

# Power Systems Business Strategy

Hitachi IR Day 2012

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**President & CEO**

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**Power Systems Company,**

**Hitachi, Ltd.**

# Power Systems Business Strategy

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- 1. Business Overview and Market Environment**
2. Business Policy and Growth Strategy
3. Thermal Power Business
4. Nuclear Power Business
5. Transmission & Distribution, Renewable Energy and Other Businesses
6. Business Performance Trends and Targets
7. Conclusion

## Thermal Power Business

Coal-fired thermal power plants    Gas turbines



Major equipment of coal-fired thermal power plants

Steam turbines



Boilers



AQCS



## Nuclear Power Business

Boiling water reactor nuclear power plants (ABWR, ESBWR)



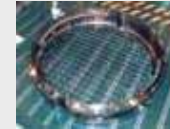
Preventive maintenance, nuclear fuel cycle, etc.

Major equipment of nuclear power plants

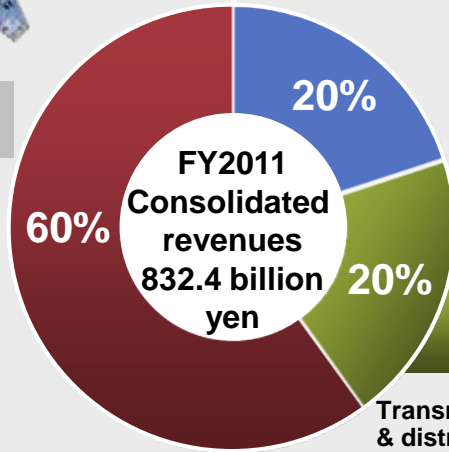
Reactor pressure vessel



Reactor component



Main Control Room Panel



## Transmission & Distribution, Renewable Energy and Other Businesses

Transmission & distribution systems



Wind power Generation systems



Photovoltaic power generation systems

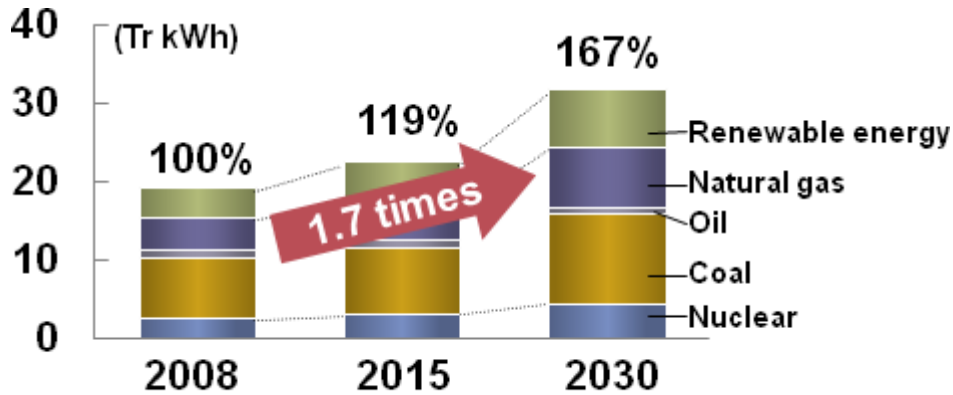


Proton beam therapy systems



Hydroelectric power generation systems, drive systems, smart grids, power semiconductor, etc.

## World Electricity Generation by energy source



Source:「International Energy Outlook 2011」

■ **World electricity generation is expected to grow by approx. 1.7 times (from 2008 to 2030)**

### ■ Market trends

- Steady growth in coal-fired thermal power plants
- Increasing demand for AQCS due to national regulation
- Many countries going ahead with nuclear power plans
- Accelerated adoption of renewable energy
- Expansion of power transmission and distribution market

## Market trends by region

### Europe

- **Shift in demand for new coal-fired thermal power plants from Western to Eastern Europe (Including rehabilitation demand)**

### Japan/Asia

- **Increased planning of new supercritical coal-fired thermal power plants**
- **Stricter environmental regulations in China, increasing demand for gas turbine (GT) systems for distributed power sources**

### Americas

- **GTCC market expansion due to increase shale gas production**
- **More stringent environmental regulations in the U.S.**

## FY2010-FY2011 Results

(Billion yen)

	FY2010 (Actual)	FY2011 (Actual)	YoY
Revenues	813.2	832.4	102%
Operating income (loss)	22.0	33.9	56.0



### Revenues

Slight increase in revenues mainly due to steady growth in the thermal power generation systems business in Japan, despite a decline in nuclear power generation systems due sales to the impact of the Great East Japan Earthquake.

### Operating income

Deterioration primarily reflected additional expenses and delays related to difficulties experienced with some boiler materials in European thermal power generation systems projects.

# 1-4 Acceleration of Global Business Development

## Lithuania

Signed Concession Agreement for new nuclear power plant



## South Korea

Received order for No. 9 and No. 10 units at the Taean Thermal Power Plant

Two 1,050 MW-class systems, the largest thermal power generation equipment in terms of power generation capacity in South Korea



## U.S.

No. 1 proton beam therapy (PBT) systems order share (FY2011)

