

# Reference materials

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# I . Financial section



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# I -1. Consolidated: Major Financial Data



(Unit: ¥100 million)

	FY2006	FY2007	FY2008	FY2009	FY2010
<b>《 P L 》</b>					
Operating revenues	5,732	5,877	7,049	5,844	6,359
(EBITDA) ※1	2,002	1,657	1,717	1,692	1,822
Operating income	771	507	571	489	705
Ordinary income	555	428	395	416	563
Net income	351	293	194	291	195
<b>《 B S 》</b>					
Shareholders' equity	4,611	4,663	3,801	4,126	4,157
Total assets	19,997	20,131	20,054	20,240	20,123
Interest-bearing liabilities	14,215	14,238	14,707	14,525	14,290
<b>《 C F 》</b>					
Cash flows from operating activities	1,572	1,362	1,586	1,691	1,512
Cash flows from investing activities	-1,554	-1,525	-1,323	-1,295	-1,246
Cash flows from financing activities	-21	171	-296	-303	-291
FCF ※2	18	-162	262	396	265
<b>Depreciation</b>	1,230	1,150	1,146	1,203	1,116
<b>Capital expenditures</b>	907	1,220	1,721	1,122	931
<b>《Group Employees》</b>					
Numbers employed	6,494	6,524	6,581	6,701	6,774

※1 EBITDA = Operating income + Depreciation

※2 FCF = Cash flow from operating activities + Cash flow from investing activities

# I -2. Key Ratios and Key Data



<b>【 Key Ratios: Consolidated 】</b>	<b>FY2006</b>	<b>FY2007</b>	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>
Ordinary Income/Operating Revenues(%)	9.7%	7.3%	5.6%	7.1%	8.9%
Shareholders' equity ratio(%)	23.1%	23.2%	19.0%	20.4%	20.7%
D/E ratio	3.1	3.1	3.9	3.5	3.4
ROE(%)※ <sup>1</sup>	7.9%	6.3%	4.6%	7.4%	4.7%
ROA(%)※ <sup>2</sup>	2.8%	2.1%	2.0%	2.1%	2.8%
EPS(¥)	211.14	175.99	121.65	194.26	130.51
BPS(¥)	2,768.95	2,800.18	2,533.28	2,750.20	2,770.77

※<sup>1</sup>: ROE = Consolidated current net income / The average of consolidated shareholders' equity at the beginning and the end of the period

※<sup>2</sup>: ROA = Consolidated ordinary income / The average of consolidated total assets at the beginning and the end of the period

<b>【 Key Data 】</b>	<b>FY2006</b>	<b>FY2007</b>	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>
Amount of coal consumption (10 thousand ton)	1,857	2,023	1,940	1,814	2,114
Load factor of coal-fired thermal power plants (%)	75%	81%	76%	68%	78%
Water supply rate (%)	112%	85%	88%	96%	106%
Australian coal price (FOB, US\$) ※ <sup>1</sup>	52.0 ~ 53.0	55.0 ~ 56.0	125.0	71.0	97 ~ 98
Average exchange rate (¥/US\$) ※ <sup>2</sup>	117	114	101	93	86

※<sup>1</sup>: Reference price

※<sup>2</sup>: TTM

# I -3. Consolidated: Electricity Sales, Revenues and Generation Capacity (Domestic)



## 【Electricity Sales (million kWh)】

	FY2006	FY2007	FY2008	FY 2009	FY2010
<b>Wholesale electric power business</b>	<b>58,672</b>	<b>60,786</b>	<b>57,532</b>	<b>55,760</b>	<b>64,353</b>
Hydroelectric	10,633	8,287	8,384	9,214	10,267
Thermal	48,039	52,499	49,147	46,546	54,086
<b>Other electric power business</b>	<b>1,657</b>	<b>1,682</b>	<b>1,616</b>	<b>1,477</b>	<b>1,462</b>
<b>Total</b>	<b>60,329</b>	<b>62,469</b>	<b>59,148</b>	<b>57,238</b>	<b>65,815</b>

## 【Electric Power Revenues (100 million yen)】

	FY2006	FY2007	FY2008	FY 2009	FY2010
<b>Wholesale electric power business</b>	<b>4,500</b>	<b>4,572</b>	<b>5,712</b>	<b>4,586</b>	<b>5,146</b>
Hydroelectric	1,234	1,145	1,109	1,089	1,081
Thermal	3,265	3,427	4,603	3,496	4,064
<b>Other electric power business</b>	<b>168</b>	<b>177</b>	<b>200</b>	<b>147</b>	<b>137</b>
<b>Transmission</b>	<b>551</b>	<b>549</b>	<b>554</b>	<b>544</b>	<b>543</b>
<b>Total</b>	<b>5,220</b>	<b>5,299</b>	<b>6,467</b>	<b>5,278</b>	<b>5,827</b>

## 【Generation Capacity (MW)】

	FY2006	FY2007	FY2008	FY 2009	FY2010
<b>Wholesale electric power business</b>	<b>16,380.0</b>	<b>16,380.0</b>	<b>16,385.0</b>	<b>16,987.5</b>	<b>16,992.5</b>
Hydroelectric	8,555.5	8,555.5	8,560.5	8,560.5	8,565.5
Thermal (incl. geothermal)	7,824.5	7,824.5	7,824.5	8,427.0	8,427.0
<b>Other electric power business</b>	<b>560.5</b>	<b>560.5</b>	<b>605.8</b>	<b>622.5</b>	<b>704.5</b>
<b>Total</b>	<b>16,940.5</b>	<b>16,940.5</b>	<b>16,990.8</b>	<b>17,610.0</b>	<b>17,697.0</b>

## 【Greenhouse Gas Emissions】

	Unit	FY2006	FY2007	FY2008	FY 2009	FY2010
<b>CO2 emissions</b> (domestic and overseas power generation)*	million t-CO <sub>2</sub>	44.91	49.86	49.07	46.52	-
	kg-CO <sub>2</sub> /kWh	0.68	0.70	0.69	0.66	-

\* Figures for CO<sub>2</sub> emissions (domestic and overseas power generation) include all consolidated subsidiaries and joint venture companies.

# I -4. Consolidated: Revenues and Expenses



( Unit : ¥1 00 million)

	FY2006	FY2007	FY2008	FY2009	FY2010
<b>Operating revenues</b>	<b>5,732</b>	<b>5,877</b>	<b>7,049</b>	<b>5,844</b>	<b>6,359</b>
Electric power operating revenues	5,237	5,317	6,483	5,302	5,844
Other operating revenues	494	560	565	541	515
<b>Operating expenses</b>	<b>4,961</b>	<b>5,370</b>	<b>6,478</b>	<b>5,355</b>	<b>5,653</b>
Electric power operating expenses	4,444	4,778	5,888	4,786	5,091
Personnel costs	272	377	436	362	313
Fuel costs	1,498	1,915	2,643	1,780	2,142
Repair and maintenance costs	411	304	514	444	460
Outsourcing costs	317	302	332	320	314
Depreciation and amortization costs	1,185	1,103	1,101	1,160	1,069
Others	758	774	859	716	790
Other operating expenses	516	591	590	568	562
<b>Operating income</b>	<b>771</b>	<b>507</b>	<b>571</b>	<b>489</b>	<b>705</b>
<b>Non-operating revenues</b>	<b>130</b>	<b>215</b>	<b>132</b>	<b>187</b>	<b>149</b>
Equity income of affiliates	55	88	74	117	90
Others	74	126	58	70	58
<b>Non-operating expenses</b>	<b>346</b>	<b>293</b>	<b>307</b>	<b>259</b>	<b>292</b>
Interest expenses	225	227	226	230	223
Others	120	66	81	28	68
<b>Ordinary income</b>	<b>555</b>	<b>428</b>	<b>395</b>	<b>416</b>	<b>563</b>

# I -5. Consolidated: Key Electric Power Operating Expenses (1)



## Personnel Expenses

### 【 Consolidated 】

(Unit: ¥100 million)

FY2006	FY2007	FY2008	FY2009	FY2010
272	377	436	362	313

### 【 Retirement benefits: the amortization of the actuarial difference 】

(Unit: ¥100 million)

	FY2006	FY2007	FY2008	FY2009	FY2010
Balance at the beginning of the fiscal year	-48	-23	36	74	-20
Actuarial difference in the fiscal year	-16	120	147	-52	(*2)
Total	-64	97	183	21	-20
<b>Amortization (*1)</b>	<b>-41</b>	<b>61</b>	<b>109</b>	<b>41</b>	<b>-18</b>

(\* 1) Up to FY2008: Actuarial differences are mainly amortized by the declining-balance method over two years from the year in which they occurred. From FY2009 onward: Actuarial differences are mainly amortized by the declining-balance method over two years from the year following the year in which they occurred.

(\* 2) Calculation of the figure in FY2010 has not been completed.

## Fuel Cost

### 【 Consolidated 】

(Unit: ¥100 million)

FY2006	FY2007	FY2008	FY2009	FY2010
1,498	1,915	2,643	1,780	2,142

\* Figures include fuel cost of consolidated subsidiaries (IPP, for PPS).

### 【 Breakdowns (Non-consolidated) 】

	FY2006	FY2007	FY2008	FY2009	FY2010
Fuel cost (¥100 million yen)	1,440	1,853	2,551	1,739	2,099
Amount of coal consumption (10 thousand ton)	1,857	2,023	1,940	1,814	2,114
Australian coal price (FOB, US\$) *1	52.0 ~ 53.0	55.0 ~ 56.0	125.0	71.0	97.0 ~ 98.0
Average exchange rate (¥/ US\$) *2	117	114	101	93	86

\*1 Reference price

\*2 TTM

# I -6. Consolidated: Key Electric Power Operating Expenses (2)



## Repair Expense

### 【 Consolidated 】

(Unit: ¥100 million)

FY2006	FY2007	FY2008	FY2009	FY2010
411	304	514	444	460

### 【 Breakdowns (Non-consolidated) 】

(Unit: ¥100 million)

	FY2006	FY2007	FY2008	FY2009	FY2010
Hydroelectric	86	68	145	80	81
Thermal	345	224	361	329	385
Transmission	15	18	25	23	22

## Depreciation and Amortization Cost

### 【 Consolidated 】

(Unit: ¥100 million)

FY2006	FY2007	FY2008	FY2009	FY2010
1,185	1,103	1,101	1,160	1,069

### 【 Breakdowns (Non-consolidated) 】

(Unit: ¥100 million)

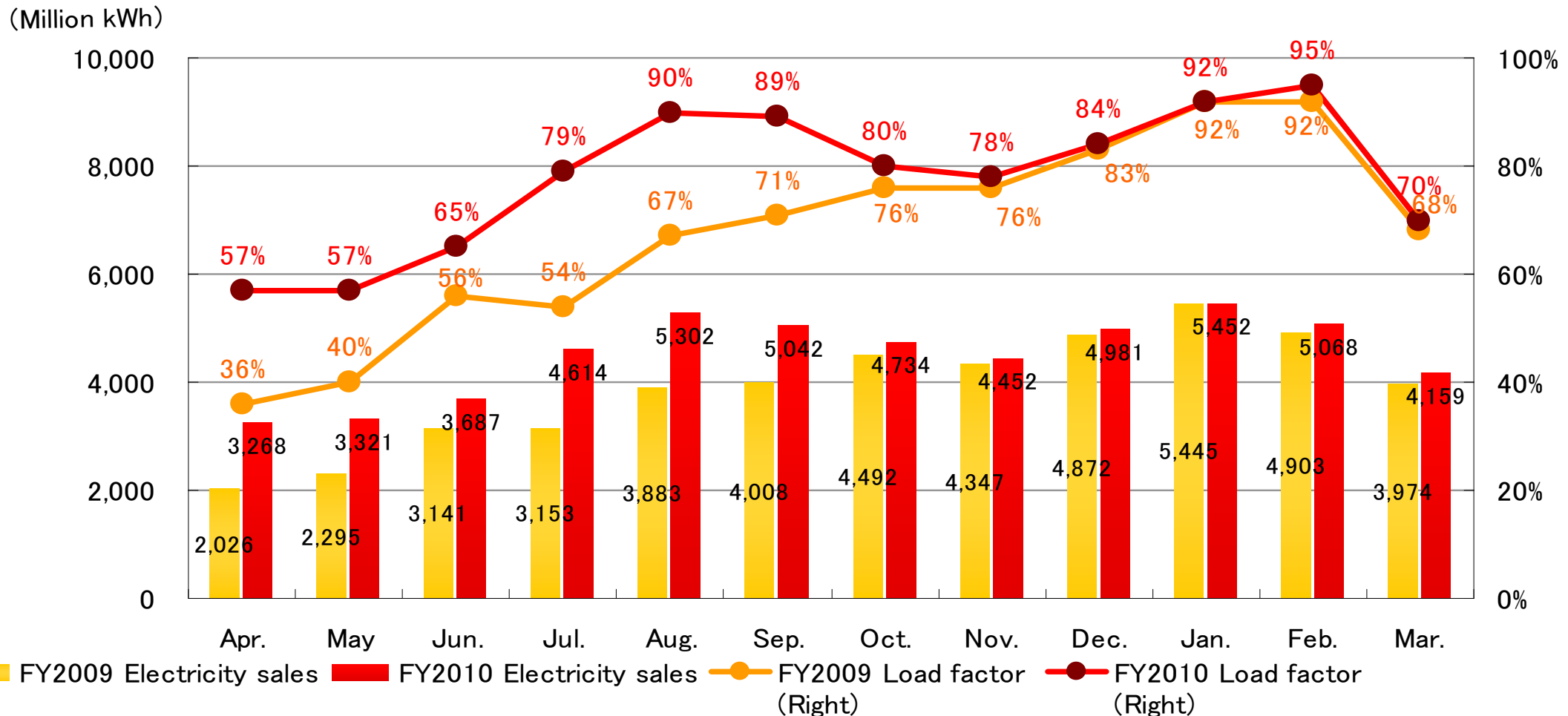
	FY2006	FY2007	FY2008	FY2009	FY2010
Hydroelectric	261	254	249	240	235
Thermal	678	610	619	643	608
Transmission	202	190	184	177	168



