

# Use of National Territory

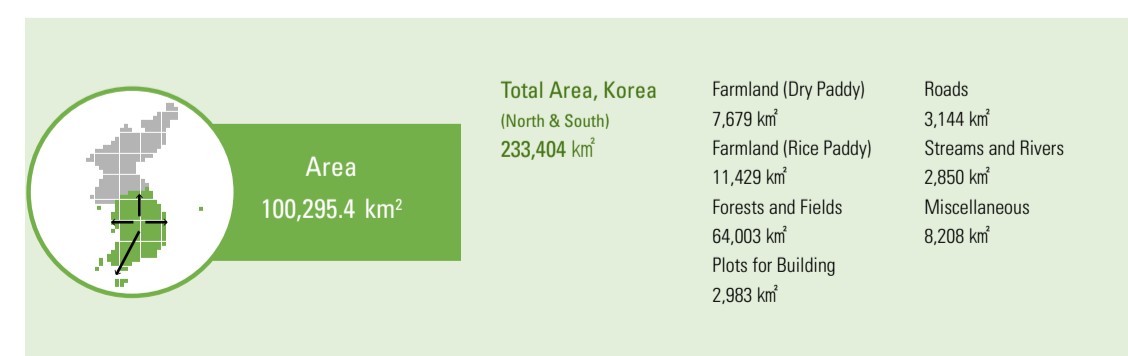
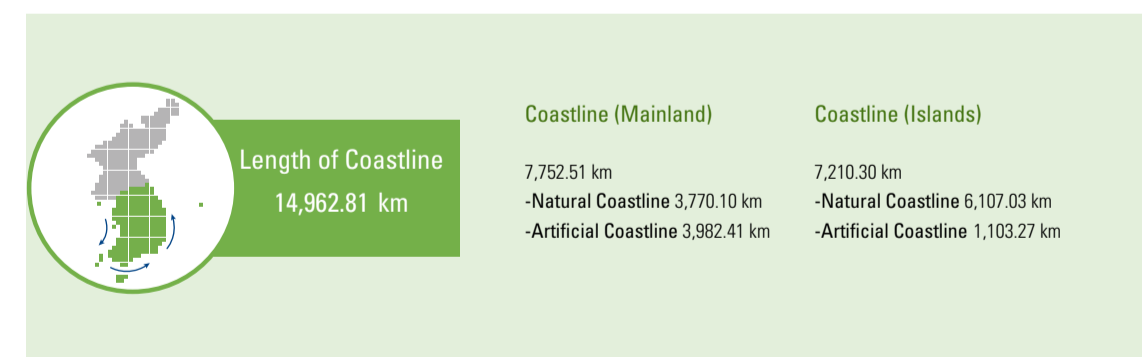
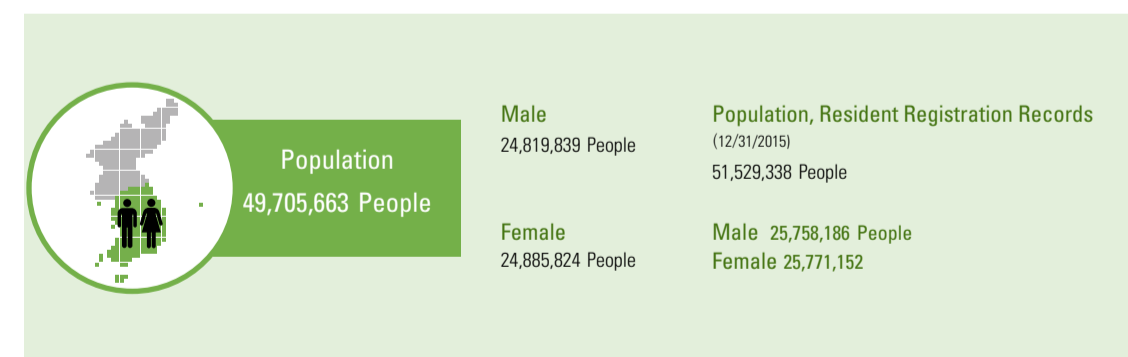
The territory of the Republic of Korea consists of the Korean Peninsula and its adjacent islands as defined in the Constitution, and its area is 233,404 km<sup>2</sup> (100,295.4 km<sup>2</sup> in South Korea). The population of South Korea is 49,705,663, according to the 2010 Resident Registration Records. It becomes more than 51.00 million when resident aliens are included. Considering that territory is where people live, its natural environments are very important, including topography (i.e., mountains, rivers, and coasts), precipitation, temperature, and the climate. These natural environments

affect vegetation patterns, and people have built settlements adapting to these natural environments. The land of Korea in the 21st century was shaped by the industrialization of the 20th century, and also was significantly influenced by both natural-environmental and socioeconomic changes. The development of Korean society has in many ways overcome the barriers of natural environments, and has brought the expansion of physical infrastructures. Transportation networks have made inter-regional travel faster, which was once hampered by mountains and rivers. In ad-

dition, the nationally planned land development projects such as dam construction and land reclamation have shaped new environments in South Korea, demonstrating how limitations of natural resources can be transcended.

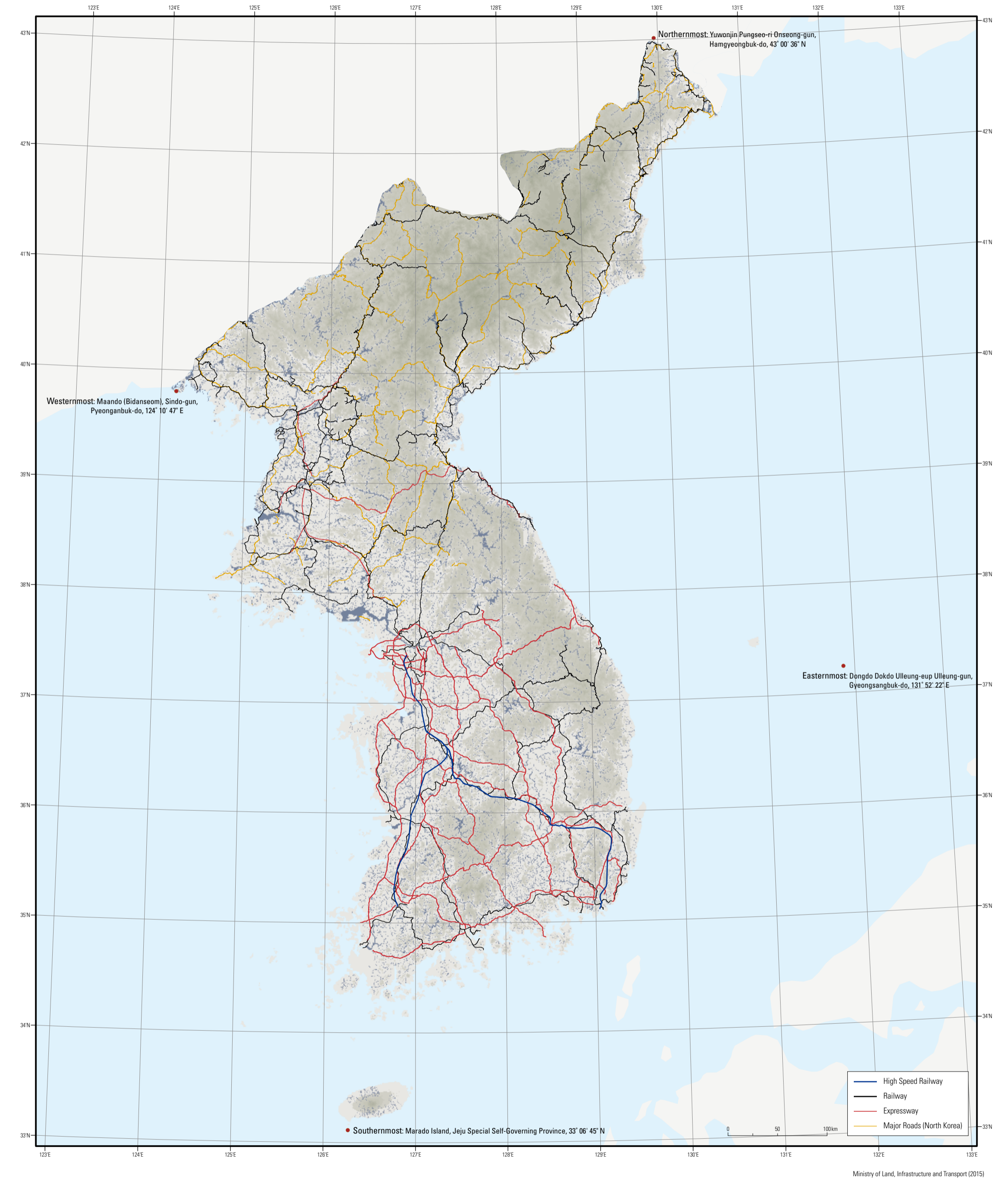
While South Korea had experienced difficulties during the period of industrialization due to limited natural resources, the country has become one of the major economies in the world through investments in human resources and infrastructures. Particularly, the National Land Development Plans, started in 1972, have promoted effective

land use by planning, building, and utilizing major national infrastructure facilities. Accordingly, people's lives are improved through public infrastructure. In sum, Korea has used limited resources effectively, both natural and human; and has built a land environment that helps to improve the quality of people's socioeconomic life.



## Overview of Korea's Geography

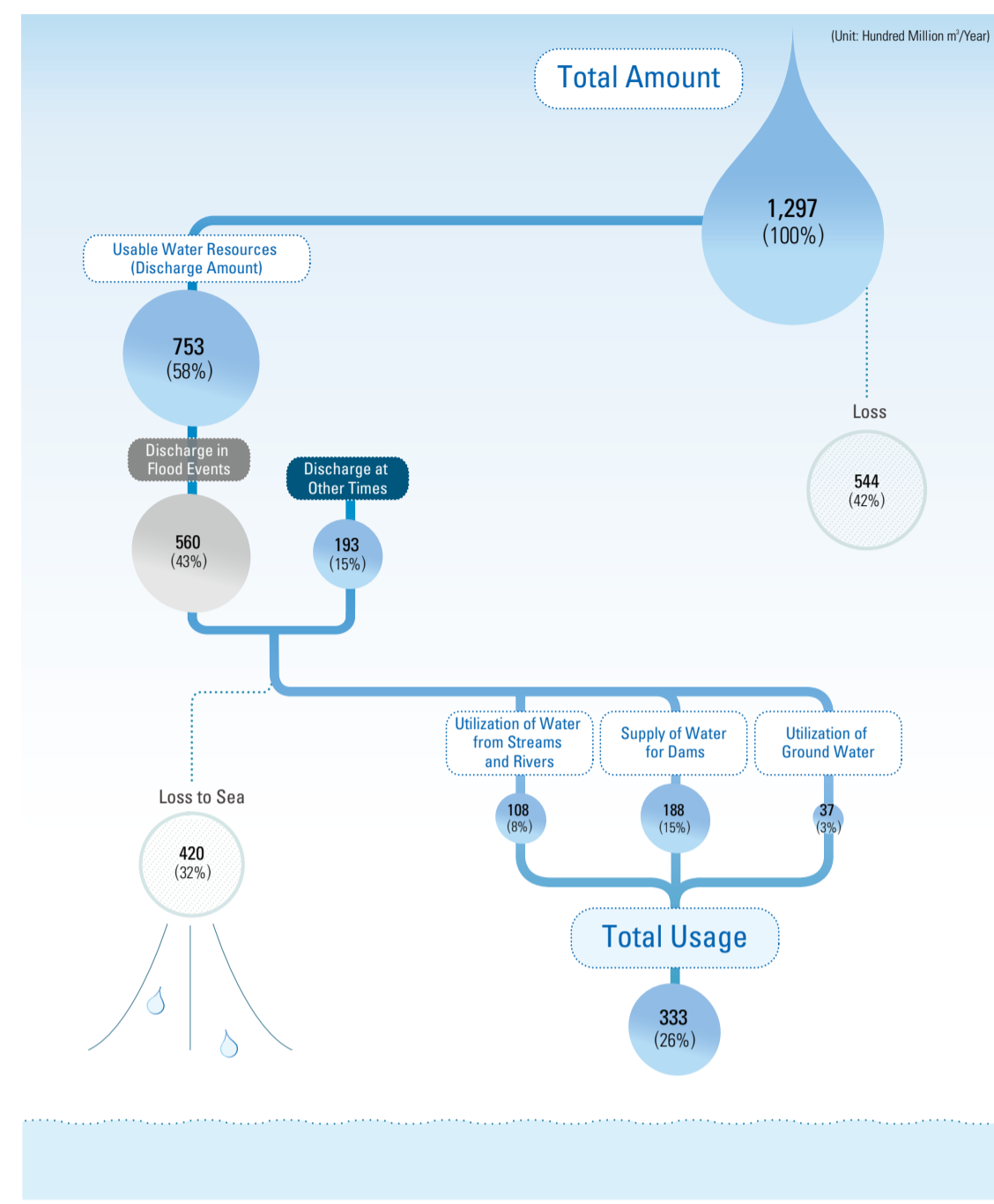
### Korea's Geography & National Transport Network





Water Resources

Use of Water Resources (2011)



Water resources have always been important in Korea because of its long history of agriculture, and have remained an essential element for industrialization and urbanization during the 20th century. Industrialization progressed along rivers that had plenty of water, such as the Hangang and the Nakdonggang. According to the National Long-Term Water Resources Plan (2011 – 2020), the total amount of water resources in South Korea (including inflow from North Korea of 2.3 billion m³) is 129.7 billion m³. Of that amount, 75.3 billion m³ are usable after losses from evaporation and other factors. Due to seasonal variation in precipitation, about 56.0 billion m³ (43%) are gained during the heavy rainfall season (June to August), and about 19.3 billion m³ (15%) are gained during the other seasons.

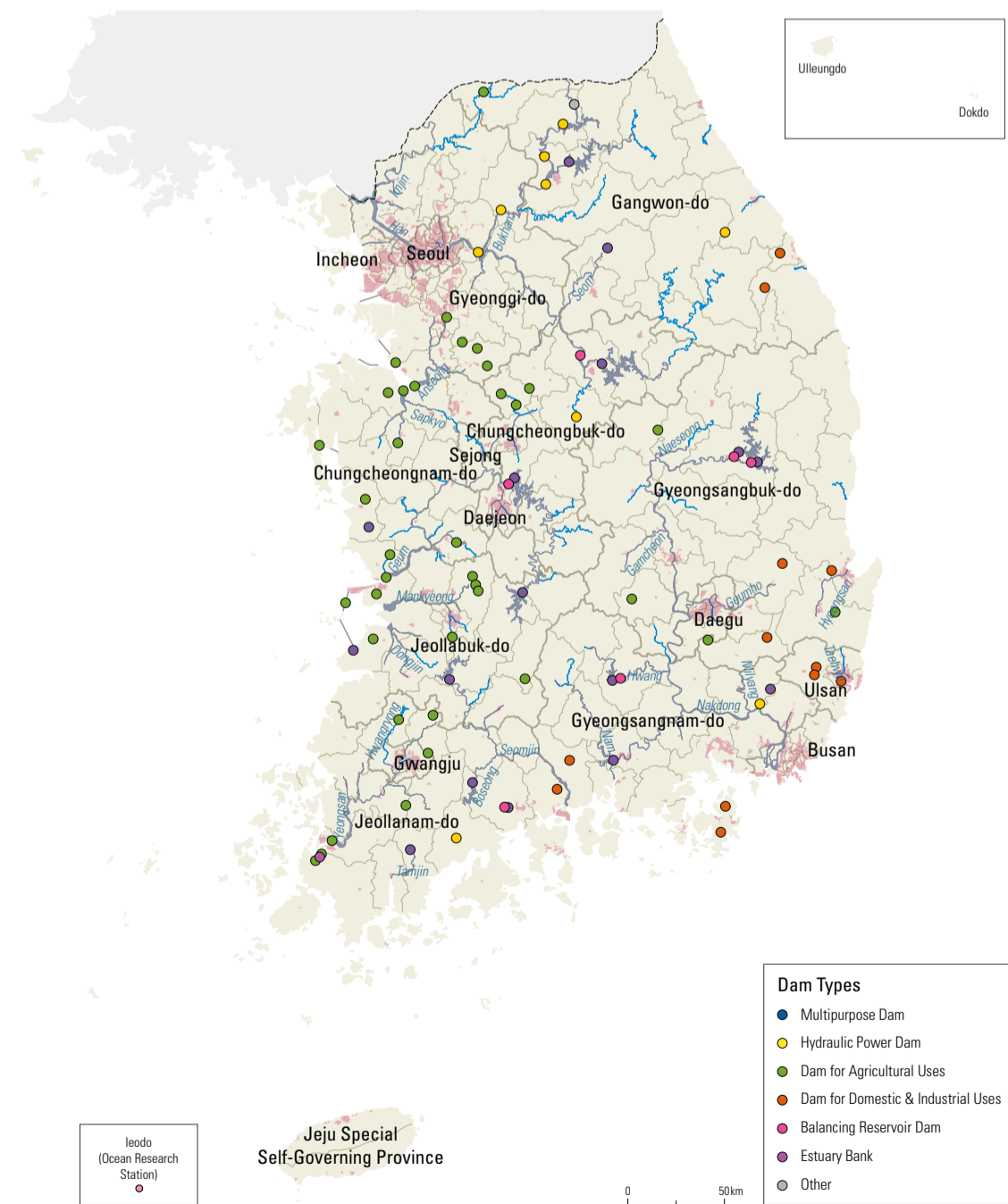
After accounting for the amount discharged into the seas, 33.3 billion m³ are available for use in streams, dams, and groundwater. Dams account for 18.8 billion m³ (56.5%) of the total amount of water use, while streams account for 10.8 billion m³ (32.4%) and groundwater accounts for 3.7 billion m³ (11%).

Dams built to store water are common in Korea because of seasonal changes in precipitation. Dams may be categorized based on the purpose of water use: irrigation dams for farming, drinking water dams for living and industries, hydraulic power dams for electricity generation, estuary banks for water preservation and flood prevention, balancing reservoir dams for water level control

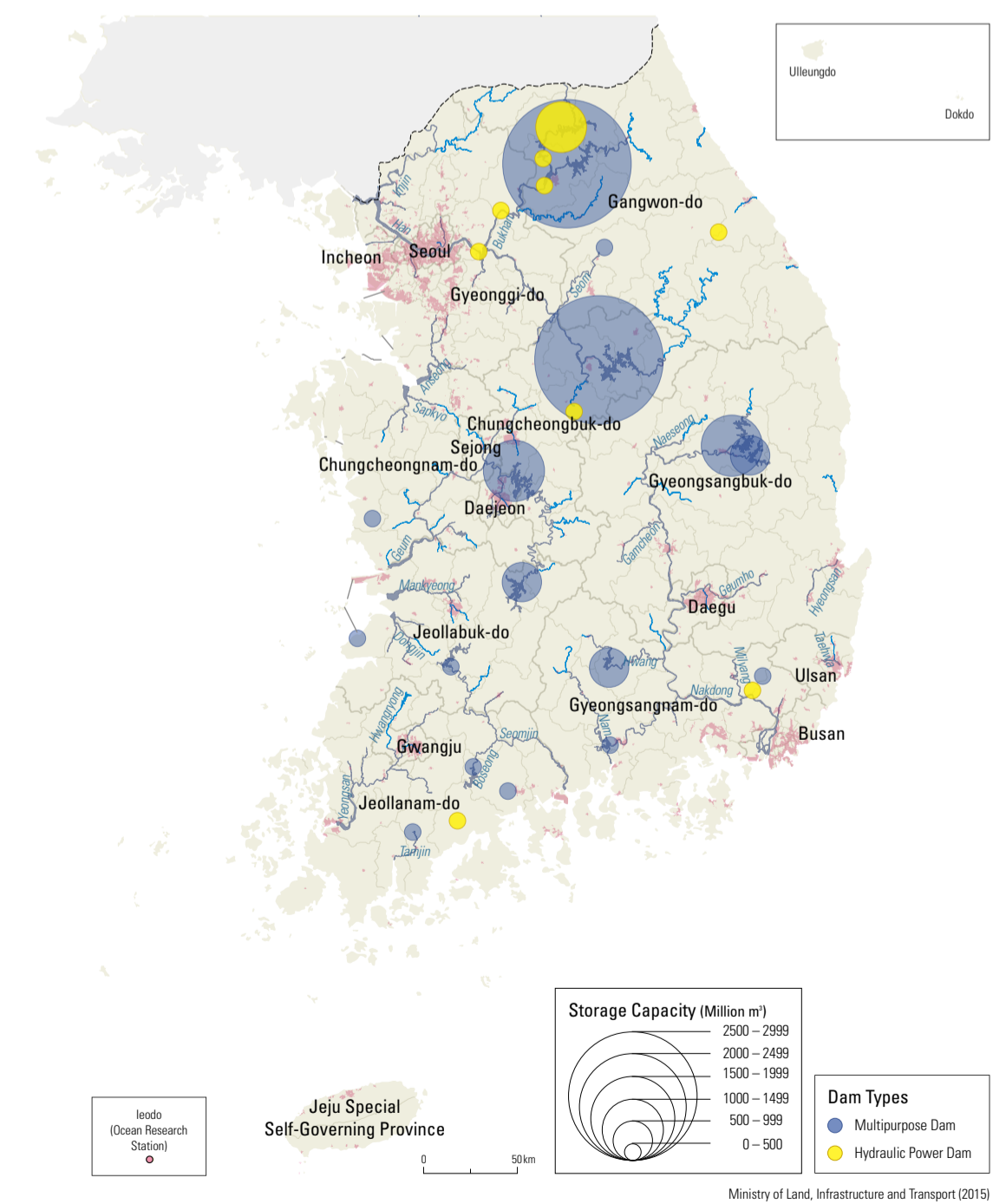
from abrupt dam effluent, and multipurpose dams. In Korea, many multipurpose dams have been built since the passage of the Specific Multi-Purpose Dams Act (April 23rd, 1966). Even though the Seomjingang Dam (built in 1965) and the Namgang Dam (built in 1971) are multipurpose dams, their projects started before the Act was enacted. The Soyonggang Dam (constructed April 1967 – October 1973) is the first multipurpose dam that was built after the legislation went into effect. Later, the Act was merged with the Dam Construction and its Surrounding Area Support Act in 1999 in order to manage water resources systematically and uniformly.

There are 17,656 dams in South Korea. Among them, 20 are multipurpose dams, 55 are living-industrial dams, 12 are electrical dams, and 17,569 are agricultural dams. The multipurpose dams account for 68.3% of the total reservoir capacity. The Hangang and the Nakdonggang watersheds hold large amounts of available water resources. According to the K-water (Korean Water Service Company) survey in 2015, the Soyonggang Dam in the Hangang drainage system has the largest reservoir capacity at 2.9 billion m³. The second is the Chungju Dam (Hangang drainage system) at 2.75 billion m³, the third is the Daechung Dam (Geumgang drainage system) at 1.49 billion m³, and the fourth is the Andong Dam (Nakdonggang drainage system) at 1.248 billion m³.

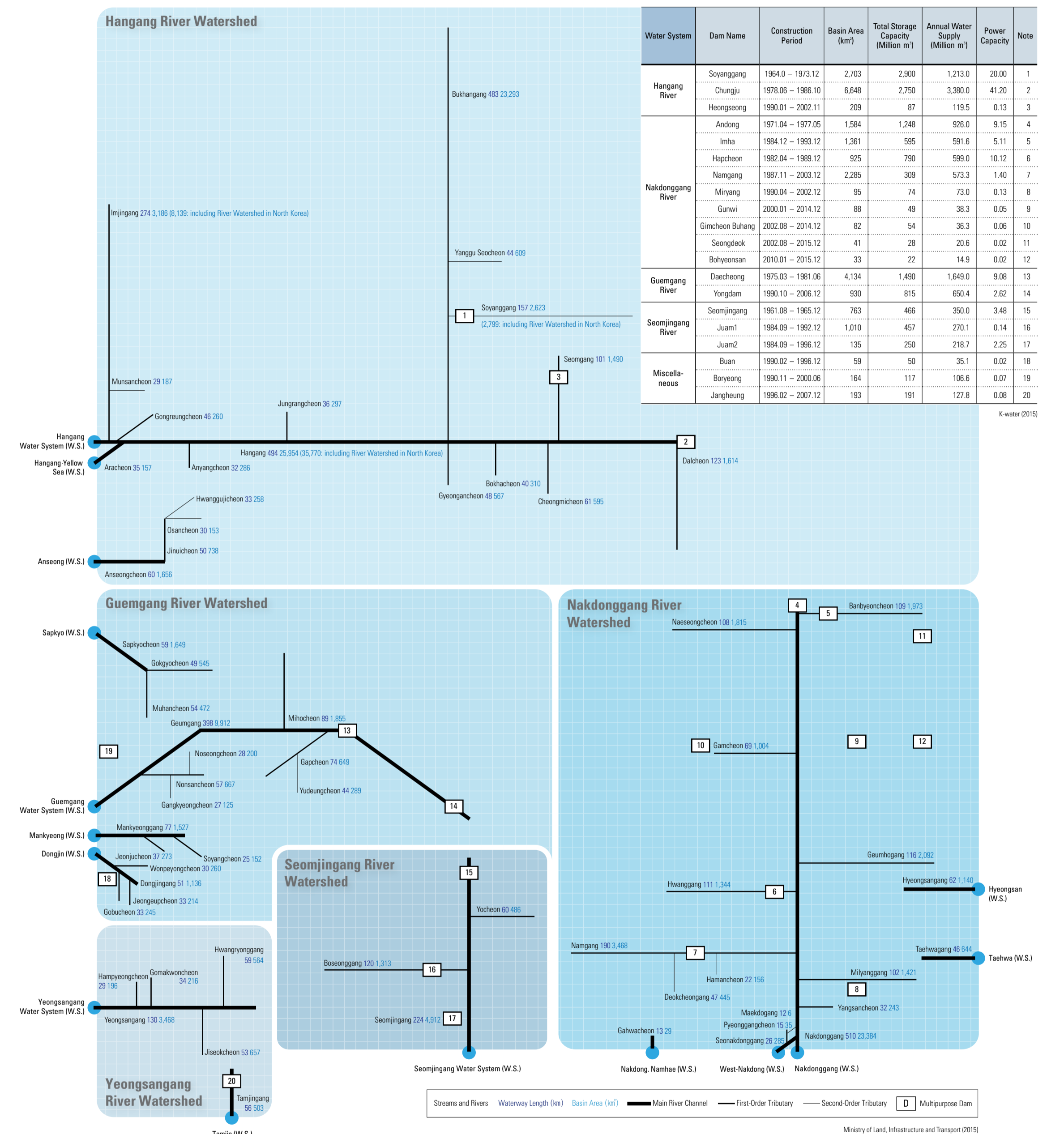
Location of Dams (2015)



Storage Capacity, Multipurpose and Power Dams (2015)



Water Systems and Major River Basins



A drainage system is composed of streams, rivers, and lakes that are connected to a main river. The main river's name is used as the name of its drainage system. For instance, every water body that flows into the Hangang estuary belongs to the Hangang drainage system. The extent of the surface area where water flows into a drainage system is called a river basin. For effective management, Korea has grouped its river basin into

six zones. Among them, the water resources in five zones have been used heavily. Two methods have been used to classify streams in Korea. One is to use natural stream ranks, i.e., the hierarchy of tributaries that are composed of a main stream, the first-order tributaries, the second-order tributaries, and so on. The other is to classify streams depending on their management agencies—national vs. local

