STATEMENT ON SECURITY OF SUPPLY

- REPUBLIC OF MACEDONIA -

Skopje, May 2009

CONTENT

1. LEGAL REGULATION ON SECURITY OF SUPPLY

1.1. ENERGY LAW

The Law on Energy (Official Gazette of Republic of Macedonia No. 63/2006, 36/2007 and 106/2008) governs: the objectives of the energy policy and the manner of its realization, energy activities and the manner of regulating the energy activities, construction of energy facilities, functioning of the Energy Regulatory Commission, introduction of market for electricity, market for natural gas, market for oil and oil derivatives, as well as market for thermal or geothermal energy, requirements for realization of energy efficiency and promotion of the utilization of renewable resources and other important issues from the energy field.

Objective of this law is to ensure:

- reliable, safe and good quality supply of energy and energy fuels to the consumers;
- creation of efficient, competitive and financially sustainable energy sector;
- efficient development of energy sector;
- stimulation of competition on the market, thus respecting the tenets of non-discrimination, publicity and transparency;
- energy efficiency enhancement and encouragement of the utilization of renewable resources; and
- Protection of the environment from adverse impacts of energy sector activities.

The energy policy is realized through:

- supplying consumers with safe, reliable and good quality of electricity, natural gas, thermal energy, oil and oil derivatives;
- creation of transparent, attractive and stable conditions for a competitive and financially viable energy sector;
- promotion of market competition in the delivery of energy services, based on principles of non-discrimination and transparency;
- efficient provision of services to consumers at the lowest reasonable cost;
- promotion of energy efficiency and sustainable development of renewable energy sources;
- protection of the environment from adverse impacts of energy sector activities; and
- compliance with the international treaty obligations.

1.2. ENERGY REGULATORY COMMISSION

Energy Regulatory Commission is an independent body regarding the operation and decision taking process within the scope of its competencies. The Energy Regulatory Commission (ERC) was established by the Law for amending the Energy Law (Official Gazette 94/2002) and became operational in 2003. The ERC is composed of five members, one of which acts as its president. The members and the president of the ERC are appointed and dismissed by the Parliament of the Republic of Macedonia, upon proposal of the Government of the Republic of Macedonia, taking in consideration the adequate and just representation of all communities.

The ERC has the following scope of competencies: monitors the energy market operations and proposes measures for its promotion due to ensuring non-discrimination, efficient competition and efficient functioning of the market; ensures promotion of the protection of the rights of the energy users; adopts regulations for governing the energy activities; issues, amends, revokes and monitors the compliance of the licensees in the pursuit of certain activities within the energy sector; settles disputes that arise between the energy entities; establishes cooperation with the competent state authorities, local self-government units, energy entities, energy users and other organizations and institutions; proposes to the relevant authorities undertaking of measures within the scope of their competencies and in a procedure as defined by this law, against the entities that pursue the activity contrary to the provisions of this law; gives initiative and proposes adoption of new and amendment to the existing laws and other regulations; adopts Rules of Procedure and other acts concerning the internal organization and operation of the Regulatory Commission, participates in regional and international organizations and cooperates with other regulatory authorities to contribute to the development of regional energy markets; and performs such other tasks as are required by this law or other regulation.

1.3. PUBLIC SERVICE OBLIGATION

The entities performing the following activities shall have the **public service obligations** imposed by the Energy Law**:** generation of electricity for tariff consumers; transmission of electricity; distribution of electricity; operation of the electricity distribution system; operation of the electricity transmission system; organization and operation of the electricity market; transmission of natural gas; operation of the natural gas transmission system; distribution of natural gas; operation of the natural gas distribution system; supply of natural gas for tariff customers connected to the transmission system; supply of natural gas for tariff customers connected to the distribution system; generation of thermal energy; generation of geothermal energy; distribution of thermal energy; distribution of geothermal energy; supply of thermal energy; supply of geothermal energy.

The public interest in the performance of the energy activities listed above shall be provided by the relevant entity through provision of the public service in a manner and procedure as determined with the license for pursuing the adequate energy activity, and in compliance with Law or other regulation.

The public service obligations ensure that all consumers of electricity on the territory of the Republic of Macedonia and all consumers of natural gas, thermal and geothermal energy connected to a natural gas transmission or distribution network in a specified geographic service territory in the Republic of Macedonia, have access and connection to the appropriate network and reliable, safe, quality and uninterrupted dispatch and supply of energy on the relevant territory on which the service is being provided, under same conditions, prices and tariffs, as previously approved and published by the Energy Regulatory Commission, which shall include the costs for provision of such services**,** as well as for efficient utilization of the energy resources, environmental and climate protection and promotion.

Reliability in the supply of certain type of energy shall be provided, particularly, through attaining balance between the offer and demand on the market of the relevant type of energy on the relevant territory on which the service is being provided, timely forecast of the anticipated future demand of the relevant type of energy and the possibilities for satisfying the anticipated needs regarding the available energy resources and capacities, timely undertaking of measures for construction of new energy capacities, quality and top level of maintenance of the energy systems, as well as measures for covering the high loadings and measures for tackling the impossibility for dispatch of the relevant type of energy.

If the legal person that performs energy activity of public interest performs energy activity that is not of public interest, that person is obliged in the accounting to supply separate accounting for each energy activity performed of public interest.

The legal person that performs energy activity of public interest submits the annual audited financial reports to the Regulatory Commission for Energy as well as consolidated accounts for the other

activities and balances with review of the incomes, expenditures, financing sources, the manner of financing of the investments and the results of the working for each of the activities separately.

1.4. ENERGY BALANCES

The needs for the total quantity of energy and of specific types of energy in Republic of Macedonia, regarding a certain period of time, as well as the possibilities for meeting thereof, through generation and import, is laid down in the **Energy Balances of the Republic of Macedonia**.

The annual energy balance of the Republic of Macedonia, regarding the following year, is adopted by the Government of the Republic of Macedonia, by the end of the current year. The producers, suppliers, users of energy and other entities shall, within 30 days upon the receipt of the request, submit to the Ministry the data requisite for preparation of the energy balance pertaining to the following year.

The Minister of the competent ministry in the area of energy sector lays down the manner and the contents of the request for submission of data. The Ministry monitors the realization of the energy balance and if required propose measures to the Government of Republic of Macedonia, and thus ensure realization thereof more efficient use of the available energy, additional import, more intensive use of the available production capacities or similar. Having regard to the realization of the energy balances, the energy entities, if required, submit data to the ministry.

1.5. ACT FOR DECLARATION OF CRISIS

The relevant act adopted by the Government of the Republic of Macedonia, upon proposal of the Ministry, governs the criteria and requirements for declaration of crisis, as well as the manner of supply of certain types of energy in such circumstances, the rights and obligations of the license holders regarding the pursuing of energy activities pursuant to the Law on Crisis Management.

The measures taken to safeguard the energy markets and energy systems of the Republic of Macedonia in the event of a crisis shall be temporary and shall cause the least possible disturbance to the functioning of the national and regional energy markets and shall not be wider in scope than necessary to remedy the difficulties which have arisen.

Government according to the above mentioned article adopted Decree for criteria for announcing of electricity crisis, manner of supply with electricity in these conditions, and the rights and obligations of the license holder for performing energy activities (Official Gazette of Republic of Macedonia No. 37/2009). According to this Decree, the criteria on the basis of which the electricity crisis is declared are: elements of the energy balance of Republic of Macedonia; published data for the available transmission capacity of the cross-border lines with the neighboring countries; planned electricity needs in cooperation with the electricity market operator; forecasts for the electricity consumption; Grid code for transmission of electricity; Grid code for distribution of electricity; situation on the international electricity market, and the current situation of the generation and transmission facilities of the power system of Republic of Macedonia.

2. MACEDONIAN ELECTRIC POWER SYSTEM

2.1. REGULATORY FRAMEWORK IN ELECTRICITY SECTOR

2.1.1. Primary Legislation

On December 6, 2002 the *Energy Law* has been modified in order to create the Energy Regulatory Commission of Republic of Macedonia.

On June 1, 2005 the *Energy Law* has been modified to create Electricity and Natural Gas Market. The new amendments enabled the establishment the electricity and natural gas market.

Starting from 2006 in for is the Energy Law (Official Gazette of Republic of Macedonia 63/2006, 36/2007 and 106/2008)

2.1.2. Secondary Legislation

The new "Rulebook on the method and conditions for regulating electricity prices", issued by the Regulatory Commission on 31.12.2009, has been published at the "Official Gazette of the Republic of Macedonia", no. 167/2008.

The Rulebook regulates the method of establishing, approving and controlling prices and revenue necessary for performing the following regulated activities:

1. The generation and the provision of the power, electricity and ancillary services, as well as to provide transmission capacity by the regulated generator of electricity, necessary to:
   - Meet the needs of electricity of the retail suppliers for tariff customers
   - Meet the needs of electricity customers directly connected to the transmission network which perform activity of public interest;
   - Cover the losses in transmission and distribution network in quantities approved by the ERC;
2. The transmission of electricity, the operation of the electricity transmission system and the organisation and operation of the electricity market on the territory of the Republic of Macedonia;
3. The operation of the distribution system and distribution of electricity on the territory of the Republic of Macedonia;
4. The retail supply of electricity for tariff customers connected to the distribution network.

The regulation of electricity prices according to the method and procedure laid down in this Rulebook takes into account:

- Creating stabile and predictable conditions for operation of the regulated companies in order to ensure regulated services,
- Protection of abuse of the dominant and monopoly position of the companies,
- Balancing the interests of the regulated companies giving the regulated services and the users of the regulated services;
- Creating incentives for efficient operation of regulated companies;
- Creating conditions for development and maintenance of the current and building of new capacities for generation, transmission and distribution of electricity;
- Ensuring non-discriminatory treatment of regulated companies and applying objective criteria and transparent methods and procedures for regulating electricity prices;
- Recovering the cost of the regulated companies for providing the regulated activities and appropriate return on capital;
- Ensuring and promoting the security of supply, as well as safe, continuous and quality generation, transmission, distribution and supply of electricity;
- Promoting an energy efficiency, energy savings, and efficient use of energy resources;
- Protection and protection of the environment in performing the regulated activities.

Prices shall be regulated by imposing the maximum regulated revenue that the entity is permitted to earn on an annual basis from the average prices, i.e. regulated tariffs levied on users for the ensured regulated service. The maximum regulated revenue shall be set at a level that enables the regulated company to recover sufficient revenue in total to cover the operating costs and the depreciation of the assets for performing the relevant regulated activity made in frames of normalized costs in ensuring prescribed quality of service and ensuring a reasonable rate of return on the assets. The maximum regulated revenue also includes the revenues from the other sources realized during the performing the regulated activity. In case of the activity electricity retail supply, the return on capital is calculated through the margin for the activity retail supply for tariff customers in accordance with this Rulebook.

