

Nuclear Energy Systems Business Operation

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1. Field of Nuclear Energy Business

■ PWR nuclear power plant

- Integrated from development to design, manufacture, construction, operation, and maintenance



■ Reprocessing plant

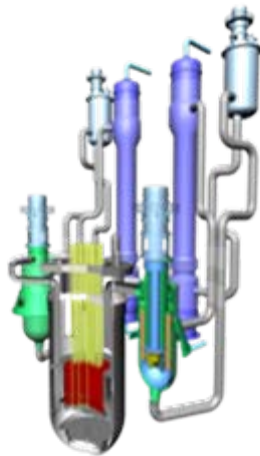
- Design and manufacture of major processing (shearing and dissolving) equipment
- Operation support and maintenance



A broad
array of
operations

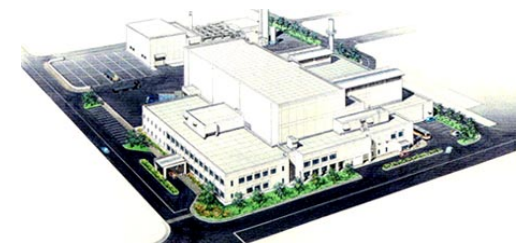
■ New-model fast breeder reactor (FBR)

- Promote development as a core company for FBR development in Japan



■ Uranium fuel, MOX fuel fabrication plant

- Design and manufacture of fabricating fuel rod and fuel assembling facilities



2. Basic Policy on Business Operations

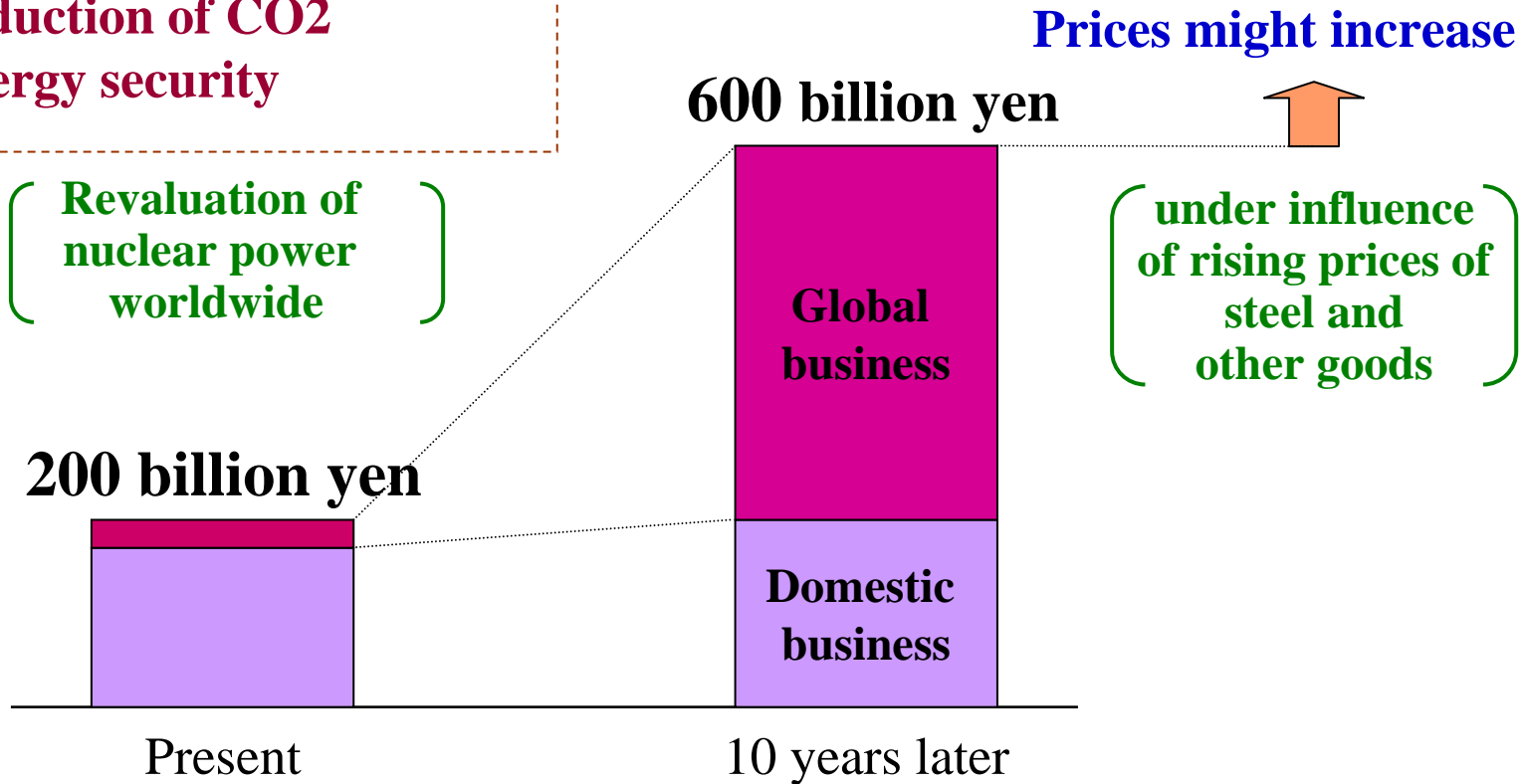
- (1) Steadily promoting the nuclear energy business, based on domestic operations
- Ensuring the safety and security of existing PWR plants in operations (with state-of-art technology of preventive maintenance)
 - Steadily proceeding with plants under construction and new plants
 - Accelerating the development of FBR as a core manufacturer in Japan
 - Constructing Building and supporting the reprocessing plants and participating in J-MOX
- (2) Accelerating global development for the future
(Developing global strategic reactors adopting the comprehensive PWR technologies)
- Original development: 1700MWe US/EU-APWR
 - Joint development: 1100MWe ATMEA1
(AREVA of France)
 - 170MWe PBMR
(PBMR of South Africa)

