

# Korea's Strategy for Promoting Eco-Friendly Cars Focused on H<sub>2</sub> Cars



Source: MOE

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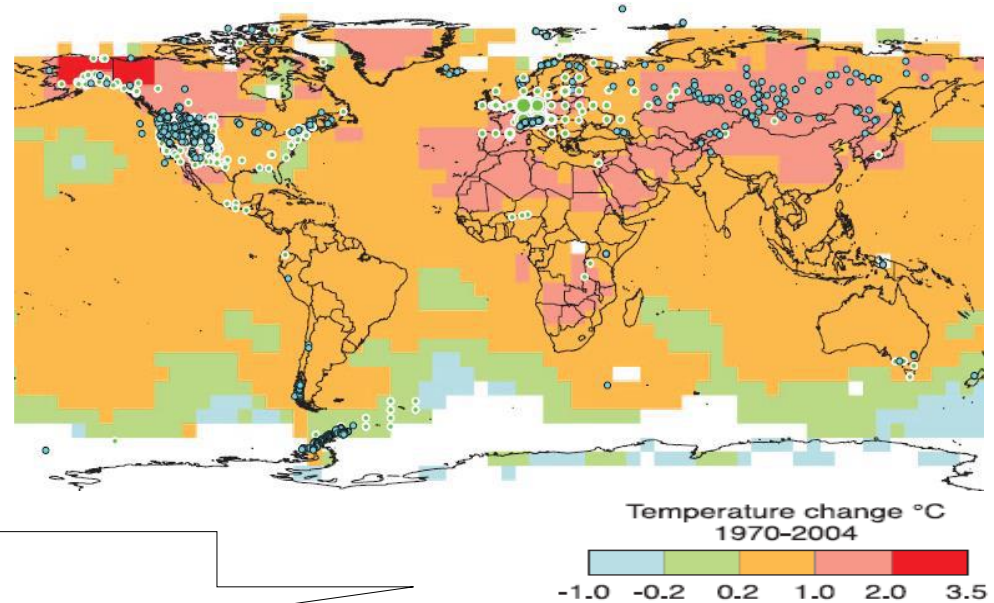
1. Needs for Promoting Eco-friendly Cars
2. Korea's Main Policy for Promoting Eco-Friendly Cars
3. Sustainable Transport Strategies & Hydrogen Transport Policies

# 1. Needs for Promoting Eco-friendly Cars

# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Global Warming & Main Actions for Climate Changes

- Global average temperature 0.74 °C increase in 100 years
- Global average sea level 1.8mm increase/year
- Average temperature 1.7 °C increase for past 100 years in Korea

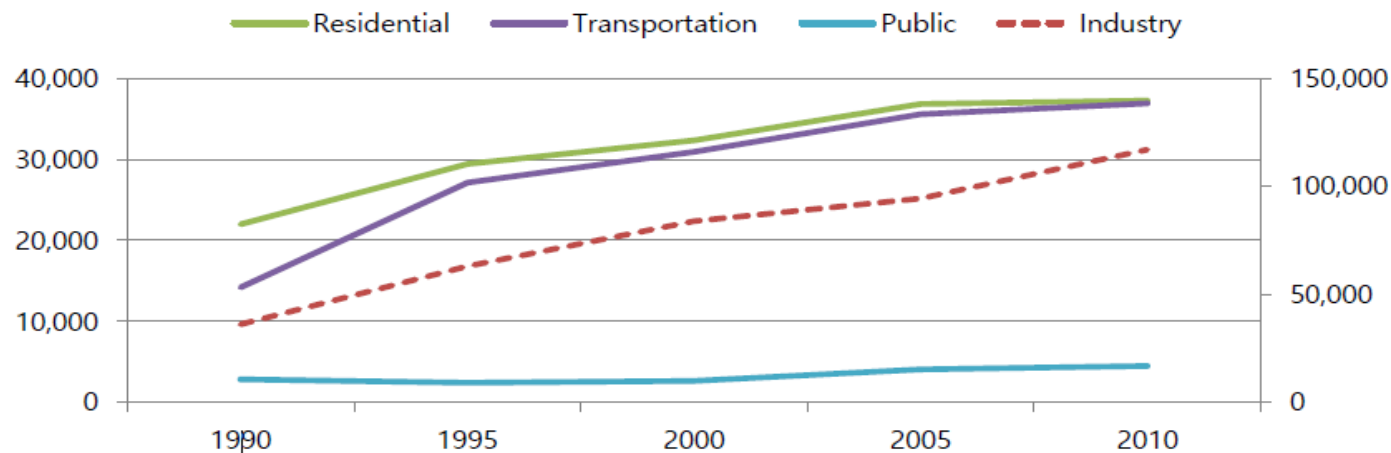


- Paris Agreement (COP 21)
- Post-2020
- Korea NDC: 24.4% GHG Reduction (Versus 2017)  
\* NDC: Nationally Dedicated Contributions



# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Energy Consumption in Korea (2016)



(Unit: 1000TOE, %)

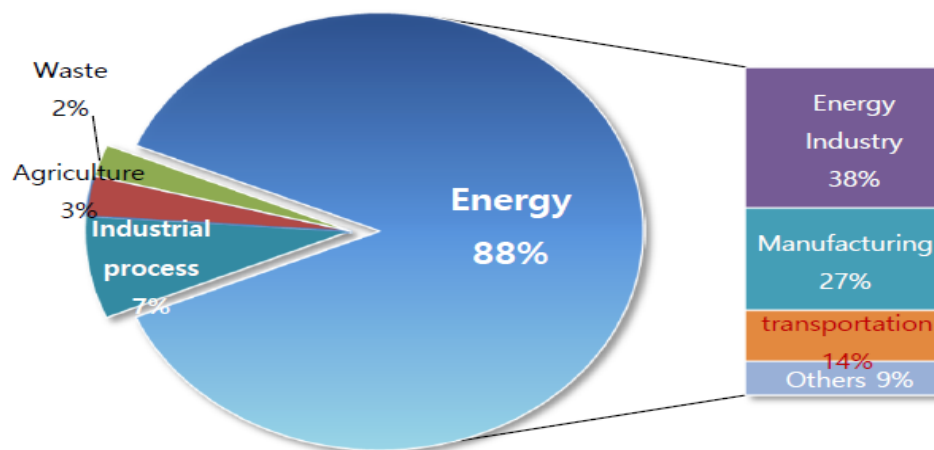
Classification	1990	1995	2000	2005	2010	2015	2016
Industry	36,150	62,946	83,912	94,366	117,046	135,713	138,469
	48.1%	51.6%	56.0%	55.2%	59.8%	62.2%	61.4%
Residential	21,971	29,451	32,370	36,861	37,256	36,603	38,261
Commercial	29.3%	24.1%	21.6%	21.6%	19.0%	16.8%	17.0%
Transportation	14,173	27,148	30,945	35,559	36,938	40,292	42,714
	18.9%	22.3%	20.7%	20.8%	18.9%	18.5%	18.9%
Public	2,812	2,416	2,625	4,068	4,483	5,753	6,237
Other	3.7%	2.0%	1.8%	2.4%	2.3%	2.6%	2.8%
Total	75,106	121,961	149,852	170,854	195,723	218,361	225,681

\* 2017 Yearbook of Energy Statistics(korea energy economics institute)

# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Korea GHG Emissions (2015)

**14% of National GHG emissions**



(Unit: 1000 tCO<sub>2</sub>)

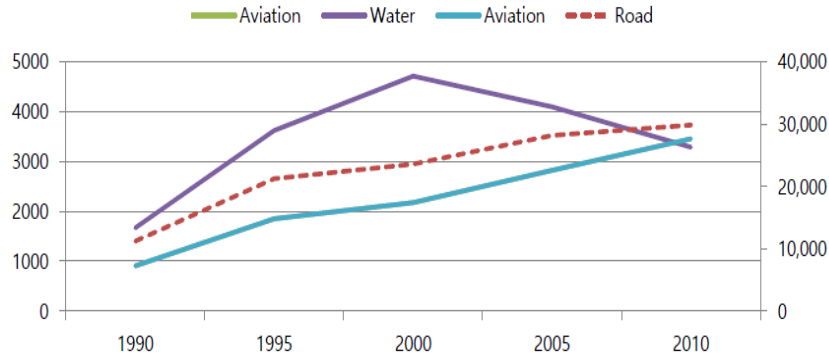
Classification	1990	1995	2000	2005	2010	2015
Energy	241.4	354.2	410.6	466.6	564.9	601
Industrial process	19.8	44.1	49.9	54.7	54	52.2
Agriculture	21.3	23.2	21.6	20.8	22.2	20.6
Waste	10.4	15.8	18.8	16.7	15.1	16.4
<b>Total</b>	<b>292.9</b>	<b>437.2</b>	<b>500.9</b>	<b>558.9</b>	<b>656.2</b>	<b>690.2</b>

# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Korea GHG Emissions

(Unit: 1000 TOE, %)