■ 3 systems ordered in FY2011



## China

Began operations at new DeNOx catalyst factory



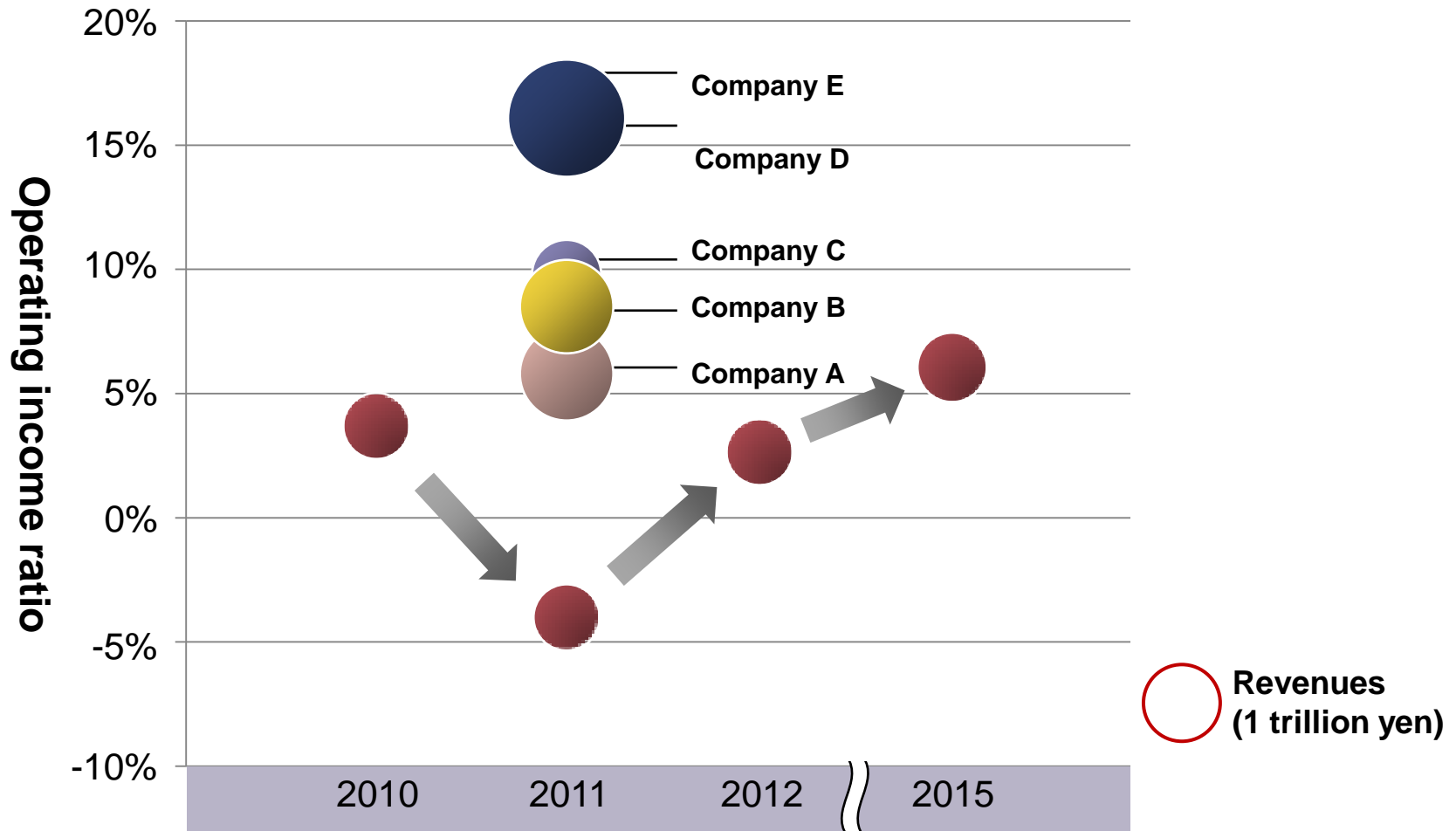
## Americas

Received order for H-25 gas turbines

## India

Received order for super critical coal-fired thermal power projects





## Target

- Establishment of the stable profit base
- Acceleration of the global management

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## Move from recovery to growth

**Strengthen business base**

**Establish high-profit structure**

**Build optimal business structure**

**Grow in global markets**

**Expand in strategic business fields**

**Gas turbines, renewable energy, AQCS, etc.**

**Bolster global R&D**

**Accelerate development of next-generation products**

## Fundamentally review cost structure

### Powerfully execute “Hitachi Smart Transformation Project”

#### Direct materials

**Expand overseas procurement and engineering**

**Double global procurement ratio at FY2015**  
(to over 70% in the thermal power business)

#### Production

**Globalize value chain**

Increase utilization of overseas production bases (China, India, etc.)

#### Indirect

**Eliminate overlapping, distributed common tasks**

## Restore trust, strengthen project management

- **Bolster MONOZUKURI (manufacturing) capabilities and enhance training for engineering by developing and utilizing human resources**
- **Enforce risk management by using people with experience in EPC**

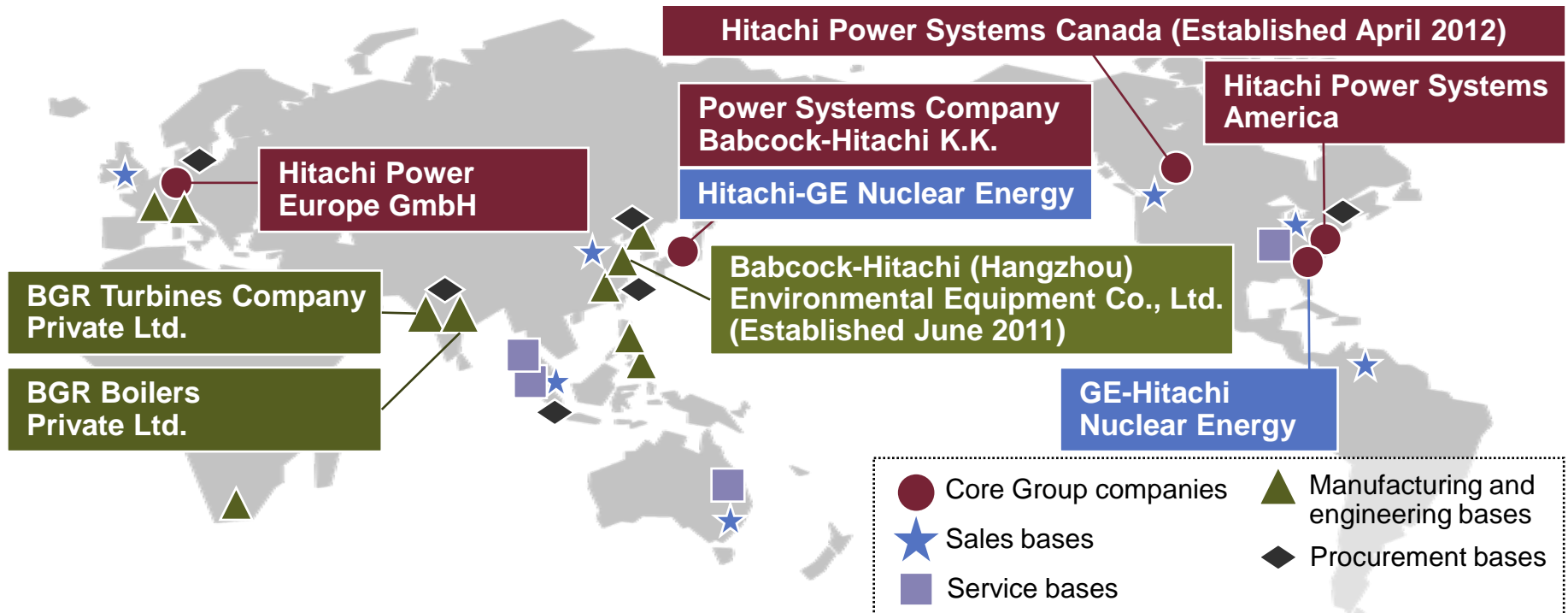
### Quick resolution on boiler material issues

