



31.1 Major Developments in 2017

Discussing electric car waste battery regulations

Korea's electric car waste battery regulations are announced in the Air Quality Preservation Act. It requires that the removed battery be returned to the local government when the electric vehicle is scrapped. However, there is no detailed procedure for recycling, disassembling and disposing of returned batteries, so it is necessary to prepare related regulations. Therefore, The Ministry of Environment is planning to hold a discussion meeting on the regulation for the improvement of system and policy direction for improving the circulation of waste batteries in electric cars. They will collect opinions from diverse stakeholders such as civic groups, recycling industry, automobile companies, as well as various methods from the discussions, and reflect them in related regulations.

Hyundai Motors Launched NEXO in March 2018

Hyundai Motors participated in 'CES 2018 (Consumer Electronics Show)' held in Las Vegas to unveil 'NEXO' car name, specifications and major technologies for the first time in the world.

Specification of NEXO: NEXO is 4,670 mm in length, 1860 mm in width and 1630 mm in height. The battery pack is equipped with a 40 kW battery pack and a 100 kW fuel cell. The maximum travelable distance is 609 km, the maximum output is 154 hp, and the zero back is 9.5 seconds. The price of the car is about 70 million KRW (approx. 55,400 EUR).

Supply Policy

The Ministry of Environment organized a budget for the supply of 130 hydrogen cars this year. Currently, there are four regions in Ulsan, Gwangju, Gyeongsangnam-do, Changwon, and Chungcheongnam-do that support the hydrogen car supplement subsidy. The additional subsidy is the highest at Ulsan with 27.5 million KRW (21,766 EUR), and the other subsidy is about 10 million KRW (7,913 EUR). In 2018, Seoul, Daejeon and Gangwon-do will provide subsidies in addition to the four regions.

Based on the Ulsan city government subsidy of 27.5 million KRW (21,766 EUR) and additional subsidies of 12.5 million won (9,889 EUR), the actual purchase price is expected to be 30 million KRW (23,734 EUR). Currently, there are 12 hydrogen filling stations, and the Ministry of Environment is also building 19 other facilities and announced plans to install 10 charging stations in 2018.

31.1.1 New policies, legislation, incentives, funding, research, taxation, etc.

The Ministry of Trade, Industry and Energy Supports Future Automobile Industry

The government plans to invest 35 trillion KRW (27.7 billion EUR) over the next five years in order to make a leap into future powers. The Ministry of Industry announced the ‘Future Automobile Industry Development Strategy’, which was established jointly by related ministries to provide a new growth breakthrough in the future automobile market such as electric and autonomous vehicles.

Electric Car Subsidy Differential Support System

Electric vehicles were subsidized by government subsidies (14 million KRW) (11,073 EUR) regardless of the type of vehicle until this year. From 2018, The Ministry of Environment announced that it will cut subsidy prices for passenger cars, but will expand the support for cargo and buses. Government subsidies (based on passenger cars) will be paid to 20,000 electric vehicles. Depending on the performance of the vehicle, the subsidy will vary from a maximum of 12 million KRW to a minimum of 10.17 million KRW (8,042 EUR).

$$= \text{Base amount} + \left\{ \text{Battery capacity} \times \left(\text{Unit subsidy} \times \frac{\text{Weighted ratio}}{\text{Lowest weighted ratio}} \right) \right\}$$

- ※ Base amount : 3,500,000 KRW (minimum subsidy)
- ※ Unit subsidy : 170,000 KRW (Unit payment according to battery capacity)
- ※ Weighted ratio : Ratio of 25% performance at low temperature (A ratio reflecting the driving distance and efficiency per charge / Purpose for minimizing the inconvenience of reducing driving distance in winter)
- ※ Lowest weighted ratio : The lowest weighted ratio of the target vehicle

Figure 1: Method of calculation of electric passenger vehicle subsidy

The provincial local subsidy system maintains a fixed subsidy system. In the case of micro electric cars, 4.5 million KRW (3,559 EUR) is paid semiannually regardless of the model. In the case of purchasers living in some local governments that do not conduct electric vehicle supply projects, only up to 500 cars can apply

for subsidies through the Korea Environment Corporation without local subsidies. In addition to purchasing subsidies, individual tax exemption benefits of up to 3 million KRW (2,372 EUR), education tax of up to 900,000 KRW (711 EUR) and acquisition tax of up to 2 million KRW (1,581 EUR) will remain the same. The tax exemption for individual consumption tax will increase from 2 million KRW (1,581 EUR) to 3 million KRW (2,372 EUR), which will reduce the burden on buyers. Up to 2 million won (1,580 EUR) will be paid to the taxi, so the maximum amount of 12 million KRW (9,489 EUR) will be paid regardless of the type of vehicle. The Ministry of Environment plans to subsidize the 1 ton cargo truck, which is widely used in delivery vehicles, by 20 million KRW (15,815 EUR), so that it will actively support the aged passenger car used by the common people to be replaced by the electric car that will be released in the second half of 2018.

