



# Investor Relations

Global Power EPC Company

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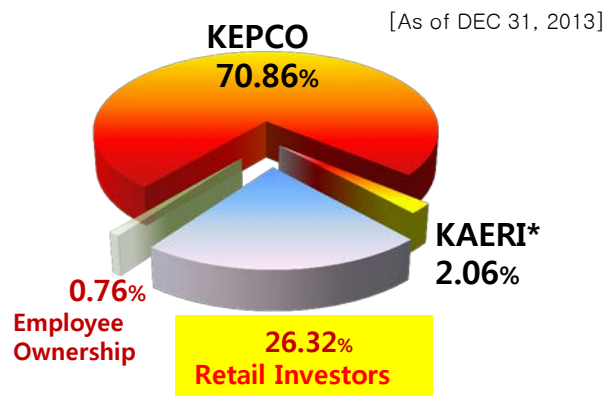
## Korea's Leading Power Plant Engineering Company

- Korea's leading provider of design and engineering for nuclear, thermal and hydro-electric plants with over 38 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	Park, Koo Woun <ul style="list-style-type: none"> <li>• Former nuclear power advisor, POSCO E&amp;C</li> <li>• Former Senior Vice President, KEPCO E&amp;C</li> </ul>
Foundation Date	October 1, 1975
Employees	2,326 (As of SEP. 30, 2013)
Business Area	Power plant design & engineering, etc.

### Ownership



### IPO Information

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

### Dividends

[Unit : KRW]

FY	2010	2011	2012	2013
Dividend Propensity*	50%	70%	55%	45%
Amount (per a share)	1,847	2,126	1,932	406

\* KAERI - Korea Atomic Energy Research Institute

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



## Business Areas

### • Design & Engineering

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

### • Environmentally-friendly Biz.

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



### • O&M (Operations & Maintenance)

- Technology & Engineering Support for Operating Power Plants

### • PM/CM

- SOC
- Private SOC
- Power Plants
- International Plants

# Business Area – Design & Engineering

All of the local nuclear power plants have been independently designed by KEPCO E&C since 1993, Ulchin Unit 3.

## Nuclear Power Plant

### 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



## Major Project Experience

### • Projects in Progress

Reactor	Project	Project Period	Client
	UAE #1,2,3,4	Jan '10 ~ May '20	KEPCO
	Shin-Ulchin #1,2	Dec '07 ~ Dec '16	KHNP
<b>APR 1400</b>	Shin-Kori #3,4	Aug '06 ~ Sep '14	KHNP
	Shin-Kori #5,6	Apr '14 ~ Mar '22	KHNP

### • Projects Completed

Reactor	Project	First Power	Design
<b>OPR 1000+</b>	Shin-Wolsung #1,2	2012 / 2014	KEPCOE&C
	Shin-Kori #1,2	2011 / 2012	KEPCOE&C
	Ulchin #5,6	2004 / 2005	KEPCOE&C
<b>OPR 1000</b>	Yonggwang #5,6	2002 / 2002	KEPCOE&C
	Ulchin #3,4	1998 / 1999	KEPCOE&C
	Yonggwang #3,4	1995 / 1996	KEPCOE&C-WEC
	Wolsung #3,4	1998 / 1999	AECL-KEPCOE&C
<b>CANDU PHWR</b>	Wolsung #2	1997	AECL-KEPCOE&C
	Wolsung #1	1983	AECL-CANATOM

\*KHNP – Korea Hydro & Nuclear Power co. LTD. (The sole nuclear power plant operator in Korea)

\*WEC – WestingHouse Electric.

\*AECL – Atomic Energy of Canada Limited

\*CANDU PHWR – CANada Deuterium Uranium Pressurised Heavy Water Reactor

# Technology – Nuclear Power Plant



## Korean Nuclear Power Plant Design Development

**OPR 1000**  
Optimized Power Reactor

- Improved Safety
- Improved Operability, Maintainability and Accessibility
- Yonggwang Units 5,6  
Ulchin Units 3~6

**OPR+**  
Improved OPR

- Optimization of plant arrangement
- Optimization of system design and Equipment capacity
- Shin-Wolsong Units 1,2  
Shin-Kori Units 1,2

**APR 1400**  
Advanced Power Reactor

- 1,400MW Class large capacity
- A Korean nuclear power reactor improved economic factor
- Shin-Kori Units 3,4  
Shin-Ulchin Units 1,2  
BNPP(UAE) Units 1~4