# I -7. Wholesale Electric Power Business: Monthly Electricity Sales (Thermal Power)



•	<b>Apr.2009 - Mar.2010 Results (Cumulative)</b>	•	<b>Apr.2010 - Mar.2011 Results (Cumulative)</b>	
	Load factor	68 %	Load factor	78 %
	Electricity sales	46.5B kWh	Electricity sales	54.0B kWh

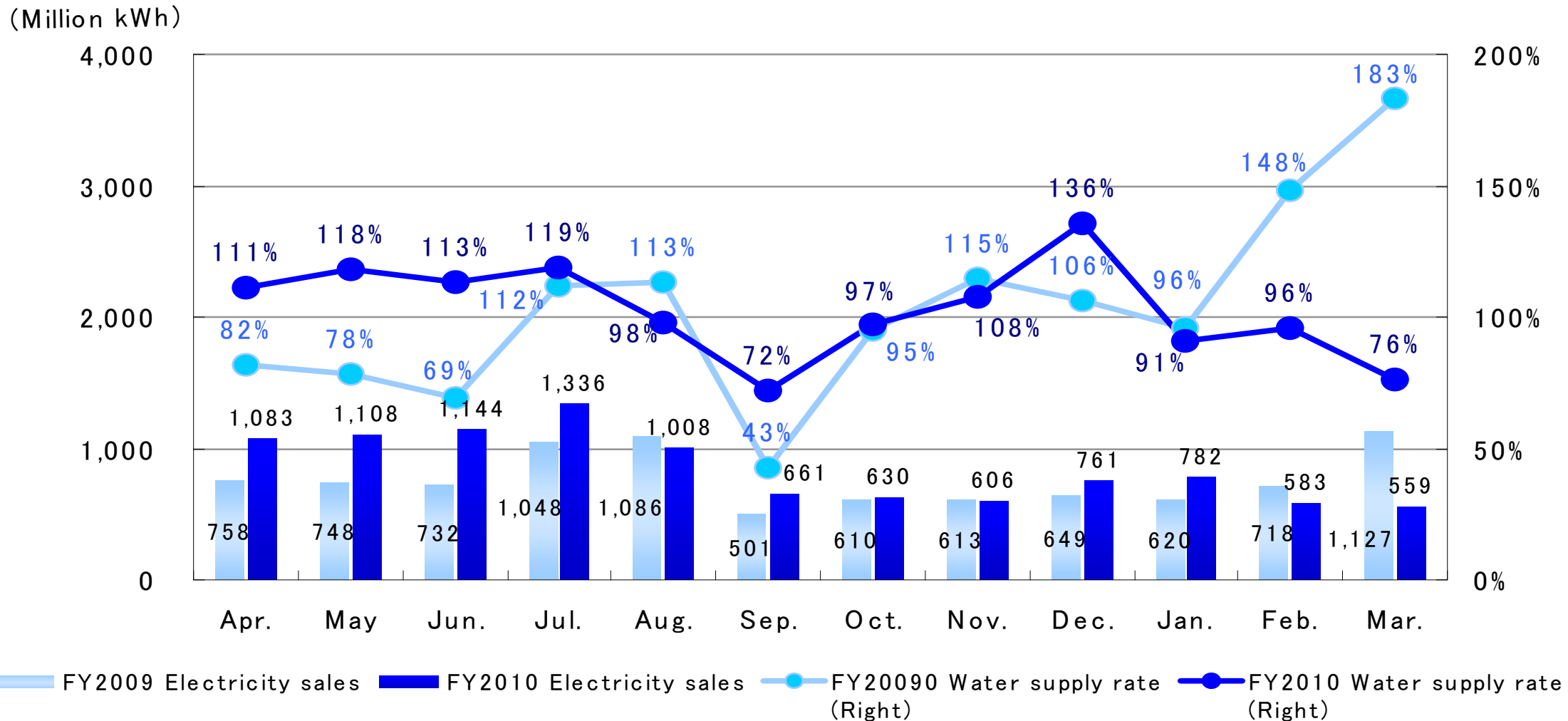


\*) Electricity sales also include electricity generated for the test run at the Isogo New No.2 (Jan. 2009 to Jul. 2009).

# I -8. Wholesale Electric Power Business: Monthly Electricity Sales (Hydroelectric Power)



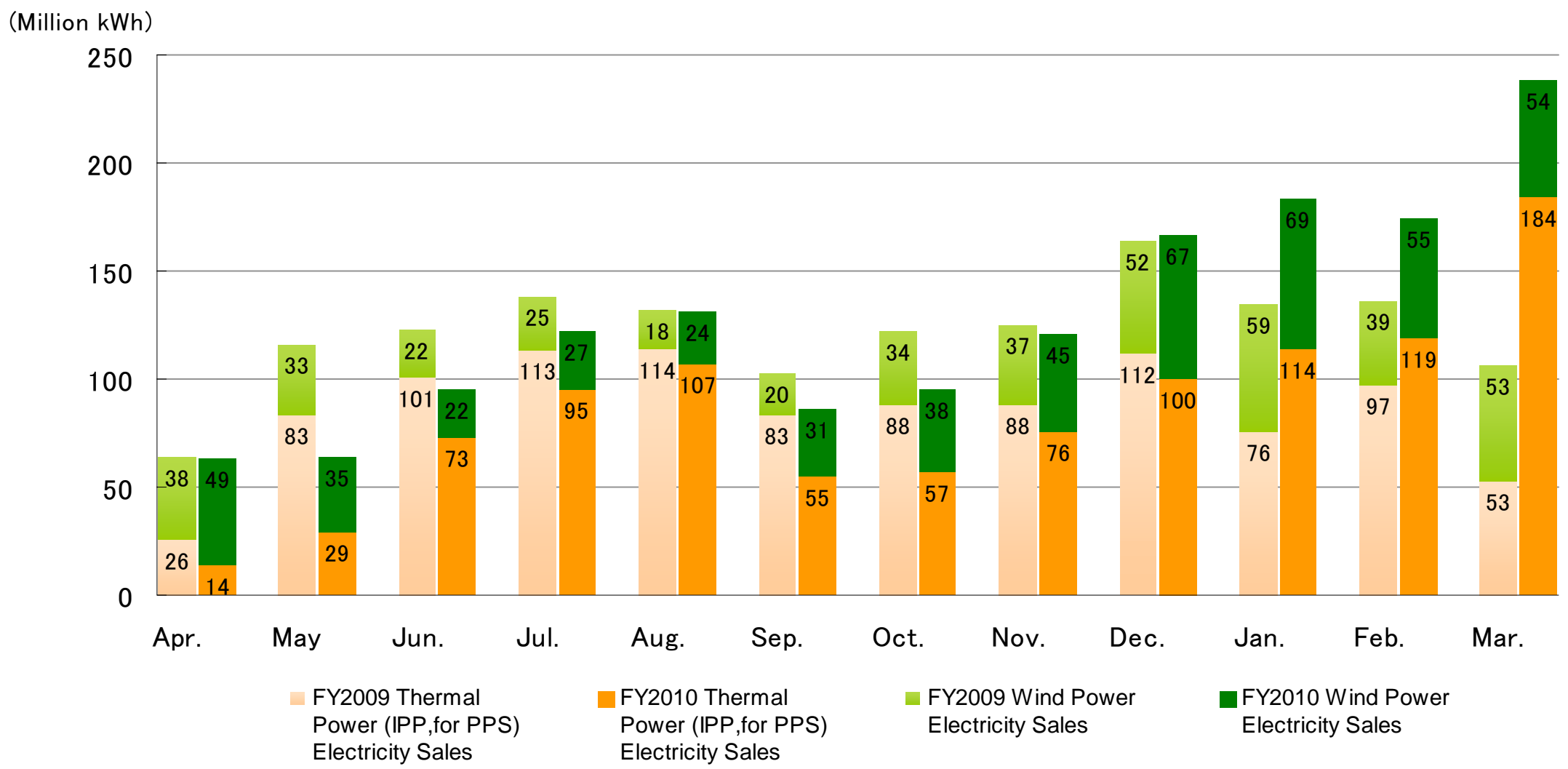
▶ <b>Apr.2009 - Mar.2010 Results</b> <b>(Cumulative)</b>	▶ <b>Apr.2010 - Mar.2011 Results</b> <b>(Cumulative)</b>
<b>Water supply rate</b> <b>96 %</b>	<b>Water supply rate</b> <b>106 %</b>
<b>Electricity sales</b> <b>9.2B kWh</b>	<b>Electricity sales</b> <b>10.2B kWh</b>



# I -9. Other Electric Power Businesses (IPP, for PPS, Wind Power): Monthly Electricity Sales



**▶ Total Electricity Sales**  
**Apr.2009 - Mar.2010 Results (Cumulative) 1.4B kWh**  
**Apr.2010 - Mar.2011 Results (Cumulative) 1.5B kWh**



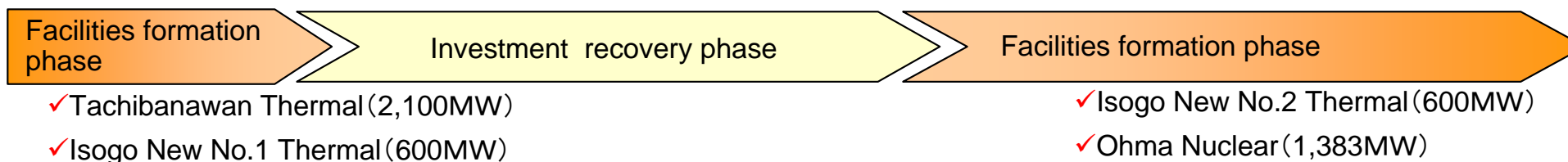
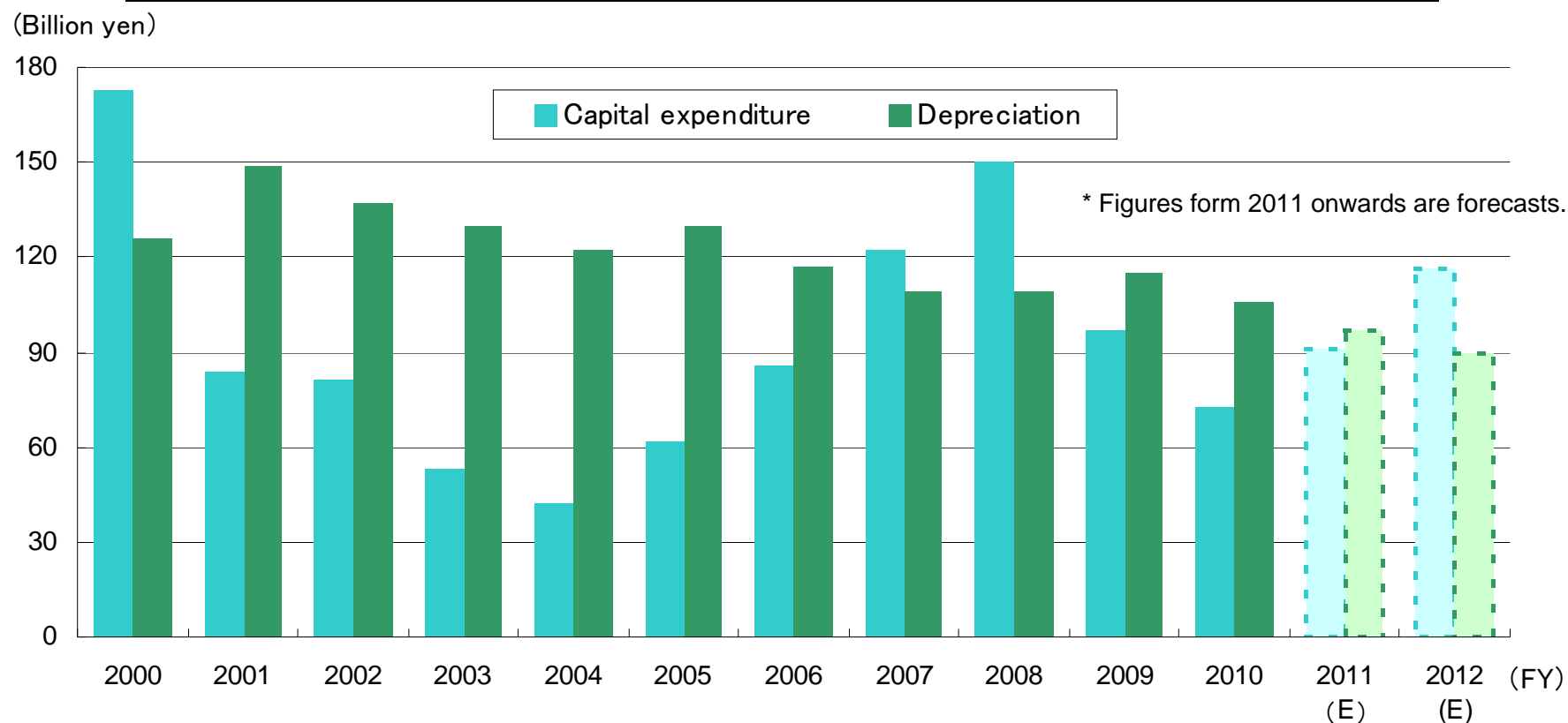
**Note: Does not take proportion of equity holdings into account**

