

**BULLETIN**  
**ON THE STATE AND DEVELOPMENT**  
**OF THE ENERGY IN THE REPUBLIC**  
**OF BULGARIA**

**MARCH 2009**

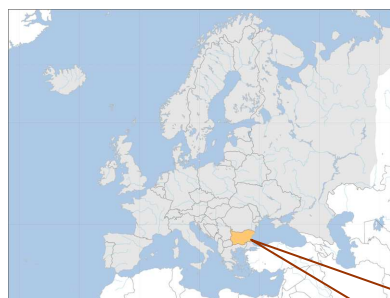
*The present document is prepared on the authority of article 4, paragraph 2, section 17 of the Energy Act which requires annual publication of Bulletin on the state and development of the energy.*

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# ENERGY PROFILE

## GENERAL OVERVIEW



- Area – 110 944 km<sup>2</sup>
- EU member from January, 1<sup>st</sup> 2007, NATO member
- Investment Credit Rating
- 0% budget deficiency
- 10% corporate debt
- 20% VAT
- Strategic geographical location



## MACROECONOMIC PARAMETERS

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Population	млн.	8,23	8,19	8,15	8,02	7,87	7,82	7,78	7,74	7,68	7,64
GDP, real growth	% год.	4	2,3	5,4	4,1	4,5	5,0	6,6	6,2	6,3	6,2
Real GDP per capita (purchase power parity, PPP)	ЕС=100	26,9	26,9	27,8	29,3	31,0	32,5	33,7	34,5	36,5	37,3
Export	млн. евро	-	3 734	5 253	5 714	6 063	6 668	7 985	9 466	12 012	13 512
Import	млн. евро	-	4 741	6 533	7 493	7 755	8 868	10 938	13 809	18 479	31 861
Average annual inflation	%	18,7	2,6	10,3	7,4	5,8	2,3	6,1	5,0	7,3	8,4
Unemployment	%			18,0	17,9	16,3	13,5	12,16	10,73	9,61	7,74
Exchange rate*	лв./евро	1,9558	1,9558	1,9558	1,9558	1,9558	1,9558	1,9558	1,9558	1,9558	1,9558

Source: NSI, BNB

\* acting currency board and fixed exchange rate of BG Lev to Euro

## MACROENERGY PARAMETERS

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Gross domestic energy consumption	1000 toe	20616	18755	19218	19470	19205	19605	19017	20137	20637	20163
Primary energy generation production	1000 toe	10641	9411	10282	10507	10761	10210	10271	10539	11011	9738
Energy dependency	%	48,5	49,8	46,5	46,0	44,0	47,9	46,0	47,7	46,6	51,7
Final energy consumption	1000 toe	9678	8744	8435	8413	8520	9185	8907	9276	9722	9528

Source: NSI

## ENERGY EFFICIENCY INDICATORS

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Gross domestic energy consumption / GDP*	Kgoe/EUR	1.313	1.167	1.137	1.106	1.043	1.014	0.922	0.920	0.886	0,697
Gross domestic energy consumption / GDP *	1998=100	100	88.7	86.5	84	79.2	77	70	70	67.5	53,1
Final energy consumption/ GDP *	Kgoe/EURкне/евро	0.616	0.544	0.499	0.478	0.463	0.475	0.432	0.424	0.418	0,329
Final energy consumption / GDP*	1998=100	100	88.3	81	77.6	75.2	77.1	70.1	69	67.9	53,4
Final/ Gross domestic energy consumption	%	0,47	0,47	0,44	0,43	0,44	0,47	0,47	0,46	0,47	0,47

Source: Eurostat, NSI

\*constant prices from 2005

## INSTITUTIONS

**Ministry of Economy and Energy (MEE)** is the state body which conducts the energy policy of the country. Under this name the institution has been known since 2005 after the merge of the Ministry of Economy and the Ministry of Energy and Energy Resources. Energy policy is defined by the Council of Ministers (MC) of Bulgaria and the Ministry of Economy and Energy through the Minister develops and proposes to the Council of Ministers strategic trends and programs for the development of the sector. The Minister implements the functions of owner in regard to the state owned energy companies (<http://www.mee.government.bg>).

