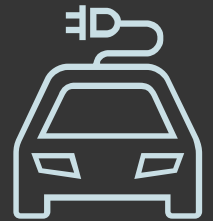


AlixPartners Automotive- Electrification Index

Q2 2018



AlixPartners Automotive Electrification Index - Executive Summary

E-Range

- Globally about 52 mio miles e-Range sold in Q2 2018 – growth continues strongly, **highest quarter ever** with an increase by 76% in comparison to Q1 2018 (33 mio miles)
- **Last twelve months numbers almost doubled in Greater China** (e-Range increase by 95%) – strong growth in China continues; growth North America (81%) slightly behind and **Europe growth still significantly slower** (36%)
- Japan fell in country ranking from position #4 to #10, Canada stepped up from #9 to #5 and South Korea from #10 to #7
- BMW (#6 → #9) and VW (#7 → #12) down in OEM ranking; SAIC #6, Geely#7, Chery #8 passed

ICE-eq. share

- Norway still #1 in country ranking, China jumps from #15 (Q1 2018) to #4 (1,27%), South Korea up from #21 to #6
- Besides Tesla, **no more European, US or Japanese player within OEM Top 20**

Others

- **Average range per vehicle increased** slightly from 110 miles to 115 miles
- Plug-In share within electrified cars sold around 35% - 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.)

