

# FUELS

2008

2009

Business Development in Thermal Fuels



THE TOKYO ELECTRIC POWER CO., INC.

# 1 Fuel Procurement Strategies

## Basic Use and Procurement Policy for Thermal Power Generation Fuels

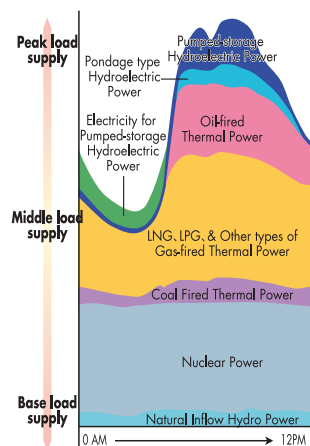
TEPCO generally uses nuclear power and run-of-the-river type hydroelectric power to meet the base load demand, and thermal power to respond to changes in demand. Thermal power generation uses LNG, oil, coal and other fuels. Each fulfills a different role depending on its price, purchasing conditions, environmental friendliness and other characteristics.

<b>LNG</b>	<b>[Role]</b> Mainly used for middle load supply <b>[Characteristics]</b> <ul style="list-style-type: none"> <li>● Environmentally friendly and easy to use compared with other fossil fuels</li> <li>● Procurement is inflexible because bilateral contracts based on long-term agreements are standard</li> <li>● Lower per calorie price compared with oil</li> </ul>
<b>Oil</b>	<b>[Role]</b> Mainly used for peak load supply <b>[Characteristics]</b> <ul style="list-style-type: none"> <li>● Excellent flexibility in responding to demand fluctuations over the course of the day and adjustability in responding to fuel supply fluctuations</li> <li>● Procurement is highly flexible due to growth of spot markets</li> <li>● Availability of low-sulfur crude oil and domestic low-sulfur C-grade heavy oil is decreasing</li> <li>● Higher per calorie price compared with LNG or coal</li> </ul>
<b>Coal</b>	<b>[Role]</b> Mainly used for base load supply <b>[Characteristics]</b> <ul style="list-style-type: none"> <li>● Excellent supply stability and very economical</li> <li>● Abundant and widespread global deposits</li> <li>● Lower per calorie price compared with LNG or oil</li> <li>● Substantial environmental burden</li> </ul>

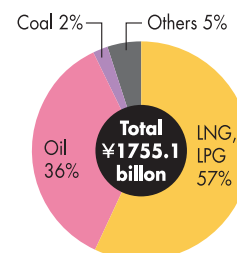
Because each thermal power generation fuel has different characteristics, TEPCO diversifies its procurement sources by region and vendor and its purchasing conditions by contract length, price, volume and other factors to achieve the optimum mix of procurement sources, just as it achieves the best mix of power sources.

TEPCO will continue to fortify its competitive fuel procurement base, in away that is responsive to environmental changes and risks, and to pursue flexible and economic fuel procurement with the best procurement mix while considering structural changes to power generation facility configuration. LNG is TEPCO's main thermal power fuel, accounting for 57 percent of the Company's ¥1,755.1 billion in fuel expenses for fiscal 2007. Stable and economic procurement of LNG is an important issue.

## DAILY PATTERN OF GENERATION MIX



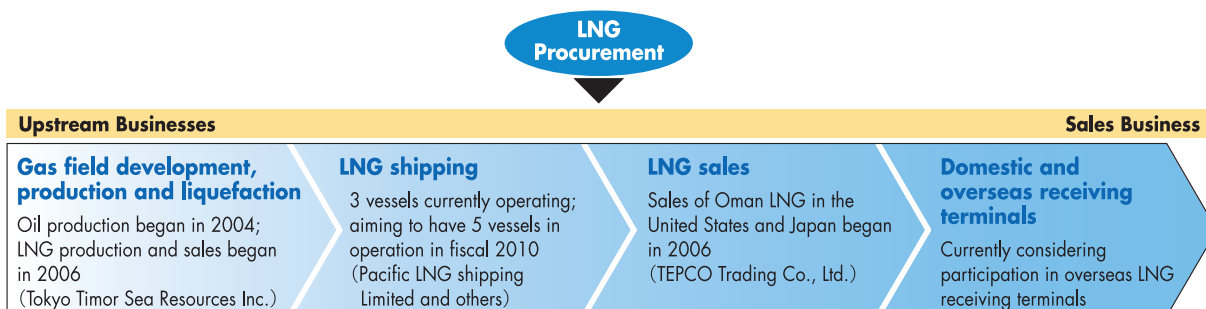
## Fiscal 2007 Fuel Expenses



## Fuel Procurement Strategies

TEPCO aims to improve its procurement capabilities by leveraging its strengths related to LNG transactions, and to achieve autonomous procurement that is minimally affected by market changes. To achieve these objectives, the Company continues to expand its presence in the upstream businesses of the energy supply chain (including gas field development and LNG production, LNG shipping and LNG trading). Going forward, we will strengthen our LNG-related businesses through participating in new areas such as overseas LNG receiving terminals. We will also work to expand the fuel business by considering developing new businesses in oil and coal. At the same time, aiming to introduce innovative transactions, we will strengthen our global procurement capabilities and make procurement more autonomous.

## Participation in the LNG Supply Chain



Recent Business Developments in Fuels **2****LNG Transportation Project**

TEPCO is promoting an LNG transportation project with the aim of reducing procurement costs and increasing flexibility of delivery through controlling LNG ships. Three ships, the Pacific Notus, the Pacific Eurus, and the Alto Acrux, have already entered into service. Two ships are now under construction, and one of which will be constructed to sail to Sakhalin in the winter season. The other one is owned by subsidiaries established by TEPCO, Kyushu Electric Power Company, and others. The ship will transport the LNG procured by Kyushu Electric Power Company.