**The State Energy and Water Regulatory Commission (SEWRC)** is an independent state body responsible for the state regulation of the activities in the energy and the water supply and sewerage services. The Commission was established in 1999 under the name State Energy Regulatory Commission. In the energy sector, SEWRC carries out monitoring of the energy markets, prices and license regulatory control in regard of the activities for generation, transmission and distribution of electric power, transmission and distribution of natural gas, electric power and natural gas trading, generation and transmission of heating energy (<http://www.dker.bg>).

The state regulation in regard of the safety use of the nuclear energy and the ionizing radiation and the safe management of radioactive waste and spent fuel is implemented by the **Nuclear Regulatory Agency**. NRA is an independent specialized authority of the executive power established in 2002 as an assignee of the former Committee for Peaceful Use of Atomic Energy (<http://www.bnsa.bas.bg>).

**Energy Efficiency Agency** (EEA) is a budgetary supported legal entity with the status of executive agency to the Minister of Energy and Energy Resources, established in 2002. Its functions are related to development of programs and projects for enhancing the energy efficiency and use of renewable energy sources, providing funds for their co-financing and implementation (<http://www.seea.government.bg>).

## ENERGY COMPANIES

### Bulgarian Energy Holding

Bulgarian Energy Holding EAD (BEH EAD) was established on September 18<sup>th</sup> 2008 with Decision of the Minister of Economy and Energy with subject of activity acquisition, management, estimation and sell of shares in trade companies that carry out business activity in the areas of production, output, transport, transit, storage, management, distribution, sell and/or buy of natural gas, coal, electricity and heating, as well as other types of energy and raw materials. BEH EAD is a joint-stock company with 100 % state share. BEH EAD, for its part, owns 100% of the capital of: “Maritsa Iztok” Mines EAD, TPP “Maritsa Iztok 2” EAD, NPP “Kozloduy” EAD, NEK EAD and its filial company ECO EAD, “Bulgargas” EAD, “Bulgartransgas” EAD and “Bulgartel” EAD.

### Coal Production

“**Maritsa Iztok**” Mines is a filial company of BEH EAD, which is at the beginning of the technological process for electric power generation in thermal power plants in “Maritsa Iztok” site. The mines operate the largest lignite coal field in Bulgaria, which supplies with coal three thermal power plants for electricity generation and a briquettes producing plant. The total coal output at the “Maritsa Iztok” mines for 2008 was 24.7 mln tons, which represents 85.7% from the total output of coal as energy fuel in Bulgaria

Priority participation in the brown coal production take the coal mines in the Pernik and Bobovdol basins.

Black coal production is realized in “Balkan 2000” mines EAD.

### Natural gas

„**Melrose Resources Sarl**” and „**Oil and Gas Exploration and Production**” JSC carry out natural gas production from Galata field, located in the Black Sea shelf. The amounts produced in 2008 cover just 6.5% of the domestic consumption and the rest 93.5% are imported from Russia.

„**Bulgargas**” EAD (Public Supplier of natural gas with functions for buying and selling of natural gas) and „**Bulgartransgas**” EAD (for transmission, transit and storage of natural gas; system operator of the gas transmission network) were established as a result of juridical and organizational restructure of

the national gas company in compliance with the requirements of Directive 2003/55, and at present they are filial companies of BEH EAD.

**Gas distribution** is implemented by regional and local companies, mainly private, with basic market share of 65.8% are the daughter companies „Overgas” AD (subsidiary of the Russian company „Gasprom”), „Chernomorska tehnologichna kompania” (Black Sea Technological Company) with market share of 13.6% and „Citygas Bulgaria”(7.9%).

## Oil and Oil Products

The market of oil and oil products in the country is completely liberalized. The largest oil refinery on the Balkan Peninsula operates in Bulgaria, with Lukoil as majority shareholder. Among the bigger players in the oil and oil products trade are **LUKOIL, PETROL, OMV, SHELL, NAFTEX, PRISTA-OIL, OPET, HELLENIC PETROLEUM.**

**“LUKOIL Bulgaria” EOOD** – filial company of the Russian Lukoil, established in 1999, is a leader in the trade and distribution of fuels, polymers and petrochemicals produces by **“LUKOIL Neftohim Burgas” AD**, a leading supplier in Europe and the USA. The group owns a chain of over 150 gas stations all over the country with a large share (20-35%) of the market of oil products, fuels and polymers in South Eastern European countries.

