



# Investor Relations

Global Leading Energy Solution Partner

# Disclaimer

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# Company Overview

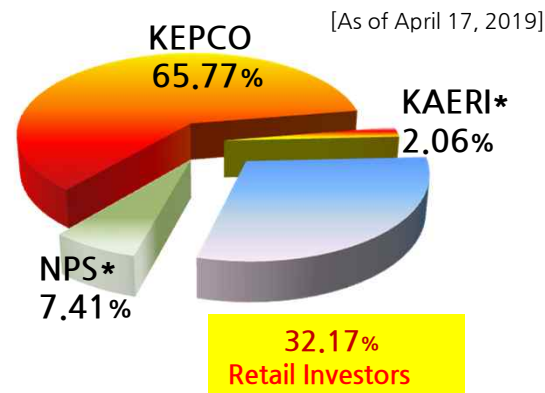
## Korea's Leading Power Plant Engineering Company

- Korea's leading provider of design and engineering for nuclear, thermal and hydro-electric plants with over 40 years of experience
- Current 100% market share in nuclear power plant design in Korea
- The world's most competitive engineering company specialized in the two sectors: A/E and NSSS
- Expanding its business to Thermal EPC, energy-related business, environment-friendly business, etc.

### Corporate Information

CEO & President	Lee, Bae Soo • Former vice president, KEPS • Former advisor, Samsung Engineering
Foundation Date	October 1, 1975
Employees	2,320 (As of June 30, 2019)
Business Area	Power plant design & engineering, etc.

### Ownership



\* KAERI - Korea Atomic Energy Research Institute

\* NPS - National Pension Service

### IPO Information

Shares Outstanding *Common shares 100%	38,220,000
Listing Date	December 14, 2009
Offered Securities	7,644,000

### Dividends

[Unit : KRW]

FY	2015	2016	2017	2018
Dividend Propensity*	25%	24%	40%	41%
Amount (per a share)	200	110	220	140

\* Dividend Propensity - Dividend/Net Income \*100

# Business Overview

## Business Area

### • Design & Engineering

- Nuclear Power Plant
- Thermal Power Plant
- Combined Cycle Power Plant
- Cogeneration Power Plant

### • O&M (Operations & Maintenance)

- Technology & Engineering Support for Operating Power Plants



### • Energy Solution Package

- Funding
- Consulting
- Procurement
- Post-management

### • Eco-friendly Business

- FGD System / DeNOx System
- ESCO, Renewable Energy
- Water Pollution Control
- Wastewater Treatment Facilities

### • National Project

- Government's task

## Business Area - Design & Engineering

### Leading the standard designs of nuclear power plants and coal-fired power plants

#### Major Project Experience

##### •Nuclear power/Reactor

Project	Project Period	Contract Amount (*)	Client
Shin-Kori #5,6	Apr '14 ~ Mar '23	4,167	KHNP
Shin-Hanul #3,4	Mar '16 ~ Dec '23	4,247	KHNP
UAE#1,2,3,4	Mar '10 ~ Dec '20	7,509	Kepco
SMART PPE BOP	June '16 ~ Feb '19	581	KAERI
Baraka Nuclear Power Plant LTEA	Jan '18 ~ Jan '31	3,400	Nawah Energy Company

##### Others

Project	Project Period	Contract Amount (*)	Client
APR 1400 NRC DC	Apr '14 ~ Sep '19	793	KHNP

(\*) Unit : 100 million won.

##### •Thermal power

Project	Project Period	Contract Amount (*)	Client
Boryeong#4,5,6 Performance Improving	Nov '18~Mar '24	273	KMP
Shin-seochon	June '14~Dec '19	668	KMP
Goseong Greenpower	May '14~Jan '22	884	SK E&C
Gangneung Anin	Feb '14~Sep '20	960	Samsung C&T
Taeon #9,10	June '11~July '19	1,125	KWP

##### Services performed

- Site selection and feasibility survey
- Engineering and design
- Construction/Project management, licensing support, quality assurance and inspection
- Support for purchasing, owner support, education/training

