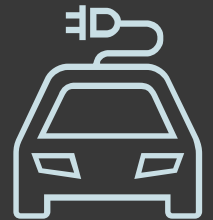


AlixPartners

AlixPartners Automotive- Electrification Index

Q4 2018



AlixPartners Automotive Electrification Index - Executive Summary

e-Range

- Globally about **101m miles e-Range** sold in Q4 2018 – growth continues strongly with an **increase by 46%** compared to Q3 2018 (69m miles)
- **Market share** of EVs jumped from 2.4% in Q3 to **3.3% mainly driven by BEVs**; PHEVs market share remains static at 0.8%
- **Last twelve months numbers almost tripled in North America** (e-Range increase by 188%) mainly due to the introduction of Tesla's Model 3; continuous strong growth in China (+100%); **Europe growth again comparably slower** (+65%)
- Two countries, China and USA, leading the country ranking with ~80% share of total e-Range; **Netherlands entering Top 5** replacing Germany
- OEM ranking led by Tesla contributing to c. 24% (vs 33% in Q3) to the total e-Range losing ground against BYD; **Tata entering Top 20 after launching the Jaguar I-Pace**

Others

- **Average range per vehicle slightly increased** from 133 miles in Q3 to 138 miles in Q4
- Plug-In share within electrified cars sold down to 25% **last quarters showing trend towards 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

- **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	MOROCCO	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	

e-Range boosted by 46% compared to Q3; EV market share increased from 2.4% in Q3 to 3.3%

Q1 2013

AlixPartners Automotive-Electrification Index

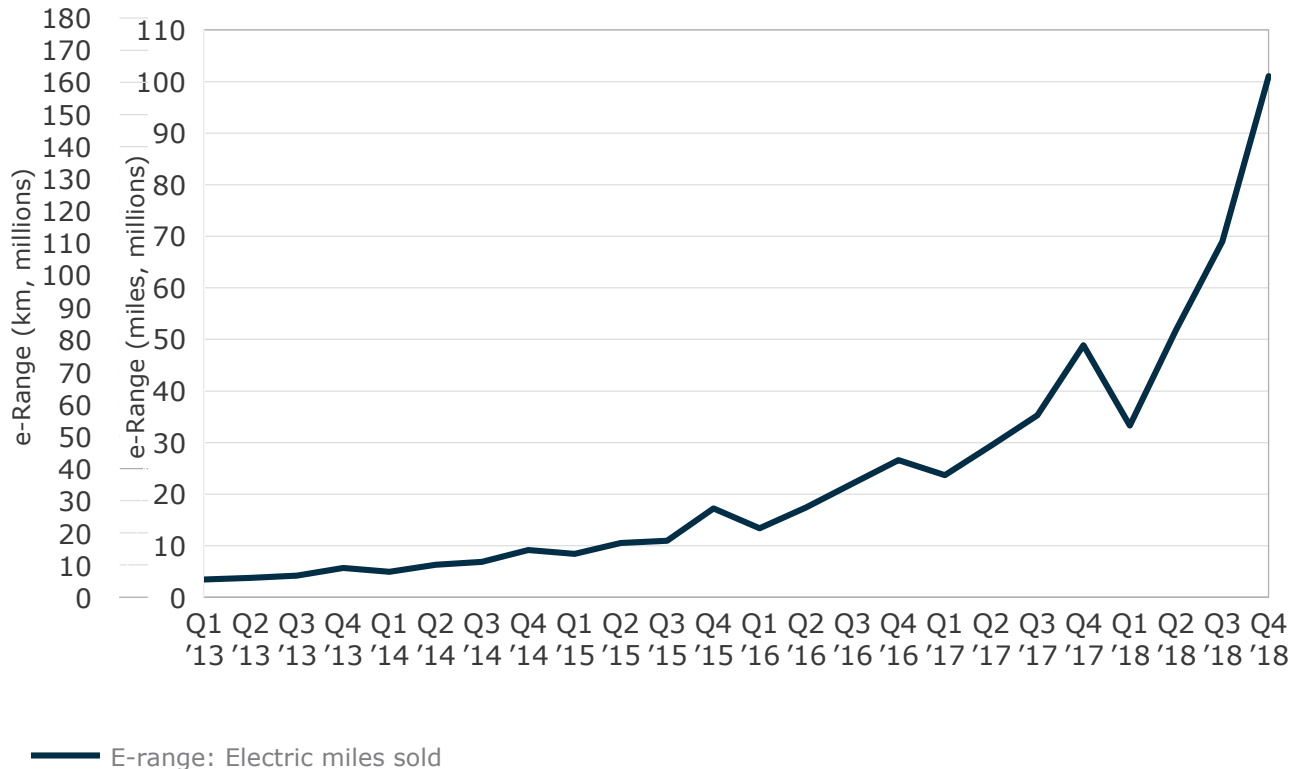
Q4 2018

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

e-Range:
3.5m miles
5.6m km

Market share:
0.21%

Average range:
84 miles
(136 km)