**„PRISTA-OIL” AD – Bulgaria** is part of the Group of „PRISTA-OIL” that through its filial companies all over Europe exercises activities in the field of generation, distribution and trade with motor and industrial oils, greases, braking fluids, metal working liquids and coolants. In April 2000 TEXACO GLOBAL PRODUCTS offers to buy 25% of the shares of “PRISTA-OIL”AD, by what the company and its affiliates enter the big family of the leading oil companies.

**"PETROL" AD** is private company established in 1932, a leader in the fuels distribution in Bulgaria with over 470 gas stations, own refinery, nine laboratories for permanent quality control of the oil products, 80 petrol bases and 3 petrol harbor terminals evenly distributed all over the country.

## Electric Power

**Bulgaria disposes of a variety of electricity generation mix, including nuclear, thermal and hydro capacities.** Electric power generation is provided by legally independent power plants separated from „NEK” EAD in 2000, one part of which are private and the other part are included currently in the structure of BEH EAD.

The nuclear power plant **„Kozloduy” NPP** (3760 MW installed capacities, after decommissioning of units 1, 2 3 and 4 respectively 2000 MW ) and **„Maritsa East 2” TPP** (1450 MW installed capacities) are single person trading companies and are 100% owned by BEH EAD.

**TPP „Varna” EAD** (1260 MW ), **TPP „ Maritsa East 3”** (840 MW ), the future replacing capacity at the site of **TPP „ Maritsa East 1”** (670 MW), **TPP „ Maritsa 3”** (120 MW), **TPP „Russe”** (110 MW) and **TPP „Bobov Dol”** (630 MW) are majoritary or completely private. The small HPPs have been privatised and the bigger water facilities and PSPS are owned “NEK” EAD.

**„Natsionalna Electricheska Kompania” EAD** (National Electric Company) is a filial company of BEH EAD that carries out licensed activities of transmission, system operation, electricity generation in HPPs and PSHPPs (2 563 MW), supply of electric power to consumers connected to the transmission network and to the Electric Power Distribution Companies, and is a party in long term

bilateral power purchase agreements. A filial company **Electricity System Operator, incorporating also Market Operator (ESO EAD)** has been separated from NEK EAD since January 1<sup>st</sup> 2007, after restructuring according to the requirements of Directive 2003/54, where the transmission assets are owned by the mother company.

The electric power **distribution** is provided by regional companies, which in result of a package privatisation procedure have become a majority property (by 67%) of **E.ON AG** (South East Bulgaria), **EVN AG** (South West Bulgaria) and **CEZ a.s.** (West Bulgaria). In view of compliance with the requirements of Directive 2003/54, the companies have been restructured by separating the activities for electrical power distribution and supply in organizational and juristic plan

## Heat Energy

Licenses for carrying out the activity for heat supply have been issues by the SEWRC to 20 regional companies for heat supply. Other 13 licenses have been granted to thermal power plants which assets belong to chemical, metallurgical, alimentary, petro-chemical and textile industrial enterprises. 23 of these companies dispose of installations for co-generation of electrical and heat energy with a total installed electrical capacity around 1400 MW with total annual production of electrical power of 6.1 TWh for 2008 (13.6% of the total electricity output) and respectively they possess also license for selling electricity obtained by co-generation applying preference prices approved by SEWRC.

All heat supplying companies, excluding “Toplofikatsia Sofia” AD (servicing over 60% of all heat power users in the country), “Toplofikatsia Pernik” EAD and “Toplofikatsia Shumen” EAD are private.

## ENERGY DEPENDENCY

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Energy dependency, total, %</b>	<b>48.5</b>	<b>49.8</b>	<b>46.5</b>	<b>46.0</b>	<b>44.0</b>	<b>47.9</b>	<b>46.0</b>	<b>47.7</b>	<b>46.6</b>	<b>51.7</b>
<b>Energy dependency, coal, %</b>	<b>31.0</b>	<b>33.0</b>	<b>33.0</b>	<b>37.0</b>	<b>32.0</b>	<b>36.0</b>	<b>36.0</b>	<b>39.4</b>	<b>37.3</b>	<b>37.5</b>
<b>Energy dependency, crude oil, %</b>	<b>99.5</b>	<b>99.3</b>	<b>99.2</b>	<b>99.4</b>	<b>99.3</b>	<b>99.4</b>	<b>99.5</b>	<b>99.5</b>	<b>99.6</b>	<b>99.6</b>
<b>Energy dependency, natural gas, %</b>	<b>99.3</b>	<b>99.2</b>	<b>99.6</b>	<b>99.3</b>	<b>99.3</b>	<b>99.5</b>	<b>89.3</b>	<b>86.4</b>	<b>87.1</b>	<b>92.2</b>

**The energy dependency** shows the dependency of the country on import of energy and raw material. It is determined as a ratio between the net energy import and the gross internal energy consumption.