Table 1: Automotive and small EV (1.265 KRW = 1 EUR)

Type	Manufacturer	Vehicle type	Government subsidy support amount (10k KRW)
Passenger car	Hyundai	Kona(basic)	1,200 (9,486 EUR)
		IONIQ EV('17) N, Q Trim	1,127 (8,908 EUR)
		IONIQ EV('17) I Trim	1,119 (8,845 EUR)
	Kia	SOUL EV('18)	1,044 (8,253 EUR)
		Ray EV	706 (5,579 EUR)
	Renault Samsung	SM3 Z.E('18)	1,017 (8,037 EUR)
		SM3 Z.E('17)	839 (6,630 EUR)
	BMW	I3 94ah('18)	1,091 (8,622 EUR)
		I3('17)	807 (6,378 EUR)
	Nissan	LEAF	849 (6,708 EUR)
	GM	Volt EV	1,200 (9,481 EUR)
Tesla	Model S 75D	1,200 (9,481 EUR)	
	Model S 90D	1,200 (9,481 EUR)	
	Model S 100D	1,200 (9,481 EUR)	
Small EV	Renault Samsung	TWIZY	450 (3,556 EUR)
	Dae-Chang motors	DANIGO	450 (3,556 EUR)
	Ssemisisco	D2	450 (3,556 EUR)

Electric buses will be subsidized to medium-sized buses. Subsidies are set at 60 million KRW (47,432 EUR) for medium-sized buses and 100 million KRW (79,062 EUR) for large buses. The Ministry of Environment plans to induce town buses and school buses to be converted into electric vehicles. Government subsidies for hybrid vehicles (HEV) have been cut from 1 million won (790 EUR) to 500,000 won (395 EUR) this year, and the amount of subsidies has increased from 50,000 this year to 60,000 in 2018. The government subsidy system for hybrid vehicles will be abolished in 2019, but for the plug-in hybrid vehicle (PHEV) will be maintained (5 million KRW (3,953 EUR) per vehicle).

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Table 2: EV trucks and EV vans (1.265 KRW = 1 EUR)

Type	Class	Manufacturer	Vehicle type	Government subsidy support amount (10k KRW)
Truck	Light	Powerplaza	Labo Peace (0.5 ton)	1,100 (8,693 EUR)
Bus	Medium	Joylong Korea	E6	6,000 (47,402 EUR)
		BYD Auto Industry	BYD eBUS-7	6,000 (47,402 EUR)
	Heavy	Hyundai	Elec-city	10,000 (79,004 EUR)
		Edisonmotorsev Co.	e-FIBIRD (PIEV)	10,000 (79,004 EUR)
			e-FIBIRD (BSEV)	10,000 (79,004 EUR)
		Woojin Industrial Systems Co.	Woojin Industrial Systems Low-floor Electricity bus	10,000 (79,004 EUR)
			Apollo Electricity bus	10,000 (79,004 EUR)
		Epic Automotive Korea Co.	Envion	10,000 (79,004 EUR)
		Daeyang Tech.	Greenearth	10,000 (79,004 EUR)
		P-line	HYPERS	10,000 (79,004 EUR)
Zyle Daewoo	BS 110CN (BSEV)	10,000 (79,004 EUR)		

Table 3: 2018 Electric vehicle subsidies by local government

City	Support Unit Price in 2017 (10k KRW)	Support Unit Price in 2018 (10k KRW)
Seoul	550 (4,347 EUR)	500 (3,952 EUR)
Busan	500 (3,952 EUR)	500 (3,952 EUR)
Daegu	600 (4,743 EUR)	600 (4,743 EUR)
Incheon	500 (3,952 EUR)	600 (4,743 EUR)
Gwangju	700 (5,533 EUR)	700 (5,533 EUR)
Daejeon	500 (3,952 EUR)	700 (5,533 EUR)
Ulsan	500 (3,952 EUR)	500 (3,952 EUR)
Sejong	700 (5,533 EUR)	700 (5,533 EUR)
Gyeonggi-do	500 (3,952 EUR)	500 (3,952 EUR)
Gangwon-do	640 (5,059 EUR)	640 (5,059 EUR)
Chungcheongbuk-do	800~1,000 (6,324~7,905 EUR)	800~1,000 (6,324~7,905 EUR)
Chungcheongnam-do	800~1,000 (6,324~7,905 EUR)	800~1,000 (6,324~7,905 EUR)
Jeollabuk-do	600 (4,743 EUR)	600 (4,743 EUR)
Jeollanam-do	440~880 (3,478~6,955 EUR)	440~1,100 (3,478~8,695 EUR)
Gyeongsangbuk-do	600~850 (4,743~6,719 EUR)	600~1,000 (4,743~7,905 EUR)
Gyeongsangnam-do	300~600 (2,371~4,743 EUR)	600~900 (4,743~7,114 EUR)
Jeju	600 (4,743 EUR)	600 (4,743 EUR)

