

Korean Nuclear Energy Policy under New Administration

June 20, 2022

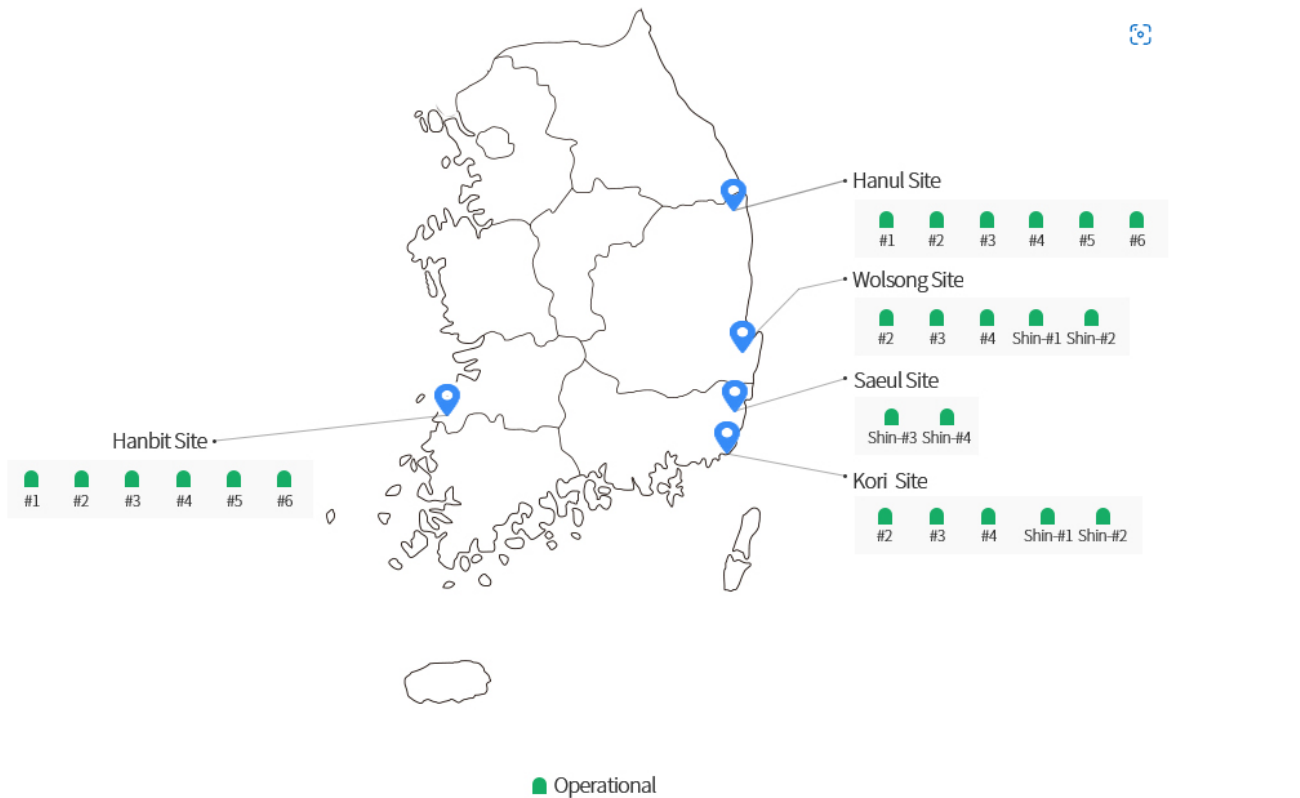
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Current Nuclear Energy Status in Korea

- 24 nuclear power units in operation in Korea



Nuclear Total

Feb. 4, 2020

Operational	Capacity (Mwe)	Power (Mwh/2019)	Availability (%/2019)	Capacity (%/2019)
24	23,929	143,947,021	70.6	71.0

Current Nuclear Energy Status in Korea

- 24 reactors provided about one-third of South Korea's electricity from 23GWe of plant.
- South Korea is among the world's most prominent nuclear energy countries, and exports its technology widely. It is currently involved in the building of the UAE's first nuclear power plant, under a \$20 billion contract.
- Nuclear energy has been a strategic priority for South Korea, but the president elected in 2017 introduced a policy to phase out nuclear energy over some 45 years.
- The new president, Yoon Suk-yeol, elected March 2022, has pledged to scrap this policy.