Basic local raw material is the lignite coal. The lignite coal deposit in “Maritsa Iztok” basin is estimated to 1 827 million tons (natural) and it provides resources for the production of electric power for the next 50 years.

The natural gas deposits are modest, but are interesting as a local source which at a certain degree limits to the prices growth of the imported natural gas. In 2009 the production of natural gas from the “Galata” deposit will be ceased due to exhaustion.

At the end of 2008 British company “Melrose Resources” found new natural gas field in the area of Kavarna city. The initial evaluations are that there are 24 billions cubic meters natural gas in the field. In February 2009 American concessioner “Direct Petroleum” said they had found gas field at about 4100

meters depth in the village of Devenzi, Pleven district. The potential quantity was estimated at about 6 billion cubic meters.

The quantity and potential of the uranium ores have only approximate estimate and their production has been terminated and the mines closed due to the high costs, imperfect technologies and radioactive pollution.

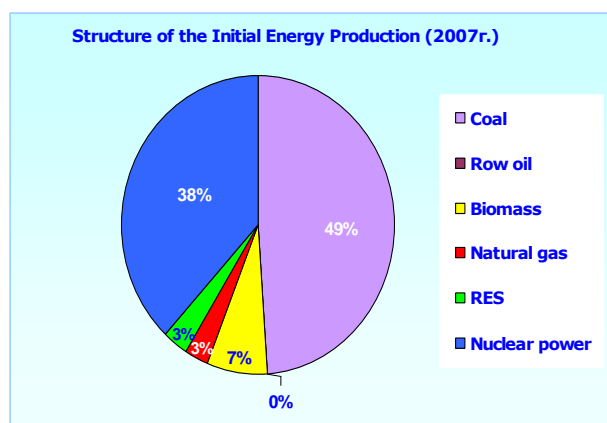
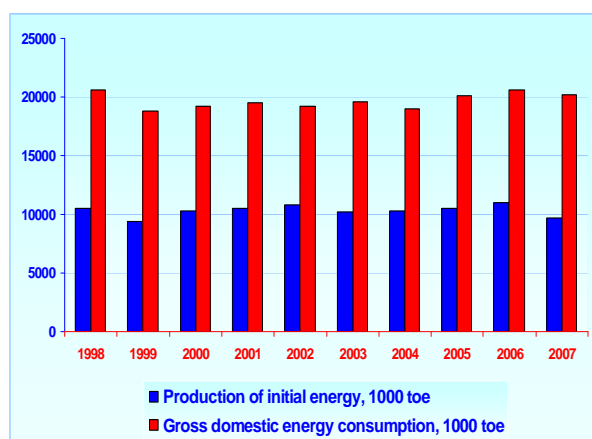
Nuclear power has been accounted as a local source and contributes to a great extent to the improvement of the energy independency.

The measures of stimulating the energy efficiencys and encouraging the energy generation from renewable energy sources and the promoted projects for building new facilities on local coal and nuclear fuel will positively influence the energy dependency index, but cannot lead to a considerable effect within a short-term period.

The energy dependency of Bulgaria is insignificantly lower than the average for the EU countries.