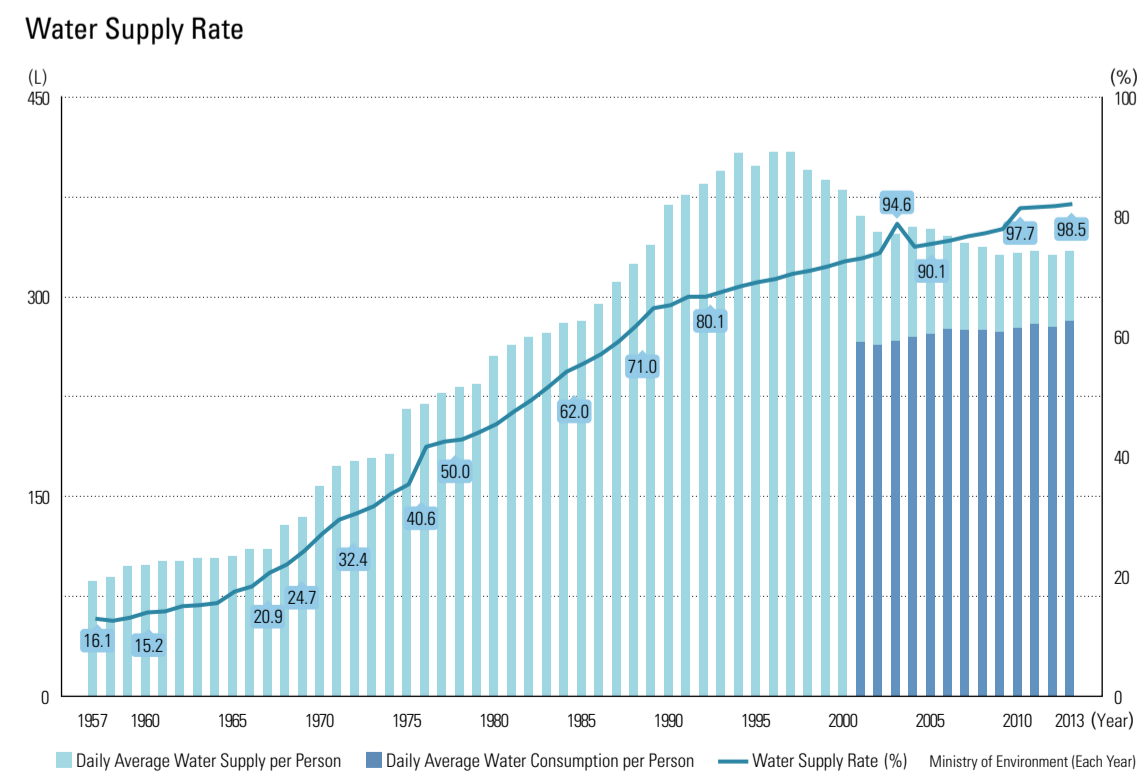
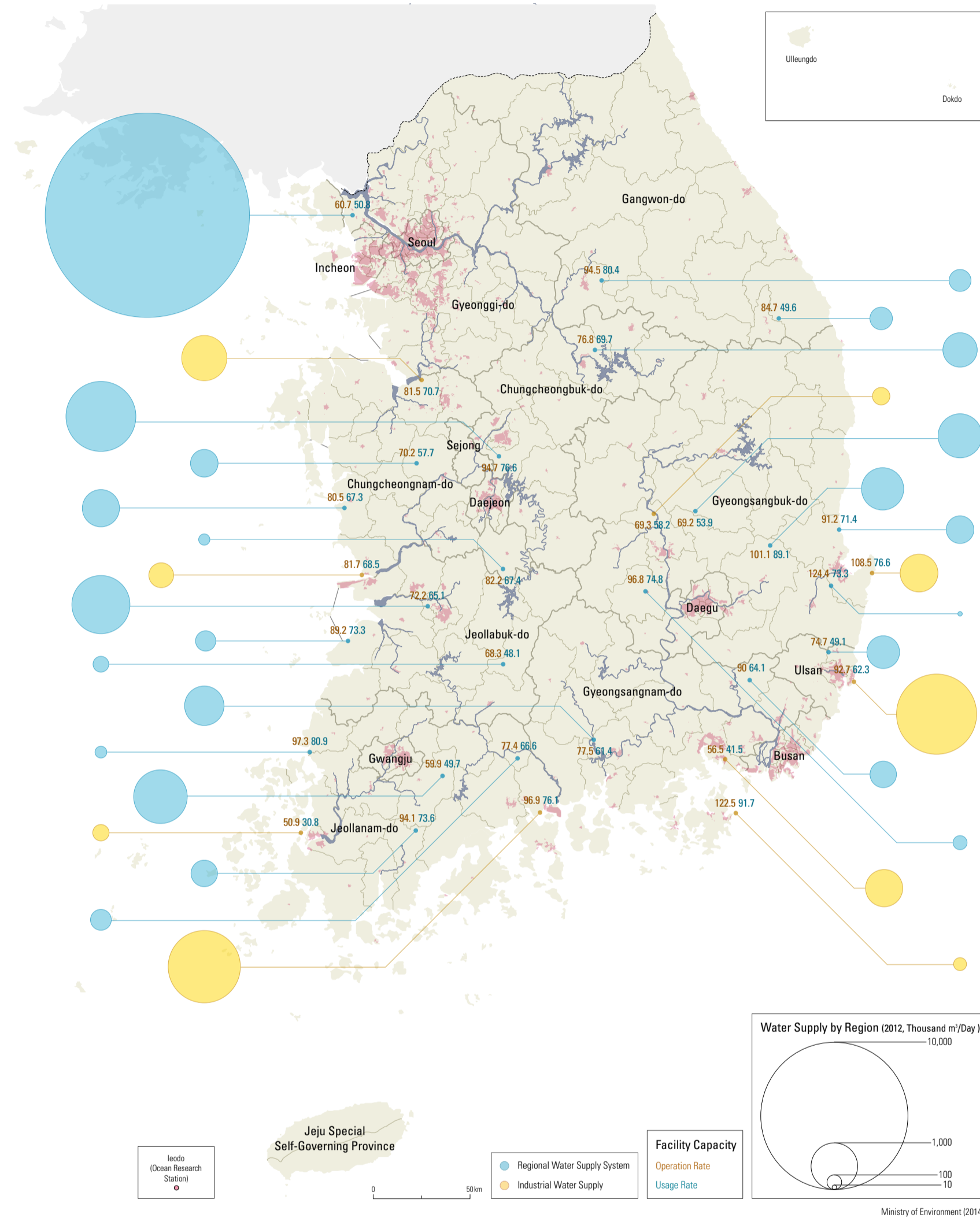
governments. According to the Korea Streams Statistics (2013), the total stream length in Korea is 29,817.62 km, and about 10% (2,995.39 km) are national streams and 90% (26,822.23 km) are local. There are 3,836 streams in Korea. Among them, 3,144 streams (24,331.29 km) are managed based on the River Master Plan. The River Master Plan is updated every 10 years, and it is the main tool

for managing water flow, water quality, aquatic environments, and water facilities. The Ministry of Land, Infrastructure and Transport manages the national streams with the help of the regional branch offices in Seoul, Wonju-si, Daejeon, Iksan-si, and Busan. The River Master Plan covers 99.12% of the length of the national streams.



Water Supply

Regional Water Supply Systems (2014)



Water Supply Dams (2015)

Water System	Dam Name	Construction Period	Basin Area (km <sup>2</sup> )	Total Storage Capacity (Million m <sup>3</sup> )	Annual Water Supply (Million m <sup>3</sup> )	Water Supply Amount (in Million m <sup>3</sup> )		
						Domestic & Industrial	Agricultural	Flow Maintenance
Taebaek-si	Gwangdong Dam	1965.12 - 1969.09	125.0	11.0	26.4	25.6	0.8	-
	Dalbang Dam	1966.11 - 1990.05	29.4	7.7	14.6	13.1	0.3	1.2
	Yeongcheon Dam	1974.11 - 1980.12	235.0	96.4	107.3	80.3	12.4	14.6
Pohang-si	Angye Dam	1968.08 - 1971.12	6.7	17.7	-	-	-	-
	Gampo Dam	2002.07 - 2006.12	3.7	2.4	1.6	1.6	-	-
Ulsan	Ulsan Dam	1965.12 - 1994.09	301.3	135.3	162.4	137.2	2.8	22.4
	Daegok Dam	1999.04 - 2005.12	57.5	28.5	32.1	32.1	-	-
Ulsan Area	Sayeon Dam	1962.10 - 1965.12	67.0	25.0	68.8	65.7	-	0.1
	Daean Dam	1968.02 - 1969.12	77.0	9.5	18.3	18.3	-	-
	Seonam Dam	1962.09 - 1964.12	1.2	2.0	-	-	-	-
Geosje-si	Yeoncho Dam	1977.12 - 1978.12	11.7	5.0	6.3	5.8	0.4	-
	Guchon Dam	1984.05 - 1987.11	12.7	9.7	7.5	7.3	0.2	-
Yeosu-si	Sueo Dam	1974.08 - 1978.05	49.0	27.5	29.7	27.4	2.3	-
Pyeongnimsudo	Pyeongnjin Dam	2001.11 - 2007.12	19.9	8.5	11.8	8.8	1.7	1.3
	Nakdonggang Estuary dike	1983.09 - 1990.06	23,560	-	750.0	750.0	-	-

The overall water supply rate in South Korea was 16.1% in 1955. The rate went up to 50% in 1976, 90% in 2003, and 98.5% in 2013. The daily average water supply per person was about 71 liters (L) in 1955, and reached 335 L by 2013. Among provinces, Gangwon-do has the largest water supply amount (457 L per person per day), while Busan has the smallest (281 L per person per day). In water consumption, the national average is 282 L per person per day (not including 335 L of industrial consumption per company and per day); by comparison, Gyeongsangnam-do has the lowest amount (244 L per person per day) and Chungcheongbuk-do has the highest (349 L per person per day).

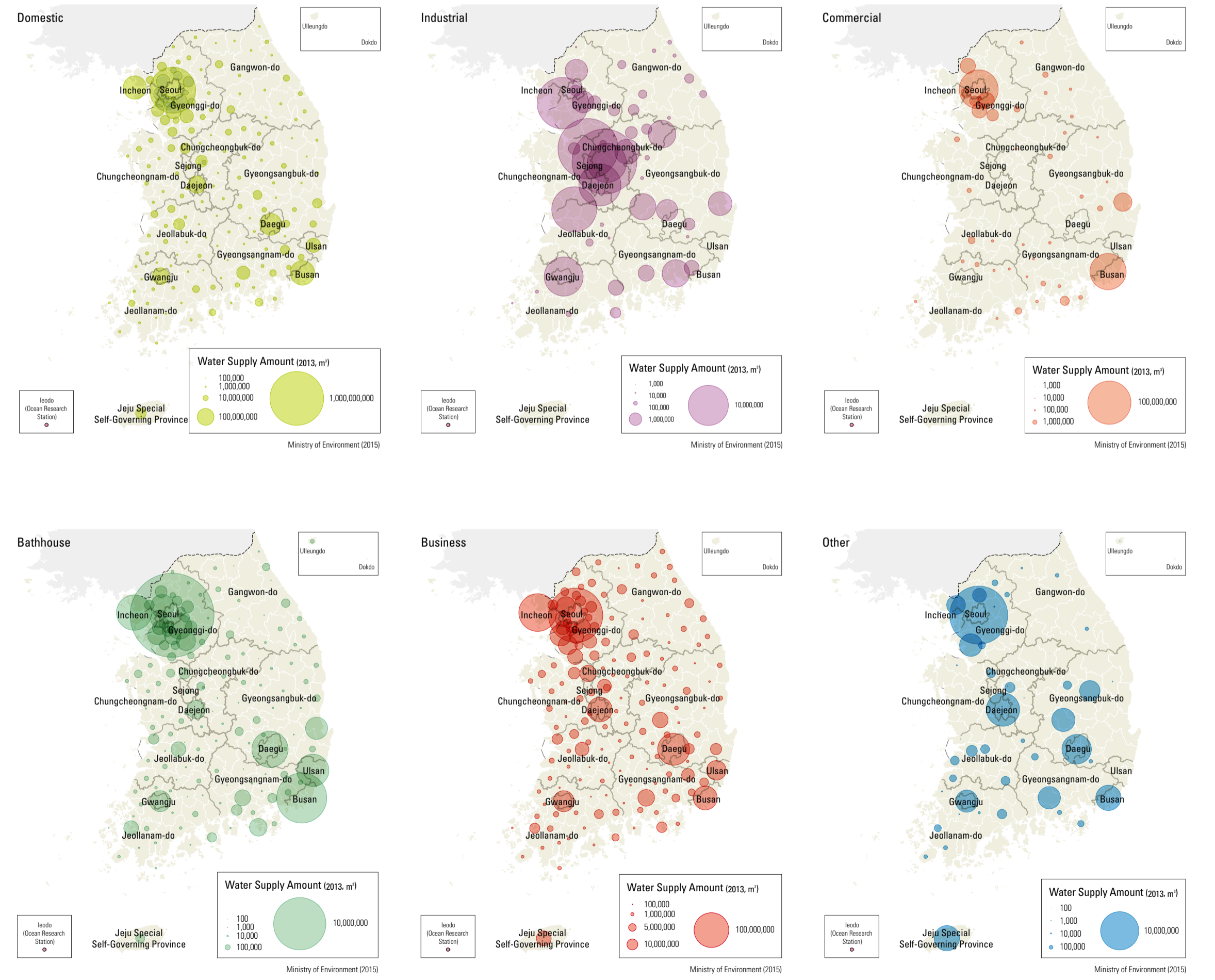
Water supply systems are composed of multi-regional water supply systems, local water supply systems, village water supply systems, and small-scale water supply systems. About 51 million people rely on water supply systems. Local water supply systems support 38 million people (74.0%), and multi-regional water supply systems support 12 million people (23.3%). Local water supply systems are managed by 162 local governments. The multi-regional water supply systems are managed by the national government.

Water supply systems are composed of intake facilities, filtration facilities, and distribution networks. In addition, distribution reservoirs store water in order to respond to temporary high demands. Korea has 589 intake facilities and their combined capacity is 37,181,000 m<sup>3</sup> per year. The intake facility operation rate is 66.2%. Geographically, Jeollabuk-do shows the highest operation rate (156.4%) and Busan shows the lowest (43.4%). Major water intake sources are streams (49.9%, 18,569,000 m<sup>3</sup>/day) and dams (43.2%, 16,073,000 m<sup>3</sup>/day), accounting for 93.1% of the total. Other intake sources are underground streams (4.4%), groundwater (1.5%), and other reservoirs (1.0%). Jeollabuk-do shows the highest rate (98.4%) of operating filtration facilities, followed by Sejong-si (94.9%). Daejeon shows the lowest rate (52.2%). The total length of distribution networks was 185,778 km as of 2013, and 97.2% belong to local water supply systems.

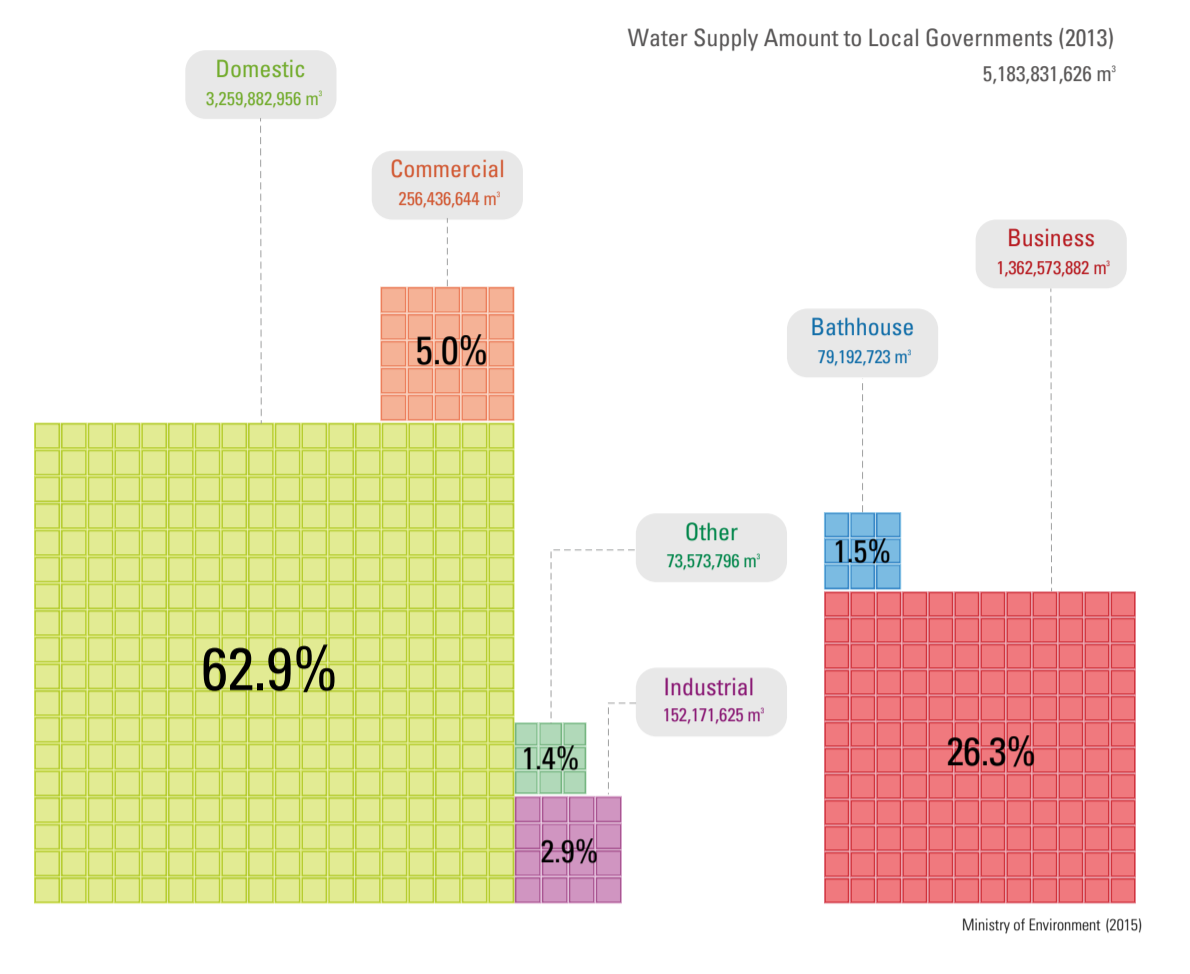
Water Supply Amount by Provider (2013)

Water Service Provider	Water Supply Amount (m <sup>3</sup> )	Service Population (Person)	Daily Average Water Supply per Person (Liter/Person/Day)	Daily Average Water Consumption per Person (Liter/Person/Day)
<b>Local Government</b>	<b>6,107,966,052</b>	<b>49,909,682</b>	<b>335.3</b>	<b>281.8</b>
Seoul	1,141,604,352	10,388,055	301.1	283.7
Busan	364,918,971	3,562,753	280.6	257.9
Daegu	280,253,835	2,522,020	304.4	277.1
Incheon	349,860,892	2,884,226	332.3	295.4
Gwangju	172,442,229	1,481,922	318.8	270.0
Daejeon	187,056,585	1,544,418	331.8	297.2
Ulsan	120,534,773	1,152,779	286.5	256.7
Sejong	15,349,253	97,167	432.8	301.1
Gyeonggi-do	1,421,425,199	12,238,599	318.2	280.6
Chungcheongbuk-do	217,371,727	1,422,225	418.7	349.0
Chungcheongnam-do	257,665,750	1,702,950	414.5	322.7
Jeollabuk-do	260,402,807	1,777,836	401.3	275.2
Jeollanam-do	215,678,036	1,601,942	368.9	244.9
Gyeongsangbuk-do	401,037,705	2,427,689	452.6	308.5
Gyeongsangnam-do	389,837,204	3,122,065	342.1	243.8
Jeju Special Self-Governing Province	82,364,135	604,670	373.2	287.0
<b>K-water</b>	<b>1,574,239,282</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>

Local Government Water Supply Amount by Use (2013)



Total Water Supply Amount by Use

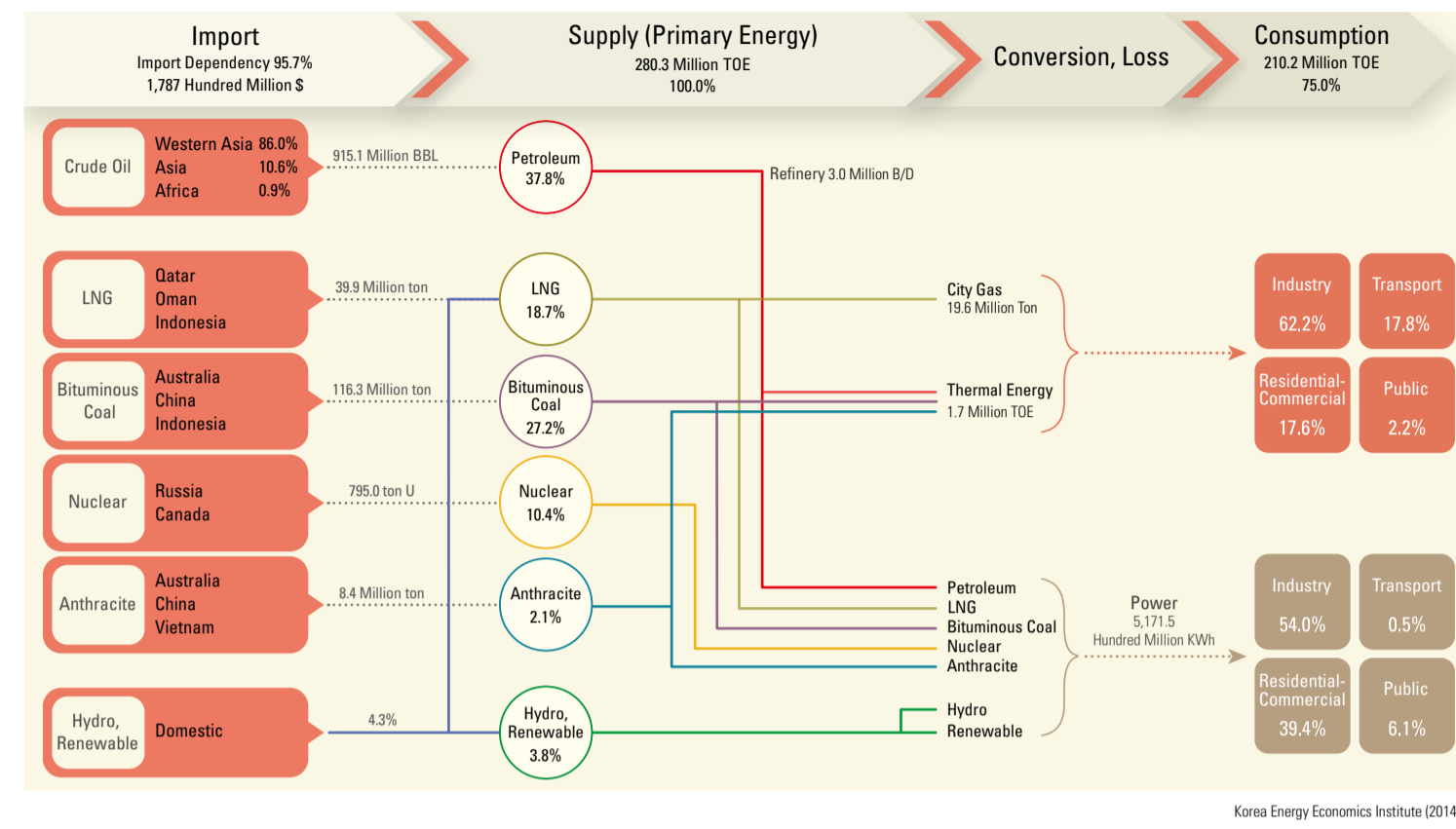


Water Supply Amount to Local Governments (2013)  
5,183,831,626 m<sup>3</sup>

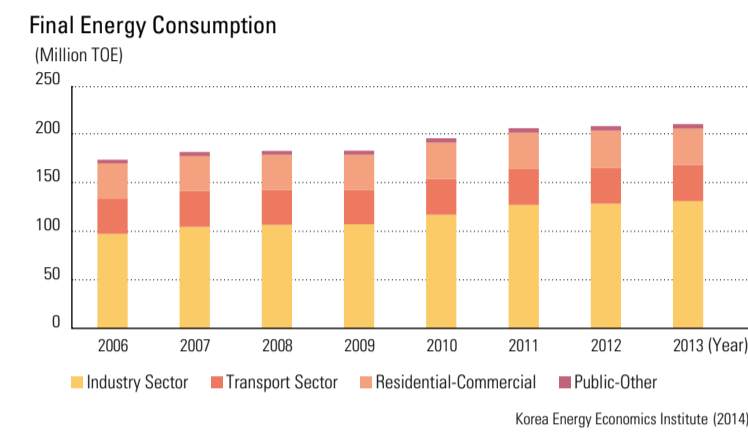
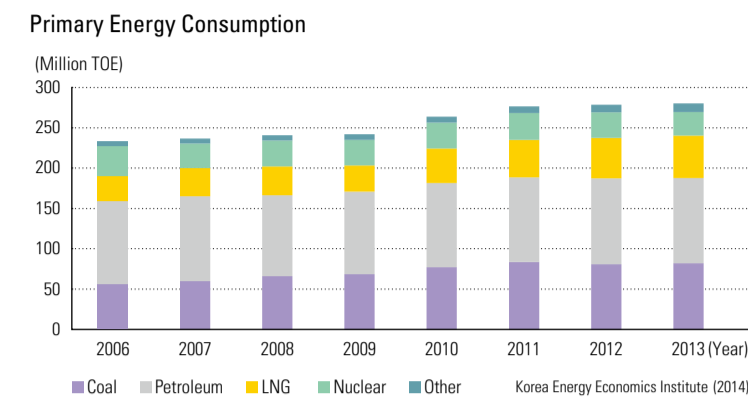


Energy and Electricity

Energy Flow



Energy Supply & Demand (2014)

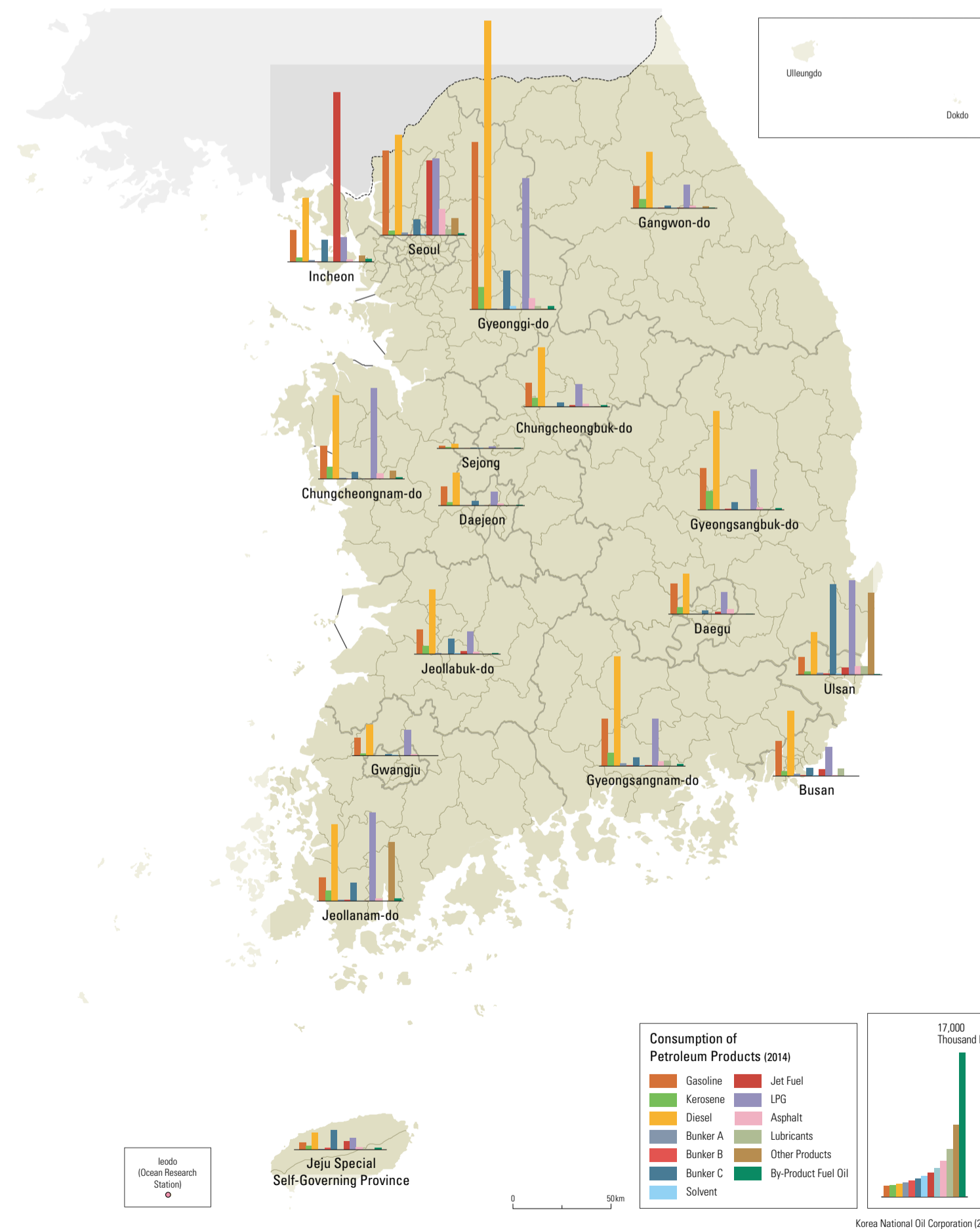


Energy Consumption by Region (2014)