### Energy consumption of transport (2016)

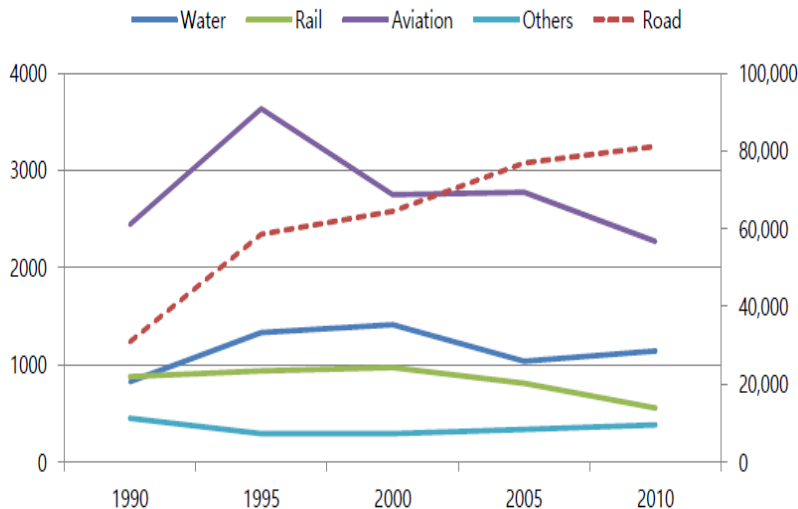


Classification	1990	1995	2000	2005	2010	2015	2016
Road	11,205	21,218	23,554	28,144	29,820	32,768	34,369
	79.1%	78.2%	76.1%	79.1%	80.7%	81.3%	80.5%
Rail	392	464	513	505	883	309	335
	2.8%	1.7%	1.7%	1.4%	1.0%	0.8%	0.8%
Water	1,669	3,618	4,705	4,092	3,282	2,946	3,351
	11.8%	13.3%	15.2%	11.5%	8.9%	7.3%	7.8%
Aviation	908	1,849	2,174	2,819	3,453	4,269	4,659
	6.4%	6.8%	7.0%	7.9%	9.3%	10.6%	10.9%
Total	14,174	27,148	30,945	35,559	36,938	40,292	42,714

\* 2017 Yearbook of Energy Statistics (Korea Energy Economics Institute)

### National GHG emissions trend

(Unit: 1000 tCO<sub>2</sub>)