3. Medium and Long-Term Business

Medium and long terms (ten years later)
⇒ Increase business three times as much

- Soaring fossil fuel prices
- Reduction of CO2
- Energy security

→ (Revaluation of nuclear power worldwide)



4. Characteristics of Nuclear Energy Business

Nuclear energy business has the following characteristics:

- (1) Society accepts it only after realizing “safety and security”
⇒ Establishing quality and reliability through manufacturing capability is critical
- (2) It is a very long-term business
⇒ Maintaining and enhancing resources (human and facility etc) is necessary
- (3) Relations with export destination are also key factors
 - (i) Ratification of the Nuclear Non-proliferation Treaty
 - (ii) Acceptance of IAEA inspections
 - (iii) Agreements on peaceful use of nuclear energy between governments, etc.

5. (1) Domestic Operations

(1) Comprehensive preventive maintenance for ensuring the safety and security of the existing plants (prevention of trouble)

- Safety assessment and , reinforcement for earthquake resistance
- Measures to preserve Inconel Alloy 600 and other materials etc.



(2) Completion of Hokkaido Electric Tomari Unit 3 and rapid materialization of APWR

(3) Stable supply of high-quality fuel and early establishment of fuel cycles

(4) Reflect overseas malfunctions to domestic plants swiftly (horizontal development of trouble prevention)

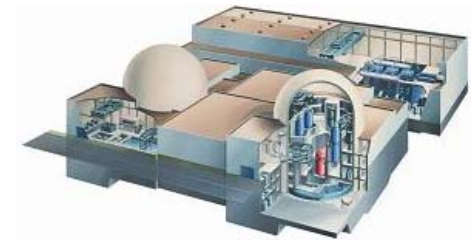


5. (2) Domestic New Plant

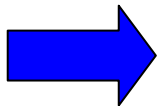
(1) Hokkaido Electric Tomari Unit 3:
(Operation scheduled in December
next year)



(2) The Japan Atomic Power Tsuruga Units 3 and 4:
Under safety examination
(the largest APWR plant in Japan)
Unit 3: Operation scheduled in Mar. 2016
Unit 4: Operation scheduled in Mar. 2017