Number of BEV, PHEV, FCEV sold:
734,539

e-Range:
101.0m miles
162.6m km

Market share:
3.25%

Average range:
138 miles
(221 km)

Strong BEV sales in Q4 resulting in significant increased market share (2.4% vs. 1.6% in Q3)

Q1 2013

AlixPartners Automotive-Electrification Index

Q4 2018

Number vehicles sold

BEV 30,430
PHEV 10,593
FCEV -

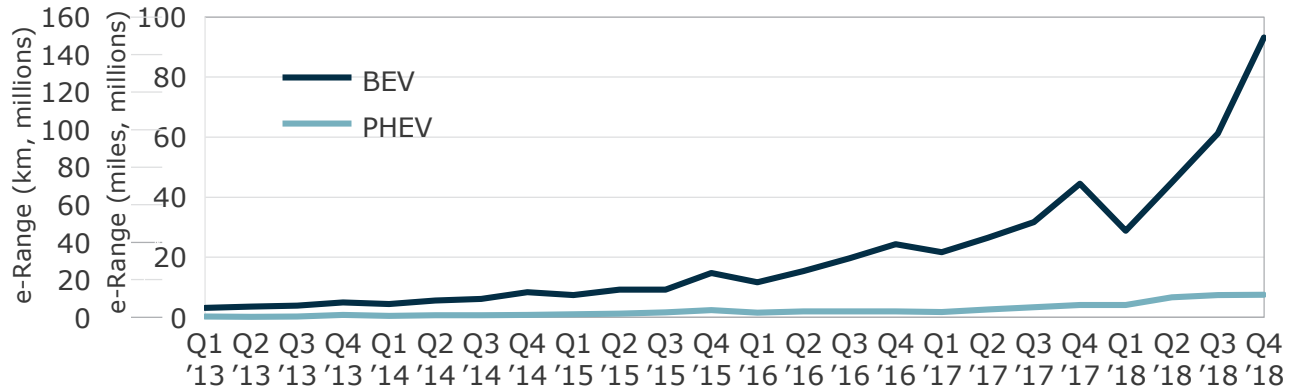
Market share:

BEV 0.16%
PHEV 0.05%

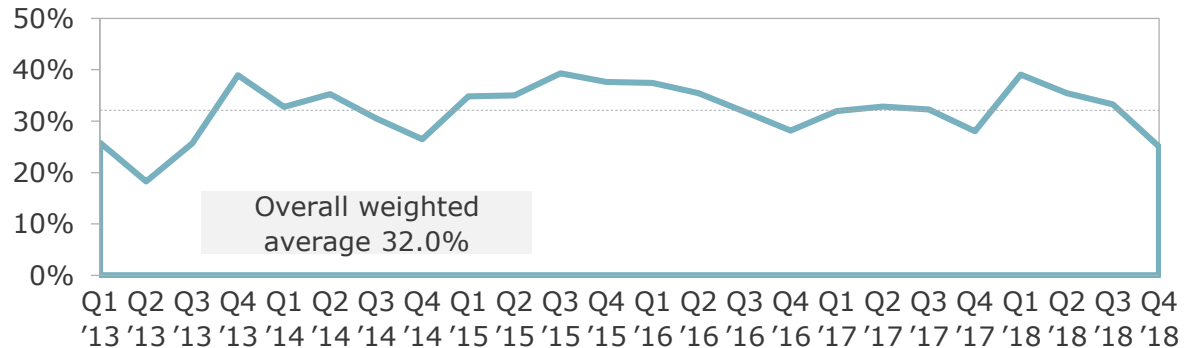
Average e-Range (miles):

BEV 105
PHEV 26

e-Range by propulsion



Share of PHEVs within total number of electric vehicles sold



Number vehicles sold

BEV 549,226
PHEV 184,108
FCEV 1,205

Market share:

BEV 2.43%
PHEV 0.82%

Average e-Range (miles):