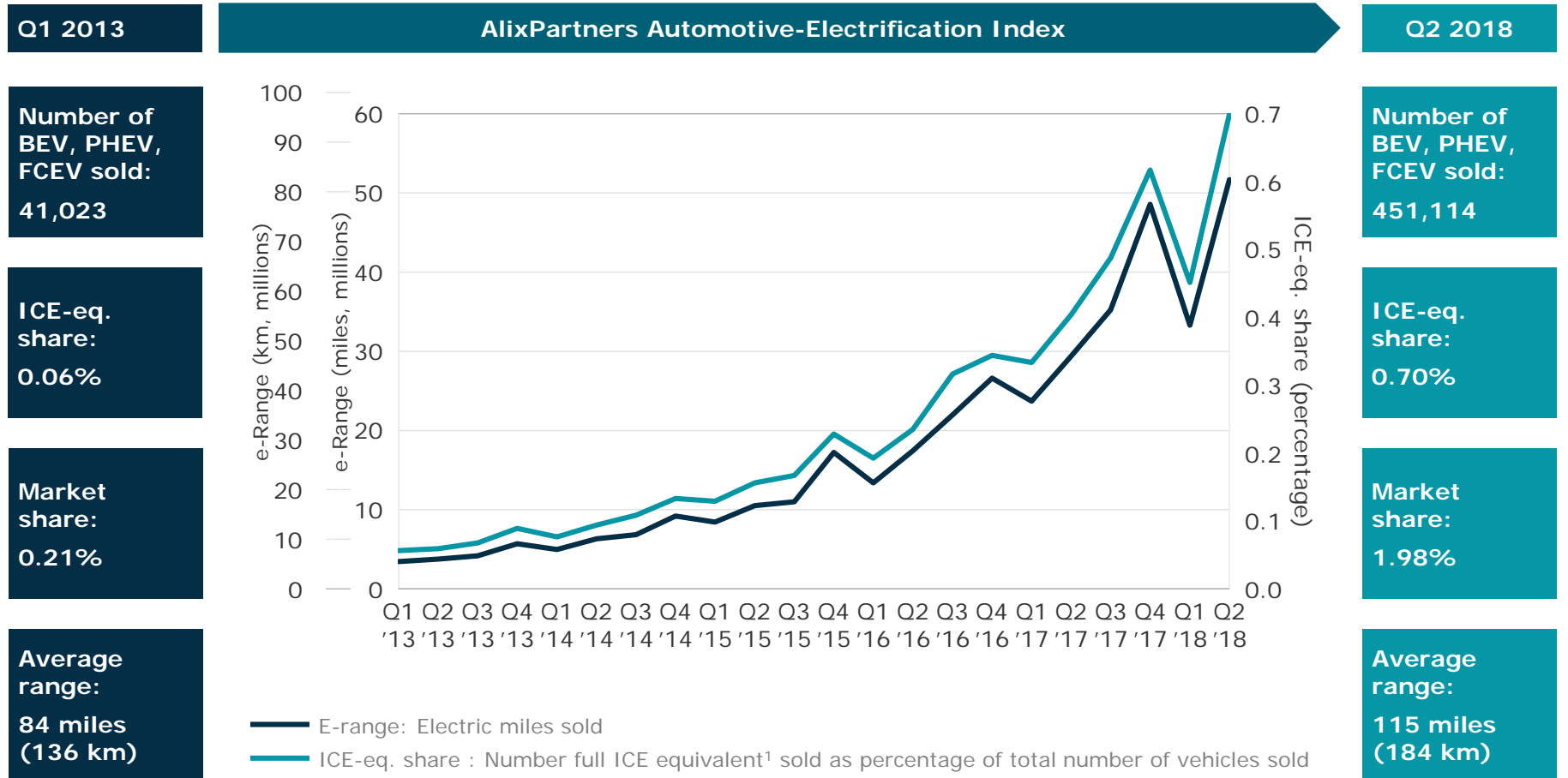
71 Countries in the Index

(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 back to growth; usual Q2 increase vs Q1 also observed in 2018; average range going up



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

In Q2 2018 BEVs contribute for c. 87% of e-Range; BEV share of total EV sold at c. 65%

Q1 2013

AlixPartners Automotive-Electrification Index

Q2 2018

Number vehicles sold

BEV	30,430
PHEV	10,593
FCEV	-

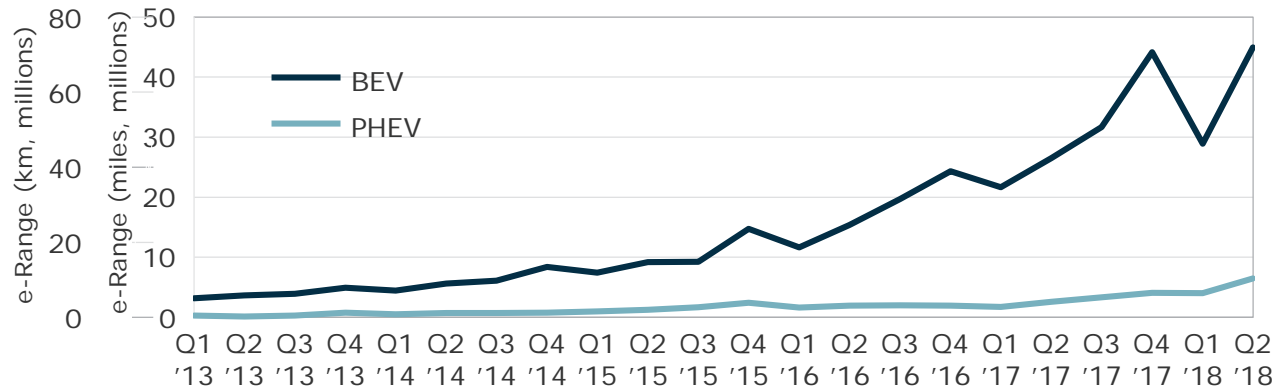
Market share:

BEV	0.16%
PHEV	0.05%

Average e-Range (miles):