Identified cause of welding cracks in boiler materials developed on a German national project; Completed tests on improvement methods (currently implementing improvements in actual plants)

# 2-3 Build Optimal Global Business Structure

## Provide solutions to target markets by expanding and enhancing global bases

- Expand and enhance sales functions of overseas bases  
(India, South Africa, Dubai, etc.)
- Make integrated proposals from power generation to transmission & distribution
- Expand and enhance overseas procurement, overseas production and overseas engineering



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**Revenues** FY2011: 490 billion yen ➡ FY2015: 500 billion yen

## Accelerate global business development

- Focus on coal-fired thermal power in Asia and Eastern Europe
- Expand gas turbine sales globally
- Expand service maintenance business globally



## Expand businesses with strategic products

- Gas turbines
- Air Quality Control Systems, DeNOx catalysts
- Development of coal-fired, IGCC and CCS technologies



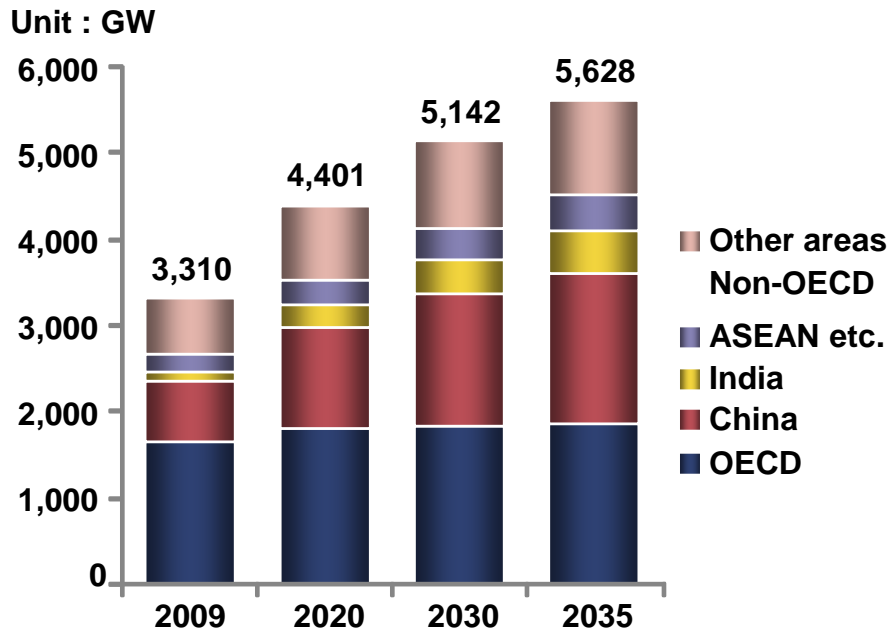
## New markets

- Expand in emerging markets, particularly in Asia
- Coal-fired systems expand in emerging markets, and gas-fired systems in all regions

## Service Maintenance Market

- Renewal of aging thermal power systems and increasing demand for large-scale refurbishment, especially in Europe and the U.S.

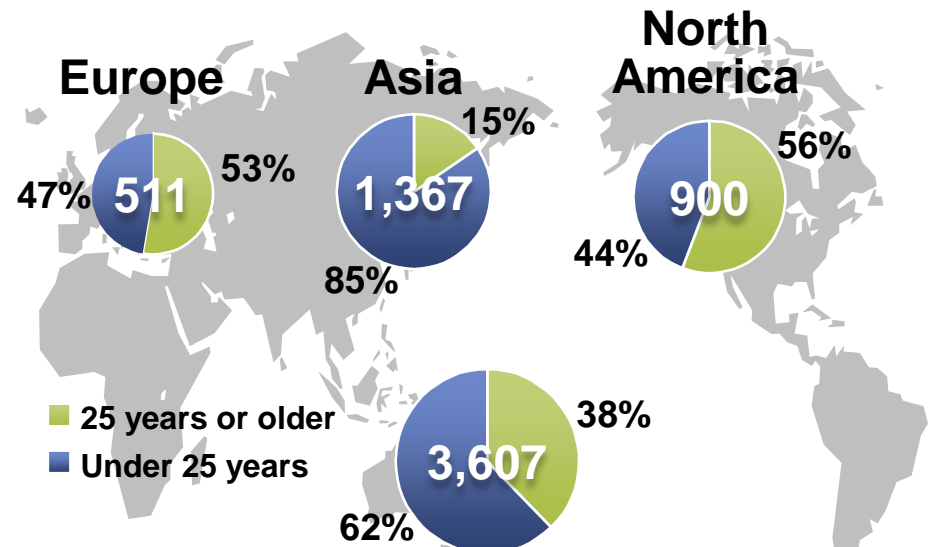
Estimation on Thermal Power Generation Capacity



Source : IEA WEO 2011

Aging Status of Thermal Power Plants

Unit : GW



Source : Hitachi estimation based on UDI data

**Worldwide total**  
(25 years or older: 38%)

## Expand business through three core bases (Japan, Europe and the Americas) and India

■ Constructing highly efficient coal-fired thermal power plants: 30 plants (26.4 GW)\* under construction

### Europe, South Africa

- Neurath (Under commissioning) B [1100MW x 2]
- Moorburg (Under construction) B [820MW x 2]



- Wilhelmshaven (Under construction) BTG [790MW]
- Rotterdam (Under construction) BTG [790MW]



- Medupi-1 ~ 6 (Under construction) B [800MW x 6]
- Kusile-1 ~ 6 (Under construction) B [800MW x 6]



### Asia

- TEPCO/Hitachinaka No. 2 unit (Under construction) BTG [1,000MW]



- South Korea/Yonghung Thermal Power Plant No.5 and No.6 unit (Under construction) TG [870MW x 2]



- South Korea/Dangjin Thermal Power Plant No. 9 and No.10 unit (Preparing for construction) B[1,000MW x 2]

### Recent orders

- South Korea/ Taeon Thermal Power Plant, Units No. 9 and No. 10 units [1,050MW x 2]BTG
- India/ NTPC [660MW x 6]B
- India/ NTPC [800MW x 4] (First refusal right)TG

<H-25 gas turbines>  
6 orders from China, India, etc.

### Americas

- Duke Energy (Under commissioning) B [900MW]



### Recent orders

- U.S./ KCP&L AQCS x 2

<H-25 gas turbines>  
4 orders from Canada, etc.