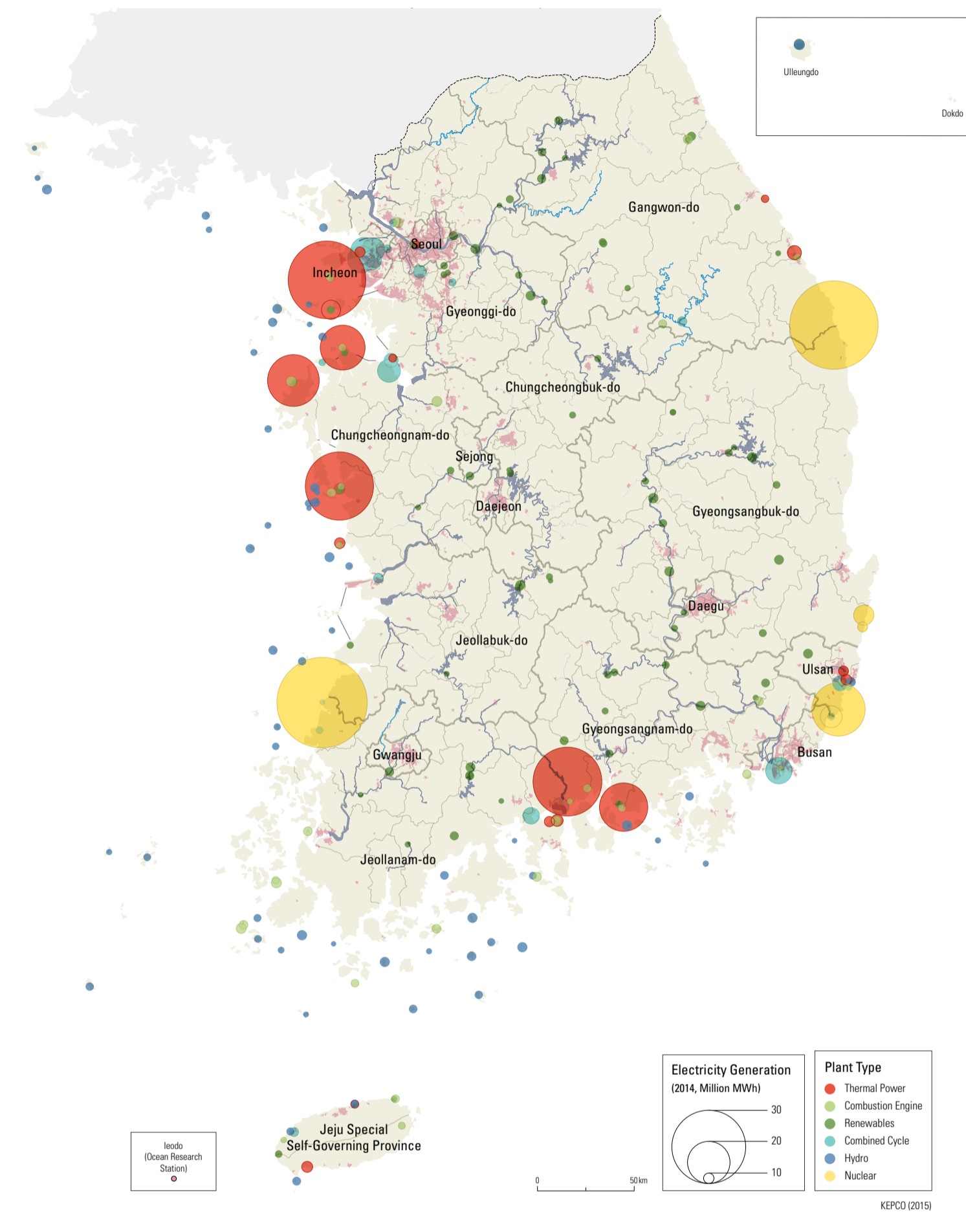
Classification	Total		Industries		Buildings	
	Energy Use (Thousand TOE)	Ratio (%)	Energy Use (Thousand TOE)	Ratio (%)	Energy Use (Thousand TOE)	Ratio (%)
Seoul	1,437	1.6	455	0.5	982	42.2
Busan	949	1.1	801	0.9	148	6.4
Daegu	796	0.9	735	0.8	61	2.6
Incheon	4,819	5.4	4,711	5.4	108	4.6
Gwangju	367	0.4	342	0.4	45	1.9
Daejeon	579	0.6	405	0.5	174	7.5
Ulsan	9,857	11.0	9,839	11.3	19	0.8
Sejong	156	0.2	150	0.2	6	0.3
Gyeonggi-do	9,591	10.7	9,142	10.5	449	19.3
Gangwon-do	2,827	3.2	2,725	3.1	102	4.4
Chungcheongbuk-do	2,637	2.9	2,603	3.0	34	1.5
Chungcheongnam-do	16,846	18.8	16,796	19.2	49	2.1
Jeollabuk-do	2,552	2.8	2,516	2.9	36	1.5
Jeollanam-do	22,619	25.2	22,610	25.9	9	0.4
Gyeongsangbuk-do	11,842	13.2	11,802	13.5	39	1.7
Gyeongsangnam-do	1,757	2.0	1,713	2.0	45	1.9
Jeju Special Self-Governing Province	28	0.0	9	0.0	18	0.8
<b>Total</b>	<b>89,678</b>	<b>100.0</b>	<b>87,354</b>	<b>100.0</b>	<b>2,324</b>	<b>100.0</b>

\* Based on Final Energy Use. TOE is a unit of energy, equivalent to amount of energy released by burning a ton of crude oil, or 10 million kcal. Ministry of Trade, Industry and Energy (2014)

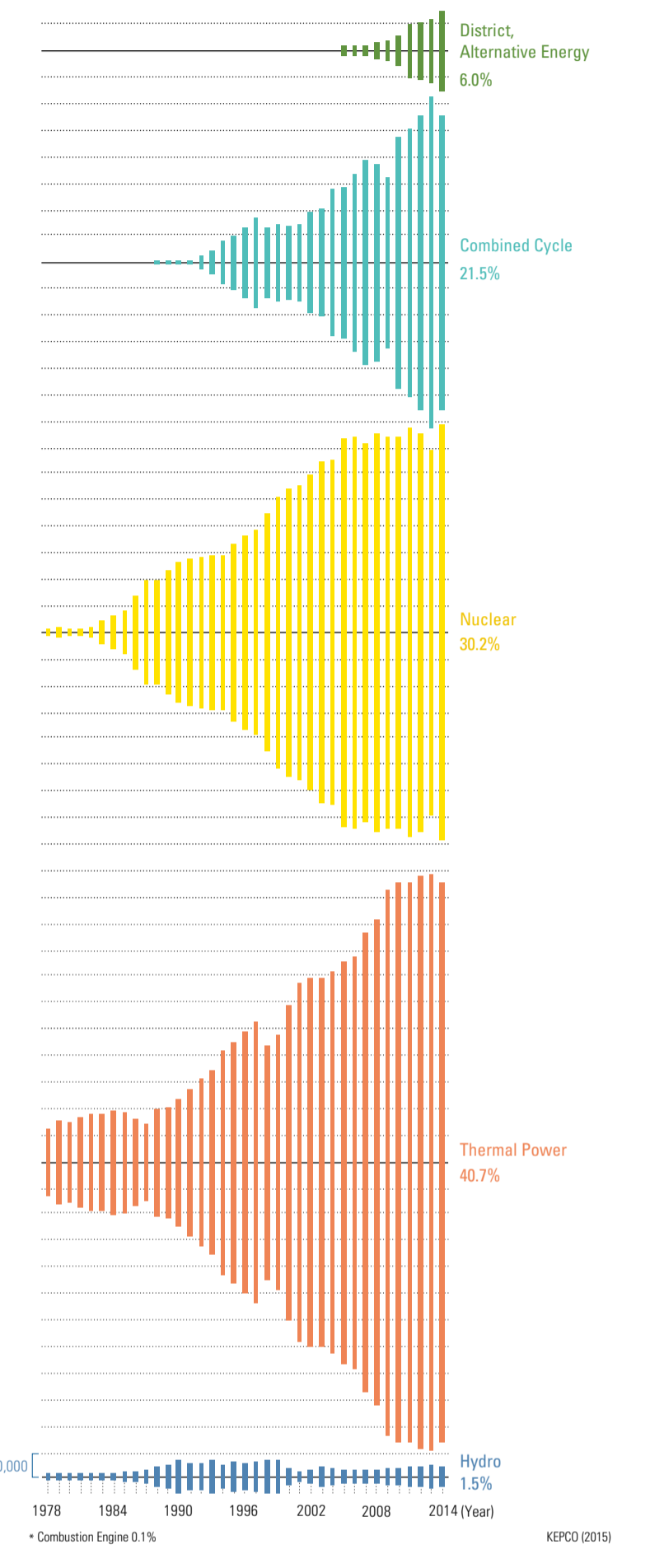
Consumption of Petroleum Products by Region



Power Plants-Locations, Types and Capacity (2014)



Electricity Generation Trend by Energy Source (1978 - 2014)



Electricity Generation by Energy Source

Year	Hydro	Thermal Power	Combustion Engine	Nuclear	Combined Cycle	District, Alternative Energy	Total	Year	Hydro	Thermal Power	Combustion Engine	Nuclear	Combined Cycle	District, Alternative Energy	Total
1979	2,328,529	31,840,761	1,278,747	3,151,904	-	-	38,599,941	1997	10,807,050	106,813,290	718,025	77,095,649	34,424,111	-	229,948,125
1980	1,984,090	31,356,437	420,952	3,477,154	-	-	37,238,633	1998	12,198,072	89,041,578	575,291	89,688,972	26,505,047	-	218,008,960
1981	2,708,530	34,304,653	296,277	2,897,205	-	-	40,206,665	1999	12,132,466	96,472,548	381,697	103,963,779	28,675,046	-	240,725,536
1982	2,005,250	36,962,751	376,926	3,777,289	-	-	43,122,216	2000	5,609,822	119,947,533	283,861	108,963,740	26,863,140	-	261,678,096
1983	2,722,617	36,906,748	255,899	8,965,058	-	-	48,850,322	2001	4,150,753	135,436,741	324,939	112,133,033	29,032,971	-	281,078,437
1984	2,388,735	39,476,841	138,958	11,792,059	-	-	53,807,593	2002	5,311,047	138,929,484	353,023	119,102,905	38,336,951	-	302,033,410
1985	3,659,080	37,484,207	118,749	16,745,341	-	-	58,007,377	2003	6,886,983	140,269,475	370,125	129,671,763	40,374,646	-	317,572,992
1986	4,019,381	32,189,899	174,573	28,314,217	-	-	64,695,077	2004	5,861,435	145,364,710	406,895	130,714,816	55,451,941	-	337,798,797
1987	5,344,196	29,096,143	237,259	33,314,193	-	-	73,991,791	2005	5,188,889	151,207,195	575,339	146,779,023	57,456,898	3,162,645	354,369,989
1988	7,132,152	41,413,570	209,725	40,100,672	172,045	-	89,028,164	2006	5,218,621	155,910,915	677,296	148,748,887	67,138,341	3,107,954	380,802,014
1989	9,115,900	42,074,929	252,965	47,365,172	220,718	-	99,029,684	2007	5,042,462	173,415,074	578,356	142,937,164	76,405,418	3,915,964	402,294,438
1990	12,722,706	47,373,994	429,062	52,886,562	618,541	-	114,030,865	2008	5,862,650	183,655,356	502,708	150,957,938	74,519,351	6,427,848	421,625,849
1991	10,101,464	56,000,432	471,635	56,310,750	784,966	-	123,669,247	2009	5,641,163	206,535,073	696,953	147,770,807	64,486,009	7,617,606	432,747,611
1992	9,726,446	63,531,023	574,046	56,530,214	5,464,029	-	135,825,758	2010	6,471,903	211,448,271	730,695	148,595,712	94,505,838	12,558,290	474,311,709
1993	12,012,158	70,464,207	640,467	58,138,203	9,187,862	-	150,242,997	2011	7,830,652	211,204,803	820,533	154,723,107	101,479,384	20,021,454	496,079,933
1994	8,196,504	85,407,970	788,923	58,650,918	18,048,714	-	169,091,029	2012	7,852,301	216,336,004	752,070	150,327,293	110,881,933	21,530,606	507,480,207
1995	10,955,836	91,131,262	824,819	67,028,647	20,198,179	-	190,138,743	2013	8,393,929	218,585,257	740,935	138,783,973	124,400,011	24,562,827	515,466,932
1996	10,402,648	98,653,519	771,846	73,924,340	26,942,526	-	210,694,879	2014	7,819,548	211,171,971	655,810	156,406,511	111,711,485	30,900,576	518,665,881

\* Does Not Include Electricity Generated for Self-Consumption KEPCO (2015)

The power generation capacity in Korea increased from 1.94 million MWh (Megawatt-hours) in 1961 to 542 million MWh in 2014 (an increase of 300 times) according to the Korea Electric Power Corporation (2015). Electricity is generated using hydraulic power, gas, internal

combustion, nuclear reaction, combined cycle power, and cogeneration/alternative energy. In Korea, internal combustion accounts for 38.9% (211 million MWh) of total electricity generation. Nuclear power takes the second spot at 28.8%, followed by combined cycle power (12.1%). In-

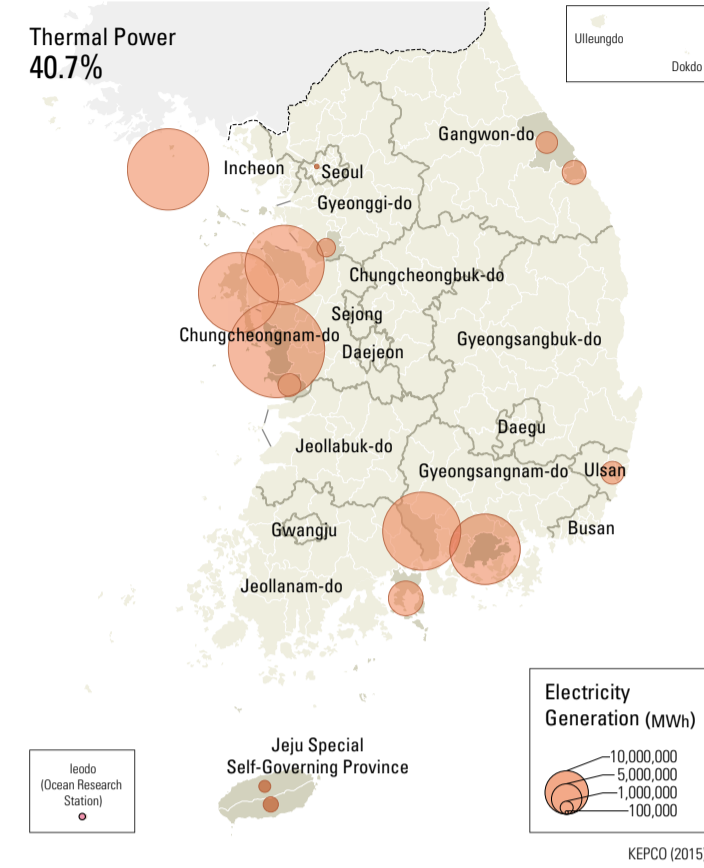
ternal combustion systems increased from 0.002 million MWh in 1961 to 0.66 million MWh in 2014 (an increase of about 320 times). The second highest growth rate appears in the cogeneration/alternative energy sector, with an increase of 306 times from 0.01 million MWh in 2004 to 3.3

million MWh in 2014. Geographically, most electricity is generated along the western and south-eastern coasts. The electric power grid delivers electricity from the large, coastal power plants to inland areas.

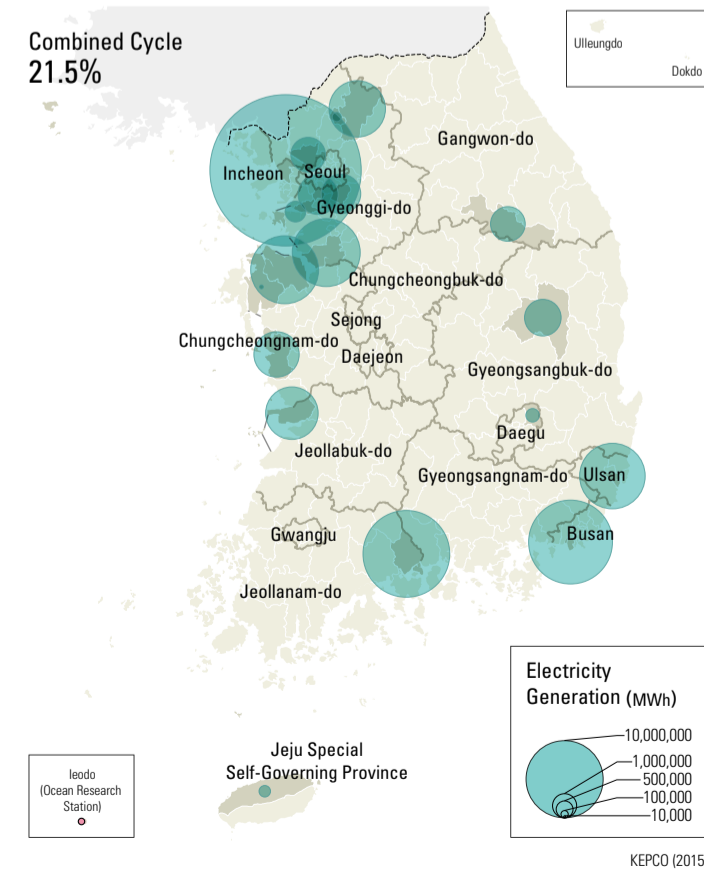
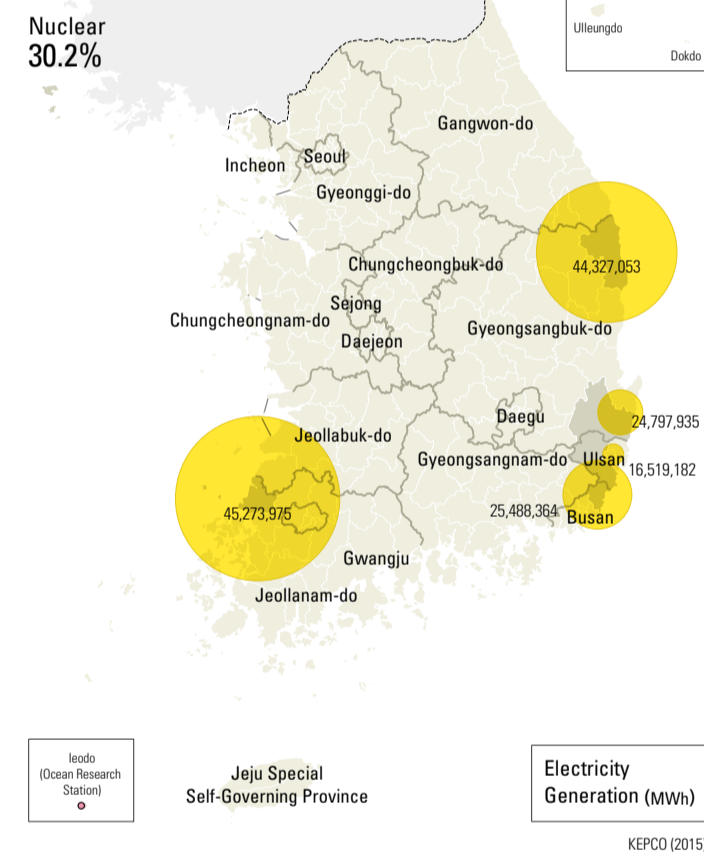
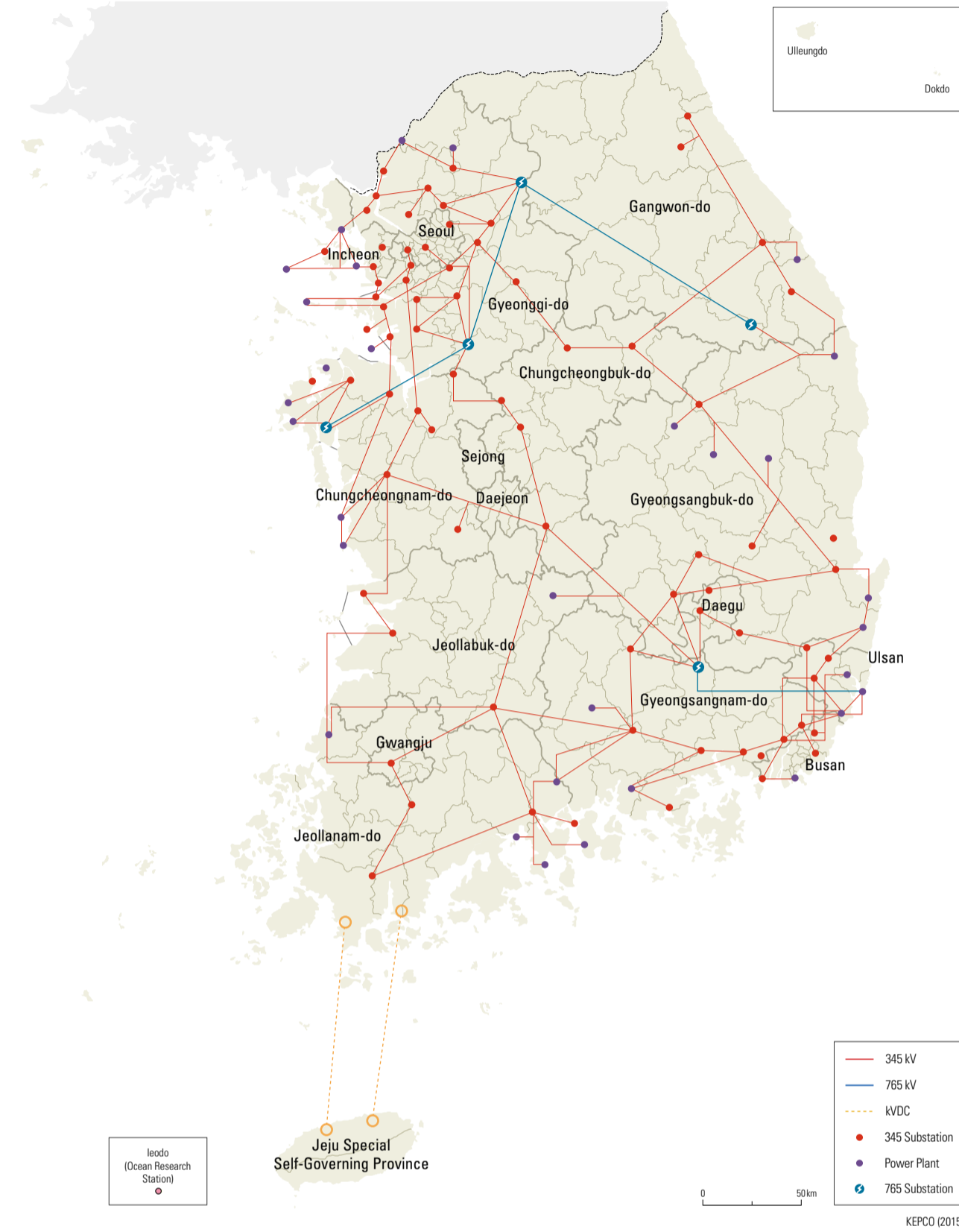


Electricity Distribution and Consumption

Electricity Generation by Energy Source (2014)

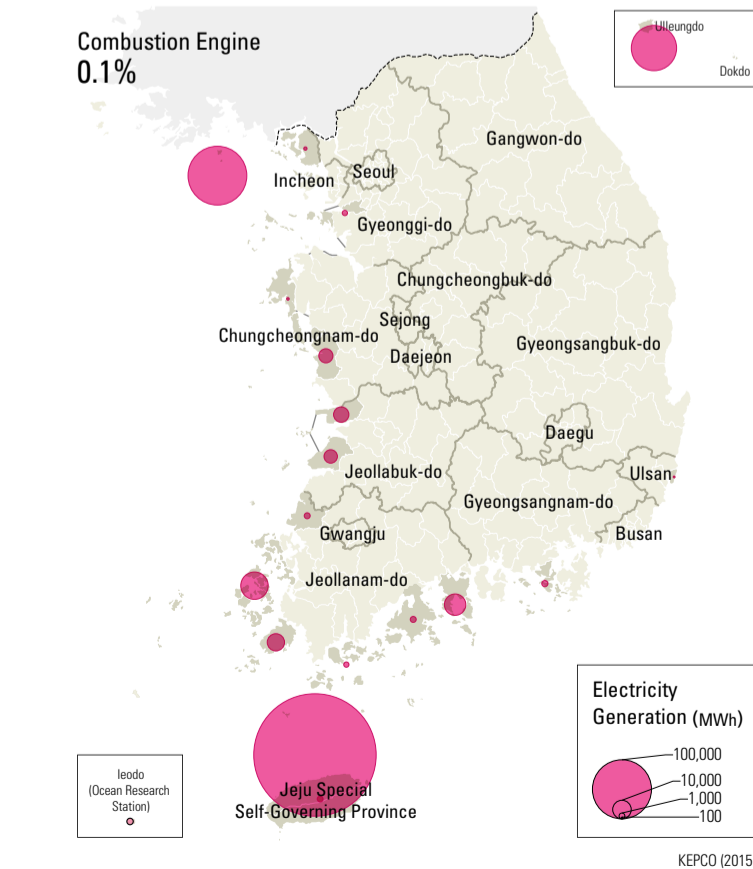
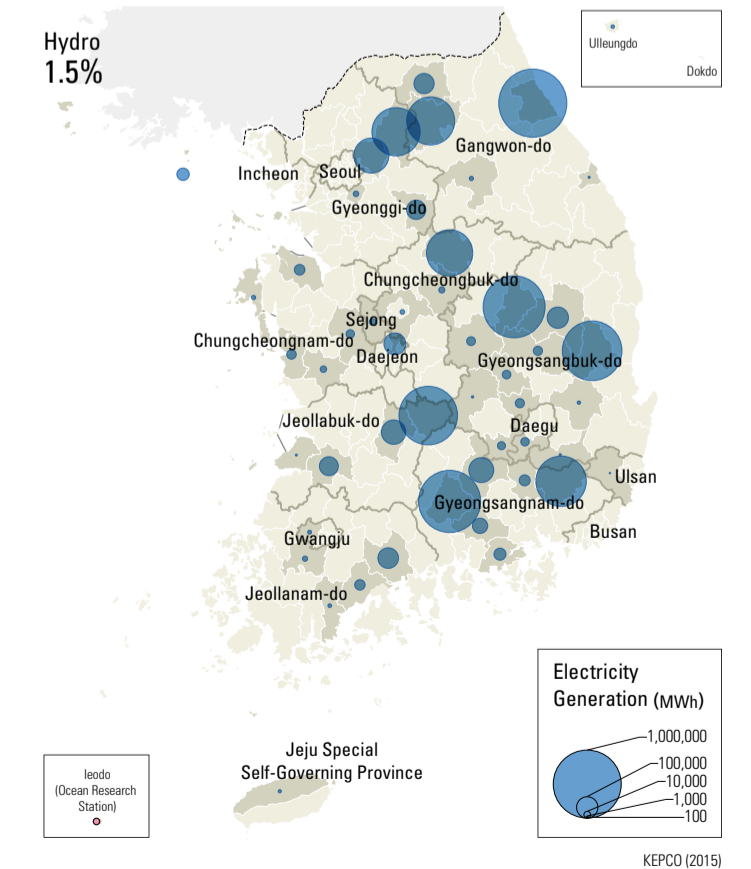