# I -10. Non-consolidated: Capital Expenditure Plan for the Wholesale Power Business

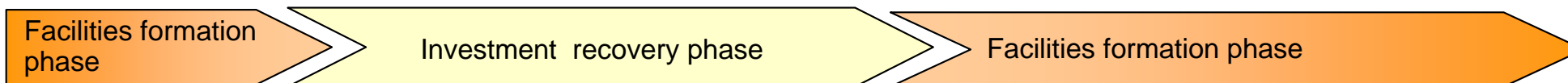
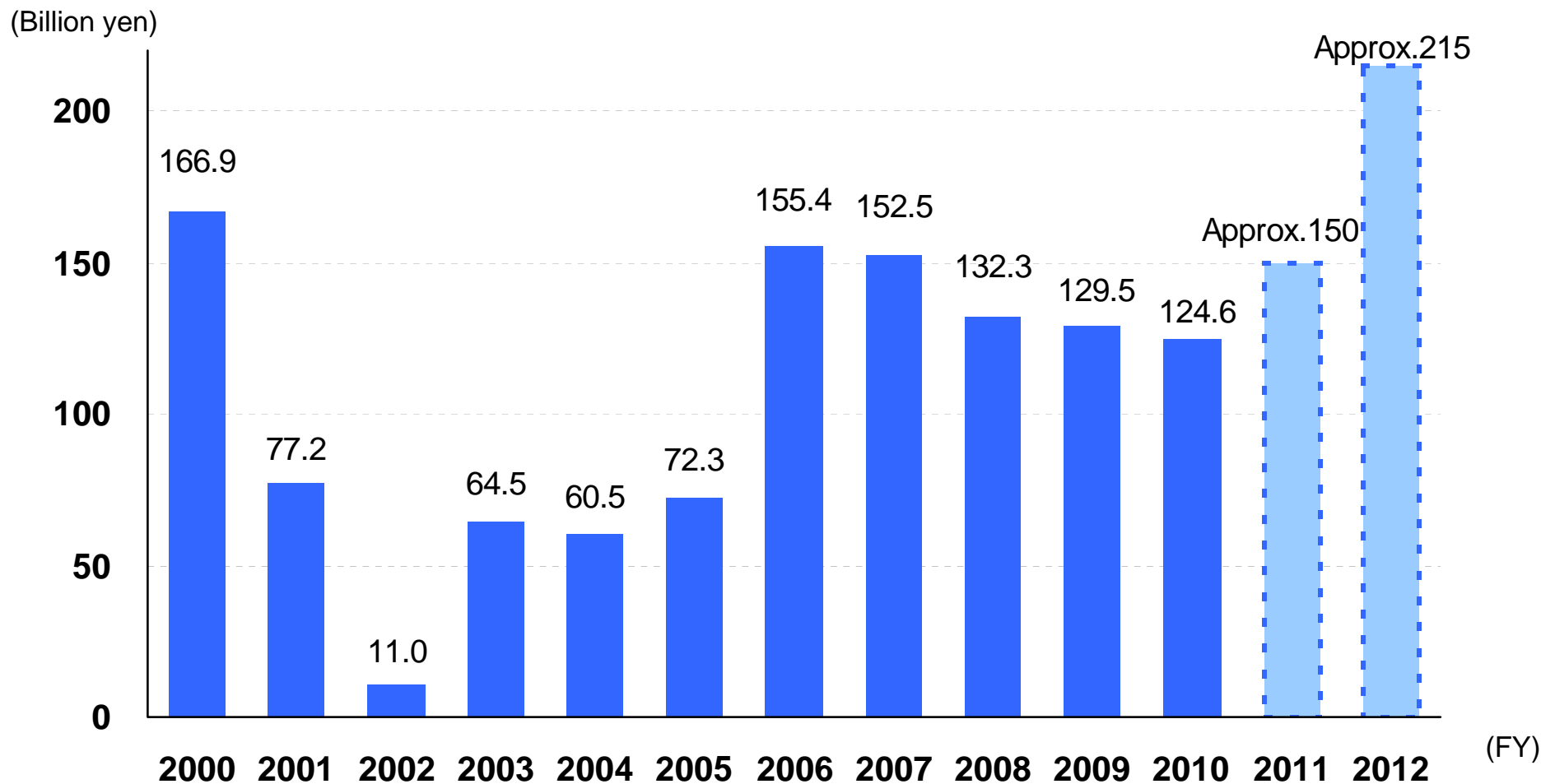


(Unit: billion yen)

	FY2010	FY2011(E)	FY2012(E)
Generation Assets	49.3	68.6	83.6
Transmission /Substation	11.3	8.2	12.0
Other	13.1	15.2	20.7
<b>Total</b>	<b>73.7</b>	<b>91.9</b>	<b>116.3</b>



# I -11. Consolidated: Outlook of Cash Flow from Investing Activities



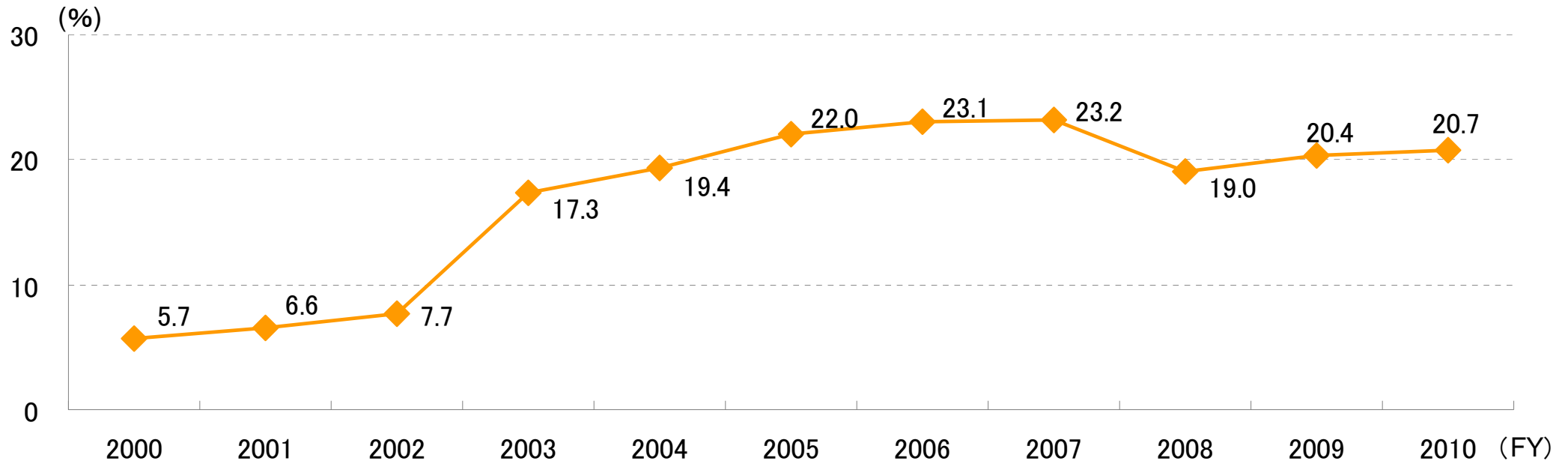
\* Plus and minus sign is reversed for convenience.

\* Figures from 2011 onwards are forecasts.

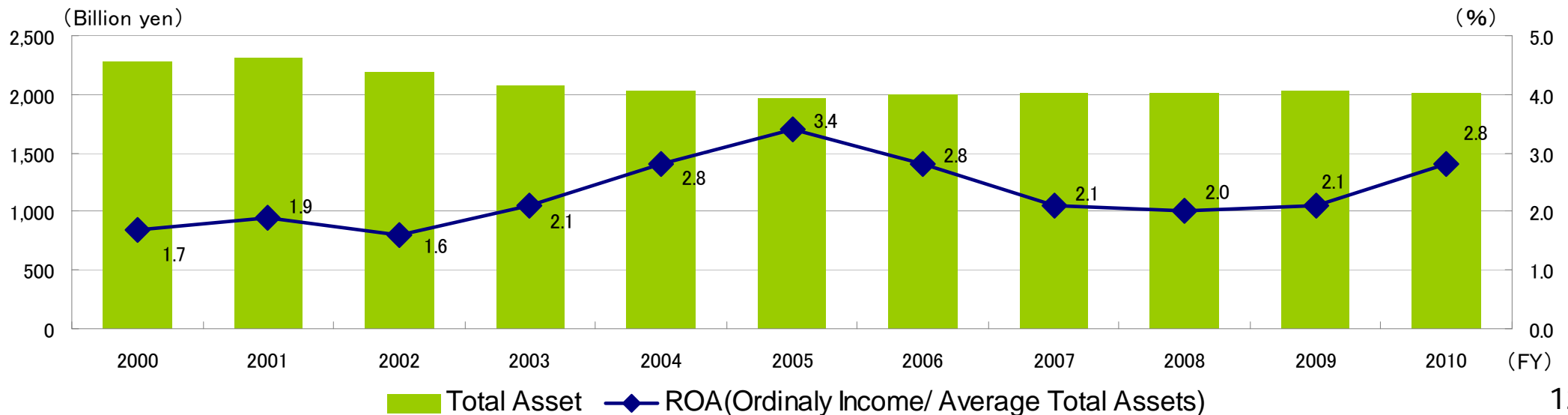
# I -12. Consolidated: Shareholders' Equity Ratio and ROA



## ✓ Consolidated: Shareholders' Equity Ratio



## ✓ Consolidated: Total asset and ROA (Ordinary Income / Average Total Assets)



## II . Business section

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## II -1. Consolidated: Power Generation Capacity



- ▶ As of March 31, 2011, power plants of 21,550MW (consolidated, on an equity basis) are in operation in a whole world.

Power Generation Capacity (Consolidated) (In operation) (as of March 31, 2011)		Number of Power Station	Total capacity (MW)	On an equity basis		
				Capacity* (MW)	Share(%)	
					In whole	In each area
Domestic	Wholesale Power Business (non-consolidated)	67	16,993	16,993	78.9	95.4
	IPP for PPS	6	844	496	2.3	2.8
	Wind Power	18	352	323	1.5	1.8
	<b>Total</b>	<b>91</b>	<b>18,190</b>	<b>17,811</b>	<b>82.7</b>	<b>100.0</b>
Overseas	Thailand	9	2,770	1,020	4.7	27.3
	USA	10	4,486	1,486	6.9	39.8
	China	5	6,226	578	2.7	15.5
	Other Area	5	1,446	653	3.0	17.5
	<b>Total</b>	<b>29</b>	<b>14,968</b>	<b>3,738</b>	<b>17.3</b>	<b>100.0</b>
<b>Total</b>		<b>120</b>	<b>33,158</b>	<b>21,550</b>	<b>100.0</b>	<b>—</b>

\* Multiplied by our percentage interest in the projects in which we are participating