## Expand and enhance global production bases

### ■ Dalian Hitachi Machinery & Equipment Co., Ltd.

- Bolster gas turbine production base
- Begin operations at a casting shop (Scheduled for July 2012)

Image of new plant



### ■ Babcock-Hitachi (Hangzhou) Environmental Equipment Co., Ltd.

- Cope with market expansion for DeNOx catalysts in China
- Constructed local production facility (Start of production in June 2012)



### ■ India/ BGR-T and BGR-B

- Bolster production bases
- Strengthen business in Indian market

## Strengthen plant business

- Cooperate with local partners
- Strengthen overseas engineering functions

## Strengthen service maintenance business globally

- Strengthen service maintenance business in North America
- Expand business through M&As

## Gas turbines

### H-25 gas turbine order track record: 151 units

- n Fuel diversification (Develop fuel combustors)
- n Strengthen business on distributed power source market

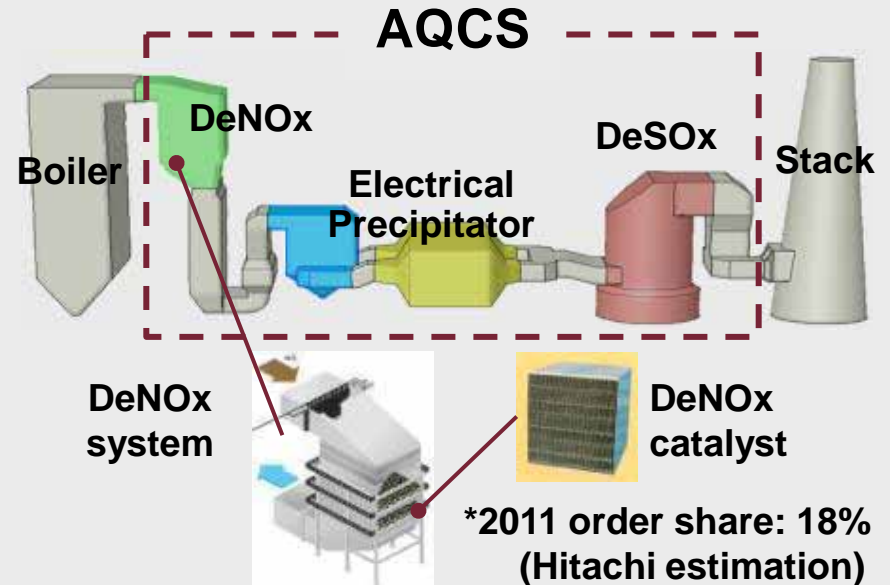


### H-80 gas turbine

- n Develop new markets in Japan
- n Actively develop overseas markets (Start of order-winning activities)



## AQCS, DeNOx catalysts



### AQCS

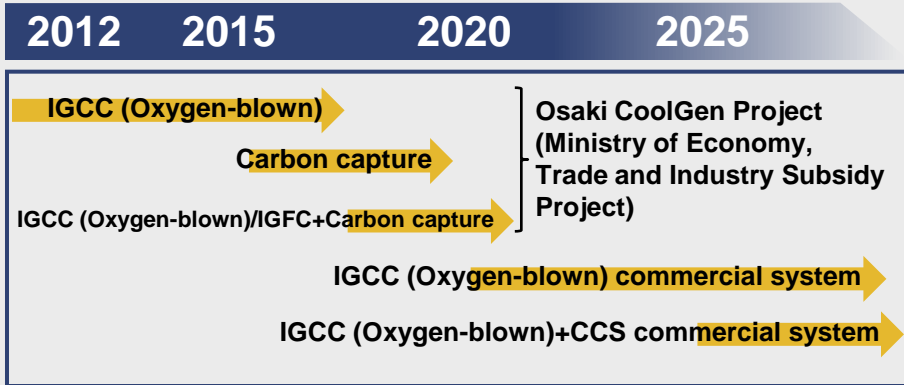
- n Cope with stricter environmental regulations in the U.S. and Europe

### DeNOx catalysts (No. 1 world share\*)

- n Cope with stricter NOx emission regulations in China

## IGCC (Oxygen-blown IGCC)

### Early commercialization with accelerated demonstration test



<b>Gasifier</b>	1,100 tons/day
<b>Combined cycle</b>	170 MW class

Scheduled to begin construction in March 2013  
(Currently conducting environmental assessment)

## CCS (Carbon Dioxide Separation · Capture)

- Accelerate Commercialization
  - Signed an agreement with Canada's Saskatchewan Power Corporation to jointly construct a Carbon Capture Test Facility (March 2012)
  - [Chemical scrubbing; amount of carbon to be captured: 120 tons/day]



Signing ceremony



Image of CCTF

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**Raise the safety of nuclear power generation as an effective source of energy for curbing CO<sub>2</sub> emissions to meet continuing global demand.**

**Revenues** FY2011: 160 billion yen  FY2020: 360 billion yen

**Lend support for medium- to long-term countermeasures related to the Fukushima Nuclear Power Station**

- Remove fuel from spent fuel storage pool in Unit No. 4
- Offer interim storage, eventual reactor decommissioning

**Offer services for the nuclear power sector in Japan and develop next-generation reactors**

- Promote enhanced safety (existing and new power plants), offer interim storage facilities
- Develop even safer ABWR, next-generation reactor technologies

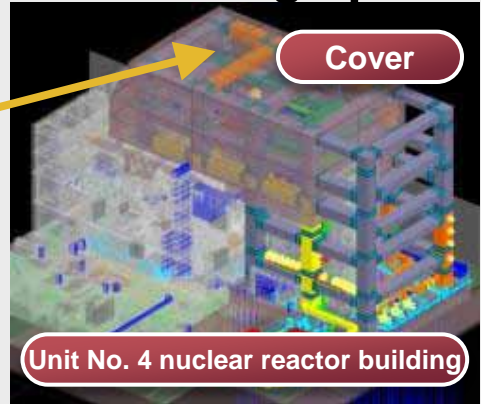
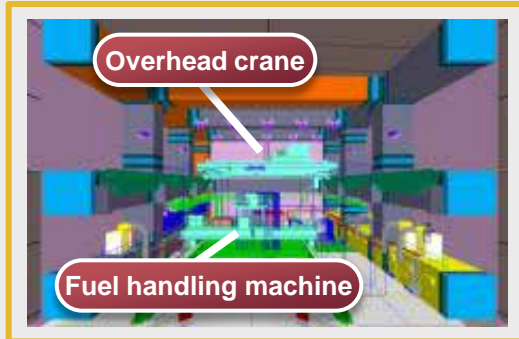
**Step up development of overseas business**

