STATEMENT ON SECURITY OF ENERGY SUPPLY

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Vlastimir Trajkovski
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Skopje, June 2019
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<tr>
<td>CARDS</td>
<td>Community Assistance for Reconstruction, Development, and Stabilisation</td>
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<td>CEE</td>
<td>Central and Eastern Europe</td>
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<tr>
<td>CFCD</td>
<td>Central Financing and Contracting Department</td>
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<tr>
<td>TPES</td>
<td>Total Primary Energy Supply</td>
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<td>CPC</td>
<td>Commission of Protection of Competition</td>
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<tr>
<td>CRES</td>
<td>Centre for Renewable Energy Sources and Savings</td>
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<td>DSO</td>
<td>Distribution System Operator</td>
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<td>ED</td>
<td>Energy Department</td>
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<td>EA</td>
<td>Energy Agency</td>
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<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<td>EC</td>
<td>European Commission</td>
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<td>ECS</td>
<td>Energy Community Secretariat</td>
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<td>ECT</td>
<td>Energy Charter Treaty</td>
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<td>EE</td>
<td>Energy Efficiency</td>
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<td>EEAP</td>
<td>Energy Efficiency Action Plan</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>EPC</td>
<td>Energy Performance Contract</td>
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<td>ERC</td>
<td>Energy Regulatory Commission</td>
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<td>ESCO</td>
<td>Energy Service Company</td>
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<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<td>EU</td>
<td>European Union</td>
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<td>EUD</td>
<td>European Union Delegation</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GEF</td>
<td>Global Environmental Facility</td>
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<td>GHG</td>
<td>Greenhouse Gases</td>
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<td>GIZ</td>
<td>German Agency for International Cooperation</td>
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<tr>
<td>Government</td>
<td>Government of Republic of Macedonia</td>
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<tr>
<td>WtE</td>
<td>Waste-to-Energy</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>WTO</td>
<td>WORLD TRADE ORGANISATION</td>
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<td>IEA</td>
<td>INTERNATIONAL ENERGY AGENCY</td>
</tr>
<tr>
<td>IPA</td>
<td>INSTRUMENT FOR PRE-ACCESSION ASSISTANCE</td>
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<tr>
<td>IRR</td>
<td>Internal rate of return of an investment</td>
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<tr>
<td>IT</td>
<td>INFORMATION TECHNOLOGY</td>
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<tr>
<td>Ktoe</td>
<td>1000 tons of oil equivalent</td>
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<tr>
<td>LSGUs</td>
<td>LOCAL SELF-GOVERNMENT UNITS</td>
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<tr>
<td>MACORA</td>
<td>MACEDONIAN COMPULSORY OIL RESERVES AGENCY</td>
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<tr>
<td>MANU</td>
<td>MACEDONIAN ACADEMY OF SCIENCES AND ARTS</td>
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<tr>
<td>MFA</td>
<td>MINISTRY OF FOREIGN AFFAIRS</td>
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<td>MoE</td>
<td>MINISTRY OF ECONOMY</td>
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<td>MoF</td>
<td>MINISTRY OF FINANCE</td>
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<td>WB</td>
<td>WORLD BANK</td>
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<tr>
<td>Mtoe</td>
<td>MILLION TONNES OF OIL EQUIVALENT</td>
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<td>NGO</td>
<td>NON GOVERNMENTAL ORGANISATION</td>
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<tr>
<td>WG</td>
<td>WORKING GROUP</td>
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<tr>
<td>NPV</td>
<td>NET PRESENT VALUE OF THE CASH FLOW OF AN INVESTMENT</td>
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<tr>
<td>OECD</td>
<td>ORGANISATION OF ECONOMIC COOPERATION AND DEVELOPMENT</td>
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<tr>
<td>PA</td>
<td>PUBLIC ADMINISTRATION</td>
</tr>
<tr>
<td>WtB</td>
<td>WASTE-TO-BIOMETHANE</td>
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<tr>
<td>PCA</td>
<td>PARTNERSHIP AND COOPERATION AGREEMENT</td>
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<tr>
<td>PCM</td>
<td>PROJECT CYCLE MANAGEMENT</td>
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<tr>
<td>PD</td>
<td>PROJECT DIRECTOR</td>
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<td>PPP</td>
<td>PUBLIC-PRIVATE PARTNERSHIP</td>
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<td>PSC</td>
<td>PROJECT STEERING COMMITTEE</td>
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<td>QAS</td>
<td>QUALITY ASSURANCE SYSTEM</td>
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<tr>
<td>RE</td>
<td>RENEWABLE ENERGY</td>
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<tr>
<td>RES</td>
<td>RENEWABLE ENERGY SOURCES</td>
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<tr>
<td>RESMD</td>
<td>REGIONAL ENERGY SECURITY AND MARKET DEVELOPMENT</td>
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<tr>
<td>RES-H</td>
<td>RENEWABLE ENERGY SOURCES – HEATING</td>
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<tr>
<td>RUE</td>
<td>RATIONAL USE OF ENERGY</td>
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<tr>
<td>SAA</td>
<td>STABILISATION AND ASSOCIATION AGREEMENT</td>
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<tr>
<td>SC</td>
<td>STEERING COMMITTEE</td>
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<tr>
<td>SCM</td>
<td>STEERING COMMITTEE MEETING</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>SE</td>
<td>SUSTAINABLE ENERGY</td>
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<tr>
<td>SEA</td>
<td>SECRETARIAT FOR EUROPEAN AFFAIRS</td>
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<tr>
<td>TPP</td>
<td>THERMAL POWER PLANT</td>
</tr>
<tr>
<td>UN</td>
<td>UNITED NATIONS</td>
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<tr>
<td>UNDP</td>
<td>UNITED NATIONS DEVELOPMENT PROGRAMME</td>
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<tr>
<td>UNIDO</td>
<td>UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION</td>
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1. LEGAL REGULATION ON SECURITY OF SUPPLY

1.1 ENERGY LAW

Scope of the Energy Law

In May 2018 was established the new Law on Energy (Official Gazette of Republic of Macedonia No. 96/2018 and 96/2019) and it is the primary piece of legislation that regulates the domestic energy sector. The Energy Law is presently updated within the framework of the EU/IPA Project for strengthening the administrative capacities of the Energy Department in the Ministry of Economy and the Energy Agency of Republic of Macedonia in order to be aligned with the prerogatives of the Third EU energy package on electricity and gas (Directives 2009/73/EC 2009/72/EC and Regulations (EC) 714/2009 and 715/2009), the Directive 2009/28/EC "on the promotion of the use of energy from renewable sources" and the Directives 2004/67/EC and 2005/89/EC.

Similar with the old law, the new law is dedicated to:

- energy policy objectives and its enforcement;
- energy activities and the manner of regulation of energy activities;
- the construction of energy facilities;
- the status and competences of the Energy Regulatory Commission of the Republic of Macedonia;
- the electricity market;
- the natural gas market;
- the crude oil, oil derivatives and fuels for transport market;
- the heating energy market;
- energy efficiency requirements and the promotion of the use of energy from renewable sources; and
- other issues of importance in the energy field.

Objectives of the Energy Law

The Energy Law purports to ensure:

- securing reliable, safe and quality energy and energy fuel supply to consumers;
- establishment of an efficient, competitive and financially sustainable energy sector;
- encouraging competition on energy markets with respect for the principles of non-discrimination, objectivity, and transparency;
- integration of Republic of Macedonia’s energy markets into the regional and international energy markets, pursuant to the commitments assumed under the ratified international treaties;
- increasing energy efficiency and promotion of the use of energy from renewable sources; and
- environmental protection from the adverse effects of particular activities in the energy field.

Objectives of the energy policy

In accordance with Article 11 of the Energy Law, the energy policy, which is set forth in the National Strategy on Energy Development, is geared towards securing:
- the reliable, safe and quality supply to consumers with all types of energy and energy fuels;
- the establishment of transparent and stable terms and conditions for competitive and economically viable energy sector;
- the promotion of market competition in energy services provision, based on the principles of non-discrimination and transparency;
- the efficient service provision to consumers,
- the integration of the Republic of Macedonia’s energy markets into the regional and international energy markets;
- the use of energy sources in a manner that provides sustainable energy development;
- the promotion of energy efficiency;
- the promotion of the use of renewable energy sources;
- the environmental protection from the adverse effects of energy activities performance;
- the fulfilment of commitments assumed under the ratified international documents; and
- measures aimed to protect citizens from energy poverty.

1.2. ENERGY REGULATORY COMMISSION

The Energy Regulatory Commission is the single legal entity that regulates issues pertaining to the performance of energy activities and which is an independent body in terms both of its operation and decision-making. 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, after taking in consideration the adequate and just representation of all communities.

1.3 Competences of the Energy and Water Regulatory Commission

According to the Energy Law, for the purpose of securing the efficient, competitive and uninterruptible operation of energy markets, the ERC has the following competences:

1) to monitor the operation of energy markets, for the purpose of securing reliable energy and energy fuel supply;
2) to adopt regulations and tariff systems and to adopt or approve tariff-setting methodologies for regulated energy activities;
3) to adopt regulations, price setting, and tariff system methodologies on relevant energy type and/or energy fuel delivery to final customers;
4) to adopt decisions on prices and tariffs, based on relevant regulations, methodologies and tariff systems;
5) to adopt regulations on price-setting methodology for oil derivatives and fuels for transport and price-setting decisions for oil derivatives and fuels for transport, pursuant to the commitments assumed by the Republic of
Macedonia;

6) to approve the Grid Codes adopted by the energy system operators, after taking into consideration of their compliance with the commitments the Republic of Macedonia has assumed under the international treaties or the commitments of the energy system operators stemming from their membership in international associations;

7) on the proposal from the relevant energy system operators, to approve the terms and conditions and connection and access charges for relevant transmission and distribution systems;

8) to adopt Electricity Supply Rules, Heating Energy Supply Rules, and Natural Gas Supply Rules;

9) to adopt Rules on Electricity Supply of Last Resort and Natural Gas Supply of Last Resort;

10) to adopt the Electricity Market Code and the Natural Gas Market Code;

11) when needed, to request relevant system operators or electricity market operator to change terms and conditions, tariffs, rules, mechanisms and methodologies governing the connection to, access to, balancing, or use of relevant systems or market;

12) to take decisions upon applications submitted for exemption from the obligation on allowing third party access to energy systems or new interconnection gas pipelines;

13) to keep the Registry of Preferential Generators and adopt decisions on awarding the status of preferential generator;

14) to take due care for the protection and promotion of rights of energy and energy fuel consumers and of energy system users;

15) to propose measures aimed to encourage competition on energy markets;

16) to stipulate the terms and conditions, manner and procedure and adopt decisions on issue, amendment, transfer, suspension, revocation and termination of separate energy activity licenses and to monitor the implementation of obligations stipulated in the energy activity licenses issued;

17) to approve transmission and distribution grid development and construction plans and monitor their timely adoption and implementation;

18) to approve and monitor the implementation of compliance programmes adopted by relevant energy system operators, by means of which they secure full legal, financial, management and operational independence of operation from the vertically integrated energy companies to which they belong, as well as from related energy companies;

19) to resolve disputes occurred between entities performing regulated energy activities and their users, including cross-border disputes;

20) to cooperate with competent state authorities, local self-government unit bodies, entities performing energy activities, energy users and other organizations and institutions;

21) to submit proposals to competent authorities on taking measures pursuant to their competences and in a procedure stipulated by law, against entities performing their activities in violation to the present law;

22) to raise initiatives and propose adoption of new and amendments to existing laws and other regulations in the energy field;

23) to participate in relevant regional and international organizations and cooperate with other regulatory bodies, for the purpose of contributing to development of regional energy markets, pursuant to the commitments assumed under the ratified international treaties;

24) to adopt the Book of Operation and other internal acts related to its operation; and

25) to perform other matters pursuant to a law.
Monitoring functions of the Energy Regulatory Commission

Under the Energy Law, the ERC, for the purpose of securing efficient performance of its competences related to the operation of energy markets, is charged with the overall supervision of the energy sector by monitoring in particular:

1) the implementation of legally stipulated obligations of any entities performing regulated energy activities related to securing the reliability of electricity, natural gas and heating energy supply;

2) the operation of energy markets, for the purpose of securing their promotion, as well as for the purpose of securing non-discrimination, effective competition, transparency and efficient operation of markets;

3) the application of rules governing interconnection allocation and congestion management in the electricity and natural gas transmission systems, based on the commitments assumed by the Republic of Macedonia under the ratified international treaties;

4) the use of income generated from congestion management in the electricity and natural gas transmission systems;

5) the time needed by transmission and distribution system operators to perform connections and repairs;

6) the timely announcement of relevant information held by transmission and distribution system operators related to interconnections, grid use and capacity allocation to interested parties, taking due consideration of the need for individual information to be treated as commercially confidential;

7) the changes in the ownership structure of entities performing energy activities and submit proposals to competent state authorities on measures aimed to protect and promote competition on energy markets;

8) the application of tariff systems and stipulated tariffs;

9) the application of terms and conditions for connection of new generation facilities, taking due consideration of the costs and benefits related to different technologies on renewable energy sources, embedded generation and cogeneration of heating energy and electricity;

10) the operation of license holders as regards their obligations stipulated in the licenses issued;

11) the quality of services provided by license holders;

12) the effective unbundling of accounting records pursuant to the present law, for the purpose of avoiding cross-subsidies between energy o

13) r natural gas generation, transmission, distribution and supply activities and for the purpose of eliminating cross-subsidies between consumer groups and transfer of income and costs for the performance of regulated and/or non-regulated energy activities; and

14) the implementation of compliance programmes adopted by relevant energy system operators, by means of which they should secure full legal, financial, management and operational independence from the vertically integrated companies to which they belong, as well as from related energy companies, for the purpose of securing non-discrimination, transparency and objectivity in the operation of energy markets.

1.4. PUBLIC SERVICE OBLIGATIONS

An obligation on public service provision is defined in the Energy Law as one or more obligations imposed to the entities performing regulated energy activities for the purpose of public interest realization pursuant to the present law, and related to safety, including the reliability of supply, service affordability for users at all times, energy or energy fuel quality and price, services, as well as environmental protection,
including energy efficiency and climate change protection.

As regards the description of a “regulated energy activity”, such an activity is defined as an energy activity by means of which the public service is provided and performed under terms and conditions, manner, prices and tariffs stipulated, i.e., approved by the Energy Regulatory Commission.

In the Energy Law, the following activities are regulated activities and the entities performing these activities are subject to public service obligations:

- electricity transmission;
- electricity market organization and operation;
- electricity distribution;
- natural gas transmission;
- natural gas transmission system operation;
- natural gas distribution;
- heating energy distribution;
- electricity supply of last resort; and
- natural gas supply of last resort.

Also, electricity generation for the needs of the electricity supplier of last resort is currently deemed regulated energy activity.

The Energy Law also states that entities performing regulated energy activities shall be obliged to comply with the obligations on public service provision. The Energy Regulatory Commission determines or approves the prices, terms, and conditions for public service provision. Any additional obligations on public service provision, imposed by the Energy Regulatory Commission, must be clearly stipulated, easily verifiable, and non-discriminatory, while such additional obligations should be determined in the relevant licence and published on the website of the Energy Regulatory Commission.

The Energy Law further stipulates that the services provided by entities performing regulated energy activities shall secure reliable, quality and uninterrupted energy and energy fuel delivery to consumers, under equal terms and conditions, prices and tariffs, after taking into consideration the need for energy efficiency improvements and environmental protection and promotion. The licence on the performance of a regulated energy activity must indicate the volume and contents of services stipulated under the present law, the service area where public services are provided, as well as the duration of the obligation on public service provision. In addition, prices and tariffs governing the provision of public service obligations should secure recovery of justifiable costs and reasonable return of capital for the entities performing regulated energy activities as regards their relevant public service provision, including the costs on efficient use of energy resources and environment protection and promotion.

It is also stated that, when the entities performing energy activities and being subject to an obligation on public service provision are awarded financial reimbursement, other form of reimbursement and/or exclusive rights, for the purpose of implementing the obligations defined under the present law, this should be done in a transparent and non-discriminatory manner. Moreover, any reimbursements awarded must not exceed the costs incurred for the public service provision, decreased by the income generated from the service provision.

Furthermore, the Energy Law provides that the entities performing energy activities and being subject to the obligation on public service provision can be awarded state aid, pursuant to the State Aid Law. The legal entity performing one or more regulated energy activities cannot perform another energy activity or other activity, unless otherwise stipulated under the present law. In the cases when a legal
entity performs one or more regulated energy activities or one or more energy activities and another energy activity or another activity, it shall be obliged to keep separate accounting for each regulated energy activity. For non-regulated energy activities or for other activities performed, the legal entity can keep consolidated accounting records. Added to this, a legal entity performing regulated energy activity is obliged to submit the Energy Regulatory Commission the audited annual financial reports and must publish them on its website. The relevant financial reports are required to be submitted and published for each regulated energy activity separately, whereas for non-regulated and other activities, the financial report submitted to the Energy Regulatory Commission can be forwarded in a consolidated form.

1.5. ELECTRICITY AND NATURAL GAS SUPPLIERS OF LAST RESORT

According to the new Energy law from 2018 there is Universal supplier which will supply with electricity households and small enterprises. Today this role has a new firm called “EVN HOME”. This company will get the license for universal supplying for 5 years. This universal supplier will be Electricity supplier of last resort for the households and small enterprises, under reasonable and clearly comparable and transparent prices set by the Energy Regulatory Commission. It will be also Electricity supplier of last resort for the big companies on the free electricity market but with different prices. The Energy Law defines the Electricity Supplier of Last Resort and Natural Gas Supplier of Last Resort. Electricity supplier of last resort is an electricity supplier that provides the public service on electricity supply to households or small consumers in the cases stipulated under the law. Natural gas supplier of last resort is a natural gas supplier that provides the public service on natural gas supply to consumers connected to the natural gas system in the cases stipulated under the law.

Under the Energy Law the electricity supplier of last resort is obliged to secure supply to households and small consumers that have decided to be supplied by the supplier of last resort, for the purpose of exercising their right to electricity supply at all times. The natural gas supplier of last resort is obligated to secure supply to consumers connected to the natural gas transmission or distribution system, for exercising their right to natural gas supply at all times, under reasonable and clearly comparable and transparent prices set by the Energy Regulatory Commission. Added to this, the suppliers of last resort are required to provide this public service and are obliged to secure electricity or natural gas supply to households or small consumers that have not signed contracts with any of the suppliers, or if their previous suppliers have discontinued the implementation of obligations assumed under the supply contracts. Lastly, it is stipulated that, in the case of electricity or natural gas supply of last resort to consumers, such supply shall be performed under approved and controlled prices that shall not prevent competition and normal operation of electricity and natural gas markets.

1.6. ENERGY SECURITY

The safeguarding of the security of energy supplies is one of the key aims of the Energy Law: Article 8 expressly states that reliability of the relevant energy type or energy fuel supply shall be secured, in particular, by means of:

- achieving supply and demand balance on the relevant energy type market;
- forecasting the level of expected future demand for a particular energy type and
the possibilities to address the forecasted demand with the available energy sources and facilities;
- undertaking measures to construct new energy facilities;
- quality and high level maintenance of relevant energy type transmission and distribution grids; and
- measures to address peak loads and contingency measures in the cases of failure to provide relevant energy type delivery.