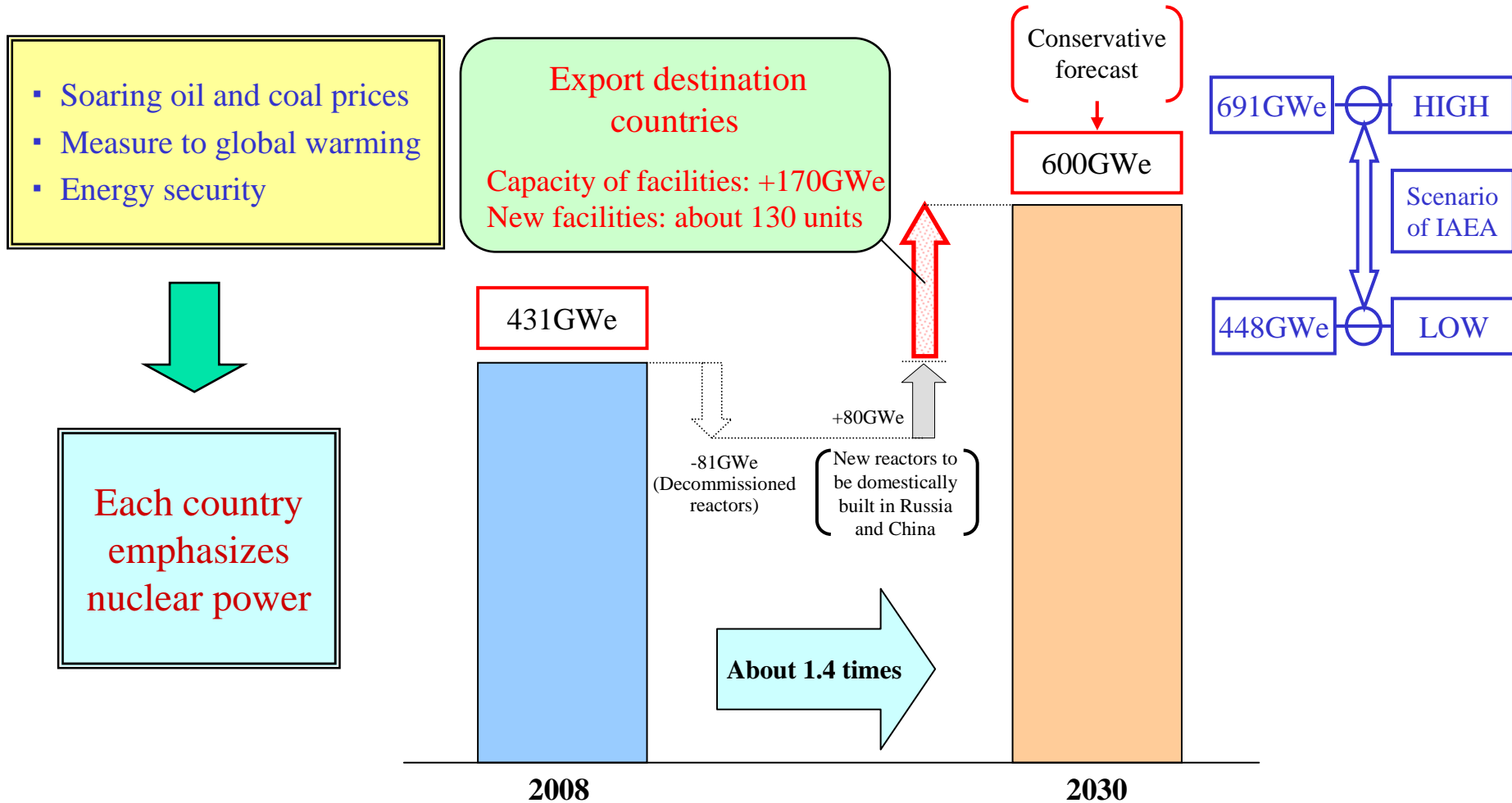
(3) Kyushu Electric Sendai Unit 3:
Operation scheduled in late 2010s



- (i) APWR plant is deployed with design standardization and community in and outside Japan
- (ii) Technical capability is maintained and improved in preparation for domestic demand for replacement plants which occurs around 2030

6. (1) Global Operations

[World nuclear power market]