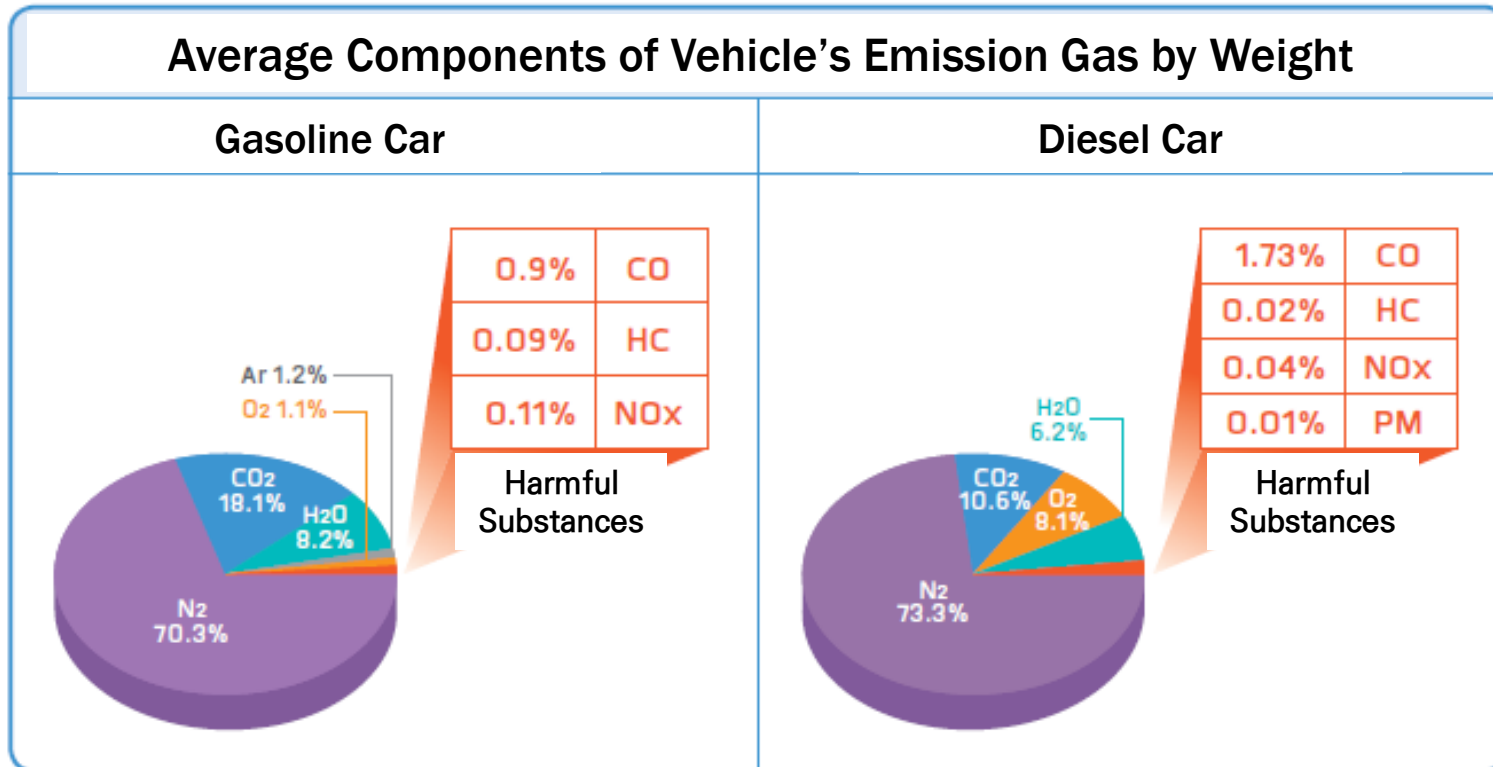


Classification	1990	1995	2000	2005	2010	2015
Water	824	1,332	1,410	1,035	1,141	1,453
Road	30,902	58,534	64,489	76,861	81,102	90,125
Rail	877	938	970	808	556	342
Aviation	2,441	3,632	2,750	2,775	2,269	1,637
Others	449	292	291	334	380	629
Total	35,493	64,728	69,910	81,813	85,448	94,186

# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Vehicles Emission Gas – Harmful Substances

- ① Carbon-monoxide, CO
- ② Hydrocarbon, HC
- ③ Nitrogen-oxides
- ④ Exhaust Gas, PM etc.





# 1. Needs for Promoting Eco-Friendly Cars

## ❖ Comparison of Emission Gas between Electronic Car and H<sub>2</sub> Car

Electronic 1 Car – Reduction of 2 tons of CO<sub>2</sub> yearly



E Car

Generation 94.1g/km + Driving 0g/km

VS



Gasoline Car

Oil Extraction 26.5g/km + Driving 165.7/km

H<sub>2</sub> 1 Car – Reduction of 2 tons of CO<sub>2</sub> yearly



H<sub>2</sub> Car

Generation 143.1g/km + Driving 0g/km

VS



Gasoline Car

Oil Extraction 26.5g/km + Driving 165.7/km

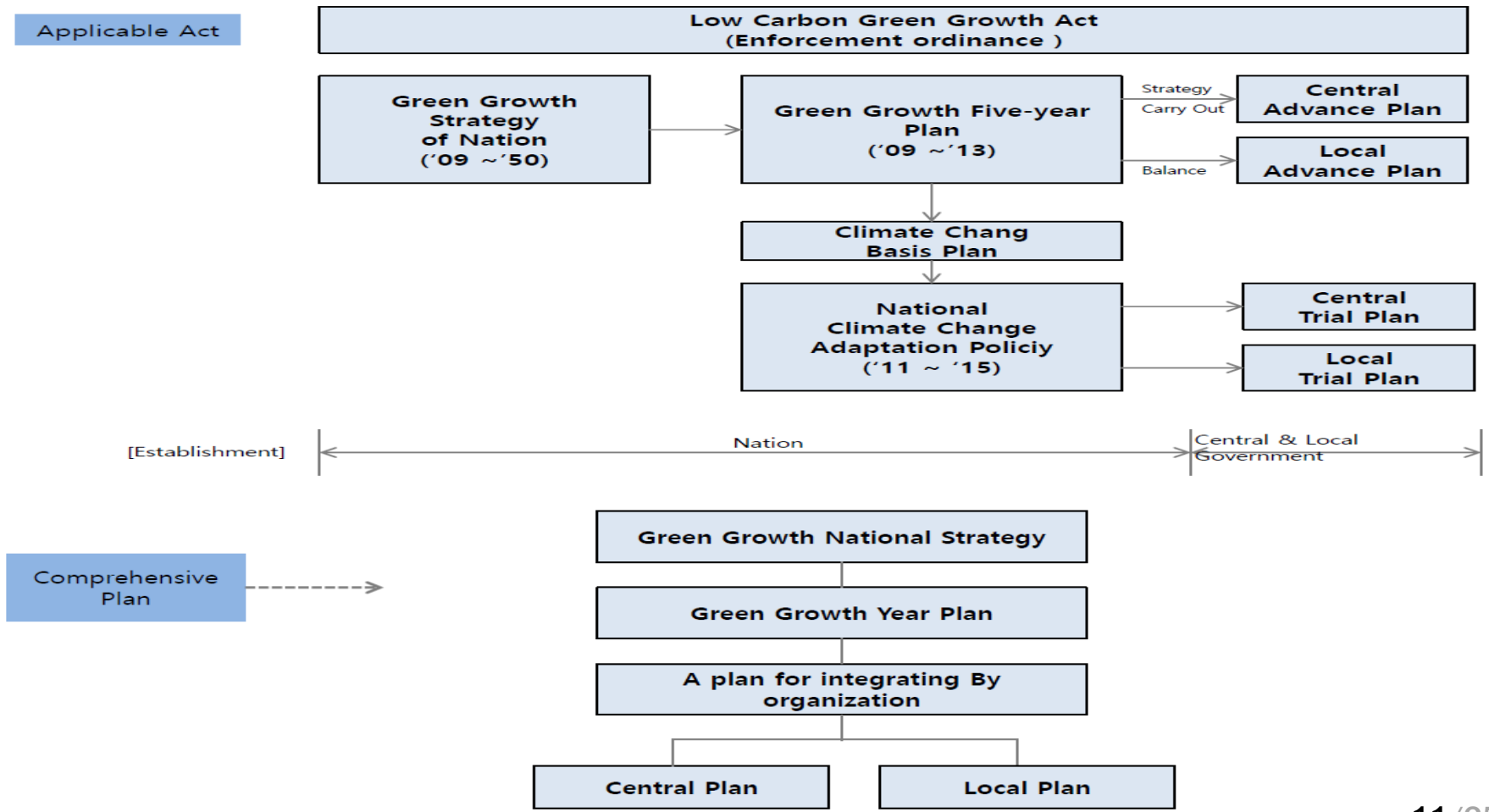
## 2. Korea's Main Policy for Promoting Eco-Friendly Cars