- Work on Lithuania Visaginas Nuclear Power Plant contract
- Focus on expanding sales to countries moving forward with plans to construct new nuclear power station



## Offer interim storage, eventual reactor decommissioning

### ■ Survey rubble and remove fuel in Unit No. 4 spent fuel storage pool

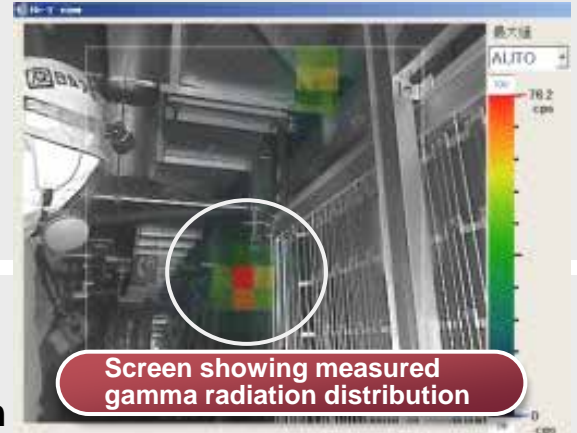


### ■ Promote development of technologies for removing damaged fuel (Participate in national project)

- n Remote decontamination inside building
- n Identification of leaks, repair and internal survey in primary containment vessel
- n Evaluate soundness of reactor pressure vessel and primary containment vessel

### ■ Monitoring in decontamination and measurement of radiation dose distribution

- n Development for gamma radiation distribution measuring system



## Propose safety-enhancement countermeasures

- Emergency safety countermeasures (Medium to long term)
- Severe accident countermeasures

Air-cooled emergency diesel power generator, filter vent system, upgrade cooling function, instrumentation system, etc.

## Interim storage

- Produce casks\* for spent fuel storage

\* 50 casks have been delivered to Recyclable-Fuel Storage Company



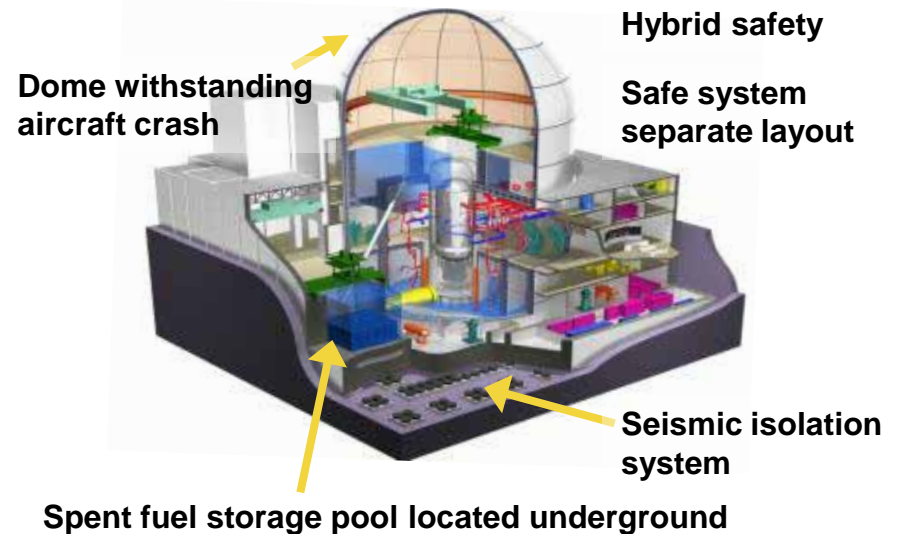
## Develop safety technologies

- Safety meets regulation requirements of international marketplace

Reflect proven latest ABWR and Fukushima countermeasures in development

- World-class safety (Next-generation ABWR)

Strengthen ability to handle external events

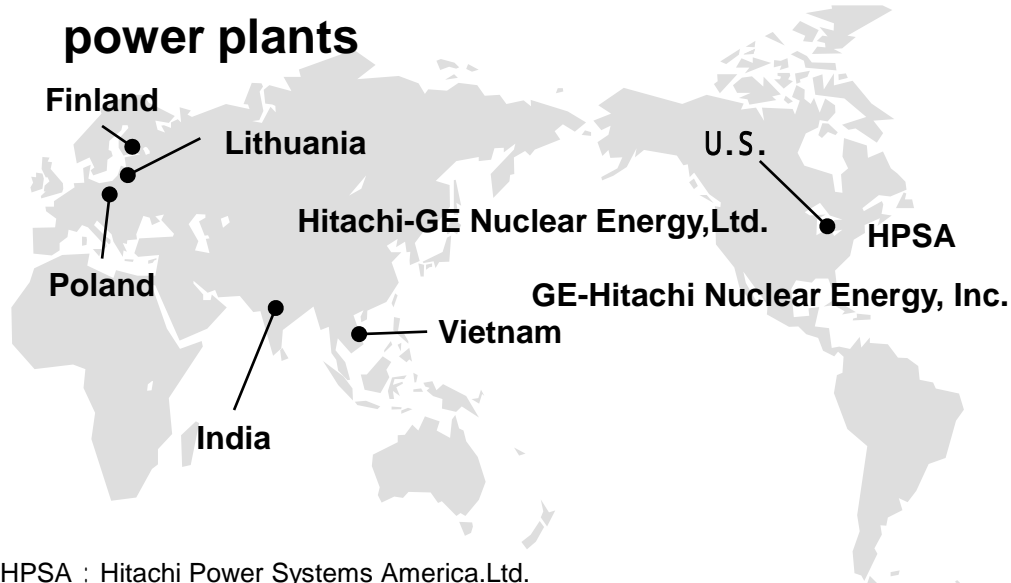




Accelerate overseas development of the nuclear power systems business under the “One Team” framework with GE

- **Lithuania Visaginas Nuclear Power Plant**
- **Signed Concession Agreement for constructing the plant**
  - Enhanced-safety ABWR
  - Scheduled to commercial operation in 2021

- **Focus on countries pushing ahead with the construction of new nuclear power plants**



HPSA : Hitachi Power Systems America.Ltd.