BEV	105
PHEV	26

e-Range by propulsion



Number vehicles sold

BEV	294,012
PHEV	156,252
FCEV	850

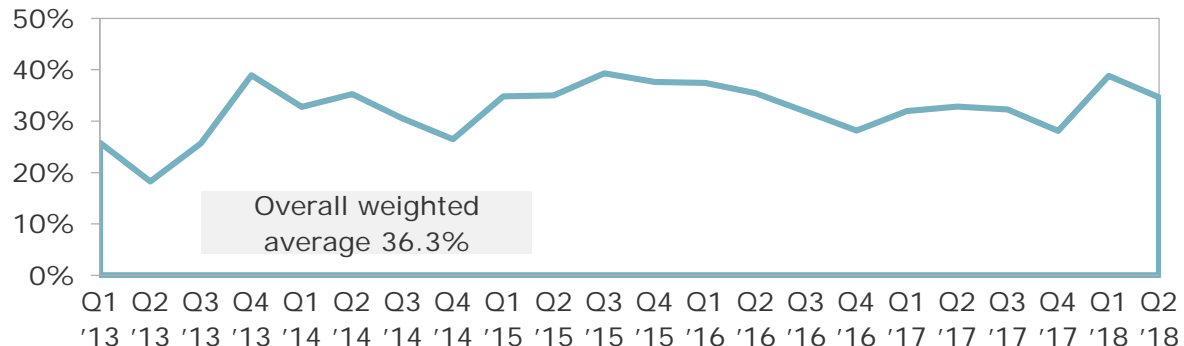
Market share:

BEV	1.29%
PHEV	0.68%

Average e-Range (miles):