# 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

## ❖ Enact "The Act on Low Carbon Green Growth" in 2010

### <Purposes>

Established for responding to climate change, energy crisis and environmental protection requirements



## 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

- ❖ Enact “Sustainable Transportation Logistics Development Act” in 2009

### Sustainable Transportation Logistics Development Act (2009)

#### Vision

- Realization Leading Nation of Sustainable Transport Development

#### Aims

- Reducing greenhouse gas emissions by 30% of the BAU level by 2020
- Green Transport about Eco-friendly & People
- Low-carbon & Energy efficiency Transport System
- new growth engine of Green Transport

#### Promote Strategy

##### Transport demand management & Efficiency of transport system

- Reduce traffic Volume
- Expand ITS Road

##### Walking % Cycling improvement

- Short distance service
- Improve of Bicycle share rate

##### The activation of Public transport

- Improve of public transport share rate
- The Railway expansion

##### Low-carbon green system

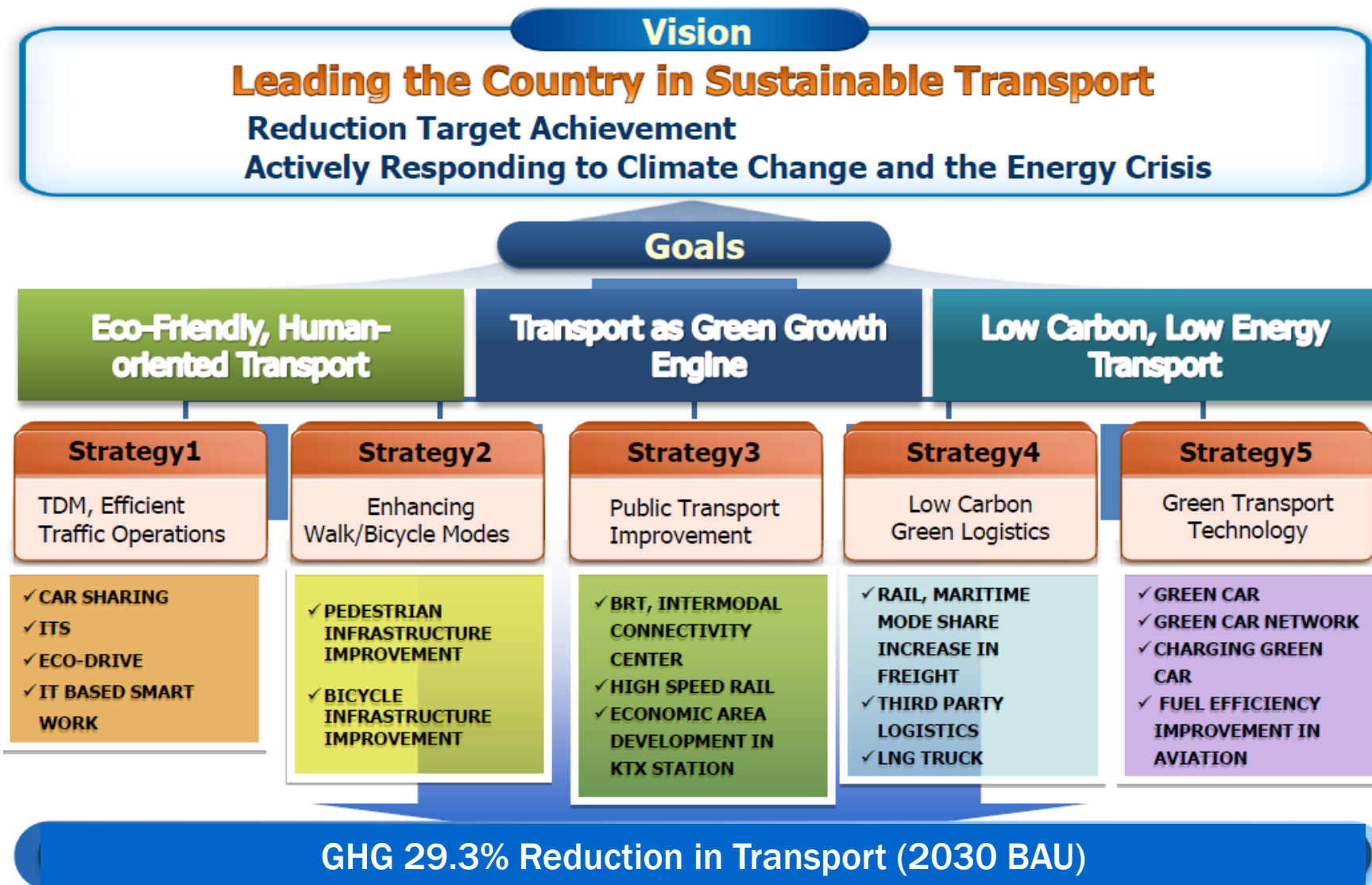
- Expand Inland logistics
- Improve Modal Shift