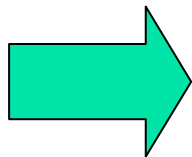


Source: "Trends in world nuclear power generation development 2007/2008" published by Japan Atomic Industrial Forum (forecast of electric capacity of the power plants in operation and under construction for 2008) and forecast for 2030 by IAEA (2007)

6. (2) Global Operations

Basic policy on global strategy

- Demonstrate overall manufacturing capability
(construct high-quality plants, maintaining delivery)
- Full lineup of nuclear reactors
 - US/EU-APWR (Large-sized)
 - ATMEA1 (Mid-sized)
 - PBMR (Small-sized)
- Strengthening global alliances

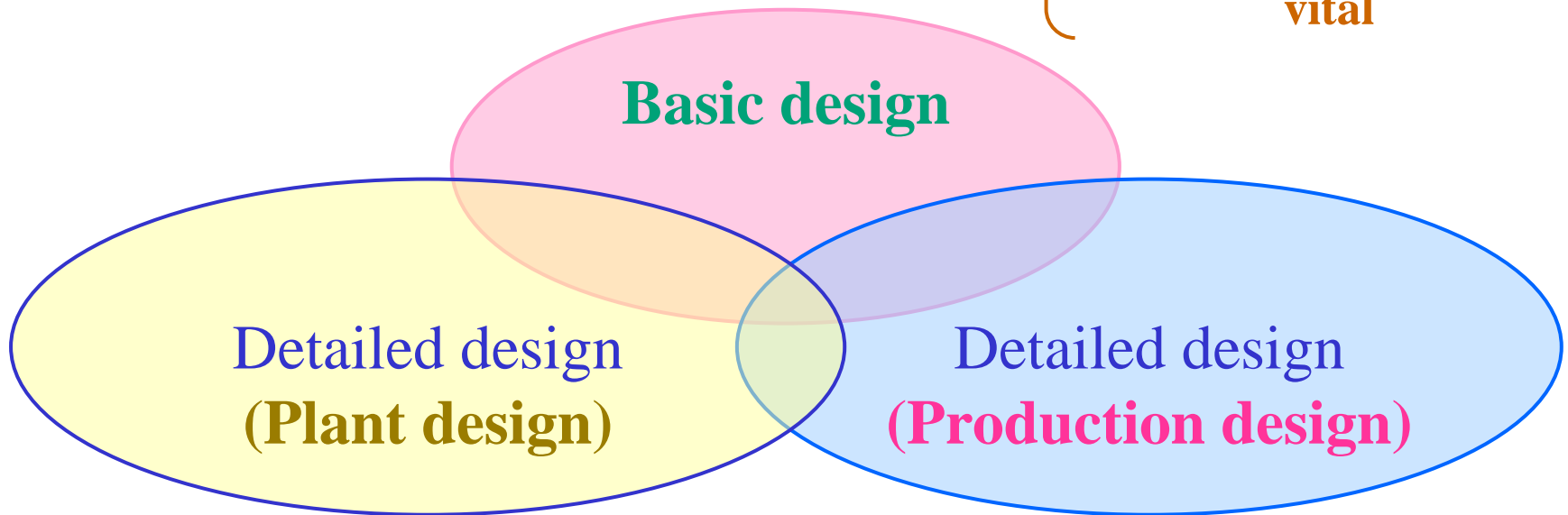


Global share to realize: 25-30%
(Continue to receive orders of approx. two units per year)

6. (3) Global Operations

Capability of craftsmanship

Consolidating a full
lineup of technologies is
vital



Detailed design
(Plant design)

Detailed design
(Production design)

[EPC Capability]

- Know-how of nuclear plant engineering
- Know-how of required specifications for nuclear plant
- Procurement and construction management capabilities

[Craftsmanship]

- Up-to-date manufacturing facilities
- Manufacturing know-how accumulated for years
- Passing down of technologies and skills supported by craftsmanship

6. (4) Global Strategic Reactors : Features

		Large reactor	Medium-sized reactor
		US-APWR 1700 MWe	ATMEA1 1100 MWe
Plant performance	Thermal efficiency	The world's maximum output 39%	39%
Economic efficiency	Power generation cost	Minus 5% to 10%	Minus 5% to 10%
Safety	Measure against airplane crash	Yes	Yes
Reliability	Long-term operation cycle	24 months	24 months
Siting	Applicable standards, measure against severe earthquake	Adaptable worldwide	Adaptable worldwide