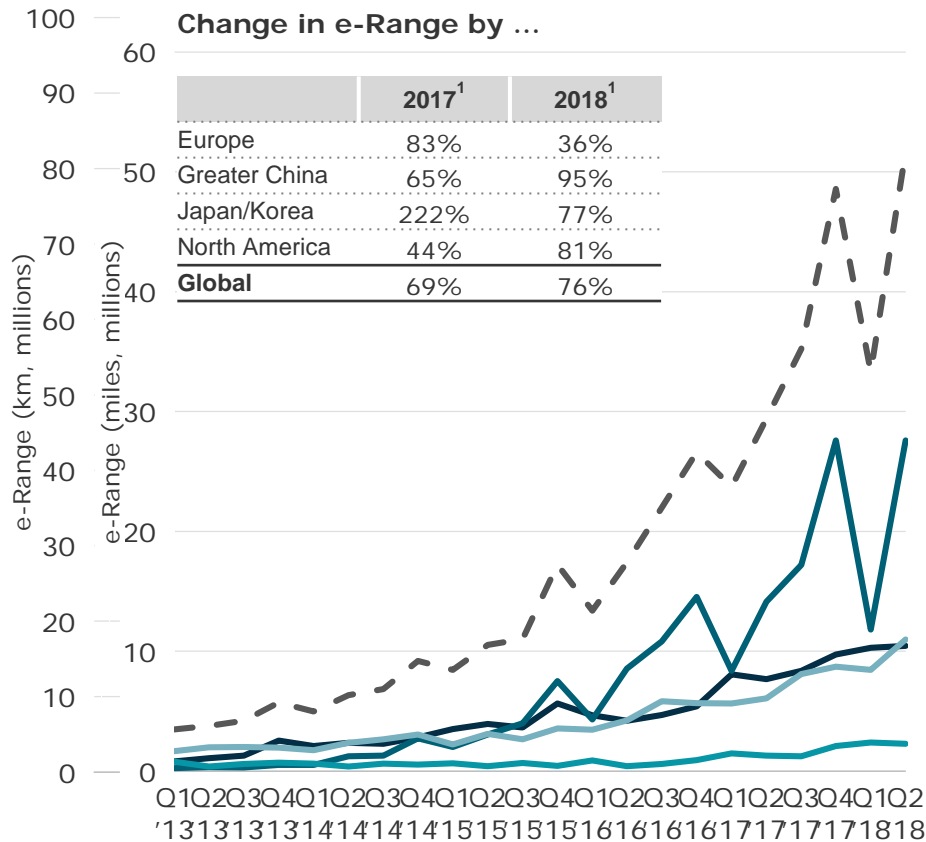
BEV	153
PHEV	42

Share of PHEVs within total number of electric vehicles sold

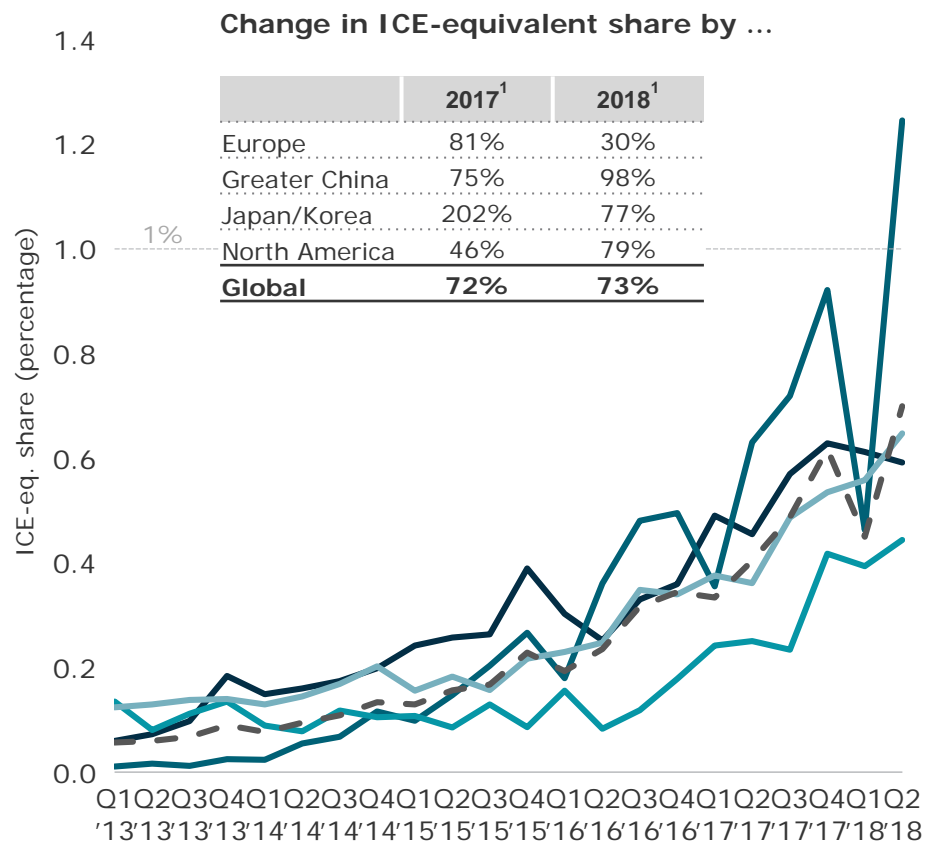


With 95% Greater China leads in e-Range growth last twelve months; Europe 36% growth only

e-Range: regions by quarter (Q1 '13 to Q2 '18)



ICE-eq. share²: regions by quarter (Q1 '13 to Q2 '18)