##### Green Transport technology Development

- Improve Technology
- Development of Green transport Technology

## 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

- ❖ Establish "Transport Masterplan for Climate Change" in 2011 (2011-2020)



## 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

### ❖ Korea's Main Transport Policy for Promoting Eco-Friendly Cars

① Subsidy for Purchasing Eco Cars	<ul style="list-style-type: none"><li>• E – Car: KRW 12million</li><li>• Hybrid Car: KRW 1million</li><li>• Plug-in Hybrid Car: KRW 5million</li><li>• H<sub>2</sub> Car: KRW 27.5million</li></ul>
② Providing Incentives	<ul style="list-style-type: none"><li>• Public Parking Fee: 20-50% discount</li><li>• Congestion Fee: Free (Seoul Namsan Tunnel)</li><li>• Freeway Toll: 50% discount</li></ul>
③ Deduction of Tax (Acquisition Tax, Consumption Tax)	<ul style="list-style-type: none"><li>• Hybrid Car: KRW 2.7million (Max.)</li><li>• Plug-in Hybrid Car: KRW 2.7million (Max.)</li><li>• E – Car: KRW 4million (Max.)</li><li>• Local Development Fund: KRW 2million (Max.)</li></ul>
④ Supporting the Construction of Charging Facilities	<ul style="list-style-type: none"><li>• E-car Normal Charging Facilities: KRW 4million</li><li>• Fast Charging Facilities: KRW 70million</li><li>• H<sub>2</sub> car Charging Facilities: KRW 15million</li></ul>

## 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

- ❖ Eco-Vehicle Supply Plan in Korea: Eco-vehicles will be Occupied 33% of all selling vehicles in 2030

		H2 Economy Promotion Roadmap (Jan. 2019)		Future Vehicle Industry Development Strategy (Oct. 2019)			Green New Deal (Jul. 2020)
		'22	'40	'22	'30	'40	'25
EV	Cars (1,000)	-	-	433	3,000	8,300	1,130
	Charging Station (EA)	-	-	10,000	20,000	-	15,000
H <sub>2</sub> V	Cars (1,000)	67	2,900	67	850	2,900	200
	Charging Station (EA)	310	1,200	310	660	1200	450

## 2. Korea's Main Transport Policy for Promoting Eco-Friendly Cars

- ❖ Number of Eco-Vehicles in Korea ('20.8): Increase EV 83.3%, H<sub>2</sub>V 214.4% PHEV 27.8% in annual average rates compared to those in 2015

(Unit: 1,000 veh.)