Electrical Transmission (2014)

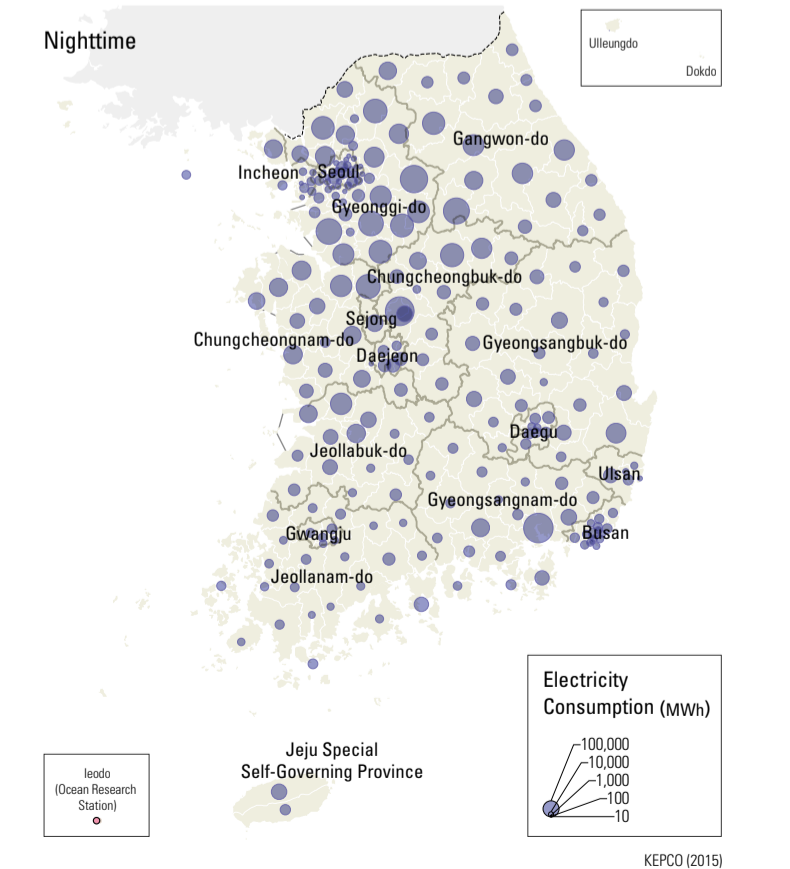
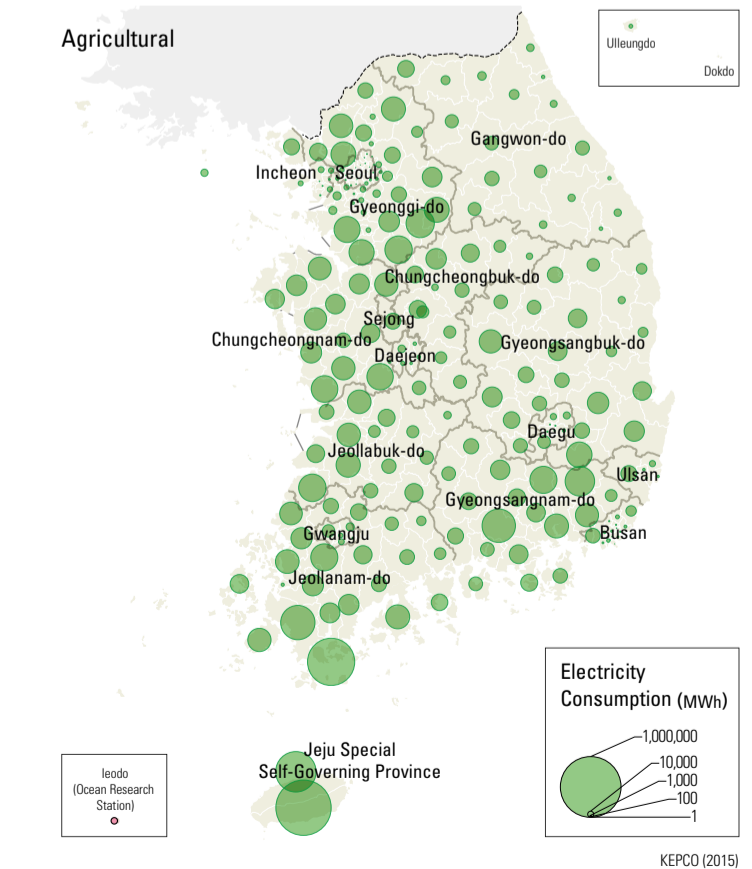
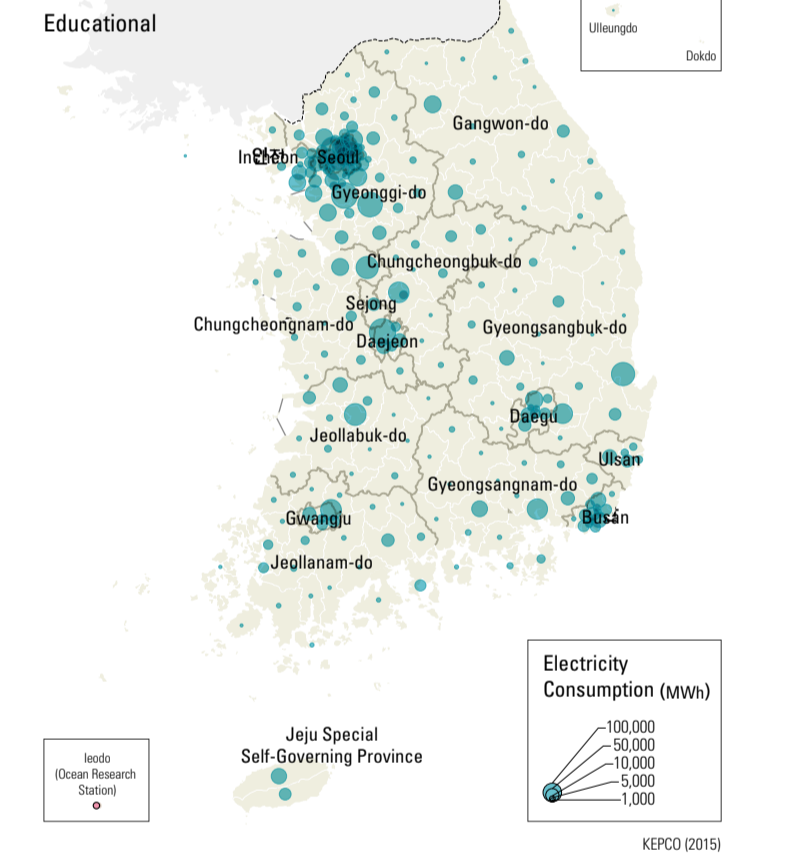
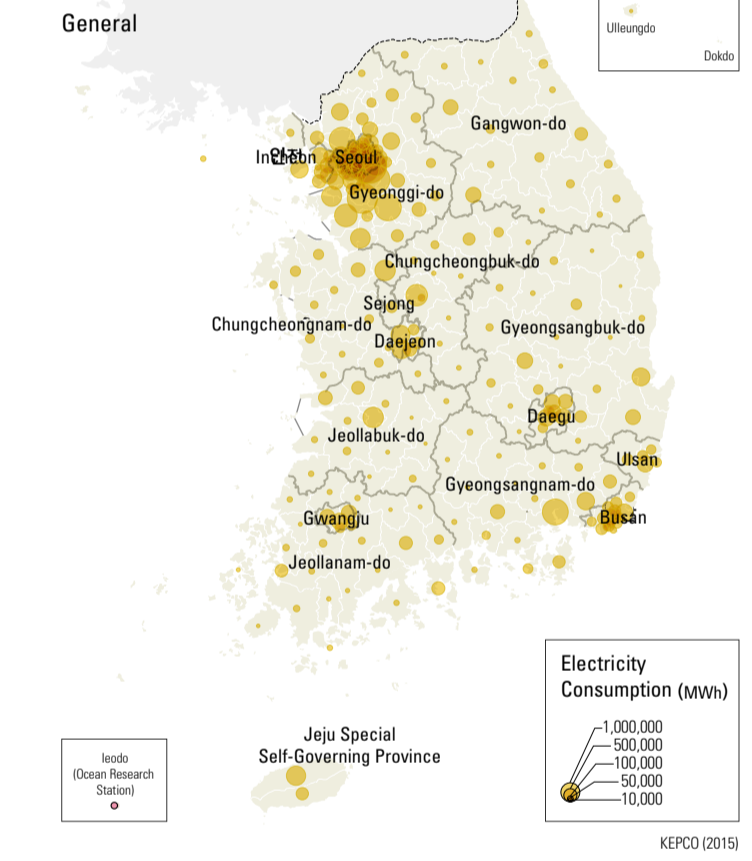
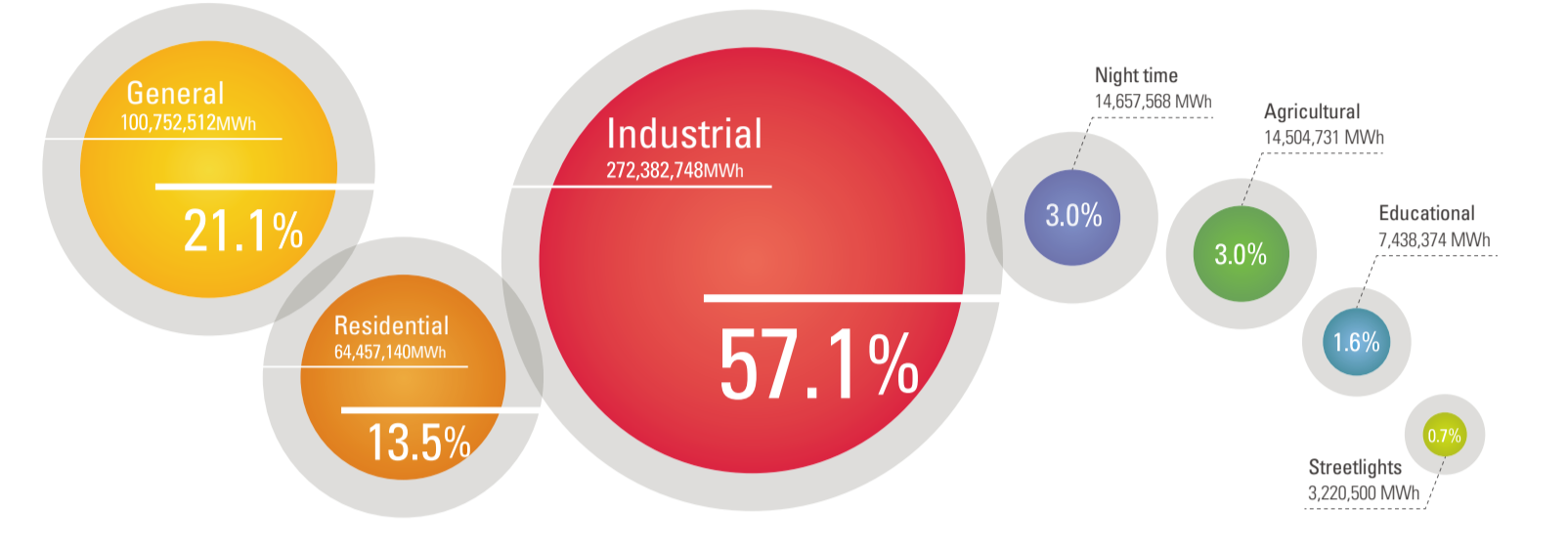
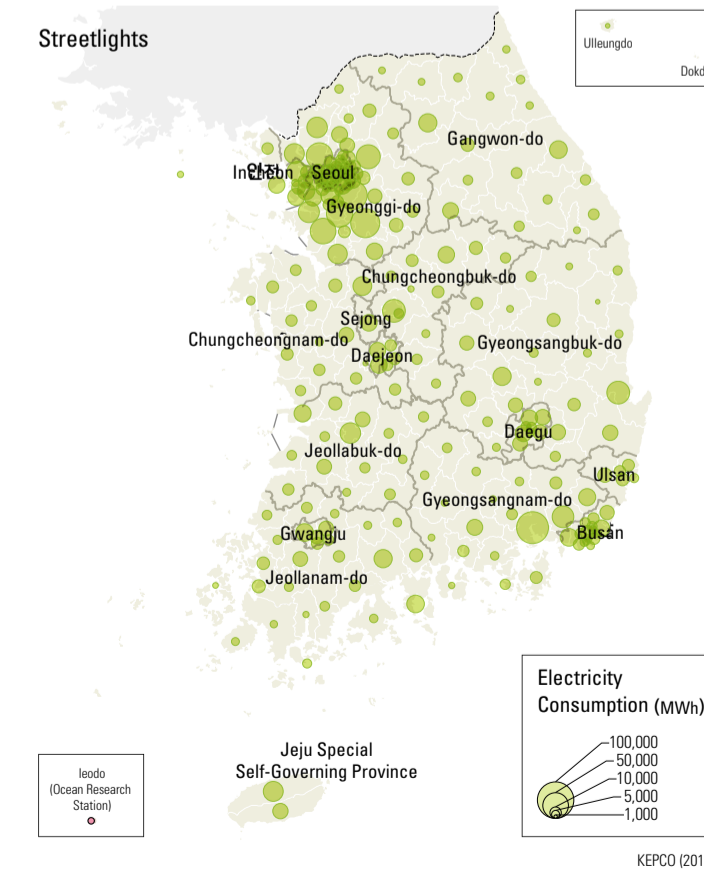
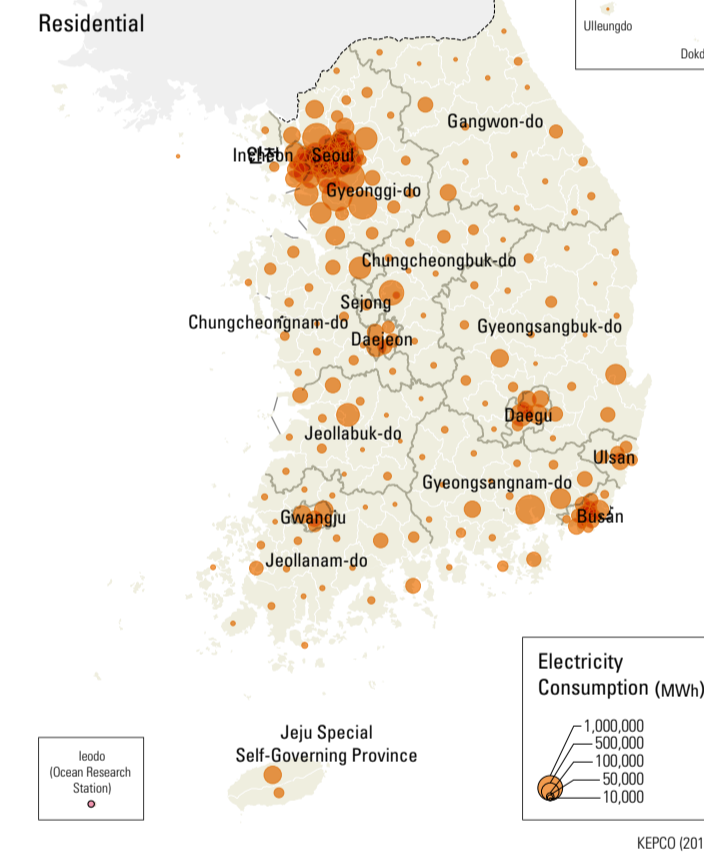
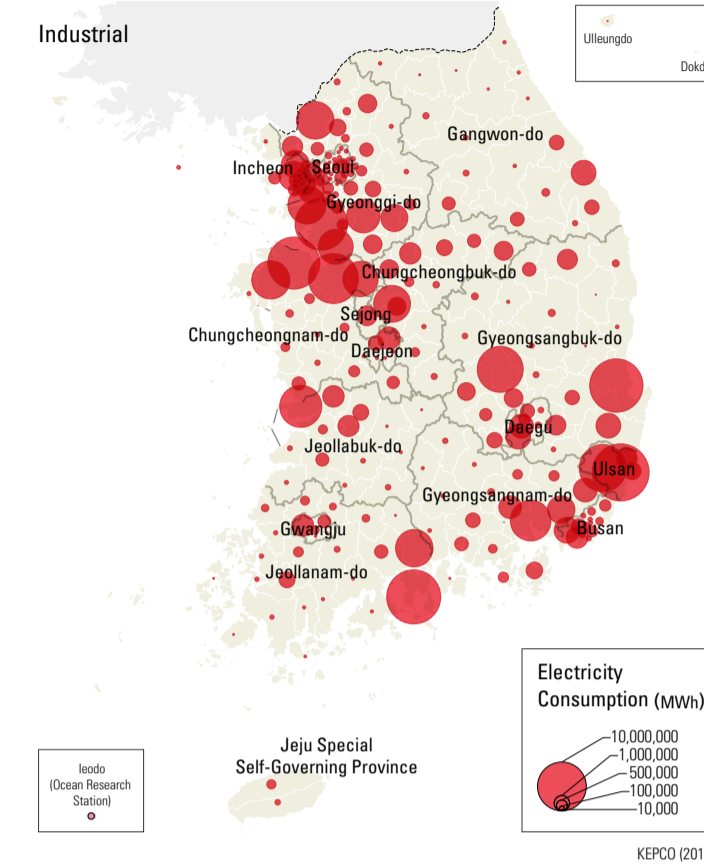


The geographic distribution of electric power plants is dependent on the method of power generation. The power plants that use gas, internal combustion power, and combined cycle power are located around large cities or industrial complexes with large demands. They also are located along coastal areas with convenient access to raw materials and water for cooling. Internal combustion power plants are located close to small cities or islands along the west coast, taking advantage of their small and light generators. Nuclear

power plants are located on stable ground along the coastlines to ensure safety. Hydraulic power plants are located on the rivers that have a large drop in elevation and abundant water flow. Alternative energy power plants primarily appear in windy areas such as Gangwon-do and Jeju-do. Cogeneration energy facilities are located near large residential areas in need of hot water supplies, such as the Seoul Metropolitan Area.



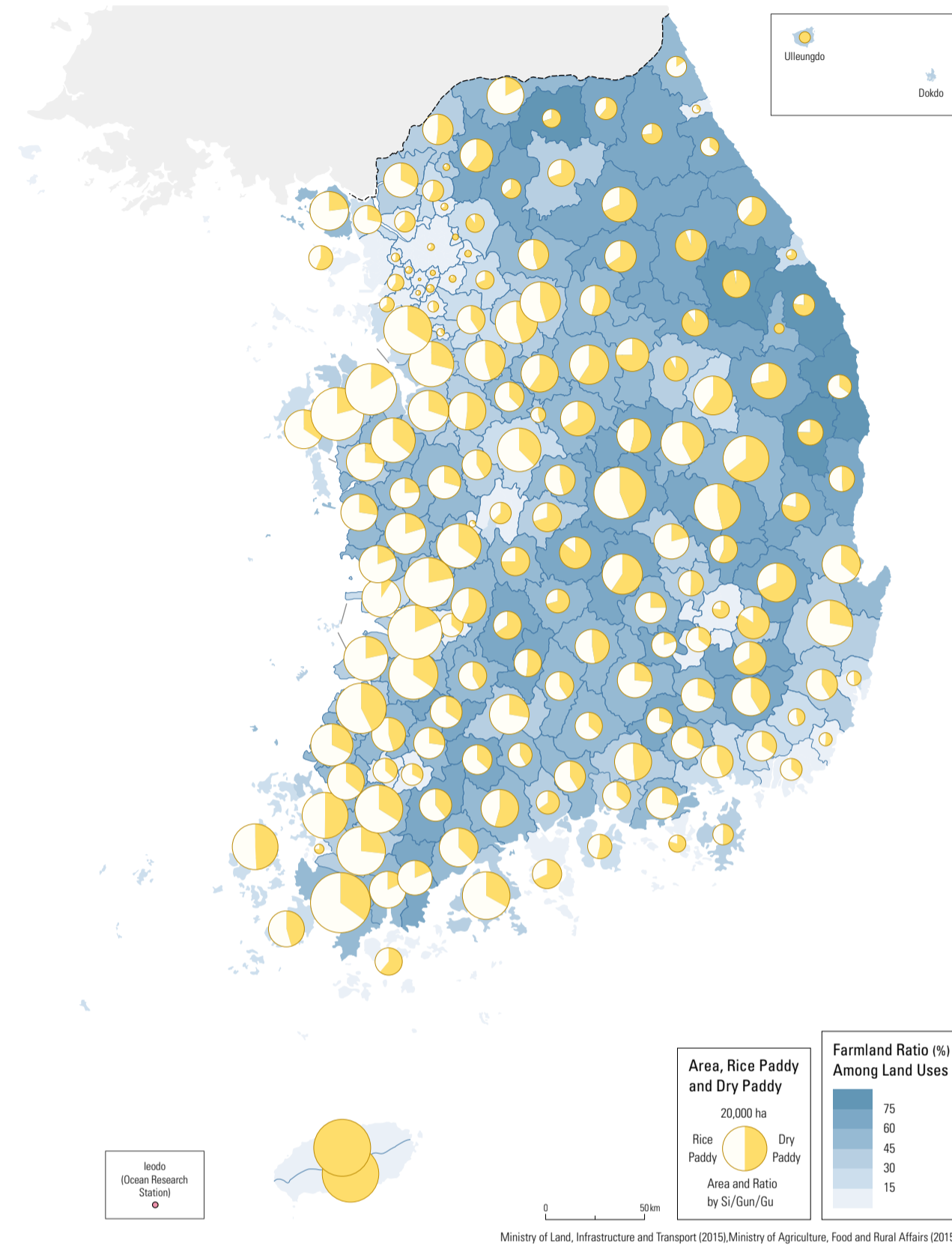
Electricity Consumption by Sector (2014)





Food Resources

Farmland Ratio & Area (2014)



Food Supply & Demand by Type (2013)

Classification	Production	Import	Carry-in	Total Supply	Carry-over	Export	Feed	Seed	Loss	Industrial Processing (Human Consumption)	Industrial Processing (Non-Human Consumption)	Food Supply	Food Self-sufficiency Rate (%)
Cereals	4,191	13,998	1,716	19,905	1,704	2	9,220	40	542	326	602	7,469	23.0
Starchy Roots	1,089	49	-	1,138	-	-	109	61	109	-	-	859	95.7
Sweeteners	1,504	1	38	1,542	-	339	-	-	12	-	-	1,191	125.0
Pulses	147	1,238	58	1,443	69	0	-	4	8	848	-	513	10.7
Tree Nuts	71	73	-	144	-	13	-	-	3	-	-	127	54.3
Oil Crops	39	109	9	156	8	1	-	0	1	122	-	25	26.2
Vegetables	9,455	1,211	2	10,668	9	125	-	53	2,397	-	-	8,083	89.8
Fruit	2,523	717	-	3,240	-	35	-	-	320	5	-	2,880	78.7
Meat	2,167	569	131	2,867	112	28	-	-	54	-	44	2,629	79.5
Eggs	605	3	-	607	-	1	-	-	12	-	-	594	99.7
Milk	2,130	1,611	9	3,751	10	108	-	-	31	519	-	3,084	58.6
Oils and Fats	14	1,055	61	1,131	57	22	-	-	11	-	-	1,042	1.3
Fishes and shellfishes	1,993	1,972	390	4,356	394	831	-	-	158	-	-	3,003	63.1
Seaweeds	1,140	36	-	1,176	-	256	-	-	46	-	-	874	124.0
Alcoholic beverages	4,329	350	686	5,365	696	264	-	-	9	247	-	4,149	98.3

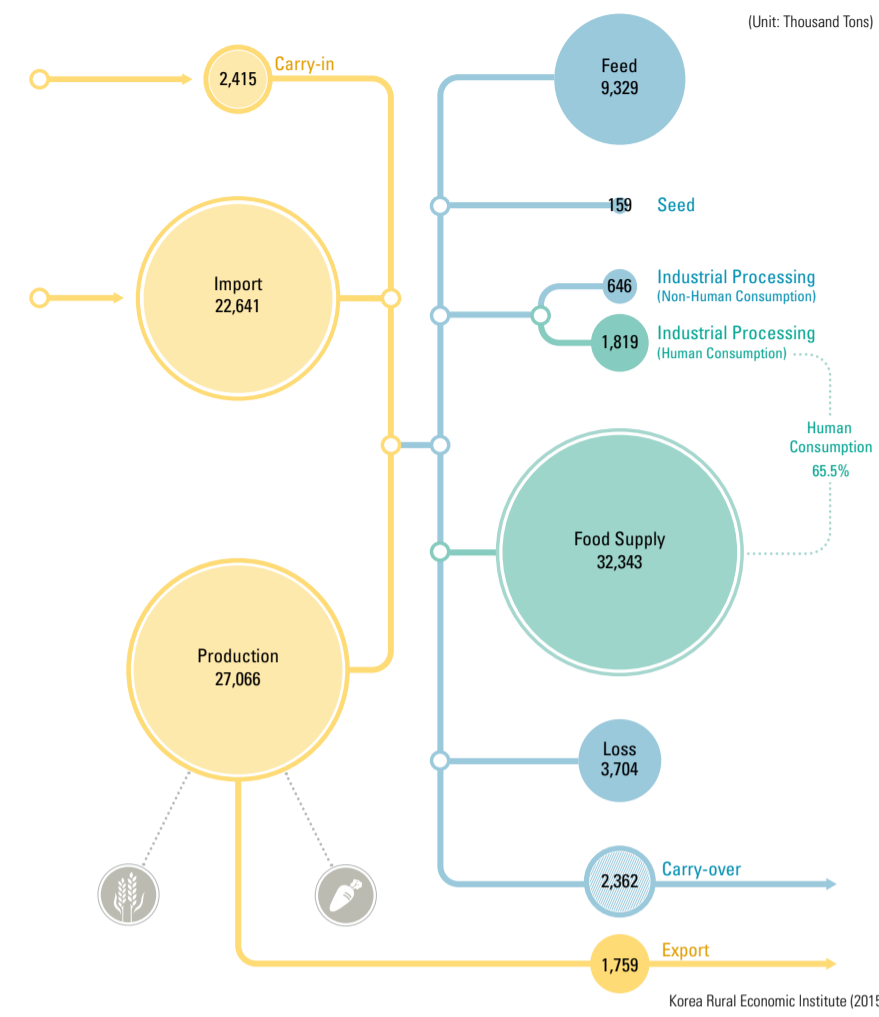
In Korea, food is supplied by domestic production and import. According to the Food Demand and Supply Statistics (Korea Rural Economic Institute, 2014), in 2013, 50 million tons of food were supplied. Of that, 27 million tons (54.5%) were produced in Korea, while the other 23 mil-

lion tons (45.5%) were imported. Food is used for animal feed, seeds, industrial processing, and human consumption. In total, about 32 million tons (65.1%) were used for human consumption, 18.8% for animal feed, and 5.0% for industrial processing.