**Under Development**

**APR 1400 (For Europe)**

**APR+**  
Improved APR

- 1,500MW
- New light water nuclear reactor

**APR 1400 (US NRC DC\*)**

**SMART**  
System-integrated Modular Advanced Reactor

- 90MW
- Reactor, steam generator, pressurizer & coolant pumps integrated in one vessel

**VHTR**  
Very High Temperature Reactor

**SFR**  
Sodium Cooled Fast Reactor

1990s - GEN. III

**• The Competing Reactors**

2010s - GEN. III+

2020s - GEN. IV

France AREVA EPR1600	USA WH-Toshiba AP1000	Japan Mitsubishi APWR+	Russia ASE VVER-1500
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\* US NRC DC: United States Nuclear Regulatory Commission Design Certification

※ All of the reactors in this box are PWR type reactors.

# Strength of Korean Nuclear Power Plants

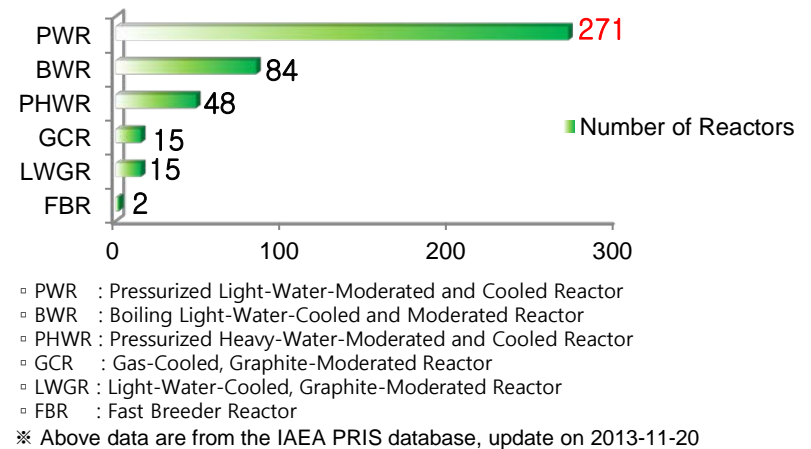


## APR1400 - The best reliability, economic efficiency and operability

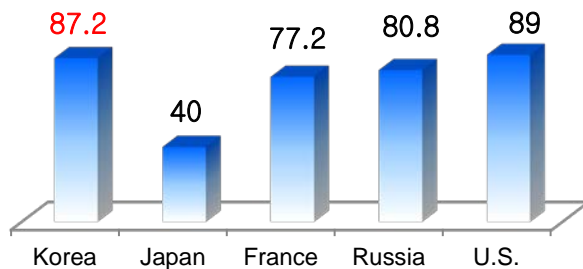
Comparison with other reactors (※ www.apr1400.com)

	APR1400	AP1000	EPR	ABWR
Developer	KHNP	WH/ Mitsubishi	Framatome ANP	Hitachi/ Toshiba/ GE
Power Capacity (MWe)	1,400	1,100	1,600 – 1,700	1,300
Design Life (Year)	60	60	60	60
Construction Period (month)	48	36	57	48
Refueling Time (month)	18	18~24	18	18~24
Reactor Type	PWR	PWR	PWR	BWR

Operational Reactors by type in the world



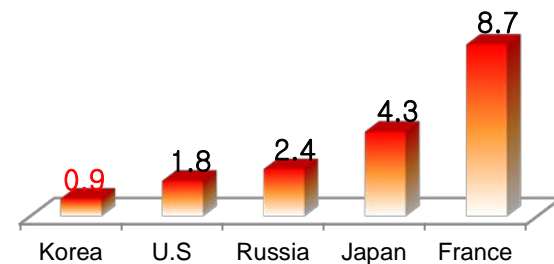
Energy Availability Factor(%)



▪ EAF = (REG-PEL-UEL-XEL)/REG x100  
 ▫ REG : Reference Energy Generation ▫ PEL : Planned Energy Loss  
 ▫ UEL : Unplanned Energy Loss ▫ XEL : External Energy Loss

※ IAEA PRIS (Power Reactor Information System), A three-year average (2010~2012)

Unplanned Capacity Loss Factor(%)



※ IAEA PRIS (Power Reactor Information System), A three-year average (2010~2012)