Grid Code for Electricity Transmission was approved by Regulatory Commission on 25th August 2006 and was published on 6th September 2006 in Official Gazette of the RM, no.95/06. The Grid Code describes minimum technical requirements for connection and for open access to the transmission network and basic technical and organizations instructions for operation and planning of transmission network. Main issues of the Grid Code are:

- Explicit definition of technical rules with transparency in operation of transmission network and unification of regulations for the system and
- Legalization of the relationship between users of transmission network.
- Grid Code consists of:
- General Introduction;
- Planning Code;
- Connection Condition;
- Operation Code.

Enhancing the security of supply is a main obligation of MEPSO carried out through regularly performed process of planning and development of the system using appropriate techno-economical criteria.

Concerning operational security of supply, Grid Code requires that MEPSO shall prepare Defense Plan with necessary conditions to secure transmission and supply of electricity in emergency conditions, such as short-circuits, transmission elements failures and power plants outages. Defense Plan foresees preventive and corrective actions. Preventive actions consist in operating the system with and approach that will limit the risk for failure to spread and become a major disturbance. In this process the implementation of "N-1" criterion is of a basic preventive importance. The aim of corrective actions is to isolate the faulty sub-system in order to avoid further spread of the dangerous phenomenon and to maintain the larger part of the system under normal conditions.

According to the article 80 of the Energy Law, the company EVN Makedonija AD - Skopje as a holder of the license for the operation of the electricity distribution system, upon prior approval by the ERC on 07.07.2008, has adopted and published the "*Grid Code for distribution of electricity*" in the "Official Gazette of Republic of Macedonia" No. 83/08. Grid Code for distribution of electricity regulates the following:

- Technical-technological and economic conditions for connecting consumers and embedded generators to the electricity distribution system and the pricing methodology for determine the costs for connecting to the distribution system;
- Technical and others conditions for reliable and safe operation of the distribution system;
- Distribution system planning, maintenance and development;
- Measures, activities and procedures in case of disruptions and outages;
- Conditions and manner of third party access to the distribution system;
- Confidentiality of distribution system service users' commercial and business data;

- Functional requests and accuracy class of metering devices, as well as the manner of electricity and power metering;
- Required data for long-term forecasts on electricity demands and manner of supply from the distribution system operator to the electricity system operator.

In accordance with Article 75 from the Energy Law, MEPSO – Market Operator is obligated to issue and publish the *Market Code* in the Official Gazette, upon prior approval from the Energy Regulatory Commission. The Macedonian electricity market is based on Third Party Access model with bid of bilateral contract and unique balancing mechanism.

In consideration to the Macedonian electricity market size and characteristics, the Government has approved the regulated mechanisms to allow a phased introduction of the Third party Access electricity market structure, starting with a bilateral contracts as a transition and regulated balancing mechanism with merit order which will approve including of other competitive requirements and bids from the electricity market participants in order to minimize the cost of the balancing regulation.

Further, having regard to considerations of efficiency and economic balance, clauses from Market Code, shall enable development of the Macedonian electricity market evolves from a centralized market structure and totally regulated to a open market, in line with Government policy in respect of the market opening.

The Market Code provides the rules that govern the functioning of the Macedonian electricity market as carried out by the Parties, which are entrusted the responsibility for the reliable and secure operation and function of the electricity market and networks, on one hand, and the rights and obligations of the Market Participants which are carrying out the transactions (buy and/or sell) on the electricity market.

2.2. KEY MARKET PARTICIPANTS AND THEIR RESPONSIBILITIES (ELECTRICITY MARKET DESIGN)

The main objective of the Market Model in Macedonia is to provide sufficient flexibility to interface with market designs considered in the region and fit well in Regional Market and European Internal Market. The Electricity Market Design Plan proposes a gradual approach in the opening of the market in a way that each step allows to the consumers and to the electricity sector as a whole to capture the greatest gains with the least risk at the lowest implementation cost.

The essential attributes of the Market Participants are as follows:

JSC ELEM is regulated electricity producer that has obligation to provide public service and on prior approval by the Energy Regulatory Commission concludes agreements under regulated prices and tariffs approved and published by the Energy Regulatory Commission with

- The operator of the electricity system for supply of ancillary services including the electricity necessary to cover the technical losses during the transformation and transmission of electricity in quantities approved by the Energy Regulatory Commission
- The electricity supplier for retail tariff consumers for the need of the tariff consumers in scope that the supplier with electricity for retail tariff consumers decides not to procure on the market excluding the electricity losses in the transmission and distribution system
- The distribution system operator for delivery of electricity necessary for covering the technical losses during the transformation and distribution of electricity in quantities approved by the Energy Regulatory Commission

The regulated electricity producer for the need of the supplier with electricity for retail tariff consumers is obliged to supply the following:

- the necessary quantities of electricity from its own generation capacities and if necessary from other generators of electricity and/or traders with electricity,
- the necessary transmission capacity and regulated services.

The regulated electricity producer can conclude sale agreements or in other manner to execute sale of surplus of power and energy under market conditions, in open transparent and non-discriminatory manner.

JSC MEPSO- The transmission system operator in Republic of Macedonia is owner of the complete equipment for transmission of electricity and keeps the maintenance, planning, expansion and construction of the transmission network, management of the electricity system as well as, organizing and management of the electricity market. JSC MEPSO as a market operator is responsible for the efficient functioning of the market, managing the system for electricity sale and purchase pursuant to the market-based principals and for development of the organized market pursuant to the principals for transparency, non-discrimination and competition, provide all services pursuant to the conditions determined in the license, under regulated prices and conditions approved and published by the Energy Regulatory Commission.

JSC EVN- Macedonia as supplier of electricity for the retail tariff consumers buys power and electricity from the regulated electricity producer, traders with electricity and from the distributed generators of electricity, as well as, necessary transmission and distribution capacity and regulated services for the needs of the tariff consumers of electricity connected on the distribution network under regulated prices. The supplier of electricity for retail tariff consumers can obtain power and electricity from other generators and/or traders with electricity only if the market conditions and prices are more favorable then the conditions and prices determined for the regulated electricity producer in a clearly defined, transparent and non-discriminatory manner that will guarantee equal access for all domestic and foreign legal persons. This purchase needs to be approved by the Energy Regulatory Commission.

JSC Negotino is electricity producer that is engaged by ELEM for electricity production, power and ancillary services and as a reserve in the power system.

The traders with electricity purchase electricity for sale to the eligible consumers, the regulated electricity generator, and the supplier with electricity for retail tariff consumers and have function of trade mediator for sale and purchase of electricity in or out of the country.

In the Republic of Macedonia there are two types of **consumers** of electricity such as:

- Tariff consumers, - purchase electricity under prescribed tariff positions for own consumption;
- Eligible consumers, - freely purchase electricity from retailer, independent generator of electricity and from import under own choice.

POWER BALANCE

The generation in the Macedonian power system is shared between thermal and hydro power plants. The Thermal power plants, with an installed capacity of 1010 MW, represent 64% of total installed capacity, and the Hydro power plants, with an installed capacity of 528,4 MW, represent approximately 36% of total.

The largest generation facility and the foundation in the whole system is TPP Bitola with 675 MW installed. TPP Bitola is located in the south-west of the country. It uses lignite for energy production from nearby located open pit mine. TPP Bitola, together with TPP Oslomej covers 80% of electricity consumption. The rest of the consumption is covered by TPP Negotino (heavy fuel fired), hydro power plants and import. The major hydro power plants are located in the west of Macedonia.

In addition to major power generating plants, various small generating units operate in the EPS. The total installed capacity of small thermal generation units owned by industrial consumers is about 50 MW. There is also dispersed generation on distribution level of ten (10) small hydro power plants with total capacity of 38 MW.

Total electricity consumption in 2005 was 8337 GWh, with power peak load of 1491 MW. Energy balance shows that TPP-s produced 4911 GWh, HPP-s produced 1646 GWh and the rest of 1780 GWh was covered by import.

2.2.1. Electricity consumption & supply

Historical consumption of electricity for the last 18 years is given bellow.

Table 1. Yearly electricity consumption (GWh) 1991 - 2008

Year	Yearly Electricity Consumption (GWh)	Yearly increase	Average increase		
			1992-2008	1997-2008	2001-2008
1991	5252				
1992	5720	8.91%	3.04%		
1993	5676	-0.77%			
1994	5559	-2.06%			
1995	5800	4.34%			
1996	6148	6.00%			
1997	6330	2.96%		2.94%	
1998	6518	2.97%			
1999	6285	-3.57%			
2000	6439	2.45%			
2001	6294	-2.25%			3.81%
2002	6410	1.84%			
2003	7226	12.73%			
2004	7385	2.20%			
2005	8089	9.53%			
2006	8337	3.07%			
2007	8,581	2.92%			
2008	8,615	0.40%			

In 2008, the increase in consumption comparing with 2007 was 0.4% which is typical value for increase in Macedonia. Contrary, consumption in 2005 comparing to 2004 has large increase of 9.5% due to increased consumption at metallurgy and higher load in summer. The climatic conditions were close to the average with some fluctuations of the temperature that caused higher consumption in summer.

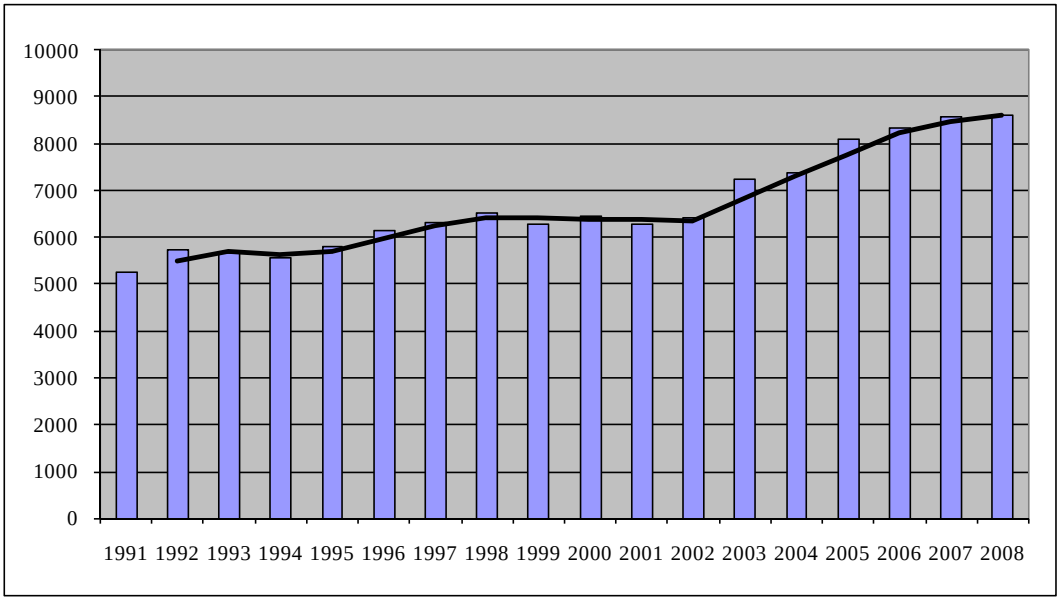


Figure 1. Trend of electricity consumption, 1991 – 2008

Power supply for the last 18 years is given bellow.