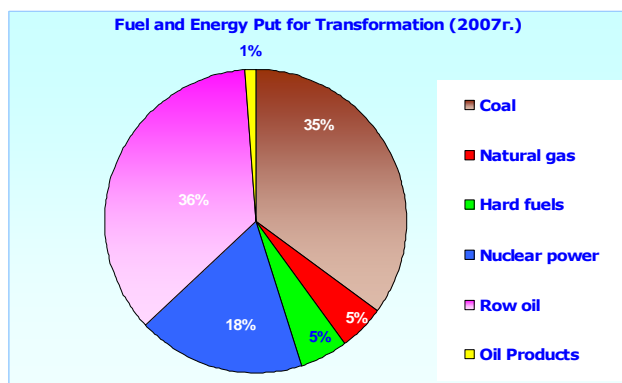
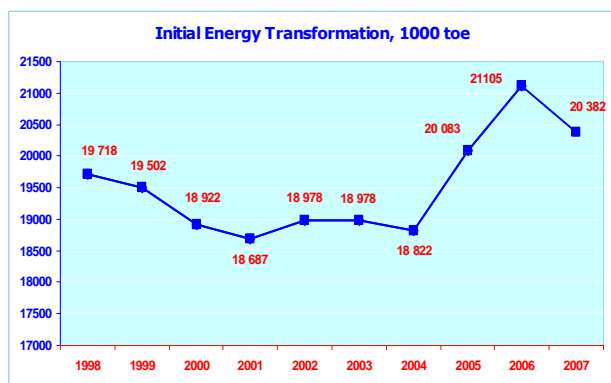
## PRIMARY ENERGY GENERATION

The primary energy generation meets about 50% of the primary Energy Consumption in the country under relatively unchanged structure over the last years and with dynamics resulting out of the dynamics of consumption.



## ENERGY CONVERSION

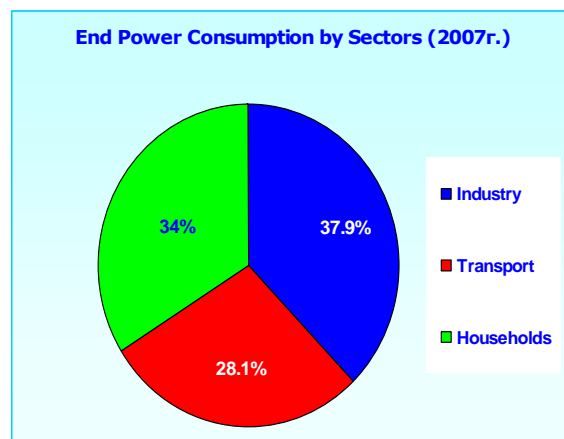
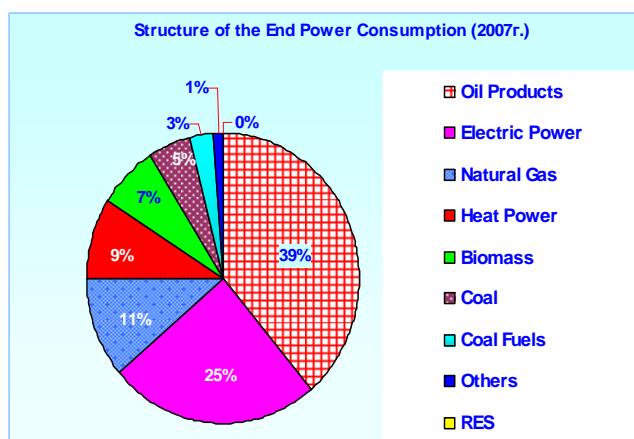
About 2/3 of the fuels and energy are used by power plants for electrical and heat energy generation, about 1/3 is used in oil refineries for oil products and an insignificant part is used in briquettes factories, blast-furnaces and coking enterprises. The energy obtained as a result from the energy conversion is about 60% of the energy put in for conversion.



## FINAL ENERGY CONSUMPTION

The available for final consumption energy is used for nonenergy consumption (mainly in the chemical industry) and for energy consumption, which after the dramatic drop down from 1989 to 2000 (with -6.1% average annual) shows some trends of stabilization and growth, following the stable sustained rate of growth of the GDP over the last six years.

Industry remains the dominant energy consumer. The share of transport is decreasing with 4.5% and respectively the consumption of liquid fuel too. The households consumption has been stabilized with a high share of the electric power (38.9% versus 22.5% for EU-27) and insignificant share of the natural gas (1.6% versus 40.1% for EU-27).



## ENERGY IN FIGURES – 2008

This section was prepared on the basis of the Energy Balance for 2008 compiled by the Ministry of Economy and Energy based on the account information submitted by the energy establishments in the country pursuant to Energy Act and the normative frame for its application.