Name	Capacity (m <sup>3</sup> )	Type	Delivery	Remarks
Pacific Notus	135,000	Moss	Sep. 2003	For Darwin and Malaysia trades
Pacific Eurus	135,000	Moss	Mar. 2006	
Alto Acrux	145,400	Moss	Mar. 2008	
TBN	145,400	Moss	Jan. 2009	For Sakhalin trades
TBN	145,400	Moss	Mar. 2009	For Kyushu Electric Power Company trades

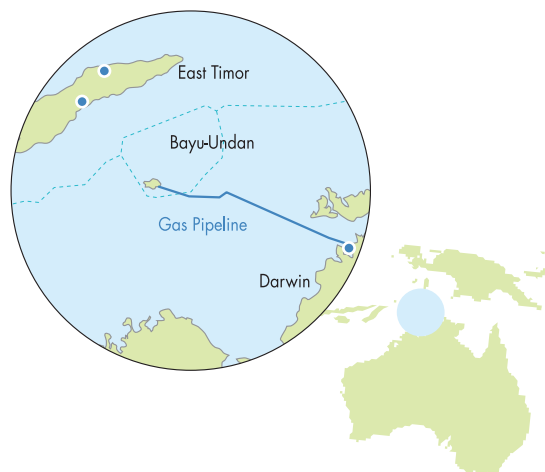


The Pacific Eurus

**Bayu-Undan Gas Field Development & Darwin LNG Project, Australia & Timor-Leste**

TEPCO is participating in the Bayu-Undan Gas Field (located 250 kilometers off the southern coast of Timor-Leste and 500 kilometers offshore from Darwin in Australia). Production, pipeline and gas liquefaction projects, which produce and sell 115,000 barrels per day of combined condensate and LPG, and 3 million tons per annum of LNG.

In conjunction with the LNG shipping project, this is the first time for a Japanese power company to be involved in the entire LNG value chain, from the production of natural gas, to liquefaction, transport, re-gasification, consumption and sales.



Estimated recoverable hydrocarbons	Darwin LNG Project		
	Contracted volume	Contract term	Contract format
Condensate and liquefied petroleum gas 550 million barrels Natural gas : 4 trillion cubic feet	TEPCO 2 million tons/year	From 2006 to 2022	FOB
	Tokyo Gas 1 million tons/year		

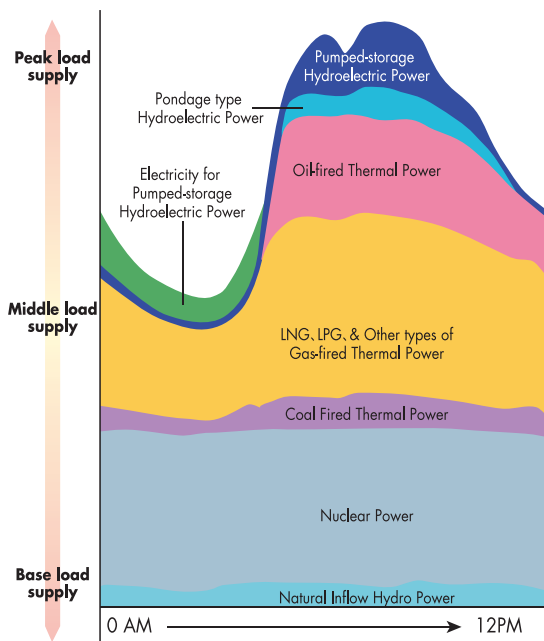
**LNG Trading Business**

TEPCO began its LNG trading business through its subsidiary "TEPCO Trading Co." with the aim of improving flexibility in its LNG procurement and creating a new profit center. TEPCO Trading is engaged in such business through its affiliated company, CELT Inc., a joint venture with Mitsubishi Corporation. CELT Inc. purchases LNG cargoes from Oman (Qalhat LNG) through Mitsubishi Corporation and sells them mainly to Japan and the United States. Cargo allocation is determined according to supply and demand in these markets.

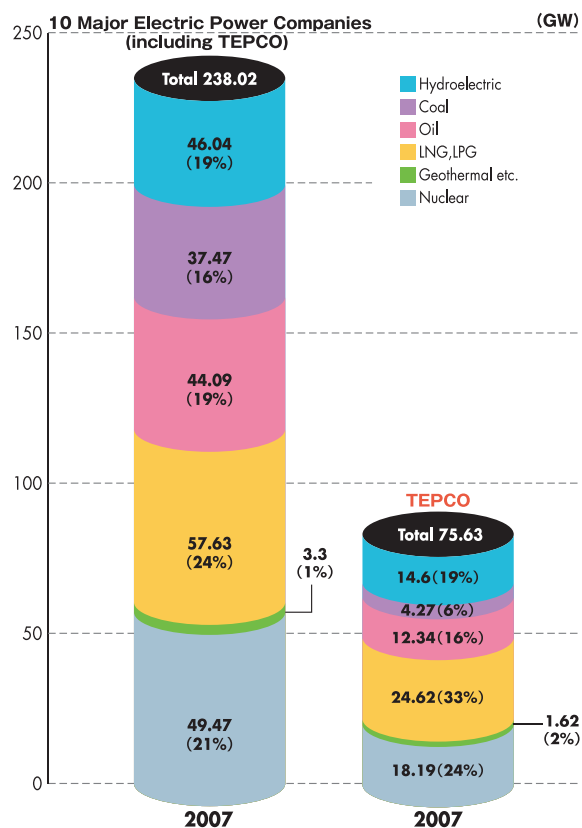
In addition, TEPCO Trading is selling and purchasing LNG cargoes by itself. TEPCO expects to expand such business to improve flexibility in the procurement of LNG and to increase the opportunity to earn profits.