# Market Opportunities

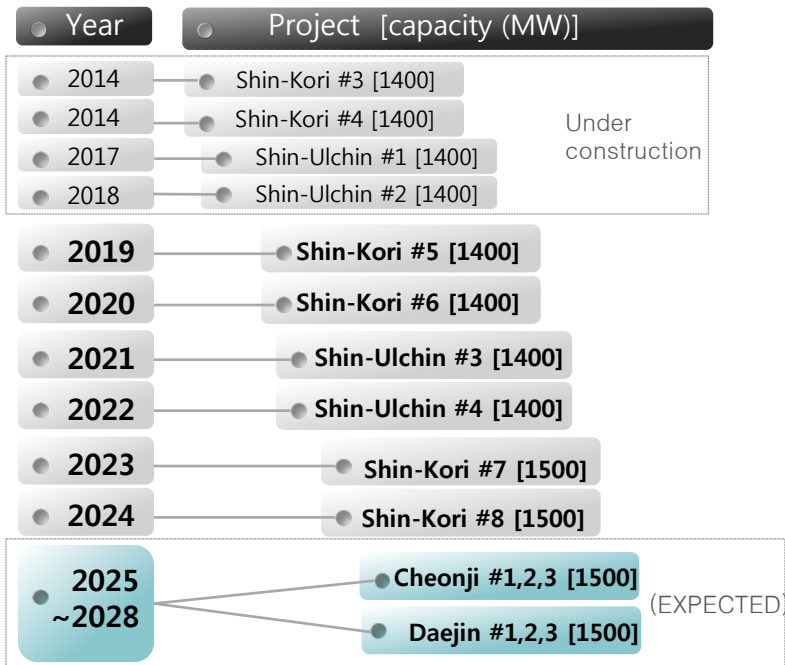


## Focus on New Opportunities at Home & Abroad

### Growth of Nuclear Power

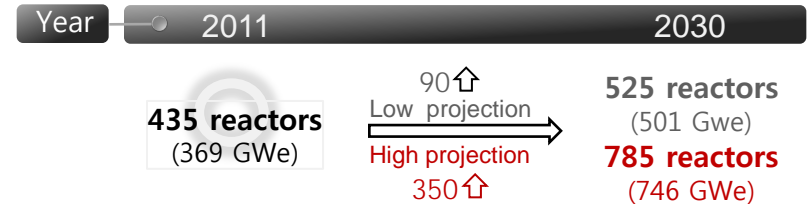
#### • Domestic

\*Timeline for Completion of Nuclear power plant construction ('13~'24)

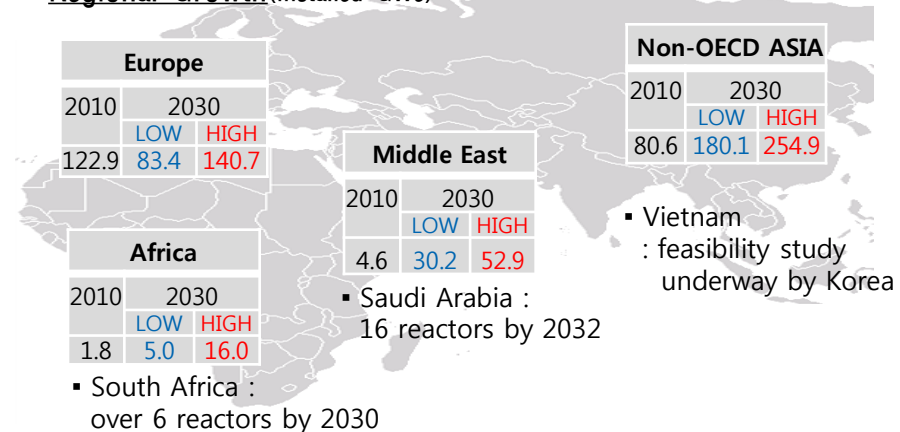


#### • Overseas

\*Projected Growth for World Nuclear Power



\*Regional Growth(Installed GWe)



\*This timeline is based on "The 6th Basic Plan of Long-term Electricity Supply" of The Ministry of Knowledge Economy, Feb, 2013

(Source : IAEA Nuclear Technology Review 2012 ; World Nuclear Association country briefings)

# Business Area – Design & Engineering

## Experiences of Coal fired/ CFBC Coal fired/ Combined Cycle/ Cogeneration Design

### Thermal Power Plant

#### Services performed

- Feasibility studies, environmental impact assessments, site survey
- Design standardization, basic and detail design of construction work
- Support for the purchase of equipment and materials
- Project management, supervision, test operation
- Quality assurance and control support
- Preparation, review and approval of documentation