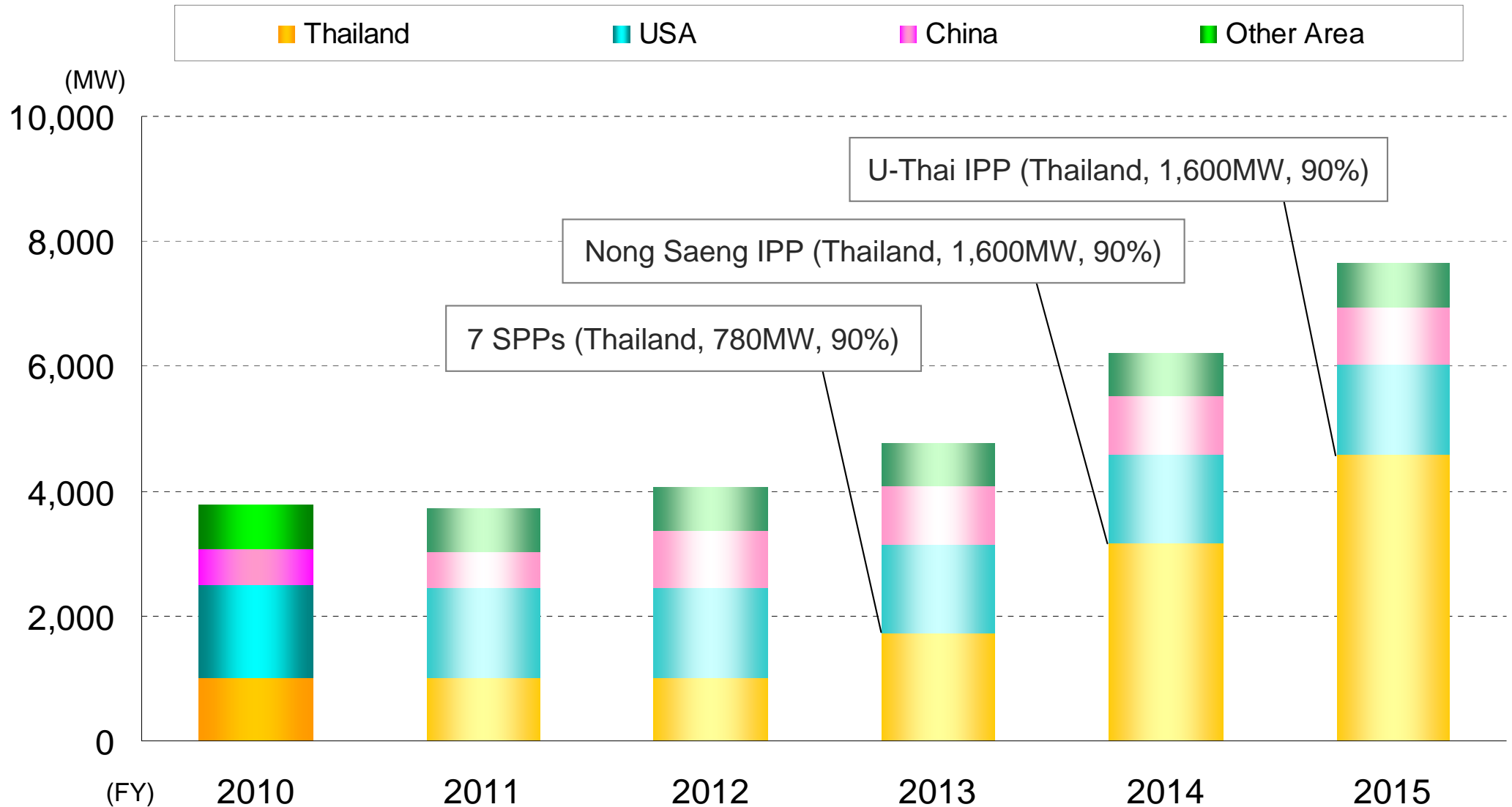
## II-2. Overseas Power Generation Business: Overview of New Projects in Thailand



Start of Operation	Project Name	Project Type and Output	Overview	Current Status
2013	7 SPPs	Type: gas-fired Output: 780MW  ( 110MW x 6 ) ( 120MW x 1 )	<ul style="list-style-type: none"> <li>✓ Projects based on the SPP program of the Thai government.</li> <li>✓ Construction of seven 10kW-class gas-fired thermal power plants in and around industrial parks in Saraburi Province.</li> <li>✓ After startup of operations, the plants will sell electricity to Electricity Generating Authority of Thailand and customers within the industrial parks for a period of 25 years (will also provide steam to customers in the industrial parks).</li> </ul>	<ul style="list-style-type: none"> <li>✓ Steadily progressing following commencement of construction in October 2010.</li> <li>✓ Moving ahead with construction to commence operation in 2013.</li> </ul>
2014	Nong Saeng	Type: gas-fired Output: 1,600MW	<ul style="list-style-type: none"> <li>✓ Projects successfully tendered in 2007 in an IPP bid solicitation under the Thai government's power development plan.</li> <li>✓ Construction of 1.6 million kW gas-fired thermal plants in Nong Saeng, Saraburi Province and U-Thai, Ayutthaya Province respectively.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Currently drawing up financing agreement</li> <li>✓ Making preparations to get work underway during the current fiscal year.</li> </ul>
2015	U-Thai (Formerly Samet Tai)	Type: gas-fired Output: 1,600MW	<ul style="list-style-type: none"> <li>✓ After startup of operations, plants will sell electricity to Electricity Generating Authority of Thailand for a period of 25 years.</li> <li>✓ Arrangements are being made to change the original site in Samet Tai to a site in U-Thai.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Making preparations for groundbreaking in FY2012.</li> </ul>

- Notes:
1. "Start of Operation" is the year we are planning to commence operations at present.
  2. SPP (Small Power Producers) program is a long-term electric power purchase scheme established to promote co-combustion thermal power systems and renewable energy aimed at reducing the importation and consumption of oil. Under this program the Electricity Generating Authority of Thailand guarantees it will purchase up to 90,000kW of electric power.
  3. Arrangements are underway to change the site from Samet Tai in accordance with a cabinet decision made by the government in July 2010. For details on the Thai Government's decision, please see the J-POWER July 23, 2010 news release, "Decision by Thai Government regarding J-POWER IPP Project in Thailand."

## II -3. Overseas Power Generation Business: Capacity of Overseas Facilities (actual/ projection)



\*Projects currently in the development stage with plans to commence operation in the years stated. Details shown in parentheses are name of country, total output, and J-POWER's investment ratio.

\*Capacity after 2011 is forecast.

## II -4. Overseas Power Generation Business: List of Projects [1/2]



### Thailand

As of March 31, 2011

Status	Project Name	Type of Power Generation	Output Capacity	Equity Stake	Owned Capacity	Participation Year	Start of Operation	Power Purchaser	Validity of purchase agreement
In operation	Roi-Et	Biomass (Chaff)	10MW	24.7%	2MW	FY2000	FY2003	EGAT	21 years
	Rayong	Gas (Combined Cycle)	112MW	20.0%	22MW	FY2000	FY2002	EGAT / Companies in the industrial park	21 years
	Thaioil Power	Gas (Combined Cycle)	113MW	19.0%	21MW	FY2001	FY1998	EGAT / Companies within the Thai Oil Refinery	25 years
	Independent Power	Gas (Combined Cycle)	700MW	10.6%	74MW	FY2001	FY2000	EGAT	25 years
	Gulf Cogeneration (Kaeng Khoi)	Gas (Combined Cycle)	110MW	49.0%	54MW	FY2001	FY1998	EGAT / Companies in the industrial park	21 years
	Samutprakarn	Gas (Combined Cycle)	117MW	49.0%	57MW	FY2002	FY1999	EGAT / Companies in the industrial park	21 years
	Nong Khae	Gas (Combined Cycle)	120MW	49.0%	59MW	FY2002	FY2000	EGAT / Companies in the industrial park	21 years
	Yala	Biomass (Rubber Wood Waste)	20MW	49.0%	10MW	FY2003	FY2006	EGAT	25 years
	Kaeng Khoi #2	Gas (Combined Cycle)	1,468MW	49.0%	719MW	FY2004	FY2007	EGAT	25 years
<b>9 projects</b>			<b>2,770MW</b>		<b>1,020MW</b>				
Planning	U Thai (Formerly Samet Thai) *1	Gas (Combined Cycle)	1,600MW			FY2007	FY2015	EGAT	25 years
	Nong Saeng	Gas (Combined Cycle)	1,600MW			FY2007	FY2014	EGAT	25 years
	Small Power Producers (7 projects)	Gas (Combined Cycle) (Total) 780MW				FY2007	FY2012-13	EGAT / Companies in the industrial park	25 years

\*1 Arrangements are underway to change the site from Samet Tai in accordance with a cabinet decision made by the Thai government in July 2010. For details on the government's decision, please see the J-POWER July 23, 2010 news release, "Decision by Thai Government regarding J-POWER IPP Project in Thailand."

### China

As of March 31, 2011

Status	Project Name	Type of Power Generation	Output Capacity	Equity Stake	Owned Capacity	Participation Year	Start of Operation	Power Purchaser	Validity of purchase agreement
In operation	Tianshi	Coal Waste	50MW	24.0%	12MW	FY2000	FY2001	Shanxi Province Power Corporation	Renewed for 1year <sup>2</sup>
	Hanjiang (Xihe)	Hydroelectric	180MW	27.0%	49MW	FY2007	FY2006	Shaanxi Electric Power Company	Renewed for 1year <sup>2</sup>
	Hanjiang(Shuhe)	Hydroelectric	270MW	27.0%	73MW	FY2007	FY2009	Shaanxi Electric Power Company	Renewed for 1year <sup>2</sup>
	Gemeng <sup>*1</sup>	Mainly Coal	4,446MW	7.0%	313MW	FY2009	—	Shanxi Province Power Corporation	—
	Xinchang	Coal	1,320MW	10.0%	132MW	FY2007	FY2009	Jiangxi Electric Power Company	Renewed for 1year <sup>2</sup>
<b>5 projects</b>			<b>6,266MW</b>		<b>578MW</b>				

\*1 Gemeng International Energy Co., Ltd. (Shanxi Province) owns eleven power generation companies.

\*2 Although "Power Purchase Agreement" is renewed every one year, J-POWER makes other agreements with the power purchasers for continuous power purchase during the operation.

## II -4. Overseas Power Generation Business: List of Projects [2/2]



### USA

As of March 31, 2011

Status	Project Name	Type of Power Generation	Output Capacity	Equity Stake	Owned Capacity	Participation Year	Start of Operation	Power Purchaser	Validity of purchase agreement
In operation	Tenaska Frontier	Gas (Combined Cycle)	830MW	31.0%	257MW	FY2006	FY2000	Exelon Generation Company, LLC	20 years
	Elwood Energy	Gas (Simple Cycle)	1,350MW	25.0%	338MW	FY2006	FY1999, FY2001	Exelon Generation Company, LLC / Constellation	valid to 2012 / 2016 / 2017
	Green Country	Gas (Combined Cycle)	795MW	50.0%	398MW	FY2007	FY2001	Exelon Generation Company, LLC	20 years
	Birchwood	Coal	242MW	50.0%	121MW	FY2008	FY1996	Virginia Electric and Power Company	25 years
	Pinelawn	Gas (Combined Cycle)	80MW	50.0%	40MW	FY2008	FY2005	Long Island Power Authority	valid to 2025
	Equus	Gas (Simple Cycle)	48MW	50.0%	24MW	FY2008	FY2004	Long Island Power Authority	valid to 2017
	Fluvanna	Gas (Combined Cycle)	885MW	15.0%	133MW	FY2008	FY2004	Shell Energy North America	valid to 2024
	Edgewood	Gas (Simple Cycle)	80MW	50.0%	40MW	FY2009	FY2002	Long Island Power Authority	valid to 2018
	Shoreham	Jet-fuel (Simple cycle)	80MW	50.0%	40MW	FY2009	FY2002	Long Island Power Authority	valid to 2017
	Orange Grove*1	Gas (Simple Cycle)	96MW	100.0%	96MW	FY2006	FY2010	San Diego Gas & Electric	25 years
<b>10 projects</b>			<b>4,486MW</b>		<b>1,486MW</b>				

\*1 Half of J-POWER's investment share (100%) of Orange Grove Project has been sold on May 1st, 2011.

### Other Countries/region

As of March 31, 2011

Status	Project Name	Type of Power Generation	Output Capacity	Equity Stake	Owned Capacity	Participation Year	Start of Operation	Power Purchaser	Validity of purchase agreement
In operation	CBK(Philippines) (3 projects)	Hydroelectric	728MW	50.0%	364MW	FY2004	FY2001 ~2003	National Power Corporation	25 years
	Chiahui(Taiwan)	Gas (Combined Cycle)	670MW	40.0%	268MW	FY2002	FY2003	Taiwan Power Company	25 years
	Zajaczkowo(Poland)	Wind Power	48MW	45.0%	22MW	FY2006	FY2008	ENERGA OBROT S.A.	15 years
<b>5 projects</b>			<b>1,446MW</b>		<b>653MW</b>				
Under construction	Nhon Trach 2(Vietnam)	Gas (Combined Cycle)	750MW	5.0%	38MW	FY2008	FY2010	Vietnam Electricity	