Operable Reactors



23,091 MWe

Reactors Under Construction



5,360 MWe

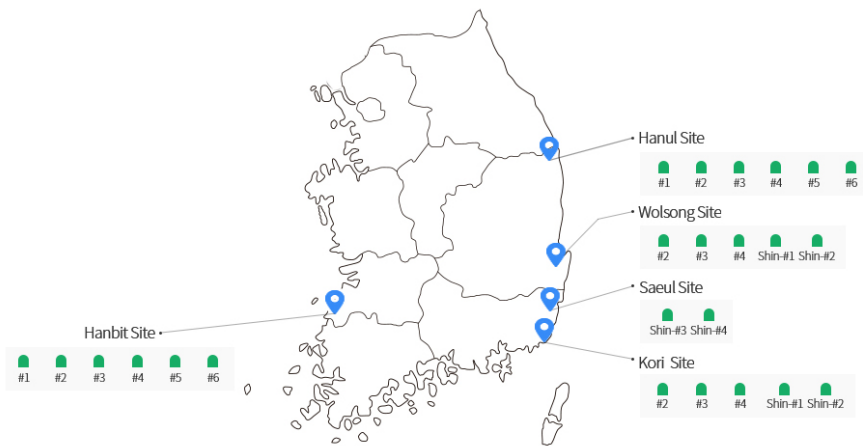
Reactors Shutdown



1,237 MWe

Nuclear Phase-out policy of Former Administration (May 10, 2017 – May 9, 2022)

- Prohibition of license renewal of operating fleet
- Abolition of new construction projects including Shin-Hanul 3&4 for which power generation business license had been issued and under construction
- Premature shutdown of Wolsong #1 (PHWR)
- Zero nuclear after shutting down Shin-Kori #6 as the last nuclear power plant



South Korean reactors being decommissioned

Reactor Name	Model	Reactor Type	Reference Unit Power (MWe)	Permanent Shutdown
Kori 1	WH 60	PWR	576	2017-06
Wolsong 1	CANDU 6	PHWR	661	2019-12



Nuclear Policy of New Administration (May 10, 2022 – May 9, 2027)

- Abolition of the nuclear phase-out policy, strengthening the nuclear industry ecosystem
- Net zero with a significant contribution of nuclear in energy mix
- License renewal of operating fleet
- Construction restart of Shin-Hanul 3&4
- Development of innovative SMR
- Promotion of nuclear power plant export
- Legislation and process start to secure waste disposal site along with pyro-process research for waste partitioning and disposal

Reactors under construction, planned, and proposed

Reactor	Type	Gross capacity	Start construction	Commercial operation
Shin Hanul 1, Ulchin	APR1400	1400 MWe	July 2012	2022
Shin Hanul 2, Ulchin	APR1400	1400 MWe	June 2013	2023
Shin Kori 5	APR1400	1400 MWe	April 2017	March 2023
Shin Kori 6	APR1400	1400 MWe	September 2018	June 2024
Total under const: 4		5600 MWe (5360 MWe net, 1340 each)		
Shin Hanul 3, Ulchin	APR1400	1400 MWe	2025	
Shin Hanul 4, Ulchin	APR1400	1400 MWe	2025	