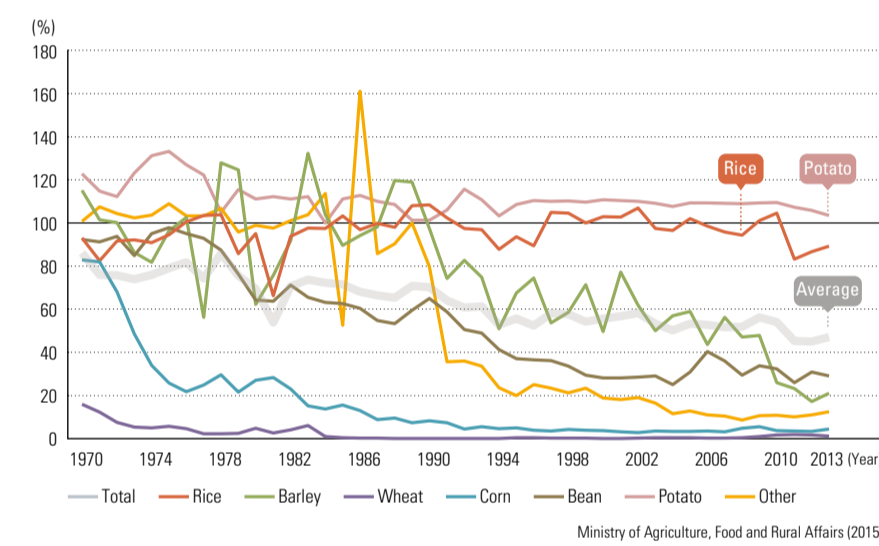
The Food and Agriculture Organization (FAO) divides food into 15 categories, including grains, starchy roots, and sweeteners. The largest supply is grains (19.9 million tons per year), followed by vegetables (10.7 million tons) and alcoholic beverages (5.4 million tons). Domestic production

(domestic production / domestic consumption x 100) are high for sweeteners (125.0%), seaweed (124.0%), and eggs (99.7%), while high-demand grains have a low domestic production rate (23.0%).

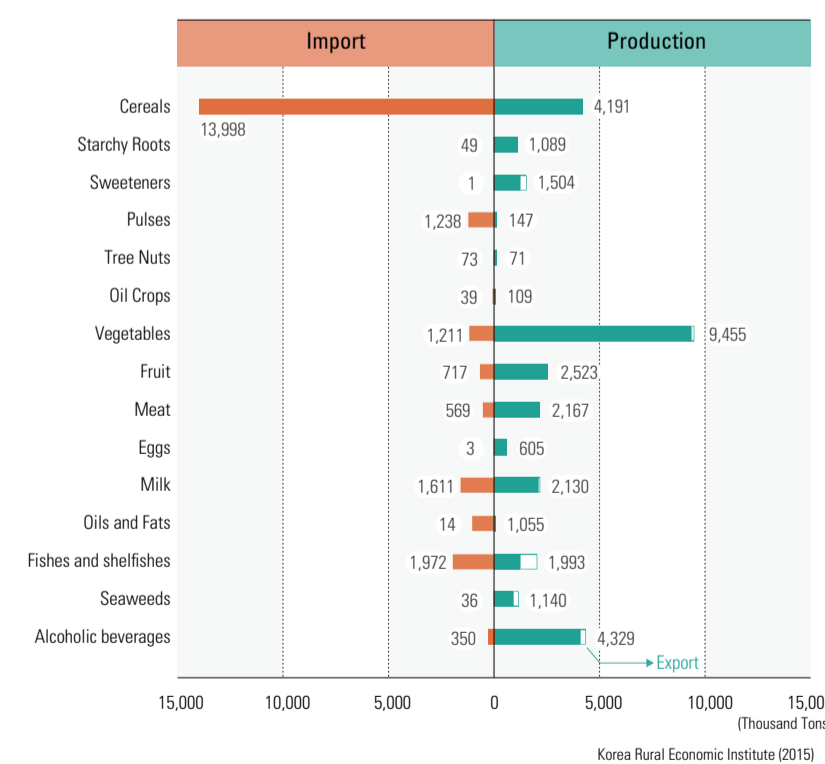
Food Supply & Demand (2014)



Agricultural & Livestock Products, Production & Consumption Trend

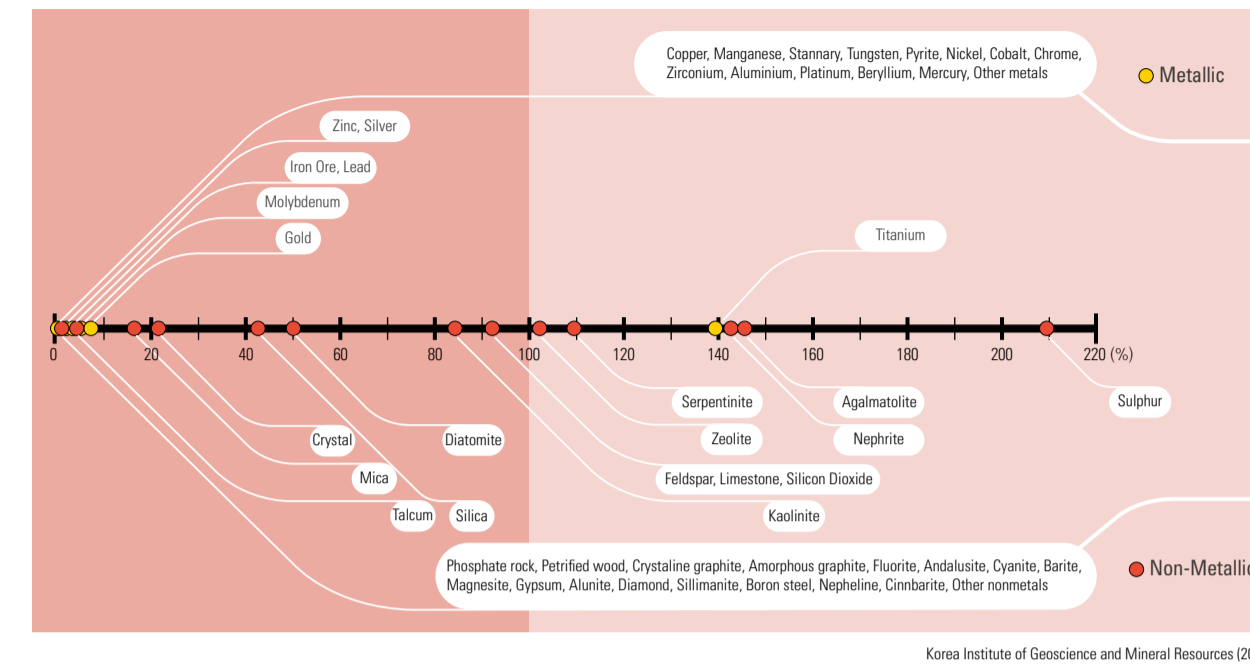


Food Import and Production by Type (2013)

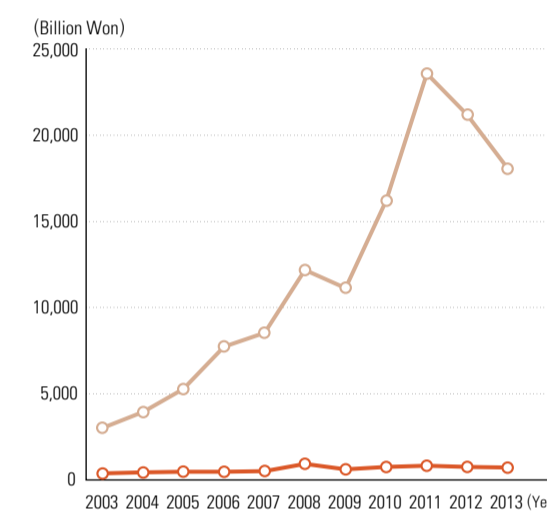


Mineral Resources

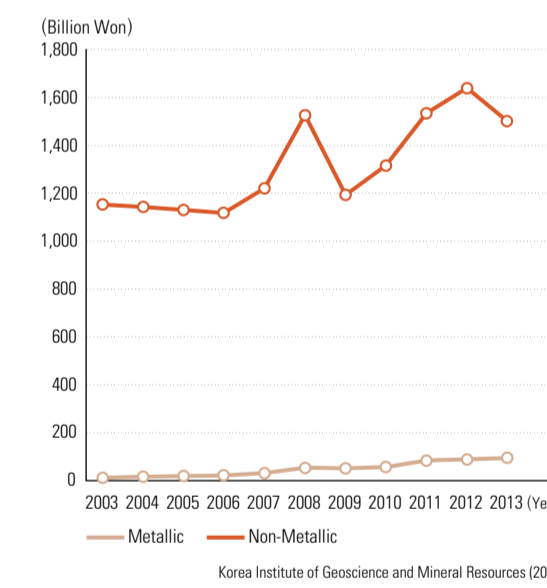
Mineral Self-Sufficiency Rate (2014)



Mineral Import Value



Mineral Production Value



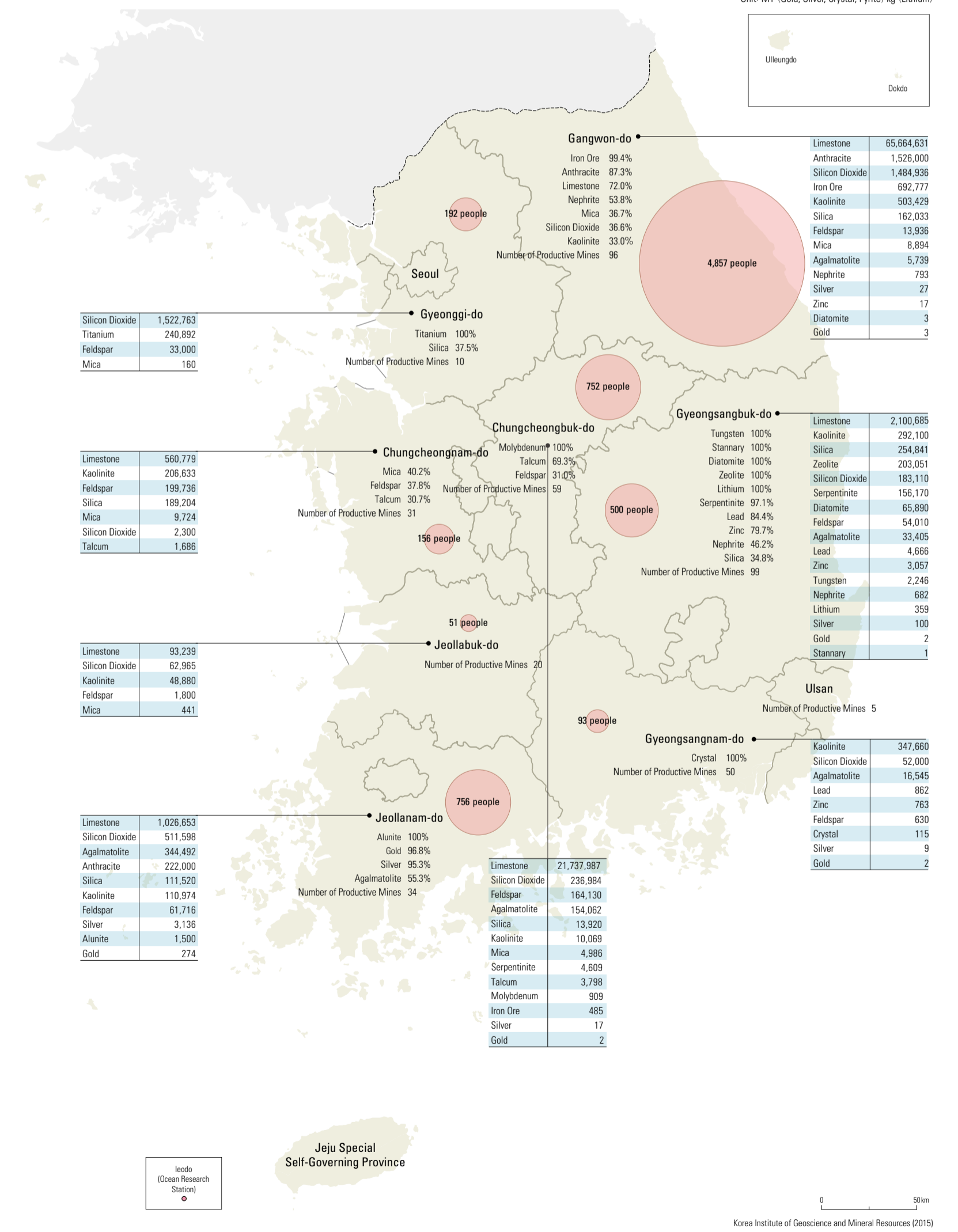
The GDP (Gross Domestic Product) of the mining industry in Korea is 2.5 trillion won. It accounts for 0.19% of the national GDP. Most mineral resources are imported to meet domestic demands. The mining industry is classified into non-fuel minerals, coal, and natural gas/crude oil. The domestic production rate of non-fuel minerals is only 8.0%. The domestic production rate of non-metallic minerals in the non-fuel mineral category is 72.8%. Metallic minerals are mostly imported and their domestic production rate is 0.7%. About 1.6% of coal is produced domestically.

There are 6,581 registered mines, according to the Korea Mineral Resources Geographic Information System. The most common are coal mines (1,255), followed by limestone (767), quartzite (642), and gold (566). Geographically, Gangwon-do has the most mines (1,270), followed by Gyeongsangbuk-do (1,138), Chungcheongnam-do (984), and Chungcheongbuk-do (943).

Top 10 Minerals—Production, Import, Export, and Domestic Demand

No	Domestic Production		Import		Export		Domestic Demand	
	Mineral Name	Ratio (%)	Mineral Name	Ratio (%)	Mineral Name	Ratio (%)	Mineral Name	Ratio (%)
1	Limestone	66.1	Bituminous Coa	36.6	Molybdenum	29.1	Bituminous Coal	35.6
2	Anthracite	13.5	Iron Ore	28.9	Copper	13.4	Iron Ore	27.6
3	Silicon Dioxide	5.2	Copper	12.4	Titanium	9.0	Copper	11.7
4	Iron Ore	2.9	Lead	5.2	Talcum	5.6	Lead	4.8
5	Kaolinite	1.9	Zinc	4.9	Zinc	5.2	Zinc	4.5
6	Agalmatolite	1.8	Anthracite	3.1	Iron Ore	4.2	Anthracite	3.7
7	Tungsten	1.5	Silver	1.8	Mica	4.1	Limestone	3.3
8	Silica	1.5	Molybdenum	1.2	Agalmatolite	3.3	Silver	1.8
9	Feldspar	1.4	Manganese	1.0	Gypsum	3.1	Molybdenum	1.1
10	Titanium	1.3	Nickel	0.5	Limestone	2.9	Manganese	1.0
1 to 5 Total		89.6		88.0		62.3		87.9

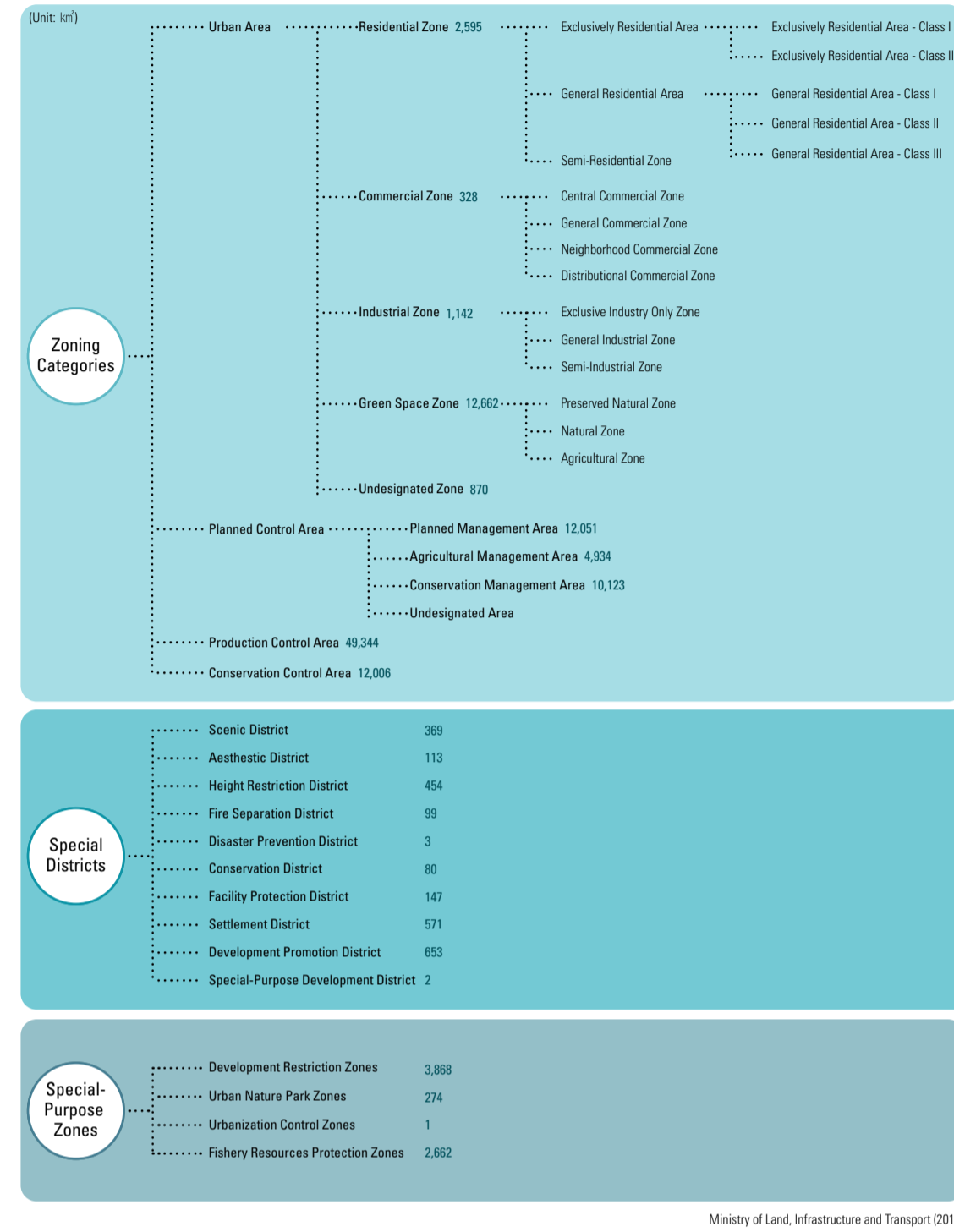
Mines and Production (2014)





Land Use Planning

Legal Land Classification of Korean Territory



Designation of Special Zones by -Si/-Do (2014)

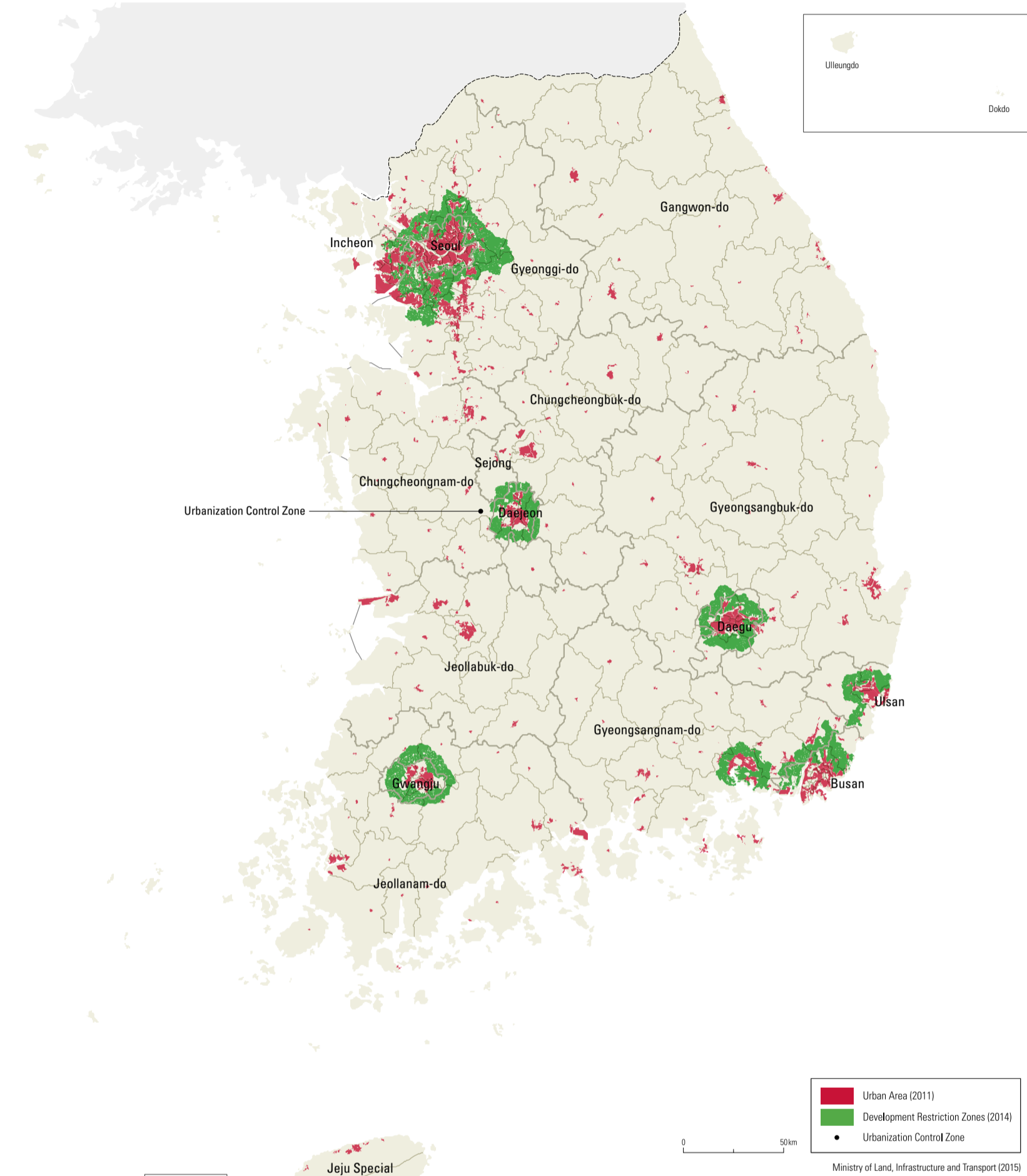
-Si/-Do	Development Restriction Zones		Urbanization Control Zones		Fishery Resources Protection Zones		Urban Nature Park Zones	
	Number of Places	Area	Number of Places	Area	Number of Places	Area	Number of Places	Area
Seoul	18	149	0	-	0	-	0	-
Busan	6	253	0	-	0	-	0	-
Daegu	6	401	0	-	0	-	7	43
Incheon	6	88	0	984,005	0	-	20	22
Gwangju	5	247	0	-	0	-	0	-
Daejeon	5	305	1	-	0	-	9	17
Ulsan	5	269	0	-	0	-	3	7
Sejong	1	41	0	-	0	-	0	-
Gyeonggi-do	21	1,175	0	-	3	24	34	41
Gangwon-do	0	-	0	-	14	110	7	6
Chungcheongbuk-do	2	54	0	-	3	18	19	27
Chungcheongnam-do	3	25	0	-	7	173	33	20
Jeollabuk-do	0	-	0	-	2	21	5	1
Jeollanam-do	4	271	0	-	15	1,169	24	42
Gyeongsangbuk-do	3	115	0	-	3	61	4	2
Gyeongsangnam-do	5	464	0	-	32	1,098	10	46
Jeju Special Self-Governing Province	0	-	0	-	0	-	14	6
<b>Total</b>	<b>90</b>	<b>3,860</b>	<b>1</b>	<b>984,005</b>	<b>79</b>	<b>2,673</b>	<b>189</b>	<b>279</b>

Korea Land & Housing Corporation (2014)

The land use plan at the national level forms the basis of the territorial plan, along with the transportation plan, local land use plans, facility plans, and park/greenspace plans. The land use plan is implemented through legal and administrative means, including special-purpose areas, districts, and zones. These entities contribute to a more economic and efficient land use while promoting public welfare. Special-purpose areas, according to the National Land Planning and Utilization Act, are composed of urban areas, controlled areas, agricultural and forest areas, and natural

environment conservation areas. Urban areas contain residential, commercial, industrial, and green areas. Controlled areas contain planned control areas, production control areas, and conservation control areas. The total size of special-purpose areas in Korea was 106,102 million m<sup>2</sup> (including land and sea) as of 2014. Urban areas account for 16.6% (17,597 million m<sup>2</sup>) and controlled areas account for 25.6% (27,154 million m<sup>2</sup>). Agricultural and forest areas account for 46.5% (49,344 million m<sup>2</sup>) and natural environmental conservation areas account for 11.3% (12,006 million m<sup>2</sup>).

Urban Area and Development Restriction Zones (2014)

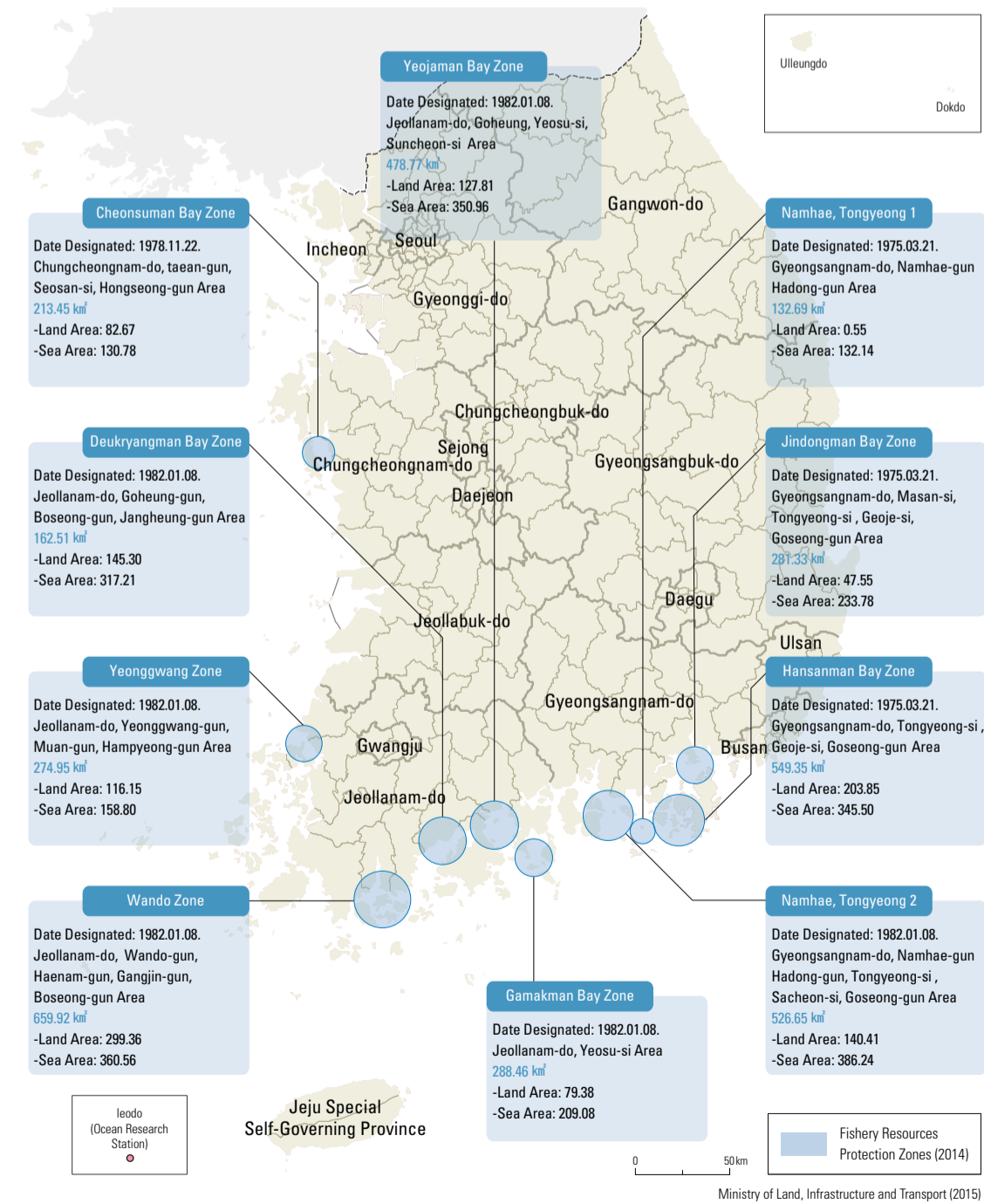


Special-purpose districts help implement special-purpose zones by pursuing the improvement of land use, aesthetics, scenery, and safety. They include scenery districts, aesthetic districts, high-density development districts, fire prevention districts, disaster prevention districts, conservation districts, facility protection districts, settlement districts, development promotion districts, and special usage districts. In 2014, there were 22,610 special-purpose districts (2,488 million m<sup>2</sup>), accounting for 2.5% of the Korean territory. Settlement districts are the most common type, with 15,224 locations. Development promotion districts cover the largest area (654 million m<sup>2</sup>) among all special-purpose districts. Special-purpose zones strengthen or ease the restrictions that are defined by special-purpose areas or special-purpose districts. They prevent uncontrolled urban sprawl, promote more organized land use, and help comprehensive management and control. There are four special-purpose zones: development-restriction zones, urban natural park zones, deferred-development zones, and fishery protection zones.