## II -5. Wind Power Business (Domestic): Update



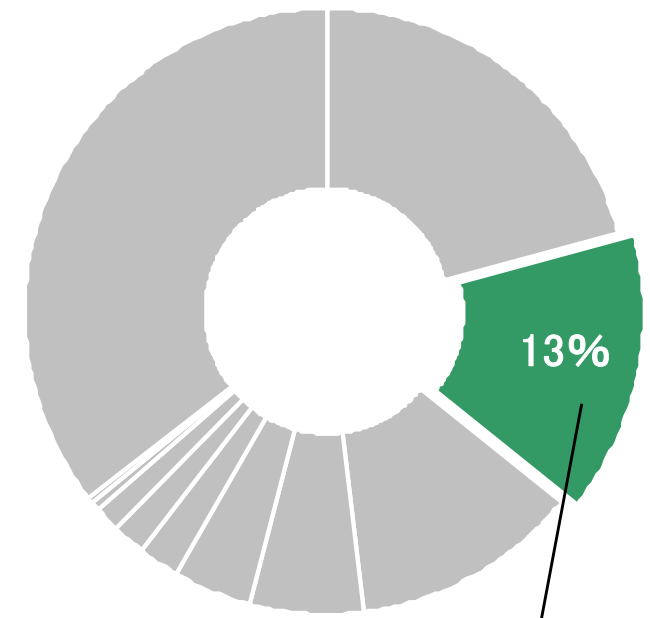
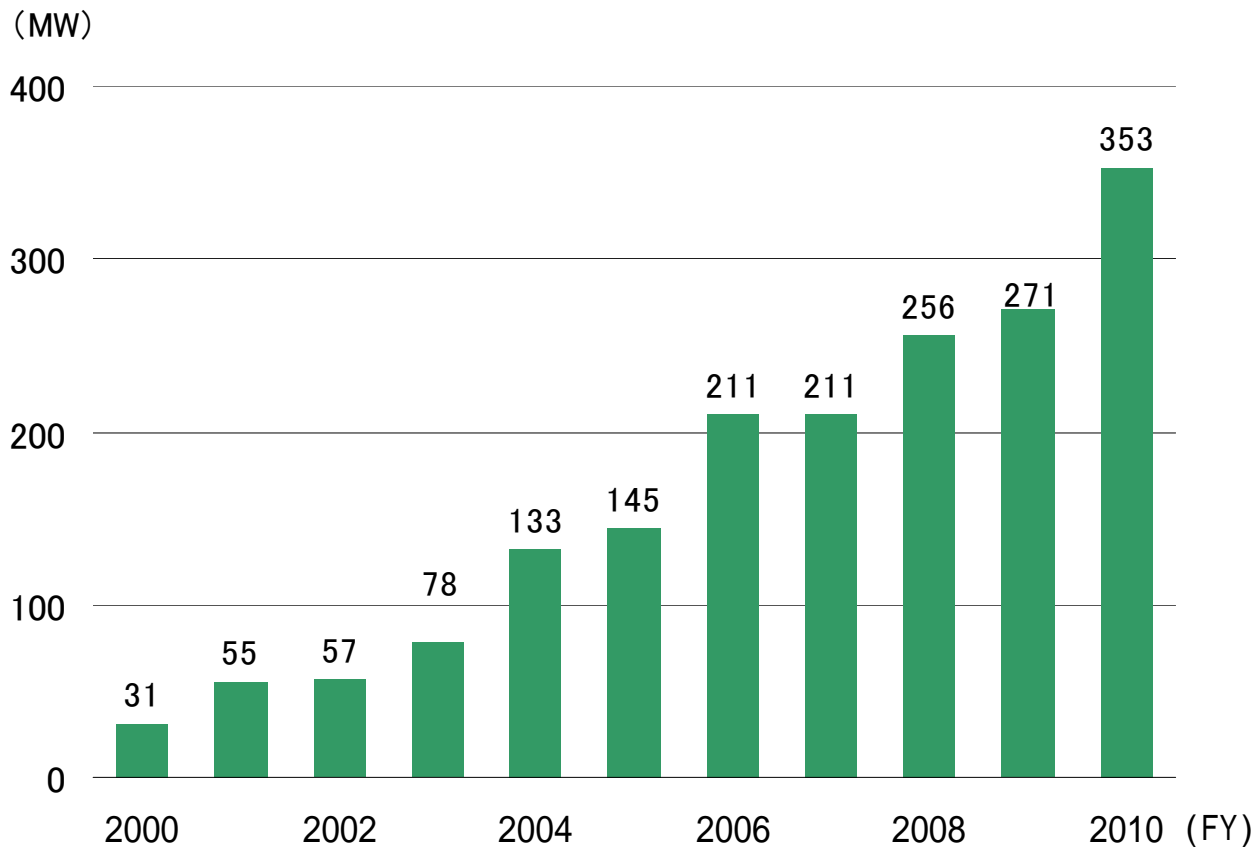
- ✓ **J-POWER's wind power generation capacity (domestic, in operation)**

- ✓ **Share of wind power generation capacity (in operation) in Japan**

(\* Investment ratio (equity basis) is not taken into account.

(\* Owned capacity (equity basis) as of March 31, 2011.

(\* Source: JWPA data and others



**J-POWER**  
**323MW**  
 (Owned capacity)

## II -6. Wind Power Business (Domestic): List of Projects



### ■ In Operation

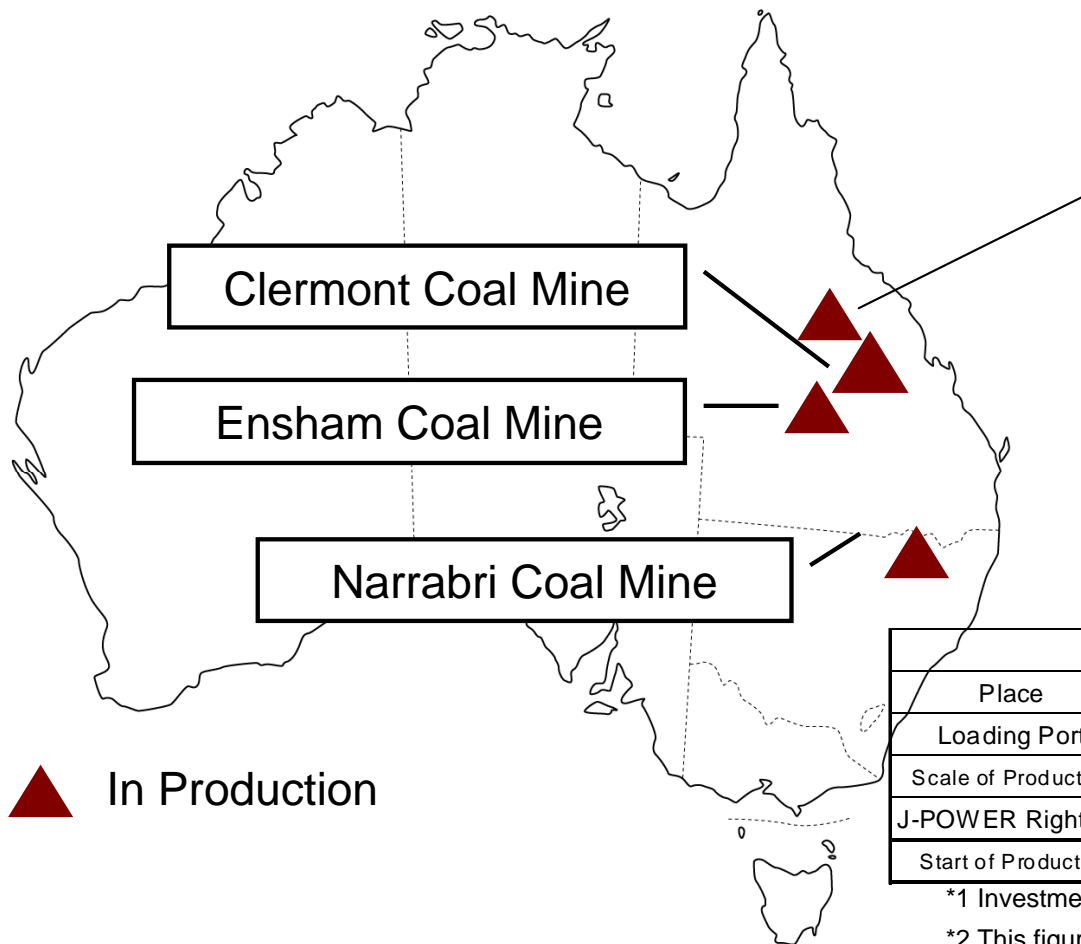
As of March 31, 2011

Location	Name	Output Capacity (kW)	Equity Stake	Owned Capacity (kW)	Start of Operation
Hokkaido	Sarakitomanai Wind Farm	14,850	49%	7,277	FY2001
Hokkaido	Tomamae Winvilla Wind Farm	30,600	100%	30,600	FY2000
Hokkaido	Shimamaki Wind Farm	4,500	100%	4,500	FY2000
Hokkaido	Setana Seaside Wind Power Farm	12,000	100%	12,000	FY2005
Iwate	Green Power Kuzumaki Wind Farm	21,000	100%	21,000	FY2003
Akita	Nikaho Kogen Wind Farm	24,750	67%	16,583	FY2001
Fukushima	Hiyama Kogen Wind Farm *1	28,000	97%	27,160	FY2010
Fukushima	Koriyama-Nunobiki Kogen Wind Farm	65,980	100%	65,980	FY2006
Tokyo	Tokyo Bayside Wind Power Plant	1,700	100%	1,700	FY2002
Shizuoka	Irozaki Wind Farm	34,000	100%	34,000	FY2010
Aichi	Tahara Bayside Wind Farm	22,000	100%	22,000	FY2004
Aichi	Tahara Wind Farm	1,980	100%	1,980	FY2003
Fukui	Awara-Kitagata Wind Farm	20,000	100%	20,000	FY2010
Yamaguchi	Yokihi no Sato Wind Park	4,500	100%	4,500	FY2003
Kumamoto	Aso-Oguni Wind Farm	8,500	88%	7,480	FY2006
Kumamoto	Aso-Nishihara Wind Farm	17,500	88%	15,400	FY2004
Nagasaki	Nagasaki-Shikamachi Wind Farm	15,000	70%	10,500	FY2004
Kagoshima	Minami Oosumi Wind Farm	26,000	80%	20,800	FY2002
<b>Domestic: 18 projects</b>		<b>352,860</b>		<b>323,459</b>	

\*1 Wholly owned by J-POWER following transfer of joint owner's 3% share in April 2011

## II -7. Coal Mine Development

- ▶ Ensuring the stable procurement and transport of coal by participating in the development of coal resources in Australia and transporting it on J-POWER's vessels
- ▶ Taking advantage of our supply capability, we will gradually expand our coal business



	Blair Athol Coal Mine	Ensham Coal Mine	Clermont Coal Mine	Narrabri Coal Mine
Place	Queensland	Queensland	Queensland	New South Wales
Loading Port	Dalrymple Bay	Gladstone	Dalrymple Bay	Newcastle
Scale of Production	6 million t/year	7 million t/year	12 million t/year*2	6 million t/year*2
J-POWER Rights*1	10.0%	10.0%	15.0%	7.5%
Start of Production	1984	1993	2010	2010

\*1 Investment through a consolidated subsidiary, J-POWER AUSTEALIA PTY LTD.

\*2 This figure shows peak production.

## II -8. Action Plans for Utilization of Biomass



### 1. Businesses to produce biomass fuel

Project	Project Overview	Equity stake (%)	Users of Biomass	Project Status
<b>Sewage sludge derived fuel (low temperature carbonization technology)</b>				
Hiroshima City Seibu Sewage Treatment Plant Project	Contracted with Hiroshima City (DBO-type project*1) Project period: 20 years Sludge treatment capacity: 100t/day	34	Expected co-combustion at Takehara #2 and other coal-fired power plants of J-POWER	Scheduled commence operation in April 2012
Hirano Sewage Treatment Plant (Osaka city) Project	PFI Project*2 contracted with Osaka city (BTO-type project*3) Project period: 20 years Sludge treatment capacity: 150t/day	60	Expected co-combustion at Takehara #2 and other coal-fired power plants of J-POWER	Scheduled commence operation in April 2014
Kumamoto Sewage Treatment Plant Project	Contracted with Kumamoto City (DBO-type project*1) Project period: 20 years Sludge treatment capacity: 50t/day	Under consideration	Expected co-combustion at J-POWER's Matsuura (coal-fired) and Kyushu EPCO's Matsuura (coal-fired)	Scheduled commence operation in April 2013
<b>Wood remnants from logging</b>				
Miyazaki Wood Pellet Production Project	Miyazaki Subsidized Project *4 Pellet production capacity: 25,000t/year	98	Co-combustion at J-POWER's Matsuura coal-fired thermal plant	Commenced operation in March 2011

\*1. DBO (design, build, operate) scheme: a scheme whereby public sector shall finance projects and then commission private sectors to undertake the design, construction and operation

\*2. PFI (Private Finance Initiative): projects that utilize private sector funds

\*3. BTO (build, transfer, operate) scheme: a scheme whereby a facility shall be constructed by a private sector financing and after its ownership shall transfer to the public sector upon completion, the facility is managed by a private sector

\*4. Proof project for biomass-coal co-firing power generation using forestry residue (METI subsidized project in FY2009)