## Business Area - O&M

### Contribution to the Improvement of the Operating Power Plants' Operability, Efficiency and Safety

#### • O&M (Operations & Maintenance)



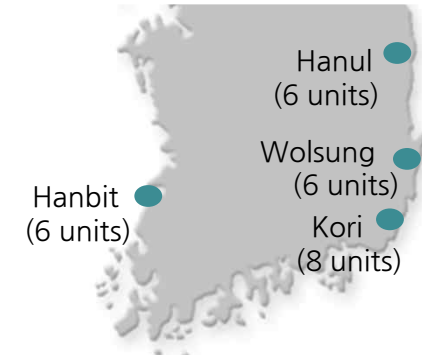
#### Services performed

- Technology support and engineering services
- Replacement design of key equipment
- Increase the output of power plants
- Design facility improvement of power plants in operation
- Technical support for license application and new regulatory requirements



#### • Nuclear Power Plants in Operation in Korea

Reactor APR 1400	Project	First Power	Design
	Shin-Kori #3,4	2016 / 2019	KEPCOE&C
OPR 1000+	Shin-Wolsung #1,2	2012 / 2015	KEPCOE&C
	Shin-Kori #1,2	2011 / 2012	KEPCOE&C
OPR 1000	Hanul #5,6	2004 / 2005	KEPCOE&C
	Hanbit #5,6	2002 / 2002	KEPCOE&C
	Hanul #3,4	1998 / 1999	KEPCOE&C
	Hanbit #3,4	1995 / 1996	KEPCOE&C-WEC
CANDU PHWR	Wolsung #3,4	1998 / 1999	AECL-KEPCOE&C
	Wolsung #2	1997	AECL-KEPCOE&C
	Wolsung #1	1983	AECL-CANATOM
PWR	Hanul #1,2	1988 / 1989	Framatome
	Hanbit #1,2	1986 / 1987	Bechtel-KEPCOE&C
	Kori #3,4	1985 / 1985	Bechtel-KEPCOE&C
	Kori #1,2	1978 / 1983	WEC-Gilbert



\*The Uljin was renamed Hanul

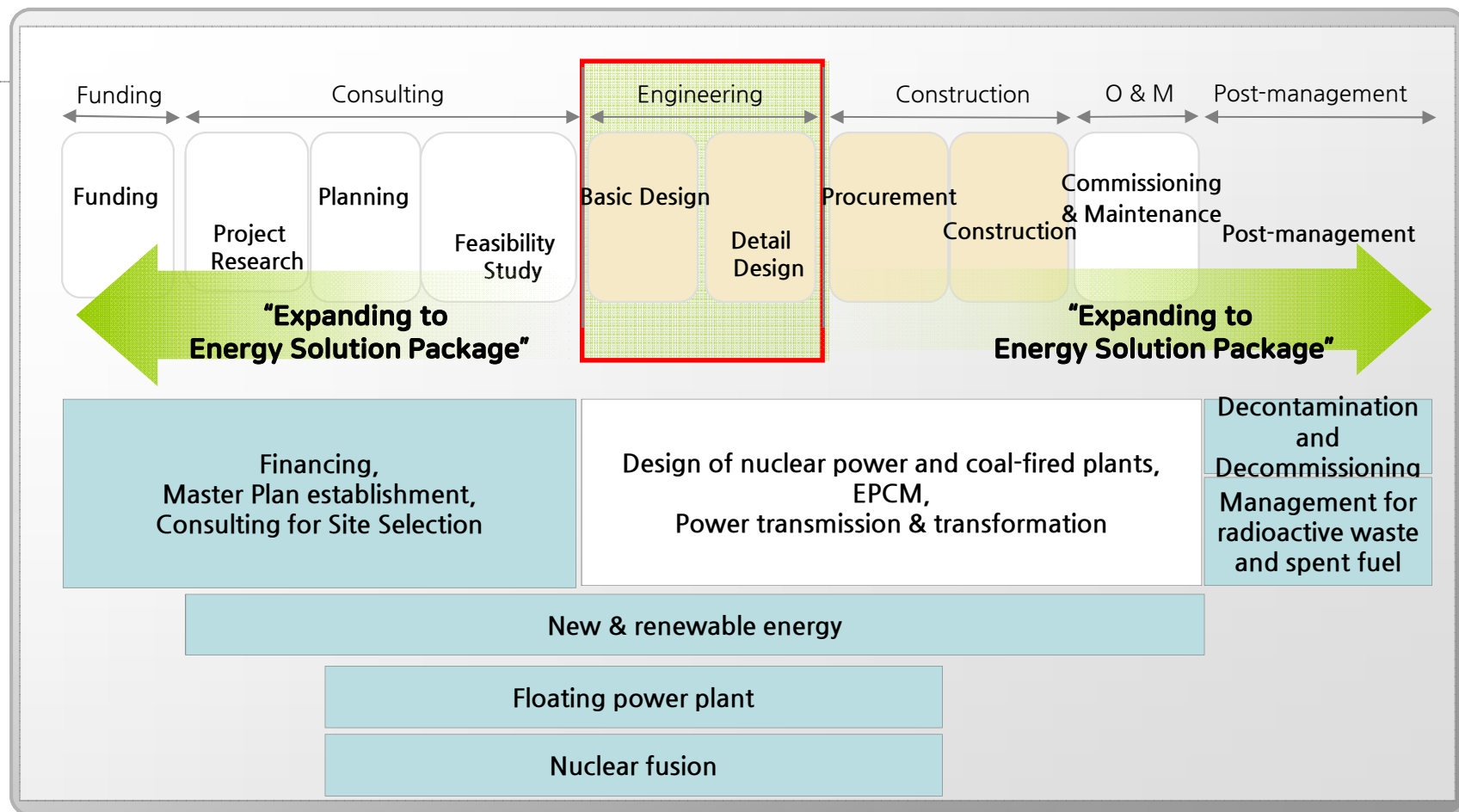
\*WEC - WestingHouse Electric.