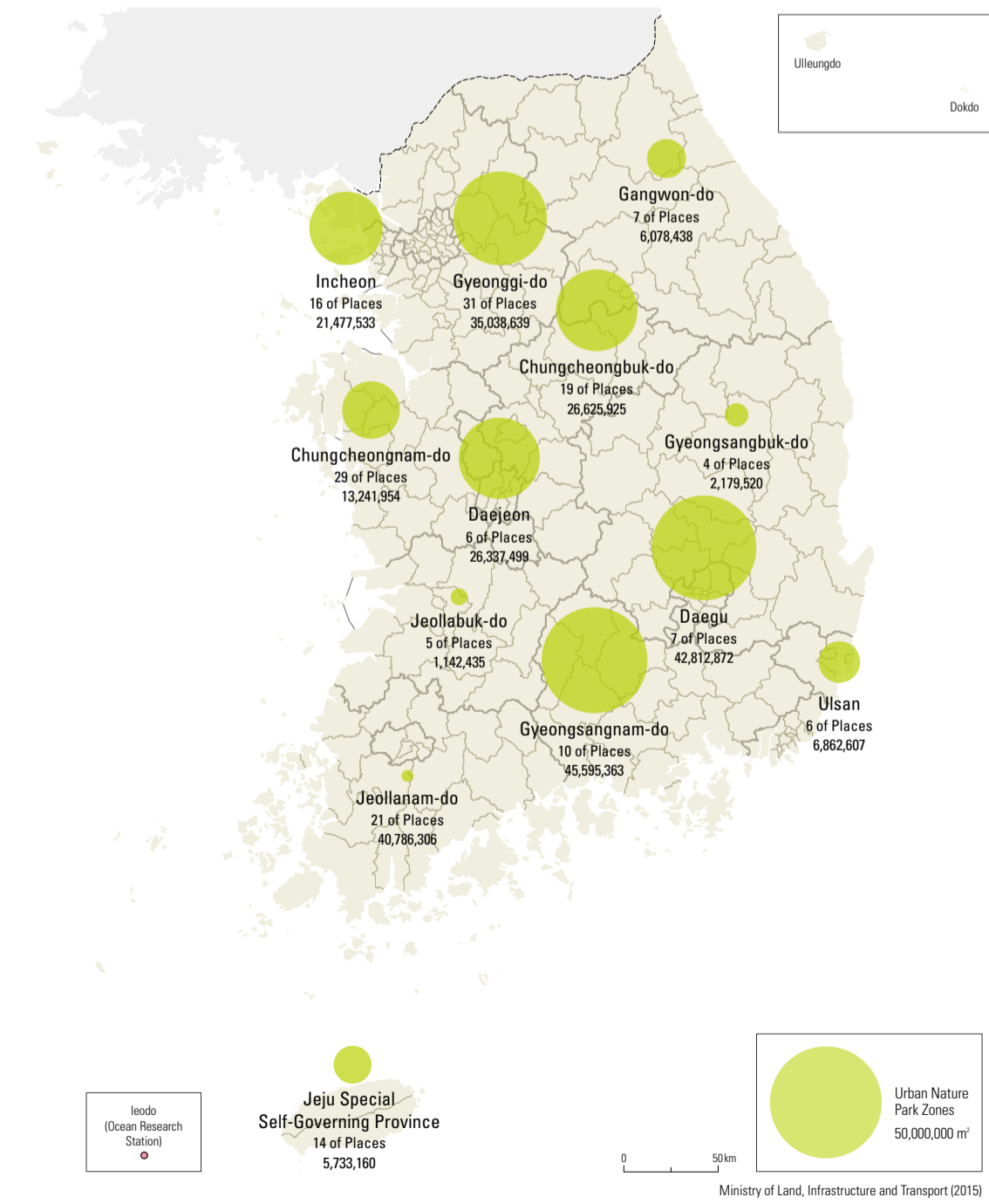
There were 343 special-purpose zones (6,805 million m<sup>2</sup>) in Korea as of 2014, and they cover 6.8% of the Korean territory. About 3,868 million m<sup>2</sup> of development restriction zones prevent uncontrolled urban sprawl. There are 80 urban natural park zones (2,662 million m<sup>2</sup>) that mainly prevent developing mountainous areas. Fishery protection zones protect public water bodies and surrounding lands for fisheries. There are 172 fishery protection zones (273 million m<sup>2</sup>) along the southern and western coasts.

Special-purpose districts help implement special-purpose zones by pursuing the improvement of land use, aesthetics, scenery, and safety. They include scenery districts, aesthetic districts, high-density development districts, fire prevention districts, disaster prevention districts, conservation districts, facility protection districts, settlement districts, development promotion districts, and special usage districts. In 2014, there were 22,610 special-purpose districts (2,488 million m<sup>2</sup>), accounting for 2.5% of the Korean territory.

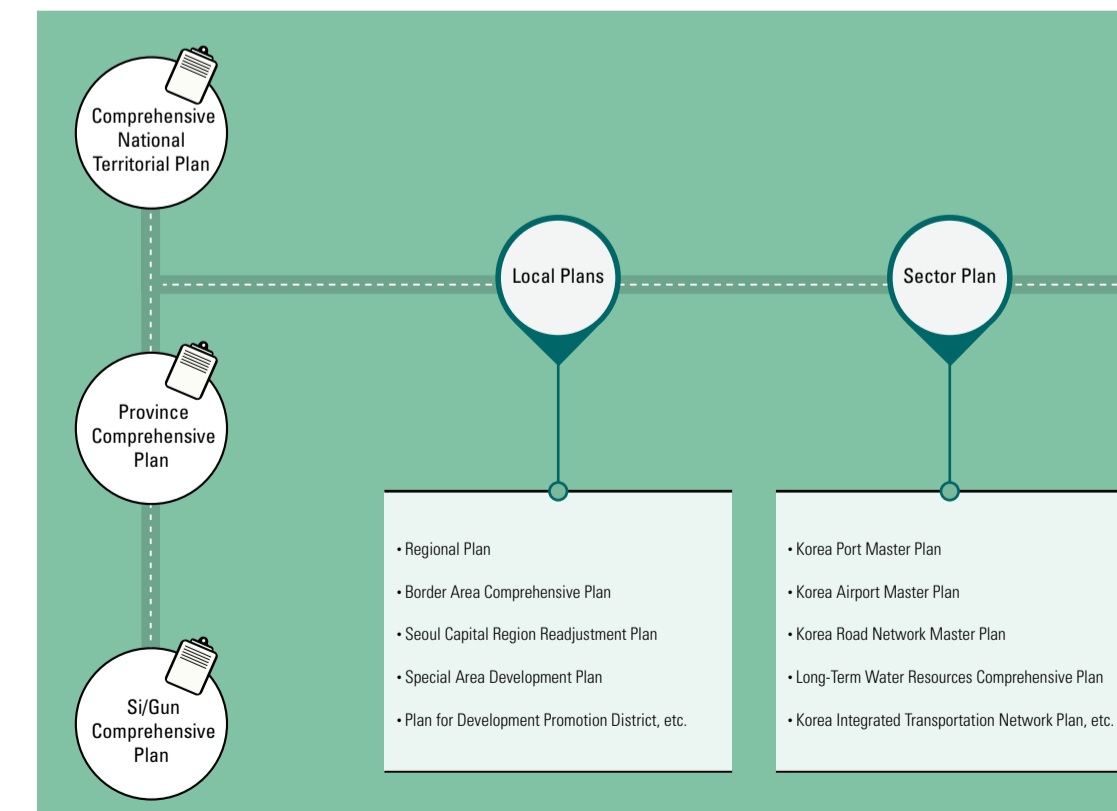
Fishery Resources Protection Zones (2014)



Urban Nature Park Zones (2014)



Legal Framework for Territorial Planning (2014)

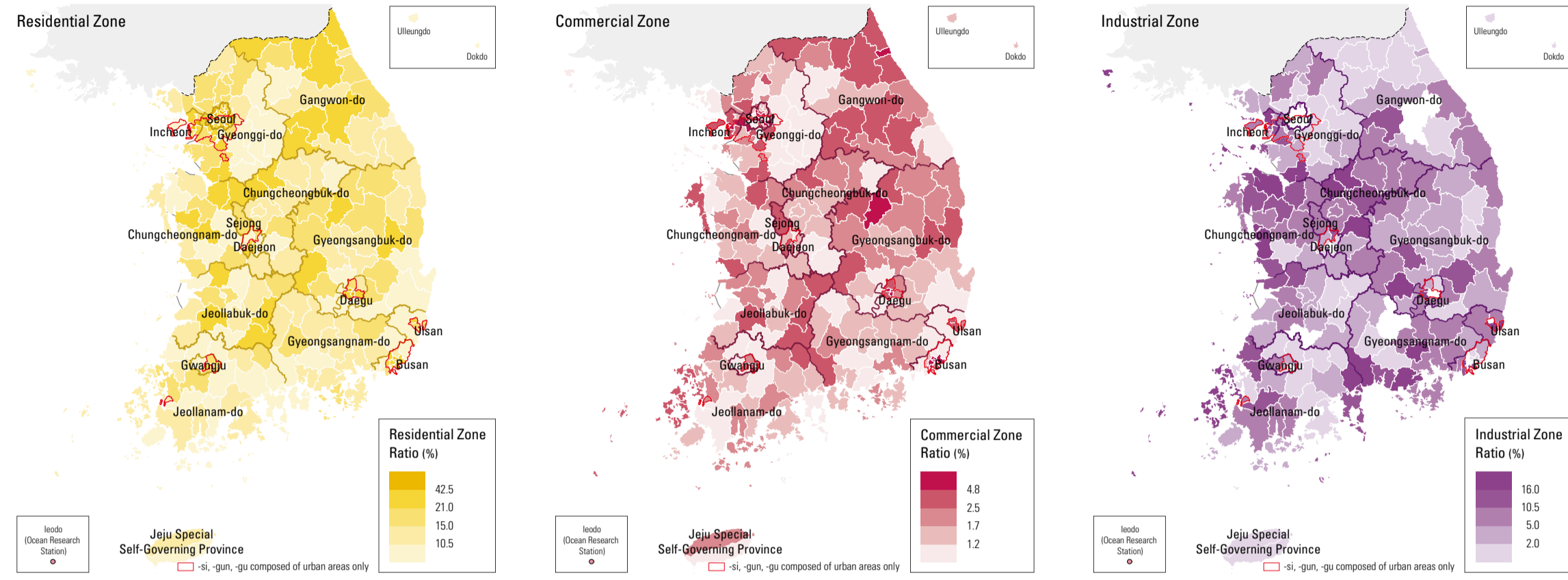


Legal Framework for Coastal Planning

Ministry	Plan	Period	Acts
Ministry of Land, Infrastructure and Transport	National Land Plan	20 years	Framework Act on the National Land
Ministry of Oceans and Fisheries	Plan for Integrated Coastal Management	10 years	Coast Management Act
Ministry of Land, Infrastructure and Transport	-	-	National Land Planning and Utilization Act
Ministry of Land, Infrastructure and Transport	Comprehensive Plan for Development of East, West, and South Coast Areas	-	Special Act on the Development of East, West, and South Coast Areas (2015.12.5)
Ministry of Oceans and Fisheries	Master Plan for Development of Maritime Affairs and Fisheries	10 years	Framework Act on Marine Fishery Development
Ministry of Oceans and Fisheries	Harbor Master Plans	10 years	Harbor Act
Ministry of Oceans and Fisheries	Master Plan for Marinas	10 years	Act on the Development, Management, Etc. of Marinas
Ministry of Oceans and Fisheries	Basic Plans on Development of Fishing Villages and Fishery Harbors	5 years	Fishing Villages and Fishery Harbors Act
Ministry of Culture, Sports and Tourism	Master Plan for Development of Tourism	10 years	Tourism Promotion Act
Ministry of Environment	Comprehensive National Environmental Plan	10 years	Framework Act on Environmental Policy
Ministry of Environment	Basic Plan for Conservation of Natural Environment	10 years	Natural Environment Conservation Act
Ministry of Oceans and Fisheries	Basic Plans on Conservation and Management of Marine Ecosystems	10 years	Conservation and Management of Marine Ecosystems Act
Ministry of Oceans and Fisheries	Comprehensive Plan for Marine Environment	5 years	Marine Environment Management Act

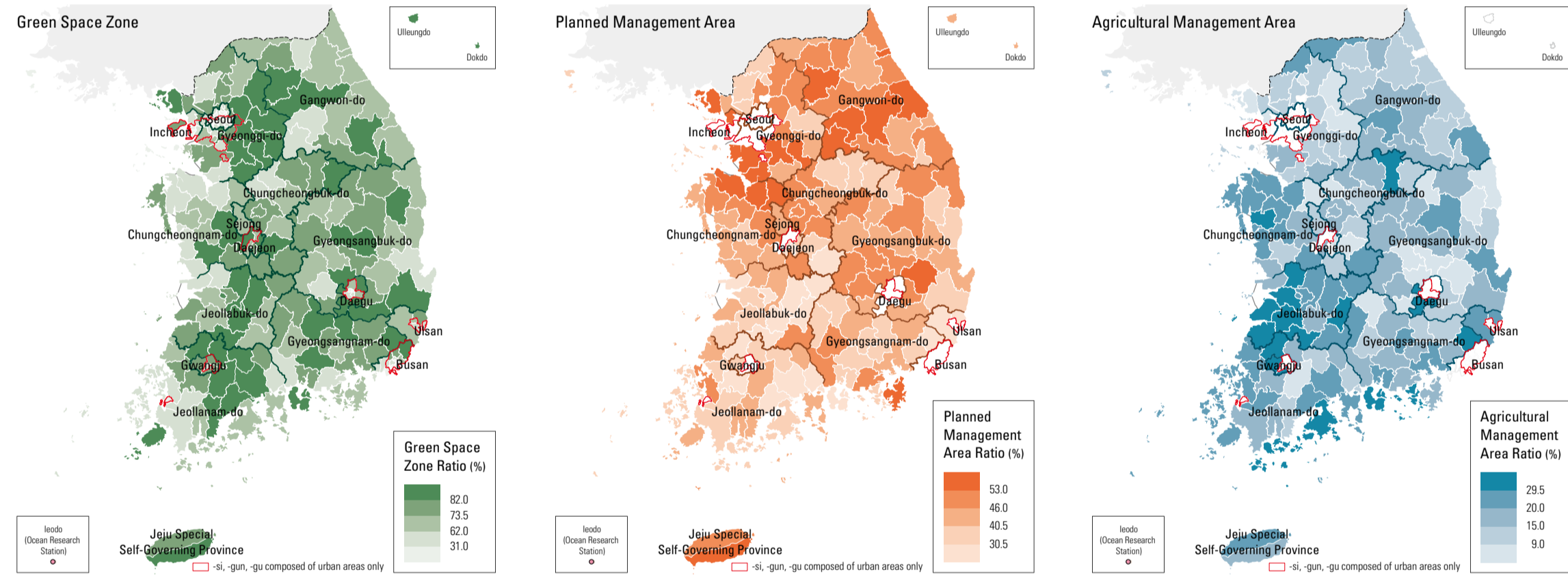


Zoning Designation (2014)

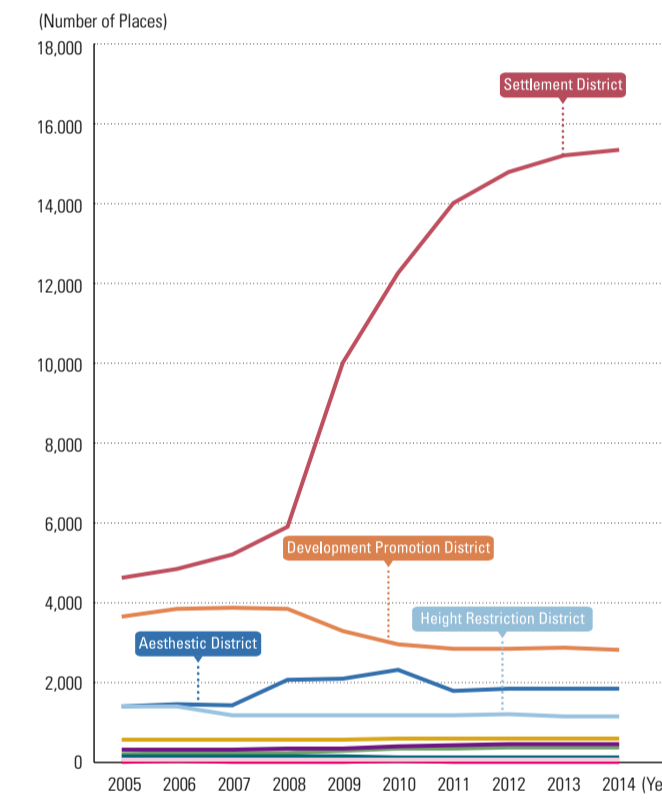


Designation of Special Districts (2014)

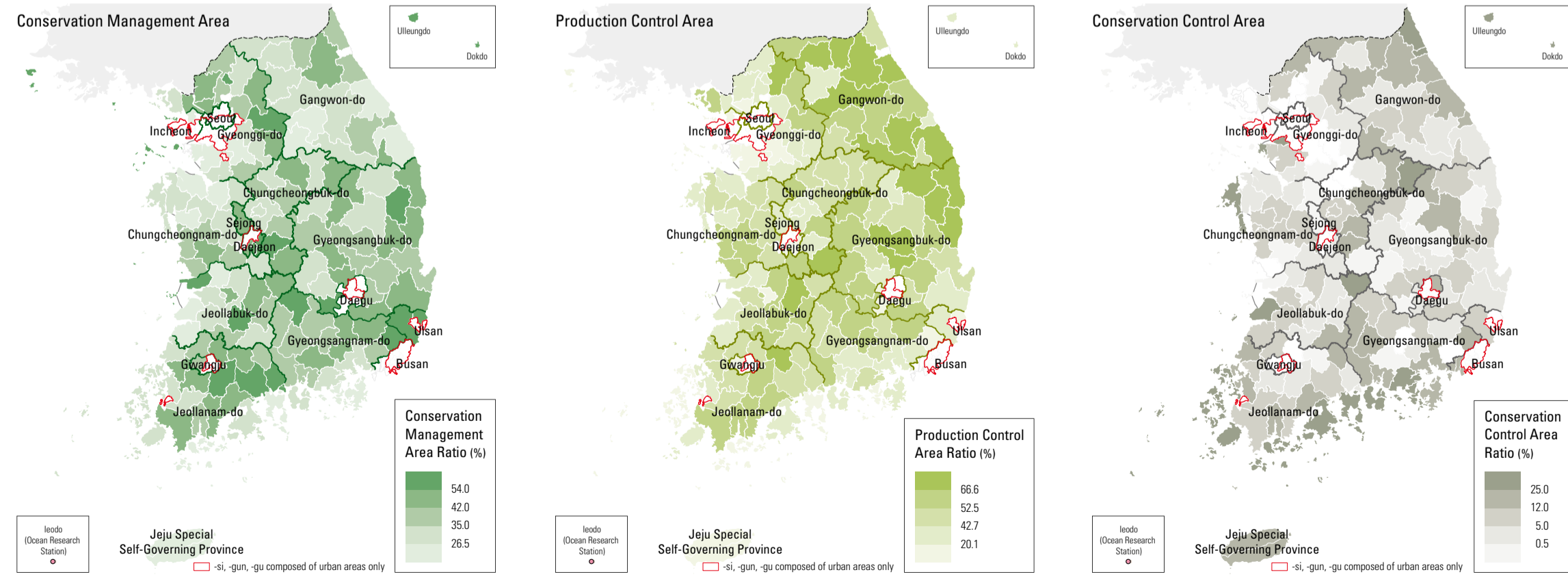
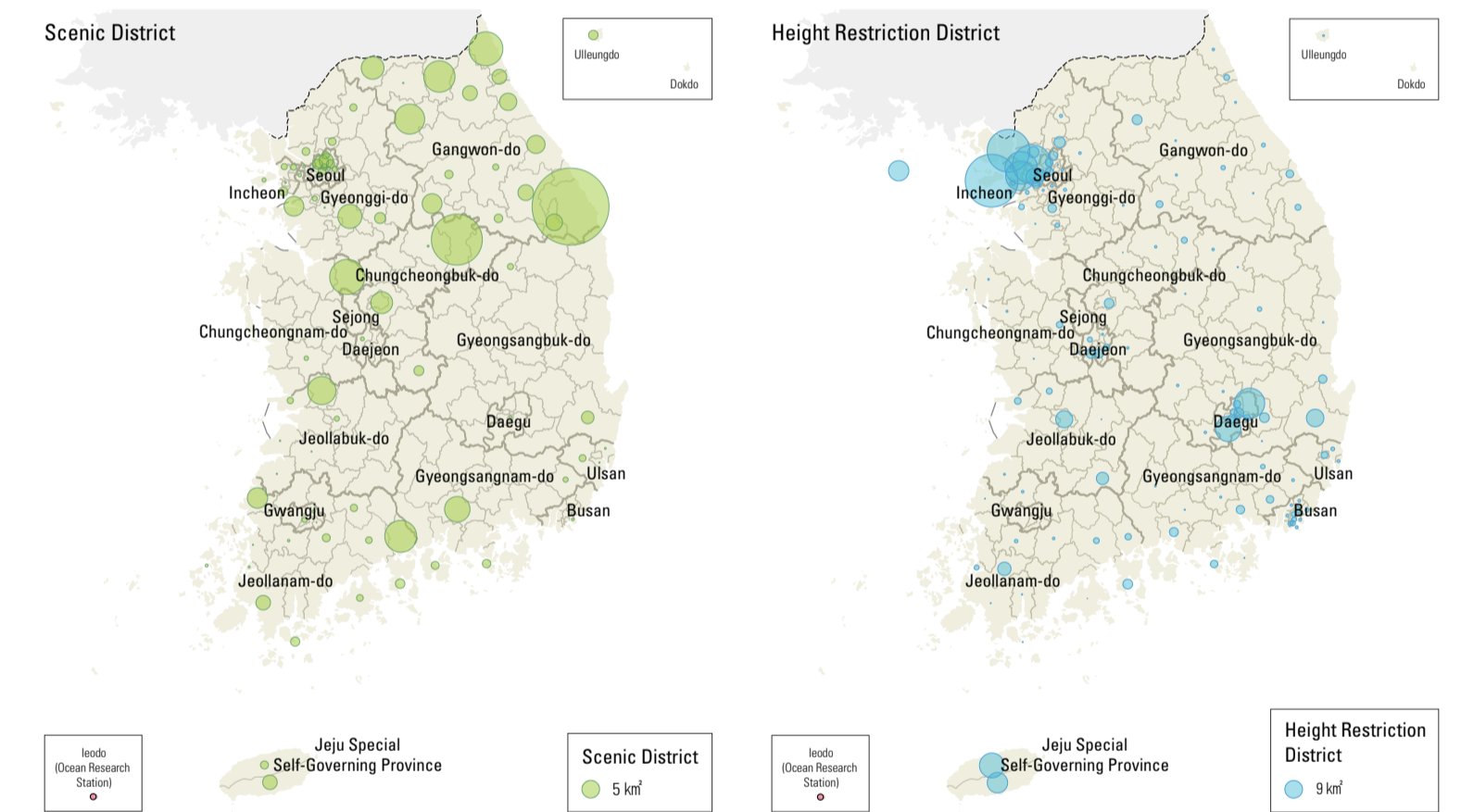
District Name	Number of Places	Area (km <sup>2</sup> )	District Name	Number of Places	Area (km <sup>2</sup> )
Scenic District	358	388.9	Ecological Conservation District	149	34.5
Nature Scenic District	203	232.1	Facility Protection District	118	147.3
Waterfront Scenic District	123	127.0	School Facility Protection District	25	10.5
Urban Scenic District	32	9.7	Common Facility Protection District	20	4.4
Aesthetic District	1,846	113.1	Port Facility Protection District	66	33.1
Central Aesthetic District	540	28.7	Airport Facility Protection District	7	99.3
History and Culture Aesthetic District	138	26.6	Settlement District	15,351	571.3
General Aesthetic District	1,168	57.9	Natural Settlement District	14,866	561.4
Height Restriction District	1,129	454.2	Group Settlement District	485	10.0
Maximum Height Restriction District	205	22.4	Development Promotion District	2,823	652.8
Minimum Height Restriction District	924	431.8	Residential Development Promotion District	1,139	172.0
Fire Separation District	581	99.4	Industry/Distribution Development Promotion District	983	110.5
Disaster Prevention District	13	3.0	Tourism/Recreational Development Promotion District	539	313.9
Urban Area Disaster Prevention District	13	3.0	Distributional Development Promotion District	11	1.2
Conservation District	442	80.2	Complex Development Promotion District	24	20.2
History/Culture/Environment Conservation District	11	18.6	Special Purpose Development Promotion District	127	35.1
Important Facility Conservation District	12	27.0	Special-Purpose Development District	56	2.4