Goals of Nuclear Energy Policy

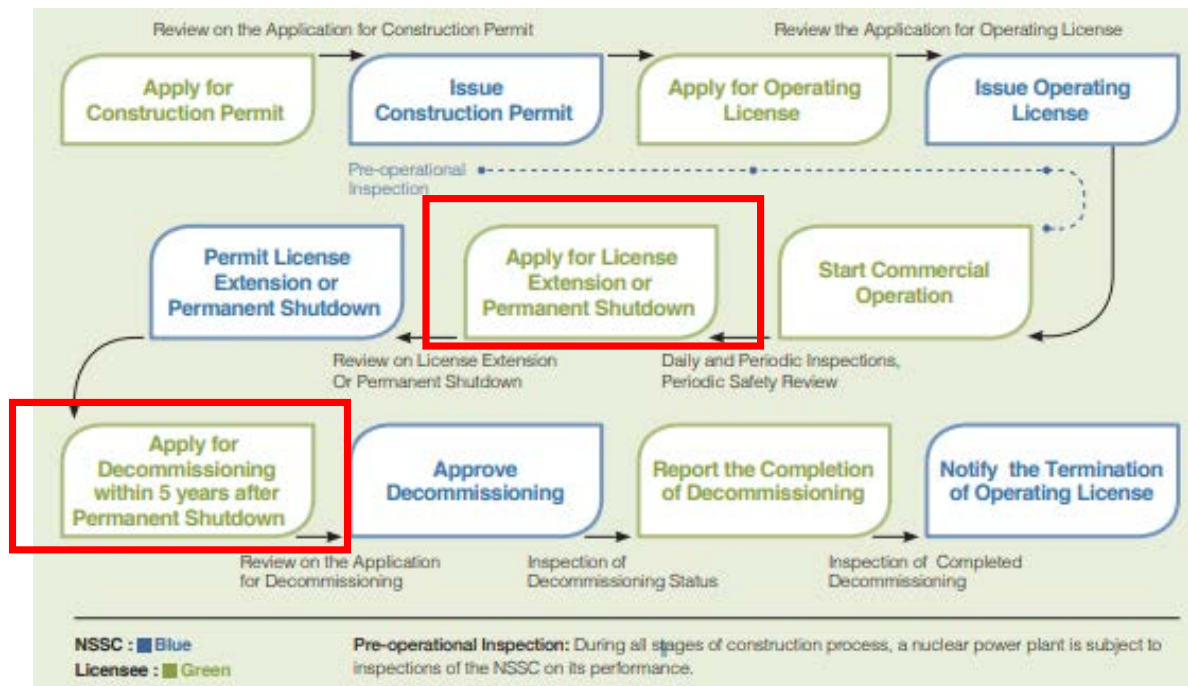
- Promptly resume construction of Shin-Hanul Units 3 and 4 and promote continuous operation of nuclear power plants whose operating licenses have expired on the premise of ensuring safety.
- Secure next-generation nuclear power plant technology such as SMR, promote competitiveness in the nuclear power plant ecosystem, and create nuclear power plant export capability through the establishment of a government-wide export system
- Promoting seamless implementation of high-level radioactive waste management policies
- Secure the expertise and independence of the Nuclear Safety and Security Commission at the level recommended by the International Atomic Energy Agency

Action Items

1. Active use of nuclear power as a base power source
2. Strengthening the competitiveness of the nuclear power plant ecosystem
3. Making nuclear power an export industry
4. Strengthening nuclear cooperation diplomacy
5. Securing next-generation nuclear power technology
6. Radioactive waste management
7. Securing nuclear safety