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

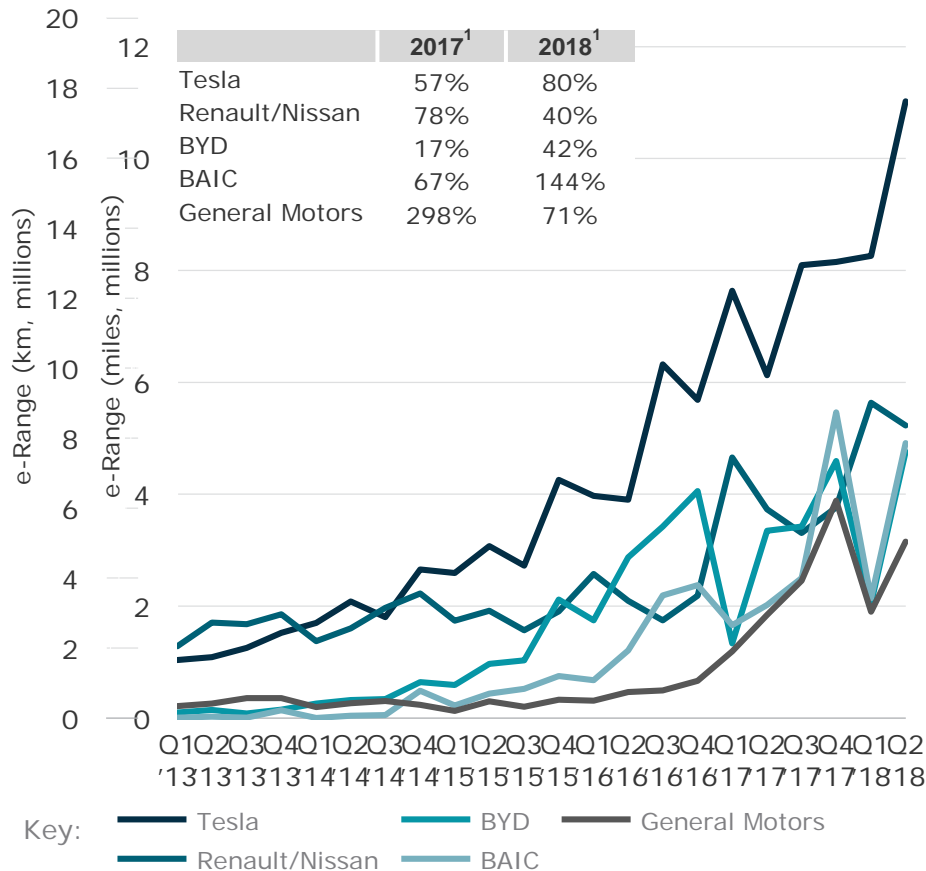
¹ Change Q2 previous year to Q2 particular year

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

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

e-Range: Major 5 OEMs by quarter (Q1 '13 to Q2 '18)

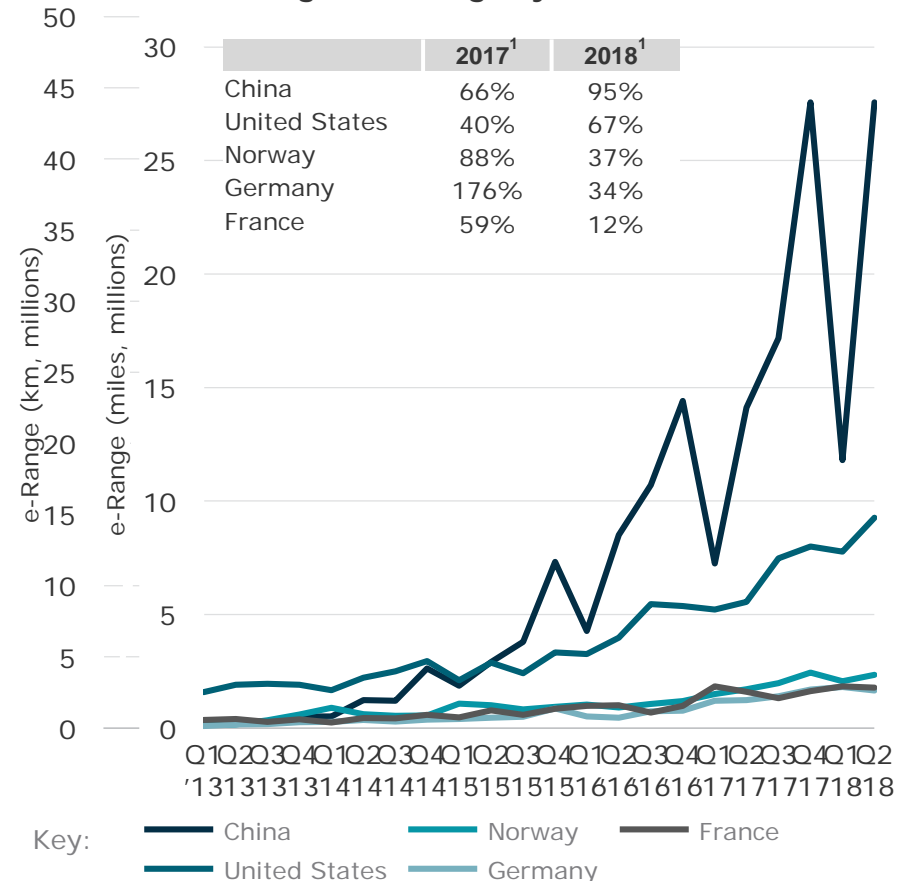
Change in e-Range by ...