The Energy Law further compels State authorities and entities performing regulated energy activities, as part of their stipulated rights, obligations and competences, to propose and undertake measures aimed to secure reliability of energy supply.

Also, the Energy Regulatory Commission is charged with the supervision of the compliance of entities performing regulated energy activities with the obligations on securing reliability of supply, and in its annual report is required to include data related to:

- reliability of the system operation;
- five-year energy balance;
- possibilities to secure reliable energy supply in the period of five to fifteen years after the year for which the report is prepared; and
- possible investments in interconnection capacities for the next five years.

1.7 ENERGY BALANCE

Article 13 of the Energy Law provides that the Government of the Republic of Macedonia by means of the energy balance for period of one (1) year as indicative plan document determines the total needs of energy and the need of certain types of energy, as well as the possibilities for their satisfaction from domestic generation and from imports. The energy balance is adopted by the Government of the Republic of Macedonia, on the proposal of the Ministry and upon previously obtaining the opinion of the Energy Regulatory Commission, by the end of each calendar year.

The Ministry of Economy, which is in charge of energy affairs, is responsible for monitoring the realisation of the energy balance for the current year, and, if necessary, can propose adequate measures to the Government of the Republic of Macedonia. Furthermore, as required by the Energy Law, the Minister of Economy has adopted the Rulebook on Energy Balances and Energy Statistics, which stipulates:

- the contents of energy balances;
- the contents, manner, and deadline for submission of data required for the development and monitoring of energy balances implementation;
- the contents, manner and deadline for submission of data required for the preparation of the Strategy on Energy Development and for the development and monitoring the outcomes of the Strategy’s Implementation Program; and
- the bodies within the state administration and within the local self-government units, licence holders on energy activities, as well as energy and energy fuel final customers that will be required to submit data required for development and monitoring of energy balances implementation, as well as the deadlines on data submission.

The entities referred to in this Rulebook are obliged - in the request from the Ministry - to submit data for the development and monitoring of energy balances and
data required for the preparation of strategies, programmes and reports on implementation programmes, whose adoption has been stipulated under the Energy Law.

1.8. ACTS FOR DECLARATION OF CRISIS

One of the principal priorities of the Government of Republic of Macedonia in the energy sector is connected with need to ensure the national goal of security of energy supplies and to tackle any unexpected event, which might jeopardise the reliability and security of energy supplies. For this purpose, Article 14 of the Energy Law states that, on the proposal from the Ministry, by means of an act, the Government of the Republic of Macedonia shall stipulate in detail:

- the criteria and terms and conditions for declaring emergency,
- the manner of relevant energy type supply under such circumstances,
- measures to be taken in cases of emergency, and
- the rights and obligations of license holders on energy activity performance, pursuant to the Law on Emergency Situation Management.

Moreover, in order to protect energy systems and secure reliability of relevant energy type supply in the Republic of Macedonia, the relevant energy or energy fuel transmission and distribution system operators are obliged, pursuant to this act, to develop contingency plans and submit them to the Ministry of Economy for approval.

It is further stipulated that any measures, which are necessary to eliminate any problems occurred and protect energy markets and energy systems of the Republic of Macedonia in emergency situations, should:

- be of temporary nature,
- last until the end of the emergency; and
- cause the least possible distortion to the energy markets operation in the Republic of Macedonia and in the region.

It is also provided that the Government of the Republic of Macedonia - in compliance with the commitments it has assumed under the ratified international treaties - must duly inform the neighbouring and any other countries that are, or can be, affected by any such emergency measures as well as any competent international institutions and bodies established under any ratified international treaties.

In line with Article 14 of the Energy Law, the Government of the Republic of Macedonia adopted the Ordinance on the criteria and conditions for the declaration of an electricity crisis, the manner of supply with electricity in these conditions, and the rights and obligations of the licence holder for performing energy activities (Official Gazette of Republic of Macedonia No. 53/2012). Pursuant to this Ordinance, the criteria on the basis of which an electricity crisis is to be declared are as follows:

- elements of the energy balance of Republic of Macedonia;
- published data for the available transmission capacity of the cross-border lines with the neighbouring 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.
Also, in compliance with Article 14 of the Energy Law, the Government of the Republic of Macedonia adopted on 16 of October 2013 the Ordinance on the criteria and conditions for the declaration of a natural gas crisis, the manner of supply of natural gas in these conditions, the measures to be taken in the event of a crisis, and the rights and obligations of the licence holders for performing energy activities (Official Gazette of the Republic of Macedonia No. 143/2013). This Ordinance, which implements the provisions of the Directive 2003/55/EC concerning the specific customers (households) and protecting measures during the natural gas crisis, enumerates the protected natural gas consumers as follows:

- households;
- hospitals, clinics and special health institutions (first aid emergency stations, blood transfusion centres, dialysis centres and other health institutions);
- facilities of special interest to the economy, lives of people and defence of the country;
- care centres for elderly persons;
- kindergartens, and
- zoos.

It further sets the criteria for proclaiming crisis situation in supply of NG, namely:

- reduced import,
- extremely low temperatures in uninterrupted duration of five days,
- periods of extremely high consumption of gas during winter months.

Moreover, it obliges natural gas suppliers to lay down in the supply contracts they sign the minimal needed quantities of natural gas. For present purposes, minimal quantities are considered the contracted quantities between the suppliers and consumers. Moreover, the natural gas suppliers of protected consumers are obliged to inform the natural gas traders about the minimal quantities for protected consumers for the subsequent year not later than 1 October (in the current year).

The Ordinance on the criteria and conditions for the declaration of a natural gas crisis also provides for the establishment of a seven-member Commission for crisis situation in natural gas supply that must be set up by the Minister of Economy and which should regularly monitor the situation and recommends the proclamation of a crisis situation. In addition, it sets forth the procedure for the proclamation of a natural gas crisis situation and prioritise any proposed curtailment measures with the aim to ensuring:

- the reduction of natural gas supplies to consumers, who are directly connected to the transmission system,
- the reduction of natural gas natural gas supplies to maintain technical minimum (in the industry),
- the cessation of supplies to consumers, who are directly connected to the transmission system and who have alternatives sources of energy,
- the reduction of natural gas supplies to consumers that are directly connected to the transmission system to maintain minimal production in co-generation facilities (or technical minimum),
- the cessation of supplies to consumers, who are directly connected to the distribution network and who have alternatives sources of energy,
- the reduction of natural gas supplies to consumers that are directly connected to the distribution network to their technical minimum (except for protected consumers),
- the cessation of supplies to consumers natural gas are directly connected to the distribution network (except to those that use it for co-generation),
- the reduction of all NG supplies to the minimum levels of all consumers, expect for the protected consumers, and
- the reduction of natural gas supplies to co-generation facilities.

Finally, this Ordinance specifies the rights and obligation of energy license holders in natural gas crisis situations. The most important of these obligations involves the preparation of management plans, which must be submitted by each relevant licence holder to the Ministry of Economy; the Ministry of Economy is then required to summarise these plans and to submit a consolidated crisis management plan to the Crisis Management Centre.

The Government send information to the ECS in Vienna about every crisis in Macedonia, according to the Energy community treaty.

2. STRATEGY FOR ENERGY DEVELOPMENT

The draft version of new document for STRATEGY FOR ENERGY DEVELOPMENT until 2040 is ready and it will adopt till the end of 2019!!!!

In order to meet the objective, the following priorities are identified:

• maintenance and modernization of the existing energy infrastructure;
• construction of new energy production, transmission and distribution facilities;
• improvement of energy efficiency;
• increased usedomestic resources (lignite and renewables);
• increased use of natural gas;
• establishment of economic market energy prices;
• integration of the Macedonian energy sector into the regional and European market of electricity and natural gas by constructing new interconnections; and
• harmonisation the legislation with the existing acquis communautaire for energy, environment, competition and renewable energy sources.

The Strategy for Energy Development also defines:

❖ long-term objectives for security of energy supply;
❖ priorities for development;
❖ energy resources and facilities of strategic importance;
❖ long-term forecasts of investment needs for electrical generation, transmission, and distribution;
❖ facilities needed for ensuring that energy demand is met and security of supply is maintained;
❖ financial means for implementing the anticipated investment projects;
❖ incentives needed for increased energy efficiency;
❖ environmental protection measures to be enforced;
❖ fulfilment of commitments under international charters, agreements, treaties and conventions;
❖ energy market competition;
❖ protection of energy consumers; and
❖ international connection of the energy systems.

2.1. ENERGY DEVELOPMENT PROGRAMME

The new Programme for the Realization of the Strategy for Energy Development will be adopted in 2019. The document has been updated but is still in the draft form.

The programme reviews the energy policy of the Government of Republic of Macedonia and sets out the basic scenario for all the projects expected to be developed in the period together with the financial means that will be needed and the
government departments responsible for their implementation. Where relevant, the latest projects are discussed in each of the electricity, natural gas and oil sectors below.

2.2. ENERGY CONSUMPTION IN THE PERIOD 2015-2019

Over the past 15 years, demand for oil products has increased by 46%, for natural gas 33%, coal 46% and for electricity by nearly 22%. The continuing rise in the demand for these sectors has given increasing importance to the securing of these strategic supplies.

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Source: State Statistical Office

2.3 ENERGY DEMAND IN THE PERIOD 2015 - 2035

According to a recent MANU base line demand forecast for the next 20 years, by 2035 the demand for electricity and oil products will continue to rise and will accompanied by a ten-fold increase in the usage of imported natural gas. With all oil products and a large proportion of electricity being imported and the production of indigenous lignite increasing only marginally, the implications for security of energy supply are apparent.

The increase in the usage of biomass and renewable energy will have only a marginal positive impact on the security of energy supply.

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3. MACEDONIAN POWER SYSTEM

3.1. REGULATORY FRAMEWORK IN THE ELECTRICITY SECTOR

3.1.1. Primary Legislation

On 28th of May 2018, the Energy law was adopted (Official Gazette of Republic of Macedonia 96/2018). This key legal act regulates the legal environment for performing energy activities, including those relating to the electricity sector. The Energy Law has undergone one update (Official Gazette of Republic of Macedonia 96/2019). This amendment set the pace of the domestic fuel market in the coming years.

Electricity consumption has been selected as the most fitting criterion for dividing the classes of small final customers with the aim to determining the dynamics of getting the status of “qualified purchaser”, who will be vested with the right to choose the supplier of electricity on the open market, for several reasons, such as:

- the availability of data and information division,
- the transparency of the procedure,
- the understandability and ease of communication,
- non-discrimination,
- the predictability of the resultant effects and of the potential risks,
- the stability of the regulated electricity sector,
- the prices for households, and
- the relevant European experience.

The adoption of this phased approach towards the liberalization of the electricity market has been necessitated by the urgent need to provide greater protection for households and small final customers because – in view of recent developments in the region’s energy sectors and beyond – a considerable increase in the electricity prices on the open market is anticipated to occur. Besides, it needs to be reminded that over 47% of the domestic electric market has already opened up, which is much higher in comparison with other Contracting Parties to the Energy Community.

3.1.2. Secondary Legislation

The Energy Law requires the enactment of several pieces of secondary legislation in order to entirely implement its provisions and to fully define and refine the regulatory framework governing the performance of energy activities in the electricity market. In this respect, the Energy Regulatory Commission (ERC) played a pivotal role by continuing to adopt the legislative instruments, which are necessary for the further liberalization of the electricity (and natural gas markets). In the next paragraph, an outline is given of the secondary acts that have been put in effect in the last two years.

Tariff system for sale of electricity to households and small customers for universal supplier and supplier of last resort

Rules for electricity supply

Rules for electricity supply for last resort

Rules on allocation of cross-border transmission capacities of JSCMEPSO Skopje
Electricity Market Rules

Tariff system for sale of electricity to small customers connected to the distribution system in the ownership of JSC ELEM – Skopje

Grid code for distribution of electricity of EVN Macedonia JSCSkopje – draft version is done and it will be in force until the end of summer 2019

According to the Energy Law, EVN Macedonia AD Skopje, as Distribution System Operator, in previous years has adopted several changes of the Distribution Grid Code upon the approval of the Energy Regulatory Commission. Most of the changes were in favour of the customers and they were connected in shortening the time for construction of the connection to the grid and physical connection to the grid.

Tariff system for distribution of electricity to customers connected to the distribution system of EVN Macedonia, SAC Skopje

3.2. KEY MARKET PARTICIPANTS AND THEIR RESPONSIBILITIES (ELECTRICITY MARKET)

One of the principal goals of the electricity market model in Macedonia is to promote and enhance the competition in the domestic electricity sector on the basis of the principles of non-discrimination, objectivity and transparency. For this purpose, the further liberalisation of the electricity market has been carefully planned so as to safeguard the reliable operation of the electricity sector and to secure the provision of adequate electricity supplies, while in parallel, protecting households and small final customers from any unexpected steep increase in electricity prices.

Added to this, another objective revolves around the need to strengthen the integration of the national electricity sector into the regional and international energy markets in accordance with the obligations undertaken by the Republic of Macedonia under ratified international agreements, such as the Treaty establishing the Energy Community. To this end, the electricity market model is geared towards providing sufficient flexibility to interface with market designs considered in the region and to fit well in the regional market and the European electricity internal market. In this respect, the Electricity Market Design Plan is based on the adoption of a gradual approach for opening-up the Macedonian electricity so that the taking of each successive step will allow final customers, as well as the electricity sector as a whole, to capture the greatest gains with the least risk and at the lowest implementation cost.

In what follows, we shall present in brief the essential attributes of the Key Market Participants. These are as follows:

JSC ELEM is the major electricity producer in the country, which is also subject to the obligation to provide public service by means of electricity generation aimed to address the demand of households and small consumers, who are supplied by the universal supplier and electricity supplier of last resort.

The electricity producer in accordance with the license issued, may sell the generated electricity and/or ancillary services on the electricity market of the Republic of Macedonia and abroad.

(2) The electricity producer, in accordance with this Law and regulations and rule adopted following this Law, shall:

1) offer ancillary services to the electricity transmission system operator for the purposes of balancing of the system, in accordance with the technical capacities and requirements determined in the rules on balancing of the electrical energy system and
the Electricity Transmission Grid Code;

2) ensure availability of contracted electricity quantities and/or ancillary services at the point in the electricity transmission or distribution system, pursuant to the terms and conditions of its licence, as well as with the connection contract;

3) be equipped with all the necessary technical resources, including also devices for telemetring of the current generation;

4) submit reports, data and information to the electricity transmission system operator or distribution system operator, pursuant to the Grid Code;

5) supply to the electricity transmission system operator and to the electricity market operator data and information contained in the agreements for purchase and sale of electricity, the availability of the generation capacity and/or ancillary services, other than business-financial data.

(3) The electricity producer has the right to purchase energy on the market, with the aim to optimise its production and to minimise operation expenses.

(4) The electricity producer from a generation plant where at least one generation unit has installed power equal or greater than 250 MW is obliged, in a period of at least five years, to keep all the data which refer to the entire generation plant, from which, for each hour, all its operational decisions in relation to the dispatching and bidding at organised electricity markets can be determined and checked, as well as the auctions for interconnection capacities, balance energy markets and bilateral agreements, which cover also data on the available generation capacities and the awarded ancillary services, as well as the distribution of the awarded ancillary services for each plant in periods when bidding and generation take place.

(5) The electricity producer is obliged the data referred to in paragraph (4) of this Article to present to the Energy Regulatory Commission, the Commission for Protection of Competition, as well as to the Energy Community Secretariat, in accordance with the obligations of the Republic of Macedonia which arise from the ratified international treaties.

(6) The producer of electricity from renewable energy sources connected to the electrical distribution network may be presented on the wholesale electricity market by a virtual electricity producer. The rights and obligations of the virtual electricity producer shall be determined with rules on the electricity market.

(7) With the aim to ensure electricity supply security, the Government, in accordance with Article 6 of this Law, may adopt a decision imposing obligation to the electricity producer to provide a public service encumbering the electricity producer, at any point of time, to have operational primary fuel reserves in quantity which is required for at least 15 days of operation at maximum capacity, in accordance with the rules on public service referred to Article 6 of this Law. The minimum operational primary fuel reserves are particularly noted in the license to perform the activity.

The electricity producer with the largest installed capacity in the Republic of Macedonia shall be obliged to offer to the universal supplier, regarding the procurement procedures for electricity in accordance with the rules for electricity supply for the universal supplier, electricity for sale as follows:

1) in 2019 at least 80% of the total annual needs of the supplier;
2) in 2020 at least 75% of the total annual needs of the supplier;
3) in 2021 at least 70% of the total annual needs of the supplier;
4) in 2022 at least 60% of the total annual needs of the supplier;
5) in 2023 at least 50% of the total annual needs of the supplier;
6) in 2024 at least 40% of the total annual needs of the supplier;
7) in 2025 at least 30% of the total annual needs of the supplier;

The electricity transmission system of the Republic of Macedonia shall be an undertaking which:

1) as a legal successor of Electric Power Company of Macedonia is the owner of the electricity transmission network which consists of transformer stations, line infrastructure objects - overhead power lines, plants, facilities and assets for performing energy activities - electricity transmission and electricity transmission management;
2) shall not be part of a vertically integrated undertaking;
3) shall be holder of a license for performing energy activity electricity transmission;
4) shall not perform and is independent from performing other activities in the energy sector, as determined by this Law and
5) has been certified and appointed as an electricity transmission system operator by the Energy Regulatory Commission, in a procedure determined by this Law.

(2) In order to ensure the independence of the electricity transmission system operator, the same person or persons shall not be entitled at the same time to:

1) directly or indirectly participate in the management of the undertaking that performs some of the activities of electricity generation and/or supply and at the same time to directly or indirectly manage or exercise other right in the electricity transmission system operator;
2) directly or indirectly participate in the management of the electricity transmission system operator and at the same time to directly or indirectly manage or exercise other right in the undertaking performing one of the activities of electricity generation or supply and
3) appoint members of supervisory board, of the managing body of the electricity transmission system operator and at the same time to directly or indirectly manage or exercise other right in the undertaking performing one of the activities of electricity generation and/or supply.

(3) The restrictions referred to in paragraph (2) of this Article shall refer to in particular:

1) exercise of voting right;
2) election and appointment of members of the supervisory body and the managing body or
3) holding of majority share.

(4) The undertaking which owns a license for performing the activity of electricity transmission may not hold licenses and may not be included in performing activities of generation, distribution, trade and supply of electricity, nor may hold a license for organisation and management of the electricity market.

(5) In cases when the electricity transmission system operator was part of the vertically integrated electricity undertaking, the operator or its employees must not transfer business-sensitive information that they own to electricity generation and/or supply undertakings.

(6) As an undertaking that performs some of the generation or supply activities referred to in paragraph (2) of this Article shall also be considered an undertaking that performs some of the natural gas generation or supply activities, and shall not include consumers that perform some of the activities of electricity generation and/or supply,
directly or through an undertaking in which they participate in the management, individually or together, provided that:

1) on annual average, they are net electricity consumers, taking into account their participation in the generated electricity by the undertakings that participate in management;

2) the economic value of electricity they sell to third parties is insignificant in proportion to their other business operations.