- **Promote global maintenance and service business**
- **Jointly develop small reactors with thermal use with Canada's Saskatchewan Province**

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**Revenues** FY2011: 180 billion yen ➡ FY2015: 270 billion yen

## Transmission & Distribution Business

- Offer everything from components to systems
- Expand systems integration business



## Renewable energy business

- Expand orders for wind and photovoltaic power generation systems
- Develop power grid connection and output power stabilization technologies



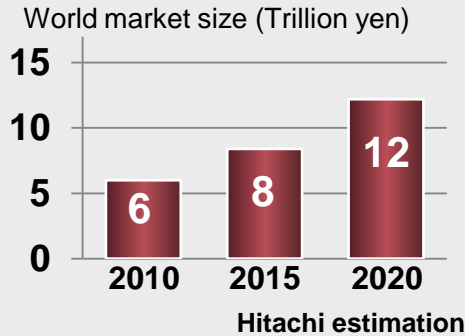
## Particle beam therapy business

- Expand business through leading edge technologies such as spot scanning technology\*, and outstanding operational track records in Japan and the U.S.



\* Compatible with beam scanning system

## Market trends



- Increased construction of grids in emerging markets and renewal of aging systems in industrialized nations
- Long-distance power transmission and HVDC (High-voltage direct current) due to enhanced wide-area grids
- Needs to strengthen power grids due to the increased introduction of renewable energy
- Acceleration in use of smart grids

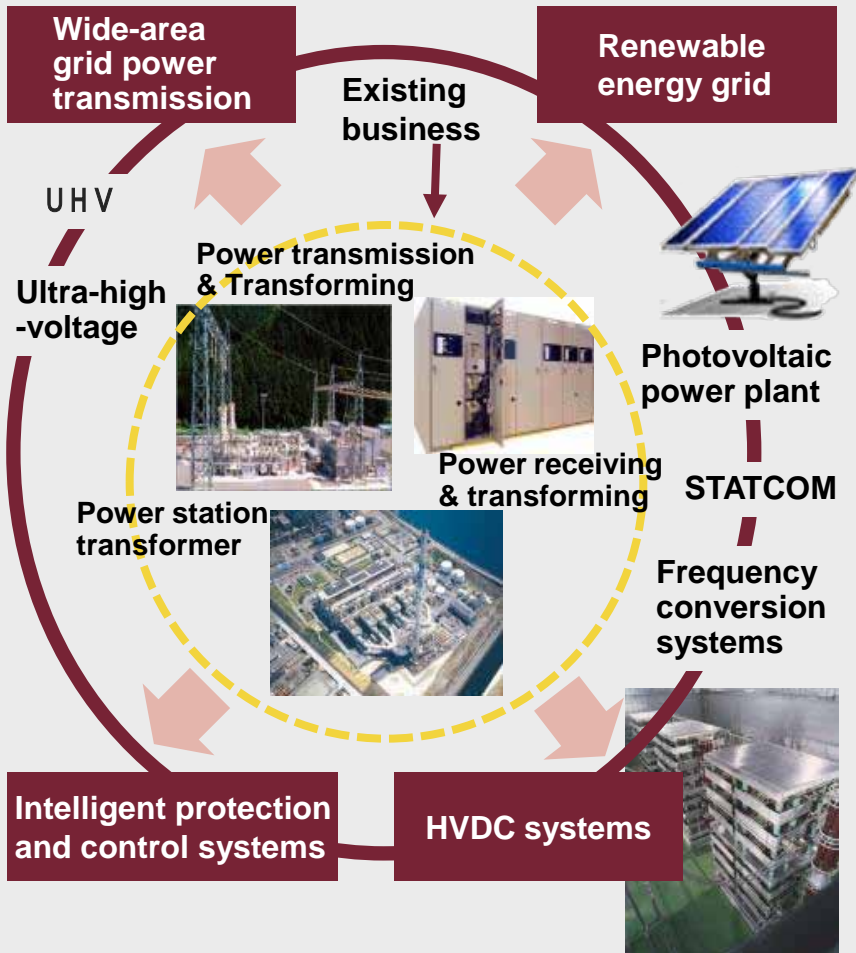
## Business strategy

- Established Transmission & Distribution Systems Division to spearhead systems integration business expansion
- Strengthen and accelerate ultra-high voltage, HVDC and smart grid businesses
- Established Transmission & Distribution Division at Hitachi Research Laboratory to strengthen technology and product development

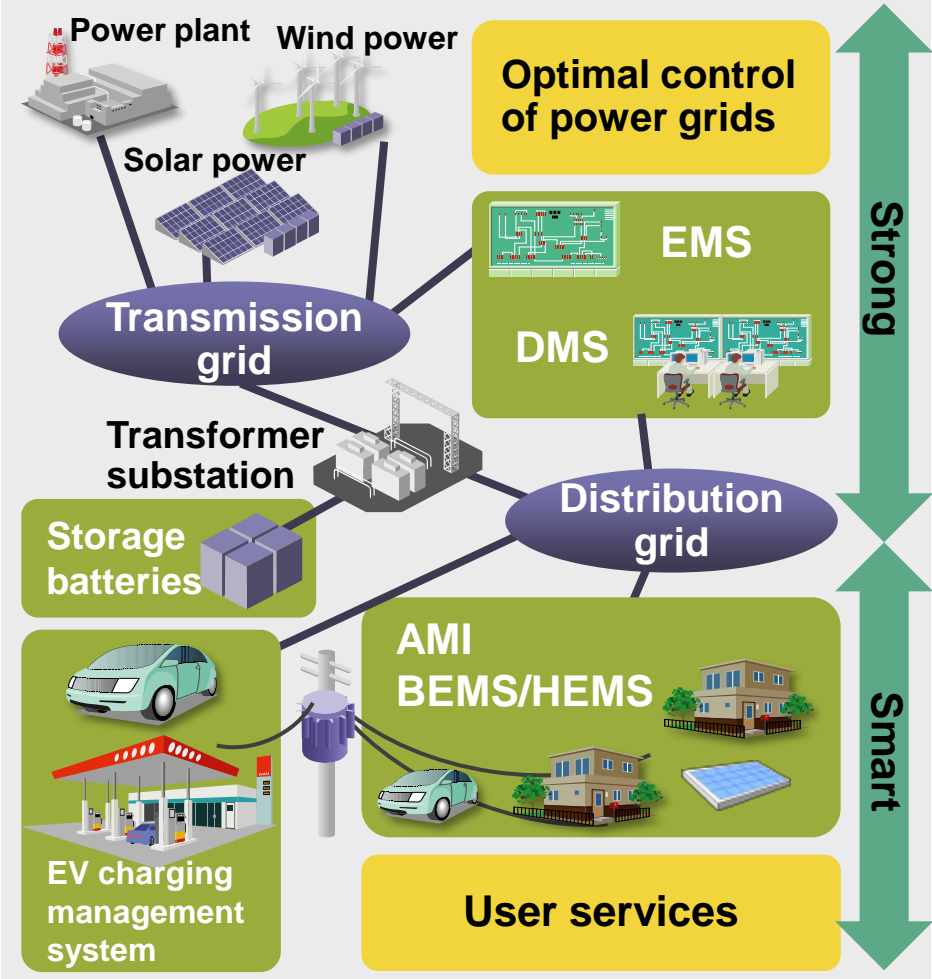


# 5-3 Transmission & Distribution Business (2)

Develop from a power transmission & transforming equipment business to a systems business