1. Active use of nuclear power as a base power source

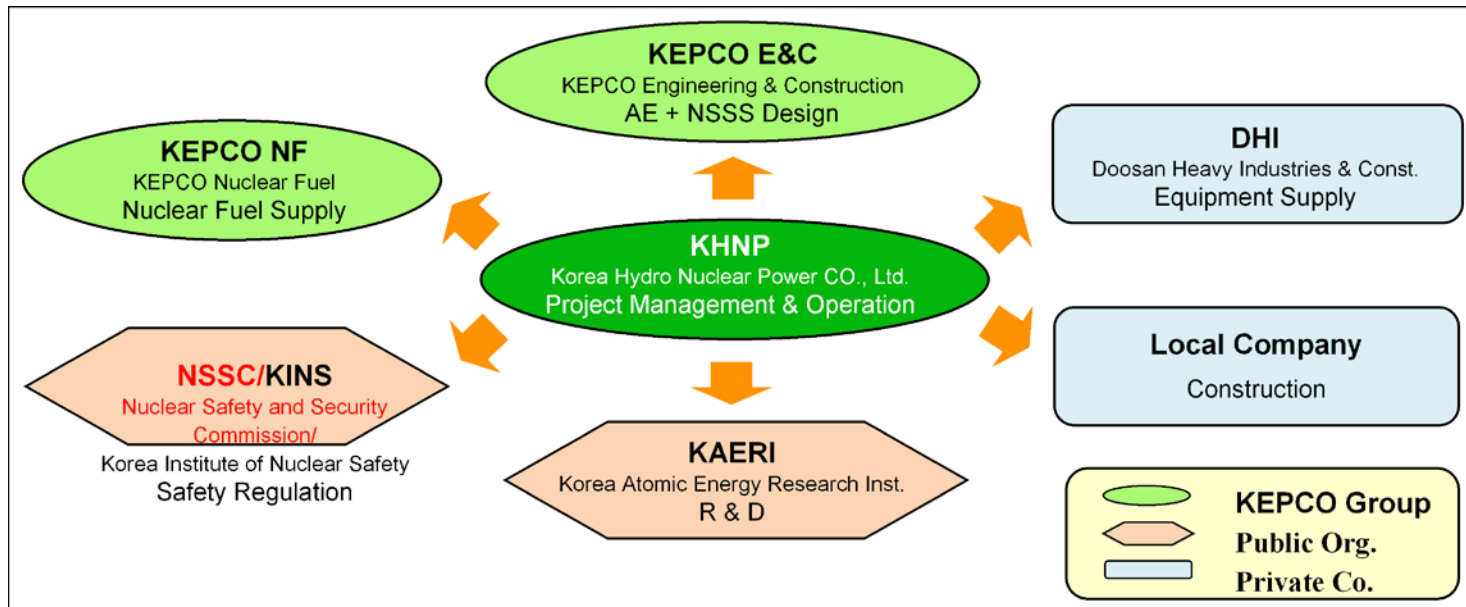
- Increase the share of nuclear power in 2030 by promptly restarting the construction of Shin-Hanul Units 3 and 4 and continuing operation of nuclear power plants whose operating licenses have expired on the premise of safety
- By changing the application deadline for continuous operation from 2-5 years before the end of life to 5-10 years before the end of life, the period of downtime is minimized



Flow chart of NPP licensing in Korea

2. Strengthening the competitiveness of the nuclear power plant ecosystem

- As it takes time to build Shin-Hanul 3&4 and to license continued operation, create work in the industry as early as we can
- Detailed analysis of the value chain of the nuclear power plant industry, localization of core equipment, R&D to secure future high-tech technologies, and promotion of strengthening the competitiveness of diverse ecosystems such as human resource training



3. Making nuclear power an export industry

- Actively carrying out bidding activities with the goal of exporting 10 units by 2030
- Export diversification through ① export of furnace, ② export of equipment, ③ export of operation and maintenance service
- In order to provide support packages for nuclear power plants, defense industry, economic cooperation, etc., government ministries, KEPCO, KHNP, financial institutions, nuclear power companies, etc. have all participated in the establishment of the “(tentative name) Bureau of Nuclear Power Plant Export Strategy” and immediately started operation.



Barakah nuclear power plant

4. Strengthening nuclear cooperation diplomacy

- Strengthen the Korea-US nuclear power plant alliance
 - materialize ROK-US cooperation in the SMR field,
 - finalize the Korea-US joint research on pyro-processing (JFCS), and
 - discuss future plans with the US

5. Securing next-generation nuclear power technology

- Intensive R&D promotion to secure future nuclear power technology
 - development of innovative SMR and 4th generation nuclear reactors,
 - nuclear fusion, and
 - nuclear hydrogen production