Table 2. Electricity supply (GWh) 1991 - 2008

Year	TPP	HPP	Exchange
1990	4634.0	427.4	115.3
1991	4378.2	845.0	29.3
1992	4650.8	822.4	138.6
1993	4612.2	521.6	509.5
1994	4794.6	695.8	73.2
1995	4888.0	797.2	117.2
1996	4731.6	1442.2	-26.0
1997	5035.0	1222.0	72.4
1998	5445.3	1077.5	-2.0
1999	5008.4	1384.6	-104.0
2000	5159.0	1170.0	112.0
2001	5241.4	621.5	431.3
2002	4863.4	755.4	791.2
2003	4902.5	1369.9	953.3
2004	4731.3	1476.9	1176.2
2005	4996.6	1478.3	1614.0
2006	4910.6	1646.2	1779.7
2007	5013.7	1057.3	2509.6
2008	4993.8	880.6	2740.7

Production of hydro power stations was low to 2007and 2006 due to relatively dry hydro conditions during the year 2008.

Production of fossil fuel power stations was only 1.7% lower as in the year 2005.

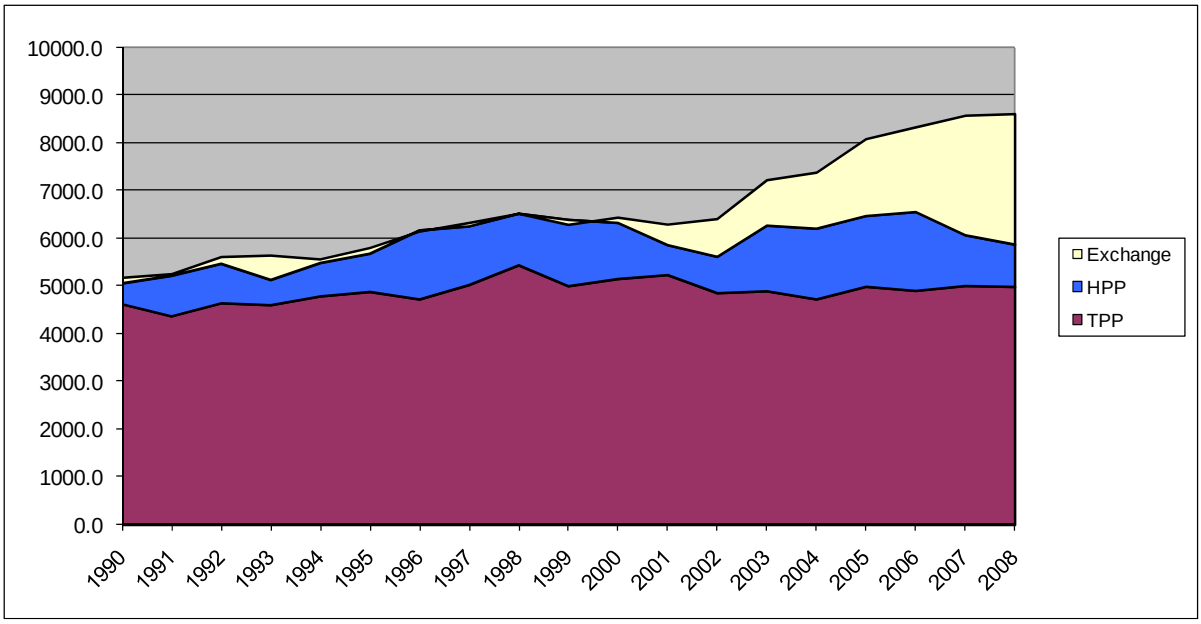
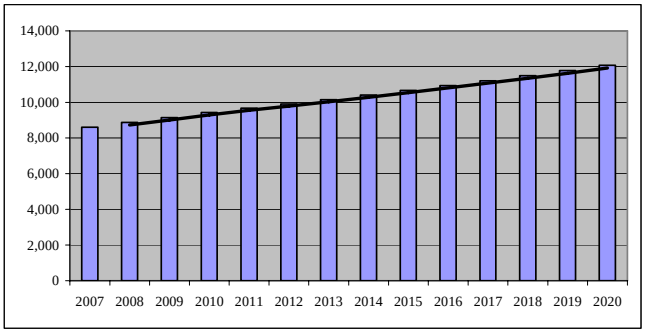


Figure 2. Participation of different sources in electricity supply, 1991 - 2008

Consumption forecast for the next period is shown in Table 3.

Table 3. Consumption forecast up to 2020

Year	Yearly Electricity Consumption (GWh)	Increase	Direct consumers		
			metalurgy		rest
			Energetika	Feni	
2006	8,337	0.0311	1,040	945	1140
2007	8,596	0.0311	1,050	900	1050
2008	8,864	0.0312	1,050	900	1050
2009	9,142	0.0313	1,050	900	1050
2010	9,428	0.0313	1,050	900	1050
2011	9,664	0.0250	1,050	900	1050
2012	9,906	0.0250	1,050	900	1050
2013	10,153	0.0250	1,050	900	1050
2014	10,407	0.0250	1,050	900	1050
2015	10,667	0.0250	1,050	900	1050
2016	10,934	0.0250	1,050	900	1050
2017	11,207	0.0250	1,050	900	1050
2018	11,487	0.0250	1,050	900	1050
2019	11,775	0.0250	1,050	900	1050
2020	12,069	0.0250	1,050	900	1050



2.2.2. Peak Load

Peak load conditions in MK system are typical for the period December – January. The system peak load of 1618 MW occurred on 06.01.2008 at 18:00 CET. Compared to previous year peak load is decreased for 2.8%. Peak load strongly depends on temperature conditions.

No load reduction measures were taken at peak load.

Table 4. Yearly peak load (MW) 1991 – 2008

Year	Yearly Peak Load (MW)	Yearly increase	Average increase		
			1992-2008	1997-2008	2001-2008
1991	989				
1992	1035	4.65%			
1993	988	-4.54%			
1994	1041	5.36%			
1995	1081	3.84%			
1996	1149	6.29%			
1997	1121	-2.44%			
1998	1221	8.92%			
1999	1214	-0.57%			
2000	1233	1.57%	3.00%		
2001	1261	2.27%			
2002	1320	4.68%		2.96%	
2003	1417	7.35%			
2004	1432	1.06%			3.50%
2005	1491	4.12%			
2006	1565	4.96%			
2007	1,664	6.33%			
2008	1,618	-2.76%			

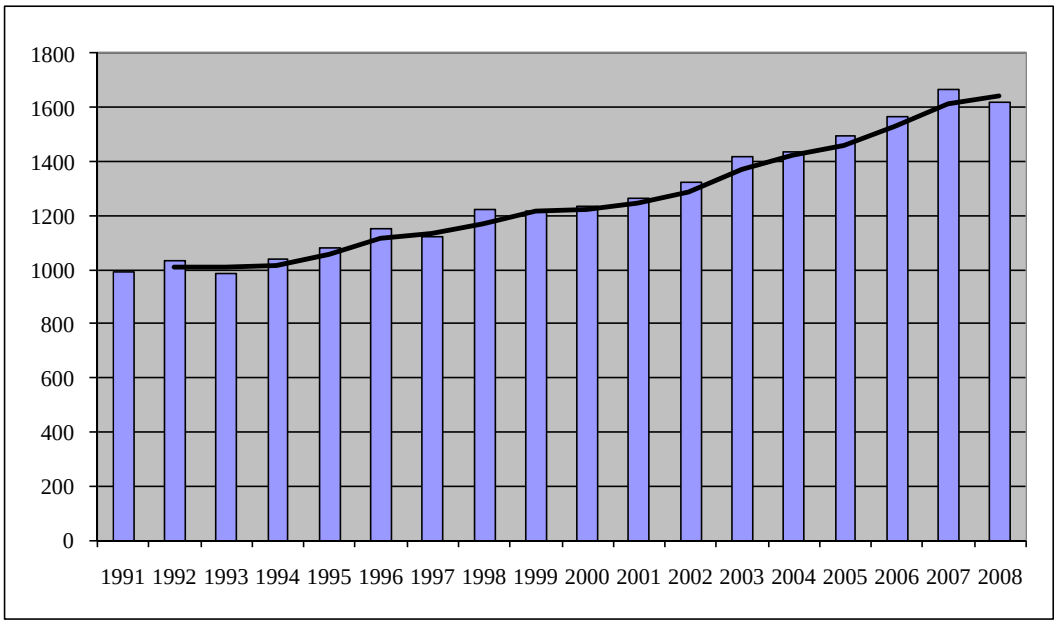
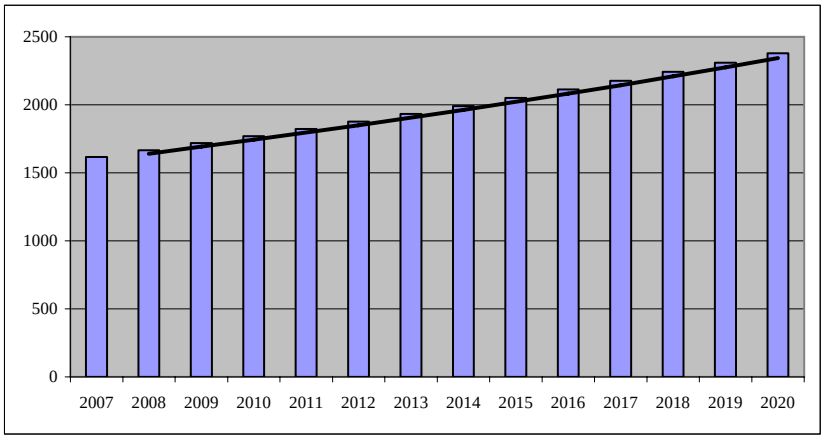


Figure 3. Trend of peak load, 1991 – 2008

In next period, peak load increased is forecasted with average 3%.

Table 5. Peak load forecast up to 2020

Year	Year Peak Demand (MW)
2006	1565
2007	1616
2008	1665
2009	1719
2010	1769
2011	1822
2012	1877
2013	1933
2014	1991
2015	2051
2016	2113
2017	2176
2018	2241
2019	2309
2020	2378



2.4. GENERATION

According to the Energy Law the construction of new facilities for electricity generation, combined electricity and thermal energy generation may be performed by domestic and foreign persons on the basis of an authorization. The authorization for construction of new electricity production facilities and combined production of electricity is granted with a decision by the Government of the Republic of Macedonia on a proposal of the Minister in charge of energy issues. An authorization for construction of new energy facilities is necessary for: generation of electricity exceeding capacity of 1 MW, except for private needs, combined generation of electricity and thermal energy exceeding capacity of 1 MW, except for private needs.