Fuse power transmission & transforming systems and IT to create strong and smart grids



UHV : Ultra High Voltage STATCOM : A static synchronous compensator HVDC : High Voltage Direct Current EMS : Energy Management System  
DMS : Distribution Management System AMI : Advanced Metering Infrastructure EV : Electric Vehicle  
BEMS : Building Environment and Energy Management System HEMS : Home Energy Management system



## 800 kV GCB for the U.S.



## Transformers for Saudi Arabia



## UHV (1,100 kV) GCB for China



## Comprehensive agreement signed with Russia's Federal Grid Company

- **Promote demonstration trials relating to power transmission & distribution**
  - **Improve energy efficiency at EMS and load dispatch center**
  - **Remote monitoring and diagnosis of transformer substations and improvement of safety and reliability of large power grids**

## Wind power systems

- Business transfer from Fuji Heavy Industries
- Integrated business from EPC to maintenance
- Development next-generation systems and step up sales expansion
  - n 2 MW system for low wind speeds, large system for offshore use

Target : No. 1 share in Japan  
(100 units/year) at FY2015

## Photovoltaic power systems

- Integrate systems in step with needs
  - n Large-project coordination
  - n Highly efficient, highly profitable systems
  - n Mega solar grid interconnection technology

## Output stabilization systems for system promotion

- Output power stabilization technologies  
(Storage battery system)

EPC : Engineering, Procurement and Construction(Turn-key solution for system construction)

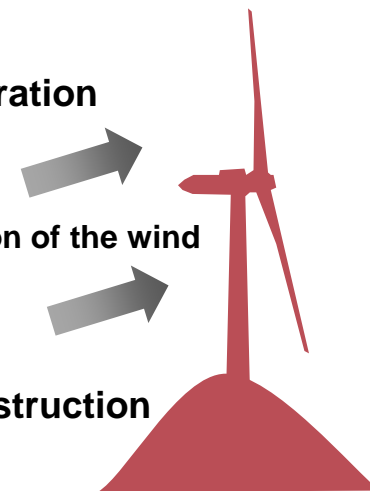
## Characteristic of the downwind-type wind turbines

(vs. upwind-type wind turbines)

- n 8% increase in electricity generation (Updraft)

direction of the wind

- n Reduction in foundation construction



## Japan's largest class mega-solar systems (13 MW-class)



Ogishima Solar Power Plant, TEPCO



## Market trends

- Number of patients treated by particle beam therapy increasing around the world

## Business policy

- Promote the advanced particle beam technology in global markets
- Achieve high system availability through long term maintenance contracts.
- Targets: 3 system orders per year, 30% market share

## Increase new orders

- High system availability in Japan and the U.S.
- Hitachi leading edge technologies including spot scanning technology are highly appreciated by prominent universities and hospitals
  - n University of Tsukuba
  - n The University of Texas: M.D. Anderson Cancer Center
  - n Nagoya City
  - n Mayo Clinic, U.S.
  - n Hokkaido University
  - n Prominent child cancer treatment center in U.S.



Nagoya City: Treatment room



Hokkaido University: Building construction

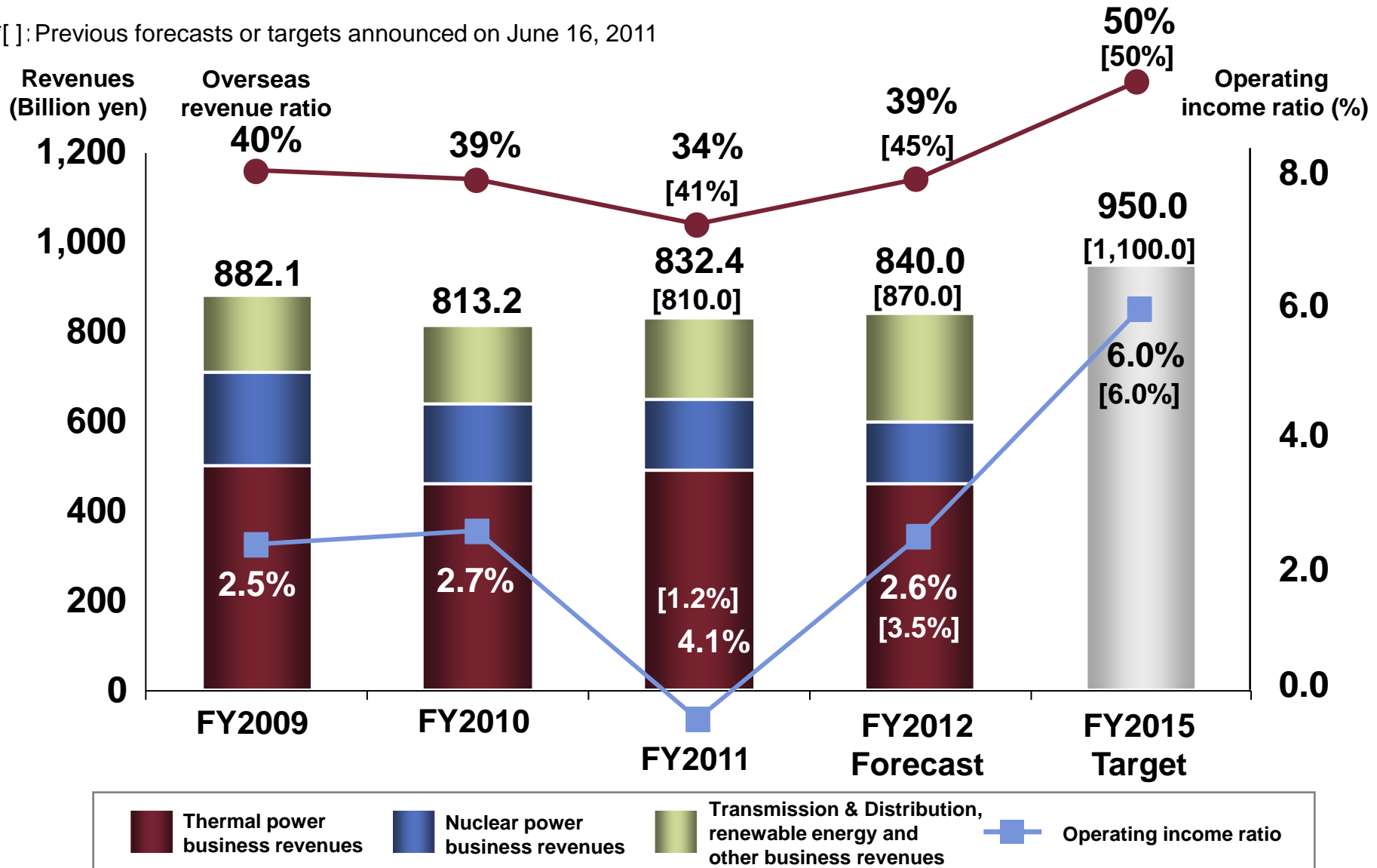
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# 6-1 Business Performance