\*AECL - Atomic Energy of Canada Limited



## Business Area - Energy Solution Package

Expanding its business areas to the overall value chain, including pre- and post-management of power plants



## Business Area - Eco-Friendly Business and National Business

**Developing eco-friendly business and leading the development of national technology as the only listed public-company specialized in engineering**

### Eco-Friendly Business

*Removal of Sulfur oxide and Nitrogen oxide, Development of eco-friendly technology such as CCS*

*Prevention of optical smog, respiratory system and skin diseases/ Being accordance with Paris Agreement*

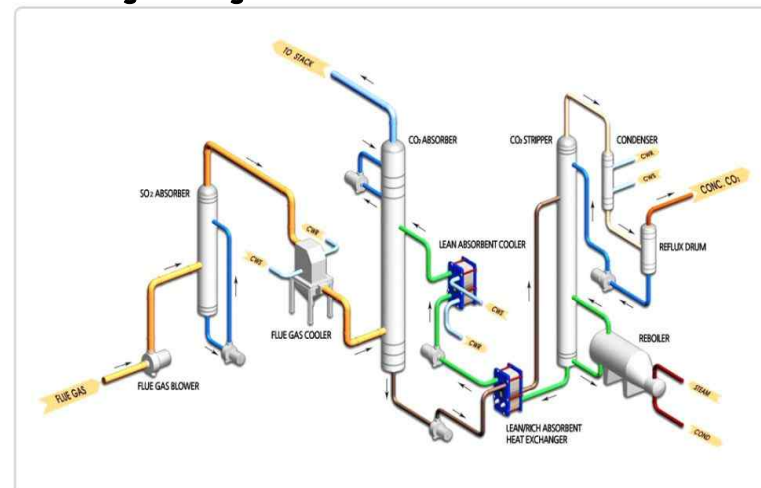
- Flue gas desulfurization
- Flue gas denitrification
- CCS(Carbon Capture Storage)  
: Lowering the level of greenhouse gas
- Prevention of water pollution/  
Location selection and Environmental evaluation