	'00	Ratio(%)	'05	Ratio(%)	'10	Ratio(%)	'15	Ratio(%)	'20.8	Ratio(%)
Gasoline	7,214.0	59.8	7,800.3	50.7	8,907.1	49.6	9,808.6	46.7	11,282.4	46.8
Diesel	3,594.1	29.8	5,650.0	36.7	6,483.4	36.1	8,822.2	41.1	9,970.8	41.3
LPG	1,214.1	10.1	1,889.6	12.3	2,443.6	13.6	2,257.4	10.8	1,995.1	8.3
EV	0.006	0.0	0.005	0.0	0.066	0.0	5,712	0.0	11,803.4	0.5
H <sub>2</sub> V	-	0.0	-	0.0	-	0.0	0.029	0.0	8,911	0.0
PHEV	-	0.0	-	0.0	192	0.1	174.62	0.8	595.412	2.5
Others	371	0.3	589	0.4	881	0.5	1,213	0.6	1,598	0.7
T o t.	Bus.	11,439.4		14,612.8		16,967.3		19,700.1		22,408.0
	NBus.	6,199.9		7,834.0		9,741		12,898		17,224
	Tot	12,059.33		15,396.4		17,941.4		20,989.9		24,130.4



# 3. Sustainable Transport Strategies & Hydrogen Transport Policies

# 3. Sustainable Transport Strategies & Hydrogen Transport Policies

## ❖ Korea's Roadmap of Transition to Hydrogen Economy (Jan. 2019)

### Vision

- 〈Top Country in the Transition to Hydrogen Economy in the World〉
- Top in the Occupancy of H<sub>2</sub>V & FECV in the World
  - Green Hydrogen Production Country from Low Fossil Fuel Production Country

### Goals

		2018 (1000veh.)	2022 (10,000veh)	2040 (10,000 veh)
H <sub>2</sub> V/FCEV	Total	1.8	8.1	620
	Export	0.9	1.4	330
	Domestic	0.9	6.7	290
Fuel Cell	Plant (Domestic)	307 (total)	1.5GW (1GW)	15GW (8GW)
	Household /Building	7MW	50MW	2.1GW
Hydrogen Supply (10,000ton/yr)		13	47	526
Hydrogen Price		-	6000 KRW/kg	3000 KRW/kg

# 3. Sustainable Transport Strategies & Hydrogen Transport Policies

## ❖ Number of HV&FCEV

### Trends on HV/FCEV

- Government's support for purchasing H<sub>2</sub>V – 9000 Vehicles(Aug. 2020)
- Since the end of 2019, Korea is the second country with 5,068 vehicles after USA
- Top Country in the world with the number of H<sub>2</sub>V since announcing the roadmap

### Korea's Trend On the Supply of H<sub>2</sub>V

	2019						2020			
	Jan.	Mar.	May	Jul.	Sept.	Nov.	Jan.	Mar.	Jul.	Aug.
Non-Business	865	1,024	1,842	2,709	3,355	4,559	5,066	6,019	8,167	8,784
Business	53	55	59	65	81	91	101	106	131	127
Total	918	1,079	1,901	2,774	3,436	4,650	5,167	6,125	8,298	8,911

### Global Trend On the Supply of H<sub>2</sub>V

	2013	2014	2015	2016	2017	2018	2019
Europe	30	43	181	172	299	920	944
USA	33	54	90	1,071	2,314	6,240	7,910
Japan	0	0	327	1,084	1,120	2,824	3,541
China	-	-	-	-	60	760	1,500+
Korea	0	10	29	48	83	893	5,068
Total	63	107	627	2,375	3,816	11,573	19,000+

# 3. Sustainable Transport Strategies & Hydrogen Transport Policies

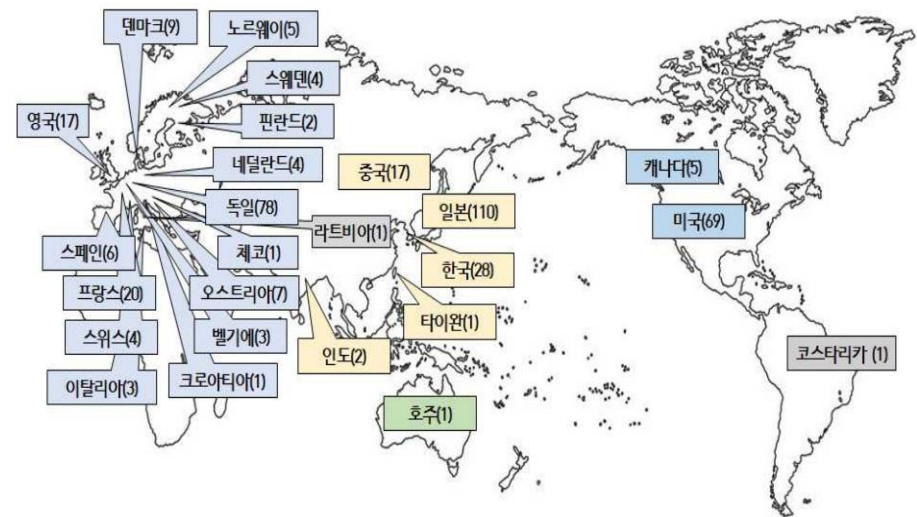
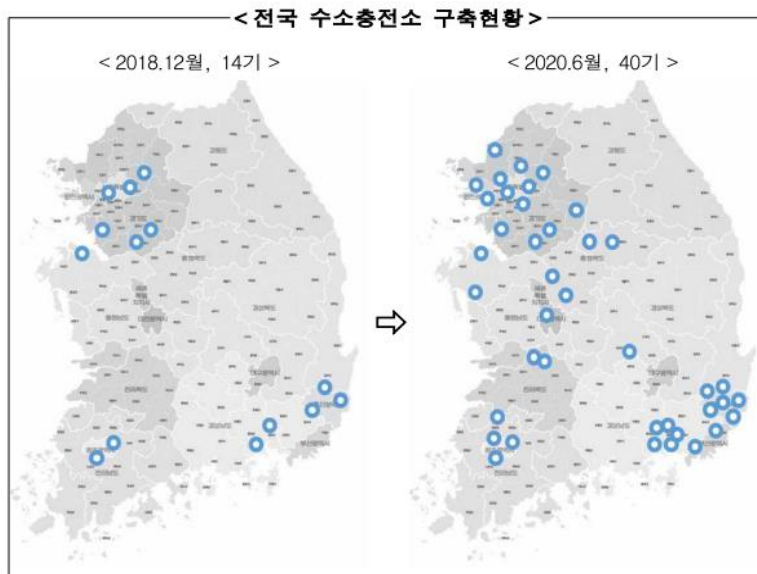
## ❖ Number of HV Fuel Station in Korea