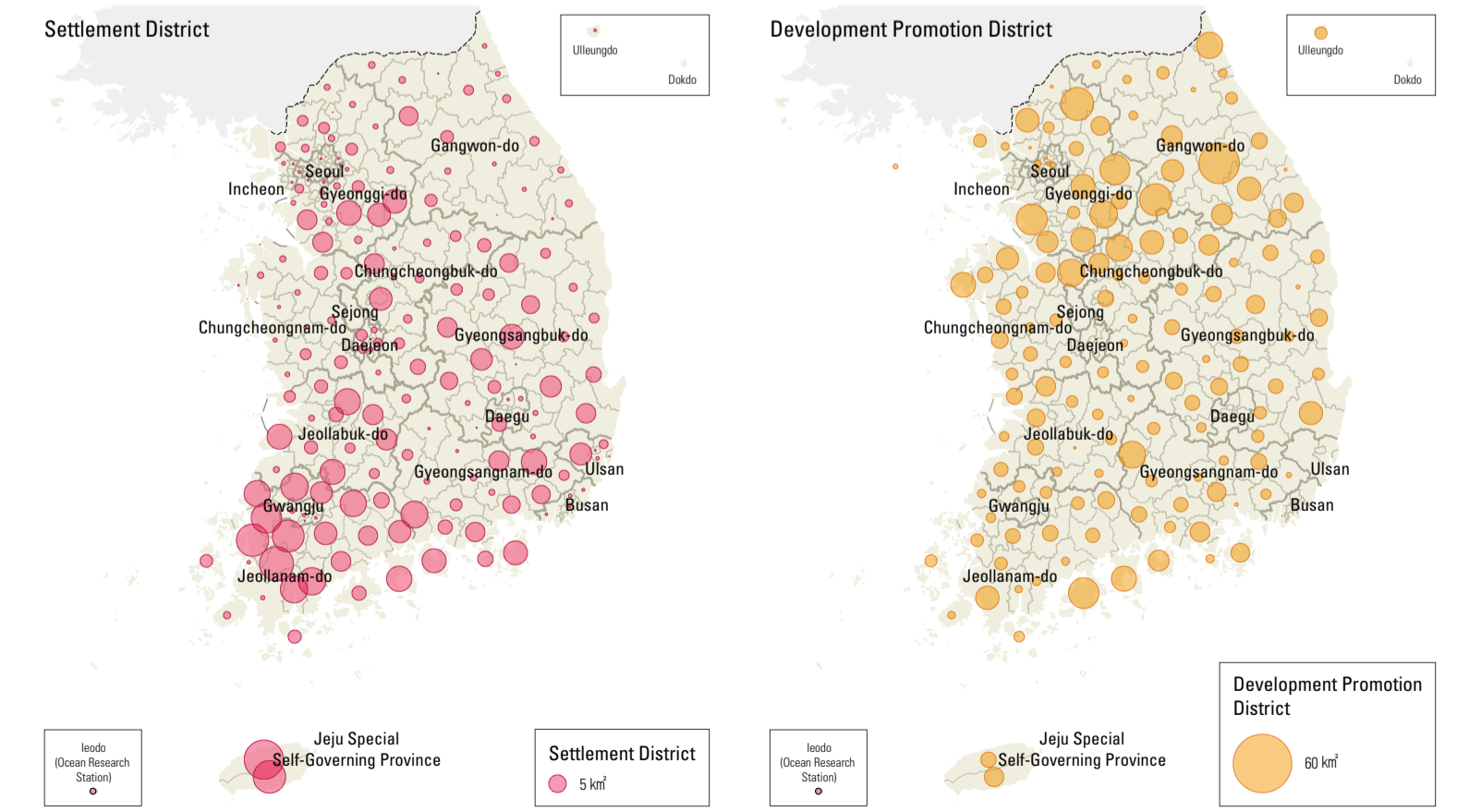
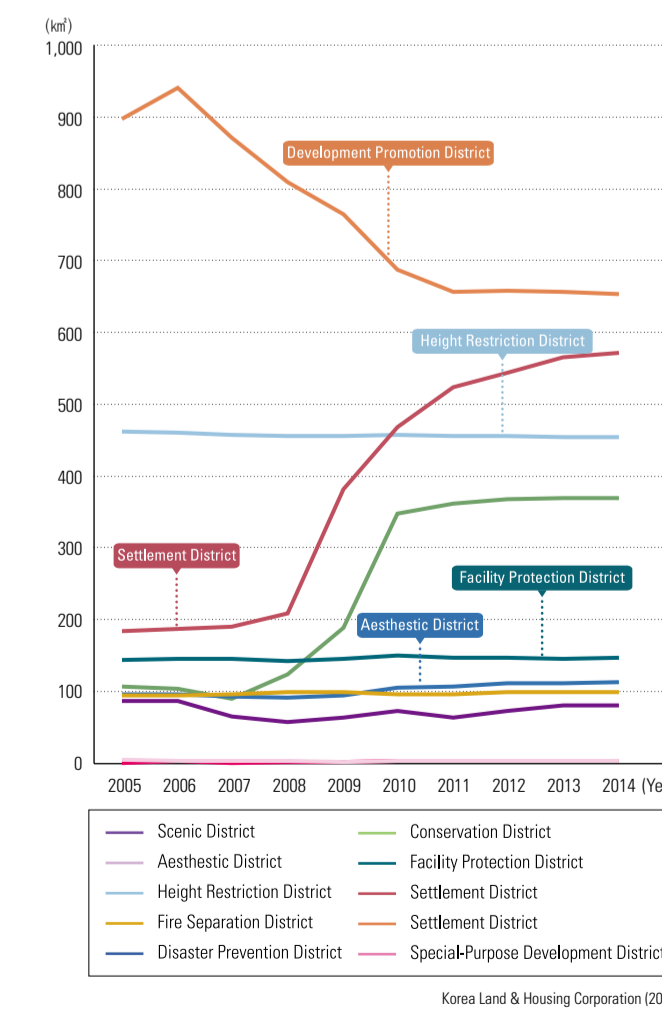
Change in Number of Designated Districts



Area of Special Districts by -Si, -Gun, and -Gu (2014)



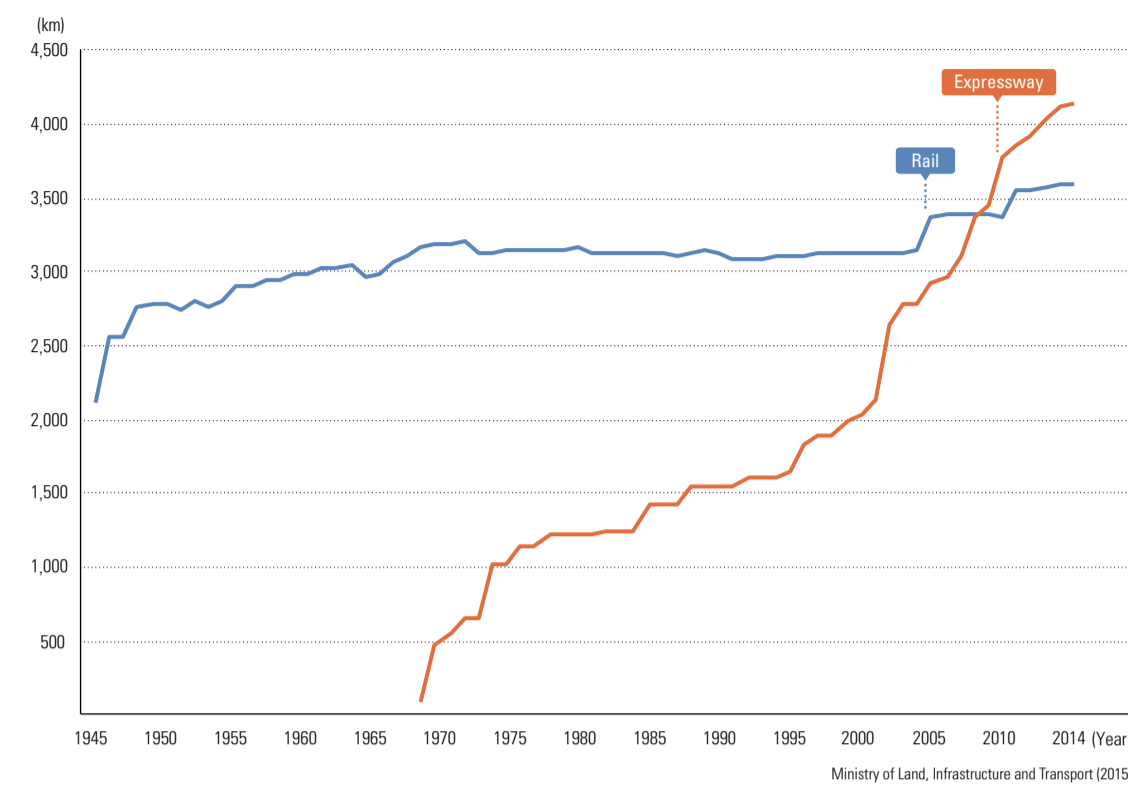
Change in Area of Designated Districts



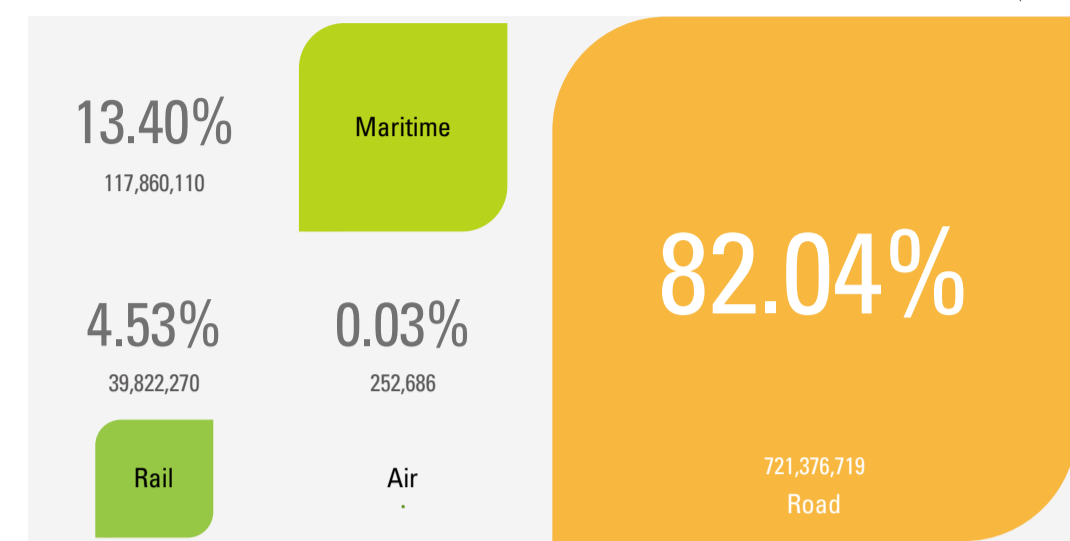


Development of the National Transportation Network

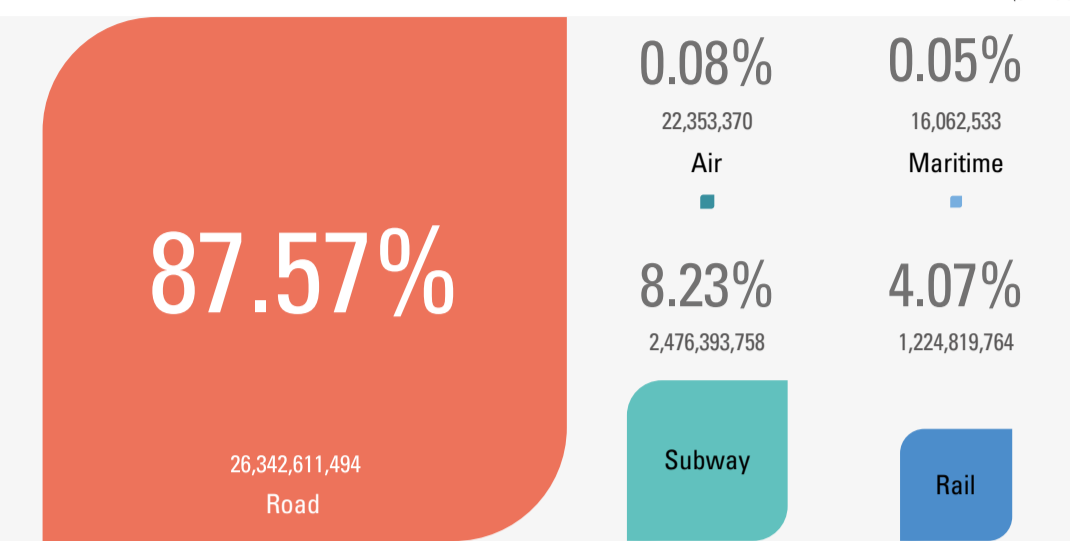
Change in Operating Lengths, Railway and Expressway



Freight Transport by Mode (2013)



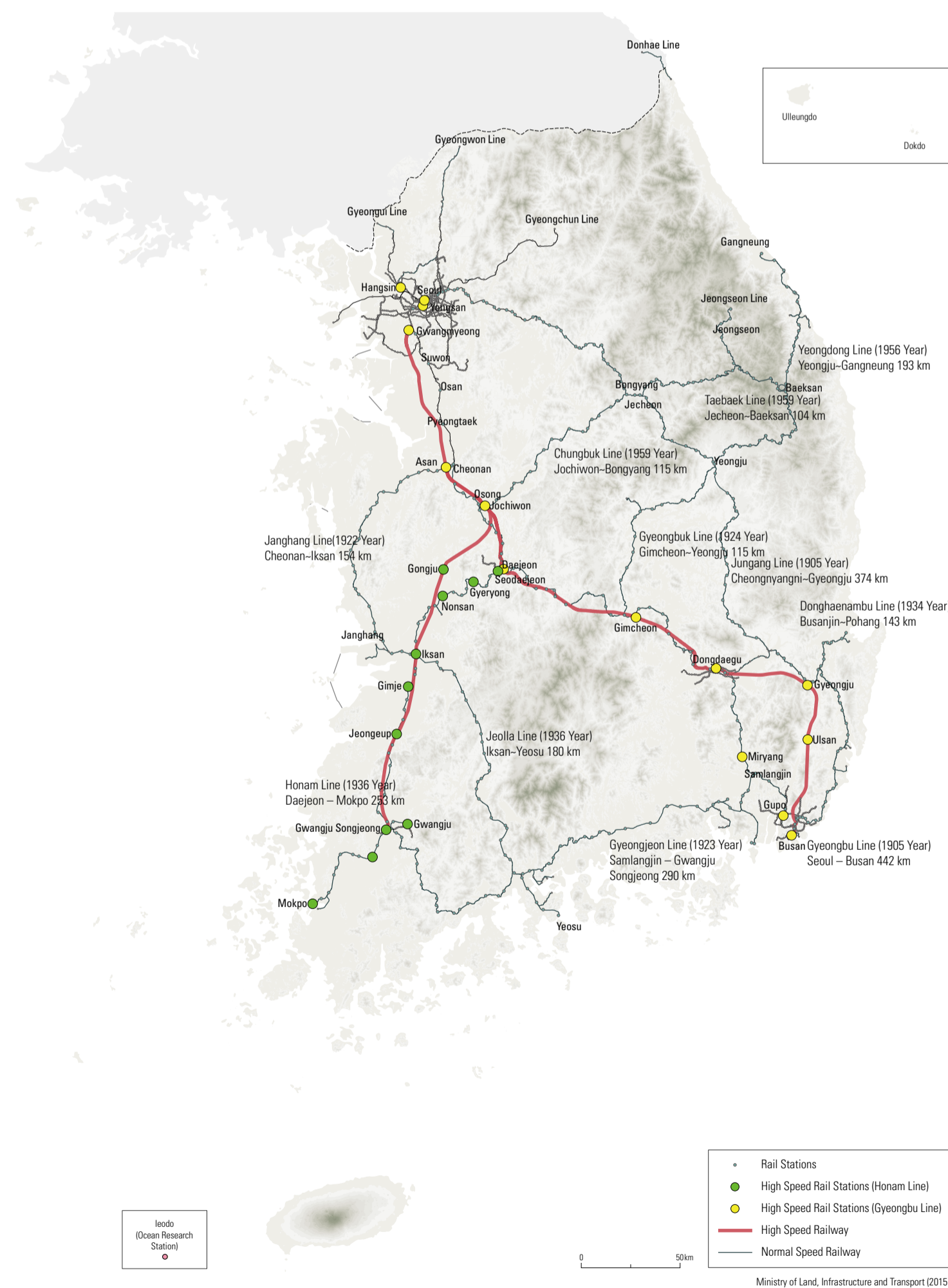
Passenger Transport by Mode (2013)



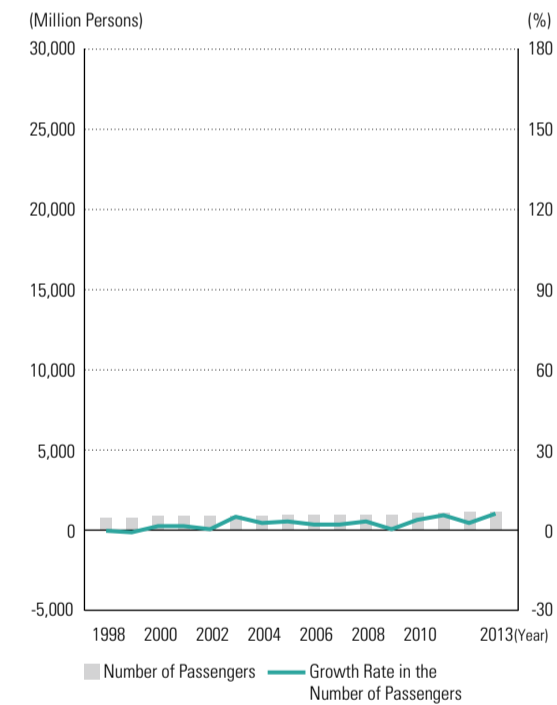
Expressway Network (2014)

Expressway Number	Expressway Name	Length (km)	Expressway Number	Expressway Name	Length (km)
33 Lines		4,138.76	60	Seoul-Yangyang	78.50
1	Gyeongbu	416.05	65	Donghae	132.28
10	Namhae	273.20	100	Seoul Ring	128.02
12	88 Olympic	223.22	102	Namhae First Branch	17.88
15	Seohaean	336.65	104	Namhae Second Branch	20.60
16	Ulsan	14.30	110	Second Gyeongin	48.06
17	Pyeongtaek-Hwasong	26.69	120	Gyeongin	23.89
20	Iksan-Pohang	130.35	130	Incheon International Airport	36.55
25	Honam	276.26	151	Seochon-Gongju	61.36
27	Suncheon-Wanju	117.78	153	Pyeongtaek-Siheung	40.30
30	Dangjin-Sangju	171.00	171	Yongin-Seoul	25.45
35	Jungbu	332.48	251	Honam Branch	53.97
37	Second Jungbu	31.08	253	Gochang-Damyang	42.50
40	Pyeongtaek-Jechon	103.19	300	Daejeon Southern Ring	13.28
45	Jungbu Naeryuk	302.03	400	Capital Region Second Ring	9.26
50	Yeongdong	234.40	451	Jungbu Naeryuk Branch	30.00
55	Jungang	370.76	551	Jungbu Branch	17.42

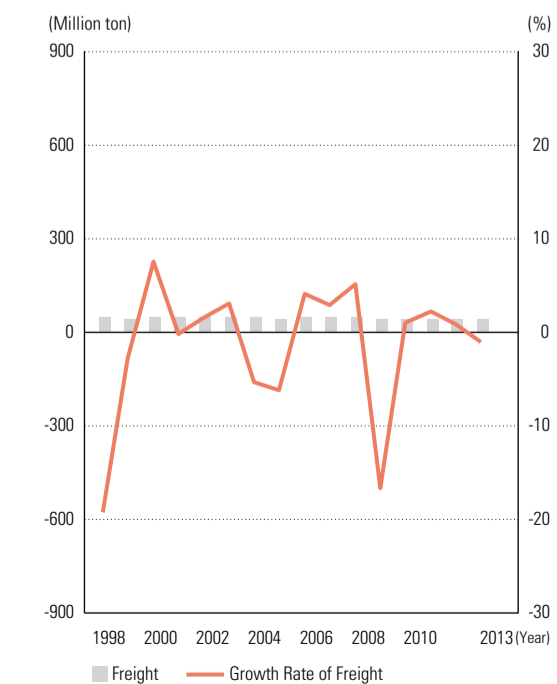
Rail Network (2015)



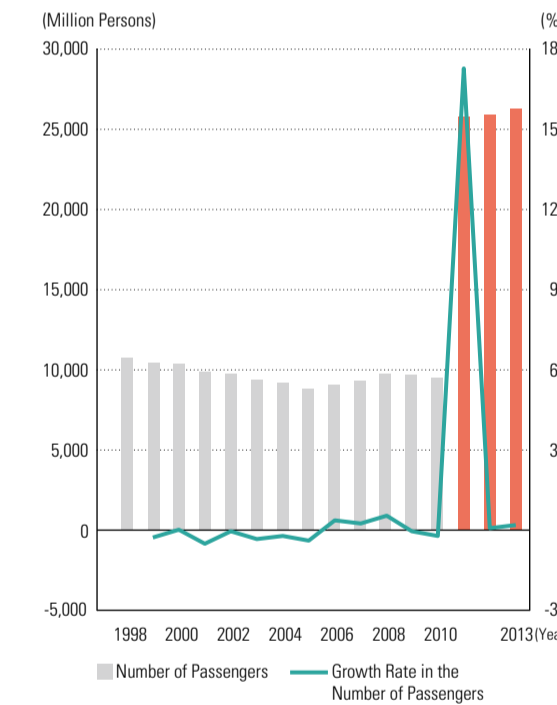
Rail-Passengers (1988 - 2013)



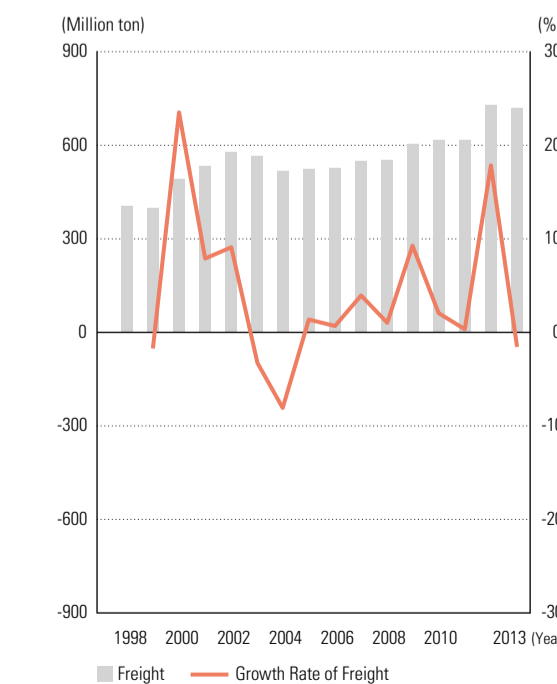
Rail-Freight (1988 - 2013)



Road-Passengers (1988 - 2013)



Road-Freight (1988 - 2013)



Road Network (2015)

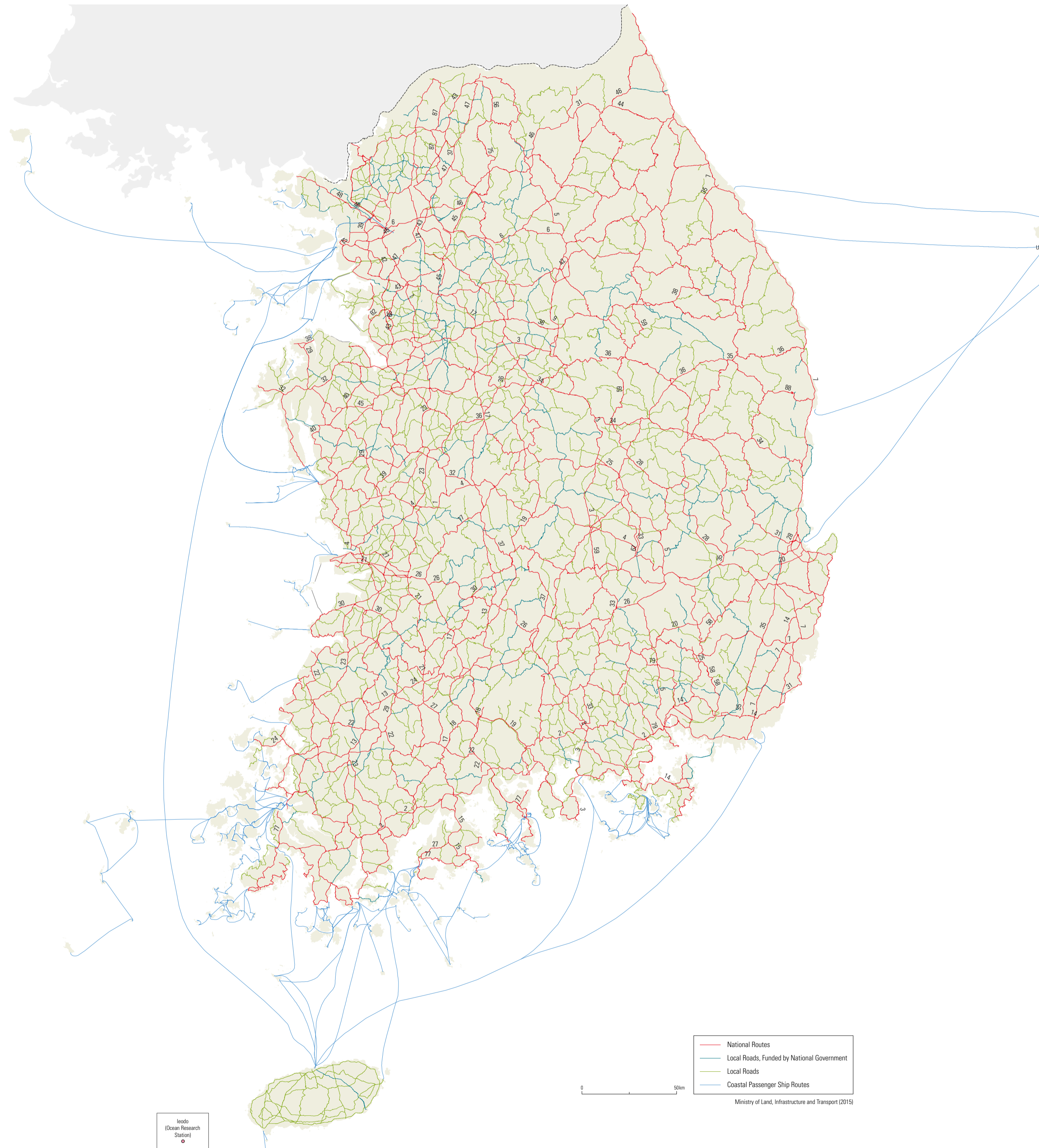


National transportation networks—including roads, railways, ports, and airports—developed rapidly after the beginning of industrialization in the 1960s. Only 10% of the roads were paved in 1970. By 2014, the road pavement coverage increased to 92%. The total length of paved roads increased from 3,864 km to 97,920 km during this period (an increase of more than 25 times). Particularly, the total highway length was extended from 550 km in 1970 to 4,139 km in 2014. Although Railways, however, showed a slow increase of approximately 1.7 times, from 2,114.2 km in 1945 to 3,590.3 km in 2014. The slow increase is attributed to the fact that the major railways were built during the Japanese colonial

period, and higher priorities were given to roads and port facilities rather than railways during the 1970s. Train speed has increased steadily with improvements in tracks and trains. The opening of the KTX (Korea Train eXpress) train service in 2004 reduced the travel time between Seoul and Busan to 2 hours and 18 minutes. In 2015, the Honam High Speed Railway was constructed. In 2013, roads transported the majority (over 80%) of passengers and cargo. The number of railway passengers has not changed much over the last 15 years. Cargo transported on the roads has increased significantly, while rail freight shipping has remained steady since 1998.