### National Business

The only listed public-company specialized in engineering

*Leading the development of national technology*

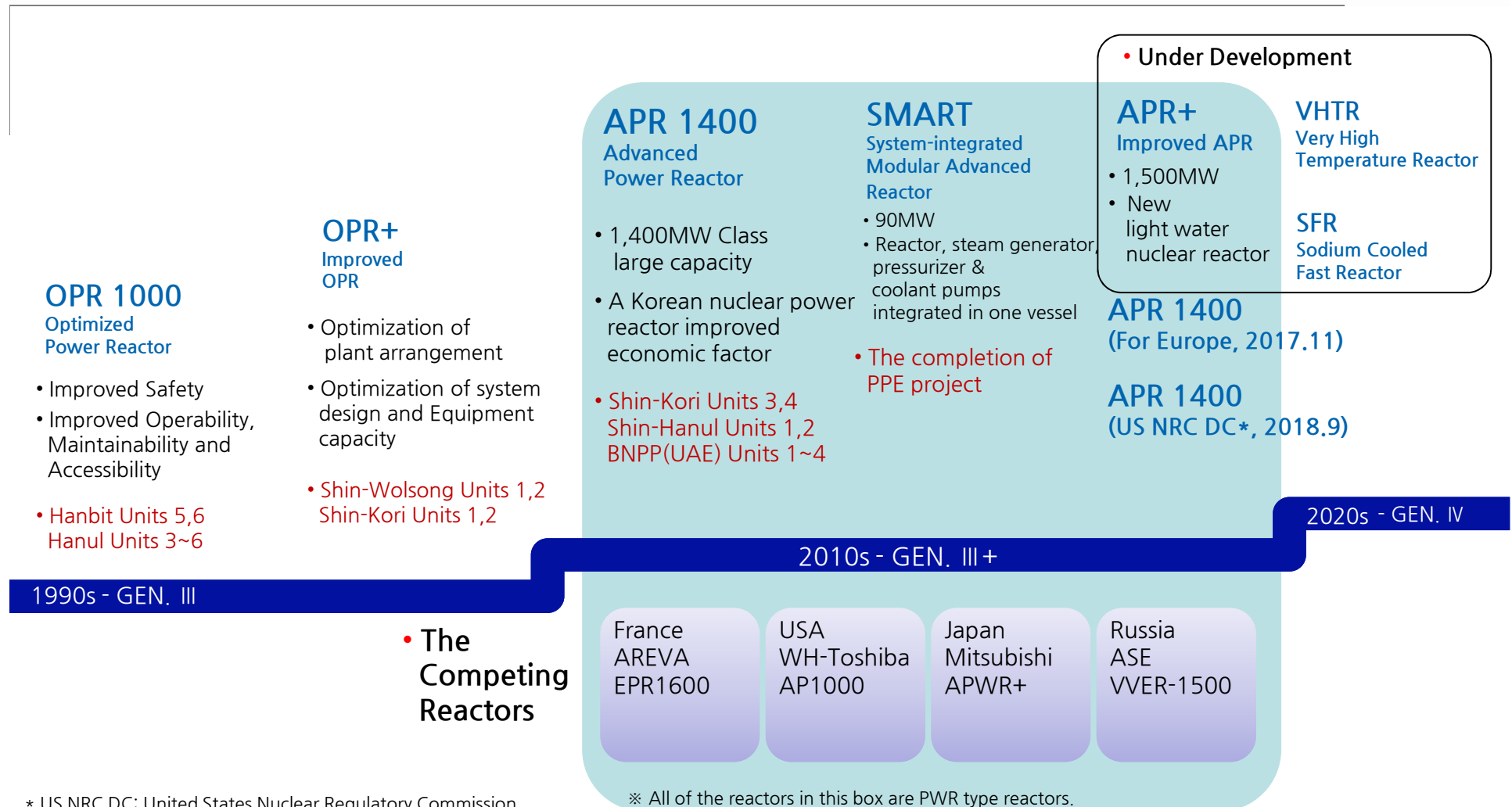