### Major Project Experience

#### • Projects in Progress

Capacity (MW)	Project	Project Period	Client
400	Osan cogeneration EPC	Apr '13 ~ Nov '15	DS Power
540	Cote d'Ivoire IV CCPP Add-on EPC	Jul '13 ~ Dec '15	CIPREL
340	Ghana Takoradi T2 EPC	Dec '11 ~ Oct '14	Takoradi Int'l Company
1000x2	Taeon #9,10	Jun '11 ~ Mar '17	Korea Western Power
150 x3	Turkey Turfanbeyli (Including Procurement)	Apr '11 ~ Feb '15	SK E&C
1000x2	Shin-Boryeong #1,2	Jan '11 ~ Sep '17	Korea Midland Power
350 x2	Morocco Jorf Lasfar	Jun '10 ~ Apr '14	Daewoo E&C
1000x2	Dangjin #9,10	Oct '07 ~ Sep '16	Korea East-West Power
1000x2	Samchok #1,2	Sep '09 ~ Mar '16	Korea Southern Power
300	Taeon *IGCC Pilot Plant	Apr '11 ~ Jul '16	Korea Western Power

#### • Projects Completed

##### ■ Coal Fired Power Plant

- 500MW 34 Units
- 800MW 4 Units

##### ■ Large Scale \*CFB Coal Fired Power Plant

- 200MW 2 Units
- 340MW 1 Unit

##### ■ Combined Cycle /Cogeneration ▪ 38 Units

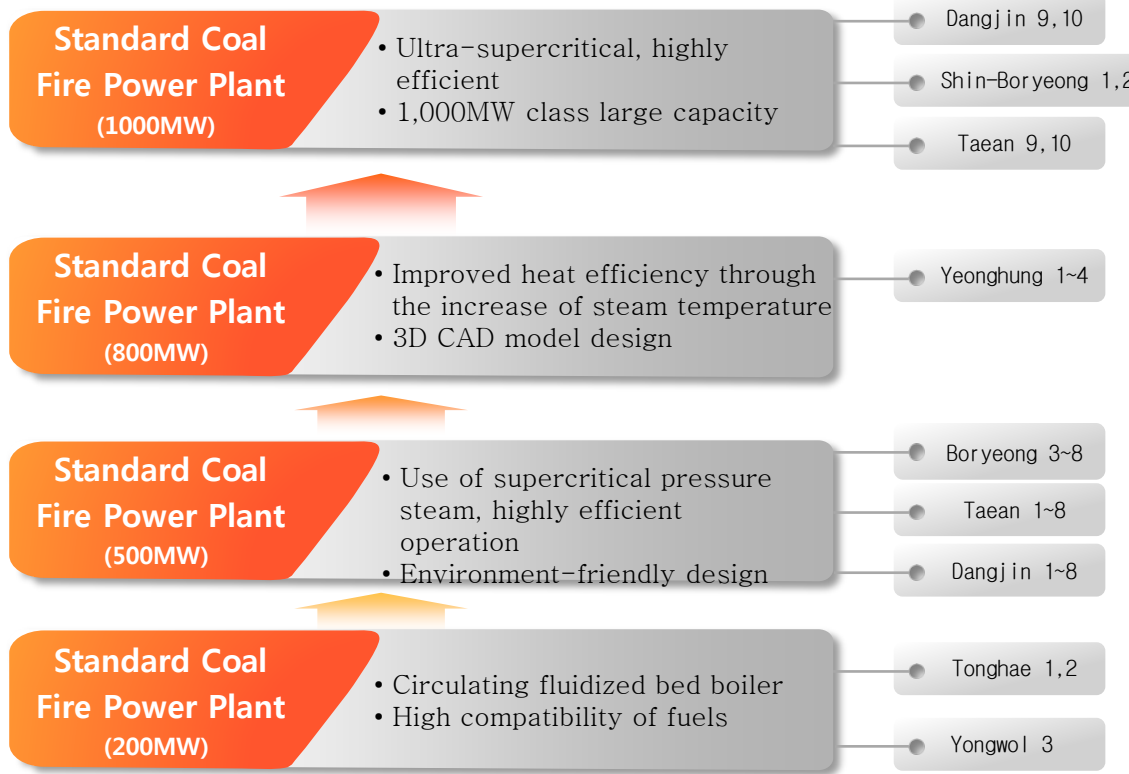
\*IGCC - Integrated Gasification Combined Cycle  
(Producing electricity by burning coal gas regarded as clean as natural gas)