¹ Change Q2 previous year to Q2 particular year

e-Range: Major 5 countries by quarter (Q2 '13 to Q2 '18)

Change in e-Range by ...



In Q2 2018 the top 15 countries cover 97% of global e-Range, more than half of it (53%) China

e-Range by country: Q2 2018

Rank Q2 '18	Rank Q2 '16	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q2 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
1	1	China	27.554	44.344	247,105	21	Iceland	0.061	0.098	1,060
2	2	United States	9.264	14.909	67,244	22	Hungary	0.056	0.090	519
3	4	Norway	2.347	3.777	20,011	23	India	0.055	0.089	690
4	3	France	1.775	2.856	12,137	24	Ireland	0.051	0.082	398
5	8	Canada	1.699	2.735	14,727	25	New Zealand	0.050	0.080	405
6	6	Germany	1.649	2.654	16,325	26	Malaysia	0.038	0.061	1,423
7	15	South Korea	1.430	2.301	8,486	27	Czech Republic	0.037	0.060	276
8	5	United Kingdom	1.066	1.716	15,555	28	Ukraine	0.035	0.057	244
9	10	Netherlands	0.951	1.530	4,646	29	Poland	0.032	0.051	349
10	7	Japan	0.849	1.367	9,220	30	Slovakia	0.029	0.046	284
11	9	Sweden	0.404	0.650	7,075	31	Slovenia	0.028	0.046	215
12	12	Austria	0.312	0.502	2,208	32	Israel	0.027	0.044	1,015
13	11	Switzerland	0.294	0.474	2,151	33	Luxembourg	0.024	0.038	271
14	16	Italy	0.285	0.458	2,652	34	Romania	0.020	0.031	161
15	14	Spain	0.284	0.457	3,145	35	Mexico	0.018	0.029	126
16	13	Belgium	0.249	0.400	3,785	36	United Arab Emirates	0.018	0.029	67
17	18	Portugal	0.233	0.374	2,271	37	Turkey	0.017	0.027	80
18	17	Australia	0.172	0.277	906	38	Hong Kong	0.017	0.027	90
19	20	Denmark	0.089	0.143	1,238	39	Colombia	0.012	0.019	170
20	23	Finland	0.077	0.125	1,744	40	Latvia	0.006	0.010	41

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

In Q2 2018 the top 15 countries cover 97% of global e-Range, more than half of it (53%) China

e-Range by country: Q2 2018

Rank Q2 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
41	Russia	0.006	0.010	51
42	Taiwan	0.005	0.009	49
43	Estonia	0.005	0.009	37
44	Cyprus	0.005	0.008	41
45	Bulgaria	0.005	0.008	55
46	Singapore	0.005	0.008	52
47	Lithuania	0.005	0.007	41
48	Thailand	0.003	0.005	102
49	Greece	0.003	0.005	37
50	Malta	0.002	0.004	14
51	South Africa	0.002	0.003	19
52	Croatia	0.002	0.002	10
53	Indonesia	0.001	0.002	4
54	Brazil	0.001	0.002	11
55	Serbia	0.001	0.002	10
56	Jordan	0.001	0.002	4
57	Chile	0.001	0.001	10
58	Uruguay	0.001	0.001	11
59	Ecuador	0.000	0.001	11
60	Panama	0.000	0.000	4

