

## INDUSTRY OVERVIEW

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### OVERVIEW OF THE PRC ECONOMY

China is a fast growing economy in the world, with double-digit real GDP growth per year between 2003 and 2007. For 2008, the China's GDP growth rate was 9%. Set out below is a table showing China's total nominal GDP and real GDP growth rate from 2000 to 2008.

<u>Year</u>	<u>Nominal GDP</u> (RMB billion)	<u>Real GDP growth rate</u> (%)
2000 .....	9,922	8.4
2001 .....	10,966	8.3
2002 .....	12,033	9.1
2003 .....	13,582	10.0
2004 .....	15,988	10.1
2005 .....	18,322	10.4
2006 .....	21,192	11.6
2007 .....	24,953	11.9
2008 .....	30,067	9.0

*Source: China Statistical Yearbook 2000-2008, Statistical Communiqué of the People's Republic of China on the 2008 National Economic and Social Development published by China National Statistical Bureau*

Historically, between 2000 and 2004, China's GDP was primarily fuelled by the increase in infrastructure investments and industrial activities. Since 2005, an increasing portion of China's GDP growth has been contributed by domestic personal spending as average personal wealth and urbanization ratio of the nation increase.

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### SUPPLY AND DEMAND FOR ELECTRICITY POWER IN THE PRC

Regardless of the source of economic growth, China's electricity consumption had constantly been growing at rate that was higher than the country's GDP growth each year between 2000 and 2007. For example, China's electricity consumption growth in 2007 was 14.4%, which was 2.2 percentage points higher than GDP growth for the same year. However, in view of current world unstable economic environment, there is no assurance for growth in demand for electricity in future.

Set out below is a table showing the amount of electricity output, consumption and the annual growth rate of consumption from 2000 to 2007 in China.

<u>Year</u>	<u>Electricity output</u> (TWh)	<u>Electricity consumption</u> (TWh)	<u>Electricity consumption growth rate</u> (%)
2000 .....	1,355.6	1,347.1	9.5
2001 .....	1,471.7	1,463.4	9.3
2002 .....	1,640.5	1,633.2	11.8
2003 .....	1,910.6	1,903.2	15.6
2004 .....	2,203.3	2,197.1	15.4
2005 .....	2,500.3	2,494.0	13.5
2006 .....	2,865.7	2,858.8	14.6
2007 .....	3,281.6	3,271.2	14.4

Source: *China Statistical Yearbook 2000-2008*

To support such rapidly increasing power demand, China's national total installed power generation capacity had more than doubled from 2000 to 2007. By the end of 2007, China had over 700 GW of installed generation capacity.

Set out below is a table showing the total amount and the annual growth rate of installed power generation capacity in China at the end of each year from 2000 to 2007.

<u>At year end</u>	<u>Total installed capacity</u> (GW)	<u>Growth rate</u> (%)
2000 .....	319	6.8
2001 .....	339	6.0
2002 .....	357	5.3
2003 .....	391	9.8
2004 .....	442	13.0
2005 .....	517	16.9
2006 .....	624	20.6
2007 .....	713	14.4

Source: *EIA<sup>(Note)</sup> — International Energy Annual 2005, China Electric Power Yearbook 2007, China Electrical Council*

Note: *EIA is the independent statistical and analytical agency within the U.S. Department of Energy created in response to the need for additional Federal initiatives to collect and disseminate energy-related information, and to evaluate and analyze this information in 1970s.*

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Despite the high growth in recent years, per capita installed power capacity and electricity consumption in China are still significantly low compared to more developed countries such as the USA, Canada, Australia, Singapore, United Kingdom and Germany, and China's neighbouring regions and countries such as Japan, South Korea, Taiwan and Hong Kong.