# 3 Fuel Mix

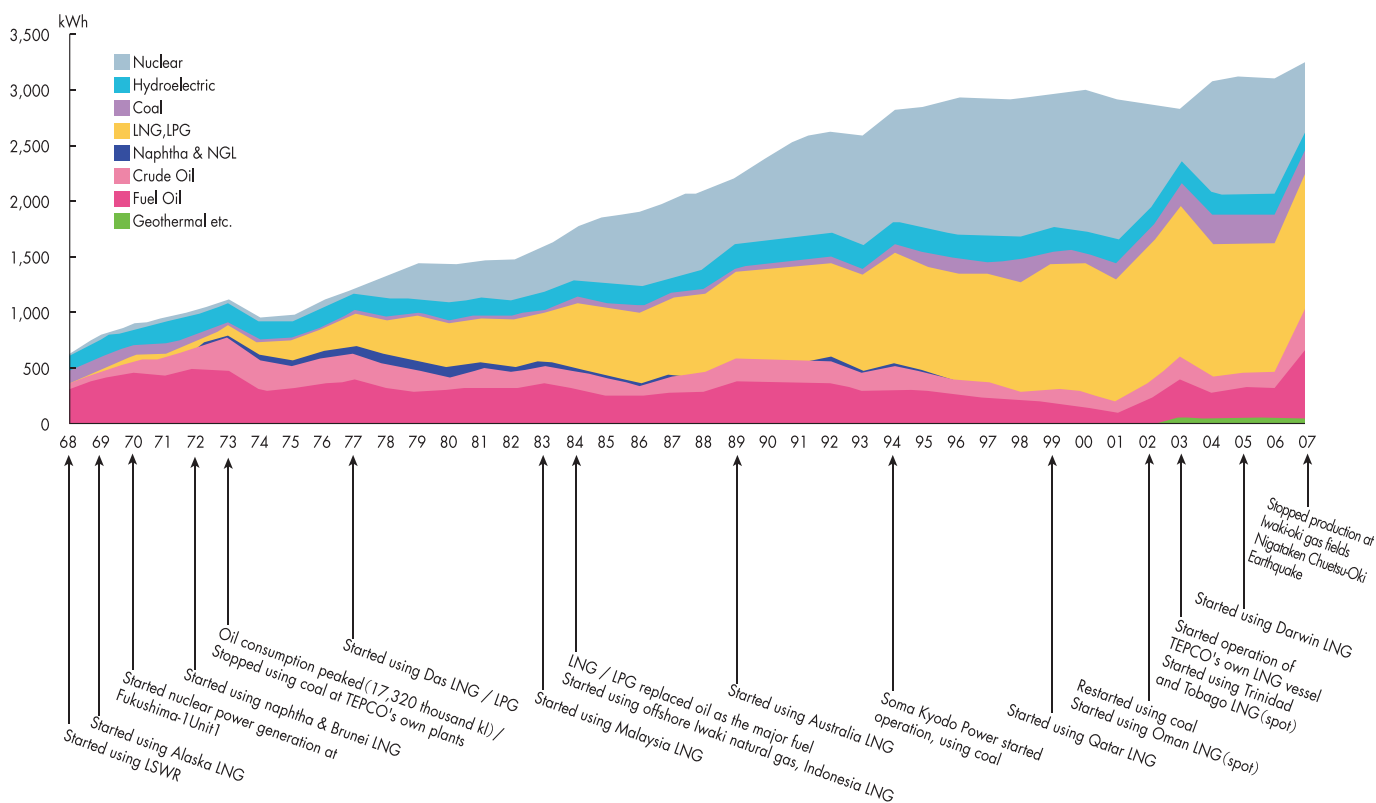
## DAILY PATTERN OF GENERATION MIX



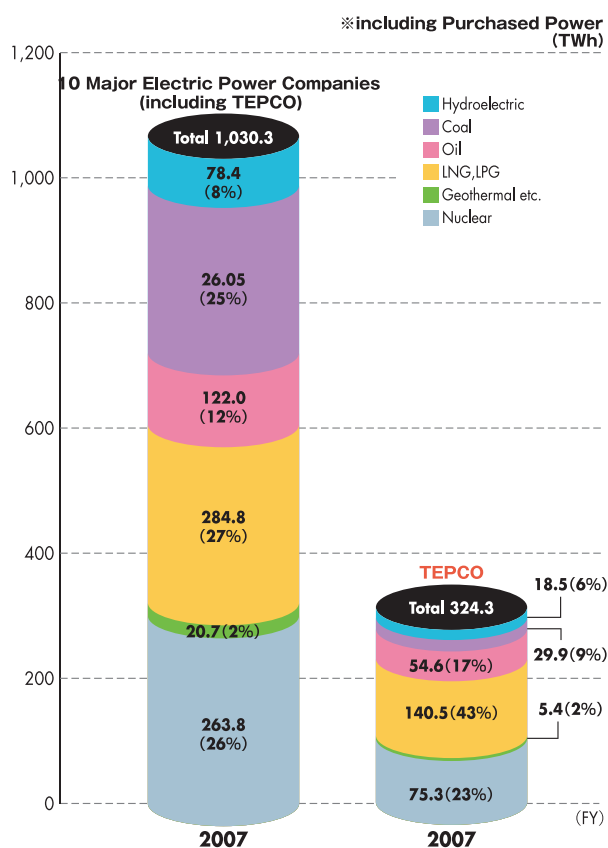
## GENERATING CAPACITY at Fiscal Year End by Type of Fuel