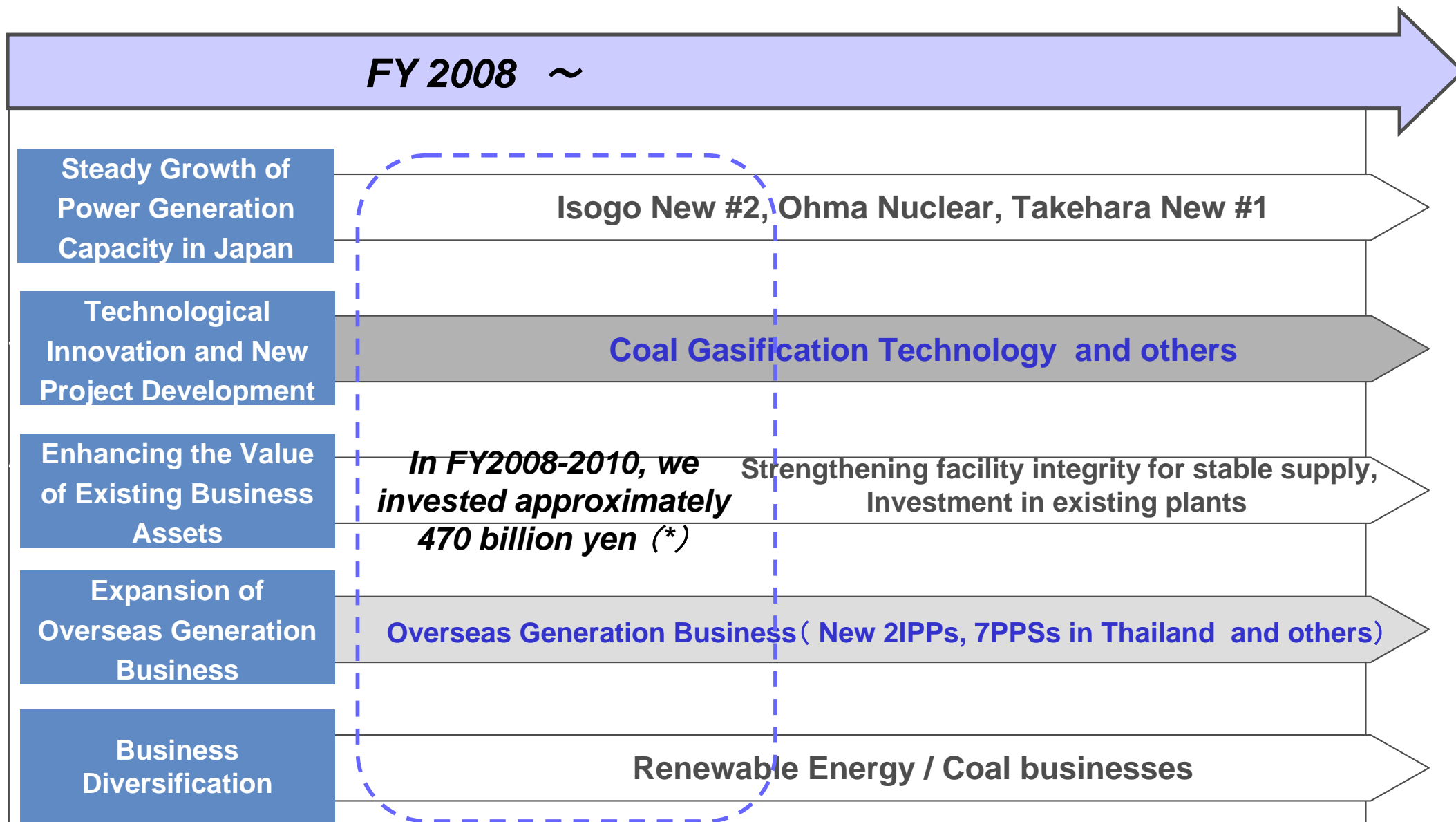
### 2. Other initiatives

Project	Site	Project Status
Co-combustion of sewage sludge derived fuel (biosolid fuel)	J-POWER's Matsuura Thermal Power Plant	2006 - : in operation
Woodchip co-combustion	J-POWER's Matsuura Thermal Power Plant	FY2008 - 2009: Long-term testing FY2010 -: in operation
Demonstration test for production of carbonized fuel derived from municipal solid waste *1	In the grounds of J-POWER's Matsushima Thermal Power Plant	FY2004 - 2009: in progress

\*1. New Energy and Industrial Development Organization (NEDO) demonstration test in unutilized biomass energy. Collaboration project with NEDO, Saikai City and J-POWER



## II -9. Outlook of Capital Expenditure



\* The amounts recorded in J-POWER's consolidated assets.

# III. Clean Coal Technologies (CCTs)



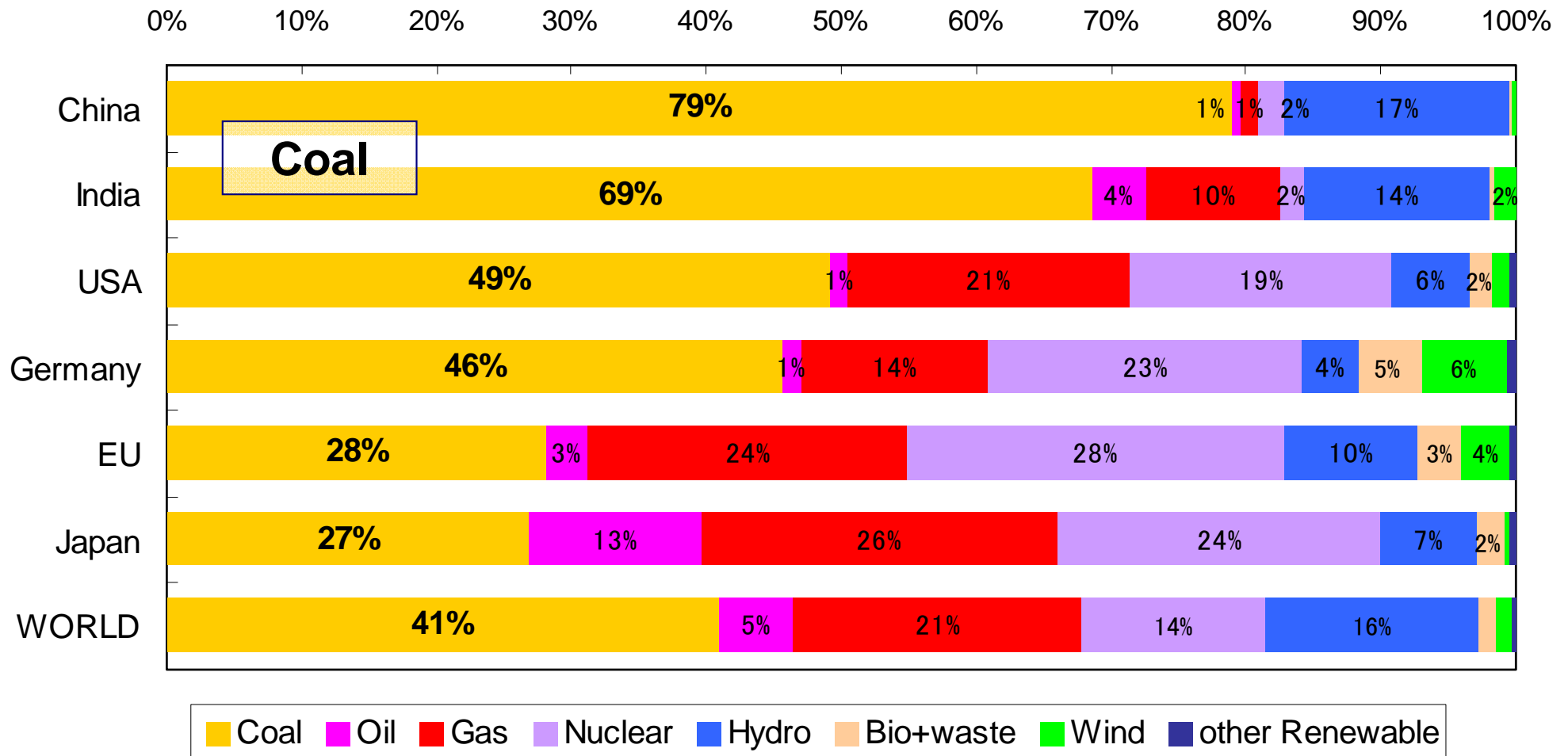
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3. **Thermal Efficiency in Worldwide Coal-Fired Power Generation and Power Generation Capacity in Asia** . . . 25
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# III-1. Electricity Generation by Fuel in Major Countries (2008)



- ▶ **Approximately 40%** of the world's power is generated by coal, the largest share.
- ▶ Coal's share of power generation is high in large energy-consuming countries such as China, India, and the U.S..

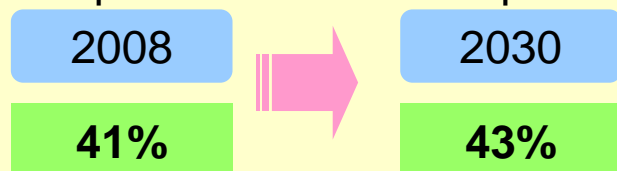


Sources: Germany - "IEA Electricity Information 2010", Others - "IEA World Energy Outlook 2010"

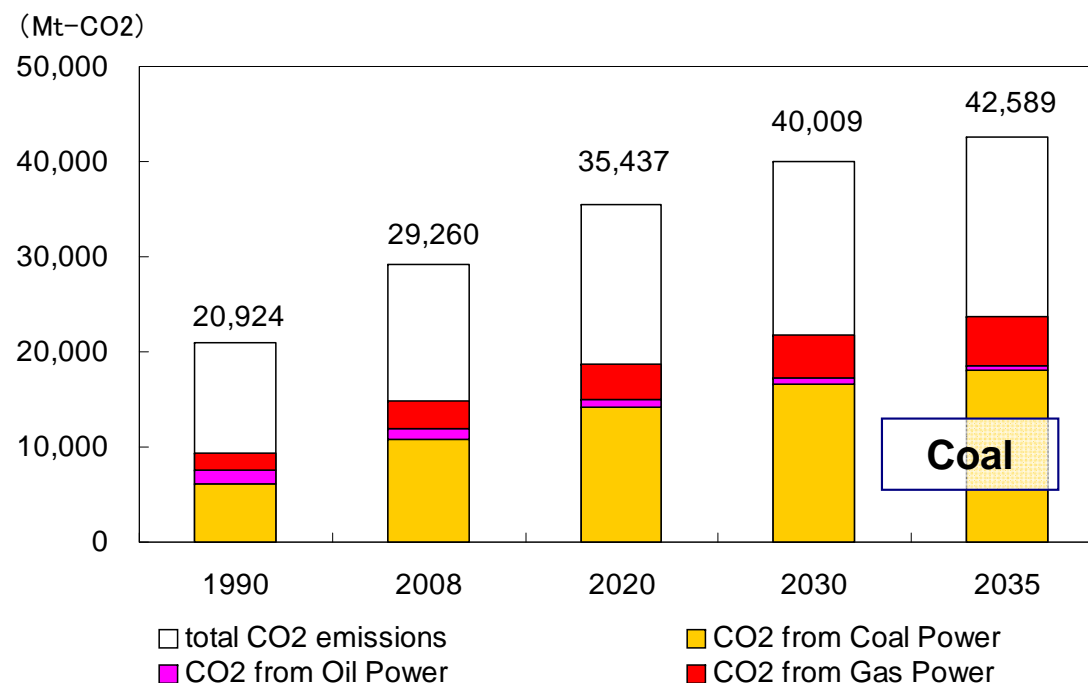
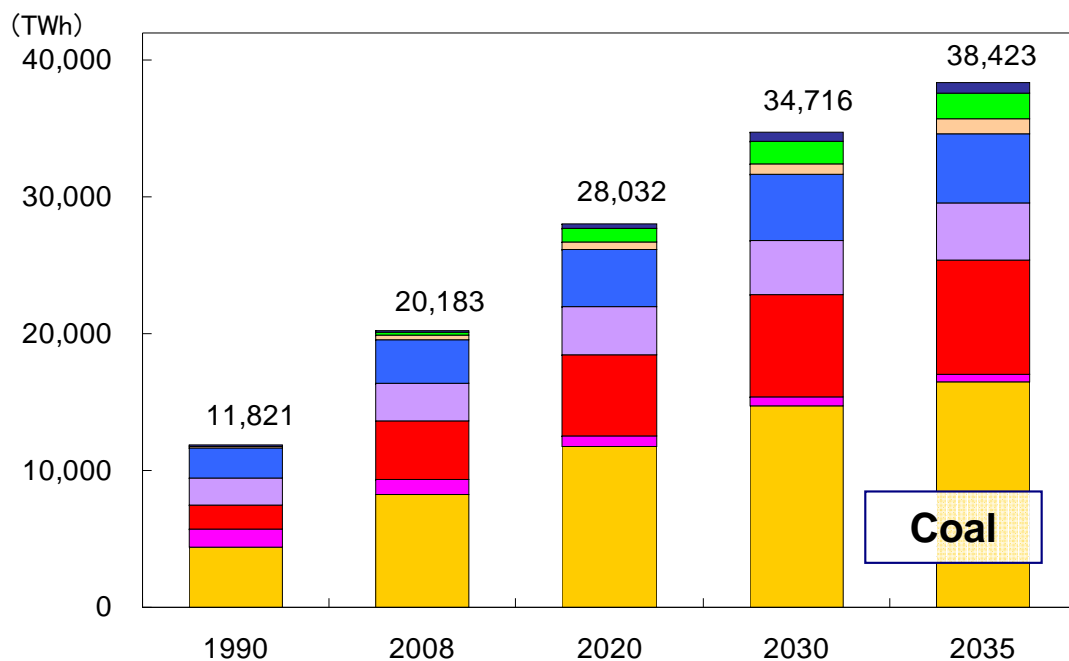
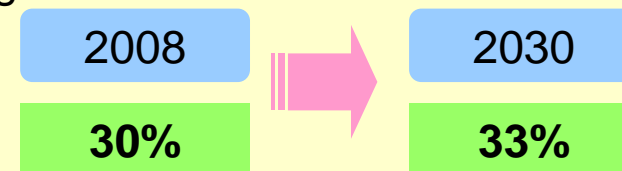
## III-2. Outlook for Power Generation and CO<sub>2</sub> Emissions: World

- ▶ Total CO<sub>2</sub> emissions from coal-fired power generation accounted for **about 30%** of total worldwide emissions. And the share is expected to increase.
- ▶ Reduction of CO<sub>2</sub> emissions from coal-fired power generation is a key to reduction of worldwide CO<sub>2</sub> emissions.