#### • CCS Engineering





# Technology - Nuclear Power Plant

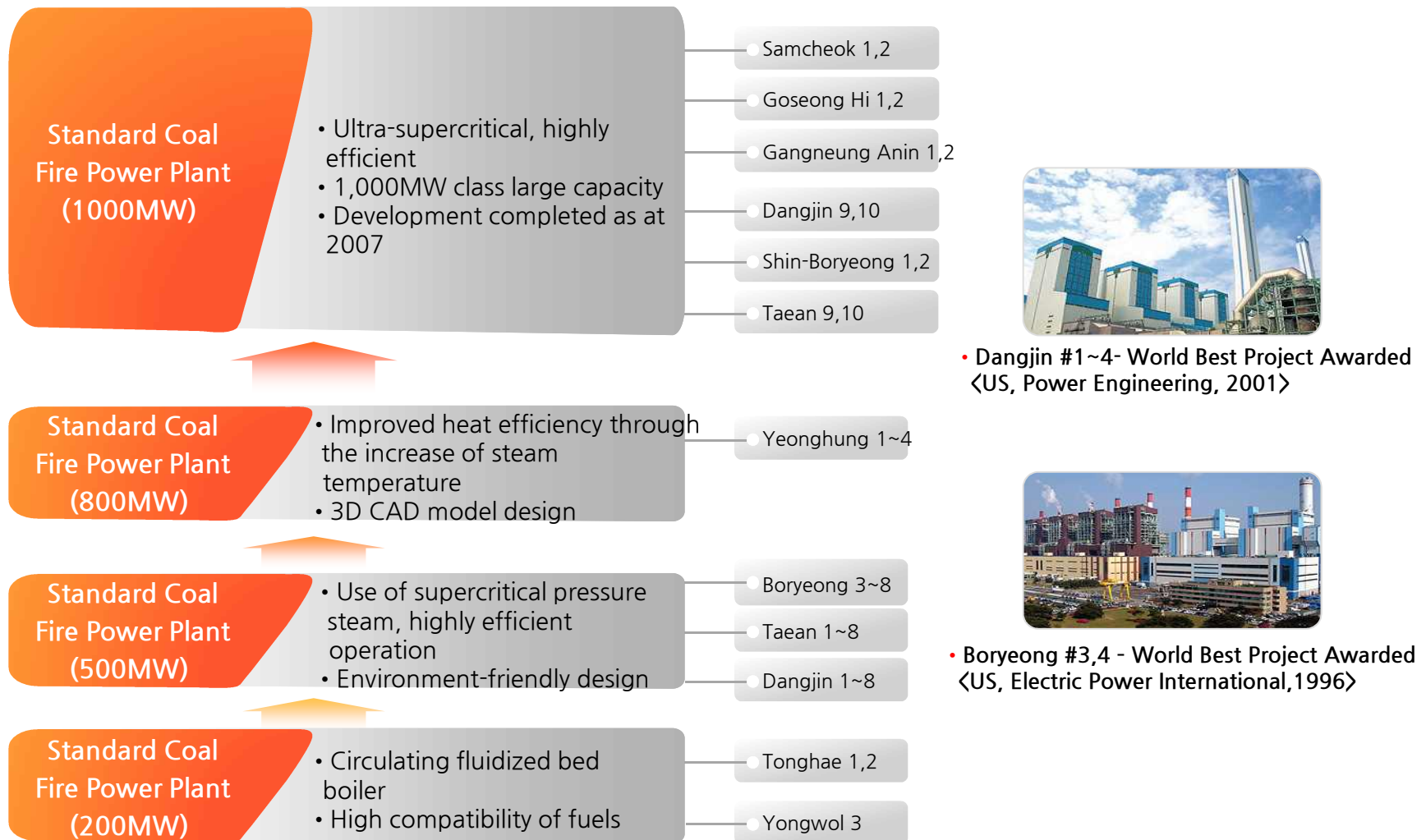
## Korean Nuclear Power Plant Design Development