6. Radioactive waste management

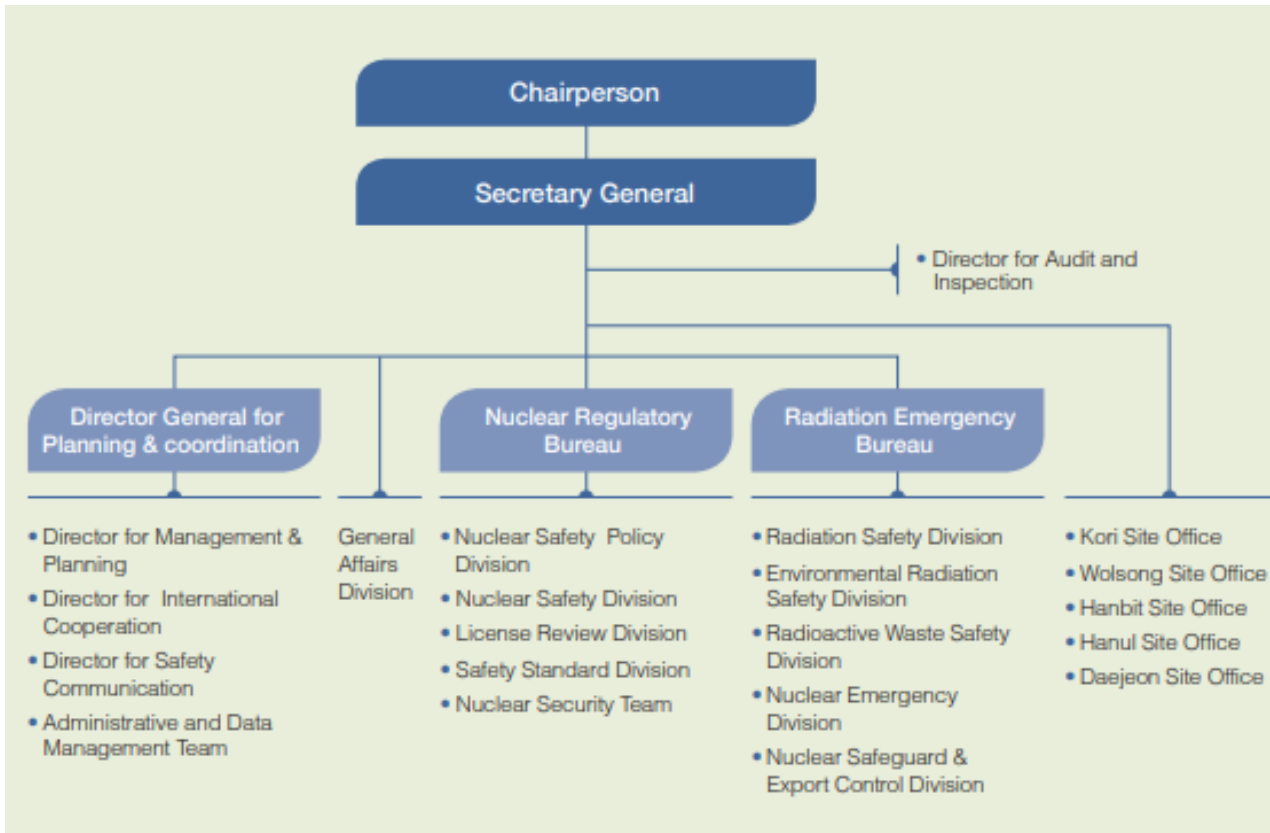
- Prepare a special law that
 - stipulates related procedures, methods, and schedules for the disposal of high-level radioactive waste and
 - promote the establishment of a dedicated organization under the Prime Minister as a control tower

HLW storage status

	Kori	Hanbit	Hanul	Saeul	Shin Wolsong	Wolsong
Storage Capacity	83.8 %	74.2 %	80.8 %	19.0 %	62.9 %	98.8 %
Expected Saturation point	2031	2031	2032	2066	2044	

7. Securing nuclear safety

- Promote the NSSC's professionalism and independence by restructuring.



Organization chart of NSSC

Energy Policy: Establishment of energy security and creation of new energy industries and new markets

- (Energy mix) Considering the harmony between nuclear power and renewable energy, rationally adjust the energy mix and revise the plan to achieve NDC in the energy, industry, and transportation sectors
- (Energy supply chain) Expand the scope of resource security to hydrogen and core minerals, expand stockpiles, diversify importing countries, and enhance stability of supply and demand by recycling resources and market principles
- (New energy industry) Advance the solar and wind power industries, innovate high-efficiency and low-consumption based energy demand management, and promote new industries in connection with the 4th industrial revolution technology
- (Grid/Market) Strengthen the independence and professionalism of the power market/rate and regulatory governance, and build a power market based on competition and market principles