The Ministry in charge of operations in the field of transport shall be the owner of the undertaking which is electricity transmission system operator.

(2) The Ministry referred to in paragraph (1) of this Article shall act individually in the course of adoption decisions on election of supervisory body, i.e. undertaking managing body referred to in paragraph (1) and must not accept directions and guidelines from the Government or other government body.

(3) The members of the supervisory body, i.e. the managing body of the electricity transmission system operator:

1) in a procedure adopting decision in line with the Law, must not request, nor accept directions or guidelines from the Government or other government body, except in cases determined by this Law and

2) must not be elected for members of a supervisory body, i.e. a managing body of undertakings performing generation, supply or trade in electricity or undertakings which have the opportunities for direct or indirect effect on decision-making in those undertakings.

The doer of the activity for electricity transmission must be certified as an electricity transmission system operator in a manner, procedure and timeline determined by this Law.

The electricity transmission system operator shall maintain, upgrade and expand the electricity transmission grid, operate the electricity transmission system of the Republic of Macedonia and shall ensure connection of the electricity transmission system to the electricity transmission systems in other countries.

Electricity market operator is a company established by the electricity transmission system operator that performs the activities related to the organisation, efficient functioning and development of markets with bilateral agreements and balance energy, and if it meets the conditions provided for in accordance with the electricity market operator referred to in Article 90 paragraph (3) of this Law, it shall also perform the activities related to the organised electricity market in the Republic of Macedonia.

The company that holds a license to perform the activity of the organisation and management of the electricity market can not be a license holder and can not participate in the generation, transmission of electricity and management of the electricity transmission system, distribution, trade, electricity supply.

(2) In cases when the electricity market operator is owned by the electricity transmission system operator, the electricity transmission system operator shall ensure its functional independence from the electricity market operator in terms of the legal form, organisation and decision-making in accordance with the program referred to in Article 73.

Organised electricity market operator in the Republic of Macedonia shall be a company designated or elected by the Government, which meets the requirements of the regulation referred to in paragraph (3) of this Article and has the exclusive right to establish and manage this market through:

...
1) concluding agreements with the participants in the organised electricity market, with the electricity transmission system operator and with the nominated electricity market operators in the region, which regulate the mutual rights and obligations, the manner of securing the confidentiality of the market transactions data, as well as the publication of the data necessary for the functioning of the market;

2) implicit auction of transmission capacities;

3) creating curves of electricity supply and demand and

4) financial settlement with the organised market participants in accordance with the concluded contracts and the obtained results.

(2) The organised electricity market operator shall:

1) in cooperation with the electricity transmission system operator perform market merger with the other nominated electricity market operators in the region;

2) ensure equal treatment of all market participants;

3) not use the fees for participating in that market for the purposes of financing activities on another organised market;

4) in cooperation with the electricity transmission system operator and upon prior approval by the Energy Regulatory Commission, adopt rules for the operation of the organised electricity market and shall publish them on its website and

5) each year, upon prior approval by the Energy Regulatory Commission, make a decision on the amount of fees for participation in the organised electricity market and shall publish it on its website.

(3) The Government shall, by regulation, prescribe the operation of the organised electricity market operator, as well as the necessary technical, staffing and financial conditions to be met.

(4) The Government may, on proposal of the Energy Regulatory Commission and upon prior opinion of the electricity system operator submitted to the Energy Regulatory Commission, adopt a decision on:

1) the appointment of the electricity market operator referred to in Article 88 of this Law as an organised electricity market operator or

2) conducting a tendering procedure by means of a public call in accordance with the regulations governing the public service procurement for the selection of an organised electricity market operator.

(5) The Energy Regulatory Commission shall issue, to the operator designated in accordance with paragraph (4) of this Article, a license for carrying out energy activity - electricity market operator in which the rights and obligations of the organised electricity market operator are determined.

The electricity distribution system operator or vertically integrated company that is the founder of the electricity distribution system operator on the territory of the Republic of Macedonia as a legal successor of the Electric Power Company of Macedonia shall be the owner of the electricity distribution network consisting of transformer stations, line infrastructure objects - overhead power lines, facilities and assets that are in function of performing the energy activity - electricity distribution.

(2) The electrical distribution system operator shall be responsible for maintaining, upgrading and expanding the electrical distribution network as well as for the functioning of the electrical distribution system and shall be obliged to ensure its connection to the electricity transmission system.
According to the new Energy law from 2018 there is Universal supplier which will supply with electricity households and small enterprises. Today this role has new firm called “EVN HOME”. This company will get the licence for universal supplying for 5 years. This universal supplier will be Electricity supplier of last resort for the households and small enterprises, under reasonable and clearly comparable and transparent prices set by the Energy Regulatory Commission. It will be also Electricity supplier of last resort for the big companies on the free electricity market but with different prices.

**EVN Elektrodistribucija Ltd**, in its capacity as a distribution system operator, legally unbundled from EVN Macedonia starting from 1st of January 2017 is responsible for the maintenance, upgrade, expansion, and operation of the distribution system used to perform its activity, and shall be obliged to secure its connection to the electricity transmission system. As such, it is responsible for the long-term electricity distribution system development planning in the area where it performs the activity. Pursuant to the Energy Law, an electricity distribution system operator is obliged:

1) to secure safe and reliable operation of the distribution system, pursuant to the applicable regulations that stipulate the technical rules;

2) to secure reliable, safe and quality electricity distribution and delivery through the distribution system it operates, in a non-discriminatory and transparent manner and under stipulated quality;

3) to connect generators and consumers to the distribution system, as well as to allow third party access for distribution system use, pursuant to the present law and the Distribution Grid Code, and based on the principles of objectivity, transparency and non-discrimination;

4) to develop, upgrade and maintain the distribution system, pursuant to the applicable regulations that stipulate the technical rules, and to provide long-term system ability to address the reasonable electricity distribution demand;

5) to develop the grid maintenance plan pursuant to the Distribution Grid Code, and submit it to the Energy Regulatory Commission;

6) to harmonize operations in the distribution system with the electricity transmission system operator;

7) to purchase electricity and ancillary services to cover the losses in the distribution grid, under market terms and conditions and in a transparent, non-discriminatory and competitive manner, pursuant to the Electricity Market Code;

8) to meter electricity received from generators and the electricity transmission system and energy delivered to consumers connected to the distribution system, as well as to submit metered data to the generators, suppliers, or traders, and to the market operator;

9) to allow users access to metering devices owned by the distribution system operator, pursuant to the present law and Distribution Grid Code;

10) to prepare reports on the financial and actual volume of planned and realized services and to submit them to the Energy Regulatory Commission in a manner and under terms and conditions and within deadlines stipulated in the license;

11) to keep the dispatch log, records on the communication systems reliability, data from the supervision and operation system, metered data, to keep such data, logs, and records for at least ten years; and
12) to secure confidentiality of commercial and business data of distribution system users.

The Energy also states that the distribution system use charge shall be settled by electricity consumers connected to the distribution grid. The electricity distribution system operator must invoice the electricity distribution system use charge to consumers connected to the electricity distribution system, as well as the electricity transmission system, use charge, pursuant to the published tariffs. As an exception from this, the electricity distribution system operator can sign contracts with electricity suppliers or traders by means of which it shall authorise them to collect the charges.

Another important participant in the national electricity market is JSCNegotino, which is an electricity producer that can sell electricity and/or ancillary services to domestic and foreign traders, electricity suppliers, electricity transmission system operator and electricity distribution system operators. Being an electricity generator, JSC is obliged under the Energy Law:

1) to secure availability of agreed energy and/or ancillary services at the receipt point in the transmission or distribution system, pursuant to the license;
2) to operate in compliance with the laws, other regulations, as well as Transmission Grid Code or Distribution Grid Code, Market Code and terms and conditions stipulated in the licences;
3) to submit reports, data and information to the Energy Regulatory Commission, pursuant to the terms and conditions stipulated in the licence;
4) to submit reports, data and information to the electricity transmission system operator or distribution system operator, pursuant to the Transmission or Distribution Grid Code;
5) to submit the electricity market operator and the electricity system operator data and information on electricity purchase and sale contracts, the availability of generation capacity and/or ancillary services, except for commercial and financial data, pursuant to the Market Code; and
6) to secure electricity for own consumption from its facilities or on the open market.

Since JSCNegotino uses mazut as fuel for electricity generation, it is obliged to dispose at all times with operation reserves of mazut in the quantity equal to at least fifteen-day operation demand under maximum operation capacity.

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

Under the domestic electricity market model, other important players are:

- **electricity suppliers**, who can shall purchase electricity in the country and from abroad, for the purpose of selling it to consumers, traders, other suppliers, the electricity transmission system operator or the electricity distribution system operators, as well as to customers abroad; and
- **electricity traders**, who can purchase electricity in the country and from abroad, for the purpose of selling it to other traders, suppliers, the electricity transmission system operator and electricity distribution system operators, as well as for selling it to customers abroad.

### 3.2.1. System Balancing Mechanism

The Energy Regulatory Commission of Republic of Macedonia in September 2018 adopted the Amendments of Electricity Market Rules. One of the novelties introduced with the Market Rules refers to the procedures for calculating of the imbalances of the nominated and realized transactions based on the data from the measurements made by the transmission system operator and the distribution
system operators.

The Electricity Market Rules, among other things, stipulate that:

- every participant on the electricity market will have balance responsibility under which it shall be obliged to submit to the TSO sufficient information that is included in the relevant bilateral transactions in order to ensure the reliable, secure, and stable operation, work, and balance of the national power system; and

- all participants in the electricity market must undertake financial responsibility for the influence of their actions with the view to safeguarding the confident, safe, and economic working, management and balance of the power system of Republic of Macedonia.

The duration of the trade interval and the interval of settlement must occur within one (1) hour.

For the purpose of ensuring that the participants on the electricity market will reduce the expenses that may occur due to imbalances on an hourly level, the Electricity Market Rules envisage that the participants on the electricity market can form balance groups freely on personal selection and based on bilateral or multilateral agreements. A balance group may be composed of only one participant on the electricity market. Every balance group has its own balance responsible party (BRP), which represents the balance group and submits all of the necessary data to the corresponding operators. Every BRP submits physical schedules to the TSO (JSCMEPSO) and the electricity market operator (JSCMEPSO) so that electricity generation and purchase, including electricity imports for the hour of the physical schedule, correspond to the consumption and sale, including the export of electricity made by every member of the balance group and for which the relevant BRP undertakes the balance responsibility. Each BRP has financial responsibility for every imbalances of its balance group that occurred as difference between the planned and realized generation, consumption, purchase, sale, import, and export of electricity. The rights and financial obligations among the members of the balance group are regulated with mutual agreement.

Each BRP for its balance group is required to submit physical schedules for every hour to the TSO and the electricity market operator. The submitted physical schedules can be changed at latest 1 hour to the real hour for which they refer which is another facilitating circumstance in the process of implementation of the calculation of imbalances on an hourly level. The submitted data of the physical schedules present the basis for calculation of any imbalances.

Pursuant to the Electricity Market Rules, the Operator of the electricity distribution system (EVN Elektrodistribucija) is obliged to prepare standard daily load curves for the consumers that do not have installed meters with possibility for hourly metering and remote reading and to submit them to the TSO and the electricity market operator upon previously obtaining the approval of the Energy Regulatory Commission.

The calculation of the imbalances is effected pursuant the Methodology for calculation of the fee for the services for balance of the Market Rules. More specifically, the imbalances of BRS (E_{IMB}) are determined on the basis of the difference between the aggregated (in absolute value) nominated (physical schedules) exchanges of electricity of BRS (E_{PN}) and the factual realized exchanges of electricity (E_{AR}) of BRS.
3.2.2. Third Party Access Exemption

In accordance with the Energy Law, the electricity transmission system may request the Energy Regulatory Commission to grant an exemption from the obligation on allowing third party access when investment is made in new interconnection lines or the investment significantly increases the capacity of the existing interconnection lines, for increasing the supply possibilities. On any such occasion, the Energy Regulatory Commission is required to approve the relevant application, provided the following requirements are met:

1) the investment results in increased competition in, and reliability of, electricity supply;
2) the investment risks are such so that the investment cannot be realised unless the exemption from the obligation on third party access is provided;
3) the interconnection line, for which the exemption from the obligation on allowing third party access was requested, must be owned by a natural person or legal entity which, at least in its legal form, is independent from the system operators where the line is to be constructed;
4) the interconnection line users will settle the charge on the line use;
5) not a single portion of investment made or of operation costs for the interconnection line can be recovered through the relevant system use charge for the systems connected by the interconnection line;
6) the exemption from the obligation on allowing third party access does not affect the electricity market competition and efficiency or the efficient operation of the regulated transmission system to which the line is connected.

3.2.3. Electricity supply and consumption

Most of the electricity generated in Macedonia comes from thermal and hydro electric plants. The thermal power plants, with an installed capacity of 1322 MW, represent 64% of the total installed capacity. The hydro plants, with an installed capacity of just under 675 MW, account for most of the remaining 33%.

The major generation plant is the lignite thermal plan TPP Bitola with an installed capacity of 700 MW. TPP Bitola is located in the south-west of the country and has undergone major modernisation in recent years. This plant, combined with the 125 MW lignite plant TPP Oslomej covers 80% of the domestic electricity consumption.

A 227 MW gas-fired combined cycle CHP was commissioned in 2011 and is owned by the Russian SINTEZ GROUP and operated by the Skopje district heating company, TOPLIFIKACIJA.

There is also a 210 MW heavy fuel oil TPP at Negotino, which is no longer normally operational, but held in reserve. In the past, there have been plans to build a 300 MW coal plant on this site, but the project is not proceeding.

Depending on weather conditions, about 20% of the country’s generation output is provided by hydropower.

There is also a good potential for the building of new large and small hydro stations.

The hydro power plants are set out in the table below.
## Statement on Security of Supply

### Large Hydro Power Plants (LHPP) 2016 (with capacity greater than 10 MW)

<table>
<thead>
<tr>
<th>HPP</th>
<th>Basin</th>
<th>No. of units</th>
<th>Installed capacity MW</th>
<th>Available annual production GWh</th>
<th>Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vrben</td>
<td>Mavrovo</td>
<td>2</td>
<td>12.8</td>
<td>45</td>
<td>1957/1973</td>
</tr>
<tr>
<td>Vrutok</td>
<td>Mavrovo</td>
<td>4</td>
<td>172.0</td>
<td>390</td>
<td>1959/1973</td>
</tr>
<tr>
<td>Raven</td>
<td>Mavrovo</td>
<td>3</td>
<td>21.6</td>
<td>53</td>
<td>1959</td>
</tr>
<tr>
<td>Tikves</td>
<td>Crna River</td>
<td>4</td>
<td>113.0</td>
<td>184</td>
<td>1966/1981</td>
</tr>
<tr>
<td>Kalimanci</td>
<td>Bregalnica</td>
<td>2</td>
<td>13.8</td>
<td>17</td>
<td>2006</td>
</tr>
<tr>
<td>Globocica</td>
<td>CrnDrim</td>
<td>2</td>
<td>42.0</td>
<td>213</td>
<td>1965</td>
</tr>
<tr>
<td>Spilje</td>
<td>CrnDrim</td>
<td>3</td>
<td>84.0</td>
<td>300</td>
<td>1965</td>
</tr>
<tr>
<td>Kozjak</td>
<td>Treska</td>
<td>2</td>
<td>82.0</td>
<td>150</td>
<td>2004</td>
</tr>
<tr>
<td>St. Petka</td>
<td>Treska</td>
<td>2</td>
<td>36.4</td>
<td>63</td>
<td>2013</td>
</tr>
<tr>
<td>Matka</td>
<td>Treska</td>
<td>2</td>
<td>10</td>
<td>40</td>
<td>2009</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>584.6</strong></td>
<td></td>
<td><strong>1455</strong></td>
<td></td>
</tr>
</tbody>
</table>


### Planned activity in energy for year 2019

**COAL MINE ZIVOJNO (Zivojno-Bitola)**

Deposit “Zivojno” is the third main coal deposit in Pelagonia region and it is located approximately 35km southeast of town Bitola to the border between Republic of Macedonia and Greece or 20 km from mine Suvodol and it is extension of mine Brod-Gnetino (cca 4 km from BrodGnetino). It is expanded to the border line with Republic of Greece on south, village Zivojno on east, village Germian on west, to the river Crna on north and spreads over an area of cca 25,0 km2. The deposit is represented by hydro geological complex with specific characteristics of the terrain. The thickness of the main coal seam has continuous spreading throughout the entire deposit and varies between 0,4-8 metres. The depth at which is situated is variable and starts from 33 meters to 195 meters.

The Mavrovo hydropower system includes the Vrben, Vrutok and Raven units on the Vardar River. This is the largest hydropower system in Macedonia (203.4 MW) with 36% of the installed capacity for all large hydropower plants.

The system on the river CrnDrim has two power plants, Globocica and Spilje. The plants are connected to the Ohrid Lake. The capacity of the two plants is 126 MW and constitutes 22% of the installed capacity for large hydropower plants.

On the Crna River, the Tikves plant has a capacity of 113 MW.

The modern 13,8 MW Kalamanci plant is on the river Bregalnica.

On the Treska River there are two modern plants, the 82 MW Kozjak unit and the 36,4 MW Sveta Petka plant.

In recent years most of the large hydropower plants have been rehabilitated with modern equipment. Most of the large hydro power plants are owned and operated by ELEM. The Matka power plant is operated by EVN.

Output from the hydropower plants varies considerably according to the weather conditions.

### Potential Large Hydro Power Plants

At present there are 8 potential large power plants in Macedonia: Boskov...
Most at Radika River, Lukovo Pole connected to the Mavrovo complex, Galiste and Cebrenat the Crn River, Gradec, Veles and 10 medium plants at the Vardar River. Feasibility studies have been prepared for these sites. ELEM has been assigned to develop the Boskov Most and Lukovo Pole projects, while Cebren is expected to be developed as a public-private partnership. For the remaining potentials no specific plans for development have yet been approved. The total capacity of the potential plants is 924 MW, which is almost double of the existing large hydro power plant output. Estimated annual output is 2,220-2,720 GWh compared to the average output of the existing LHPP of 1,415 GWh. Hydrological analysis and feasibility studies have been carried out but the economics of the investments are not yet published. The tendering procedures have been initiated but no contracts have yet been signed. In addition to the technical designs, environmental assessment reports will be necessary and land ownership agreements signed. It will be some time before these potential projects can be realised.