The authorization for construction of new facilities for electricity generation, combined electricity and thermal energy generation determines: the type and location of the facility the authorization refers to, the delay for beginning and finalizing the construction of the facility, the modality and requirements for performing energy activities in the facility, according to the rules on granting, modifying, extending, suspending and revoking the license treatment of the facility after the cease of its activities, requirements concerning the use of public goods or public infrastructure, requirements for environmental protection according to law, requirements concerning the efficiency of the work of the facility; and fulfillment of special requirements concerning the technical, human resource and economic capacities as well as the financial capacity of the holder of the authorization.

By way of exception, in case if, based on the issued authorization and the Strategy for Energy Development in the Republic of Macedonia, the electricity demand forecast and an assessment of the possibilities for its satisfying, it is estimated that the long-term security of supply may be jeopardized, the Ministry may launch a public announcement concerning the construction of new electricity generation facilities. The public announcement procedure, the requirements for participation and the criteria for selection are in accordance with the Law on Public Procurement.

2.4.1. Existing generation capacities

1. THERMAL POWER PLANTS

TPP BITOLA

The Mining Power Complex Bitola is located in the new municipality Novaci which was founded in 1975 year. The plant is located in the periphery of Pelagonija plain. The plant which basic activity is the production of electricity and coal is the biggest in the system of the Macedonian Industry and consists of two production units: Mine Suvodol and Thermal power plant and Working unit.

The production in the plant started in 1980, by mining the first overburden of waste land in the first BTO system (Excavator, Conveyor, Stacker) and the production of first kilowatt-hours of power in 1982, when the first of three units of the three units of the thermal power plant was put into operation. The production is ensured by three units, which power with a reconstruction in 1994 was increased by additional 15 MW per unit or total 45 MW new power, so the installed capacity now is 225 MW per unit or total 675 MW. The gross electricity production of the plant is 4.600 GWh/year.

All this potential in MPC Bitola allows the plant to participate with more than 70 % in the total electricity production in EPS. When we talk about MPC Bitola, we should not neglect the fact that we mean a permanently high production, which compared to the power facilities of this kind, even compared to wider areas, deserves high respect. The constant exceeding of the yearly power supply demands proves this.

Location	Novaci, Bitola
Number of units	3
Type of fuel	coal
Year commissioned	1982/1984/1988
Steam boiler Type Supplier Capacity	 p-65 ZIO-Podoljsk,Russia 700t/h
Steam turbine Type Supplier Rated power	 K-210-130-3 LMZ, Russia 225 MW
Generator Type Supplier Rated power	 TVV-200-2AV3 Elektrosila, Russia 264.7 MVA
Cooling tower	3

TPP OSLOMEJ

The majority production of electricity in the Republic of Macedonia, about 80%, is based on the thermal power plants. The smallest thermal capacity, within the power system, is the Mining Power Complex Oslomej near Kichevo, with an installed unit of 125 MW and net production of about 400 GWh/year. MPC Oslomej started the production in 1980, and until now it has achieved excellent production results. With installed capacity of 125 MW this power plant supplies about 10% of the total production of electricity in Macedonia. This power plant uses coal as a basic fuel with an average calorie amount of 7600 kJ/kg, and the coal consumption is 1,52 kg/Wh, while the crude oil consumption is 2,73 gr/Wh.

Location	Oslomej, Kicevo
Number of units	1
Type of fuel	coal
Year commissioned	1980
Steam boiler Type Supplier Capacity	 OB-380 Rafako, Poland 380t/h
Steam turbine Type Supplier Rated power	 13K-125 Zameh, Poland 125 MW

Generator	
Type	TGH-120
Supplier	Zameh, Poland
Rated power	125 MW
Cooling tower	1

2. HYDRO POWER PLANTS

MAVROVO SYSTEM

Taking the advantage of the fact that the water is energy resource from the point of its springs to the point where it is streaming in the see, the Hydro Power System Mavrovo has been constructed, on the springs itself on the mountains Korab, Bistra and Sar Planina. The System is planned and constructed in a way that the water energy is used several times. The waters from the Korab river basins, through HPP Vrben, already used once are stored in the Mavrovo accumulation. The accumulated power is used second time in HPP Vrutok and after that in HPP Raven also.

The Mavrovo Hydro Power System with the three hydro power plants Vrutok, Raven and Vrben and with total accumulated water quantity of 277 million m3 is one of the greatest and most complex systems in the Macedonian Hydro Power System. In the total installed hydro capacities in the country, this system participates with 42 %. The Mavrovo Hydro Power System with the three plants HPP Vrutok, HPP Raven and HPP Vrben and with total water accumulation of 277 million m3 is one of the greatest end most complex systems in the Macedonian Electric Power System. In the total installed hydro capacity in the country, this system participates with 42 %.

- HPP Vrutok

HPP Vrutok is located on the North-West part of Republic of Macedonia and is the largest Hydro Power Plant in the country. With its large accumulation has major role in the regulation of the daily diagram of the consumption in the Electric Power System.

The Power Plant has been constructed the following phases:

- 1947 – start of construction
- 1952 – decision for founding HPP Mavrovo
- 1957/58 – putting in operation of two aggregates
- 1973 - putting in operation of two additional aggregates

HPP Vrutok is accumulation-derivative power plant and altogether with the entire electro-mechanic equipment is located in cavern built underground. The cavern itself is built in four levels where the four hydro aggregates and the control room are located.

Transformer Chamber This chamber is as well located underground and there are stationed four block transformers of 42 MVA each. The power from the transformer chamber in 110 kV voltage level is leaded to the 110 kV distribution plant.

110 kV Plant Typical for this plant is that it presents knot of two input and three output transmission lines of 110 kW, where one of the output lines leads to 220 kV distribution plant. As integral part of the plant, also is included the 35 kV distribution plant, on which HPP Vrben and HPP Raven are connected.

HPP VRUTOK	
Power Plant Type	accumulation-derivative
Location	Village of Vrutok
River Basin	River Mavrovska
Number of aggregates	4
Installed capacity	172 MW
Average yearly production	350 GWh
Put in operation	1957/1973
Net altitude of the fal	525 м
Installed inflow	32 (4x8) м3/sec
Turbine Type	Pelton with 4 injectors

- HPP Vrben

Six kilometers in north of the Mavrovo accumulation is located HPP Vrben. The difference with the two other hydro power plants, this plant is of run-river type. It is set in a way that at first it uses the waters from Gorna Radica River basin before they are stored in the Mavrovo accumulation. The two aggregates were put in operation in 1959. In the mechanical building is located the control room, as well as 35 kV and 10 kV plant. From this plant through 35 kV transmission line, the power is transmitted to HPP Vrutok, from where it is released in the Electric Power System of Macedonia

HPP VRBEN	
Power Plant Type	run of river
Location	Village of Vrben
River Basin	Gorna Radika River
Number of aggregates	2
Installed capacity	12,8 MW
Average yearly production	45 GWh
Put in operation	1959
Net altitude of the fall	196 м
Installed inflow	8 (2x4) м3/sec
Turbine Type	Francis

- HPP Raven

HPP Raven is located about two kilometers downstream from HPP Vrutok and it uses the already used water from HPP Vrutok. This power plant does not have its own accumulation, and is directly dependent of the operation regime in HPP Vrutok. In the mechanical building are located three aggregates with power of 6,4 kV each, which were put in operation in phases, two in 1959 and one in 1973. In it besides the aggregates is located the control room and 35 kV distribution plant. In front of the Power Plant itself are located three power block transformers 6,3/35kV.
The already used water, through underground tunnel is discharged in the regulated bed of the Vardar River, from where it is taken in purpose of irrigation the Polog Field.

HPP RAVEN	
Power Plant Type	run of river
Location	village Raven
River Basin	Mavrovska River
Number of aggregates	3
Installed capacity	21,6 MW
Average yearly production	40 GWh
Put in operation	1959/1973
Net altitude of the fall	74 м
Installed inflow	32 (3x10,6) м3/sec
Turbine Type	Francis

HPP TIKVES

HPP Tikves is located at the River Crna, about 27 km upstream of its inflow in the Vardar Rver nearby Kavadarci. This hydrosystem is double purposed: irrigation of the Tikves Field, which is one of the most warm and most dry areas in Macedonia; and the second purpose, is generation of electric energy.

Dam and Accumulation
HPP Tikves has rock filled dam with height of 113,5 m, where is formed accumulation with total volume of 475 million m3, out of which the useful volume amounts to 309,6 million m^3. The normal projected operational level of the accumulation is 265,00 meters abowe the sea level and the minimal level is 233,00 meters above the sea level.

Hydro Power Plant
The Hydro power plant Tikves is projected and constructed with installed capacity of 92 MW and annual generation of 184 GWh. The mechanical building is located in the underside of the dam. In the building are located four aggregates equipped with Frances turbines with vertical axis, as well as three phase sinchrone generators.
The three transformers are located outside the mechanical building.
The location of the switch gear is outside.

HPP TIKVES	
Power Plant Type	accumulation-nearby
Location	Kavadarci
River Basin	Crna River

Number of aggregates	4
Installed capacity	92 MW
Average yearly production	184 GWh
Put in operation	1966/1981
Net altitude of the fall	91,30 m
Installed inflow	120 (4x30) m3/sec
Turbine Type	Francis

HPP SPILJE

The largest accumulative hydro power plant in the confluence area of the Crn Drim River is HPP Spilje, located nearby Debar. With the operation start in 1969, this hydro power plant is important source of electric power in the Electric Power System of Macedonia.

HPP Spilje has accumulation with volume of 520 million m^3, out of which the useful volume is 223 million m^3. The hydro power plant is located right at the connection of the Crn Drim and Radika Rivers, so the regime of inflows in the accumulation is in dependence of the regime of the both rivers. The inflow from Crn Drim during the year is mostly steady because of the existence of two upstream accumulations, the Ohrid Lake and the accumulation Globocica. The inflows from Radika are very variable, which is due to the natural factors in the confluence.

Dam and Accumulation
HPP Spilje has rock filled dam with height of 110 m, where is formed accumulation with total volume of 520 million m3, out of which the useful volume amounts to 223 million m^3. The normal projected operational level of the accumulation is 580,00 meters abowe the sea level and the minimal level is 575,00 meters above the sea level, but in order to decrease the overflows during the exploitation, the level of the accumulation is decreased to level of 560,00 meters abowe the sea level.