	<b>Per capita electricity consumption in 2006 (MWh)</b>	<b>Per capita installed power capacity in 2006 (kW)</b>
Canada .....	16.23	3.76
U.S. ....	12.79	3.23
Australia .....	10.86	2.44
Taiwan .....	9.16	1.83
Singapore .....	7.82	2.25
Japan .....	7.70	1.97
South Korea .....	7.48	1.32
Germany .....	6.66	1.47
United Kingdom .....	5.75	1.30
Hong Kong .....	5.48	1.70
China .....	1.92	0.39

Source: EIA — International Energy Annual 2006

### NATURAL GAS AS AN ENERGY SOURCE

In China, coal has been the most widely used type of fuel for the production of electricity because of the abundant supply of coal reserve domestically and consequently lower fuel cost compared to other fuel types. It is estimated that over 70% of the electricity produced in China was generated by coal.

However, burning coal brings other costs, particularly long-term damages to the environment through the emission of pollutants such as sulphur dioxide and carbon dioxide. While sulphur dioxide may combine with moist in the atmosphere to form acid rain, carbon dioxide is generally believed to be the primary cause of global warming and climate change. According to IEA<sup>(Note)</sup>, China produced about 5.6 billion tons of carbon dioxide in 2006, making it the world's second largest contributor of carbon dioxide emission behind the USA.

To reduce China's reliance on coal and to help reduce long-term environmental damages, the PRC government has in recent years started to encourage the development and establishment of power generation facilities using alternative fuels and energy sources, such as natural gas, nuclear, hydro, solar and wind power, as well as more efficient power generation technologies such as combined cycle combustion process, cogeneration, trigeneration and distributed energy supply.

In particular, natural gas is a cleaner fossil fuel that can be used to generate electricity as it produces a small amount of nitrogen oxides, almost no sulphur dioxide and fine particles as compared to coal. For the same amount of heat generated, burning natural gas produces about 50% less carbon

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*Note: IEA is an intergovernmental organisation which acts as energy policy advisor to 28 member countries including Australia, Japan, Germany, U.S. and United Kingdom, in their effort to ensure reliable, affordable and clean energy for their citizens. The main decision-making body of IEA is its governing board, composed of energy ministers from each member country or their senior representatives. The IEA's key areas of work includes oil markets, gas markets and energy technology and with a staff of around 190, mainly energy experts and statisticians from its 28 member countries, the IEA conducts a broad programme of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices.*

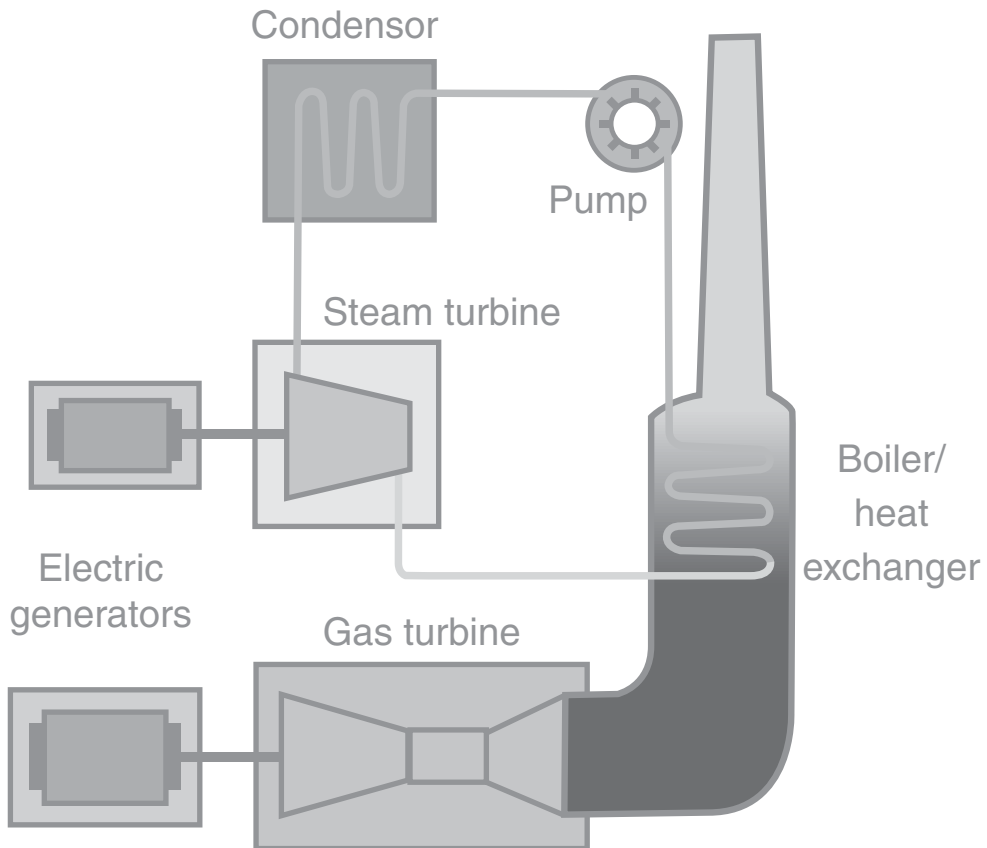
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dioxide than burning coal. Furthermore, higher level of power efficiency can be achieved by combining gas turbine with a steam turbine under the combined cycle combustion process, where residual heat from the gas combustion cycle is used to produce steam which is then used to generate additional electricity through the steam turbine. For the same level of installed capacity, the thermal efficiency ratio of combined cycle gas-fired plants is on average approximately 8% to 10% higher than that of traditional coal-fired plants.