BEV 170
PHEV 41

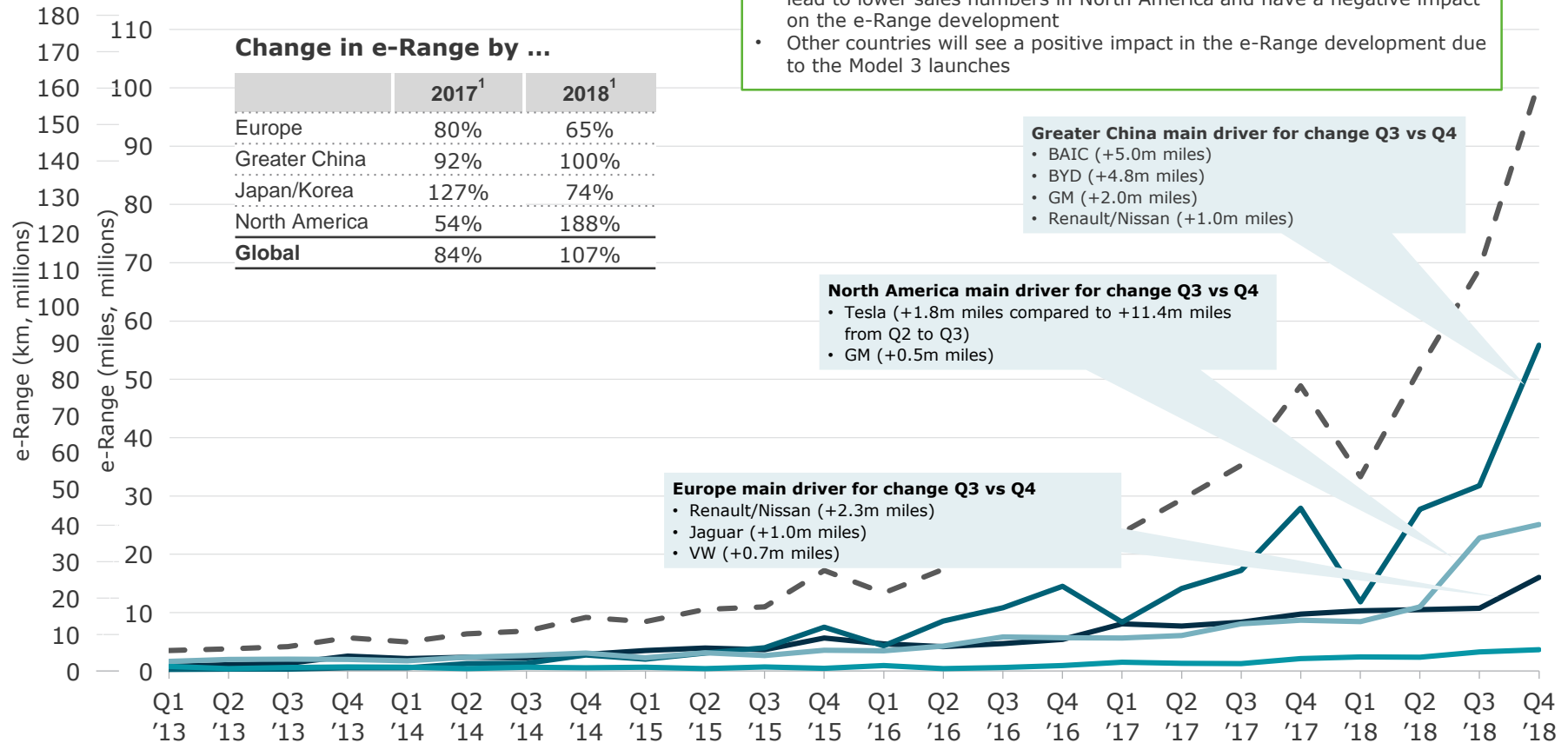
Greater China increased e-Range by c. 75% compared to Q3 (56m miles vs. 32m miles)

e-Range: regions by quarter (Q1 '13 to Q4 '18)

Change in e-Range by ...