## TEPCO'S POWER GENERATION BY ENERGY SOURCE



## ELECTRICITY GENERATION by Type of Fuel



Source : Management plans from Japanese electric power companies

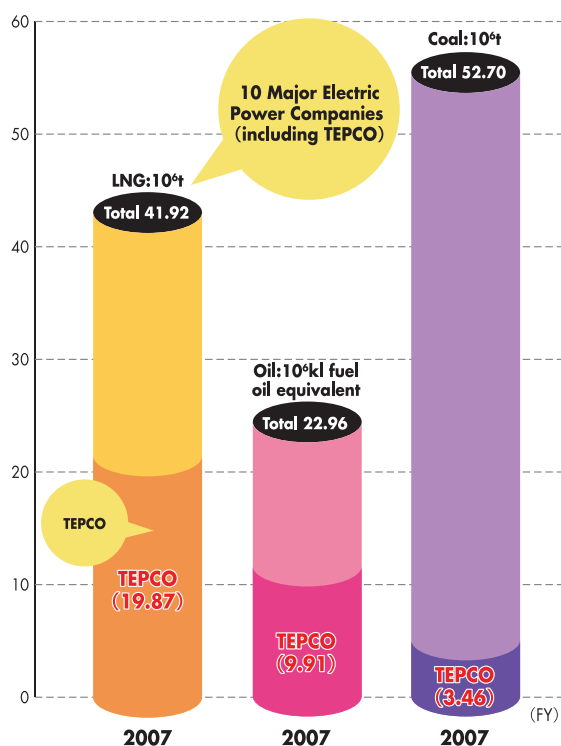
In fiscal year 2007, TEPCO generated 324.3TWh (including purchased power) and supplied 297.4TWh of electricity to the Tokyo Metropolitan Area. Thermal power accounted for 69% of TEPCO's power generation. In that period, 63% of TEPCO's total thermal power was generated by LNG, LPG in addition to 24% oil, and 13% coal.

Coal, with its abundant reserves and economic competitiveness, also supplies energy for the base load. TEPCO utilizes advanced technologies for environmental protection.

TEPCO continues to develop LNG thermal power for its environmental benefits. LNG has become a major fuel for TEPCO.

Oil-fired power fulfills a role in dealing with adjustment for seasonal fluctuations, especially heat waves and severe winter weather. TEPCO uses extremely low sulfur oil, and pollution control devices.

## MAIN FUEL REQUIREMENTS FOR THERMAL POWER



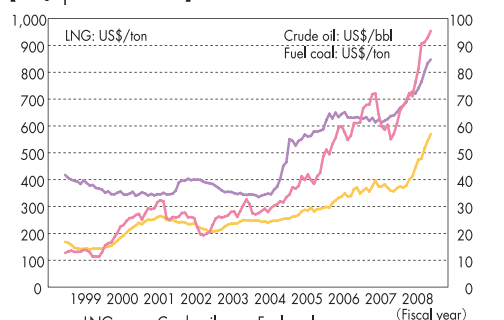
Source : TEPCO estimates

Note : ( ) TEPCO inclusive

## The Fuel Procurement Environment

About 10 years ago, crude oil was traded for roughly 20 to 30 U.S. dollars per barrel. The price began to rise steeply from the end of 2004, exceeding 100 U.S. dollars per barrel in 2008. Prices for other fuels including LNG and coal are also rising substantially compared to the past due to the tight market. In particular, demand for highly economical and clean natural gas is growing significantly worldwide, and global competition for LNG is underway with emerging nations such as China and India actively securing supply as a national policy. Further, there are concerns that the power balance is shifting in markets due to the increasing presence of countries with rich natural gas deposits such as Russia, Qatar and Iran.

### [All Japan CIF Prices]



Source : Trade Statistics of Japan, Ministry of Finance



# 4 LNG, LPG

LNG, LPG

## OUTLINE OF LNG / LPG PROJECTS

① Contract Period (1st delivery-termination) ② Annual Contract Quantity  
TEPCO's share / Total Project (10<sup>3</sup>t) ③ Seller(s) ④ Number of Tankers

**Qatar**  
① 1999.6 – 2021.12  
② 200 / 6,000  
③ QATAR LIQUEFIED GAS  
④ 135,000m<sup>3</sup>×10 Tankers

**Das Island (U.A.E.)**  
① 1977.5 – 2019.3  
② LNG 4,300 / LPG 700  
(All for TEPCO)  
③ ABU DHABI GAS  
LIQUEFACTION (ADGAS)  
④ 135,000m<sup>3</sup>×8 Tankers  
75,200m<sup>3</sup>×class Tankers  
(LPG)

**Qalhat (Oman)**  
① 2006.4 – 2020.12  
② 800 (co-buyer : Mitsubishi Corporation)  
③ QALHAT LNG  
④ 145,000m<sup>3</sup>×1 Tanker (MC)