Hydro Power Plant
The Hydro power plant Spilje is projected and constructed with installed capacity of 66 MW and annual generation of 384 GWh. With revitalization of the initial equipment of the Hydro power plant, which was performed from 1997 till 1999, the installed capacity of HPP Spijle is increased to 84 MW. The mechanical building is located about 70 m in the underside of the dam. In the building are located 3 aggregates equipped with Frances turbines with vertical axis, set at level of 485,75 meters, as well as three phase sinchrone generators. The three transformers are located outside the mechanical building. The area between the fundament of the dam and the mechanical building is used as location for the switchgear plant 110 kV.

HPP SPILJE	
Power Plant Type	accumulation-nearby
Location	Debar
River Basin	River Crn Drim
Number of aggregates	3
Installed capacity	84 MW
Average yearly production	300 GWh

Put in operation	1969
Net altitude of the fall	91,30 m
Installed inflow	108 (3x36) m3/sec
Turbine Type	Francis

HPP KOZJAK

The Dam and the hydro power plant Kozjak are located at the Treska River, at about 25 km upstream of its inflow in the Vardar River and at about 16 km upstream of the HPP Matka, nearby Skopje and is the first of the cascade of dams and hydro power plants on the Treska River. With the construction of this dam is formed large accumulation space and as front accumulation provides regulated water for the downstream hydro power plants as well as waters for irrigation of the Skopje agricultural field (Skopsko Pole). One of the basic purposes of this dam is retention of the flood impact of the Treska River where 100 million m^3 accumulation space are provided for this purpose.

Dam and Accumulation HPP Kozjak has rock filled dam with height of 126,1 m, where is formed accumulation with total volume of 550 million m3, out of which the useful volume amounts to 260 million m^3. The maximal projected operational level of the accumulation is 459,00 meters above the sea level and the minimal level is 432,00 meters above the sea level.

Hydro Power Plant The Hydro power plant Kozjak is projected and constructed with installed capacity of 80 MW and annual generation of 156 GWh. The mechanical building is located in the underside of the dam. In the building are located 2 aggregates equipped with Frances turbines with vertical axis, as well as three phase synchronous generators. The three transformers are located outside the mechanical building. The location of the switchgear plant 110 kV is external.

HPP KOZJAK	
Power Plant Type	accumulation-nearby
Location	Skopje
River Basin	River Treska
Number of aggregates	2
Installed capacity	80 MW
Average yearly production	156 GWh
Put in operation	2004
Net altitude of the fall	92 m
Installed inflow	100 (2x50) m3/sec
Turbine Type	Francis

HPP GLOBOCICA

HPP Globocica is located in the western part of Macedonia on the River Crn Drim, about 30 km in north of Struga. This derivative power plant that is locking the narrow profile of the River Crn Drim, with its accumulation performs weekly balancing of the diagram of consumption.

Dam and accumulation
HPP Globocica has rock filled dam with height of 94,5 meters , where is formed accumulation accumulation with volume of 58,4 million m^3, out of which the useful volume amounts to 13,2 million m^3. The normal projected perational level of the accumulation is 687,50 meters above the sea level and the minimal is 682,00 meters above the sea level. With separate inflow lines the waters from Jablanska and Selecka Rivers are brought to the Globocica accumulation. The last is connected in the surge tank and from there are brought to the accumulation.

Hydro Power Plant
The Hydro power plant Globocica is projected and constructed with installed capacity of 42 MW and annual generation of 191 GWh. The mechanical building is located at the right shore of the Crn Drim River, at 7,8 km downstream of the dam, nearby upstream from the inflow of Selecka River. In the building are located 2 aggregates equipped with Frances turbines with vertical axis, set at level of 576,75 meters, as well as three phase synchronous generators. The three transformers are located outside the mechanical building.

The location of the 110 kV switchgear plant is external.

HPP GLOBOCICA	
Power Plant Type	accumulation-derivative
Location	Struga
River Basin	River Crn Drim
Number of aggregates	2
Installed capacity	42 MW
Average yearly production	191 GWh
Put in operation	1965
Net altitude of the fall	95,29 m
Installed inflow	50 (2x25) m3/sec
Turbine Type	Francis

2.4,2. Development of new capacities

HPP SVETA PETKA

Introduction
HPP Sv. Petka (previously named Matka 2) is the missing link for the optimal utilization of the hydro potential of the Treska River. HPP Sveta Petka is located between the new built HPP Kozjak (about 16 km upstream of Sv. Petka) and HPP Matka located downstream. With parallel operation of HPP Kozjak and HPP Sv. Petka, additional available capacity of about 110 MW in the electric power system will be provided. The construction of HPP Sv. Petka has started 17th of June, 2005 and the expected put into operation in 2011.

Project description

Dam The dam will be double curve dam, with height of 69 meters, crown length of 118 m, crown level of 364 meters above the sea level and total dam volume of 27.325 m^3.

Accumulation The accumulation shall cover surface of 0,54 km^2 at minimal operational level of 355 meters above the sea level and maximal surface of 0,62 km^2, at maximal level of 357,3 meters above the sea level. The total volume is 9,1 x 10^6 m^3, with active volume of 1,1 x 10^6 m^3. The length of the accumulation is 11 km along the Treska River.

Turbine capacity The installed capacity of the power plant is 36,4 MW. Two Frances turbines, each with 18,2 MW are installed in the HPP. The projected discharge in the turbines is 2 x 50 m^3/s.

HPP SVETA PETKA	
Power Plant Type	accumulation-derivative
Location	Skopje
River Basin	River Treska
Number of aggregates	2
Installed capacity	36,4 MW
Average yearly production	66 GWh
Put in operation	expected in end of 2011
Net altitude of the fall	40,00 m
Installed inflow	100 (2x50) m3/sec
Turbine Type	Francis

HPP CEBREN

On 19 December 2008, an ***international public bid for showing interest for participation in the procedure for pre-qualification for granting concession for electricity generation from two hydro power plants on Crna Reka*** and public private partnership with ELEM was announced, and the pre-qualification was completed on 15 April 2009. The interest was shown by ENEL, Italy, Verbund, Austria, and Consortia of RWE, Germany, and HSE, Slovenia. The construction should start within three years, and the construction of the two hydro power plants is envisaged to last for 8 years.

HPP Cebren is predicted to be constructed on the river Crna Reka, near to village Manastir, 7 km upstream of the bridge Rasimbegov Most. With its huge accumulation area, this HPP is enabled for regulation of natural flows of river Crna Reka. This accumulation is the first of three energetic scales and is very important because it produce qualitative energy, not only to **HPP Cebren**, but also to other downstream HPPs, which have been already constructed or will be constructed (HPP Tikves and HPP Galiste).

HPP Cebren is settled in the river bad, close to the gravity arch dam. In the design documentation overflow is predicted to be over the dam, and foundation outlets are in the dam body a small dam, the **Orlov Kamen**, is intended as a bottom basin for HPP CEBREN, reversible units. This reservoir occupies the furthest upstream part of the Galiste reservoir and is separated by a concrete barrier; enables that the Galiste reservoir works independently from the upstream reversible units dam Cebren.

Technical documentation is on the level of primary design.

Main characteristics of the HPP Cebren are:

Average discharge	26,00 m3 /s
Average production	840/786 GWh
Construction height of the dam	192,50 m
Surface height	180 m
Installed flow (turbine/pumps)	231/208 m3/s
Number of units	3
Installed capacity (turbine/pump)	333/347 MW
Gross head (max/min)	172/150 m
Turbine type	Francis reversible
Generator type	Synchrony Three Phase
Investment value	318.489.000 EURO
Construction period	6 years

Main characteristics of the Orlov Kamen dam are:	
Max. operating level (max. power pool)	400,00 maSL
Min. operating level	393,00 m
Active storage volume	14,9 million m^3
Type of dam	arch dam
Dam height	55 m
Crest level	408 maSL
Investment value	19.892.000 EURO
Construction period	3 years

HPP GALISTE

HPP Galiste The partition place (future dam) "Galište", located in the middle part of the gorge (ravine) stretch of the r.Crna Reka, at the very front spot of the existing water storage "Tikveš", i.e. 54 km. upstream of the r.Crna Reka emptying into the r.Vardar.It will be a dam site facility. The HPP includes the following structures: rockfill dam with a clay core, grouting curtain, upstream and downstream cofferdam which enters the dam body, a diversion tunnel which will serve as a foundation outlet, a spillway (overflow) organ - shaft overflow, supply organ, power house comprising of three generator sets as well as a 110 kV switchyard located in the area between the dam and the power house.

Design documentation is on the level of primary design.

Main characteristics of the Galiste dam are:	
Average discharge	28,90 m3 /s
Average production	262,50 GWh
Construction hight of the dam	141,50 m
Surface hight of the dam	138,50 m
Installed flow	180,00 m3/s
Number of units	3

Installed capacity	193,50 MW
Gross head (max/min)	129,20/78,30 m
Turbine type	Francis
Generator type	Synchrony three phase
Investment value	200.241.000 EURO
Construction period	7 years

HPP BOSKOV MOST

HPP Boskov Most is predicted to be constructed on the river Mala Reka, near Debar and main road Skopje-Debar-Ohrid. It is predicted constructing of dam and accumulation with intake facilities on all streams of the river basin of Mala Reka, derivation channels, main intake-derivation tunnel, penstock and power house. At the end of the intake tunnel is cylindrical surge tank. The water from surge tank is transferred through two pipelines to the power house.

The design documentation is on the level of main design.

The main characteristics of the HPP Boskov Most are:	
Average discharge	4,60 m3 /s
Average production	126,7 GWh
Construction height of the dam	33,00 m
Surface height	33,80 m
Head race tunnel length	8987,30 m
Head race tunnel diameter	3,00 m
Rated flow	22,00 m3/s
Number of units	2
Installed capacity	68,0 MW
Design head	358,00 m
Turbine type	Francis
Generator type	Synchrony three phase
Investment value	70.000.000 EURO
Construction period	4 years

HPP VELES

HPP Veles is predicted to be constructed on the river Vardar near village Basino Selo upstream of Veles. The railway Skopje - Veles will be flood out with future accumulation Veles. That's why it will be dislocated on the higher level and this scope of works must be predicted before dam construction. The access to the dam site is possible through highway Skopje-Veles.

HPP Veles is dam site facility with concrete gravity dam. The power house is located close to the dam in the river bad. Design documentation is on the level of primary design for construction of the dam and for dislocation of the railway. The new (dislocated) railway is predicted as two way with construction speed of 160 km/h, much better than the existing one. The construction period for dislocation of the railway is 3 years and must be finished before starting of the dam construction.

Main characteristics of the HPP Veles are:	
Average discharge	86,32 m3 /s
Average production	300,60 GWh
Construction hight of the dam	69,00 m
Surface dam	59,50 m
Installed flow	195,00 m3/s
Number of units	3
Installed capacity	93,00 MW
Nominal head	53,50 m
Turbine type	Francis
Generator type	Synchrony three phase
Investment value	251.000.000 EURO
Construction period	7 years

HPP GRADEC

HPP Gradec is predicted to be constructed on the river Vardar, 30.4 km from the Macedonia-Greek border. The access to **HPP Gradec** is possible through highway Skopje-Gevgelija directly to the dam crest. Power house is an integral part of the dam and there are predicted two units with Kaplan turbines.