**Basic features of the potential large hydro power plants**

<table>
<thead>
<tr>
<th></th>
<th>Basin</th>
<th>Planned Capacity MW</th>
<th>Annual production GWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galiste</td>
<td>Crna River</td>
<td>193.5</td>
<td>263</td>
</tr>
<tr>
<td>Cebren</td>
<td>Crna River</td>
<td>333/347</td>
<td>340/682</td>
</tr>
<tr>
<td>Gradec</td>
<td>Vardar</td>
<td>54.6</td>
<td>252</td>
</tr>
<tr>
<td>Veles</td>
<td>Vardar</td>
<td>93.3</td>
<td>300</td>
</tr>
<tr>
<td>10 HPP Vardar Valley</td>
<td>Vardar</td>
<td>176.8</td>
<td>784</td>
</tr>
</tbody>
</table>

**Hydro Power Plant Spilje II**

Increasing of the domestic electricity generation HPP Spilje is storage electric power plant with a useful volume of 223 million m³, which allows daily and weekly levelling as well as seasonal levelling. For maximum utilization of the flow in the reservoir, respectively reducing water overflow to a minimum, in the spring when the flows in the storage are at highest level, hydropower plant should operate at maximum capacity. In the remaining period and especially during the period from November to February, when there is greatest demand for power and energy, the hydropower plant will be used to produce peak power energy. For this kind of operation of HPP Spilje its installed capacity should be as large as possible.

**Revitalization of Hydro Power Plants – III phase**

The project includes revitalization of the hydropower plants "Vrutok", "Raven", "Vrben", "Globocica", "Spilje" and "Tikves". In the third phase of modernization of the existing hydro power plants, the following major intakes are planned: □ Replacement of power transformers, as follows: one in HPP "Spilje", two in HPP "Globochica", two in HPP "Vrben" and two in HEC "Tikves", as well as two new energy regulation transformers in HPP "Spilje"; □ Modernization of two generators in HPP "Globocica" and one in HPP "Spilje"; □ Replacement of conductive rope on 35 kV transmission line HPP "Vrutok" - HPP "Vrben" and replacement of protective rope with new optical ground wire, rehabilitation of 35 kV transmission line HPP "Spilje" - HPP "Globocica" and construction of a new 35 kV transmission line HPP "Kozjak" - HPP "Sv. Petka"; □ Replacement of rotor poles from three rotor units in HPP "Raven" and new unit bearings based on new PTFE technology; □ Replacement of ball valves and turbine equipment of two units in HPP "Vrben"; □ Replacement of butterfly valves in HPP "Spilje", in HPP "Globocica" and in HPP "Tikvesh"; Remediation of the concrete linings at the water supply shafts in HPP.
**Galiste** will be located at the Crna River and includes construction of a reservoir. Capacity is planned to be 193.5 MW with an annual production 264 GWh. Current investment costs are estimated at EUR 216 million.

**Cebren** will also be located at the Crna River and includes the construction of a reservoir. The capacity is planned to be 333/347 MW and annual production 340/682 GWh. Current investment costs are estimated to be EUR 345-366 million. The project includes a possibility of increasing the production considerably by establishing a pumping system utilizing the reservoir Orlov Kamen and thereby reuse of the water flow. However, this solution is promising from a technical point of view, but there will be considerable operating costs for electricity for the pumping and such options are only feasible if there is a considerable difference in the electricity price peak/off peak.

The partition place Cebren is located at the River CrnaReka, 81 km upstream from its inflow in the River Vardar, near the village Manastir and about 7 km upstream of the Bridge Rasimbegov (Rasimbegov Most), in the canyon part of CrnaReka.

On this part there is already constructed HPP Tikves with regular accumulation level of 265,00 meters above the sea level, while for the remaining canyon part of CrnaReka there are analyzed several variant solutions for its energetic utilization, while in the preceding study phase of designing, it is accepted to be constructed two dam hydro power plants with significant accumulation space and they are: HPP Galiste with regular accumulation level of 392,00 meters above the sea level HPP Cebren with regular accumulation level of 565,00 meters above the sea level.

**Hydro Power Project TenovoKozjak**

The idea for tunnel for redirecting of part of the waters from Vardar river in Treska river respectively from Tenovo site to Kozjak storage dates more than 50 years ago. According to the first Study about this idea [1] which is prepared by Norwegian Consulting Company, there is technical documentation only for tunnel Tenovo-Kozjak [3] where there are energy indicators and some financial analyses with current prices and construction of Energy Power system of Macedonia. At the end of 2014, analysis was made with proposed variants for resolving of this idea along with water usage from HPP Raven to Kozjak storage in ToR [2] from AF – Consult. As a result from these documents, opinion was provided by Civil Engineering Faculty for variants of this project.

**Hydro Power System Vardarska Dolina**

The area of the Vardar Valley has been the focus of interest in its current development and particularly in the last two decades. These interests amplify depending on the specific geopolitical and economic situation of our country, and various aspects of integration of the interest to landscape this area into the development plans at the regional level, as well as the specific interests of developing the economy as a whole. The complex landscaping of the Vardar Valley will includes: – Construction of facilities for energy use; – Construction of systems for the development of agriculture; – Construction of systems for the development of tourism industry, sport and recreation; – Construction of systems for environmental protection, protection of surface and groundwater and other environmental values. Hydro-power utilization of the river Vardar has been studied in several phases. The Vardar Valley Programme envisages energy use of the Vardar stream and its most important tributaries.
10 HPP in the Vardar Valley.

Mainly between Gradec and Veles construction of 10 hydro power plants are planned, the capacity of each one is between 17 and 24 MW. Combined capacity of the system is 176.3 MW and the annual output of the system is estimated to be 756 GWh. Total investments is estimated to be EUR 730 million. It is considered that some but not all 10 could be constructed.

In addition there is also a possibility to develop Globocica 2 which could add a capacity of 29 MW and an annual generation of 41 GWh. Also construction of a channel between Tetovo-Kozjak could provide additional annual production from the plants at Treska up to 110 GWh. There are no detailed feasibility studies and are interesting but not necessarily feasible.

LHPP are characterised by long construction and development time and a long lifetime. Even if a project at present electricity prices could appear to be unattractive, increasing prices must be expected over the longer term which would improve the economics.

Small hydro power plants

These are plants with a generation capacity of up to 10 MW. All SHPPs are operating without reservoirs as “run of river” generators.

Macedonia has a significant potential for construction of small hydropower plants located at roughly more than 400 sites throughout the country. The generation from these units could potentially meet up to 16% of the country’s current electricity needs. Not all of these sites are economically attractive as data on hydrology is often not accurate and the connection to the grid is problematic in some cases. An estimated additional 874 GWh could be generated annually from this resource.

In addition to the major generating plants there are small generating units owned by industrial consumers with a total capacity of around 50 MW together with small contributions from wind and solar power installations.

The total generation from all sources is listed in the table below together with the annual consumption.

Electricity generation and consumption 2018 (MWh)

<table>
<thead>
<tr>
<th>Source</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>377423</td>
</tr>
<tr>
<td>Net import</td>
<td>2,297169</td>
</tr>
<tr>
<td>Total electricity production</td>
<td>5,447,057</td>
</tr>
<tr>
<td>Main thermal power plants</td>
<td>2,703379699,115</td>
</tr>
<tr>
<td>CHP and other thermal plants</td>
<td>716579</td>
</tr>
<tr>
<td>Hydro power plants (larger than 10 MW)</td>
<td>1,460297</td>
</tr>
<tr>
<td>Small hydro power plants (smaller than 10 MW)</td>
<td>379,313</td>
</tr>
<tr>
<td>Solar</td>
<td>23,333</td>
</tr>
<tr>
<td>Biogas</td>
<td>54050</td>
</tr>
<tr>
<td>Wind</td>
<td>97338</td>
</tr>
<tr>
<td>Losses in the transmission system</td>
<td>125269</td>
</tr>
</tbody>
</table>
3.3. GENERATION

3.3.1. Procedure for construction new generation facilities

According to Article 52, paragraph 1 of the Energy Law, new generation facilities and cogeneration facilities can be constructed based on an authorization, which is issued by the Government of Republic of Macedonia. The procedure on issuing the decision on the authorization for construction of electricity generation facilities and cogeneration facilities must be based on the principles of objectivity, transparency, and non-discrimination. The authorization decision is issued pursuant to criteria that refer to:

1) reliability of relevant energy type supply;
2) safety and reliability of the energy system, facilities and relevant equipment;
3) protection of public health and safety;
4) environmental protection;
5) use of land and sites;
6) use of public land;
7) energy efficiency;
8) primary energy type; and
9) specific characteristics of the applicant as regards its technical, financial, and economic ability.

Article 52, paragraph 2 of the Energy Law also provides that the authorization shall not be necessary provided that:

- the energy generation facility has total installed electricity equal to or less than 10 MW;
- the expansion of the energy generation facility results in total installed electricity and/or heating energy capacity increase by up to 10 MW; or
- the energy generated by the energy facility will be used only for its own consumption.

Under Article 59 of the Energy Law, the authorization for the construction of new electricity generation facilities and cogeneration facilities should stipulate in detail:

1) the type, features, installed capacity and expected annual energy output, fuel type and necessary quantity;
2) the facility’s location, in compliance with the relevant urban planning documents;
3) the authorization’s validity period;
4) the proceedings with the facility upon the termination of its operation;
5) the manner of public infrastructure use;
6) the environmental protection requirements to be fulfilled pursuant to the law;
7) the efficiency requirements concerning the facility’s operation; and
8) other terms and conditions related to the facility construction.

Moreover, the Energy Law provides that in any case where -based on the issued authorizations for construction of new electricity generation facilities and cogeneration facilities, in compliance with the Strategy on Energy Development of the Republic of Macedonia, the forecasts on electricity consumption, after taking into
account the measures on energy efficiency improvement and consumption management and the possibilities for address the said demand - it has been assessed that the reliability of energy supply is disturbed, the Government of the Republic of Macedonia, on the proposal from the Ministry, can adopt a decision and announce an open call (tender) for the construction of electricity generation facilities and cogeneration facilities. Any such open call must contain in particular:

- the type of energy facility for which the open call is announced;
- its planned capacity;
- the deadline for the initiation of facility construction works;
- the location where the facility is to be constructed, as this is determined on the basis of the excerpt from the existing urban planning documents, the state urban planning documents or the local urban planning documents;
- the required economic, technical or operational ability of bidders; and
- possible incentives offered, and the manner and deadline for the bid submission.

3.3.2. Renewable energy Sources and Preferential producers

For the purpose of stimulating construction of new power plants using renewable energy sources or high-efficiency cogeneration plants, Article 187 of the Energy Law prescribes that these facilities can obtain the status of preferential producer, and thereby the right to sell electricity under feed-in tariffs. The feed-in tariffs can be applied in a manner and under procedure stipulated in the Energy law and the by-laws adopted pursuant to the law.

In the previous period feed-in tariffs for sale of electricity produced and delivered from SHPP, wind energy, solar energy, biomass, and biogas from biomass were determined, as follows:

<table>
<thead>
<tr>
<th>Type of RES</th>
<th>Feed-in tariff for electricity generation(€/kWh)</th>
<th>Duration of usage (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydro</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(with installed capacity lower or equal to 10 MW)</td>
<td>- monthly quantity of delivered electricity per blocks:</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>I block: 12,00 (≤ 85,000 kWh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>II block: 8,00 (&gt; 85,000 and ≤170,000 kWh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>III block: 6,00 (&gt; 170,000 and ≤350,000 kWh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV block: 5,00 (&gt;350,000 and ≤700,000 kWh)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V block: 4,50 (&gt;700,000 kWh)</td>
<td></td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>8.9</td>
<td>20</td>
</tr>
<tr>
<td>(with installed capacity)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower or equal to 50 MW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>premium ≤15 euros per MWh</td>
<td></td>
</tr>
</tbody>
</table>
| Thermal power plants on biomass  
(with installed capacity less or equal to 3 MW and percentage share of the fossil fuels in the total energy values of the used fuels lower or equal to 15%) | 15 |
| Thermal power plants on biogas  
(with percentage share of the fossil fuels in the total energy values of the used fuels lower or equal to 10%) | 18 |

The electricity market operator is obliged under Article 193 of the Energy Law to purchase the electricity generated by preferential electricity producers. On the request from the preferential producers, the electricity market operator is required to sign the electricity purchase contract in compliance with the terms and conditions set forth in the Energy Law, the decision on the application of feed-in tariff issued by the Energy Regulatory Commission and the Electricity Market Rules. Furthermore, electricity suppliers and traders are obliged to purchase the electricity generated by the preferential electricity producers from the electricity market operator on a daily basis and pursuant to the shares established on the basis of announced electricity demand of their consumers in the total demand of electricity consumers in the Republic of Macedonia. The price under which the electricity market operator sells RES electricity to suppliers and traders is calculated at the end of the month as the average price according to which the operator has purchased the electricity from preferential generators, increased by the costs incurred for balancing and required ancillary services related to the operation of preferential electricity producers.

On another note, it needs also to be mentioned that the Energy Regulatory Commission is under the duty to oblige the relevant energy system operator to cover the grid connection costs of preferential producers and recover the costs incurred as part of the regulated services price, when needed for the purpose of:

- providing incentives for electricity generation from renewable energy sources or at high-efficiency cogeneration plants; or

The Energy Law further stipulates that the electricity transmission or distribution system operators, within the operational possibilities in the relevant system, must provide priority access to electricity systems for the electricity generated
from renewable sources.

Also, the Energy Law sets forth other supporting schemes for the promotion of the use of RES, such as the issue of guarantees of origin, while the administrative procedures regarding the issue of such guarantees is precisely in secondary legislation, as required under the Energy Law.

As regards the possibilities for the use of renewable energy sources in the national energy mix, these are analysed in the Strategy for utilization of the RES in Republic of Macedonia until 2020, which was adopted in September 2010 by the Government of Republic of Macedonia.

The construction of the wind power plants would contribute in the decrease of energy imports dependence, the quality in electricity supply, local and regional development, increase in the participation of the renewable energy in the total electricity generation and could further enhance environmental protection by lowering the level of CO₂ emissions, in accordance with the commitments assumed by the Republic of Macedonia under the Kyoto protocol. In this sector, the most advanced project is JSCELEM's wind farm, which was commissioned in March, 2014 for a total investment of €55.5 million. The project is constructed in the area of Bogdanci and Valandovo and - owing to its complexity – its implementation is planned to be carried out in two phases. The first phase, which included the construction of access road and of a substation and the installation of 36.8 MW capacity wind turbines (of an individual turbine size of 2.3 MW), has already been finalised and the facility is now operational. In the second phase, the wind park Bogdanci would be fully completed following the construction and assembly of the remaining wind turbines (13.2 MW) so that the plant will reach the target of 50 MW of installed capacity.

Up to now, 109 photovoltaic plants have been licensed and 98 such plants have been put into operation with a total installed capacity of 17,513 MW.

For this year and next year the expected installed capacity for photovoltaic plants will be 200 MW.

3.4. TRANSMISSION

3.4.1. National transmission network

The line diagram below shows the main high voltage transmission system in Macedonia and the existing international connections. The 400 kV system forms a ring of three lines connecting the largest consumption concentration in the northern part of the country with the largest production facilities in the south west. The 400 kV transmission lines are used for interconnection to the neighbouring power systems. The 110 kV transmission grid connects the large hydro power plants, the major cities and towns and the industrial centres.
3.4.2. International connections

Macedonia has borders with Serbia to the north, Kosovo to the northwest, Bulgaria to the east, Greece to the south and Albania to the west.

The 400 kV transmission line SS Skopje 5 - SS Kosovo B and the 400 kV transmission line SS Stip – SS Vranje connect the northern border. To the south there are two 400 kV interconnecting transmission lines: SS Bitola 2 - SS Florina and SS Dubrovo - SS Thessaloniki.

The main 400 kV interconnection with Bulgaria is by the SS Shtip - SS Cervena Mogila Basic transmission line. There are also two 110 kV connections.

Details of the lines is given in the table below.

<table>
<thead>
<tr>
<th>Node 1</th>
<th>Country</th>
<th>Node 2</th>
<th>Country</th>
<th>Voltage Level (kV)</th>
<th>Line Length (km)</th>
<th>Type of Circuit</th>
<th>Type of Conductor</th>
<th>Conductor per phase</th>
<th>Rated Current (kA)</th>
</tr>
</thead>
</table>
The yearly NTC between neighbouring TSOs and MEPSO are agreed before November 20, for the upcoming year. In case of difference between these values, the lower value shall be valid.

The monthly NTC values between neighbouring TSOs and MEPSO are evaluated and agreed until the 5th calendar day of the previous month.

The following procedure for monthly NTC evaluation is applied:

15 days before the deadline for monthly NTC evaluation, forecast models are exchanged in the scope of regional sub-group ENTSO-E RG SEE CMMI, including active reserves for increasing/decreasing of the generation, exchange programs and data about maintenance programs (beginning and end) for the investigated period.

10 days before the deadline for monthly NTC evaluation, calculation of TTC and NTC is performed according to ENTSO-E rules. Each Party calculates the TTC values checking the n-1 criterion at least in its power system.

2 days before the deadline for monthly NTC evaluation TTC, TRM and NTC values are exchanged by email and harmonized. If no agreement is reached about the NTC value – lower value is in force.

In case of significant changes in the network topology, NTC values could be changed according to the results of weekly and daily operational planning, after consultation and by mutual agreement.

When calculating Macedonian north and east border transmission capacity in direction North to South, simulations consider the joint import of Macedonia, Greece and Albania from Bulgaria, Serbia and Romania. Export from Greece, Albania and Macedonia is simulated for calculation of transmission capacity in direction North to South. In that manner, typical borders are "coupled" into a composite NTC calculation, assessing maximum bulk power flow to maximize the transmission capacities and improve the level of security of supply.

Auctions
The auction/allocation procedures are construed in accordance with the regulations set out by European law, respectively by the Regulation (EC) 714/2009 of the European Parliament and of the Council of 13 July 2009.

Auctions are organized on 3 borders: MK-GR, MK-RS and MK-BG.

Auctions for allocation of cross-border capacities between the bidding zones of MK and GR are organized by SEE CAO, Podgorica, and auctions on MK-RS border and MK-BG border are joint explicit auctions organized by both TSOs.

Calculations of ATC (Available Cross-border Capacities) on the borders are done by each side individually in accordance with ENTSO-E methodology. The allocation of ATC is defined in the Joint Rules for the provision of cross-border transmission capacities, approved by the each national ERC and are in accordance with the European regulations and procedures adopted within the framework of ENTSO E. The allocation of the ATC defined in the Rules is transparent, market-oriented and provides non-discriminatory access to cross-border transmission capacities, taking into account the congestion in the transmission system, payment for the use of cross-border transmission capacities in case of congestions, and the publication of data.

For calculation of ATC, a regional model of Southeast Europe is used as well as appropriate software tools by the electricity transmission system operators.
"N-1" criterion must be fulfilled, for calculating the ATC. This means that in case of outage of some network element, the parameters of the network should remain within the acceptable operational limits in order to ensure safe and stable operation of the interconnected transmission system.

TSOs confirmed that the results from each individual calculation of ATC correlates with the other side calculation, with small differences. If there are differences between the values of calculated values, then the smaller value will be accepted.

The goal is to eliminate congestion on the borders. Therefore the incomes from the cross border auctions are used by TSOs for strengthen the internal transmission capacities as well as the cross border capacities.