**Malaysia (Satu)**  
① 1983.2 – 2018.3  
② 4,800 / 7,400  
③ MALAYSIA LNG  
④ <Ex-ship>  
130,000m<sup>3</sup>×8 Tankers  
137,100m<sup>3</sup>×6 Tankers  
<for FOB>  
135,000m<sup>3</sup>×1 Tanker (TEPCO)  
145,000m<sup>3</sup>×1 Tanker (Tokyo Gas)

**Sakhalin II (Russia)**  
① Uncertain – 2029.3  
② 1,500 + Short-Term Volume  
③ SAKHALIN ENERGY  
INVESTMENT  
④ <for FOB>  
145,000m<sup>3</sup>×1 Tanker (TEPCO)

**Alaska (U.S.A.)**  
① 1969.11 – 2009.3  
② 918 / 1,224  
③ CONOCOPHILLIPS ALASKA  
NATURAL GAS  
MARATHON OIL  
④ 88,500m<sup>3</sup>×2 Tankers

**Brunei**  
① 1973.1 – 2013.3  
② 4,030 / 6,010  
③ BRUNEI LNG  
④ 75,000m<sup>3</sup> × 5 Tankers  
77,000m<sup>3</sup> × 2 Tankers  
135,000m<sup>3</sup> × 1 Tanker

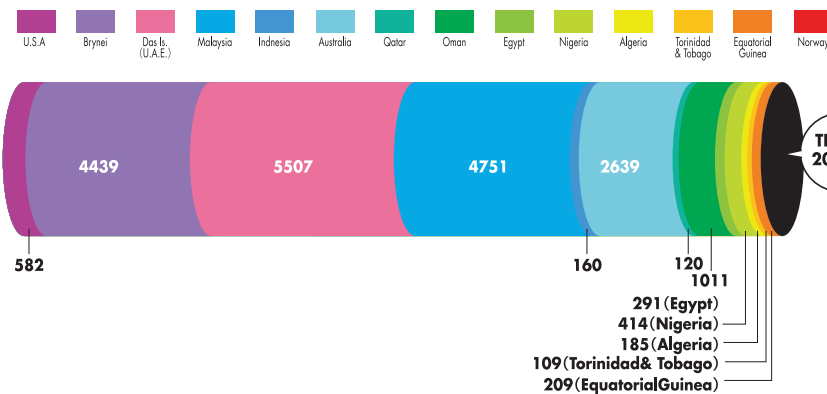
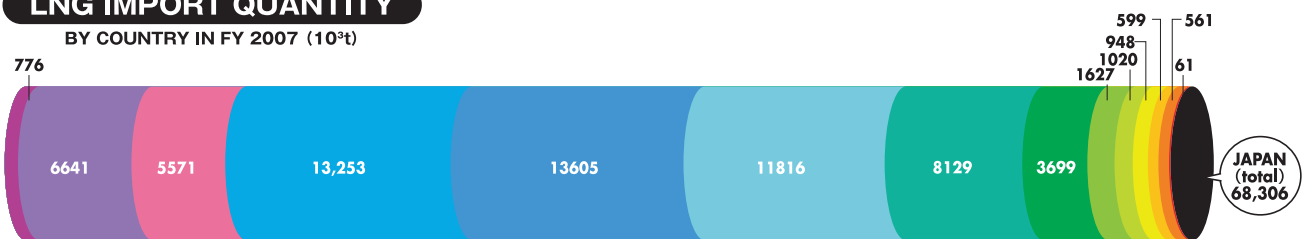
**Arun (Indonesia)**  
① 1984.1 – 2009.12  
② 130 / 960 (2005-2009)  
③ PERTAMINA  
④ 125,000m<sup>3</sup>×1 Tanker  
(2005-2009)

**Darwin (Australia)**  
① 2006.3 – 2022.12  
② 2,000 / 3,000 (TEPCO)  
③ DARWIN LNG  
④ <for FOB>  
135,000m<sup>3</sup>×1 Tanker (TEPCO)  
145,000m<sup>3</sup>×1 Tanker (TEPCO)  
147,000m<sup>3</sup>×1 Tanker (Tokyo Gas)

**Australia**  
① 1989.8 – 2017.3  
② 1,180 / 7,330  
③ SHELL DEVELOPMENT  
BHP BILLITON PETROLEUM  
CHEVRON OIL TRADING  
BP INTERNATIONAL  
WOODSIDE PETROLEUM  
JAPAN AUSTRALIA LNG  
④ 125,000m<sup>3</sup>×8 Tankers  
137,000m<sup>3</sup>×1 Tankers

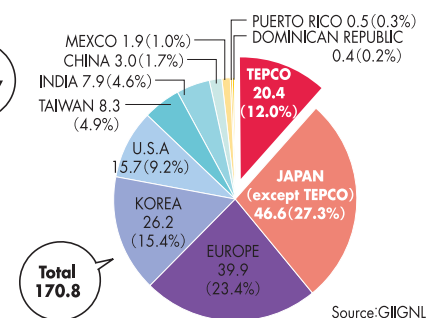
## LNG IMPORT QUANTITY

BY COUNTRY IN FY 2007 (10<sup>3</sup>t)



## LNG IMPORT IN THE WORLD

IN CY 2007 (10<sup>3</sup>t)



Source: GIIGNL



Darwin LNG Plant



Futtsu Thermal Power Station (3,520 MW)

In 1969, TEPCO became the first importer of liquefied natural gas (LNG) in Japan. Since then, our LNG import has expanded steadily considering its environmental advantages and supply stability. Currently, we import LNG from 9 LNG projects located in Alaska, Brunei, Das Island (the United Arab Emirates), Malaysia, Indonesia, North West Shelf (Australia), Qatar, Darwin (Australia), and Oman under long-term contracts. Furthermore, in FY 2008 we will begin importing LNG from Sakhalin, Russia.