The diagram below depicts the major equipment and their configuration for a combined cycle gas-fired plants.



One other feature of gas-fired power plants is that their start-up time is significantly shorter compared to coal-fired plants. As a result, gas-fired plants play an integral part of a steady electricity supply system through the provision of peak power supply service. This is especially so in China where a large percentage of existing power plants are coal-fired.

### CHINA'S GAS-FIRED POWER GENERATION INDUSTRY

China's plan to increase the use of natural gas is in line with the global trend. According to the Eleventh Five Year Plan, the NDRC has set the target to increase the proportion of consumption of natural gas to total fuel consumption by 2.5% to 5.3 % in year 2010 as compared to year 2005, while to decrease the proportion of consumption of coal to total fuel consumption by 3.0% to 66.1 % in year 2010 as compared to year 2005. According to World Energy Statistics 2008, gas-fired power supply accounted for approximately 20% of the world's total power supply, compared to approximately 41% for coal-fired. According to the International Energy Outlook 2008 issued by EIA, the world's consumption of natural gas is expected to increase from approximately 2.9 trillion m<sup>3</sup> in 2005 to approximately 4.5 trillion m<sup>3</sup> in 2030, and the percentage of natural gas used for power generation is expected to reach 35% by 2030.

According to the BP Review<sup>(Note)</sup>, consumption of natural gas in the PRC has increased significantly from approximately 24.5 billion m<sup>3</sup> in 2000 to approximately 67.3 billion m<sup>3</sup> in 2007, representing a CAGR of approximately 15.53% during this period. Going forward, the overall trend in China would be to increase the use of natural gas versus petroleum as a fuel source, to increase the use of natural gas for power generation and to further expand city gas networks. Overall, The Directors believe that the percentage of natural gas used for power generation purposes would increase to over 30% by 2010. According to EIA's estimation in its International Energy Outlook 2008, the installed gas-fired generating capacity in China is expecting to grow at an average annual percent change of 13% from 2005 to 2030.