Rank Q2 '18	Country	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
61	Macedonia	0.000	0.000	6
62	Oman	0.000	0.000	9
63	Costa Rica	0.000	0.000	3
64	Saudi Arabia	0.000	0.000	5
65	Bahrain	0.000	0.000	1
66	Egypt	0.000	0.000	1
67	Peru	0.000	0.000	1
68	Bermuda	0.000	0.000	0
69	Morocco	0.000	0.000	0
70	Puerto Rico	0.000	0.000	0
71	Qatar	0.000	0.000	0
	Global	51.668	83.151	451,114

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

ICE-equivalent share by country: China strong increase to 1.3%; Canada gaining momentum

ICE-eq. share¹ by country: Q2 2018

Rank Q2 '18	Rank Q2 '16	Country	ICE-eq. share (%)	Number EV sold	Rank Q2 '18	Country	ICE-eq. share (%)	Number EV sold	Rank Q2 '18	Country	ICE-eq. share (%)	Number EV sold
1	1	Norway	14.04	20,011	26	Slovakia	0.30	284	51	South Africa	0.00	19
2	8	Iceland	2.47	1,060	27	Japan	0.23	9,220	52	Russia	0.00	51
3	5	Netherlands	2.20	4,646	28	Spain	0.20	3,145	53	Ecuador	0.00	11
4	9	China	1.27	247,105	29	Estonia	0.19	37	54	Thailand	0.00	102
5	3	Switzerland	1.01	2,151	30	Australia	0.18	906	55	Chile	0.00	10
6	29	South Korea	0.97	8,486	31	Romania	0.18	161	56	Oman	0.00	9
7	16	Portugal	0.91	2,271	32	Italy	0.16	2,652	57	Bahrain	0.00	1
8	19	Canada	0.91	14,727	33	Czech Republic	0.15	276	58	Brazil	0.00	11
9	6	Austria	0.87	2,208	34	Lithuania	0.14	41	59	Saudi Arabia	0.00	5
10	23	Ireland	0.84	398	35	Bulgaria	0.12	55	60	Egypt	0.00	1
11	4	Sweden	0.78	7,075	36	Israel	0.12	1,015	61	Peru	0.00	1
12	7	France	0.76	12,137	37	Malaysia	0.08	1,423	62	Bermuda	0.00	0
13	10	United States	0.66	67,244	38	UAE	0.08	67	63	Costa Rica	0.00	3
14	20	Finland	0.63	1,744	39	Poland	0.07	349	64	Cyprus	0.00	41
15	2	Hong Kong	0.58	90	40	Colombia	0.07	170	65	Indonesia	0.00	4
16	13	Ukraine	0.53	244	41	Singapore	0.06	52	66	Jordan	0.00	4
17	18	Germany	0.51	16,325	42	Serbia	0.04	10	67	Malta	0.00	14
18	12	United Kingdom	0.50	15,555	43	Macedonia	0.03	6	68	Morocco	0.00	0
19	14	Luxembourg	0.43	271	44	Turkey	0.03	80	69	Panama	0.00	4
20	11	Belgium	0.42	3,785	45	Greece	0.02	37	70	Puerto Rico	0.00	0
21	25	New Zealand	0.42	405	46	Croatia	0.02	10	71	Qatar	0.00	0
22	26	Hungary	0.40	519	47	India	0.02	690		Global	0.70	451,114
23	22	Denmark	0.39	1,238	48	Taiwan	0.02	49				
24	28	Slovenia	0.37	215	49	Uruguay	0.02	11				
25	27	Latvia	0.36	41	50	Mexico	0.01	126				

Sources: IHS Markit, EV-volumes.com, Automaker responses, AlixPartners research
¹Electric Range/311 miles (500km) defining the equivalent full ICE vehicle share

e-Range by automaker: Tesla strengthened lead, Renault/Nissan ahead of BAIC & BYD