The share of coal-fired power generated output in worldwide output



The share of CO<sub>2</sub> emissions from coal-fired power generation in total worldwide emissions



■ Coal 
 ■ Oil 
 ■ Gas 
 ■ Nuclear 
 ■ Hydro 
 ■ Bio+waste 
 ■ Wind 
 ■ other Renewable

Source: IEA World Energy Outlook 2010: Current Policies Scenario\*

\* Scenario based on official adoption as of mid 2010

# III-3. Thermal Efficiency in Worldwide Coal-Fired Power Generation and Power Generation Capacity in Asia

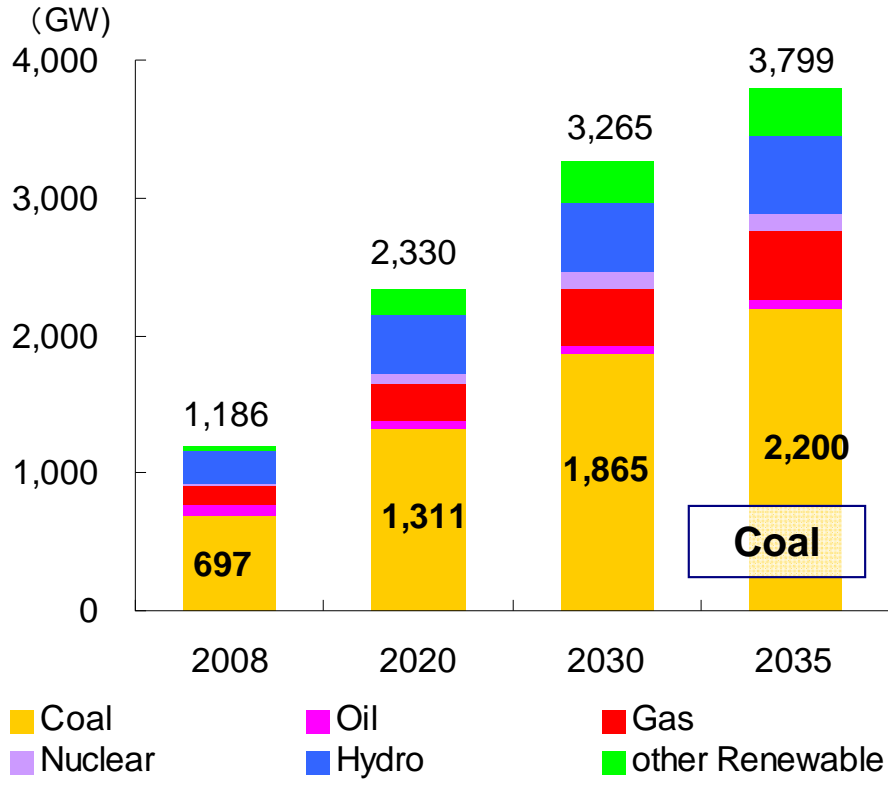
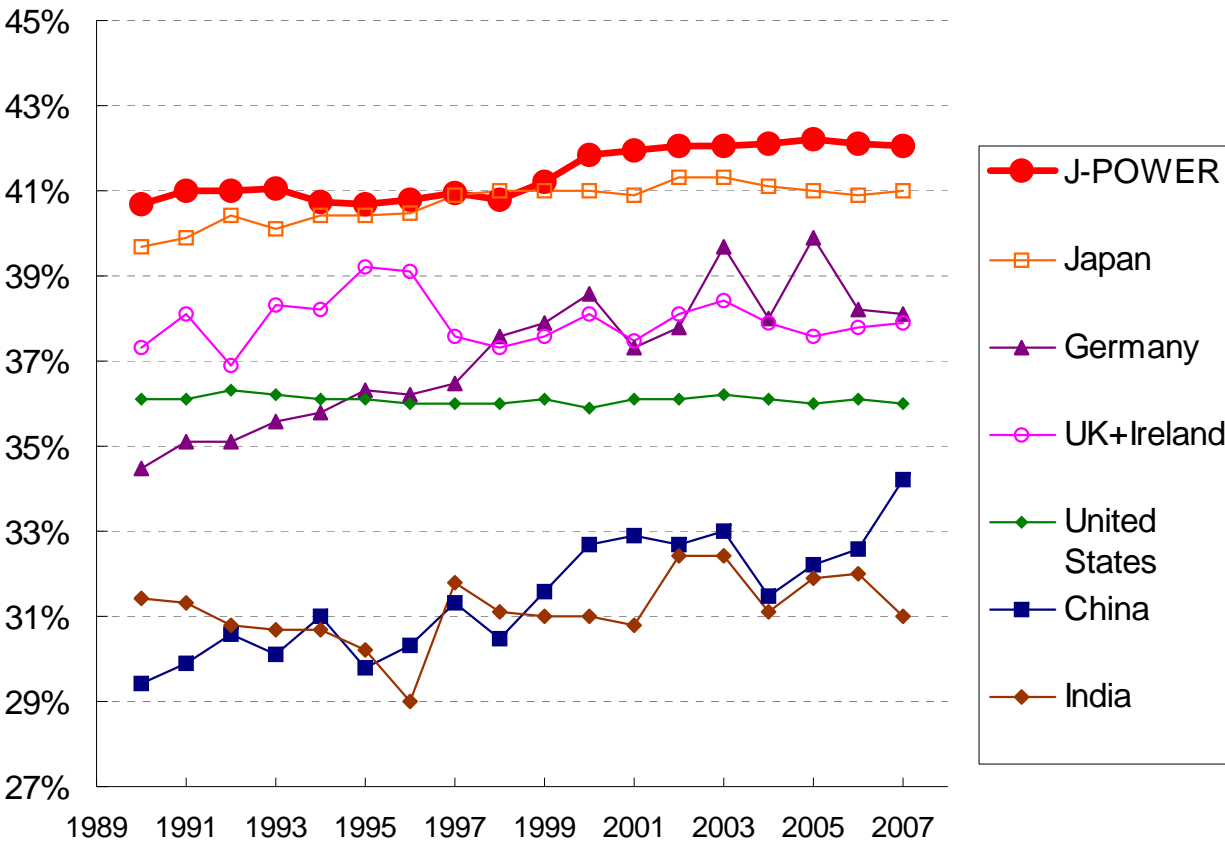


- ▶ Japan's coal-fired power plants lead the world in thermal efficiency
- ▶ Thermal efficiency in the U.S., China and India, the world's big CO2 emitters, is relatively low

Thermal Efficiency in Worldwide Coal-Fired Power Generation (Gross · LHV basis)

Outlook of Power Generation Capacity in Asia

A significant increase in coal-fired thermal generation in Asia is expected in the future.



Source: Ecofys International Comparison of Fossil Power Efficiency and CO2 Intensity 2010

Source: IEA World Energy Outlook 2010 - Current Policies Scenario  
Note: Japan is not included in the above.

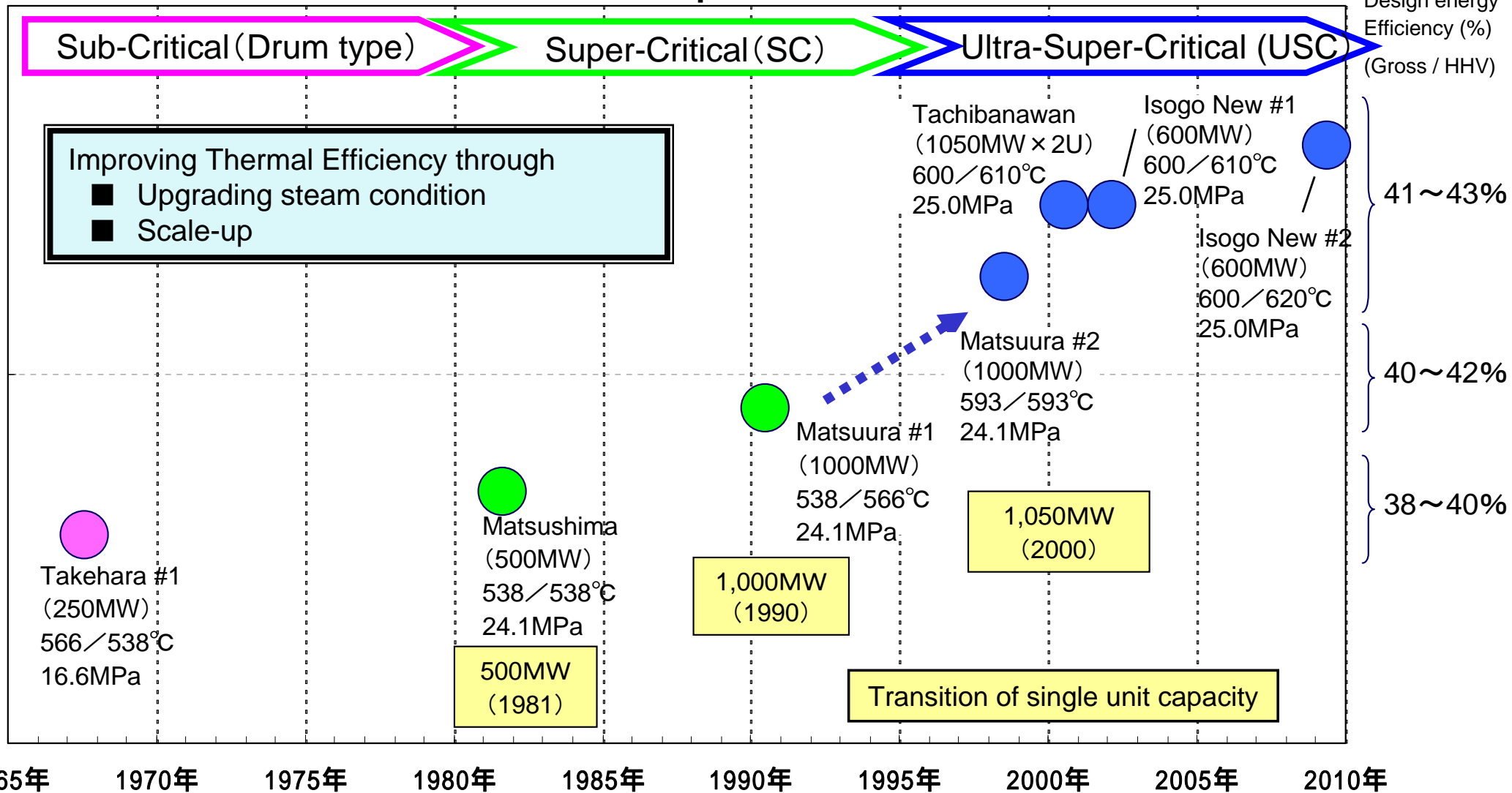
# III-4. Thermal Efficiency Improvements and USC Technology



▶ Achieving the world's highest level of thermal efficiency at Isogo Thermal Power Plant by continuous improvements through upgrading steam conditions

### Transition of Coal-fired plant steam conditions

Steam Condition (primary/ reheat temperature & pressure)