The railway Skopje - Gevgelija will be flood out with future accumulation Gradec. That's why it will be dislocated on the higher level and this scope of works must be predicted during the dam construction. Design documentation is on the level of main design for the overflow and power house part and on the level of primary design for the left and right part of the dam.

Main characteristics of the HPP Gradec are:	
Average discharge	152,70 m3 /s
Average production	252,40 GWh
Construction hight of the dam	42,50 m
Surface hight	33,00 m
Installed flow	240,00 m3/s
Number of units	2
Installed capacity	54,60 MW
Nominal head	27,15 m
Turbine type	Kaplan
Generator type	Syncrony three phase
Investment value (railway+dam)	156.800.000 US $
Construction period (railway+dam)	4 years

HPP IN VARDAR VALEY

The ten **HPPs in Vardar Valey** are planned to be constructed in a purpose to use whole water potential of the river Vardar. For these plants technical documentation is on the level of study. Their basic characteristics are shown in the following table:

Main caracteristics of the plants are:						
Plant	**Qav[m3/s]**	**Qins[m3/s]**	**H[m]**	**P[MW]**	**W[GWh]**	**Cost[mil.$]**
Babuna	91,2	2x120	8,5	17,34	56,9	47,6
Zgropolci	91,2	2x120	8,5	16,93	55,5	51,7
Gradsko	112,4	2x120	8,3	16,93	66,6	57,6
Kukurecani	147,6	2x120	8,3	16,93	79,5	57,0
Krivolak	148,9	2x120	8,3	16,93	80,0	57,0
Dubrovo	149,6	2x120	8,3	16,93	80,2	68,2
Demir Kapija		2x120	12,0	24,48	116,4	80,4
Miletkovo	157,2	2x120	8,2	16,72	80,3	70,0
Gavato	161,8	2x120	8,2	16,72	83,2	78,8
Gevgelija	164,4	2x120	8,3	16,93	85,1	63,0

For the realization of this project was announced Public call for expression of interest for participation in prequalification procedure for granting water concession for electricity generation. The dead line for expression of interest is 30 June 2009.

COMBINED CYCLE GAS POWER PLANT TE-TO – SKOPJE

The availability of the natural gas in Skopje provides conditions for installation of combined cycle power plant for generation of electric and heating power with the use of the natural gas as fuel. The new 300 MW power plant with combined cycle is intended to supplement the lack of electric power in the winter period. The power plant is intended to be installed in the complex of the existing plant "Energetika" – Skopje.
The existing "Energetika" – Skopje is power plant that used to operate on crude oil and used to generate 30 MW electric power, has capacity for 100 MWth heat, process steam 40t/h and in the moment operates on natural gas. If as fuel in the new 190 MW TE-TO is used gas, there will be significantly decreased the NOx emission due to the installation of the dry law NOx burner in the gas turbine.
For this object there is Feasibility study prepared, by Stork, Netherlands in 1998, Feasibility study by the Japanese Consultant Institute in December 1999 and Feasibility study made by Enprima, Finland in 2004.

Technical parameters of TE-TO Skopje			
	Units	Winter	Summer
Electric power	[MW_e]	300	300
Heating power	[MW_t]	150	0
Generation from TE-TO Skopje			
	Dimension	Yearly	
Time of operation	[h]	7.000	
Electric power	[GWh]	2.000	
Heating power	[GWh]	500	

MINE BROD-GNEOTINO
UNDER-STRATUM SERIES IN MINE SUVODOL – BITOLA

The determined coal quantities in the two deposits mine Brod-Gneotino and Under-stratum coal series, with its techno-economic, exploitable justification represent guarantee for continuous supply of coal and extension of the operation of the thermal power plant Bitola for the period till 2025. The opening of the two open pit mines is imposed as necessity, because otherwise the exploitation of coal in the existing mine Suvodol will end, and with that will end the operation of the thermal power plant.
About 70% of the total electricity generation in Republic of Macedonia is provided by REK Bitola, which operates on base of the determined coal reserves located in the Suvodol mine, reserves that provide operation of the thermal power plant till 2010-2011.

WIND FARMS

The construction of the wind power plants would contribute in decrease of the imports dependence, quality electricity supply, local and regional development, increase of the participation of the renewable energy in the total electricity generation and as major benefit of this kind of energy is the environmental protection with lowering the CO_2 emissions, and in accordance with the Kyoto protocol. The possible development of the wind power plants in near future will also have positive implications on the local economy. This initiative is perfectly coinciding with the Governmental strategy for development of the renewable electricity resources as well as the European Union strategy for development of this type of capacities.

2.5. TRANSMISSION

2.5.1 Basic data for transmission network

The Macedonian power system has interconnection lines with Greece, Bulgaria and Serbia. The Macedonian power system is a net importer for electricity for the all year. The imports represent around 15% - 30 % total consumption in the system,.

High voltage transmission system operates at three (3) voltage levels: 110, 220 and 400 kV. The length of overhead transmission lines is about 507 km on 400 kV voltage level, 103.2 km length of overhead transmission lines on 220 kV voltage level, and 1479.7 km length OHTL-s on 110 kV voltage level.

The backbone of the system is the 400 kV level. The ring of three 400 kV lines connects the biggest consumption area in the northern parts in the country (Skopje) with the main power generation plants, situated in the southern parts (Bitola and Negotino).

The power system of Macedonia, in the year 2008, include 66 substations 110/x kV with total 3617 MVA installed capacity, two substations 220/110 kV with total 600 MVA installed capacity and four substations 400/110 kV with total 2400 MVA installed capacity.

2.5.2. Interconnections

The HV system is interconnected on 400 kV voltage level with Greece, Bulgaria and Serbia.

The two (2) 220 kV lines with Serbia are out of operation since 1999 and there is no rehabilitation project defined at this moment for these lines.

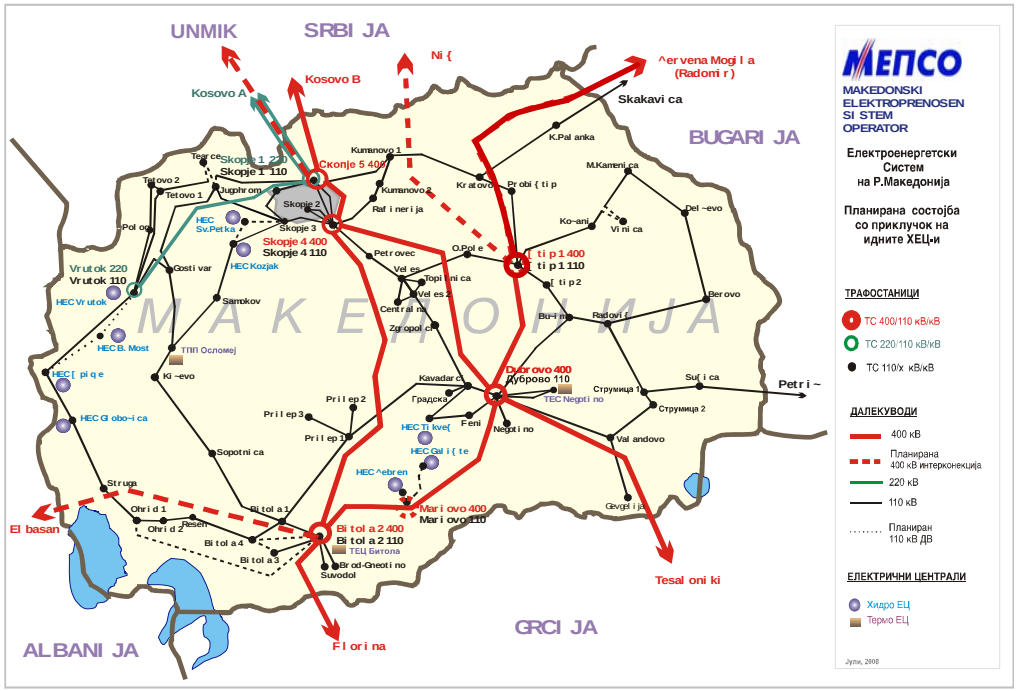
. Two 110 kV interconnections between Macedonian and Bulgarian power systems are used only in special circumstances, in parallel or island mode of operation depending of operational regime, and mutually agreed.

Basic data of existing interconnection lines can be found in .

Table 6. Basic data of existing interconnections

Node 1	Country	Node 2	Country	Voltage Level (kV)	Line Length (km)	Type of Circuit	Type of Conductor	Conductors per phase	Rated Current (kA)
Kriva Palanka	MKD	Skakavica	BUL	110	18.1	single	3 x Al/Fe 240/40	1	0.647
Susica	MKD	Petric	BUL	110	32.6	single	3 x Al/Fe 240/40	1	0.647
Skopje 1 220	MKD	TPP Kosovo A	SER	220	82.5	single	3 x Al/Fe 360/57	1	0.824
Skopje 1 220	MKD	TPP Kosovo A	SER	220	82.3	single	3 x Al/Fe 360/57	1	0.824
Bitola 2	MKD	Meliti	GRE	400	40.0	single	3 x 2 x Al/Fe 490/65	2	1.920
Dubrovo	MKD	Thessaloniki	GRE	400	115.3	single	3 x 2 x Al/Fe 490/65	2	1.920
Dubrovo	MKD	C. Mogila	BUL	400	150.0	single	3 x 2 x Al/Fe 490/65	2	1.920
Skopje 5	MKD	Kosovo B	SER	400	90.9	single	3 x 2 x Al/Fe 490/65	2	1.920

Figure 4. Single-line diagram of Electric Power System of Macedonia, year 2008



MEPSO allocate cross-border transmission capacities on yearly, monthly and weekly level using NTC based mechanisms.

Due to strong interdependence among the transmission capacities for certain SEE borders, SEE TSOs trough SETSO NACMPF SG agreed on a regular procedure of making the monthly reference network model, in order to obtain compatible and comparable results in monthly binding NTC calculation. Most of TSOs use this model as a basis for the monthly NTC calculation. Modeled reference regime is 3rd Wednesday at 1030 h of next month. The countries which models are exchanged and merged into a common regional model within this procedure are: Albania, BiH, Bulgaria, Croatia, Greece, Hungary, Austria, Macedonia, Romania, Slovenia, Serbia, Montenegro Ukraine (Burstyn) and Italy.