e-Range by automaker: Q2 2018

Rank Q2 '18	Rank Q2 '16	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold	Rank Q2 '18	OEM	e-Range (miles, millions)	e-Range (km, millions)	Number EV sold
1	1	Tesla	11.02	17.74	40,649	21	Guangzhou Auto	0.67	1.08	5,868
2	3	Renault/Nissan	5.23	8.41	32,248	22	Daimler	0.46	0.74	11,542
3	4	BAIC	4.91	7.91	39,887	23	Soueast	0.35	0.57	2,204
4	2	BYD	4.76	7.66	43,396	24	Mitsubishi	0.30	0.49	8,895
5	10	General Motors	3.16	5.08	23,628	25	Honda	0.28	0.45	4,853
6	17	SAIC	2.39	3.84	30,914	26	Hanteng Autos	0.20	0.32	1,670
7	11	Chery	1.93	3.11	16,856	27	PSA	0.17	0.27	1,834
8	5	Geely	1.81	2.91	21,223	28	TATA	0.16	0.25	2,945
9	6	BMW	1.76	2.84	32,873	29	Great Wall	0.15	0.24	2,002
10	31	Hawtai	1.65	2.65	11,314	30	Fujian Motor Industry	0.14	0.22	1,358
11	15	Hyundai	1.62	2.61	17,180	31	FCA	0.14	0.22	3,042
12	8	Volkswagen	1.36	2.19	20,724	32	Ford	0.11	0.18	3,232
13	16	Jiangling	1.03	1.66	11,745	33	Lifan	0.10	0.15	883
14	12	Changan	1.02	1.63	8,926	34	Xpeng EV	0.05	0.09	252
15	9	Zotye	0.87	1.40	9,617	35	FAW	0.02	0.03	304
16	13	Zhidou	0.84	1.35	8,583	36	Mahindra & Mahindra	0.02	0.03	240
17	24	Dongfeng	0.81	1.31	4,055	37	Other	0.00	0.00	69
18	7	Jianghuai	0.81	1.30	8,231		Global	51.67	83.15	451,114
19	22	Toyota	0.69	1.11	13,247					
20	36	Hainan Automobile	0.68	1.09	4,625					

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

ICE-equivalent share of OEMs: top 20 exclusively with Tesla and Chinese players

ICE-eq. share¹ by automaker: Q2 2018

Rank Q2 '18	Rank Q2 '16	OEM	ICE-eq. share (%)	Number EV sold	Average range (miles)	Rank Q2 '18	OEM	ICE-eq. share (%)	Number EV sold	Average range (miles)
1	1	Tesla	87.3	40,649	271	21	BMW	0.9	32,873	54
2	-	Xpeng EV	70.2	252	218	22	Renault/Nissan	0.7	32,248	162
3	2	Zhidou	31.4	8,583	98	23	General Motors	0.5	23,628	134
4	32	Fujian Motor Ind	26.9	1,358	100	24	Mitsubishi	0.4	8,895	34
5	27	Hawtai	24.0	11,314	146	25	Hyundai	0.3	17,180	94
6	34	Hainan Automobile	16.6	4,625	147	26	Great Wall	0.2	2,002	74
7	3	BYD	14.0	43,396	110	27	Daimler	0.2	11,542	40
8	6	BAIC	7.4	39,887	123	28	TATA	0.2	2,945	54
9	16	Soueast	7.0	2,204	161	29	Volkswagen	0.2	20,724	66
10	5	Zotye	4.6	9,617	91	30	FAW	0.1	304	66
11	7	Chery	4.4	16,856	115	31	Toyota	0.1	13,247	52
12	-	Hanteng Autos	4.2	1,670	119	32	PSA	0.1	1,834	93
13	36	Jiangling	3.7	11,745	88	33	Honda	0.1	4,853	58
14	8	SAIC	3.7	30,914	77	34	Mahindra	0.0	240	78
15	35	Jianghuai	3.1	8,231	98	35	FCA	0.0	3,042	45
16	4	Lifan	2.0	883	108	36	Ford	0.0	3,232	34
17	14	Guangzhou Auto	1.8	5,868	114	37	Other		69	
18	18	Dongfeng	1.6	4,055	200		Global	0.70	451,114	115
19	10	Changan	1.5	8,926	114					
20	9	Geely	1.0	21,223	85					

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