Number of H<sub>2</sub>V Fuel Station in Korea

- Total 71 Stations (including 10 stations on Expressway) (Dec. 2020)
- Seoul Metropolitan Area: 19 stations / Middle & Southern West Area: 27 Stations / Southern East Area: 25 stations

Construction Plan of H<sub>2</sub>V Fuel Station

- Until 2022: 310 stations
- Until 2030: 660 Stations



(출처: Netinform.net/H2)

# 3. Sustainable Transport Strategies & Hydrogen Transport Policies

## ❖ 2020 Statistics on the Transition to Hydrogen Economy in Korea

### Central Governments

- Total Budgets: 545.4 billion KRW (2.9Times compared to 2019)
- Ministry of Environment : 349.4 Billion KRW (H<sub>2</sub>V (254.2 Billion KRW, Fuel Station 85.1Billion KRW etc.)
- Ministry of Trade Industry and Energy : 131.4 Billion KRW (Hydrogen Production base 29.4 Billion KRW etc.)
- Ministry of Land Infrastructure and Transport : 37.5Billion KRW (H<sub>2</sub> Model city 12.5Billion KRW, H<sub>2</sub> Fuel Station on Freeway 13.0 Billion KRW etc.)
- Others: 27.1 Billion KRW

### H<sub>2</sub> City

- H<sub>2</sub> Model Cities (3 cities): Ulsan, Ansan, Jeonju · Wonju
- H<sub>2</sub> R&D Special City: Samcheok
- Masterplan in 2020, Construction in 2022
  - Ulsan: 10 H<sub>2</sub> Intra–Buses, 1 city tour bus, H<sub>2</sub> Pipeline 10km etc.
  - Ansan: 10 H<sub>2</sub> Intra–Buses 3 H<sub>2</sub> Fuel Station, 10 H<sub>2</sub> Forklift s etc
  - Jeonju · Wonju : 40 H<sub>2</sub> Intra–Buses , 3 H<sub>2</sub> Shuttle/Theme Buses etc.
  - Samcheok : 2 H<sub>2</sub> Intra/Inter–Buses , 10 H<sub>2</sub> Bikes etc.

### Number of H<sub>2</sub> Buses & Fuel Stations

Province		Seoul	BS	DG	KJ	DJ	US	SJ	GK	GW	CB	CN	JB	KN
Bus	'19	7	5	-	6	-	3	-	-	2	-	9	-	5
	'20	30	15	2	16	13	7	5	30	5	4	10	17	26
Fuel Stat.	'19	-	1	-	1	-	-	-	-	1	-	1	-	1
	'20	-	1	1	-	1	1	-	3	1	1	2	2	- 21/25

#### **Suggestions for Promoting H<sub>2</sub> Cars**

- ❖ **Importance of H<sub>2</sub> Car: Eco Vehicles with Using Green H<sub>2</sub> / Storable / One of Future Leading Vehicles**
- ❖ **Prepare the Advent of H<sub>2</sub> Car Era: Legal & Institutional System, Plan & Policies, Finance, Technologies(R&D)**
- ❖ **Efforts to Promote of H<sub>2</sub> Car : Campaign / Events / Exhibition / H<sub>2</sub> Buses**
- ❖ **International Cooperation with Other Countries including France, USA, Germany, Japan, China etc.**

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감사합니다  
Thank you