	2017 ¹	2018 ¹
Europe	80%	65%
Greater China	92%	100%
Japan/Korea	127%	74%
North America	54%	188%
Global	84%	107%

- E-Range boost over the last quarters in North America mainly driven by Tesla's Model 3
- Model 3 launches in other countries and limited production capacities will lead to lower sales numbers in North America and have a negative impact on the e-Range development
- Other countries will see a positive impact in the e-Range development due to the Model 3 launches



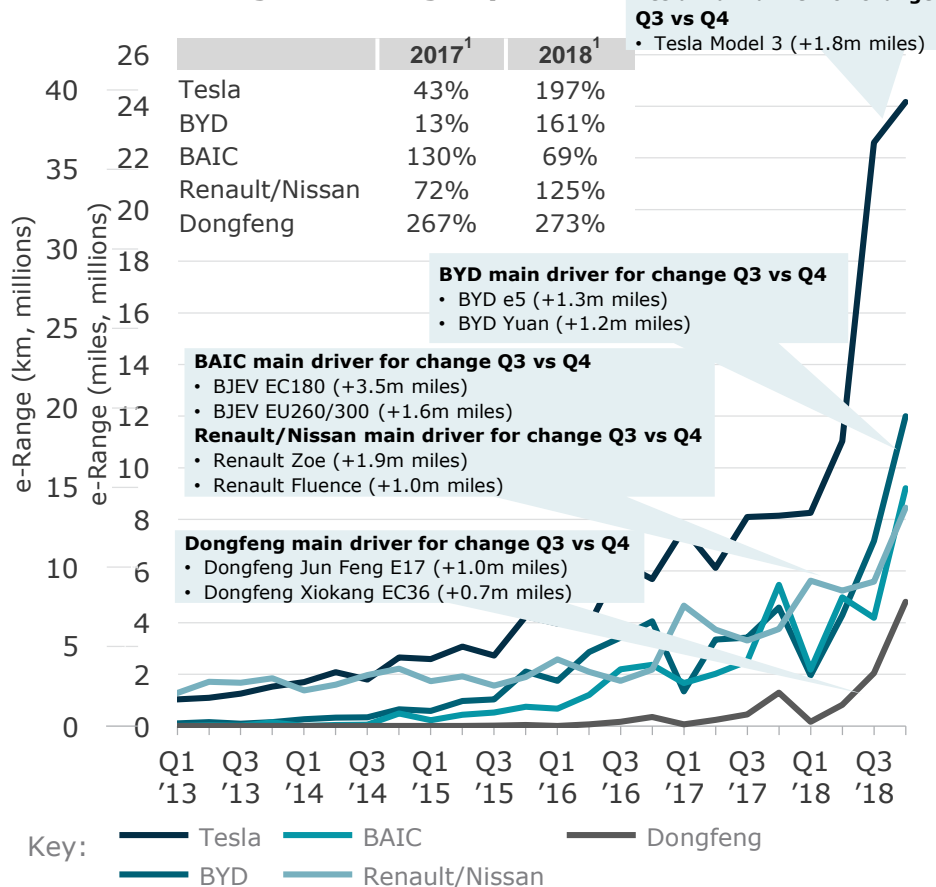
¹ Change Q4 previous year to Q4 particular year

Dongfeng entering Top 5 OEMs; Netherlands replaces Germany in country ranking

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

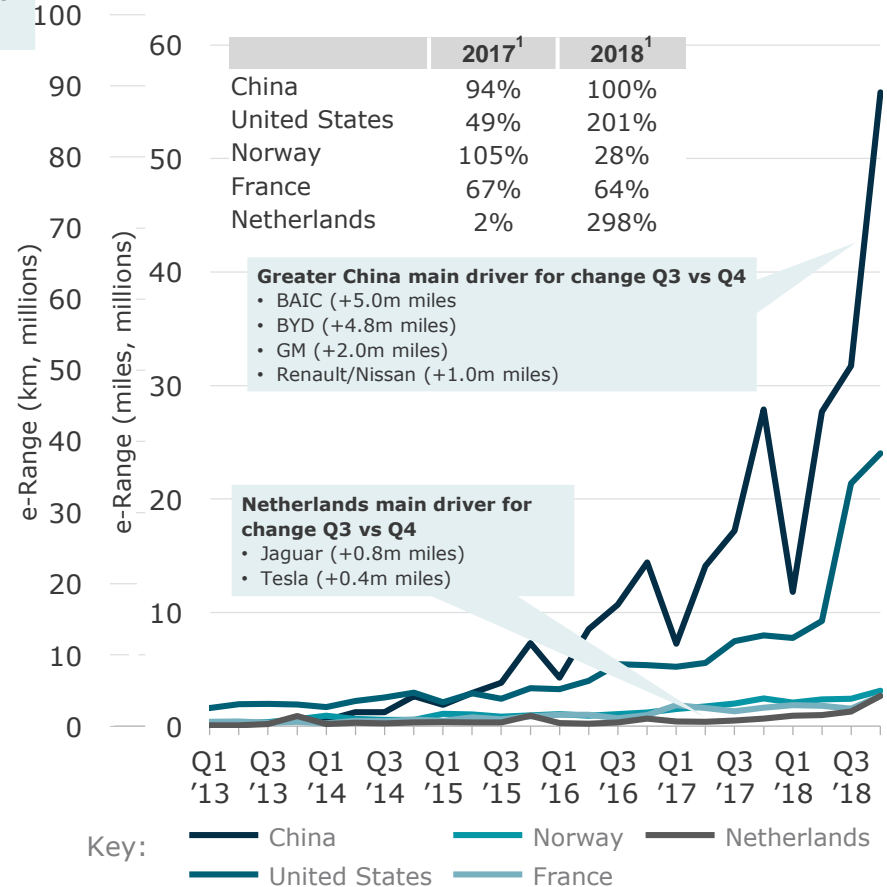
e-Range: Major 5 countries by quarter (Q1 '13 to Q3 '18)