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*Note: BP has been publishing the BP Statistical Review of World Energy, an annual publication which has been published by BP (a global energy group listed in New York Stock Exchange (symbol: BP) which employs over 96,000 people and operating in over 100 countries worldwide) for 58 years and has provided data on world energy markets with statistics taken from government sources. BP Review is one of the most widely respected and authoritative publications in the field of energy economics, used for reference by the media, academia, world governments and energy companies.*

### THE SUPPLY OF NATURAL GAS IN CHINA

According to BP Review, it is estimated that China had a total 1.88 trillion m<sup>3</sup> of proved natural gas reserves at the end of 2007. The amount of proven gas reserve had grown rapidly in recent years, which increased from 1.16 trillion m<sup>3</sup> in 1997 to 1.88 trillion m<sup>3</sup> in 2007. Whilst most of China's gas fields are located in the Western regions, with the launch of West-East Gas Pipeline (Phase I), owned and operated by PetroChina<sup>(Note)</sup> to transport natural gas to the Yangtze River Delta area, up to 17 billion m<sup>3</sup> of natural gas is now being transported per year and sold to end customers in a number of provinces along the gas transporting pipeline from the Tarim Oilfield in Xinjiang to Shanghai, including Zhejiang province.

According to Natural Gas Pipe Network Plan in Zhejiang province 2015-2020 prepared by PetroChina, the natural gas fields connecting to the West-East Gas Pipeline (Phase I) have a total proven reserve of approximately 1.7 trillion m<sup>3</sup>. The West-East Gas Pipeline (Phase I) is only part of a nationwide natural gas supply infrastructure network as stated in the Eleventh Five Year Plan. The construction of other sections such as West-East Gas Pipeline (Phase II) is in progress and is expected to reach and supply natural gas to Zhejiang in 2010. West-East Gas Pipeline (Phase II) is expected to be 8,000 km in length, running through 13 provinces with annual transport capacity of 30 billion m<sup>3</sup>.

In addition, the construction of the Sichuan-East Gas Pipeline is expected to reach and supply natural gas to Zhejiang in late 2009. This pipeline is expected to be over 1,700 km in length, running from Sichuan to Shanghai through a number of provinces including Zhejiang. This pipeline has a designed capacity of 12 billion m<sup>3</sup> per year. Furthermore, gas fields in the East Sea area, located approximately 350 km away from Ningbo city of Zhejiang province, carry a certified reserve of 200 billion m<sup>3</sup> in aggregate. These fields have been in production since 2005.

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*Note: PetroChina holds and operates an oil and gas product pipeline network and storage system covering 26 provinces, municipalities and autonomous regions across China. In particular, PetroChina is responsible for the construction of several natural gas pipeline networks across China including Southwest gas pipeline network and West-East gas pipeline.*

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Below is a map of China showing the locations of the West-East Gas Pipeline Phase I & II and the Sichuan-East Gas Pipeline, and their connection to the Zhejiang province.



Source: Zhejiang Gas Company, China National Petroleum Corporation

Note: The route of West-East Gas Pipeline phase II (under construction) and Sichuan-East Gas Pipeline (under construction) is for illustration purpose only.

## PRICING OF NATURAL GAS IN CHINA

Natural gas prices are regulated in China. Firstly, wellhead prices are regulated by NDRC of China and are generally adjusted based on macroeconomic conditions. Provincial price bureaus then set different prices for different types of end users. For example, the price of natural gas in Zhejiang province is set by the Zhejiang Provincial Price Bureau. As at the Latest Practicable Date, the price of natural gas applicable to Our Power Plants was RMB1.94 per m<sup>3</sup> (including VAT).

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Currently, Zhejiang Gas Company, owned by the State, is the sole agent for the supply of natural gas in Zhejiang province and is responsible for the operation of natural gas pipelines, sale and distribution of gas in Zhejiang province.

### THE SALE AND DISPATCH OF POWER IN CHINA

China's nationwide power grid is mainly managed by two power grid companies, namely State Grid Corporation of China and China Southern Power Grid Co., Ltd. China Southern Power Grid Co., Ltd operates power grids in 5 provinces in Southern China, and State Grid Corporation of China operates power grids in the rest of the regions of China. Their group companies are responsible for the procurement, sale, distribution and transmission of electricity in their respective provinces and regions. Electricity produced by individual power plants is sold to the power grid companies to which they are connected to pursuant to power dispatch agreements. The power grid companies then sell electricity to end customers, including residential, commercial and industrial customers.