The documents for auction rules for all borders are available on:


**Macedonia – Serbia interconnection**

Due to the rising demand by market participants, EMS and MEPSO organize transparent auction/allocation procedures for the available transmission capacities at border between the bidding zones of EMS and MEPSO in order to make these capacities accessible for the market participants in a non-discriminatory way. The auction/allocation procedures are construed in accordance with:

- the regulations set out by European law, respectively by the Regulation (EC) 714/2009 of the European Parliament and of the Council of 13 July 2009,
- Energy Community Treaty signed on October 25, 2005,
- Serbian and Macedonian primary legislation and
- Serbian and Macedonian secondary regulation.

In order to achieve maximum transparency in the allocation of the transmission capacity and to avoid discrimination in allocating capacities, TSOs organize common explicit auctions, i.e. a common allocation of cross zonal capacities. The auctions of capacities are organized on yearly, monthly, daily and intraday level. MEPSO is performing Yearly and Monthly auctions, and EMS is performing daily and intraday auctions.

**Macedonia - Bulgaria interconnection**

Due to the rising demand by market participants, ESO and MEPSO organize transparent auction/allocation procedures for the available transmission capacities at border between the bidding zones of ESO and MEPSO in order to make these capacities accessible for the market participants in a non-discriminatory way. The auction/allocation procedures are construed in accordance with:

- the regulations set out by European law, respectively by the Regulation (EC) 714/2009 of the European Parliament and of the Council of 13 July 2009,

- Bulgarian and Macedonian primary legislation and
- Bulgarian and Macedonian secondary regulation.

In order to achieve maximum transparency in the allocation of the transmission capacity and to avoid discrimination in allocating capacities, TSOs organize common explicit auctions, i.e. a common allocation of cross zonal capacities. The
auctions of capacities are organized on yearly, monthly, daily level. MEPSO is performing Yearly and Monthly auctions, and ESO is performing daily auctions.

**Macedonia - Greece interconnection**

Yearly Auction for the allocation of transmission capacities at the border of control areas of Electricity Transmission System Operator of Macedonia (MEPSO) and Independent Power Transmission Operator (IPTO or ADMIE) for the year 2019 are conducted in accordance with: Auction Rules for Capacity Allocation in SEE CAO

SEE CAO is the Coordinated Auction Office which is performing auctions on yearly, monthly and daily base for both TSOs.

**Balancing mechanism:**

The Transmission System Operator is responsible for procuring balancing services from Balancing Service Providers in order to ensure operational security taking into account all planned disconnections, outages due to the defects and maintenance of frequency and voltage stability of the system.

Till 01.01.2019, all balancing services are procuring from the only BSP – ELEM, the biggest production company in Macedonia. ELEM, EVN and MEPSO are not balance responsible during this period, till 01.01.2019.

With the new Balancing rules, ELEM, EVN and MEPSO will be balance responsible parties, from 01.01.2019.

The Transmission System Operator is responsible for implementation and operation of balancing market in Macedonia by procuring balancing services in the form of FCR, aFRR, mFRR and RR provided by BSPs. Balancing services shall be procured by the Transmission System Operator in a transparent and non-discriminatory manner by performing auctions for capacity and energy for aFRR and mFRR.

In relation to Balancing Service Providers, the Transmission System Operator will be responsible for:

- signing a contract with Balance Service Providers,
- procuring balancing services from Balancing Service Providers,
- collecting bids for procurement of balancing capacity,
- collecting bids for balancing energy,
- making a merit order list for procurement of balancing capacity and balancing energy for aFRR and mFRR,
- establish and maintain of Registry of BSP and Registry of Balance Group (BG) and Balance Reponsible Parties (BRPs)
- calculating activated and delivered balancing energy.

**3.4.3. Development of the transmission network**

In accordance with the Grid Code, MEPSO prepared a study on the development of
transmission network for the period 2010-2020 in order to fulfil obligations for network maintenance, development and security of supply. This study covers short, medium and long term forecasts for a 10 year timescale to insure that the least cost development of the transmission system is able to cope with future demands and maintain a quality in compliance with the ENTSO-E 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.

A new 400kV line is planned to connect the western border with Albania.

<table>
<thead>
<tr>
<th>Voltage Line</th>
<th>Type of Conductors</th>
<th>Rated Current (kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node 1</td>
<td>Country</td>
<td>Node 2</td>
</tr>
<tr>
<td>Skopje 5</td>
<td>MK</td>
<td>Kosovo B</td>
</tr>
<tr>
<td>Bitola 2</td>
<td>MK</td>
<td>Elbasan</td>
</tr>
</tbody>
</table>

The interconnection line will provide a link between Bitola in Macedonia and Elbasan in Albania.

During 2014, the environmental impact assessment and technical design documentation have been completed.

The tender procedure for the selection of a contractor is expected to begin in the next period, and construction is planned to be completed after 2020. MEPSO has received information that EBRD has expressed an interest to provide funding for this project whose total estimated value is EUR 43.5 million.

This connection will be the first between the two countries and will improve the security of supply in the south of Macedonia. This project will include a new major 400kV substation at Ohrid in the south of Macedonia near to the Albanian border.

3.4.4. Security of Supply Operations

In real time operation MEPSO exchange data in accordance with OAs signed between MEPSO and neighbouring TSOs. MEPSO monitor P, Q, A, BB voltage, f and LFC, generation and load for MEPSO observability area. In case of potential violations of security limits MEPSO exchange information NDC-NDC or via EAS installed in NCC. Also we use ancillary services, redispatching, network reconfiguration in accordance with directions described in Defence plan (remedial actions).

In real time operation using SCADA/EMS network applications MEPSO performs additional N-1 simulations prior to the application of important topology changes by maneuvers (opening line, opening bus-bar coupler) and after a relevant unexpected change of topology or a significant shift of the generation pattern (e.g. Units tripped or out of operation).

In accordance with Operational agreements signed with the all neighboring TSOs the transmission line protection devices are agreed by both Parties and confirmed in written form - OAs.

MEPSO, as the TSO, is responsible for disturbance management in accordance with Defense Plan, in order to secure electricity supply to the customers connected on transmission grid.
In practice, the Top-down and bottom-up scenarios existing in our Defense plan.

For realization of Bottom-up scenario we have enough generating units with black-start capability.

The realization of Top-down scenario is in accordance with OAs signet between neighboring TSOs with external voltage thru the interconnection lines.

To prevent voltage drop, there is a provision (Defense plan) 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.

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

Also, MEPSO reserves the right to perform load shedding (either manually or automatically according to the voltage) in accordance with arrangements with the distribution companies.

In case of 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, 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.

A existing load shedding plan allow MEPSO to avoid total blackouts. The amount of load to be shed at each stage is defined by MEPSO 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 TSO.

As a signatories to the MLA, the participation of MEPSO in RSCIs is mandatory, especially in terms of security assessment at the regional level through the services defined within RSCIs. MEPSO in 2017 has signed an Agreement with SSC Belgrade.

The subject of procurement are the following services described in MLA:

1. Improved Ind. Grid Models (IGMs) / Common Grid Model (CGM) Delivery
2. Coordinated Security Analysis
3. Coordinated Capacity Calculation
4. Short and Medium Term Adequacy- SMTA
5. Outage Planning Coordination

3.5. DISTRIBUTION

3.5.1. Security of Supply Investments

Since entering the electricity market in 2006, EVN has already invested substenatial resources into the distribution system. During the period 2017-2019 EVN has maintained the grid in accordance to the high level standards and has invested into the grid in order to provide secure and quality of electricity delivery. In the past 2018 EVN has constructed new 265 km law, midium and high voltage lines. Also 45 new substations have been built. Several projects can be point out which have contributed to the security od supply and improving of the conditions to the distribution grid such as: new midium voltage cablesZapad-Saraj and Skopje 1 –
Radishani, increasing of the installed power of TSSaraj, TSKumanovo 1, TS Bitola 4, TSKozle, TSDemirKapija, etc.

In the next period EVN plans to construct new TSCentralna 110/10 (20) kV and two new 100 kV lines and more projects to further modernise the network from which will benefit the existing and the potential new users of the system.

The total number of measurement points now are 741,867. From this amount big consumers on free electricity market are 8,784, small tariff consumers are 61,682, households are 658,687 and small consumers on free market are 12,714.

3.5.2. Dispatching

The management of the electricity distribution systems in Macedonia is performed by EVN via a single dispatch centre in Skopje.

All 110 kV and 35 kV transformer stations are remotely monitored by SCADA equipment which also monitors the small hydro plants owned by EVN.

Radio links provide rapid transfer of data and voice information and the system incorporates a computer Distribution Management System that controls maintenance as well as distribution control.

4. MACEDONIAN NATURAL GAS SYSTEM

4.1 Regulatory framework in gas sector

The Law on Energy (Official Gazette of Macedonia No. 96/2018 and 96/2019), is the primary piece of legislation that regulates the domestic energy sector. The Energy Law is aligned with the prerogatives of the Third EU energy package on electricity and gas and Directive “on the promotion of the use of energy from renewable sources”:

- Directive 2009/72/EC concerning common rules for the internal market in electricity and Regulation 714/2009 on conditions for access to the network for cross-border exchanges in electricity
- Directive 2009/73/EC concerning common rules for the internal market in natural gas and Regulation 715/2009 on conditions for access to the natural gas transmission networks,
- Directive 2005/89/EC concerning measures to safeguard security of electricity supply and infrastructure investment
- Directive 2004/67/EC concerning measures to safeguard security of natural gas supply,
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources and
- Regulation 543/2013 on submission and publication of data in electricity markets.

Pursuant to the above quoted directives and regulations, the Law establishes effective legal framework for cooperation, mutual reporting and coordination of the activities of the competent authorities of the country with the relevant institutions of the Energy Community in relation to the obligations for reporting on security of supply, coordinated management in crisis situations, reporting on the imposition and monitoring of the fulfillment of the obligations for providing public and universal service and the possibility for coordinated activities regarding the functioning and the development of regional energy markets, especially in the allocation of interconnection.
capacity, balancing and managing third party access to energy systems.

The main reforms arising from the new Energy Law are: separation and certification of the electricity transmission system operator and natural gas transmission system operator, establishment of a concept for universal service for electricity and public service in natural gas, full liberalization of the market of electricity from the beginning of 2019, as well as increasing the competences and independence of the ERC.

4.1.1. Secondary legislation

As stipulated in the Energy Law, a number of secondary legislative acts have been enacted to further formulate and refine the legal regime governing the performance of natural gas activities. In what follows, we shall give a concise account of these acts and the issues they respectively address.

The Natural Gas Transmission Grid Code

Pursuant to the Article 123 of the Energy Law, the natural gas TSO is obliged to adopt (within 1 yer after adoption of Energy Law) and, upon previous approval from the Energy Regulatory Commission, to publish in the “Official Gazette of Macedonia” and on its website the Natural Gas Transmission Grid Code, one year after the entry into force the Energy Law.

Because of the status quo with the gas TSO, the existing Grid Code for transmission of natural gas was prepared by AD GA-MA, the natural gas transmission system operator, which was approved by the Energy Regulatory Commission on 30th of March 2009 (“Official Gazette of Macedonia” No 45/2009). However, GAMA did not amend the grid code in order to be in compliance even with the Energy law from 2011.

The natural gas transmission Grid Code specifically governs:

1) the technical and other conditions for safe and safe operation of the natural gas transmission system,
2) the technical and technological conditions and the manner of connection of the facilities, devices and installations of the natural gas transmission system,
3) the procedure for granting consent of the users for connection to the transmission network, as well as the cooperation and obligations of the transmission system operator,
4) the methodology for determining the fee for connection to the transmission network,
5) the conditions and method of access of a third party to the transmission system, as well as the manner of determining the guarantees for payment of the services for transmission of natural gas,
6) the manner of compliance with the users of the natural gas transmission system in cases of planned interruptions,
7) the contents of the plans for development and maintenance of the transmission system, as well as the manner and procedure according to which the system users submit the necessary data for the preparation of those plans,
8) the manner and procedure for forecasting the needs of natural gas, as well as the obligations of the users of the natural gas transmission system with regard to the supply of the necessary data necessary for the preparation of the forecasts for the needs of natural gas,
9) measures, activities and procedures in case of disturbances and accidents,
10) the functional requirements and the accuracy class of the measuring devices, as well as the manner of measuring the quantities of natural gas,

11) technical criteria for the provision of system services,

12) the manner and procedure for publication and allocation of the available transmission capacity and management of overloads in the natural gas transmission system,

13) the manner and procedure for access to installations and measurement-regulation stations that are integral part of the transmission system and are owned by consumers or users,

14) the quality of the services provided by the operator of the natural gas transmission system to the users,

15) the operation of the operational management systems,

16) the manner of publishing information that, in accordance with the provisions of this Law, is obliged to be published,

17) the manner and procedure for providing the information for users of the system, and

18) the manner of cooperation with the operators of the natural gas transmission systems to which it is connected, as well as with the operators of the distribution systems connected to the natural gas transmission system.

Natural gas supply rules

Pursuant to the Article 30 of the Energy Law, the ERC issues the Natural Gas Supply Rules. These rules determine the general terms and conditions governing the supply of natural gas, as well as the mutual rights, obligations and responsibilities of natural gas suppliers, customers, the operator of the natural gas transmission system, and the natural gas distribution system operators, and especially:

1) the conditions, the manner and the term of concluding the contract for supply with the appropriate type of energy,

2) the method of measurement, calculation, invoicing and recovery of the delivered energy,

3) consumers to whom the delivery can not be interrupted and the manner of providing guarantees for settling the expenses for the consumed energy,

4) the manner and procedure for changing the supplier by consumers and exercising the right to a consumer without compensation, to change the supplier,

5) the quality of services provided by energy suppliers,

6) the minimum conditions and the manner of organizational setup and technical equipment of the energy suppliers for providing communication with the consumers in order to provide the prescribed quality of the services provided by the supplier,

7) the supplier's obligations to the different categories of consumers and the specificity of each category of consumers in terms of their financial and negotiating ability,

8) the manner and procedures for communication and exchange of information between the energy supplier and the operator of the appropriate system in order to ensure the prescribed quality of the energy and services provided by the operators,

9) the conditions and the procedure for exclusion of consumers from the transmission or distribution systems in cases where consumers do not fulfill the obligations determined by law, other regulation and / or contract,
10) the manner, the form and deadline for submission of reports, which energy suppliers and the respective operators are obliged to submit to the Energy Regulatory Commission,

11) the necessary information that suppliers are obliged to provide to consumers in their accounts in a timely manner, as well as information that should be made publicly available and of interest to all consumers,

12) conditions and ways to supply vulnerable consumers, and

13) special measures for consumer protection.

The ERC issued the Natural Gas Supply Rules on 1st March 2019.

**Natural Gas Market Rules**

The Energy Regulatory Commission shall adopt (within 9 months after the adoption of the Energy Law) Rules for the natural gas market, based on the principles of transparency, non-discrimination and competitiveness, which are particularly regulated:

1) the organization and functioning of the natural gas market,

2) the conditions to be met by the participants in the natural gas market,

3) the elements of the agreements for participation in the natural gas market,

4) the establishment, organization and control of natural gas trading and ancillary services, including cross-border trading,

5) the procedure and the manner of collecting and submitting data to the Energy Regulatory Commission in relation to the condition state and occurrences with the natural gas market.

Natural Gas Market Rules were adopted on 18th June 2019 by ERC.

**Natural Gas Distribution Grid Codes**

As required under Article 132 of the Energy Law, the adoption (within 1 year after the adoption of the Energy Law) of the Natural gas distribution Grid Codes will specify:

1) the technical conditions for connection of natural gas consumers to the natural gas distribution system,

2) the methodology for determining the fee for joining the natural gas distribution system,

3) the conditions and the method of access of a third party to the system,

4) the technical and other conditions for the reliable and safe operation of the distribution system and for the provision of quality services to the users of the system,

5) measures, activities and procedures in case of outages and crisis situations,

6) the manner and procedure for supervision and testing of the natural gas distribution network,

7) the manner and procedure for regulating the flow and pressure of natural gas through the distribution network,

8) the manner and procedure for harmonization of the activities in the natural gas distribution system with the activities in the natural gas transmission system,

9) the functional requirements and the accuracy class of the measuring devices, as well as the manner of measuring the quantities of natural gas,
10) planning for the maintenance and development of the natural gas distribution system,

11) the manner of compliance with the users of the natural gas distribution system in cases of planned interruptions,

12) the content of the plans for the development of the natural gas distribution system, as well as the manner and procedure according to which the system users submit the necessary data for the development of the development plans,

13) the quality of the service for the delivery of natural gas,

14) the forecast of the needs of natural gas, on the basis of the data obtained from the suppliers and the plans for the development of consumers,

15) the manner and procedure for providing information to the users of the system, and

16) the manner of cooperation with the transmission system operator and other operators of natural gas distribution systems.

The Tariff Systems

The Energy Regulatory Commission for the purpose of exercising its competence will adopt the tariff systems for transmission and distribution of electricity and natural gas and distribution of heat, as well as for the services provided by the gas market operator and the operator for the natural gas market, shall determine the manner of establishing the tariffs for regulated services determined by applying the appropriate methodologies referred to in Article 28 of the Energy Law.

ERC adopted the tariff systems in December 28th 2018.

Certification Rulebook

The Energy Regulatory Commission for the purpose of exercising its competence also adopts Rulebook on Certification of Transmission System Operator and Transmission System Operator of Natural Gas.

The Rulebook on Certification of Transmission System Operator and Transmission System Operator of Natural Gas was adopted on 1st August 2018.

4.1.2. Cooperation measures

Pursuant to Energy Law paragraphs (6) and (7):

In order to achieve security in the supply of electricity and natural gas in crisis, the competent authorities and the entities performing energy activities, within their rights, obligations and competences, shall cooperate with the appropriate competent authorities and entities performing energy activities from the other contracting parties and participants in the Energy Community Treaty and undertake measures for:

1) coordination and harmonisation of national crisis measures;

2) identification and, where necessary, development or upgrading of electricity and natural gas interconnections;

3) assistance and cooperation in crisis or disruptions in the energy supply with international and regional security supply centres and

4) determination of the conditions and methods for mutual assistance.

The Government shall notify the Energy Community Secretariat and the other contracting parties of each type of regional cooperation stipulated in paragraph (6) of this Article.
4.1.3. Measures to cover peak demand

Pursuant to Energy Law Article 78 paragraph (2) point (25):

The electricity transmission system operator shall be obliged, in accordance with this Law and the regulations and rules adopted on the basis of this Law, among other things to address peak loads in the electricity transmission system, pursuant to the Electricity Transmission Grid Code.

Pursuant to Energy Law Article 116 paragraph (2) point (20):

The natural gas transmission system operator shall be obliged, in accordance with this Law and the regulations and rules adopted on the basis of this Law, among other things to address peak loads in the natural gas transmission network, pursuant to the Natural Gas Transmission Grid Code.

4.1.4. The regulatory incentives for new investment

The Energy Law in Article 83 paragraph (3) prescribes that:

For each regulated period, the electricity transmission system operator shall prepare and submit for approval to the Energy Regulatory Commission investment plans in the electricity transmission system, in which, as a result of the investments foreseen, the following should be shown:

1) the expected increase in the efficiency of the operation of the electricity transmission system by reducing the losses of electricity and

2) improvement of the quality of the delivered electricity from the electricity transmission network and in Article 117 paragraph (3):

For each regulated period, the natural gas transmission system operator shall prepare and submit for approval to the Energy Regulatory Commission investment plans in the transmission system, in which the expected increase in the efficiency of the system operation in particular should be shown as a result of the foreseen investments.