Pacific Notus

In FY 2007, we imported approximately 20.4 million tons of LNG. Our LNG share equals nearly 30% of Japan's total LNG import and approximately 12% of the total LNG volume traded globally. We import liquefied petroleum gas (LPG) from the Das Island Project as well. The power output from these fuels accounts for about 63% of our total thermal power generation.

## Units No.2 and No.3 of Group 1 in Kawasaki Thermal Plant began Operation

Units No.3 (500MW) and No.2 (500MW) of Group 1 in Kawasaki Thermal Power Plant began their operation from June, 2007 and June 2008, respectively. The type of power generation facility is MACC (More Advanced Combined Cycle, 1,500°C class), which is improved type of ACC (Advanced Combined Cycle, 1,300°C class) existing in thermal power plants in Yokohama, Chiba, Futtsu, and Shinagawa. MACC achieved 59%<sup>(\*)</sup> of the thermal efficiency, which is the world's highest level. It is the first time to operate MACC in Japan. All units of Group 1 will begin operation in February 2009, and the total output will become 1,500 MW.

<sup>(\*)</sup>LHV: Lower Heating Value

· Group 2 (1,500MW): It will begin its operation from 2013 onward (FY).



Kawasaki Thermal Power Station (3,000 MW)

Oil, along with LNG and coal, is one of the main thermal fuels used by TEPCO. Oil-fired power plays an important role in keeping up with power demand fluctuations.

TEPCO uses low sulfur crude and fuel oil (around 0.1 - 0.3%) to meet with environmental standards. Middle Eastern crude oil, which contains high sulfur, must be refined into low sulfur fuel oil for use by TEPCO.

In order to promote stable and flexible procurement, TEPCO obtained a direct import license for oil, and always seeks to purchase crude oil from new sources.

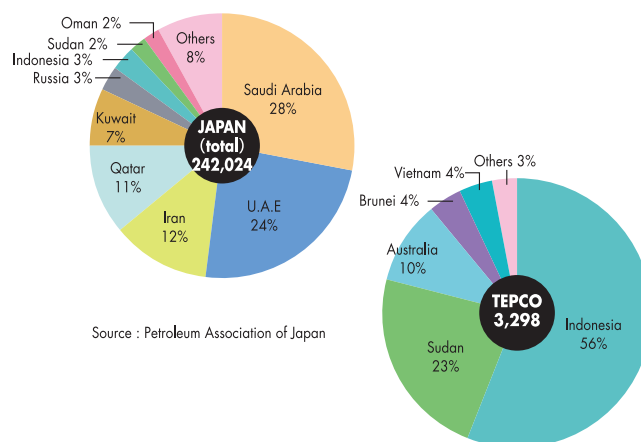
## TEPCO'S SOURCES OF CRUDE OIL

IN FY 2007 (including Condensate)



## CRUDE OIL SUPPLY SOURCES

IN FY 2007 (10<sup>3</sup>kl) (including Condensate)

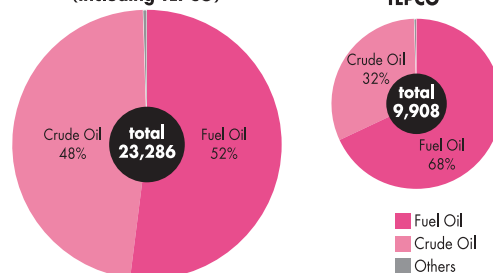


Source : Petroleum Association of Japan

## OIL CONSUMPTION BY TYPE

IN FY 2007 (10<sup>3</sup>kl fuel oil equivalent)

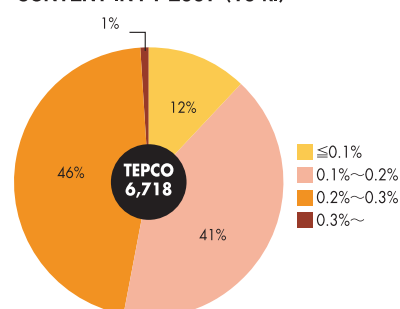
10 Major Electric Power Companies (including TEPCO)



Kashima Thermal Power Station (4,400MW)

## FUEL OIL SUPPLY TO TEPCO BY SULFUR

CONTENT IN FY 2007 (10<sup>3</sup>kl)