Change in e-Range by ...



¹ Change Q4 previous year to Q4 particular year

Change in e-Range by ...



China & USA still dominating, covering ~79% of total e-Range; Netherlands entering Top 5

e-Range by country: Q4 2018

Rank Q4 '18	Rank Q4 '16	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q4 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
1	1	China	55.84	89.87	451,248	21	Malaysia	0.07	0.12	3,070
2	2	United States	24.03	38.68	126,443	22	Hungary	0.07	0.12	609
3	3	Norway	3.11	5.00	21,253	23	Singapore	0.07	0.11	559
4	4	France	2.67	4.29	16,804	24	Ukraine	0.07	0.11	359
5	6	Netherlands	2.64	4.25	11,959	25	Iceland	0.06	0.09	712
6	9	South Korea	2.63	4.24	11,854	26	Luxembourg	0.05	0.08	372
7	5	Germany	2.35	3.78	17,489	27	New Zealand	0.04	0.07	348
8	7	United Kingdom	1.32	2.13	15,298	28	Czech Republic	0.04	0.07	290
9	10	Canada	1.03	1.66	8,272	29	Poland	0.04	0.07	324
10	8	Japan	0.99	1.59	11,957	30	Malta	0.04	0.06	157
11	11	Sweden	0.81	1.30	8,594	31	Thailand	0.03	0.05	390
12	15	Spain	0.57	0.91	4,944	32	Hong Kong	0.03	0.05	184
13	13	Austria	0.48	0.76	2,963	33	Romania	0.02	0.04	183
14	12	Switzerland	0.39	0.63	3,076	34	Russia	0.02	0.04	633
15	20	Portugal	0.33	0.53	2,591	35	Slovenia	0.02	0.04	157
16	17	Italy	0.32	0.52	2,885	36	Colombia	0.02	0.03	213
17	14	Belgium	0.31	0.50	2,977	37	Costa Rica	0.02	0.03	160
18	18	Denmark	0.14	0.23	1,153	38	Israel	0.02	0.03	436
19	19	Australia	0.12	0.19	1,039	39	United Arab Emirates	0.01	0.02	82
20	21	Finland	0.08	0.12	1,215	40	Croatia	0.01	0.02	82

China & USA still dominating, covering ~79% of total e-Range; Netherlands entering Top 5

e-Range by country: Q4 2018

Rank Q4 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
41	Slovakia	0.01	0.02	120
42	Ireland	0.01	0.02	112
43	Lithuania	0.01	0.02	67
44	Mexico	0.01	0.02	179
45	Jordan	0.01	0.02	77
46	Turkey	0.01	0.02	46
47	Latvia	0.01	0.01	45
48	Bulgaria	0.01	0.01	54
49	Brazil	0.01	0.01	129
50	Greece	0.01	0.01	69
51	Chile	-	0.01	36
52	Taiwan	-	0.01	75
53	Estonia	-	0.01	31
54	South Africa	-	0.01	24
55	Serbia	-	-	14
56	Cyprus	-	-	23
57	India	-	-	20
58	Uruguay	-	-	15
59	Ecuador	-	-	13
60	Puerto Rico	-	-	12