4.2 KEY MARKET PARTICIPANTS AND THEIR RESPONSIBILITIES

As it has already been stressed, the Energy Law has set up the prerequisites for the full opening-up of the natural gas market in Macedonia by regulating all issues related to the legal and financial aspects pertaining to the performance of natural gas transmission, transmission system operation, distribution and supply activities. In the next sections, we shall present a concise account of the key participants in the domestic natural gas sector and describe in brief their respective functions and tasks.

![Natural gas market scheme in Macedonia](Picture. Natural gas market scheme in Macedonia)
The Natural Gas Transmission System Operator (JSC GA-MA) shall:

- maintain, upgrade and expand the natural gas transmission network, manage the natural gas transmission system, and provide connection to other systems, including the systems for the transmission of natural gas. The transfer of natural gas to other countries for the transfer of natural gas, upon prior approval by the ERC, prepares and publishes the rules for balancing the natural gas transmission system, which should be objective, transparent, non-discriminatory and market-oriented, and to reflect the needs of the system, taking into account the recycling of the property owned by the natural gas transmission system operator, upon prior approval by ERC, adopt and publish rules for allocation of cross-border transmission capacities,

- charge fees for access to the transmission system of natural gas, which are determined on the basis of the tariffs approved for ERC, whereby the fees for each entry point or exit from the transmission system that the operator charges for users of the natural gas transmission system are are determined in accordance with the mechanisms and methodologies. In addition, the law stipulates that the rules of the ENTSO-G network are regarded as accepted and applied directly by the operator of the natural gas stopping system in accordance with the obligations of Macedonia undertaken with the ratified international agreements, as well as the obligations of the operator ENTSO-G membership. This provision applies after the entry of the natural gas stopping system operator to ENTSO-G.

The Natural Gas Market Operator (none)

Is a company that carries out activities related to the organization, efficient operation and development of the organized natural gas market and is obliged to provide confidentiality of the commercial data that the participants in the natural gas market submit. ERC in cooperation with the natural gas market operator and the natural gas transmission system operator shall adopt rules for the natural gas market that regulate the organization and functioning of the market, the conditions that market participants should fulfill, the elements of the contracts for the participation in the market, the establishment, organization and control of natural gas trading and ancillary services, including cross-border trading, as well as the procedure and the manner of collecting and submitting data to the ERC in relation the situation and the phenomena on the market. Until the establishment of a market operator, this function will be performed by the operator of the natural gas transmission system.

Natural Gas Distribution System Operators (DTIRZ, JP Kumanovo-Gas, JP Strumica gas)

Is the operator of the natural gas distribution system for a certain area of the territory of Macedonia in which it distributes natural gas, maintains and, when economically viable, upgrades and expands the distribution system it manages and connects to the natural gas transmission system. The natural gas distribution system operator shall be obliged to:

- develop, upgrade and maintain the system it manages and ensure the long-term ability of the system to meet the justified requirements for the distribution of natural gas,

- ensure reliable, reliable, economically viable and safe operation of the system, to ensure safe, safe and quality delivery of natural gas in a non-discriminatory and transparent manner and in accordance with the prescribed quality,

- to integrate the consumers of the distribution network and to provide access to a third party for the use of the system,

- publish a list previously approved by ERC, with allowances for each category of consumers,
- to harmonize the operation of the natural gas distribution system with the operation of the natural gas transmission system gas,
- upon prior approval by the ERC, to adopt and publish the Grid Code for distribution of natural gas for the system it manages,
- to measure the quantities of natural gas that it undertakes and delivers to the users of the system it manages, with measuring devices , in accordance with this Law and the network rules for distribution of natural gas.

**Natural Gas Suppliers** (Makpetrol Prom Gas main supplier, DSOs etc.)

Form another important category of participants in the domestic natural gas market. The natural gas supplier purchases natural gas in Macedonia and / or from abroad for the purpose of selling its customers, including electricity and / or heat producers, other suppliers, traders, operators of natural gas transmission or distribution systems and other participants natural gas market. The supplier who has committed to deliver natural gas provides the necessary transmission and / or distribution capacity of the respective operators. The supplier, on the basis of the performed measurements from the appropriate distribution system operator, invoices his consumers for the delivered natural gas at the agreed price, including in the invoice the fees for using the transmission system, the fee for using the natural gas market and / or the fee for using the distribution system.

**Natural Gas Supplier With a Public Service Obligation**

Is selected on the basis of a tender procedure conducted by the Government. If a tenderer with a public service obligation is not selected in the tender procedure, the Government shall, on a proposal from the Ministry, the opinion received from the ERC makes a decision on the appointment of a natural gas supplier with a public obligation. The natural gas supplier with a public service obligation shall:

- inform consumers about their rights and conditions for delivery of natural gas within the public service,
- apply the price of natural gas established in accordance with the Tariff System of today ERC ,
- to inform consumers about the conditions for supply and price of natural gas, and to inform them that they have the right to choose another supplier of natural gas,
- to supply them with natural gas, as a public service, households and small consumers of natural gas gas within the territory for which it has a license to provide a public service for the supply of natural gas,
- to procure natural gas under market conditions and to select the best offer that enables it to provide efficient provision of the public service,
- publish it on its website supply prices within the public service for the supply of natural gas.

Natural gas prices charged by a natural gas supplier that has a public service obligation should be objective and transparent, reflect costs in terms of supply and supply of natural gas, are easily comparable to those of other natural gas suppliers, discriminate against consumers of the same category.

**Natural Gas Supplier of Last Resort** (DSOs)

Is obliged to supply consumers who have not been provided with a natural gas supplier in the event that:

- the previous supplier has stopped fulfilling its obligations for supply within the existing supply contracts,
- a bankruptcy procedure has been initiated or liquidation procedure of the previous supplier,

- the license of the previous supplier has been suspended, permanently revoked or terminated, and

- the consumers have not concluded a new natural gas supply contract after termination or and the expiration of the existing supply contract.

The natural gas supplier, of Last Resort, sells natural gas at market prices, which it publishes on its website and updates at least once a month and has the right to request an instrument for securing payments from consumers, other than households and small consumers. After the conducted tender procedure, the Government shall make a decision on the election of the supplier with the obligation to provide a natural gas supply of Last Resort.

**Natural Gas Consumers**

Can, at their option, be supplied with natural gas from a supplier, in accordance with the conditions laid down by this Law and the rules for supplying natural gas, whereby consumers who meet the conditions for independent participation in the natural gas market can to acquire natural gas from natural gas traders. Consumers who fulfill the conditions for independent participation in the natural gas market can purchase natural gas from a supplier or trader registered in another country that has acceded to all valid international agreements in the field of natural gas that the Macedonia has ratified, provided that such supplier to comply with the applicable rules shall comply with the regulations and rules adopted pursuant to this Law.

The natural gas market is fully liberalized starting from 1st of January 2015.

### 4.3 THE EXISTING NATURAL GAS SYSTEM

#### 4.3.1. Transmission and distribution

Macedonia has neither indigenous natural gas resources nor a gas storage facility and all gas is imported from Russia (via Bulgaria, Moldova, Romania, and Ukraine) through a single transmission line that crosses the Bulgarian border at Deve Bair.

The pipeline was constructed in 1997 and runs almost 98 km to Skopje, connecting KrivaPalanka, Kratovo, and Kumanovo on the way. The installed capacity is 0.8 bcm/y at 54 bar with a possibility of an upgrade to 1.2 bcm/y at a higher pressure. The present throughput capacity is 145,000 m3/h.

The existing natural gas network is concentrated in the northern part of Macedonia and mainly serves the Skopje area.
Table. The Natural Gas System in Macedonia

<table>
<thead>
<tr>
<th>Pipeline</th>
<th>Length (km)</th>
<th>Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgarian border to Skopje</td>
<td>1582</td>
<td>500</td>
</tr>
<tr>
<td>Klecovce- Shtip branch</td>
<td>61</td>
<td>500</td>
</tr>
<tr>
<td>KrivaPalanka branch</td>
<td>1.5</td>
<td>100</td>
</tr>
<tr>
<td>Ginovci branch</td>
<td>1.7</td>
<td>100</td>
</tr>
<tr>
<td>Kratovo branch</td>
<td>4.6</td>
<td>100</td>
</tr>
<tr>
<td>Kumanovo branch</td>
<td>7.0</td>
<td>200</td>
</tr>
<tr>
<td>Skopje South branch</td>
<td>8.3</td>
<td>400</td>
</tr>
<tr>
<td>Skopje North branch</td>
<td>1.3</td>
<td>300</td>
</tr>
<tr>
<td>TIDZ – Bunardzik branches</td>
<td>5.6</td>
<td>200</td>
</tr>
</tbody>
</table>

The system has eight main branch points from the main line and 52 pressure reduction stations, 3 metering stations, 7 valve stations and a pig launching station.

In 2018, JSC GAMA (TSO) continued the construction of a gas ring around Skopje connecting more major customers from the public sector and industrial plants. The gas ring will also serve the planned distribution system in Skopje, which is in the process of being tendered for construction. The gas ring is operated by GAMA and operates at a pressure of 12 bar. At present, some 6.5 km still needs to be constructed. The original plan was that JSC GAMA would pay the connection charges for any new customers on the distribution system. This offer is no longer available, as GAMA does not have sufficient funding. New customers will have to pay for their own connection costs.

Transmission system operator, JSC GAMA, is jointly controlled by Makpetrol and the state, operating 98 km of the main transmission pipeline and 82.9 km of branch pipelines.

There are three distribution companies, in Kumanovo with gas network length of 15 km that supplies 24 public and legal entities and cca 50 households and DTIRZ (Directorate for Technological Industrial Development Zones, Skopje) with 5.2 km gas network length serving 8 big industrial consumers. There is also a small usage of natural gas in the Strumica region with gas network length of 33 km in the south of the country where compressed gas (CNG) is supplied by road from Bulgaria. The customers are 14 public buildings, 20 commercial and 250 households. Pursuant to the Energy Law these DSOs have also the licence for natural gas supply and supply of last resort.

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2 This length does not include the recent developments in the gas sector in Macedonia starting as of 2016 where 204 km of main gas pipeline is under construction till 2020
4.3.2. Consumption

The heavy seasonal consumption is apparent with most of the gas used for heating and CHP plants in the winter (79%). The small industrial load is maintained throughout the year (19%). A winter disruption would obviously have the most economic and social impact.

The contribution of natural gas to the overall energy consumption has not increased significantly over the past decade. Gas accounts for less than 6% of the country’s energy supply. According to the annual GAMA reports, in 2018 gross inland consumption was 0.253 bcm of which over 79% was consumed in heat and CHP plants. Only a minimal amount 2 % is supplied to residential customers.
4.3.3 Market operations

The gas market operations are, for all practical purposes, controlled by JSC GAMA (a joint venture between the company JSC Makpetrol and the State) supervised by the Energy Regulatory Commission and finally by the Government of Macedonia.

The precise division of the ownership of GAMA is still the subject of a longstanding legal dispute. At present, operations are based on an agreement that sets ownership at 50/50 between the two parties.

Due to its involvement in both transmission and supply (trade), JSC Makpetrol is an important player in the market.

According to the Implementation Report prepared by the Energy Community Secretariat, the present organisation of GAMA is in line with Second EU Energy Package on Gas, but it not fully compliant with the most recent Gas Directive (Directive 2009/73/EC). At present, the TSO is GAMA, which is a separate legal entity. However, one of the GAMA shareholders, Makpetrol, operates as the sole importer of Russian gas and owns a daughter company Makpetrol Prom Gas, which supplies customers and is subject to public service obligations. This means that a vertically integrated company is involved in both supply and transmission system operations, which contravenes the unbundling requirements of Third EU Energy Package on Gas. Pursuant to Energy Law.

ERC have issued 16 licenses for natural gas trading and 8 for natural gas supply. As already mentioned, there are also 3 licensees for distribution system operations: DTIRZ, Kumanovo-Gas (both supplied by Prom Gas) and Strumica Gas (using CNG traded from Bulgaria via road) with incorporated licencees for natural gas supply. Beside Makpetrol as a trader, presently JSC TE-TO, JSC ELEM Energetika, TE-TO Gas trade and JSC Toplifikacija (BEG) have made supply contracts directly with foreign natural gas trading companies.

JSC MER is 2010 established state-owned company (100%), Macedonian Energy Resources (MER) for performing energy activities for the purpose of realization of project of construction and development of National gas pipeline system in Macedonia.

At the beginning of 2012, Macedonian Energy Resources (MER), applied for a TSO licence based on the 2011 Energy Law. This licence is based on the planned expansion of the Macedonian natural gas transmission system and has not yet been issued. ECS in that time had an opinion that the whole process of the license issuing and certification of the JSC MER should be conducted after the adoption of the Third Energy Package in Macedonian legislation.

Makpetrol Prom Gas supplier issues annual contracts to the customers, while JSC Makpetrol is operating a medium term contract with Gazprom revised on annual basis. It is understood that the Macedonian companies pay Gazprom directly at the Bulgarian border without the intervening transit fees.

4.3.4 Planned expansion of the National gas system

There are plans to expand the gas distribution system throughout Macedonia. According to a feasibility study conducted in 2010, the total annual natural gas demand in 2030 could be 1.84 bcm compared to the present annual consumption of 0.25 bcm.

The 2010 feasibility study allows for the construction of several pipeline projects to complete the national distribution system.
Planned expansion of the natural gas system

On another plane, given that one of the major challenges facing the Macedonia revolves around the need to strengthen the use of alternative fuels, important legislative developments have taken place in order to expand the existing natural transmission and distribution networks.

In June 2016 JSC MER has finished the construction of the main gas pipeline, Lot1: ,,Klecovce-Block Stanica 5(near city of Shtip)" that was financed through funds provided by the “Agreement between the Government of Macedonia and the Government of the Russian Federation for regulation of obligation of foreign SSSR upon the calculations related to the stock exchange between foreign SSSR and foreign SFRJ”.

The total lenght of the Lot1’ ,,Klecovce-Block Stanica 5(Shtip)" is 61km.

In 2015 the Macedonian Government with a loan from Comercial Banks, Erste Bank and Deutche Bank, started financing the project “National Gasification system in Macedonia - Phase 1 - section Stip - Negotino - Bitola (length 127km) and section Skopje - Tetovo - Gostivar “(length 76 km), as the first phase of construction of the National Gas Transmission System in Macedonia. The construction is planned to take place in the period 2016 –2020.

Lot1”:In August 2016 started the construction of the Section,,Valve station 6(Shtip)-Negotino" with total length 36km(finished ongoing test period prior commissioning&start up).
Lot5: In April 2017 started the construction of the section „Skopje - Tetovo – Gostivar” with total length 76 km commissioning&start up beginning of 2020(40%done).

Lot2: In April 2017 started the construction of the section „Negotino(Kavadarci)-Prilep - Bitola” with length 92 km, commissioning&start up 2020(55% finished).
So far, only part of Lot 1, Lot 2 and Lot 5 has been approved by the Government.

The funds for the construction of the remaining sections of the gas pipeline system in Macedonia are expected to be provided by international financial institutions, CEB, European Investment Bank, European Bank for Reconstruction and Development, WB, KfV and other.

In the course of 2019, the construction of the national gas pipeline system is planned to start with the following activities in relation to future projects:

1. Project for gasification of Macedonia - Phase 1;
2. Commissioning of the gas pipeline in Macedonia - Section Block station 5 - Negotino and connection of the first connections to the pipeline;
3. Commissioning of the gas pipeline in Macedonia - Section Klechovce-Blok station 5;
4. Future projects for the construction of national gas pipeline system;
   1. Interconnection pipelines with the neighboring countries;
   5. International gasification projects and regional cooperation;
   6. Activities for performing energy activity and management of the system for transmission of natural gas and natural gas.

JSC MER Skopje in cooperation with the Ministry of Finance will additionally determine concrete items regarding the realization of these projects and will be adopted in appropriate procedures.

Plans for further connections to the international gas transmission pipeline network are yet to be finalized. The 2010 Feasibility Study proposes six possible interconnection points: two to Greece, one to Bulgaria, and single connections to Serbia, to Kosovo and Albania.

In accordance with the development of international gas pipelines there are several possibilities for interconnection of the gas pipeline system of Macedonia, with
TESLA, TAP (Trans Adriatic Pipeline), Turkish Stream, LNG terminals in Greece and with the neighbors through CESEC and PECI/PMI Projects.

4.3.5 Distribution system

During 2014 and 2015, a feasibility study was also carried out on the possibility of establishing a public-private partnership (PPP) for developing a local distribution system for Skopje and further systems for the East and West regions of Macedonia.

The separation by region is made in proportion to the available consumption (orientation) and the same regions are almost identical.

![Picture 4. Available consumption for development of distribution network](image)

The Government have estimated that the potential heat market, which could be connected to the Skopje system, would be 1720 GWh/y, equivalent to 0.190bcm of natural gas. If this were to be achieved, it would account for over 50% of the Skopje heating demand. At present, JSC GAMA has enough pipeline capacity to cover this increased gas flow. The required investment cost for Skopje Region is estimated at EUR 98 million.

The investment costs involved would be EUR 27.5 million for the East for the construction of a 220km network over four years and potential consumption of 0.100bcm of natural gas.

The Western region would require an investment of EUR 22.2 million for a 180km system over four years and potential consumption of 0.100bcm of natural gas.

In February 2019, the Government adopted the Decision to initiate the procedure for awarding an agreement for the establishment of a public private partnership for the financing, design, construction, management, maintenance and development of the natural gas distribution system in Macedonia. In April 2019 a commission was formed in aim to prepare the needed tender documentation for the public call. The procedure for awarding the contract for the establishment of a public private partnership for the financing, design, construction, management, maintenance and development of the natural gas distribution system in Macedonia will be conducted as a procedure for a competitive dialogue in accordance with the Public Procurement Law. During the process through the competitive dialogue, the offerers will have the opportunity to offer an appropriate solution, with the project being able to be realized at some stage, and the offerers to give a technical solution that will be evaluated in the second phase of the procedure, and in the third phase of the accepted technical decision that will include scope, conditions and duration of the concession period, the bidders should submit the economically most favorable bid.
Natural gas demand

When these plans are completed, the forecast natural gas demand has been estimated by the feasibility study and is outlined in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>0.095</td>
<td>0.170</td>
<td>0.310</td>
</tr>
<tr>
<td>Commercial/public services</td>
<td>0.043</td>
<td>0.070</td>
<td>0.095</td>
</tr>
<tr>
<td>Industry</td>
<td>0.140</td>
<td>0.210</td>
<td>0.335</td>
</tr>
<tr>
<td>Total end users</td>
<td>0.280</td>
<td>0.450</td>
<td>0.740</td>
</tr>
<tr>
<td>Power generation</td>
<td>0.930</td>
<td>1.100</td>
<td>1.100</td>
</tr>
<tr>
<td>Grand Total</td>
<td>1.210</td>
<td>1.550</td>
<td>1.840</td>
</tr>
</tbody>
</table>

Source: Executive Summary of Feasibility study for the gas pipeline system in the country (2010)

This substantial increase in gas demand, all of which would be supplied from one connection and one supplier, would obviously have serious implications for the security of supply. The effects of a disruption would be much more damaging and costly.