### LOCAL COALS

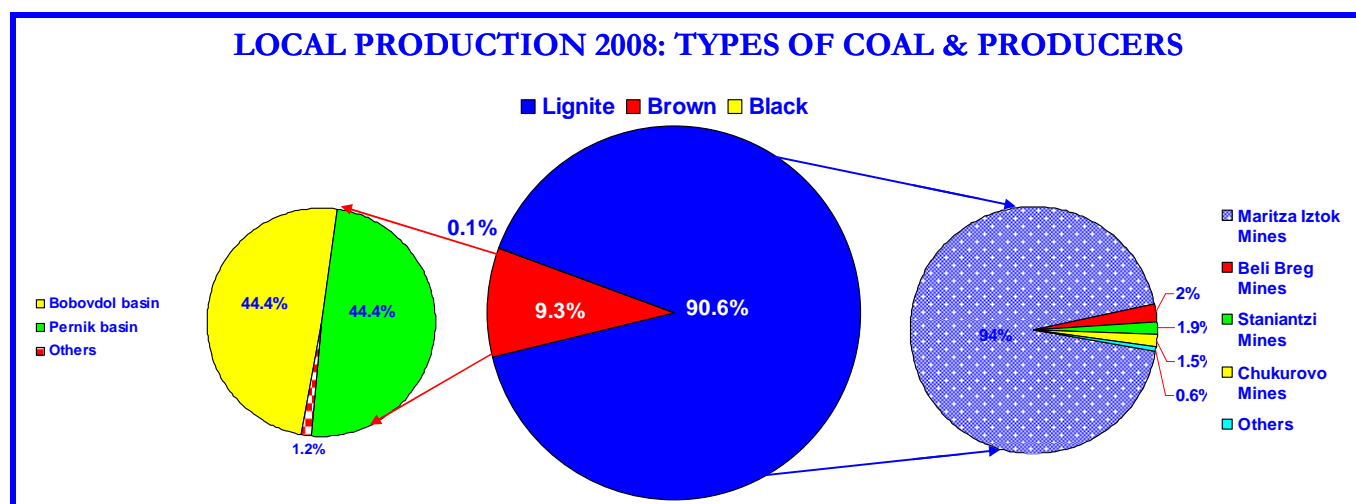
The coal **PRODUCTION** amounts to 28,8 mln tons, which is 1.4% more compared to 2007.

Lignite coal predominates in the structure of the produced coals – 90.6%, followed by the brown coal - 9.3% and black coal – 0,1%.

The total production of lignite coal is 26.1 mln. tons and the main producer is “Maritsa Iztok Mines” EAD with a share of 94.5%. Other producers of lignite coal are the coal mines “Beli Breg” (2%), „Stanyantsi” (1.9%) and „Chukurovo” (1.5%).

The total production of brown coal is 2.7 mln. tons, produced mainly from the Bobovdol (1.2 mln. tons) and Pernik (1.2 mln. tons) basins..

The total production of black coal is insignificant (18,6 thousand tons) and has been realized in “Balkan 2000” EAD mines.



Coal **CONSUMPTION** is mainly for electric and heat power generation– 97.1%, as well as for briquettes production (2.4%), for own needs and other consumers (0.2%) and for household heating (0.3%).