\* CFB - Circulating Fluidized Bed Combustion Boiler



# Technology – Thermal Power Plant

## Coal-Fired Power Plant Design Development



• **Dangjin #1~4- World Best Project Awarded**  
 <US, Power Engineering, 2001>



• **Boryeong #3,4 – World Best Project Awarded**  
 <US, Electric Power International, 1996>

# Business Area – O&M

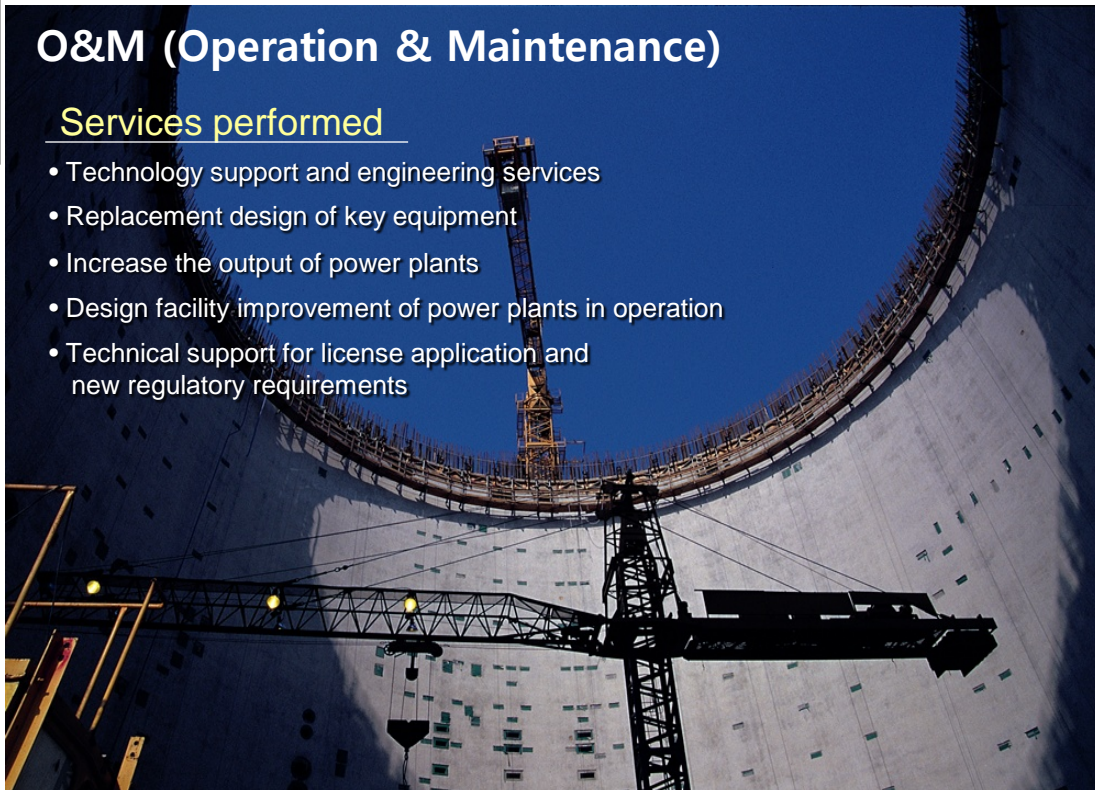


## Contribution to the Improvement of the Operating Power Plants' Operability, Efficiency and Safety

### O&M (Operation & 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



### Major Project Experience

#### • Recent Projects

- Technical support for license application to replace the steam generator for Unchin #1,2
- Technical consulting for license application to increase the output for Ulchin #1,2
- Improvement of facilities at Yeosu #2
- hundreds of small projects are in progress

# Business Area – O&M

The O&M market is growing  
due to the old operating nuclear power plants.