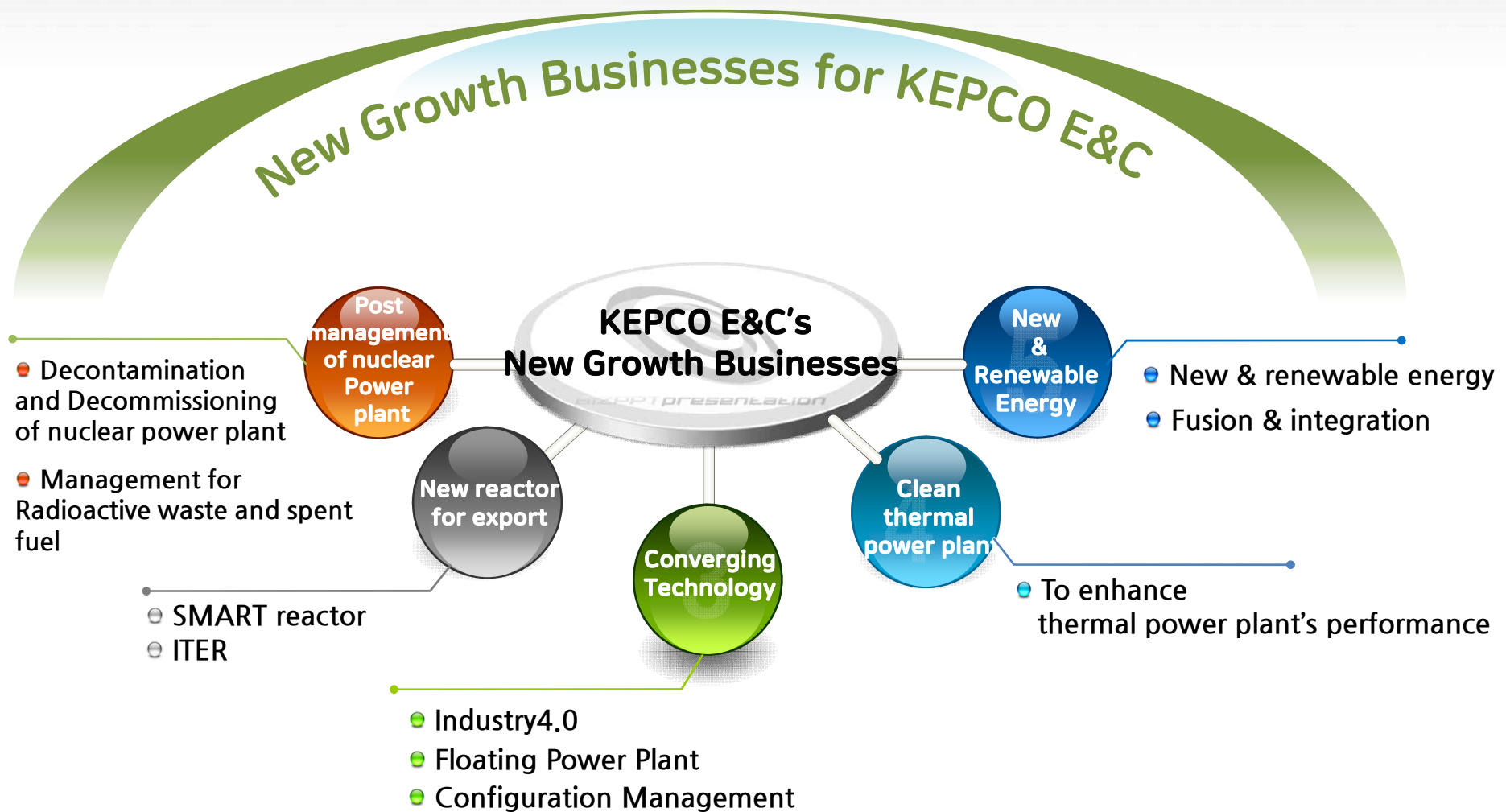
\* US NRC DC: United States Nuclear Regulatory Commission Design Certification

# Technology - Thermal Power Plant

## Coal-Fired Power Plant Design Development



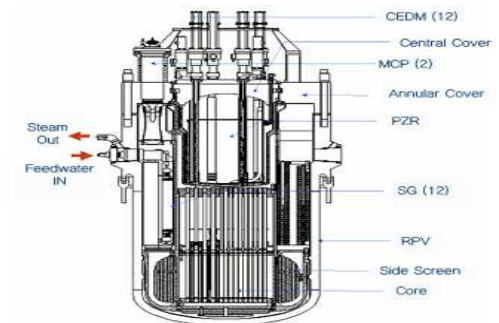
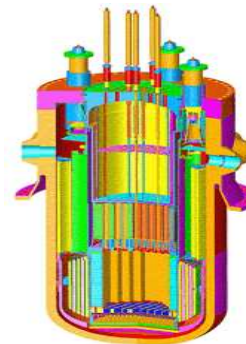
## Focus on 10 core businesses in 5 areas