Since only bilateral allocation procedures exist in the region at present, the interdependence among these borders has been taken into account by calculating the composite, simultaneously feasible NTC values, which are then fractioned per individual borders, then again split 50:50 at each border and offered at the separate allocation procedures. When calculating Macedonian north and east border transmission capacity, simulations consider joint import of Macedonia, Greece and Albania from Bulgaria and Serbia. Considering capacity of south Macedonian border to Greece, export from north to Greece and Albania is simulated. In that manner, typical borders are "coupled" into a composite NTC calculation, assessing maximum bulk power flow from north and east to south and distributing NTC on (north and east) and south Macedonian border. Main idea of approach is to maximize the transmission capacities and level of security of supply at the same time.

Macedonia – Serbia interconnection

This border is congested in direction SR MK. Capacity is evaluated and distributed yearly, monthly and weekly. Capacity is shared 50% between two TSOs in both directions. On Macedonian side there is a yearly, monthly and weekly procedure of allocation based on the explicit auction On Serbian side there is a yearly and monthly procedure of allocation based on the auction. 50:50 method allocation of Macedonian part of capacity is applied.

Macedonia – Greece interconnection

This border is congested in direction MK GR. There is ongoing activity for signing an agreement based on 50%/50% share and separate auctions in both directions. In mean time, capacity is shared 50% between two TSOs in both directions. On Macedonian side there is a monthly and weekly procedure of allocation based on the explicit auction. On Greek side there is a yearly, monthly and daily procedure of allocation based on the explicit auction.

Macedonia – Bulgaria interconnection

This border is congested in direction BG MK. Capacity is shared 50% between two TSOs in both directions. On Macedonian side there is a yearly, monthly and weekly procedure of allocation based on the explicit auction. On Bulgarian side there is a yearly and monthly procedure of allocation based on the explicit auction.

In parallel with introducing and/or operating the bilateral allocation procedures, SEE TSOs keep on with joint investigation on the possibilities for implementing coordinated flow-based explicit auctions.

2.5.3. Development of transmission network

In accordance with the Grid Code, MEPSO shall issue System Reliability Study in order to fulfil obligations for network maintenance, development and security of supply. System Reliability Study is updated every year covering 10 year time horizon.

System Reliability Study comprises retrospective reports for years Y-1 and Y-2 and forecast reports concerning three levels of forecasts:

Short term forecast : years Y+1,Y+2 and Y+3.

Middle term forecast : year Y+5.

Long term forecast : year Y+10.

The System Reliability Study has to insure that the least cost development of the transmission system is able to cope with future demands and maintains a quality in compliance with the UCTE reliability standards. This study is based on the forecast demand, the assessment of the generation adequacy (if generation can meet the demand for the following years with respect to the N-1 criterion), the assessment of the transmission capacity and transmission system adequacy and the need for interconnection with other power systems. The aim of this report is to propose a list for the construction of new transmission network elements and network enhancements. System Operator inside MEPSO is responsible for planning analyzes and completion of System Reliability Study.

The System Reliability Study, after approval by the Regulatory Authority, has to be published and provided to UCTE as the System Adequacy Forecast (i.e. Transmission Development Statement).

According to Energy Law, MEPSO prepares 5 years Development Program (Transmission Investment Plans) and gives them for approval to the Energy Regulatory Commission. List of new investments in Development Program is output of techno-economical analyzes worked out in System Reliability Study.

Methodology and criteria for system planning are defined in the Grid Code.

Basic planning rule is N–1 criterion that covers loss of following elements (contingencies): single-circuit lines, double-circuit lines, transformers, generators.

Events that are not allowed to happen during normal regime and contingency check are: thermal overloading of branches (lines and transformers), voltage declination below permitted range, loss of stability, loss of load, interruption of power transits.

During transmission planning different kind of analyzes are applied: load flow, voltage and reactive power flow analyzes (OPF), short circuit analyzes, stability analyzes, economical evaluation of potential projects.

Uncertainties during transmission network planning are taking into account using deterministic multi-scenario approach. Following uncertainties are considered: uncertainties in new power plants size and location, uncertainties in generators engagement, uncertainties in hydrological conditions, uncertainties in country power balance.

Analyzes are carried out for the extreme system conditions represented by reference snapshots and forecasted regimes:

For Y+1 and Y-1, 3rd Wednesday for every month, 11:00h and 19:00h CET.

For Y+2, Y+3, Y+5 and Y+10, 3rd Wednesday in January and July, 11:00h and 19:00h CET,

LDC for typical working day and weekend.

Development program is realized by Grid Owner inside MEPSO according its responsibility for maintenance, rehabilitation and construction of transmission network.

Main transmission projects are funded using loans from IFI's. Loans are serviced through transmission fee as part of the invoice of final customers.

Brief info for main transmission projects with both national and regional significance, planned for the next period, is given further in tables.

Table 7. On-going projects for interconnections

Node 1	Country	Node 2	Country	Voltage Level (kV)	Line Length (km)	Type of Circuit	Type of Conductor	Conductors per phase	Rated Current (kA)
Stip	MKD	Nis (Vranje)	SER	400	195.0	single	3 x 2 x Al/Fe 490/65	2	1.920

Forecasted completion of new 400 kV line for connection between Macedonia and Serbia is middle 2011. Activities already started from Serbian side based on memorandum of understanding

between TSO's. Macedonian section is about 70 km and at the moment there are ongoing activities for preparing technical documentation.

Table 8. Interconnections projects under investigation

Node 1	Country	Node 2	Country	Voltage Level (kV)	Line Length (km)	Type of Circuit	Type of Conductor	Conductors per phase	Rated Current (kA)
Skopje 5	MKD	Kosovo B	SER	400	84.0	single	3 x 2 x Al/Fe 490/65	2	1.920
Bitola 2	MKD	Elbasan	ALB	400	160.0	single	3 x 2 x Al/Fe 490/65	2	1.920

New 400 kV line for connection between Macedonia and Albania is part of the project for establishing east – west electricity corridor. Pre-feasibility study is completed;MEPSO should perform new investigation of project feasibility due to recent changes in development plans in Albanian power systems and Italian strategy for interconnections to SEE. Project for second 400 kV OHL to SS Kosovo is in phase of preliminary negotiations and analyzes.

Table 9. New 400/110 kV substations

Name	kV	Year of commissioning	Description
SS Stip	400	2009	400/110 kV/kV
SS Ohrid	400	2015	400/110 kV/kV

2.5.4. Security of Supply from operational aspects

MEPSO as a transmission system operator shall draw up a catalogue of measures for disturbance management according to the Defense Plan, in order to secure electricity supply to the customers.

MEPSO as a transmission system operator shall ensure that: it has at its disposal enough generating units with isolated operation and black-start capability; it can recognize, from changes in status variables supplemented by suitable signaling of status changes (from its own installations and those of the system users) the occurrence and the extent of disturbances, in order to determine based of such information the measures required for elimination of the disturbance or limitation of its effects.

To prevent voltage drop, MEPSO should include a provision for reduction of the voltage controller set point values and/or blocking of the voltage controllers on the substation transformers for the transmission and distribution systems in the Connection Agreement.

MEPSO reserves the right to perform load shedding (either manually or automatically according to the voltage). MEPSO shall make arrangements with distribution companies within the distribution network for controllable load shedding through voltage reduction and/or customers disconnection.

Should limit values for system operation variables (e.g. voltage, short-circuit current) or equipment loading (e.g. current loading) continue to be violated following the performance of corrective measures or should a risk exist of the disturbance spreading, MEPSO may order disconnection of the sections of the installation in which the disturbance originated, in order to ensure reliable system operation and/or rapid restoration of the network subject to the disturbance.

If necessary, adjustments must be made to the generating units schedule for the purpose of overcoming congestion in the system.

A Load shedding plan shall apply for load shedding as a function of the frequency to avoid total blackouts. The amount of load to be shed at each stage shall be defined by MEPSO as a transmission system operator taking into account the technical requirements of the system users.

Every distribution operator and transmission system user must ensure automatic load shedding at low frequency or voltage according the requests of the transmission system operator.

MEPSO is responsible for monitoring and coordinating maintenance and for maintaining continuously adequate and reliable operation backup telecommunication facilities to assure coordinated control of operations during normal and contingency situations.

Restoration of the normal operation after a system-wide blackout in relation to already defined scenarios shall be conducted as fast as possible based on the Defense Plan where supply restoration measures are included.

MEPSO shall develop various scenarios to re-establish the power system in order to define further operation effectively and responsively. This plan must be verified and tested periodically under MEPSO authority. Telecommunication facilities used to implement the plan shall be periodically tested while MEPSO operators and the operating personnel of generating units involved in the process shall be trained in the implementation of the plan.

2.6. DISTRIBUTION

"EVN Macedonia" AD Skopje, reorganized as a joint stock company, is 10% in the state ownership, with 90% of the shares sold to EVN AG (Austria). The following licenses have been issued to EVN Macedonia by the ERC of the Republic of Macedonia:

- For electricity distribution and operation of the distribution system;
- For retail electricity supply to the tariff customers;
- For power generation from small power stations connected to the distribution grid (distributed generation).

The distribution network in Macedonia is privately owned by the private company EVN Macedonia AD. This company owns 150 km of distribution network at a voltage level of 110 kV, 1000 km at 35 kV, 720 km at 20 kV, 8900 km at 10 kV and 11600 km at 0.4 kV. EVN Macedonia AD supplies a total od 720,000 consumers with electricity. According to this source the company has 3,531 employees.

Recently EVN made a new reorganization whereby the distributive consumers were divided into 19 Electricity User Centers (EUC). A map with the division is provided bellow.

EVN Macedonia AD also owns 11 small hydropower plants with 25 generation units with a total power of 39.6 MW (table 3.2.3.1) which have generated 124 GWh in 2006. Seven of the small hydropower plants of EVN Macedonia, are in the ROT program until 2009. The distribution network of EVN also includes the small hydropower plants owned by private generators, mainly water management organizations.

Small HPPs		P_{inst} [MW]
MAK ROT program	Sapunchica	2.9
	Kalimanci	13.8
	Zrnovci	1.4
	Doshnica	4.1
	Pesochani	2.7
	Matka*	8
	Pena	2.5
Total	MAK ROT	**31.6**

Small HPPs	P_{inst} [MW]	Small HPPs
Other EVN	Babuna	0.7
	Belica	0.3
	Turija	2.2
	Popova Shapka	4.8
Total	EVN	**8.0**
Other companies	Strezhevo	3.4
	Komunalec	1.2
	Standard	
Total	Other	**4.6**
Total		**44.2**

3. MACEDONIAN NATURAL GAS MARKET SYSTEM

3.1. REGULATORY FRAMEWORK IN GAS SECTOR

3.1.1. Secondary Legislation

In accordance with the article 86, item 5, from the Energy Law (Official Gazette No 63/2006, 36/2007 and 106/2008), after the approval of the Energy Regulatory Commission, JSC GA-MA transmission system operator of the natural gas, published Grid Code for transmission of natural gas (Official Gazette of Republic of Macedonia No 45/2009).