## • Domestic Operating Nuclear Power Plants (23 units)

Plant		Capacity (MW)	Commercial Date	NSSS Supplier	Plant A/E	Model
Kori	#1,2	587/650	Apr `78/ Jul `83	WEC	Gilbert	PWR
	#3,4	950	Sep `85 / Apr `85	WEC	Bechtel/KEPCO E&C	
Wolsung	#1,2	679 /700	Apr `83 / Jul `98	AECL/	AECL	PHWR
	#3,4	700	Jul `98 / Oct `99	AECL/DOOSAN	AECL/KEPCO E&C	
Yonggwang	#1,2	950	Aug `86 / Jun `87	WEC	Bechtel/KEPCO E&C	PWR (OPR1000)
	#3,4	1,000	Mar `95 / Jan `96	DOOSAN	KEPCO E&C	
	#5,6	1,000	May `02 / Dec `02	DOOSAN	KEPCO E&C	
Ulchin	#1,2	950	Sep `89 / Sep `88	Framatome	Framatome	PWR (OPR1000)
	#3,4	1,000	Aug `98 / Dec `99	DOOSAN	KEPCO E&C	
	#5,6	1,000	Jul `04 / Apr `05	DOOSAN	KEPCO E&C	
Shin-Kori	#1,2	1,000	Feb `11 / Jul `12	DOOSAN	KEPCO E&C	PWR (OPR1000+)
Shin-Wolsung	#1,2	1,000	Jul `12	DOOSAN	KEPCO E&C	



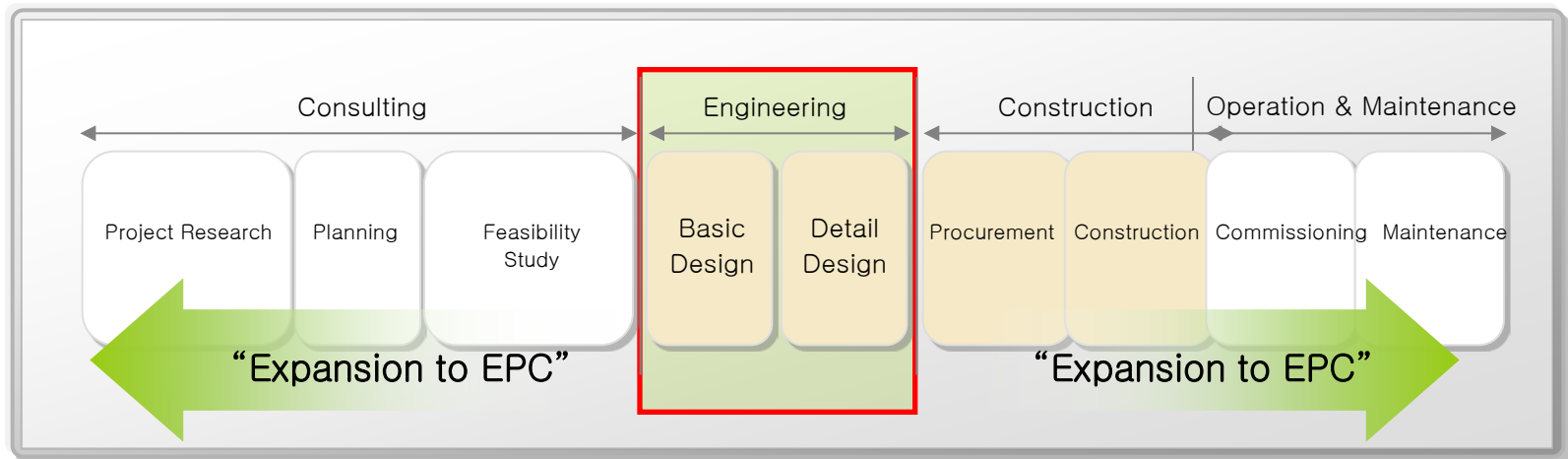
## • Developing Canada PHWR O&M Market

- MOU with SNC-Lavalin Nuclear (Mar `12)
- MOU with CANDU Energy (May `12)
- Established the Office in Toronto, Canada (Dec `12)


- \* CANDU Energy
  - created in 2011 when parent company SNC-Lavalin purchased the commercial reactor division of AECL(Atomic Energy of Canada Limited), along with CANDU reactor technology
- \* CANDU reactor
  - CANada Deuterium Uranium PHWR(Pressurised Heavy Water Reactor)

# Business Area – PM/CM

Management of the Entire or Parts of a Construction Project  
(Consulting, Engineering, Construction, O&M , etc. )