Inland and Coastal Transportation Network (2014)



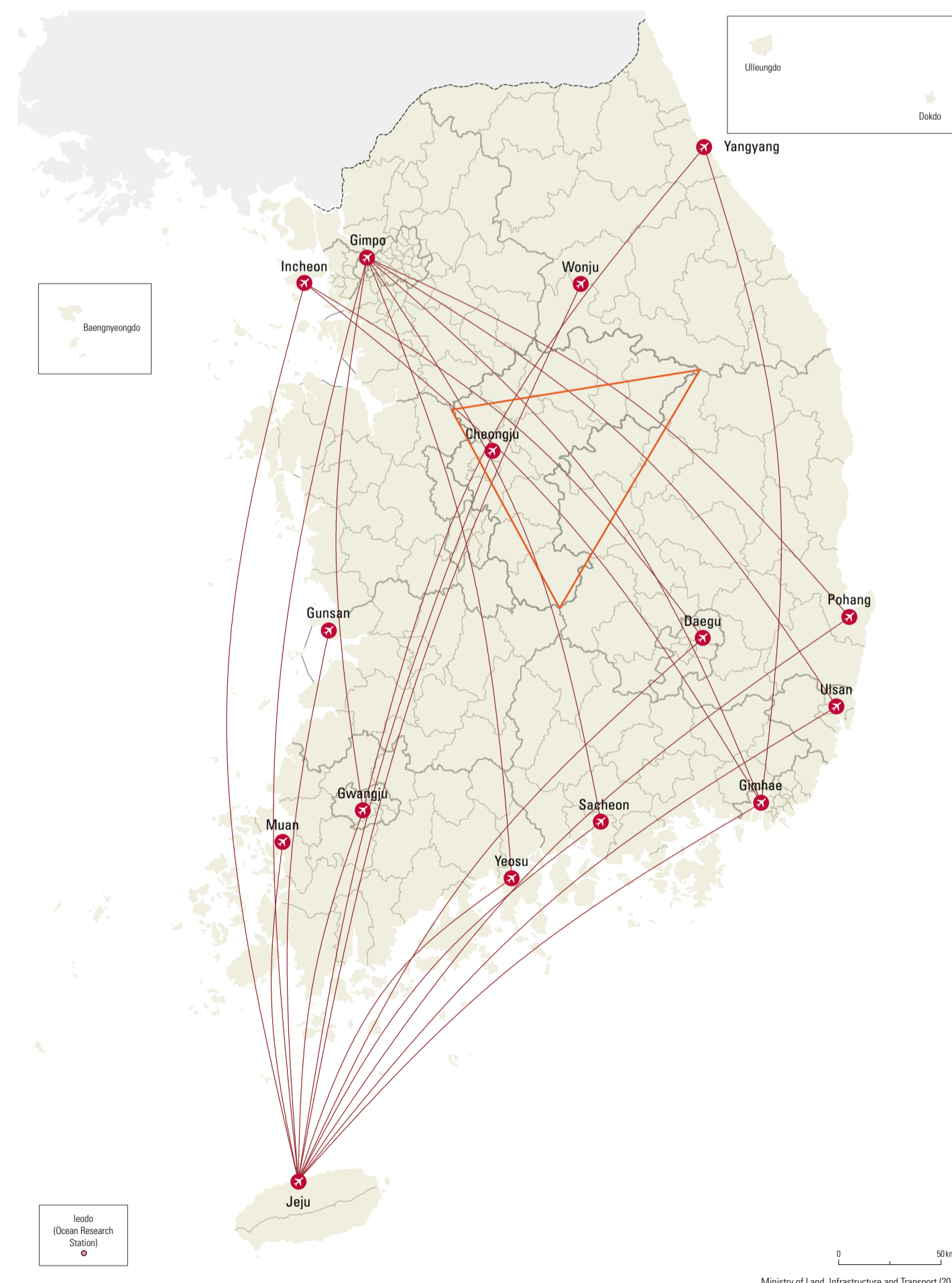
The cargo capacity at Korea's ports has been increasing steadily. Total capacity increased from 82 million tons in 1980 to more than one billion tons in 2013. Busan and Gwangyang-si are the ports that process the largest amount of cargo in Korea, processing 27% and 20%, respectively. The number of vessel passengers also has increased steadily. It was 8.2 million in 1990, and doubled to 16.1 million in 2013. Categorizing vessel passengers

into visitors and island residents, the number of trips by island residents decreased, while trips by visitors have greatly increased. The Mokpo port accounts for the largest portion of passenger travel (39.2%), followed by the Masan port (14.0%) and the Yeosu port (13.3%). As of 2013, there were 55 ports—14 national ports, 17 local ports, and 24 domestic ports.

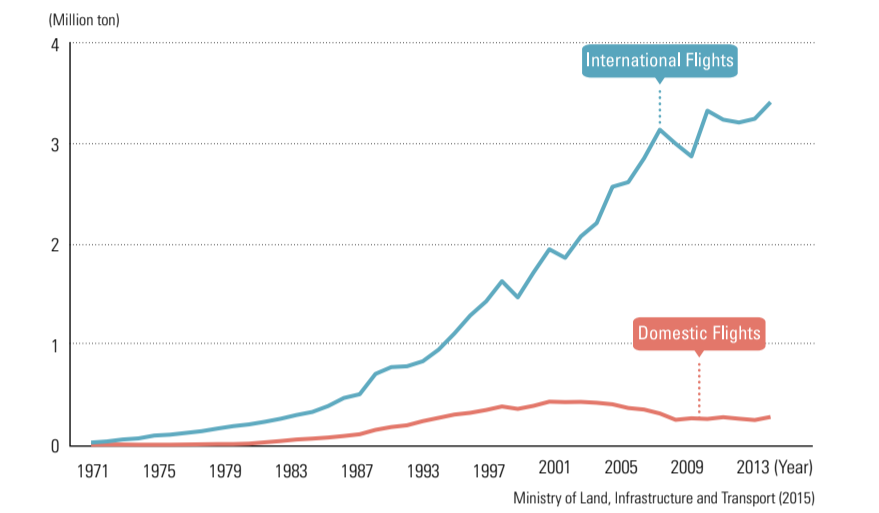
Korea's airport capacity was 73 million passengers and 2.9 million cargo tons in 1999. It increased to 152 million passengers and 6.8 million cargo tons by 2014. The growth of airport capacity is in line with the global increase in air travel during the period. Between domestic and international travel, domestic travel shows little change during the mid-1990s, followed by a slight increase after 2010. On the other hand, international travel steadily increased after the 1990s, with

some inflection points during specific periods. A total of 77 airlines operated in Korea during 2013 (7 domestic airlines and 70 foreign airlines), serving destinations of 152 international cities in 51 countries. The most frequent international destination is Southeast Asia (33.1%), followed by Japan (24.2%) and China (22.6%). Domestically, the Gimpo (Seoul)-Jeju route was the most popular, accounting for 53.9% of domestic trips.

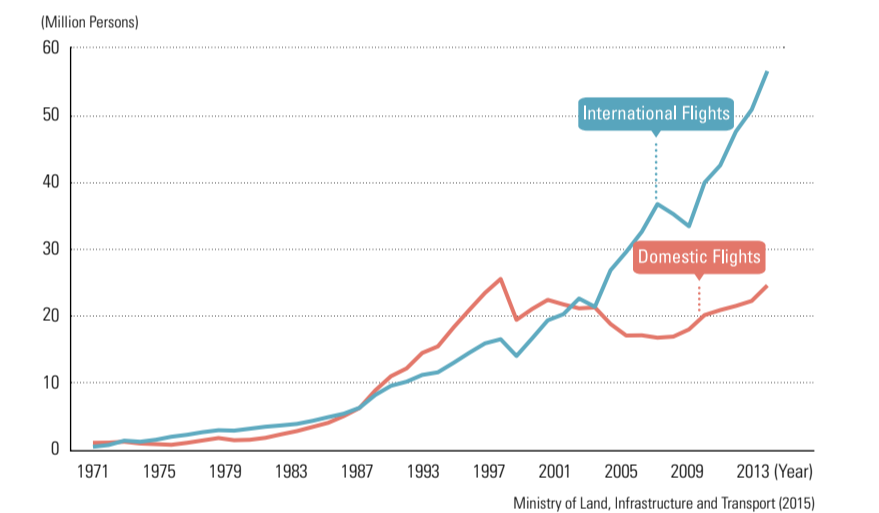
Domestic Air Routes (2014)



Air Freight Transport (2014)



Air Passenger Transport (2014)



Most Popular Domestic Flights

No	Passengers		Freight (Ton)	
	Route	Goods	Route	Goods
1	Gimpo ↔ Jeju	13,690,624	Gimpo ↔ Jeju	172,501
2	Gimhae ↔ Jeju	3,040,691	Gimhae ↔ Jeju	36,736
3	Gimpo ↔ Gimhae	2,054,878	Jeju ↔ Daegu	14,521
4	Jeju ↔ Cheongju	1,214,529	Gimpo ↔ Gimhae	14,377
5	Jeju ↔ Daegu	1,173,274	Jeju ↔ Cheongju	12,537
6	Jeju ↔ Gwangju	965,305	Jeju ↔ Gwangju	11,991
7	Gimpo ↔ Gwangju	482,935	Incheon ↔ Gimhae	6,180
8	Gimpo ↔ Ulsan	429,986	Gimpo ↔ Gwangju	3,382
9	Gimpo ↔ Yeosu	403,354	Gimpo ↔ Ulsan	2,398
10	Incheon ↔ Gimhae	343,399	Gimpo ↔ Yeosu	1,822
11	Jeju ↔ Gunsan	150,878	Incheon ↔ Daegu	1,769
12	Incheon ↔ Jeju	138,061	Incheon ↔ Jeju	1,242
13	Incheon ↔ Daegu	117,760	Jeju ↔ Gunsan	1,046
14	Gimpo ↔ Pohang	97,512	Jeju ↔ yangyang	552
15	Gimpo ↔ Sacheon	81,169	Jeju ↔ Wonju	447
16	Jeju ↔ Wonju	74,862	Gimpo ↔ Sacheon	374
17	Jeju ↔ yangyang	59,260	Gimpo ↔ Pohang	356
18	Jeju ↔ Sacheon	39,700	Jeju ↔ Sacheon	257
19	Jeju ↔ muan	31,611	Jeju ↔ Yeosu	226
20	Jeju ↔ Yeosu	23,795	Jeju ↔ muan	170



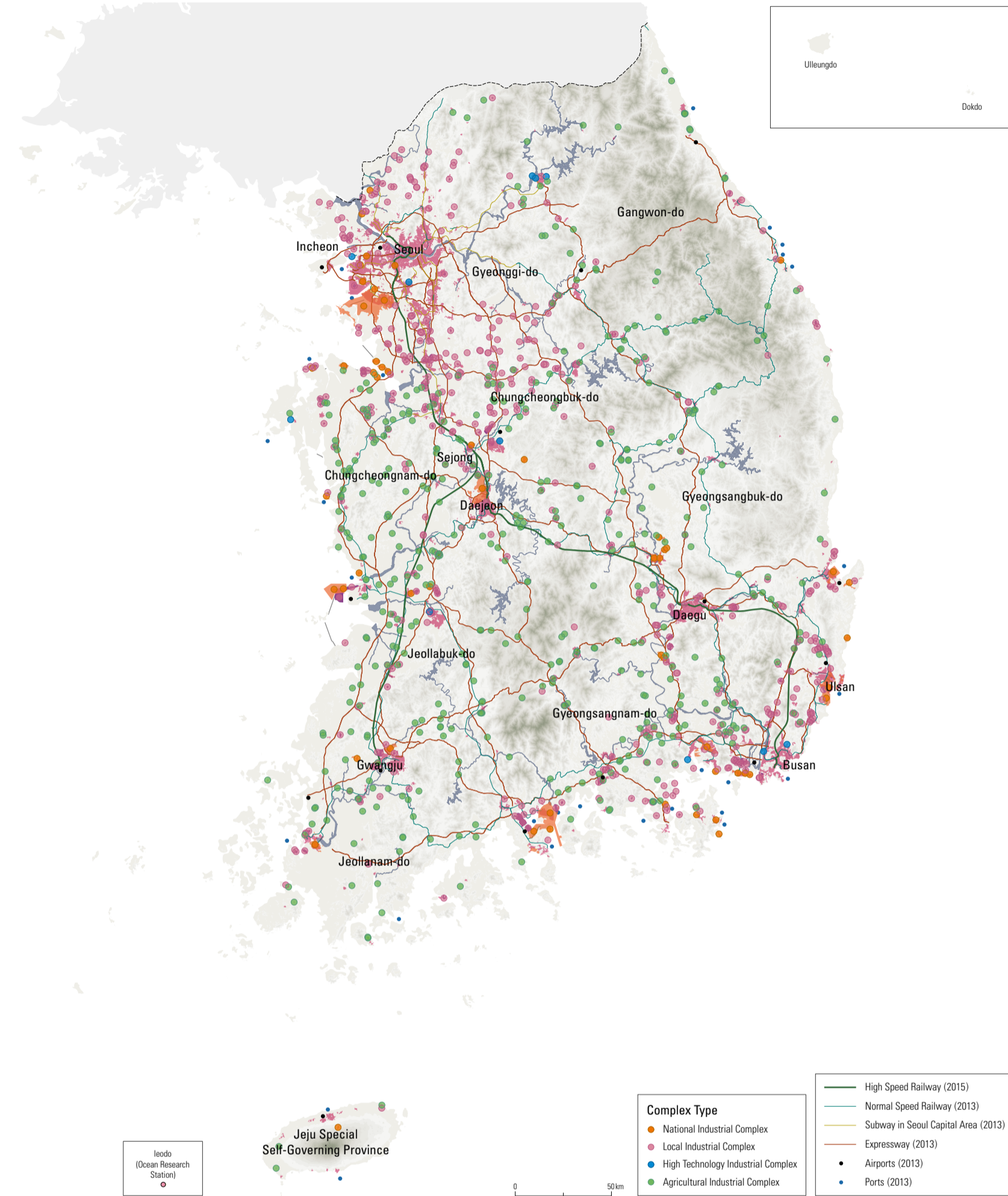
Distribution of Industrial Complexes

Industrial complexes play a key role in the national economy. They accounted for 62% of national manufacturing production, 79% of exports, and 42% of employment in 2010. An industrial complex is an area that is developed and managed under a comprehensive plan to host industries. Since the 1960s, Korea has promoted industrial complexes for firms to take advantage of infrastructure and agglomeration effects. They were once called "industrial parks," but the name was later changed to "industrial complexes" to reflect the shift to a knowledge-based economy in the 1990s.

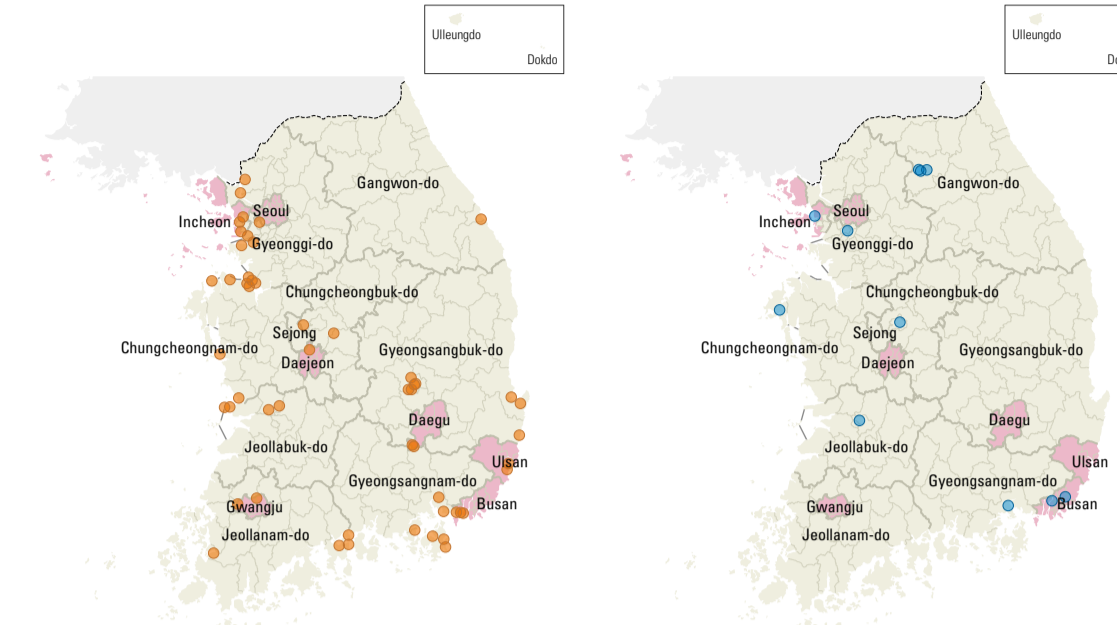
Industrial complexes include national industrial complexes, local industrial complexes, and agricultural-industrial complexes. Local industrial complexes are further split into urban high-tech industrial complexes and general rural industrial complexes. These different types of industrial complexes reflect different developers and diverse purposes. National industrial complexes are designated by the Ministry of Land, Infrastructure and Transport. Local industrial complexes are designated by local governments. National industrial complexes frequently target developing specialized industrial fields, stimulating underdeveloped regions, or developing areas under multiple government jurisdictions. Local industrial complexes frequently aim at promoting regional dispersion of industries and boosting local economy. Agricultural-industrial complexes focus on hosting the industries that may help local farmers or fishermen increase their incomes.

There were 1,033 industrial complexes at the end of 2013. Among these, there are 41 national industrial complexes, 528 general industrial complexes, 11 urban high-tech industrial complexes, and 453 agricultural-industrial complexes. The total area of industrial complexes is 484.7 km<sup>2</sup>, and their occupancy rate is 93.9% with 80,547 tenant companies. National industrial complexes are located mostly in the vicinity of the Seoul Metropolitan Area and along the southeastern coastal region. Many of the general rural industrial complexes are located along the Gyeongbu Expressway, which connects Seoul and Busan.

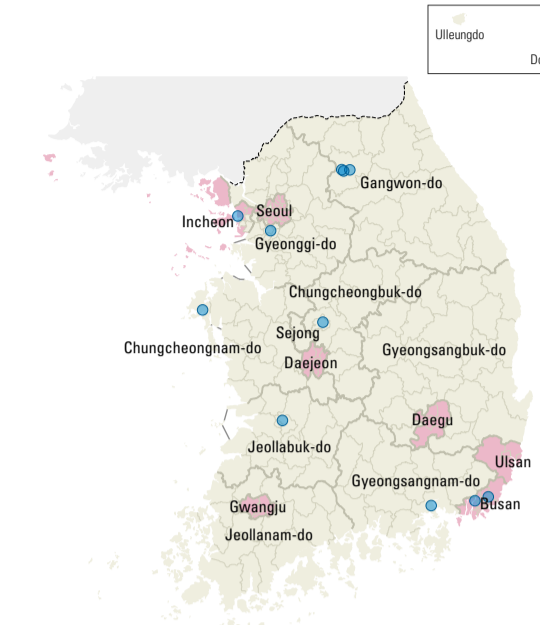
Location of Industrial Complexes (2014)



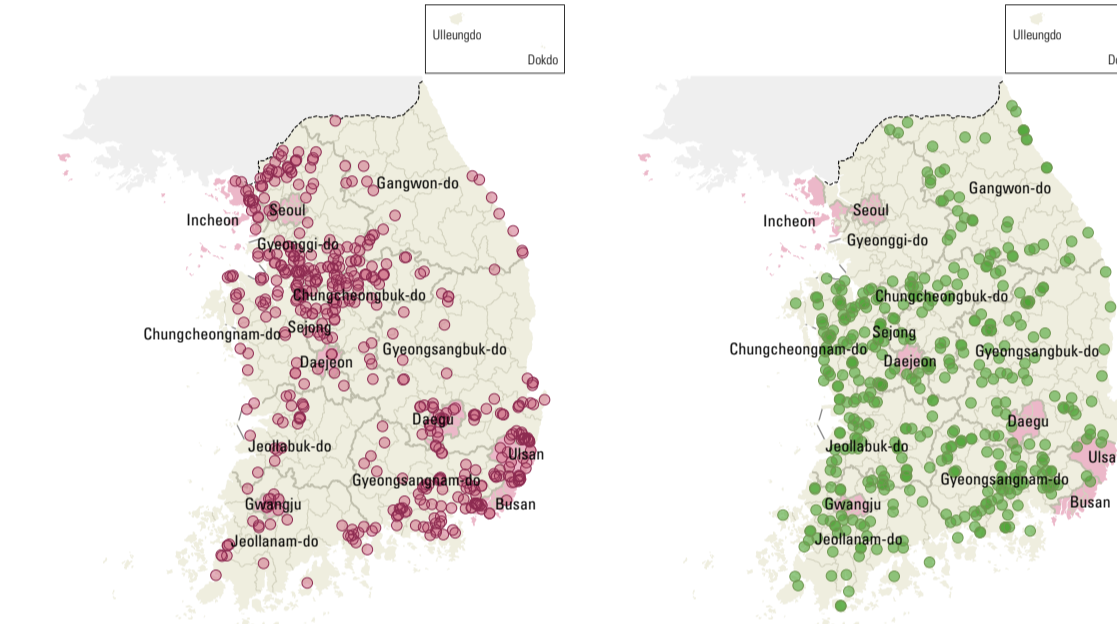
National Industrial Complex



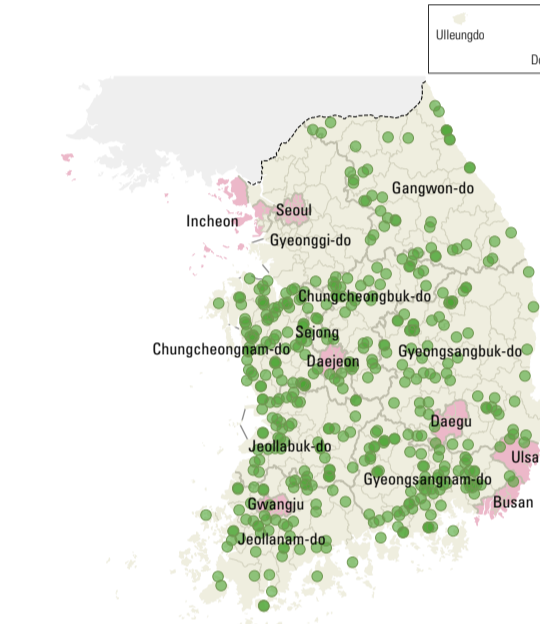
High Technology Industrial Complex



Local Industrial Complex



Agricultural Industrial Complex



One urban high-tech industrial complex is currently in the development stage, and every industrial zone (Daejeon, Ulsan, Jeju, Namyangju-si, Gyeongang-si, Suncheon-si, Chuncheon-si, etc.) hosts one or two urban high-tech industrial complexes. There is no agricultural-industrial complex in the Seoul Metropolitan Area, as these are

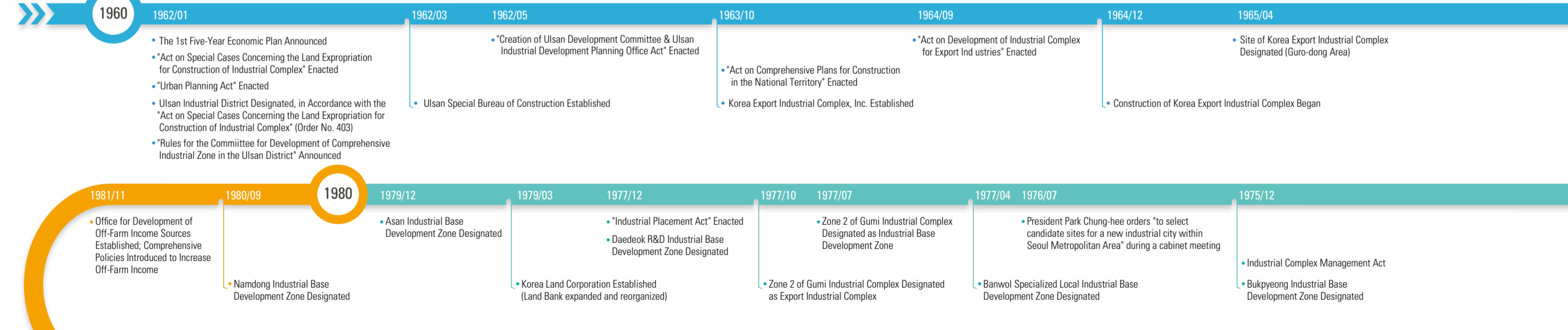
mostly located in rural areas with large farming populations. Industrial complexes have contributed to creating jobs and developing domestic industries. They are geographically located adjacent to highways and harbors to maximize accessibility.

Location of Industrial Complexes (2014)

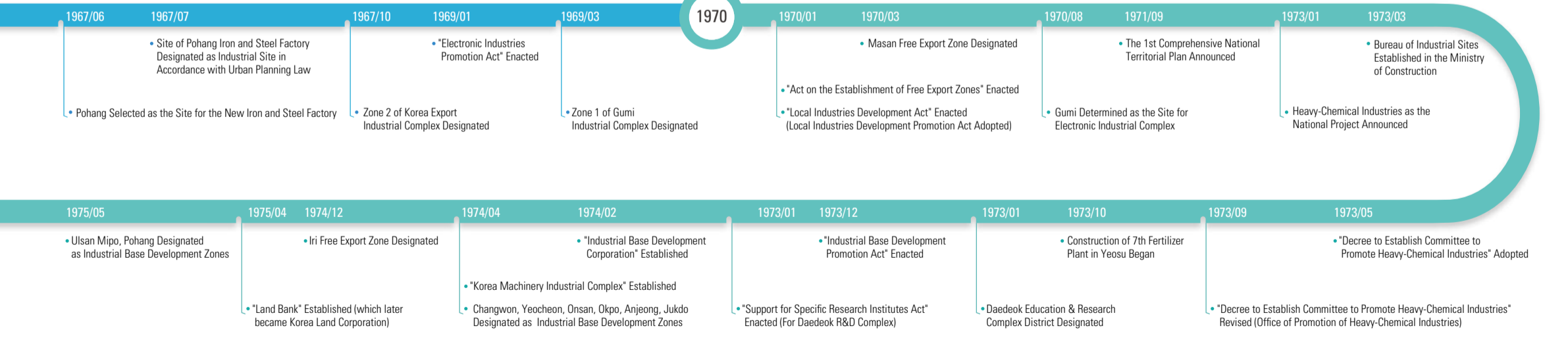
Name of Complex	Province/ City	Date (yyyy/mm/dd)	Designated size	Size of industrial location	Project Promoters
Industrial complex in Hwajoen Zone	Busan	2003/10/30	2,451	1,424	Busan Metropolitan City Corporation
Industrial complex in Mieuem Zone	Busan	2007/05/30	3,600	1,660	Busan Metropolitan City Corporation
Namyang Zone	Gyeongnam	2003/10/30	293	133	LH Corporation
Saenggok Zone	Busan	2009/07/31	549	377	Busan Metropolitan City Corporation
Myungdong Zone	Busan	2009/07/31	494	310	Nuclear Industrial Complex Corporation
Geohwa General Industrial Zone	Busan	2009/06/24	51	16	Geohwa Special Steel Co.
Busan Science General Industrial Zone	Busan	1991/12/21	1,962	1,031	LH Corporation, Busan City Office
Shinho general industrial complex	Busan	1994/01/27	3,121	1,713	Busan City Office
International industrial Logistics City (1st Phase)	Busan	2010/02/02	4,924	2,820	Busan Metropolitan City Corporation
Daegu Isia Polis	Daegu	2001/10/30	1,177	153	Daegu City Office, Isia Polis
Daegu Techno Polis	Daegu	2006/12/29	7,269	2,911	LH Corporation
Yongcheon general industrial complex	Gyeongbuk	2006/06/29	1,471	950	Korea Land & Housing Corporation
Songdo Knowledge Information Industrial Complex	Incheon	2000/09/18	2,402	848	Songdo Techno Park Foundation, Incheon City Office
Cheongla the 1st General Industrial Zone	Incheon	1997/08/06	194	129	Korea EMS Co., Ltd.
IHP Urban high-tech Industrial Complex	Incheon	2011/09	1,783	1,512	LH Corporation
Korea-China Tech Valley	Gyeonggi	2008/09/12	1,322	604	Pyeongtaek Korea-China Tech Valley Co., Ltd.
Saemangeum industrial complex	Jeonbuk	2010/02/02	18,700	10,120	Korea Rural Community Corporation
Gunjang industrial complex	Jeonbuk	1989/08/10	15,889	7,318	LH CORPORATION
Yulchon the 2nd General Industrial Zone	Jeonnam	2003/10/30	9,570	6,057	Gwangyang Free Economic Zone Authority
Yulchon the 3rd	Jeonnam	2003/10/30	9,762	5,438	Gwangyang Free Economic Zone Authority
General Industrial Zone	-	-	-	-	Zone Authority
Hwangyeon industrial complex	Jeonnam	2003/10/30	2,590	1,358	Gwangyang Free Economic Zone Authority
Seonghwang industrial complex	Jeonnam	2003/10/30	1,071	376	Gwangyang Free Economic Zone Authority
Galsaman Joseon Industrial Complex	Gyeongnam	2003/10/30	5,613	3,883	Hadong-gun Office Hadong Development Corporation
Daesong industrial complex	Gyeongnam	2003/10/30	1,374	785	Hadong-gun Office, Daesong Industrial Development Co., Ltd.
Haeryong general industrial complex Daesong industrial complex	Jeonnam	1998/04/22	954	622	Sooncheon City Office
Yulchon the 1st General Industrial Zone	Jeonnam	1992/05/13	9,193	5,772	Gwangyang Free Economic Zone Authority
<b>Total (26)</b>			<b>107,725</b>	<b>58,320</b>	

Ministry of Land, Infrastructure and Transport (2012)

Construction of Industrial Complexes to Promote Export-Oriented Light Industries



Construction of Industrial Complexes for Heavy-Chemical Industries



Development of Industrial Complexes to Promote Balanced Development



Construction of High Tech Industrial Complexes to Foster High Tech Industries



Construction of High Tech Industrial Complexes to Foster High Tech Industries