6. (5) Global Strategic Reactors: Present Status

US-APWR

[Marketing in where the large electricity demand exists (USA and Europe)]

(Large state-of-the-art reactor in 3rd generation)

- (1) Applied for DC officially in December last year
(Docketed in February this year)
- (2) Conducting operations supporting the COL application of
Luminant (planned in September)
- (3) Applied for certification of
adaptability to European
Standard (EUR)
(EU-APWR)



US-APWR

MHI

6. (6) Global Strategic Reactors: Present Status

ATMEA 1

[Marketing in East Europe, Asia etc.]

(Medium sized state-of-the-art reactor in 3rd generation)

- (1) Developing in joint venture with AREVA
- (2) Basic design completes
in 2009

Marketing starts in 2010



AREVA

ATMEA1

MHI

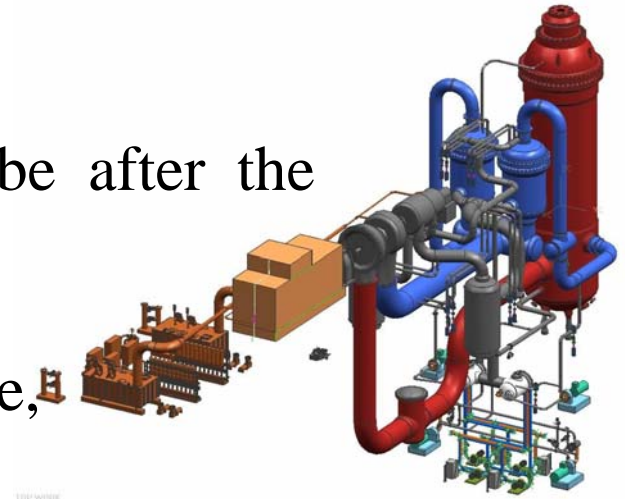
6. (7) Global Strategic Reactors: Present Status

PBMR

[Planning 24 commercial reactors in South Africa]

(Small-sized state-of-the-art and strategic high-temperature gas-cooled reactor)

- (1) Developing demonstration reactors
(start operation in 2013)
- (2) Constructed 24 commercial reactors to be after the demonstration reactor operates
- (3) Components that MHI is responsible are,
 - (i) Core barrel
 - (ii) Helium gas turbine, electric generator

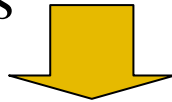


PBMR

6. (8) Strategies in China and Southeast Asia

(1) China

- Localization of new plant is inevitable due to the national policy
- Challenge the component business jointly with Chinese manufacturers



Received orders of turbine facility for
Sanmen and Haiyang
(Consortium with the Harbin Group)

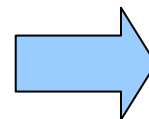


(2) Southeast Asia (Indonesia, Vietnam)

- Participating in international cooperation programs of the Japanese government, and marketing in the future

7. (1) How to realize Our Vision

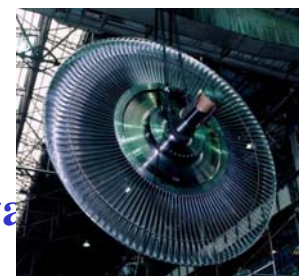
Priority investment for mass-production



Enhancing production capacity

(1) Special factory for nuclear turbine [Takasago Machinery Works]

- (i) Expanding production capacity about twice as much (for ultra large size and high efficiency)
- (ii) Began strengthening facilities in FY2007



(2) Special factory for reactor vessel and core internals [Kobe Shipyard Machinery Works]

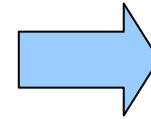
- (i) Expanding the production capacity about twice as much (for large size and special structure)
- (ii) Shortening production periods 30%