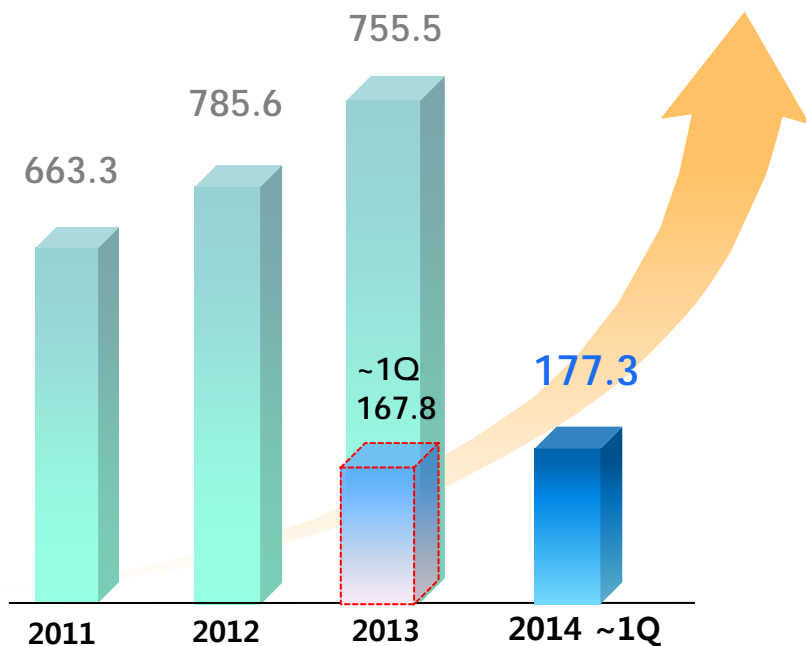
• Involved Projects

SOC		POWER PLANTS		PRIVATE SOC	
					
KTX Project	Incheon Int'l Airport	Nuclear	Thermal	Incheon Int'l Airport Rail	Bridge of Busan-Gejei

## 2014 1Q Revenue

### • Revenue

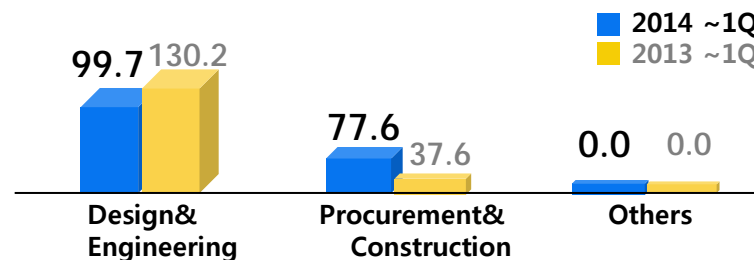
[Unit: KRW bn.]



### • Revenue Breakdown

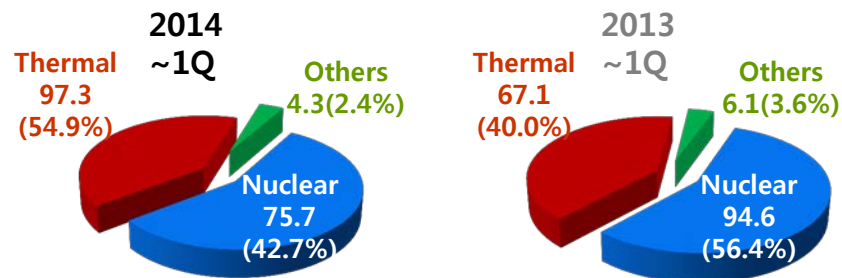
#### ▣ By Business Area

[Unit: KRW bn.]



#### ▣ By Division

[Unit: KRW bn.]