Pursuant to the Regulations on the Administration of Electric Power Dispatch to Networks and Grids ("Dispatch Regulations") issued by the State Council in 1993, electricity dispatch centers, subsidiaries of power grid companies, were established at various levels (national, inter-provincial, provincial, municipality and county) to manage the power generation resources within their respective scope in China. Dispatch centers determine the amount of electricity to be produced by each power plant within their scope, through managing the mix of fuel and technology used, to ensure a cost-efficient and reliable power supply system.

In the fourth quarter of each year, NDRC issues a power supply plan for the whole nation for the following year. Based on such national plan, provincial offices of SETC issue annual planned output guidelines (in terms of utilization hours) to each of the power plants operating within their respective regions, taking into account the characteristics of each plant, and approve new projects accordingly. In practice, dispatch centers of power grid companies may adjust the daily planned output allocated to power plants based on the actual electricity demand at the time, the stability of the power grid (and other power providers) and weather conditions. Dispatch centers monitor power generation companies closely to ensure that they are able to fulfill the planned output originally allocated to them each year.

### ON-GRID TARIFF

On-grid tariff is the price paid by power grid companies to power generation companies for each unit of electricity sold. According to the Interim Measures for the Administration of On-Grid Tariff (上網電價管理暫行辦法) issued by NDRC in 2005, on-grid tariffs applicable to power generation companies are determined by price bureaus based on various factors, including the economic life of the facilities, fuel type, cost structure and applicable tax rates, to ensure that power generation companies are able to achieve reasonable profitability and investment return. As a result, on-grid tariffs of power generation companies using different fuel types are different. On-grid tariffs may also be different for power plants using the same fuel type operating in the same province. In addition, the adjustment in the on-grid tariff will be affected by the change in fuel cost of the power plants.

Zhejiang Provincial Price Bureau is responsible for setting both the price of natural gas and on-grid tariff within Zhejiang province. The approved on-grid tariff (including VAT) applicable to Our Power Plants increased from RMB600 per MWh (De-Neng Power Plant and Blue Sky Power Plant)



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and RMB650 per MWh (Jing-Xing Power Plant) as at 31 December 2006 to RMB705 per MWh as at 31 December 2008, while the gas price (including VAT) applicable to Our Power Plants increased from RMB1.71 per m<sup>3</sup> as at 31 December 2006 to RMB1.85 per m<sup>3</sup> as at 31 December 2008. However, there is no guarantee that on-grid tariffs of Our Power Plants will be adjusted in line with the increase in the price of natural gas in future.

### OVERVIEW OF ZHEJIANG PROVINCE

Zhejiang province, located in the Golden Triangle of the Yangtze River near Shanghai, is one of the largest and fastest growing provinces in eastern coastal China. According to the China Statistical Yearbook 2008, Zhejiang had a population of over 50 million, and ranks fourth in terms of both Gross Regional Product and Gross Regional Product per capita among all provinces, autonomous regions and municipalities in China in 2007.

The table below sets out the Gross Regional Product and growth rate of Gross Regional Product of top 10 regions in China in 2007.

	<b>2007 Gross Regional Product (RMB billion)</b>	<b>Growth rate (%)</b>
Guangdong	3,108.4	18.6
Shandong	2,596.6	17.6
Jiangsu	2,574.1	18.9
<b>Zhejiang</b>	<b>1,878.0</b>	<b>19.3</b>
Henan	1,501.2	20.1
Hebei	1,371.0	17.6
Shanghai	1,218.9	17.6
Liaoning	1,102.3	19.2
Sichuan	1,050.5	21.6
Beijing	935.3	18.8
	<b>2007 per capita Gross Regional Product (RMB)</b>	<b>Growth rate (%)</b>
Shanghai	66,367	15.0
Beijing	58,204	15.3
Tianjin	46,122	12.0
<b>Zhejiang</b>	<b>37,411</b>	<b>17.4</b>
Jiangsu	33,928	17.7
Guangdong	33,151	17.0
Shandong	27,807	16.9
Fujian	25,908	20.7
Liaoning	25,729	18.1
Inner Mongolia	25,393	26.6

Source: China Statistical Yearbook 2008

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From 2000 to 2008, Gross Regional Product growth of Zhejiang province has been consistently higher than China's overall GDP growth.