(3) Reinforced steam generator production facility already

7. (2) How to realize Our Vision

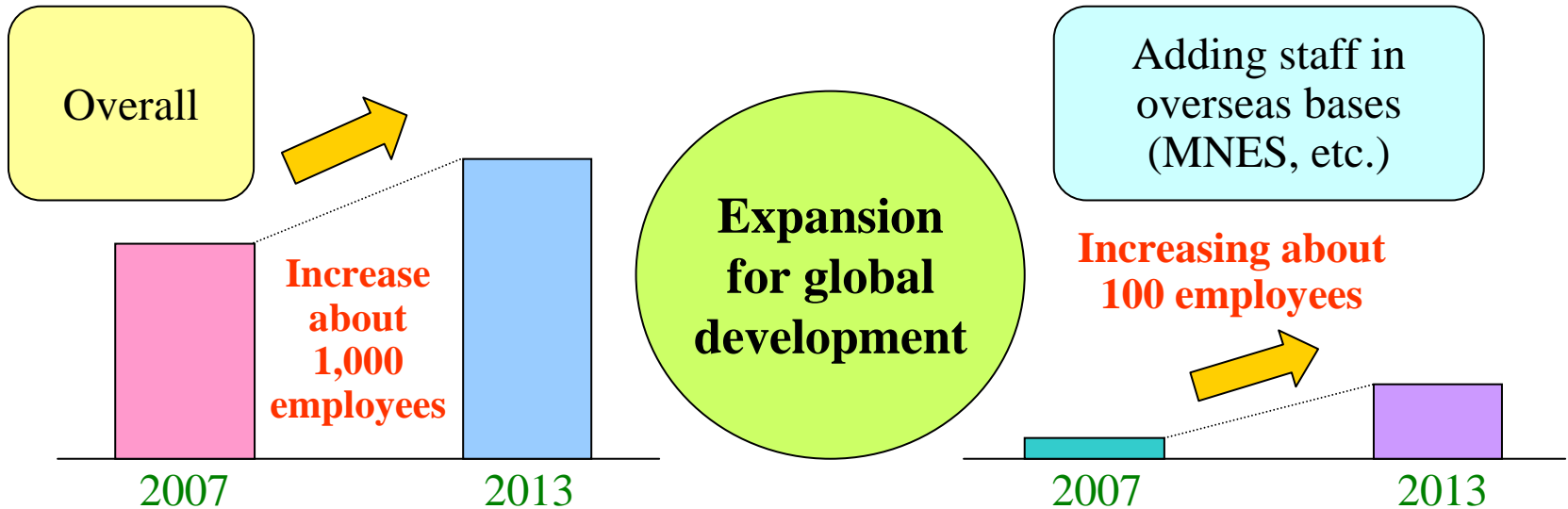
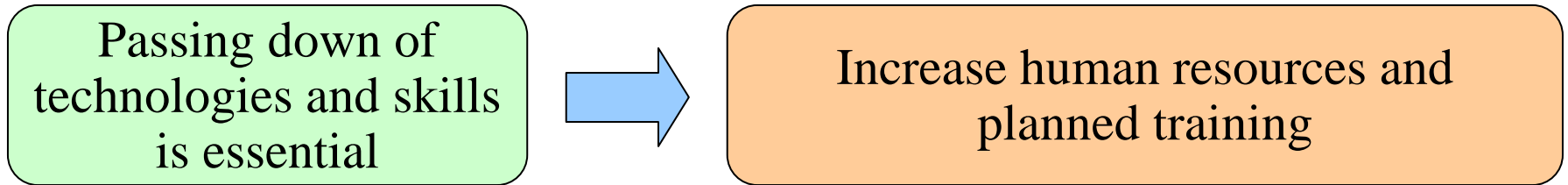
Enhancing our ability to deal with
the global market



Global alliances

Partner	Object operations business
AREVA	ATMEA1, nuclear fuel, EPR major component, and GNEP
Harbin Group	Turbine component for China
Major U.S. construction company	US-APWR plant construction
Major U.S. engineering company	U.S. maintenance business
COMEX	Service business for France

7. (3) How to realize Our Vision



- (1) Basic strategy for increasing employee
- (i) Reinforce the design engineer in advance
 - (ii) Increase manufacturing personnel steadily

- (2) Human resources development program
- (i) System for enhancing the basic skills of design engineers
 - (ii) Craftmanship school

**“A comprehensive nuclear energy company”
that leads the world**

**Through development, design, manufacture,
construction, operation, and maintenance,**



**We contribute to the planet with safety and
security of nuclear energy.**