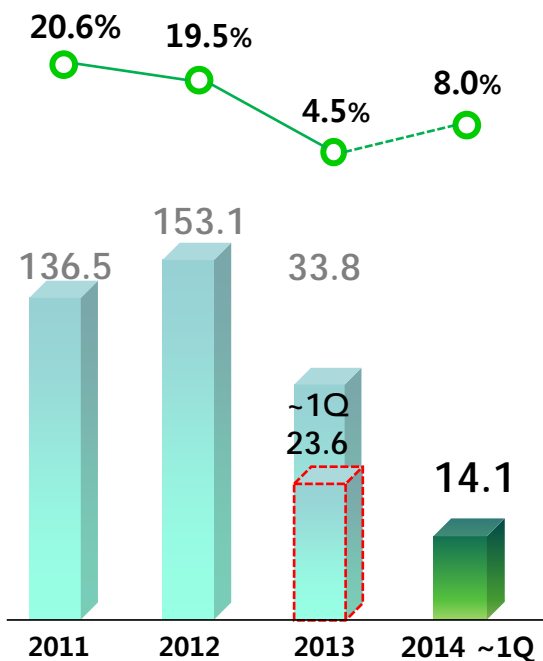
#### ▣ By Region



## 2014 1Q Financial Highlights

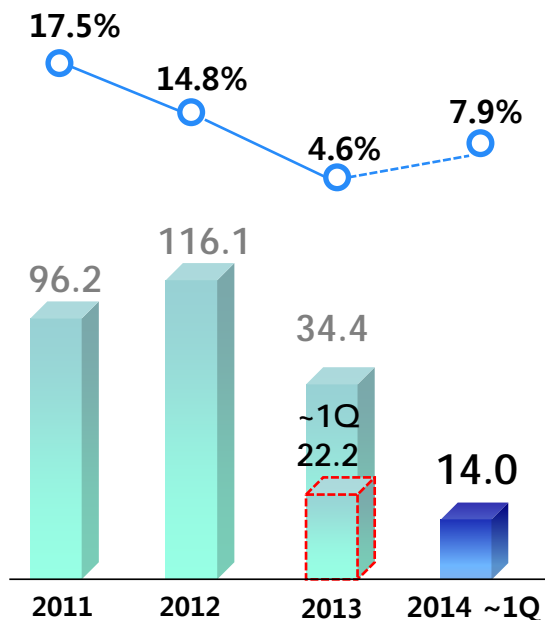
### • Operating Income /Margin

[Unit : KRW bn.]



### • Net Income /Margin

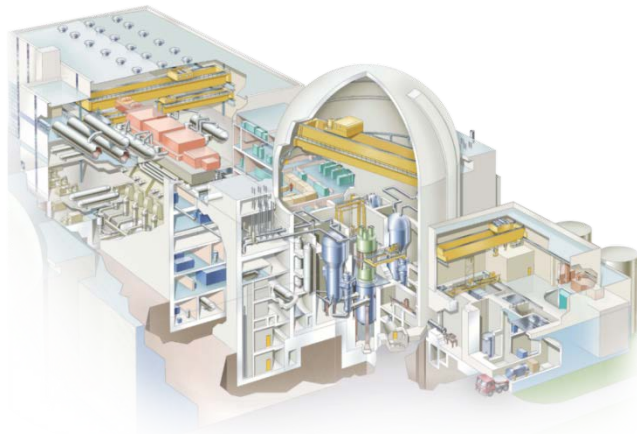
[Unit : KRW bn.]



### • 2014 1Q Overview

[Unit : KRW bn.]

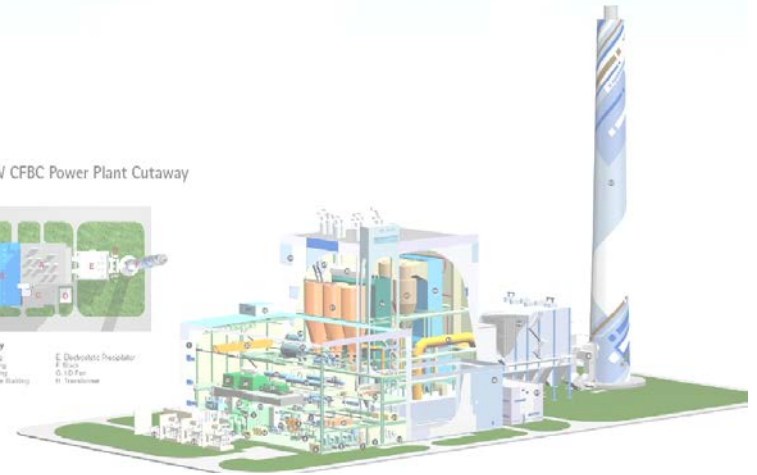
	2014 1Q	2013 4Q	2013 1Q
Revenue	177.3	240.3	167.8
Operating Income	14.1	-7.4	23.6
Net Income	14.0	-3.2	22.2



200MW CFBC Power Plant Cutaway



- Site plan key
- A. Boiler Building
  - B. Turbine Building
  - C. Control Building
  - D. Auxiliary Nucle Building
  - E. Desulphuric Precipitator
  - F. Stack
  - G. 150 Feet
  - H. Transformer



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