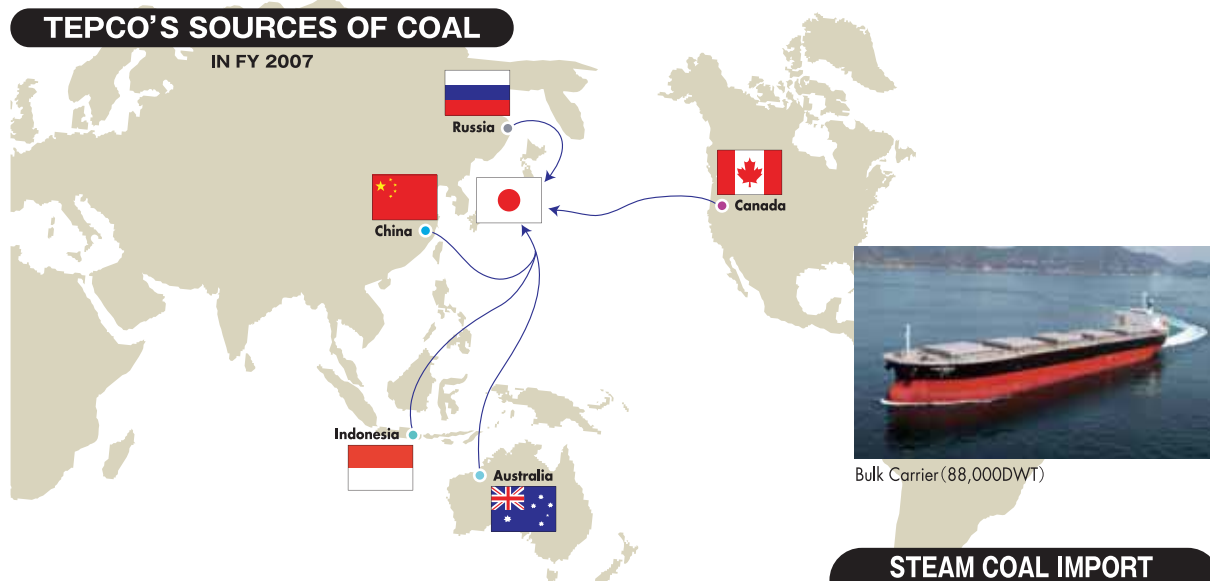




Coal provides fuel supply stability and economic competitiveness. TEPCO imports coal primarily from Australia, Indonesia, China and Canada. In order to achieve economic competitiveness and supply stability, TEPCO plans to use as many brands of coal as possible and to diversify supply sources, for example to include Russia. TEPCO has installed desulfurizers, denitrizers and electric precipitators for clean and environmentally friendly coal use. TEPCO also participates in the IGCC (Integrated Coal Gasification Combined Cycle) R&D joint venture with the Japanese government and industries. In addition to the coal for our two units, TEPCO also procures half of coal consumed by Soma Kyodo Power Company's Shinchi Power Station.

### TEPCO'S SOURCES OF COAL

IN FY 2007



Onahama Coal Center



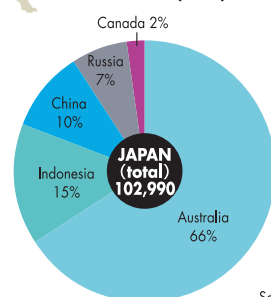
Hirono Thermal Power Station  
3,200 MW Oil fired  
600 MW Coal fired



Shinchi Power Station,  
Soma Kyodo Power Co. (2,000 MW)

### STEAM COAL IMPORT QUANTITY BY COUNTRY

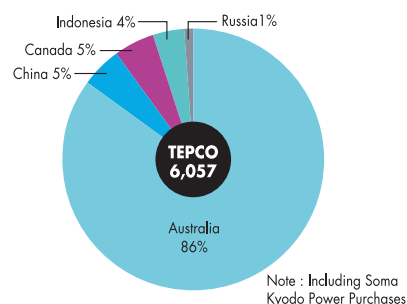
IN FY 2007 (10<sup>3</sup>t)