## New Growth Businesses - SMART and ITER

### • SMART export plan

- **SMART - Integral type reactor**
  - steam generator, pressurizer, and coolant pump are all integrated into one vessel.
- 90MW of electricity output, 40,000ton/day of desalination capacity
  - can supply a city with a population of 100,000
- Year 2012 : Acquired SDA(standard design approval) in Korea.  
(the first SDA as integral type reactor in the world)
- Year 2013 : Cooperation agreement with Saudi Arabia on the introduction of SMART in Saudi Arabia
- Year 2015 : Signed a deal to jointly invest in studying the prospect of building at least two SMART in Saudi Arabia
- Year 2017 : Performing PPE(Pre-Project Engineering)  
to build two SMARTs in Saudi Arabia
- Year 2019 : Completion of PPE(Pre-Project Engineering) project



### • Participation in the international project - ITER

- International Thermonuclear Experimental Reactor(ITER) Project
- 7 countries that run the project - EU, U.S., Russia, China, Japan, India and South Korea
- Total amount of orders KEPCO E&C has received : 63.8 KRW bn. (expecting more orders)

## New Growth Businesses - Decommissioning

### Expanding businesses for post-management of the early nuclear power plants due to the upcoming closing

#### • Decommissioning

##### ▫ The early nuclear power plants in Korea

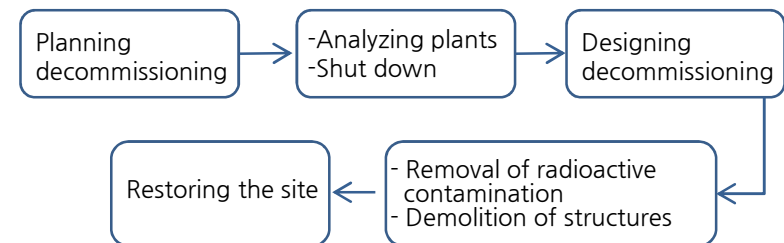
Plant	Commercial operation	Planned close	
KORI #1	1978	2017	license extended 2007 → 2017
Wolsung #1	1983	2012	license extended 2012 → 2018
KORI #2	1983	2023	
KORI #3	1985	2024	
KORI #4	1986	2025	

- Kori-1, the first nuclear power plant in Korea, is scheduled to become the first reactor to go dormant.
  - it had 30-year lifespan expired in 2007, but gained approval of additional 10-year operation.
- The Korean government announced in June, 2015 that the development of the 17 decommissioning techniques that have yet to be finished would be completed by 2021.

#### • Decommissioning?

- series of various follow-up processes upon the completion of operation regarding nuclear power plant facilities.
- Minimization of radioactive contamination from facilities after decontamination and decommissioning.
- Republic of Korea and UK have strengthen cooperation in the research on nuclear decommissioning.

#### • Decommissioning Flow



# New Growth Businesses - Configuration Management

## Application of Configuration Management

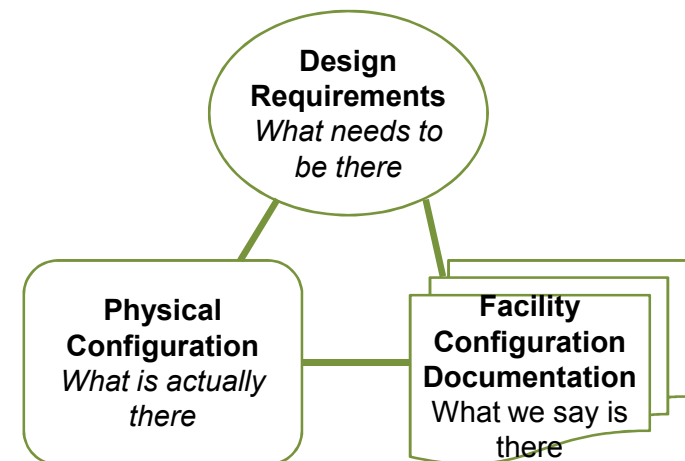
### • Need of Configuration Management for prevention of critical accident