## NATURAL GAS

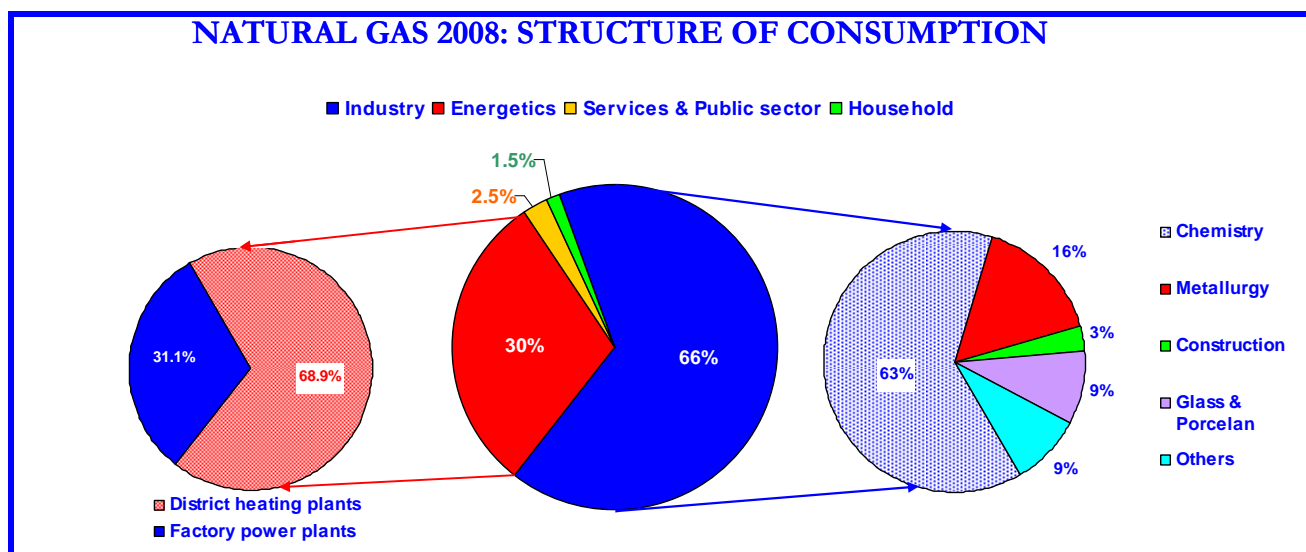
The natural gas **IMPORT** in Bulgaria for 2008 is 3 487 mln. m<sup>3</sup> and is procured from Russia – the only supplier for this resource for Bulgaria. The local production of natural gas is 218 mln. m<sup>3</sup>, realized by “Oil and Gas Exploration and Production” AD and „Melrose Resources Sarl” and has decreased with 26% compared to 2007.

Bulgaria exploits the underground gas storage “**CHIREN**” with a capacity of active gas about 350 mln. m<sup>3</sup>/year. The maximum production from the underground gas storage “Chiren” reached in January 2008 was 3.5 mln. m<sup>3</sup>/day.

Natural gas **CONSUMPTION** in the country is 3 350 mln. m<sup>3</sup> which is 2% less in comparison with 2007 (3 370 mln. m<sup>3</sup>). Industry is with 57% share, followed by the energy sector with 30%, and the distribution companies – 13%. The natural gas sales to the consumers in the country are performed by “Bulgargas” EAD and the licensed gas distribution companies.

Leading share of 33% in the structure of the industrial consumers has the chemical industry, followed by energetic – 30%, natural gas distribution companies – 13%, metallurgy - 10%, glass and porcelain industry – 6%, construction - 2% and other – 6%.

The structure of the energy sector consumers includes all enterprises and/or energy installations that transform natural gas into heat and/or electric power. Predominant share of 68% has the group of the heat supply companies performing central heat supply and the factory power plants (installations in the industrial enterprises) with a share of 32%.



The sales dynamics of the gas distribution companies, whose network development is in an opening stage, is a subject of special attention. Their total sales have increased with 14% in comparison with 2007, including “Overgas” with 9%, “Black Sea Technological Company” with 21% and the rest gas distribution companies with 32%.

## OIL, OIL PRODUCTS AND BIOFUELS

The demand of **OIL** in the country has been ensured mainly by import. The main oil importer and processor is “Lukoil Neftohim Burgas” AD.

Oil is produced in Bulgaria in insignificant amounts. Production has been performed by “Oil and Gas Exploration and Production” in Dolni Dabnik, privatised in 2004.

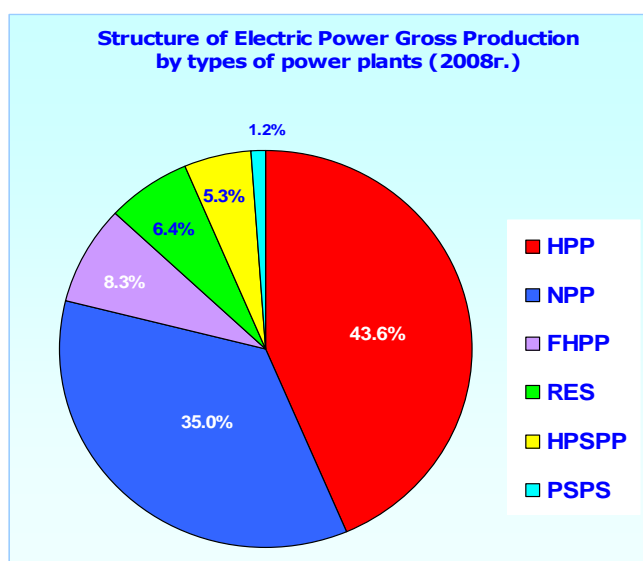
7.2 mln. tons of row oil were imported by the refinery in 2008 which was with 1.4% more than 2007..