\*[ ]: Previous forecasts or targets announced on June 16, 2011



## 6-2 Differences From Previous Forecast

### FY2011(Actual) · FY2012(Forecast) · FY2015(Target)

(Billion yen)

		FY2011(Actual)	FY2012(Forecast)	FY2015(Target)
Revenues	Previous forecast	810.0	870.0	1,100.0
	Actual and revised forecast	<b>832.4</b>	<b>840.0</b>	<b>950.0</b>
Operating income ratio	Previous forecast	1.2%	3.5%	6.0%
	Actual and revised forecast	<b>4.1%</b>	<b>2.6%</b>	<b>6.0%</b>
Overseas revenue ratio	Previous forecast	41%	45%	50%
	Actual and revised forecast	<b>34%</b>	<b>39%</b>	<b>50%</b>

### Main differences

	FY2012(Forecast)	FY2015(Target)
Revenues	Revised targets due to change in overseas thermal power systems markets such as Europe	
Operating income ratio	Lower revenues, etc.	Same as previous forecast by establishing a stable earnings structure

## FY2011 Results and FY2012 Forecast

(Billion yen)

	FY2011(Actual)	FY2012(Forecast)	YoY
Revenues	832.4	840.0	101%
Operating income (loss)	33.9	22.0	+55.9



### Revenues

Forecasting a 1% YoY increase in revenues, with lower sales from nuclear power generation systems, and thermal power generation systems in Japan offset by robust growth for thermal power generation systems, especially in emerging countries, in addition to high sales from the renewable energy business, etc.

### Operating income

Expect to see a return to pre-disaster-level earnings due to the absence of one-time expenses incurred in FY2011, stronger project management, and cost-cutting programs.

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The World Market Leader Advancing the Future Global Society with Evolutionary Energy Technologies

## Establish a stable earnings structure



### FY2015 targets

- **Revenues: 950 billion yen**
- **Overseas revenue ratio: 50%**
- **Operating income ratio: 6%**



# Cautionary Statement

Certain statements found in this document may constitute “forward-looking statements” as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such “forward-looking statements” reflect management’s current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as “anticipate,” “believe,” “expect,” “estimate,” “forecast,” “intend,” “plan,” “project” and similar expressions which indicate future events and trends may identify “forward-looking statements.” Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the “forward-looking statements” and from historical trends. Certain “forward-looking statements” are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on “forward-looking statements,” as such statements speak only as of the date of this document.

Factors that could cause actual results to differ materially from those projected or implied in any “forward-looking statement” and from historical trends include, but are not limited to:

- economic conditions, including consumer spending and plant and equipment investment in Hitachi’s major markets, particularly Japan, Asia, the United States and Europe, as well as levels of demand in the major industrial sectors Hitachi serves, including, without limitation, the information, electronics, automotive, construction and financial sectors;
- exchange rate fluctuations of the yen against other currencies in which Hitachi makes significant sales or in which Hitachi’s assets and liabilities are denominated, particularly against the U.S. dollar and the euro;
- uncertainty as to Hitachi’s ability to access, or access on favorable terms, liquidity or long-term financing;
- uncertainty as to general market price levels for equity securities, declines in which may require Hitachi to write down equity securities that it holds;
- the potential for significant losses on Hitachi’s investments in equity method affiliates;
- increased commoditization of information technology products and digital media-related products and intensifying price competition for such products, particularly in the Digital Media & Consumer Products segments;
- uncertainty as to Hitachi’s ability to continue to develop and market products that incorporate new technologies on a timely and cost-effective basis and to achieve market acceptance for such products;
- rapid technological innovation;
- the possibility of cost fluctuations during the lifetime of, or cancellation of, long-term contracts for which Hitachi uses the percentage-of-completion method to recognize revenue from sales;
- fluctuations in the price of raw materials including, without limitation, petroleum and other materials, such as copper, steel, aluminum, synthetic resins, rare metals and rare-earth minerals, or shortages of materials, parts and components;
- fluctuations in product demand and industry capacity;
- uncertainty as to Hitachi’s ability to implement measures to reduce the potential negative impact of fluctuations in product demand, exchange rates and/or price of raw materials or shortages of materials, parts and components;
- uncertainty as to Hitachi’s ability to achieve the anticipated benefits of its strategy to strengthen its Social Innovation Business;
- uncertainty as to the success of restructuring efforts to improve management efficiency by divesting or otherwise exiting underperforming businesses and to strengthen competitiveness and other cost reduction measures;
- general socioeconomic and political conditions and the regulatory and trade environment of countries where Hitachi conducts business, particularly Japan, Asia, the United States and Europe, including, without limitation, direct or indirect restrictions by other nations on imports and differences in commercial and business customs including, without limitation, contract terms and conditions and labor relations;
- uncertainty as to the success of alliances upon which Hitachi depends, some of which Hitachi may not control, with other corporations in the design and development of certain key products;
- uncertainty as to Hitachi’s access to, or ability to protect, certain intellectual property rights, particularly those related to electronics and data processing technologies;
- uncertainty as to the outcome of litigation, regulatory investigations and other legal proceedings of which the Company, its subsidiaries or its equity method affiliates have become or may become parties;
- the possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- the possibility of disruption of Hitachi’s operations by earthquakes, tsunamis or other natural disasters;
- uncertainty as to Hitachi’s ability to maintain the integrity of its information systems, as well as Hitachi’s ability to protect its confidential information or that of its customers;
- uncertainty as to the accuracy of key assumptions Hitachi uses to evaluate its significant employee benefit-related costs; and
- uncertainty as to Hitachi’s ability to attract and retain skilled personnel.

The factors listed above are not all-inclusive and are in addition to other factors contained in other materials published by Hitachi.

**HITACHI**  
**Inspire the Next**