Still MER JSC has conducted market survey and has reviewed the forecast of the total consumption of natural gas from the Feasibility study for the National gas pipeline system (2010) with the following results:

Chart: Future gas consumption by conducted market survey by MER JSC

Financing

EBRD in their letter from 30th of May 2018 has expressed interest to be financing institution to provide funds for the preparation and implementation of the gas distribution network project. Because the Project is of Governments key priority investments EBRD express readiness to mobilize internal funds for technical assistance for project preparation, design and implementation, including capacity building of the implementing entity.

4.4. SECURITY OF SUPPLY

4.4.1. Background of 2009 crisis

In January 2009, the South Eastern European region including Albania, Bosnia Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Serbia and
Kosovo suffered from a disruption of the flow of Russian gas supplied through the Ukraine. The disruption in supply coincided with a period of particularly cold weather and severely affected a region already suffering the adverse effects of the economic crisis. The region is supplied from Russia through three different transit routes. Romania, Bulgaria, Greece, and Macedonia take gas directly from the Ukraine. Serbia and Bosnia Herzegovina are also supplied from the Ukraine, but the connection is through Hungary. Croatia takes the gas through Austria and Slovenia. As the three systems are not connected, there could be no cooperation in the event of a major disruption.

Of all the States in the region, Bulgaria and Macedonia are particularly vulnerable to interruption from the Ukraine as these countries are 100% reliant on Russian gas. Bulgaria has a very small gas storage capability of just a few days, whilst Macedonia has no gas storage facilities. Most of the other Balkan States now have gas storage and interconnection facilities to enable them to cope with any gas supply interruption of up to two months.

Bearing in mind the present political difficulties between Russia and the Ukraine, another disruption in natural gas supplies is possible. Only the development of alternative cross-border connections and gas storage facilities will improve the security of gas supply.

The cancellation of the South Stream project whereby a Russian pipeline route would cross the Black Sea and make landfall in Bulgaria has put on hold the Macedonian plans to connect to this system. Officially, the project is closed, but it may not be necessarily completely dead. The original plan to connect a Black Sea pipeline may still be viable. The planned South Stream components can be used to build an alternative route via a landfall in Turkey to transport large amounts of gas to Southern Europe. A great deal of design and feasibility work has already been done on these routes. It is interesting that a flow of 63 bcm has been mentioned for an alternative route – the same volume as would have been provided by South Stream. Of this, 13bcm would go to Turkey and a further 50 bcm to a Greek border hub for further distribution.

If a new gas hub were to be created in Turkey, then Bulgaria and Romania could be supplied merely by reversing the flow in existing pipelines.

Other promising routes are the Trans-Adriatic Pipeline (TAP), which would bring Azerbaijani gas to Italy via the Balkans, and LNG imports via a proposed terminal on the Croatian island of Krk (which now looks increasingly likely) and an existing and planned LNG facility in Revithoussa and Alexandropolis in Greece.

These sources of supply can in no way be seen as alternatives to South Stream as their combined flow rates will be much less. The TAP will initially provide 10 bcm and the Krk terminal up to 6bcm and it is likely that Russian gas will maintain a price advantage.

### 4.4.3 Supply crisis management

Since 2009, the Government has taken steps to manage a gas supply interruption. The Ordinance on Natural Gas Supply Crisis published in 2013 allows a committee to be formed in the event of a supply interruption. This committee is established under the leadership of the Minister of Economy and is comprised of two officials from the Ministry of Economy and representatives from the system operator for natural gas, the distribution companies, gas traders, suppliers, and the Energy Regulatory Commission. In the event of an interruption, the committee assembles, evaluates the crisis together with the Centre for Crisis Management, and informs the government. The new Ordinance updated in accordance to the new Energy Law is in the process of adoption.
This Ordinance, which implements the provisions of the Directive 2003/55/EC concerning the specific customers (households) and protecting measures during the natural gas crisis, enumerates the protected natural gas consumers as follows:

- households;
- hospitals, clinics and special health institutions (first aid emergency stations, blood transfusion centres, dialysis centres and other health institutions);
- facilities of special interest to the economy, lives of people and defence of the country,
- care centres for elderly persons,
- kindergartens, and
- zoos.

It further sets the criteria for proclaiming crisis situation in supply of NG, namely:

- reduced import,
- extremely low temperatures in uninterrupted duration of five days,
- periods of extremely high consumption of gas during winter months.

Moreover, it obliges natural gas suppliers to lay down in the supply contracts they sign the minimal needed quantities of natural gas. For present purposes, minimal quantities are considered the contracted quantities between the suppliers and consumers. Moreover, the natural gas suppliers of protected consumers are obliged to inform the natural gas traders about the minimal quantities for protected consumers for the subsequent year not later than 1 October (in the current year)

The measures to be taken are ranked into 11 levels according to the severity of the supply situation. The measures start with a reduction of all deliveries from the transmission system excepting the CHP plants and district heating systems, which are regarded as the priority. The next step is to disconnect all consumers that have a dual fuel capability and are able to switch to an alternative fuel.

Finally, a gradual reduction of supplies can be made whilst maintaining deliveries to the CHP plants, district heating and protected consumers as long as possible.

Macedonia now participates in the Security of Supply Coordination Group and the Gas Subgroup under the Energy Community.

The Secretariat of the Energy Community participates in the EU Gas Coordination Group.

4.4.4. Impact of future disruptions

During the summer of 2014, a stress test was carried out under four possible scenarios.

- Disruption of the Ukrainian route to the EU during a period of 1 month (1.2.2015-28.2.2015)
- Disruption of the Ukrainian route to the EU during a six month period (1.9.2014-28.2.2015)
- Disruption of all Russian supplies to the EU during a period of 1 month (1.2.2015-28.2.2015)
- Disruption of all Russian supplies to the EU during a sex month period (1.9.2014-28.2.2015)

Bosnia and Herzegovina, the Republic of Macedonia, Moldova, and Serbia would be among the countries most affected in case of supply disruptions of gas in Europe.
This is a returning message of any of the ENTSOG simulations. Within a few days (at most weeks), in all the analyzed scenarios, the availability of gas would be reduced by between 80%-100%, in these countries, with the exception of Serbia.

Domestic production covers in Serbia 1/4 of demand. Another 1/4 of demand can be covered from storage facilities. In Serbia, the gas storages reached a level of almost 500 million cubic meters already in August 2014 which, together with domestic production, would allow for undisturbed supplies to households and some plants producing heat from October until February when the storages start to be depleted.

Those Contracting Parties which lack sufficient storage possibilities to cover the shortfalls raised the issue of the difficulties to find gas storage capacities within the EU and import gas from abroad in case of disruption scenarios. These difficulties include a lack of clear Third Party Access rules (implemented in terms of the 3rd Energy Package) on the interconnection points with the EU Member States, lack of available quantities or discriminatory pricing for the transport of gas from the storages or simply lack of clarity and trust on whether they would be able to use the quantities stored in the storages of the EU Member States and access them in case of a supply crisis.

Since gas storage and domestic production would provide none or only limited relief in the event of supply disruptions, all Contracting Parties analyzed the potential demand side measures to be taken in order to cover the potential shortages of gas. The biggest potential for such measures is in the Republic of Macedonia and Bosnia and Herzegovina where households consume only relatively small parts of gas (20%) and demand side measures can take place on the side of the industry. However, a general conclusion can be drawn that the exact potential of such demand side measures is not fully known to the Contracting Parties and regulation of energy prices for industry prevents deployment of market based demand side measures.

An important demand side measure is the possibility of fuel switching from gas to fuel oil for district heating plants (up to 30% of winter daily demand in Serbia and Bosnia and Herzegovina and up to 2/3 in the Republic of Macedonia) or switching from gas to electricity. For example in Moldova gas is consumed mainly in district heating and by households (76% of total gas consumption) and its power generation is mainly gas fuelled (80% of electricity production). In view of this situation, i.e. difficulty in reducing gas consumption due to low level of consumption by the industry, Moldova will need to rely on switching to fuel oil for heating and switching electricity production from gas to coal.

Nevertheless fuel switching may not take place in industrial sectors where consumers are not prepared for switching and lack the appropriate equipment. Moreover, as regards fuel switching and switching to electricity, an important logistical problem arises: namely the lack of significant oil stocks for heating purposes (in Serbia, Moldova and Bosnia and Herzegovina) and coal stocks (in Moldova) for electricity production. Some of the Contracting Parties raised the issue of the lack of financial resources to increase the stocks.

National infrastructure capacities are very limited and prevent a flexible flow of gas and diversification of sources. The new interconnector Iasi – Ungheni between Romania and Moldova is not yet used (except only for the Ungheni district (1-3% of the total consumption)) and the interconnector Serbia-Bulgaria did not enter yet in the construction phase. These limited infrastructure options, a regulatory framework that does not allow the use of the existing infrastructure flexibly, as well as the lack of a developed gas market result in a situation where any disruption of gas from Russia and/or disruption of gas through Ukraine has a very serious impact including on household consumers in those Contracting Parties.
Recommendations

While the general recommendations made in the Communication are also to be applied for the Contracting Parties in this region, the Commission considers, in the light of the previously discussed results and assessments, the following specific recommendations particularly relevant for the concerned Contracting Parties:

Common recommendations to all Contracting Parties

1. Full use of infrastructure on market terms. Although in most of the Contracting Parties the provisions of the second energy package apply, more detailed rules of the 3rd Package will become applicable as of 1 January 2015. Full application of these rules will allow using the capacities of infrastructure to the full extent and flexibly, allowing for diversification of suppliers of gas and for the transport of gas for storages. An important pre-condition to apply the Third Package regime to infrastructure is effective implementation of unbundling. Therefore, the Contracting Parties needs to introduce unbundling as soon as possible.

2. Deregulation of gas and electricity prices for industry. When it comes to demand side measures targeting industry and power production, it is crucial to allow that the cheapest alternatives are being deployed first and therefore Contracting Parties need to allow for full market opening at national level for electricity and gas markets for industrial customers.

3. Examining in more detail the potential of the demand side measures. The Commission recommends examining in more detail the potential for demand side measures, both for district heating and for industry at the level of individual companies.

Such an examination should also include the potential of switching industrial consumers from gas to oil – a topic which has not been explored sufficiently at the company level.

4. Tackling the logistical problems that may occur in case of fuel switching. All Contracting Parties pointed to logistical problems that may occur in the event of fuel switching for heat and electricity production. Building up stocks of oil, anthracite and coal is a matter of time (and logistics) but not of a lack of supply – oil, anthracite and coal are abundantly available on world markets. The authorities should therefore urgently address this issue.

5. Establish convergence of the definition of protected customers. In order to effectively apply measures on the demand side and prevent free-riding, the Contracting Parties need to define first the level of consumption of protected customers using possibly converging definitions of protected customers. Since the Security of Supply Regulation 994/2010 does not apply in the Energy Community, the Contracting Parties could voluntarily make an attempt to converge these definitions. This would be a building block to transpose the EU acquis in the Contracting Parties in the next future.

6. Application of internal energy market rules on the flow of energy between the EU Member States and the Energy Community Contracting Parties. Given the limited options to cover potential gas supply disruptions and the lack of mechanisms and developed gas markets allowing self-regulating responses to a sudden drop in the supply of gas from single supply sources, the Contracting Parties are bound to cooperate on a regional basis and negotiate at the level of governments. Unfortunately, such cooperation is rather weak, in particular in the Balkan region. This is, to a great extent, a result of the missing dialogue with the EU Member States. Closer cooperation of authorities and the consistent application of the EU's internal market legislation on the borders between the Contracting Parties and the EU Member States are elements that could improve the security of supply in the Contracting Parties and the EU Member States. Positive examples include the solutions found around the reverse flow from
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Slovakia to Ukraine. However, more can be done, in particular as regards the supply in the Balkan region in particular as regards the use of pipelines between Hungary and Serbia and Romania and Moldova. In order to facilitate such cooperation with a formal act, the Commission is issuing, in parallel with this report, a Recommendation to the EU Member States to cooperate with the Contracting Parties in the application of the Third Package and on questions of security of supply. However this needs to be followed by the necessary negotiations that need to take place between the EU Member States and the Contracting Parties in the region on how to use the common infrastructure and on which terms in case of a crisis.

7. Developing of new infrastructure. Improving infrastructure and building interconnectors is a long term challenge. The Commission regrets the lack of progress in finalizing projects such as the interconnector between Bulgaria and Serbia and the construction of the Krk LNG terminal in Croatia that would allow for diversification options for the Western Balkan Region. The Commission therefore urges the parties concerned to rapidly address the outstanding hurdles to the realization of these projects.

8. Increase in the demand for electricity due to switching for heating purposes, and decrease in electricity generation due to difficulties in supply of coal and heating oil are a likely effect of the analyzed disruption scenarios and lowering of supply of gas. The Commission recommends monitoring of the situation of supply and demand of electricity at a regional and national level closely and take precautionary measures to ensure stability of grid and necessary back-up capacities in particular for nuclear power production.

Especially for Macedonia:

Gas consumption reduction plan. Due to a limited number of industrial consumers it is feasible to prepare for each individual industrial plant gas consumption reduction plans that could be applied in terms of emergency.

In parallel with the stress test, the Energy Department conducted a survey on the expected loss of supply to each consumer and their status as far as ability to switch to an alternative fuel. The results of the survey are set out in the table below.

| Natural gas disruption and alternative fuel availability – all figures in bcm: |
|---|---|---|---|---|---|
| Category                      | Loss of NG Feb 2015 | Loss of NG Sep to Feb 2014/15 | Alternative fuel options Feb 2015 | Alternative fuel options Sep to Feb 2014/15 | Plants with no alternative fuel |
| CHP                           | 0.0337              | 0.2089                         | 0.002                               | 0.010                           | 2 of 3                          |
| Heat plants                   | 0.0111              | 0.0511                         | 0.0111                              | 0.0511                          | 0 of 4                          |
| Industry                      | 0.00374             | 0.0190                         | 0.0028                              | 0.0135                          | 9 of 25                         |
| Commercial and public         | 0.00118             | 0.00371                        | 0.00106                             | 0.00344                         | 5 of 12                         |
| Total                         | 0.0498              | 0.2827                         | 0.01699                             | 0.0781                          | 16 of 44                        |

The main effect of disruption will be felt by the two CHP plants that have no dual-fuel capability. The heat plants can switch to heavy fuel oil and they can cover the heat supplied from the CHP plants so that the effect on residential heating should be minimal. The electricity produced from the CHP plants can be replaced by the existing generation or imports. There are nine industrial loads, which cannot switch fuels, and these include the two steel plants. In the commercial and public building sectors, five of
the consumers are not able to switch fuels. Any transport using compressed natural gas can readily switch to other fuels.

A survey was conducted of the interrupted consumers asking for them to estimate the costs involved in switching fuels. Of those plants that responded, the total estimates were equivalent to EUR 1.7 million for one month in winter and EUR 8.8 million for the six winter months. The Energy Department estimated that if all customers had responded, the six monthly cost would have been some EUR 76 million but this is a very rough estimate, as the methodology for calculating the financial losses is not specified.

As the supply comes effectively from one supplier along one pipeline, the location of the interruption is irrelevant. The only crisis measure that can be adopted is a gradual reduction in gas pressure and the interruption of all consumers that have a dual fuel capability. Operating the essential consumers on reduced gas pressure would maintain adequate supplies for a maximum period of one week but possibly for only 2 to 3 days.

At present, there are no residential consumers directly connected to the gas distribution system but the district heating customers would be threatened if supplies to the CHP and heating plants were cut off. As these plants take 80% of the current supply, the situation would soon be critical. The CHP plants account for nearly 60% of the consumption and have no dual fuel capability. The heating plant boilers are dual-fuel and can switch to heavy fuel oil and these could meet the peak load lost from the CHP plants.

If the extension of the gas transmission and distribution systems goes according to the existing plan, then the residential consumption will expand rapidly leading to an increased vulnerability in the event of the gas interruption.

4.4.5. Options to strengthen the security of supply

Macedonia has neither indigenous natural gas resources nor a gas storage facility and all gas is imported from Russia (via Bulgaria, Moldova, Romania, and Ukraine) through a single transmission line that crosses the Bulgarian border at Deve Bair.

The pipeline was constructed in 1997 and runs almost 98 km to Skopje, connecting Kriva Palanka, Kratovo, and Kumanovo on the way. The installed capacity is 0.8 bcm/y at 54 bar with a possibility of an upgrade to 1.2 bcm/y at a higher pressure. The present through put capacity is 145,000 m3/h.

Makpetrol Prom Gas supplier issues annual contracts to the customers, while JSC Makpetrol is operating a medium term contract with Gazprom revised on annual basis. It is understood that the Macedonian companies pay Gazprom directly at the Bulgarian border without the intervening transit fees.

The contribution of natural gas to the overall energy consumption has not increased significantly over the past decade. Gas accounts for less than 4% of the country’s energy supply.

Therefore the need for new gas supply routes is inevitable for Macedonia.

CESEC (Central and South East Gas Connectivity)

Initiative CESEC aims to promote the diversification of natural gas supply and security of supply in the region by enhancing the regional infrastructure and improving the integration of markets through joint engagement of all EU Member States and of the Parties to the Energy Community.

Memorandum of understanding (MoU) and its action plan under the European Commission initiative of Central Eastern and South-Eastern European Gas Connectivity
(CESEC) was signed in 2015 in Dubrovnik, Croatia. The document will pave the way for the closer integration of the EU and Energy Community energy markets. The “Interconnector Greece/Bulgaria – Macedonia” was also listed among “other projects” in the CESEC Action Plan. Accordingly Macedonia has fulfilled obligations regarding the CESEC Action Plan 2.0 monitoring reports.

MoU was signed on 14th October, 2016 between MER JSC Skopje and DESFA S.A. WG was also established between MER JSC and DESFA for construction of gas interconnection for transmission of natural gas between the two countries.

MoU was also signed on August 1st, 2017 between Ministry of Energy of R.Bulgaria and Ministry of Economy of R.Macedonia for construction of gas interconnection for transmission of natural gas between the two countries. Based on MoU Agreement was signed between MER JSC and Bulgartransgaz EAD for the implementation of feasibility study for the construction of new gas interconnection between the two countries.

**Picture 6. CESEC Projects**

**PECIs/PMIs 2018**

During 2017 the Energy Community Secretariat concluded agreement with a consortium of REKK and DNV GL to help the Energy Community Secretariat and the Groups for electricity and gas for evaluation of projects of interest for the Energy Community in the development and application of methodology to identify projects of interest to the energy community for 2018. Representatives of the Ministry of Economy participated actively in the work of this Working Group. As a result of this the preliminary list of PECIs/PMIs 2018 was agreed by the group for gas and electricity at the meetings at technical level. Following the positive opinion of the Regulatory Board of the Energy Community (“ECRB”) of the consistent application of the assessment criteria and the cost / benefit analysis, the proposed list will then be discussed and agreed at the Permanent High Level Group of the Energy Community (“PHLG”), and adopted by a Decision of the Ministerial Council of the Energy Community to establish a list of projects of interest for the Energy Community and Projects of mutual interest (“PECIs/PMIs”) for 2018. The selected PECIs projects will benefit from streamlined permitting and the possibility of regulatory incentives, cross-border cost allocation and funding under the EU’s Instrument for Pre-Accession Assistance and the Neighbourhood Investment Facility.