5.8 mln. tons of oil products have been produced and they have been realized mainly on the internal fuel market – automobile, diesel, aircraft fuel and oils.

## ELECTRICITY

The gross **electricity GENERATION** was 45 TWh, which was with 4.3% less than the production in 2007. The commercial **EXPORT** of electricity was 5.4 TWh or 11.9% of the gross generation.

Heat power plants using coal dominate in the structure of the electric power generation, followed by the nuclear power plant Kozloduy. The electric power produced by wind generators in 2008 was 122.2 GWh, which was with 161.1% more compared to 2007 and represented 4.2% of the gross electricity generation by RES.



The share of the local energy sources put into electricity generation in 2008 was 81.6%, and this of the imported sources – 18.4% (nuclear energy was accounted as local energy source).

The end **CONSUMPTION** of electricity in the country in 2008 amounted to 29.9 TWh, which was with 1.9% more than in 2007. The industrial and public sector participated in the end consumption of electricity with 66.5%, and the domestic sector with 33.5%.

The electricity sales in the free market in 2008 were 4.4 TWh (14.8% of the electricity sold to the end users in the country).

## HEAT POWER

18 133 GWh heat power was **GENERATED** in 2008 by HPSPP, FHPP and NPP, which was 0.6% more than in 2007 (for the factory plants – increase with 3.1%, and for the heat production and supply companies – reduction with 3.1%). Gaseous fuels had the biggest relative share (47.5%) of the fuels put into production of heat power, followed by imported coal – 27.6%, local coal – 19.0%, liquid fuel – 4.2% and nuclear power – 1.7%.

Dominating share in the heat production structure had the factory power plants – 59.2%, followed by the heat production and supply companies – 39.4% and Kozloduy NPP – 1.4%.

The heat power **REALIZED** in 2008 amounted to 15 580.5 GWh, which was 0.3% more compared to 2007. The biggest share in the heat power consumption structure held the industrial and economic users – 69.5%, followed by the households – 26.3% and budget supported organizations – 4.2%. Compared to 2007, the consumption of heat power by industrial and economic users has increased with 3.5%, this of the budget supported users has decreased with 9.5%, and for the domestic sector has decreased with 5.9%.

The heat power produced by **COMBINED** installations for electric and heat power was 97.8%. The electric power produced by the heat production and supply companies by the combined way has been increasing over the last two years. The effectiveness of the combined production totally for all heat production and supply companies was 67.2%. The power plants working with natural gas had effectiveness about 75%, and with coal the effectiveness was from 33% up to 58%.

*LIST OF ABBREVIATIONS*

<b>NPP</b>	Nuclear Power Plant
<b>GDP</b>	Gross Domestic Product
<b>RES</b>	Renewable Energy Sources
<b>WPP</b>	Water Power Plant
<b>GWh</b>	Gigawatthour
<b>EU</b>	European Union
<b>EU-27</b>	European Union comprising 27 member states
<b>FHPP</b>	Factory Heat Power Plant
<b>koe/euro GDP</b>	Kilogram(s) Oil Equivalent per unit Gross Domestic Product
<b>BGN/EUR</b>	Exchange rate of Lev towards Euro
<b>Mln.m<sup>3</sup></b>	Million cubic meters
<b>Mlrd.m<sup>3</sup></b>	Milliard cubic meters
<b>Mln.t.</b>	Million tons
<b>NSI</b>	National Statistic Institute
<b>PSPS</b>	Pumped Storage Power Station
<b>TWh</b>	Terawatt hour
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>HPP</b>	Heat Power Plant
<b>toe</b>	Tons oil equivalent
<b>HPSP</b>	Heat Production and Supply Power Plant (heat production and supply company)
<b>HPC</b>	Hydropower complex
<b>Thousand t.</b>	Thousand tons
<b>MW</b>	Megawatt