Situation	Purpose	Project
<ul style="list-style-type: none"> <li>• 25~29% of accidents in nuclear plants relating with error of Configuration Management</li> <li>• Satisfaction of regulatory requirements</li> </ul>	<ul style="list-style-type: none"> <li>• IT-basis establishment of Configuration Management</li> <li>• Maintaining consistency between structure, systems and components</li> <li>• Assurance of that operational information consistent with design requirements is available</li> </ul>	<ul style="list-style-type: none"> <li>• Project : Establishment of system of Configuration Management for Shin-kori #5,6</li> <li>• Contract Period : 2019.1 ~ 2023.10</li> <li>• Contract Amount : KRW 27.1billion</li> </ul>

### • Definition

#### Configuration Management

Definition. The process of identifying and documenting the characteristics of a facility's structure, systems and components (SSCs) (including computer systems and software) and of ensuring that consistency is maintained between the design requirements, physical configuration, facility configuration and documentation.



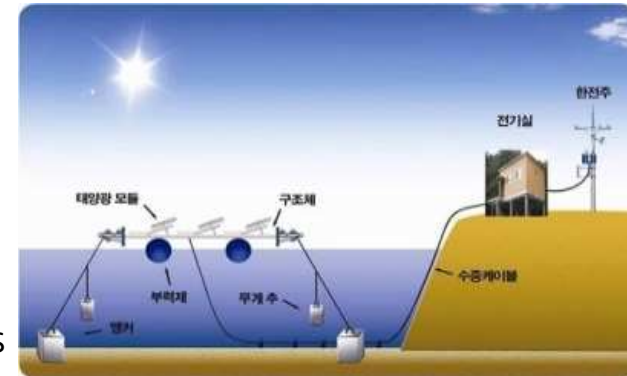


## New Growth Businesses - New and Renewable Energy

### Expanding the portion of new & renewable energy by the government's policy

#### ***The 3<sup>rd</sup> Energy Plan : Transition to Clean and Safe Energy Mix (2019.6)***

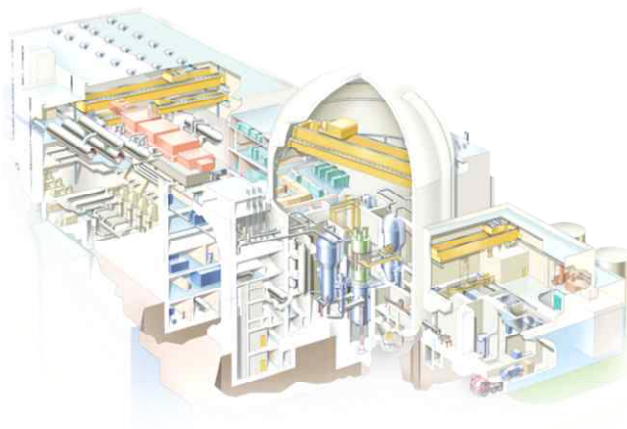
- Reducing the number of nuclear power plants and coal-fired power plants
- Expanding the portion of renewable energy to 30~35% (2040)
- Lowering the level of fine dust and performing the 2030 Road map to reduce the level of greenhouse gas



#### ***Developing and Performing Businesses for New & Renewable Energy***

- Wind Power Plant : In Jeju Island,  
Preparing the business
- Solar Power Plant : Research for development  
of diverse solar-power module
- Other Businesses : Fuel cell, Biogas, Coal gasification, Energy Independent Island,  
Zero energy building





200MW CFBC Power Plant Cutaway



- Site plan key**
- A. Boiler Building
  - B. Turbine Building
  - C. Control Building
  - D. Auxiliary Water Storage
  - E. Electrostatic Precipitator
  - F. Chimney