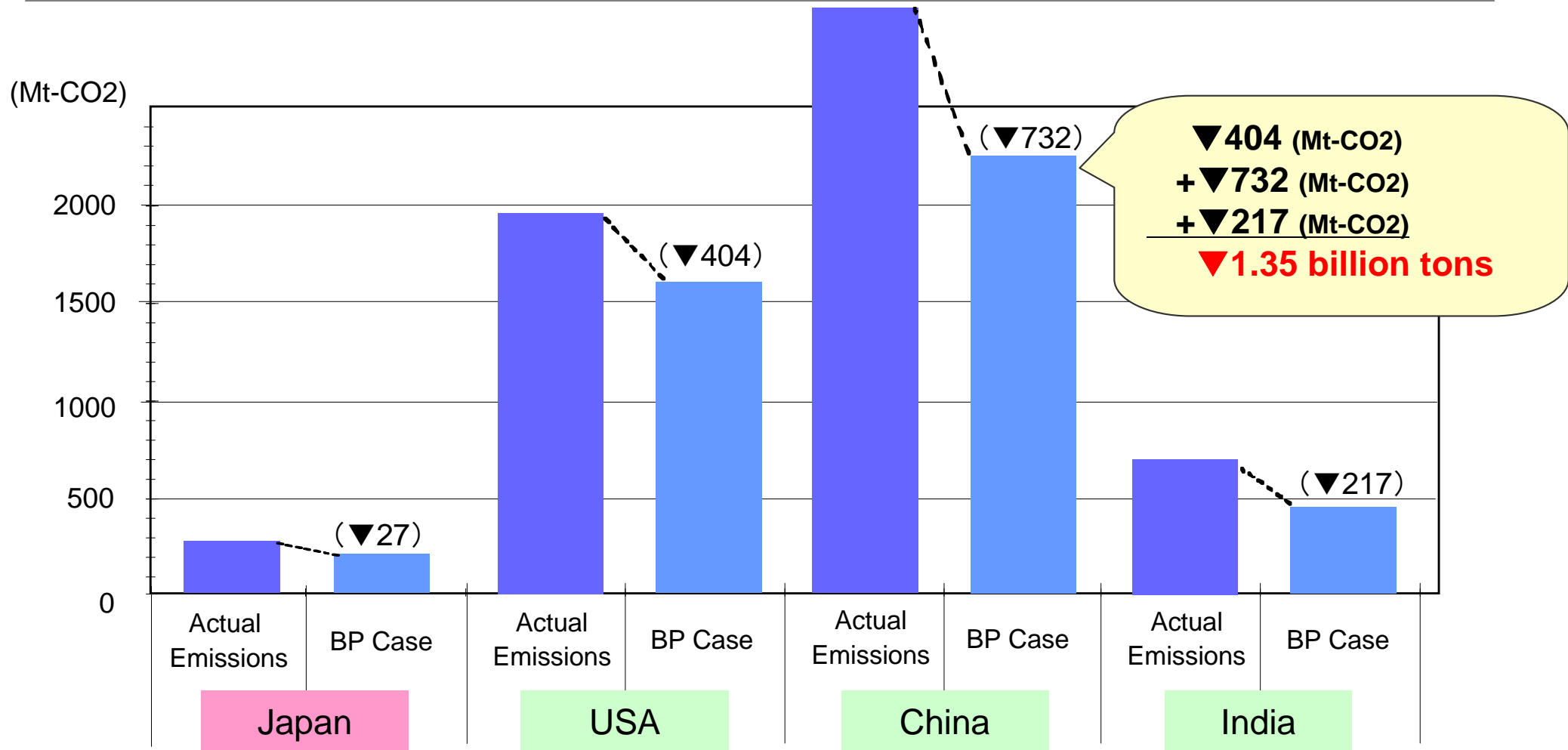


# III-5. Potentiality of Lower CO2 Emission by Japanese High Efficient Generating Technology



- ▶ Applying current best practice thermal efficiency in Japan to the U.S., Chinese, and Indian coal-fired power generation could reduce CO<sub>2</sub> emissions by **1.35 billion tons**.
- ▶ This is equivalent to **5% of worldwide CO<sub>2</sub> emissions from all sources (28.8 billion tons)**, or **almost the same as the total CO<sub>2</sub> emissions for Japan as a whole** based on 2007 levels.

Actual CO<sub>2</sub> emissions from coal-fired power plants (2007) and Estimated emissions with best practice



Source: "IEA World Energy Outlook 2009", "Ecofys International Comparison of Fossil Power Efficiency and CO<sub>2</sub> Intensity 2010"

### III-6. Replacement Plan for

## Takehara Thermal Power Station New Unit No.1



- ▶ Plan to replace the No.1 (250MW) and No.2 (350MW) units of Takehara Thermal Power Station (Takehara City, Hiroshima Prefecture) with a new unit No.1 (600MW) and currently conducting an environmental impact assessment.
- ▶ Over 43 years have passed since the No.1 unit went into operation and over 36 years for the No. 2 unit, so we need to cope with the effect of aging. Considering this situation, and from the perspective of taking a proactive approach to global warming problems as well, we plan the replacement.
- ▶ With the introduction of state-of-the-art plant, our aim is to increase energy efficiency and lower carbon dioxide emissions along with reducing the environmental burden of sulfur oxides (SOx) and nitrogen oxides (NOx).

Unit	No.1	No.2	No.3
Output	250MW	350MW	700MW
Start of operation	1967	1974	1983

### New Unit No.1 (600W)

Start of construction: 2014 (planned)  
 Start of operation : 2020 (planned)

### Main Schedule (Plan)

Fiscal Year	2010	11	12	13	14	15	16	17	18	19	20	21	22
New Unit No.1													commercial operation
Environmental Assessment													
Construction													



# III-7. Future technology development for coal-fired high-efficiency power plant



▶ Our long-term goal is to achieve zero emission coal-fired power by incorporating CCS

Ageing coal-fired	Latest coal-fired	Next generation coal-fired power plant		
<b>Sub-Critical</b>	<b>USC</b> (Ultra Super Critical)	<b>A-USC</b> (Advanced-USC)	<b>IGCC</b> (Integrated Coal Gasification Combined Cycle)	<b>IGFC</b> (Integrated Coal Gasification Fuel Cell Combined Cycle)
Efficiency: 36% (Net / HHV basis)	Efficiency: 41%	Efficiency: 46%	Efficiency: 46~48%	Efficiency: at least 55%
Temperature: approx. 560°C 	Temperature: approx. 600°C 	Temperature: approx. 700°C 		
	(Pulverized coal-fired)		(Coal gasification)	

ST: Steam turbine, GT: Gas turbine, FC: Fuel cell

Upgrade ageing power plants

CO<sub>2</sub> emissions 17%(\*)

Employing biomass co-firing, further reduction of 1 to 10% is expected.

\* Actual results through the replacement of J-POWER's Isogo Thermal Power Plant

Technology development

11%

Further reduction of CO<sub>2</sub> emissions

13%

25%

# III-8. Development and Deployment Roadmap for CCTs



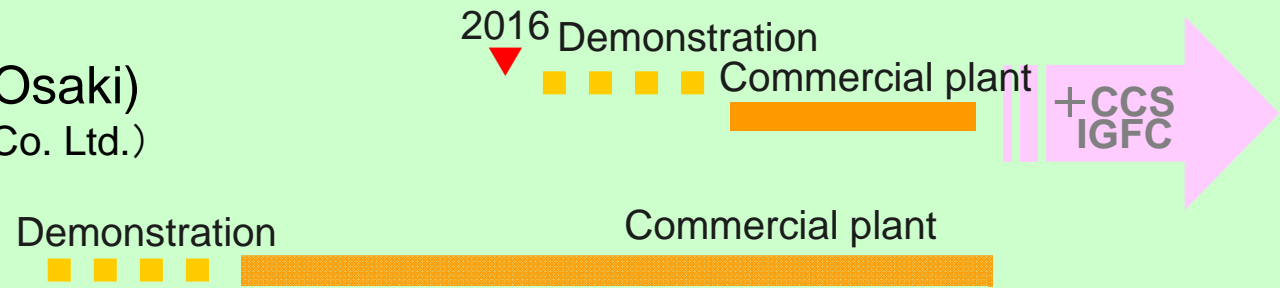
## ➤ PCF\* Development

- A-USC 700°C class



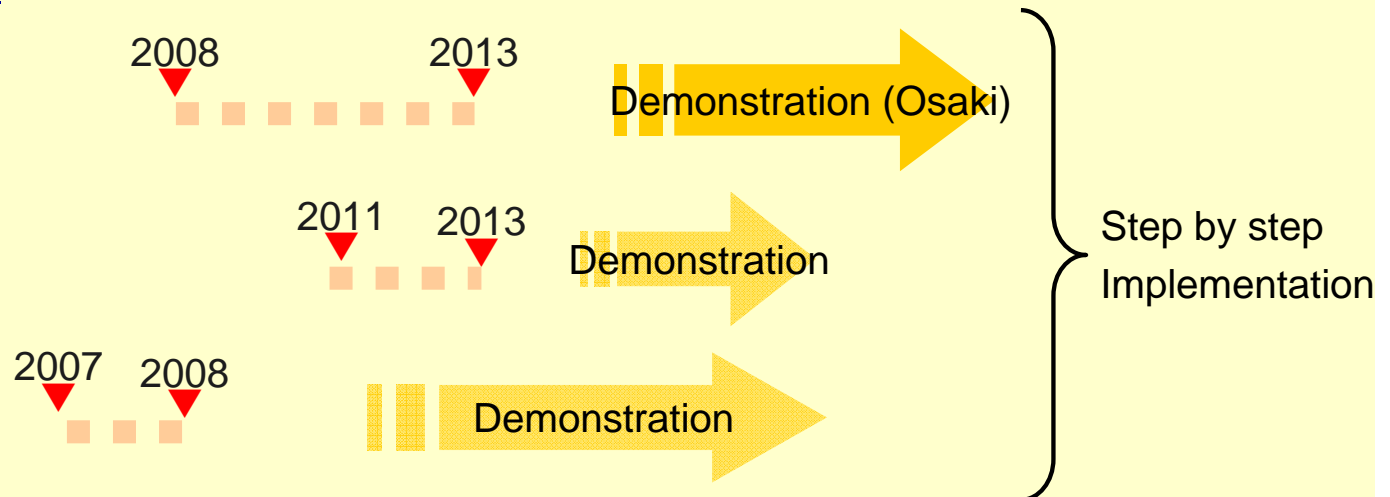
## ➤ IGCC/IGFC Development

- Oxygen-blown Coal Gasification (Osaki)  
(J-POWER, The Chugoku Electric Power Co. Ltd.)
- Clean Coal Power (Nakoso)  
(Joint project of EPCOs)



## ➤ CO2 Capture Development






- Wakamatsu EAGLE  
(gasification, pre-combustion)
- Callide, Australia  
(PCF\* Oxy-fuel)
- Matsushima PS  
(Post-combustion, Chemical Absorption)



\*PCF: Pulverized Coal-Fired generation

# III-9. Major Projects towards Coal Gasification and CO2 Capture



<b>Coal Gasification</b>	<b>Coal Gasification</b>	<ul style="list-style-type: none"> <li>■ Organization: J-POWER/NEDO</li> <li>■ Coal Consumption: 150t/day</li> <li>■ Test Period: FY2001-FY2009</li> </ul>	 <p>J-POWER Wakamatsu R.I. EAGLE Pilot Plant</p>
	Oxygen-blown (IGFC)		
<b>Coal Gasification</b>	<b>Coal Gasification</b>	<ul style="list-style-type: none"> <li>■ Organization: 9 EPCOs / JP/ CRIEPI</li> <li>■ Coal Consumption: 1,700t/day (250MW)</li> <li>■ Test Period: FY2007-FY2010</li> </ul>	 <p>CCP R&amp;D Nakoso P/S</p>
	Air-blown (IGCC)		
<b>CO2 Capture</b>	<b>Coal Gasification</b>	<ul style="list-style-type: none"> <li>■ Organization: J-POWER/NEDO</li> <li>■ Gas Flow: 1,000Nm<sup>3</sup>/h</li> <li>■ CO2 captured: about 20 t-CO<sub>2</sub>/day</li> <li>■ Test Period: FY2008 - FY2013</li> </ul>	 <p>J-POWER Wakamatsu R.I. EAGLE Pilot Plant</p>
	Pre-combustion		
	<b>Pulverized Coal-Fired</b>	<ul style="list-style-type: none"> <li>■ Organization: Japan (JP, IHI ...)/ Australia</li> <li>■ Scale: 30MW class</li> <li>■ CO2 captured: 30,000 t-CO<sub>2</sub>/year</li> <li>■ Test Period: FY2011- FY2013 (Planned)</li> </ul>	 <p>Australia Callide P/S</p>
Oxy-fuel			
<b>Pulverized Coal-Fired</b>	<ul style="list-style-type: none"> <li>■ Organization: J-POWER/MHI</li> <li>■ Gas Flow: 1,750Nm<sup>3</sup>/h</li> <li>■ CO2 captured: 10 t-CO<sub>2</sub>/day</li> <li>■ Test Period: FY2007 - FY2008</li> </ul>	 <p>J-POWER Matsushima P/S Chemical Absorption T.E.</p>	
Post-combustion			

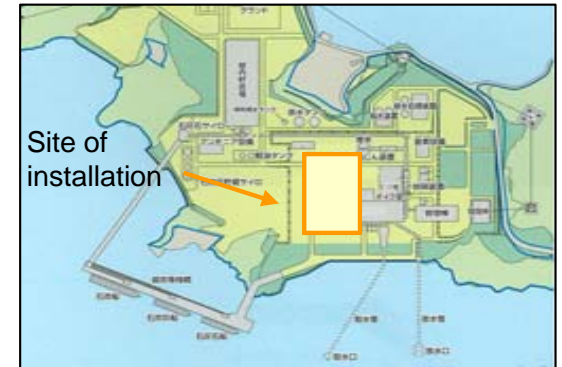
# III-10. OSAKI Oxygen-blown Coal Gasification Demonstration Project: Update



- ▶ Plans to commence a large-scale demonstration test (Osaki CoolGen Project) in fiscal 2016 on an oxygen-blown integrated coal gasification system (IGCC) jointly with Chugoku Electric Company in the lead up to the commercialization of IGCC
- ▶ Currently conducting an environmental assessment

## Outline of the project

Corporate Name	Osaki CoolGen Corporation (Established in July, 2009)
Capital contribution	J-POWER 50%, The Chugoku Electric Power Co.,Ltd. 50%
Location	Osaki Power Station, The Chugoku Electric Power Co., Ltd. (Osaki Kamijima-cho, Hiroshima Prefecture)
Scale	Coal feed: 1,100t/day class (output 170MW class)
Details of test	The demonstration test will examine technological feasibility of a larger scale IGCC and CO <sub>2</sub> capture.



Osaki Power Station (Hiroshima Pref.), Chugoku Electric Power

## Schedule

Fiscal Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Optimization Survey Research	Preparation		Optimization											
Environmental Assessment	Preparation		Environmental Assessment											
Construction & Demonstration Test			IGCC	Design & Construction						Demonstration Test				
				CO <sub>2</sub> separation & recovery						Design & Construction		Demonstration Test		



**Electric Power Development Co., Ltd.**

<http://www.jpowers.co.jp/>