Natural gas transmission grid code specifically governs:

- technical conditions for connecting natural gas distributors, direct customers of natural gas, and other natural gas transmission systems to the natural gas transmission system;
- technical and other conditions for secure and safe functioning of the natural gas transmission system;
- transmission system planning, maintenance and development;
- measures, activities and procedures in case of breakdown;
- terms and conditions for third party access to the natural gas transmission system;
- functional requirements and precision class of measuring devices,
- natural gas quality standards;
- criteria for providing system services;
- natural gas nomination and scheduling procedures;
- data collection and communications protocols; and
- supervision and control of operational management systems.

3.2. KEY MARKET PARTICIPANTS AND THEIR RESPONSIBILITIES

Energy Law (Official Gazette of the Republic of Macedonia 63/2006, 36/2007 and 106/2008) creates prerequisites for opening the natural gas market in the Republic of Macedonia through regulating the issue related to legal and financial division of the functions for performing transmission, distribution and supply of natural gas. In addition, the Law lays down the terms for acquiring the capacity of eligible customers.

The natural gas transmitter is liable to provide safe and secure functioning of the gas transmission grid; development and maintenance of the transmission system and the other capacities that are in the function of transmission, as well as the interconnection lines with the other systems pursuant to the natural gas transmission system operation rules and the system development plans; connection with the natural gas transmission systems of the other countries; taking all measures provided for safety during the use of the transmission system and other capacities that are in function of transmission, as well as environmental protection measures; and provide quality transmission of natural gas.

The natural gas transmission system operator is liable to provide: reliable and secure transportation of natural gas through the transmission system; operational management of the natural gas transmission system through regulating the flow and the pressure of natural gas through the natural gas transmission system; conforming of the driving manipulations in the transmission system with the natural gas transmitter; following the technical and functional readiness of the natural gas transmission and distribution facilities, and approving the overhaul schedule for the natural gas transmission facilities; balancing the deviations between the current and agreed natural gas consumption; purchasing natural gas for providing system services; using, maintaining and upgrading the systems for supervision and

management of the natural gas transmission system and providing reliability of business data of the natural gas transmission system users.

The natural gas distributor is liable to provide: safe and secure functioning of the distribution gas pipe grid, development and maintenance of the distribution system and the other capacities that are in the function of the distribution system, pursuant to the natural gas distribution system operation rules and the system development plans taking all measures provided for safety during the use of the natural gas distribution system and other capacities that are in function of the natural gas distribution system, as well as environmental protection measures. Natural gas supply through the distribution system from the connection point with the natural gas transmission system to the natural gas consumers connected to the distribution system, under the terms and conditions and in a manner determined with this law, other regulations and pursuant to the terms and conditions determined in the license and quality supply of natural gas through the distribution system.

The natural gas trader is a legal entity that trades natural gas on the territory of the Republic of Macedonia based on a license and he provides gas from import or from other natural gas traders and sells it to eligible customers and/or natural gas suppliers of tariff customers. The natural gas trader can supply tariff consumers directly connected to the transmission system with natural gas, pursuant to a license to supply these consumers and pursuant to the set tariffs and prices and other rules and regulations for supplying tariff consumers.

Eligible natural gas customers are consumer categories that consume over 10,000,000 m^3 of natural gas and natural gas distributor to tariff consumers. The government can extend the categories of those that can be qualified as eligible customers with a Decree based on criteria that may include consumption, pressure, consumer groups or connection point, etc. Changing the status of an eligible customer to the status of a tariff customer or vice versa cannot be executed prior to the expiration of one year from the day of the last status change.

3.3. LIBERALIZATION OF GAS MARKET\

In Accordance to the Energy Law, in compliance with the Directive of EU 2003/55 and the Regulation 1775/2005, in the last period have been prepared and adopted several regulations and acts. In the Sector for natural gas are prepared and adopted:

- "Rulebook on the method and conditions for regulating prices for transport, distribution and supply with natural gas" ("Official Gazette of the Republic of Macedonia", No. 94/05 and 164/08);
- Tariff system for transport of natural gas ("Official Gazette of the Republic of Macedonia", No. 94/05);
- Tariff system for selling natural gas to tariff customers ("Official Gazette of the Republic of Macedonia", No. 94/05);
- "Rulebook of the conditions, method and procedures for obtaining and ceasing the status of eligible customers of natural gas" ("Official Gazette of the Republic of Macedonia", No. 49/07); and
- "Grid Code for transmission of natural gas" ("Official Gazette of Republic of Macedonia", No 45/2009).

Rulebooks and Tariff systems for regulating prices in the natural gas sector are designed on methodologies based on incentive price regulation which is applied by the price cap method.

The price cap method means establishing a price adjusted to cost fluctuations, ensuring sufficient revenue to cover justified expenses.

With this regulation in large extent is achieved equal treatment for all energy entities, access to natural gas transport and distribution assets, eliminate each other subvention, as to ensure transparency and foresee in the price and with that majority security in current and planning working for energy entities and sustainable development in this sector.

According Energy Law and "Rulebook on conditions, method and procedures for granting, modification and revocation of licenses for performing energy activities", Energy Regulatory Commission in the natural gas sector has published many licenses:

- License for transmission of natural gas, GA-MA Stake holder –Skopje;
- License for operation of natural gas transmission systems, GA-MA Stake holder –Skopje;
- License for supply of natural gas for tariff customers connected to the transmission system, Makpetrol, Stake holder-Skopje;
- License for trade with natural gas, Makpetrol, Stake holder-Skopje;
- License for trade with natural gas, Makgas DOOEL-Skopje;
- License for trade with natural gas, Gas Trade DOOEL – Skopje;
- License for trade with natural gas, MAKGAS CONSULT DOO-Skopje;
- License for distribution natural gas, JP KUMANOVO GAS-Kumanovo;
- License for operation of natural gas distribution systems, DTIDZ-Skopje;
- License for distribution natural gas, DTIDZ –Skopje, and
- License for supply of natural gas for tariff customers connected to the distribution system, DTIDZ – Skopje.

The time duration of the licenses for transmission as well as operation of the transmission system of natural gas are 35 years, while for supply of natural gas for tariff customers connected to the transmission system and for trade with natural gas, the time duration of the licenses are 10 years.

The Regulatory Commission monitors the fulfillment of the obligations deriving from the license by means of reports on the operation on regular and extraordinary bases that the license holder is liable to submit, reviews and controls through direct inspection of operation to the license holder under official duties or on the basis of a request and/or information from other government bodies, organizations, institutions, legal and natural entities and news media, as well.

The license holder is liable to allow upon the request made by the Regulatory Commission free access to do its job necessary to monitor the execution of obligations deriving from the license and upon its request to submit the entire documentation to it in manner, scope and form as defined by the Regulatory Commission.

The license holder is liable to submit to the Regulatory Commission an annual report for the operation in the previous year by 31 March at the latest in the current year and other interim reports and in manner, scope and form as defined in the license.

3.4. EXISTING GAS SYSTEM

The constructed gas pipeline system which provides natural gas to Republic of Macedonia is connected to the Russian transmission gas pipeline which crosses Ukraine, Romania and Bulgaria, and it is intended for the needs of Turkey, Greece, Serbia and Macedonia.

The connecting point of the gas pipeline with the Bulgarian one is on the east border of the Republic of Macedonia in the region called Deve Bair and the same extends in the direction of the Kriva Palanka, Kratovo, Kumanovo region all the way to the Skopje region.

The constructed main gas pipeline is with projected annual capacity of $800X10^6$ (Hm^3) and working pressure of 54 (bars), supplies the following regions with natural gas: Kriva Palanka region, Kratovo region, Kumanovo region and Skopje region.

The entering pressure of the constructed main gas pipeline on the border crossing is 40 bars.

The characteristics of the high pressure main gas pipeline with the distribution gas pipelines are as follows:

A. Line part

Number	Facility	Length (km)	Nominal diameter (mm)
1.	Main gas pipeline	98.197	500
2.	distribution gas pipeline towards Kriva Palanka	1.521	100
3.	distribution gas pipeline towards Ginovci	1.692	100
4.	distribution gas pipeline towards Kratovo	4.592	100
5.	distribution gas pipeline towards Kumanovo	6.972	200
6.	distribution gas pipeline towards Skopje - south	8.314	400
7.	distribution gas pipeline towards Skopje - north	1.859	300
8.	distribution gas pipeline towards TIDZ-Bunarxik	5.600	200

B. Constructed facilities at the line part

- 1 dispatching cleaning station on the main gas pipeline of 500mm
- 1 receiving cleaning station on the main gas pipeline of 500 mm
- 8 block stations on the main gas pipeline
- 8 block stations on the distribution gas pipelines
- 8 cathode station
- 1 MMS (main measuring station)
- 1 MMRS (main measuring regulation stations)

Natural gas transmission quantity

- Transmission quantity in 2007 is 119.607.641 nm^3;
- Transmission quantity in 2008 is 120.512.168 nm^3 and
- The planned transmission quantity in 2009 is 100 million nm^3.

3.5. INVESTMENT IN FUTURE PROJECTS

With aim for further development of the natural gas system in Republic of Macedonia, a public announcement for preparation of Feasibility study for natural gas system in Republic of Macedonia with preliminary design was published. The Study should give technical and economical analysis for current situation of the gas system, regional, cross border and other conditions for development, proposals and manner for further construction of the excising pipeline according to the conditions in South East Europe. Also the Study should provide possibilities for utilization of the natural gas from the sources of Russia, Caspian region in the period of 20-30 years.

The study should define strategic conditions and phases for timely realization of the gas system and the priorities directions for the fastest realization as well. According to the timeframe the study should be finished until the end of 2009.

In order to introduce cheap and ecologically justified fuel in the energy structure of Republic of Macedonia, and at the same time to increase the security in the energy supply, realization of several concrete projects is planned in the near future period:

1. Closing of the first gas pipeline ring in Skopje (total length 12,5 km, working pressure 12 bars, nominal diameter DN 400, investment value of around 6.3 million USD, construction period 12 months)
2. Construction of the second gas pipeline ring in Skopje(total length 13 km, working pressure 12 bars, nominal diameter DN 300, investment value of around 5.3 million USD, construction period of 12 months)
3. Construction of main gas pipeline Klecovce-Veles and Stip and gas distribution in Veles and Stip (the total length of the main gas pipeline is 82 km, working pressure 54 bars, nominal diameter DN 500 and DN 200, length of the city gas pipeline network is 10 km, investment value 37 million USD, construction period 18 months)
4. Construction of the main gas pipeline Skopje-Tetovo and gas distribution in Tetovo (total length of the main gas pipeline is 48km, working pressure 54 bars, nominal diameter DN 400 and DN 200, length of the city gas pipeline network is 5 km, investment value 20 million USD and construction period 18 months)
5. Construction of main gas pipeline Stip-Negotino (total length 32 km, working pressure 54 bars, nominal diameter DN 500, investment value 12 million USD, construction period 18 months).