Source : MOF

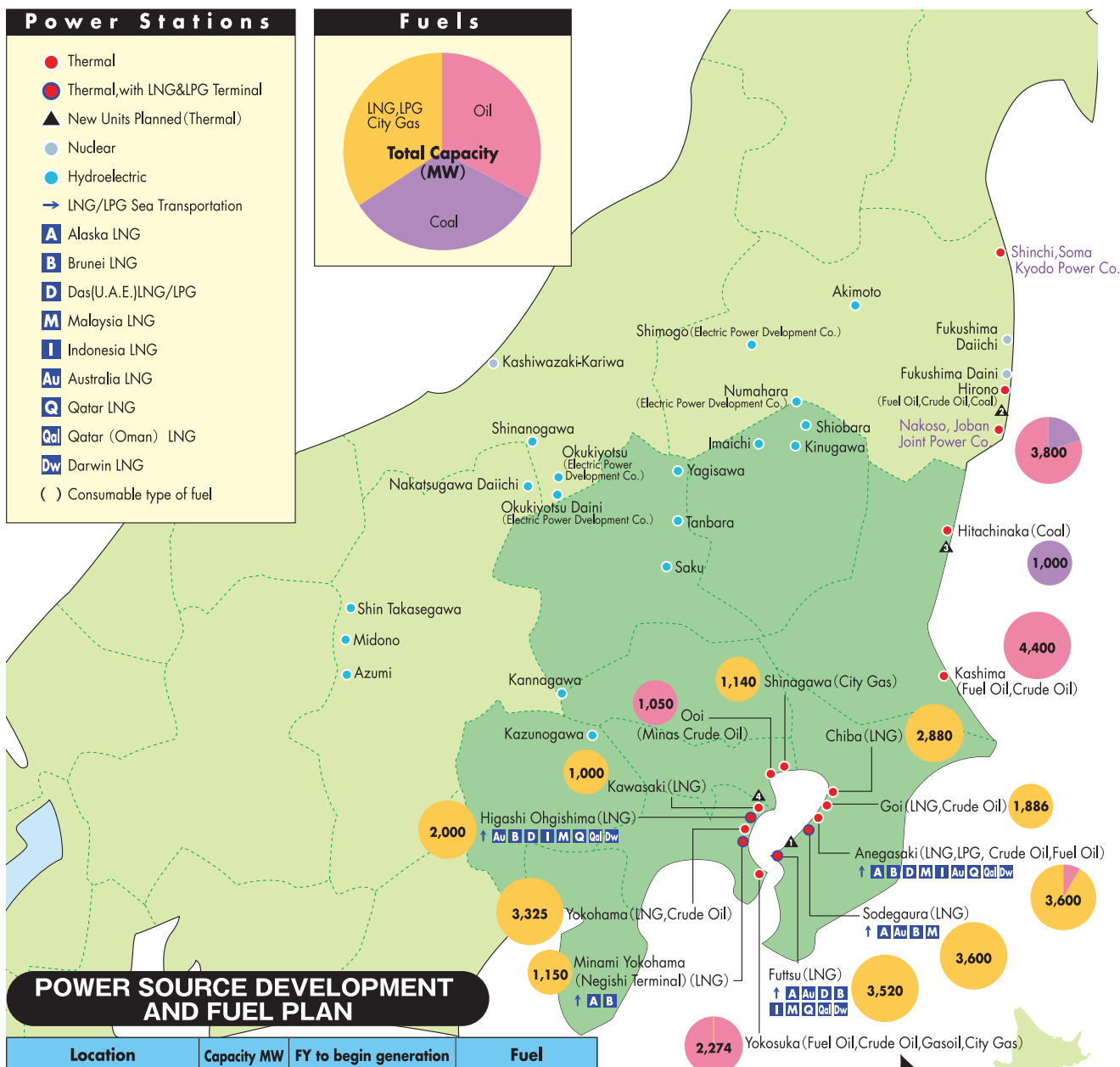
### COAL PURCHASES

IN FY 2007 (10<sup>3</sup>t)



Note : Including Soma Kyodo Power Purchases

# 7 Thermal Power Stations



## INTERNAL COMBUSTION POWER STATIONS (ISLANDS)

Total Capacity 50.9 MW		
① Oshima	15.4 MW	⑥ Miyakejima 5.0 MW
② Toshima	0.7 MW	⑦ Mikurajima 0.6 MW
③ Niijima	7.7 MW	⑧ Hachijojima 11.1 MW
④ Shikinejima	*	⑨ Aogashima 0.6 MW
⑤ Kozushima	4.5 MW	⑩ Chichijima 4.3 MW
		⑪ Hahajima 1.0 MW

\*Electricity is transmitted from Niijima

TEPCO operates four LNG terminals and fifteen large-scale thermal power stations. Among these fifteen power stations, six are LNG-fired, two are oil-fired, one is coal-fired, three are switchable between LNG and oil, one uses oil and coal, one uses oil and city-gas, and one is city-gas-fired. Fuels for these plants are brought in by ships and pipelines.



Hitachinaka Thermal Power Station (1,000MW)



Yokohama Thermal Power Station (3,325MW)



Sodegaura Thermal Power Station (3,600MW)



TOP: Coal Ship "YAMAYURI" (12,000 t)  
UNDER: Oil Tanker (5,000kl)

## CORPORATE OUTLINE

as of March 31, 2008

<b>Established</b>	May 1, 1951
<b>Capital Stock</b>	676.4 billion yen
<b>Non-Consolidated Revenues</b>	5,224.3 billion yen
<b>Number of Employees</b>	38,234
<b>Number of Customers</b>	28.34 million
<b>Electricity Sales</b>	297.4 TWh *
<b>Peak Load</b>	64,300 MW (July 24, 2001)
<b>Number of Power Stations and Generating Capacity</b>	190 62,473 MW
	<ul style="list-style-type: none"> <li>●Thermal 26 36,179 MW</li> <li>●Nuclear 3 17,308 MW</li> <li>●Hydro 160 8,985 MW</li> <li>●Wind 1 1 MW</li> </ul>
<b>Transformer Facilities</b>	1,587 265,136 MVA
<b>Transmission Lines</b>	40,073 km
<b>Distribution Lines</b>	1,030,533 km

\*Fiscal year started in April 1, 2007, and ended in March 31, 2008.

## THREE-YEAR SUMMARY OF REVENUE

	billion yen		
Fiscal Year (April-March)	FY 2005	FY 2006	FY 2007
<b>Current Revenue</b>			
Residential	2,022.4	1,983.4	<b>2,096.2</b>
Commercial & Industrial	2,659.5	2,721.1	<b>2,818.4</b>
Other	296.7	353.3	<b>351.0</b>
Total	4,978.7	5,057.9	<b>5,265.8</b>
<b>Current Expenditure</b>			
Fuel (including Nuclear Fuel)	1,040.0	1,062.7	<b>1,755.1</b>
Personnel	401.0	458.9	<b>337.7</b>
Maintenance	469.3	459.0	<b>432.1</b>
Depreciation	753.4	704.5	<b>726.2</b>
Power Purchase Payments	629.3	650.6	<b>773.1</b>
Interest Payments	153.7	148.0	<b>143.0</b>
Taxes and Public Charges	336.4	337.0	<b>330.2</b>
Other	798.0	864.7	<b>789.9</b>
Total	4,581.5	4,685.8	<b>5,287.8</b>
<b>Ordinary Profit</b>	397.2	372.0	<b>▲22</b>
<b>Extraordinary Loss</b>	12.0	—	<b>267.1</b>
<b>Drought Reserve</b>	▲3.2	5.9	<b>▲5.0</b>
<b>Corporate Taxes</b>	129.9	179.3	<b>▲87.9</b>
<b>Net Income for the Period</b>	260.8	262.1	<b>▲177.6</b>



THE TOKYO ELECTRIC POWER CO., INC.

1-3, Uchisaiwai-cho 1-chome, Chiyoda-ku, Tokyo 100-8560, JAPAN

INTERNET HOME PAGE <http://www.tepco.co.jp>