.5
14	Geely Emgrand	D	10,340	2.4
15	Toyota Prius Gen-2	C	10,289	0.6

Rank Q3 '18	Model	Segment	Number EV sold	% of e-range
16	BJEV EU260/300	D	10,244	2.6
17	BJEV EX200/260	SUV-C	9,514	2.0
18	SAIC Roewe Ei5	C	9,459	2.6
19	BMW i3	B	7,888	1.7
20	BJEV EC180	A	7,471	1.1
21	BYD Song	SUV-B	7,338	0.4
22	Renault Zoe	B	7,124	2.6
23	Dongfeng Jun Feng E17	D	6,597	2.1
24	SAIC Roewe eRX5	SUV-C	6,575	0.3
25	Chevrolet Volt	C	6,214	0.5
26	Chevrolet Bolt	MPV-B	6,095	2.1
27	JMC E200	A	5,388	0.7
28	Honda Clarity	D	5,361	0.3
29	Geely BoRui GE	E	5,339	0.2
30	Zotye E200	A	5,258	0.8
	Others	-	173,393	24.4
Total Top 30			519,237	100.0

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research

¹ Electric range/311miles (500km) defining the equivalent full ICE vehicle share