Table 4: Diffusion goals and support benefits

EV	2017	2018	Remarks
Supply target	14,000 unit	20,000	42.9% Increase
Government subsidy budget	196 billion unit	240 billion unit	22.4% Increase
<ul style="list-style-type: none"> Subsidies by car type declined as subsidy support changed. Adjusted from 10.17 million to 12 million won depending on battery capacity and mileage (fuel economy). 			

31.2 Charging Infrastructure or EVSE

Until now, charging infrastructure has been installed in highway rest areas, public institution parking lots, etc. in Korea. In the future, it is planned to improve charging conditions by installing the AC level 2 charger in welfare facilities such as accommodation facilities, large marts and parks. Therefore, the public charging conditions of plug-in hybrid vehicles (PHEV), which is evaluated as a quasi-electric car, is expected to improve significantly. In case of plug-in hybrid vehicles, it was difficult to use the nationwide installed fast chargers, because of battery capacity and cost problems. Therefore, the Ministry of Environment wants to install the charger through amendment of the guidelines, and is going to apply for the land owner or the customer who can use it publicly. In the existing charger installation instructions, it was limited to apartment houses and workplaces with more than 100 parking spaces. However, with this revision, there is space for charger installation, and anyone with a management staff can apply for installation. The charger installation application will be received from August 18, and the installation budget of 546 rapid chargers will be additionally reflected in the Congress in July, and a total of 1,076 rapid chargers will be installed only this year. As for the fast charger, 750 units were installed and operated nationwide by the end of last year. In addition, 1,076 units will be installed by the year 2018, and charging conditions are expected to improve by more than 40 % from last year.

Table 5: Information on charging infrastructure in 2017 (Data source: The Ministry of Environment)

Charging Infrastructure on 31 December 2017	
Chargers	Quantity
AC Level 2 Chargers	1,730
Fast Chargers	5,373
Totals	10,198

31.3 HEVs, PHEVs and EVs on the Road

Electric Car Distribution Status in This Year

At the end of this year, a total of 25,593 electric vehicles were supplied. The number of electric cars distributed this year was 13,826, 2.3 times more than last year's 5,914. The number of electric cars will increase from 1,075 units in 2014 to 2,907 units in 2015 and 5,914 units in 2016. The number of infrastructure units to be installed is doubling every year, including 750 units in 2016 and 1,801 units in currently year.

Table 6: Domestic supply amount (data from January 2018)

Car	26,208
Vans	141
Truck	57
For special	6
Total	26,412

Table 7: Distribution and sales of EVs, PHEVs and HEVs in 2017 (Data source: Ministry of Land, Infrastructure and transport, January 2018)

Fleet Totals on 31 December 2017					
Vehicle Type	EVs	PHEVs	HEVs	FCVs	Total
Passenger Vehicles ¹	26,208	n.a.	320,652	177	347,037
Buses and Minibuses ²	141	n.a.	280	n.a.	421
Medium and Heavy Weight Trucks ³	57	n.a.	n.a.	n.a.	57
Totals without bicycles	26,406	n.a.	320,932	177	347,515

n.a. = not available

¹ UNECE categories M1

² UNECE categories M2-M3

³ UNECE categories N1-N3

Table 8: Available vehicles and prices in South Korea

Market-Price Comparison of Selected EVs and PHEVs in Korea	
Available Passenger Vehicles	Untaxed, Unsubsidized Sales Price (in KRW and EUR)
Hyundai Ionic Electric	40~43 million KRW (31,626~33,976 EUR)
KIA Soul EV	43 million KRW (33,976 EUR)
KIA RAY EV	45 million KRW (35,569 EUR)
Renault Samsung Motors SM3 Z.E.	39~41 million KRW (30,826~32,407 EUR)

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Renault Samsung Motors Twizy	15~15.5 million KRW (11,856~12,251 EUR)
GM Chevrolet BOLT EV	48 million KRW (37,940 EUR)
BMW i3	59~65 million KRW (46,635~51,370 EUR)
Tesla Model S 90D	115 million KRW (90,885 EUR)
Nissan LEAF	46~52 million KRW (36,356~41,098 EUR)