Rank Q4 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
61	Egypt	-	-	5
62	Indonesia	-	-	2
63	Panama	-	-	5
64	Oman	-	-	11
65	Saudi Arabia	-	-	10
66	Bahrain	-	-	6
67	Qatar	-	-	4
68	Morocco	-	-	1
69	Bermuda	-	-	0
70	Peru	-	-	0
71	Macedonia	-	-	0
Global		101.04	162.605	734,539

e-Range by automaker: BYD (+59% vs Q3) reducing gap to Tesla (+7% vs Q3)

e-Range by automaker: Q4 2018

Rank Q4 '18	Rank Q4 '16	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q4 '18	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
1	1	Tesla	24.17	38.89	90,523	21	Guangzhou Auto	0.79	1.27	9,812
2	2	BYD	12.00	19.31	99,389	22	Toyota	0.67	1.08	11,439
3	3	BAIC	9.21	14.82	74,334	23	Hainan Automobile	0.62	1.00	4,319
4	4	Renault/Nissan	8.45	13.60	47,578	24	Great Wall	0.56	0.89	3,978
5	15	Dongfeng	4.81	7.73	25,362	25	Mitsubishi	0.47	0.75	13,753
6	9	Hyundai	4.60	7.40	31,183	26	Soueast	0.45	0.73	3,067
7	12	General Motors	4.32	6.94	32,265	27	Daimler	0.44	0.71	6,001
8	6	Geely	3.40	5.47	36,504	28	Lifan	0.43	0.69	2,677
9	38	Hawtai	3.06	4.93	19,433	29	Hanteng Autos	0.34	0.54	2,378
10	10	Chery	2.52	4.05	21,707	30	Honda	0.33	0.52	7,025
11	7	BMW	2.42	3.90	44,492	31	Fujian Motor Industry	0.28	0.45	2,934
12	20	SAIC	2.42	3.89	21,693	32	Sichuan Yema	0.25	0.40	1,316
13	14	Jiangling	2.37	3.82	21,813	33	Zhidou	0.19	0.30	1,872
14	8	Volkswagen	2.20	3.53	21,942	34	PSA	0.18	0.29	1,986
15	13	Jianghuai	2.12	3.42	17,833	35	FCA	0.12	0.19	2,913
16	23	Changan	1.92	3.10	14,295	36	Ford	0.07	0.11	2,777
17	33	TATA	1.49	2.39	9,150	37	Other	0.04	0.07	437
18	34	NEXTEV	1.30	2.10	8,467		Global	101.04	162.61	734,539
19	5	Zotye	1.13	1.82	11,829					
20	32	FAW	0.92	1.48	6,063					

Tesla's Model 3 best selling EV, BAIC's BJEV EC180 with a big step forward (+36k units vs Q3)

Top 30 sales by EV model Q4 2018

Rank Q4 '18	Model	Segment	Number EV sold	% of e-Range
1	Tesla Model 3	D	63,043	16.4
2	BJEV EC180	A	43,260	4.2
3	Nissan Leaf	C	21,603	3.0
4	BYD Yuan	SUV-B	20,012	3.8
5	BJEV EU260/300	D	19,577	3.4
6	BYD Tang	SUV-C	19,249	0.9
7	BYD e5	D	18,271	3.4
8	BYD Qin	D	16,387	0.8
9	Renault Zoe	B	15,103	3.7
10	Chery eQ	A	14,631	1.4
11	Tesla Model X	SUV-E	14,418	3.5
12	Mitsubishi Outlander	SUV-C	13,572	0.4
13	JAC iEV6E	A	13,186	1.4
14	Tesla Model S	E	13,062	4.0
15	Baojun E100	A	12,973	1.2

- In total 199 EV models sold globally in Q4 2018
- Top 30 EV models make up 69.2% of the total e-Range
- Tesla Model 3 ~50% higher sales but ~400% higher e-Range contribution compared to BAIC's BJEV EC180
- First European EV model ranked at #9, no other European vehicle in top 20

Rank Q4 '18	Model	Segment	Number EV sold	% of e-Range
16	JMC E200	A	12,413	1.2
17	Dongfeng Jun Feng E17	D	11,118	2.5
18	BJEV EX200/260	SUV-C	11,096	1.6
19	BYD Song	SUV-B	10,779	0.4
20	Toyota Prius Gen-2	C	10,776	0.5
21	Hyundai Kona	SUV-B	10,171	2.6
22	BMW i3	B	10,040	1.4
23	Geely Emgrand	D	9,787	1.5
24	BMW 530e	E	9,595	0.3
25	VW e-Golf	C	8,611	1.5
26	Nio ES8	SUV-E	8,467	1.3
27	Hawtai EV160	A	8,399	0.8
28	SAIC Roewe i6	C	7,243	0.2
29	BMW 530Le	E	6,994	0.2
30	Chevrolet Bolt	MPV-B	6,877	1.6
	Others	-	273,826	30.8
Total			734,539	100.0