<u>Year</u>	<u>Gross Regional Product growth rate — Zhejiang province</u>	<u>GDP growth rate — China</u>
	(%)	(%)
2000 .....	11.0	8.4
2001 .....	10.7	8.3
2002 .....	12.6	9.1
2003 .....	14.7	10.0
2004 .....	14.5	10.1
2005 .....	12.8	10.4
2006 .....	13.9	11.6
2007 .....	14.5	11.9
2008 .....	10.1	9.0

Source: China Statistical Yearbook 2000-2008, China Statistical Bureau's publish, Zhejiang Provincial Statistical Yearbook 1999-2007, Zhejiang Provincial government's publish

With the increase in economic activities, urbanization and personal wealth, the demand for electricity in Zhejiang province has also increased significantly over the past few years. Except for 2004 when growth of electricity consumption was slightly below national average, the growth of electricity consumption in Zhejiang province has been consistently higher than the national average between 2000 and 2007.

<u>Year</u>	<u>Electricity consumption growth rate — Zhejiang province</u>	<u>Electricity consumption growth rate — China</u>
	(%)	(%)
2000 .....	21.5	9.5
2001 .....	15.1	9.3
2002 .....	18.8	11.8
2003 .....	22.1	15.6
2004 .....	14.5	15.4
2005 .....	15.7	13.5
2006 .....	16.3	14.6
2007 .....	15.2	14.4

Source: China Statistical Yearbook 2000-2008, Zhejiang Statistical Yearbook 1999-2007

At the end of 2007, there was a total of 45,180 MW of power generation capacity in Zhejiang province, including a total of 3,366 MW of gas-fired installed capacity under the Zhejiang provincial grid. There were six gas-fired power plants within the Zhejiang provincial grid at the end of 2008, of which four were state-owned gas-fired power plants regulated by the provincial government of Zhejiang province with installed capacity ranging from 789 MW to 1,170 MW. The other two gas-fired power plants within the Zhejiang provincial grid were our De-Neng Power Plant and Blue Sky Power Plant<sup>(Note)</sup>. As at the Latest Practicable Date, Our Power Plants had total installed capacity and total

Note: According to the regulations issued by Zhejiang Electric Power Bureau (浙江省電力工業局) and Zhejiang Electric Power Corporation, only the gas-fired power plants with total installed power generation capacity at 100 MW or above are connected to the Zhejiang provincial grid. As the total installed power generation capacity of our Jing-Xing Power Plant is below 100 MW, it is connected to the Huzhou city power grid instead of the Zhejiang provincial grid.

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attributable installed capacity of 299 MW, comprising 112 MW of De-Neng Power Plant, 112 MW of Blue Sky Power Plant and 75 MW of Jing-Xing Power Plant.

Zhejiang province is well connected to the major natural gas fields and pipeline infrastructure in China. Since the launch of West-East Gas Pipeline Phase I in 2004, the amount of natural gas supplied to Zhejiang province had increased from approximately 227 million m<sup>3</sup> in 2005 to approximately 1,810 million m<sup>3</sup> in 2007. Other trans-provincial pipelines that will be passing through Zhejiang province, including the West-East Gas Pipeline Phase II and the Sichuan-East Gas Pipeline are expected to reach and supply natural gas to Zhejiang in 2010 and late 2009, respectively. As a coastal Province, Zhejiang province also has access to natural gas, in liquefied form, through sea transport from East-Sea region and overseas. According to the Natural Gas Pipe Network Plan of Zhejiang province 2015-2020 prepared by PetroChina, it is expected that the amount of natural gas supplied in Zhejiang province would grow to approximately 10.4 billion m<sup>3</sup> in 2015 among which half were for electricity generation use.