The list of projects of interest to the Energy Community (PECIs) for the year 2016 covers 2 projects from Macedonia (PECI) Project of interest to the Energy Community for gas connection with the Republic of Serbia and (PMI) Project of common interest for gas connection with Greece. The same projects were proposed for
selection in the list of projects of interest to the Energy Community (PECIs) for 2018.

Pursuant to the Decision of the Ministerial Council of the Energy Community held in Skopje on 29th of November 2018 the list of projects of interest for the Energy Community ("PECIs") was established and it covers one project in Macedonia, such as (PECI) Project of interest for the Energy Community for gas interconnection with Republic of Serbia and additional one Project of mutual interest ("PMI") for gas interconnection with Greece.

**Project of mutual interest ("PMI") for gas interconnection with Greece**

The Project envisages the construction of 126 km long gas pipeline, where 70 km is on Macedonian side while 56 km is on the Greek side. It is planned to be designed, financed, built and operated by the respective companies.

The starting point of the routing is proposed to be located in the border with Greece near Idomeni village and Gevgelija city, where the Greek part of the pipeline will end. The ending point was the already constructed valve station (block station BS 7) of the new pipeline Shtip - Negotino, near the city of Negotino.

![Map of PMI Project Interconnector Greece-Macedonia](image)

In January / February 2019, JSC MER and DESFA completed a FS for the gas interconnector. The aim of the report was to assess the technical, environmental and economic feasibility of the project, in order to support the investment decisions to be taken by the two sponsors (DESFA and MER) and their subsequent endorsement by the respective National Regulating Authorities for Energy and State authorities. In addition, the report will support the applications to be submitted by the sponsors to national and international financing institutions that will provide grants and/or loans for the implementation of the project.

Each part of the interconnector (in Greece and in Macedonia) will be built and operated by the respective sponsor as a stand-alone project supported by an Interstate Agreement. A joint market test will be carried out before the Final Investment Decision.

The results showed that the project can ensure a transportation tariff lower, during the evaluation period, than the one applied until now while it will provide to Macedonia very important benefits regarding security of supply, creation of conditions for gas-to-gas competition and integration in the regional gas market.

Moreover, Greece will benefit from a decrease in the Use of System Charge of 4.5% in average, over the evaluation period, under condition of achievement of the expected throughput.

According to the preliminary time schedule, the project is expected to be commissioned in the 4th quarter of 2022. An important milestone will be the launching of the Market test, expected in summer 2019, and the finalization of the funding agreements until the beginning of 2020.

There are also plans for transit of gas supplied through the new pipeline to other gas markets of the region (Kosovo, Serbia and up to Hungary). Discussions are in
progress between MER and Partners in neighbouring countries (namely Kosovo and Serbia). The transit volume to Kosovo might range from 350 to 500 mcma and the one to Serbia 250 to 300 mcma. However due to the uncertain outcome of these discussions the corresponding capacity has not been included in the Demand forecast of the DESFA study.

**Technical data:**

Within the main gas pipeline Section “Stojakovo - border with Greece” the following objects and systems are included:

- Line part in length of 68 km with pipe diameter \( \varnothing 711 \text{ mm (DN 700) (28\")} \)
- Valve station 3 pieces
- Pig Launcher/receiver 2 pieces
- Regulation station 1 piece
- Capacity \( Q = 326 \times 10^3 \text{ m}^3/\text{h} \)
- Automatic operation system with technological process for natural gas transport (DCS/SCADA);
  - Line for connection with optic fibres;
  - Power supply system,
  - Cathodic protection system,
  - Security signalling system and fire signalization.

**Technical parameters:**

Maximum pressure and operating (projected) pressure \( p_{\text{max}} = 70 \text{ bar} \)

Minimum pressure \( p_{\text{max}} = 25 \text{ bar} \)

The technical parameters of the gas interconnection pipeline allow further development of the gasification in the country and the construction of new national gas pipelines.

The benefits for Macedonia of realization of this project are enormous because it will provide additional quantities of natural gas of other sources in Macedonia and further through Serbia to Central Europe as well as possibility of using natural gas from the Southern Gas Corridor and at the same time it allows connection to the existing Revithoussa and Alexandroupolis LNG terminals in Greece. This leads to diversification and security of supply.

For the economy it is important that it will enable development of competitive component and possibility of decreasing the import price of natural gas because it will ensure availability of natural gas from various producers and suppliers.

Because previous routing to City Shtip was too long and thus expensive the two companies are actively cooperating on all issues:

- Routing;
- New routing investigated on both sides;
- Position of the Border Metering;
- Environmental Gap analysis concluded in MK for the routing “Gevgelija-Shtip”;
- So far EIB and EBRD has expressed interes to finance the whole Project;
- JSC MER applied for investment grant (INV GAF) on the last call of the Western balkans investment framework in 2018 and
- JSC MER applied in 2019 for technical grant through CONNECTA for Cost
Benefit Analysis, Environmental and Social Impact Assessment and Basic Design for the gas interconnector MKD – Greece.

Future steps for finalisation of the Project:
- Completion and endorsement (by sponsors) of Feasibility Study;
- Agreements with users;
- Securing of Funding/Granting (in principle Project is eligible for financing/granting by EIB, EBRD through WBIF)
  - FID;
  - Design and Permitting;
  - Issue of Tenders;
  - Award of Procurement, Services and Construction contracts and
  - Commissioning in 2022

EIB and EBRD express interest to finance the whole Project of mutual interest (“PMI”) for gas interconnection with Greece.

The summary cost estimation of the two pipeline parts, in Greece and in Macedonia with all ancillary installations i.e. valve stations, scraper stations, cathodic protection, telemetry etc is 49 and 54 million EUR each. The Greek part contains also the Border Metering Station.

Project of interest for the Energy Community (PECI) for gas connection with Republic of Serbia

Considering (PECI) Project of Energy Community Interest - Gas Interconnector between Macedonia with Republic of Serbia, there are ongoing activities for harmonization of the similar MoU with the Republic of Serbia.

The pre Feasibility study for the Macedonian side of the interconnector has been already prepared, but the Final Project Designs still need to be prepared. For this purpose Macedonian partner will apply for Technical grants (TA GAF) on the next call of the Western balkans investment framework (WBIF) or through CONNECTA.

There are ongoing activities for the gasification of the south part of Serbia, also.

No financial institution has expressed interest about this project yet.

Picture 8. Gas interconnection with R.Serbia

The transit pipeline link from Serbia to Macedonia should be with a maximum operation pressure of 50 bars. The connection should be realized along the route Niš-Leskovac-Vranje to Serbia-Macedonia border with a length of 115 km. The main pipeline Serbia-Bulgaria (along the route Dupnica-Kalotina-Dimitrovgrad-Niš) is connected to the construction of the compressor station in Dupnica in Western Bulgaria. It should provide satisfactory pressure in Southern Serbia. The maximum operation
pressure in Bulgaria is 54 bars. Due to that the pressure in the main pipeline network at the region of the Serbia-Macedonia border should be 50 bars.

The diameter of the main pipeline branch Niš-Leskovac-Vranje to Serbia-Macedonia border (Northeast of the town of Kumanovo) is DN500 (20") or DN700 (28"), depending on the hydraulic calculations.

The pipeline Bulgaria-Serbia capacity (route Dupnica-Kalotina-Dimitrovgrad-Niš) should provide total transit to Serbia of 3-4 milliard m³/year.

The necessary natural gas quantities for Macedonia from the branch through Serbia are about 0.5-1 milliard m³/year. Taking into account the possibilities for delivering LNG gas quantities from Macedonian-Greek Interconnector, this must be reversible link.

In the case of link of Serbia toward Macedonia from the main pipeline network of Serbia it is necessary to construct a compressor or reduction station at the Serbia-Macedonia border. So according to the law and regulations in both states the maximum operation pressure in the main pipeline networks is 50 bars and 54 bars.

Trans Adriatic Pipeline (TAP)

Another option that could be considered is a connection to the Trans Adriatic Pipeline (TAP) through Greece or Albania. This connection would have the advantage of providing an alternative supplier – that of Azeri gas from the Shah Deniz field in the Caspian basin that is expected to come on stream in 2020. The pipeline could also transport gas from Iraq, Turkmenistan and Mediterranean in future so would form a secure supply route.

There is also a proposal to connect the TAP between Albania northwards along the Croatian coast, the Ionian Adriatic Pipeline (IAP). This connection, along with a proposal to build an LNG terminal on the island of Krk of the Croatian coast, would substantially increase the security of supply in the region. This coastal pipeline would form part of the Energy Community gas ring concept whereby the gas markets of Albania, Bosnia-Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia could be linked. The ring would have the advantage of having the capability of being supplied from multiple directions and would facilitate the development, regional gas market. Another advantage would be that this system could be developed incrementally by adding new entry points and pipeline sections. A system of gas-fired power stations could help underpin the world in countries with relatively small gas demands such as Macedonia, Albania, Montenegro and Croatia.
**Statement on Security of Supply**

**Gas interconnection to Albania**

MER JSC and ALBGAZ JSC in September 2018 have signed a Memorandum of understanding ("MoU") between Albanian gas TSO ALBGAZ JSC and JSC MER. The Memorandum with ALBGAZ JSC is in line with the realization of the project for the construction of a gas interconnection for natural gas transmission that should connect Macedonia and the Republic of Albania.

![Gas interconnection to Albania](image)

**Gas interconnection to Kosovo**

The same Memorandum of understanding ("MoU") was signed with Kosovo in February 2019 between the Ministry of Economy of Macedonia and the Ministry of Economy of Kosovo, too.

The route for gas interconnection would take place from the city of Pristina, near Urosevac in Kosovo, to the Kosovo-Macedonian border (northwest of Skopje). It then continues to the south and connects to the future main gas pipeline network in Macedonia west of the city of Skopje. The total length of the gas pipeline is 85 km. At a diameter of DN500 (20") or DN700 (28") depending on the hydraulic calculations, it is possible to order the construction of a compressor station in the middle of the route.
**Storage facilities**

Access to storage facilities would also strengthen the security of supply but this is prohibitively expensive for Macedonia to consider building and there is limited storage in Bulgaria and Serbia (Banatski dvor).

**New gas interconnection to Bulgaria (CESEC)**

Access to Greece via a two-way Trans Balkan pipeline is a possibility. At present Macedonia has no agreement to use the Sidirokastro to Kulata pipeline from Greece to Bulgaria that was used in the 2009 crisis to provide LNG from the Revithoussa terminal in Greece to Bulgaria. There is over 8.5 bcm of unused entry capacity available from the Greek system, most of it from the underused LNG terminal.

In this context MoU was signed on August 1st, 2017 between Ministry of Energy of Republic of Bulgaria and Ministry of Economy of R.Macedonia for construction of gas interconnection for transmission of natural gas between the two countries. Pursuant to the Memorandum, Macedonia and Bulgaria will deepen their cooperation in the energy sector by considering the possibility of building new interconnection gas connection between the gas systems of the two countries.

Also on the basis of the signed Memorandum, Agreement was signed between the Joint Stock Company for performing energy activities Macedonian Energy Resources Skopje in state ownership and Bulgartransgaz EAD for the implementation of feasibility study for the construction of new gas interconnection between Macedonia and the Republic of Bulgaria. The document should include analyzes of the technical, market, economic, financial and regulatory aspects of the project, and identify solutions for the necessary infrastructure on the territory of both countries. On the last meeting between the two ministries on 7th May 2019 it was emphasized that the work of this working group should be intensified in the future in purpose for realization of the construction of new gas interconnection between the two countries!

![Picture 14. New gas interconnection to Bulgaria](image-url)

The output pressure supported by the CS „Petrič“ is 54 basr, as it is the maximum operation pressure of the main gas pipelines in the Republic of Bulgaria and Macedonia. The maximum operation pressure of the second connection from the Republic of Bulgaria toward the Macedonia should be 54 bars too. The new main gas pipeline length in the territory of the Republic of Bulgaria is 25-26 km. The diameter of the second connection from the Republic of Bulgaria toward the Macedonia could be DN700 (28”), DN800 (32”), or DN1000 (40”), depending on the hydraulic calculations. The diameter could be DN1000 (40”), due to the fact that the gas pipeline starts at the compressor station.
At present Macedonia will remain in a highly vulnerable position as far as security of natural gas supply is concerned but with clear vision and strong determination to overpass all its obstacles in the future process of securing the energy supply.

5. OIL AND BIOFUEL SECTOR

5.1. Legal framework

Within the framework of the Government of the Republic of Macedonia, the Ministry responsible for the oil sector is the Ministry of Economy. The strategic commitments of the Republic of Macedonia in the oil sector and its obligation to harmonise its national legislation with the oil acquis, have been incorporated in the Law on Energy, as subsequently amended, and the recent Law on Compulsory Oil Reserves (“Official Gazette of the Republic of Macedonia”, No. 144/2014 and 178/2014), which repealed the previous Law on Compulsory Reserves of Oil and Oil Derivatives (Official Gazette No. 84/2008, 35/2011 and 84/2012).

As it is the case with the other segments of the domestic energy sector, the supervision of the performance of oil activities, which are set forth in the Energy Law, falls within the competences of the Energy Regulatory Commission (ERC) of the Republic of Macedonia. In the context of the oil sector, the ERC is also responsible for:

- adopting the Ordinance and methodology for oil derivatives and fuels for transport; and
- stipulating the manner of setting, approving and controlling of refinery and retail prices for petrol, diesel fuels, light fuel oil and mazut, as well as of retail prices for blends of fossil fuels and biofuels for transport.

On the other hand, the new Law on Compulsory Oil Reserves has harmonised the national legislation with the EU Council Directive 2009/119/EC and in the main regulates:

- the principles governing the establishment, structure, maintenance, storage and calculation of compulsory oil reserves coupled with the corresponding statistical reporting requirements;
- the functions, structure and responsibilities of the Macedonian Compulsory Oil Reserves Agency;
- the manner of financing of the compulsory oil stock scheme;
- the rules pertaining to the maintenance of oil derivatives in the form of specific reserves, including the terms and manner of usage of these specific compulsory reserves; and
- the supervision of the compulsory oil reserve scheme, including the penalties to be imposed in any event of non-compliance.

The oil market in Macedonia is primarily driven by market-based forces, although the maximum refining and retail prices for oil derivatives and the maximum retail prices for blends of fossil fuels and biofuels are set pursuant to the price-setting regulations that are issued by the Energy Regulatory Commission. The maximum retail prices for oil derivatives are set by the ERC at an interval of seven (7) days.

Macedonia has no domestic production of crude oil. Up to 2013, the main avenue of oil supply was the crude oil pipeline, which connected Hellenic Petroleum’s Thessaloniki refinery in Greece with the OKTA refinery outside Skopje. This pipeline has been agreed to be converted into an oil products pipeline and the relevant
requisite technical operations are in the process of being implemented. At present, oil imports are solely effected through the use of tank trucks, which transport oil products mainly from Greece and Bulgaria. It needs further to be mentioned that the OKTA refinery was agreed to cease its refining operations in 2013, although - owing to its large tank capacity - it is still used as a main hub for the distribution of oil products.

As regards the biofuel sector, it is in the early stages of its development and the penetration of the market remains limited. Makpetrol, a domestic energy conglomerate, has set up a factory for the production of biodiesel with a production capacity of 20,000 tons per year. In the legislative front, as part of the EU/IPA project, a new Law on Biofuels has been drafted along with all corresponding pieces of secondary legislation in order to ensure that the biofuel provisions of the Directive 2009/28/EC are fully transposed into the Macedonian legal order. This whole legislative package has been submitted to, and commented by, the ECS and it is planned to be adopted by the Macedonian Parliament in the very near future. Added to this, within the framework of the EU/IPA project, a draft National Biofuel Action Plan of the Republic of Macedonia has been prepared, which covers a period of ten years with the aim to promoting the production and use of biofuels in the domestic transport sector. The primary objective of this Plan is to further elaborate the manner for the attainment of the compulsory national target and the estimated trajectory for the share of energy from different types of biofuels consumed in transport in the coming years with annual targets defined for each technology (biofuel type). It further streamlines and enforces the proposed supporting measures for the promotion of biofuel production and use, which are laid down in the Law on Biofuels and the related secondary legislation. Last but not least, it includes information on adopted and additional planned policies, instruments and measures and responsible bodies for biofuels production and use as well as indicative amounts of crops’ production in the agricultural sector that will be utilised for biofuels production.

5.2. KEY MARKET PLAYERS IN THE OIL SECTOR

The Energy Law primarily regulates the activities of whole and retail traders in fuels. In particular, a wholesale trader in fuels is entitled:

- to purchase crude oil, oil derivatives, biofuels and/or fuels for transport from the producers;
- to trade with other wholesale traders in fuels; and
- to supply the retail traders in fuels and final customers.

Any wholesale trader in fuels is required to own, or to have the right to use, the storage premises for crude oil, oil derivatives, biofuels, and/or fuels for transport. It is further obligated to hold operational reserves in oil derivatives and fuels for transport at all times in the quantity sufficient to cover at least five-day average volume of trade, calculated on the basis of actual trade in each oil derivative separately for the previous year.

The Energy Law vests in final customers the right - without requiring them to obtain a licence on wholesale trade in crude oil, oil derivatives, biofuels, or fuels for transport - to purchase oil derivatives and transport fuels also from abroad, provided that the relevant oil products are used for a customer’s own consumption.

On the other hand, a retail trader in fuels must perform its activity at petrol stations or at appropriate facilities, which meet the requirements stipulated by the Energy Law or any other related regulation. The retail trader in fuels can display or otherwise use the logo of fuel producers or of the wholesale trader in fuels pursuant to a mutual agreement, for the purpose of indicating the origin of the oil derivative
or fuel for transport, thus guaranteeing its customers reliable and uninterrupted supply in oil derivatives and transport fuels under the quality guaranteed by the relevant producer of wholesale trader.

5.3. CURRENT INFRASTRUCTURE

Oil products account for over 40% of the total energy consumed in Macedonia. Usage is divided approximately between the transport (60%), industrial (30%), and residential and commercial (10%) sectors.

Macedonia is landlocked and totally dependent on oil import through neighbouring countries. Recently, the main supplies have come through Greece from the refinery and harbour in Thessaloniki.

There is a pipeline connecting the OKTA refinery in Skopje with refineries and hubs in Thessaloniki. This pipeline is presently not functioning because it is being converted to carry oil products instead of crude as the refinery is being closed down but preserved for possible future operation.

At present all oil products are imported by road with the refinery, with is substantial tank storage capacity, being the main hub for distribution. Once the pipeline is operational and able to transfer oil products, it would have an annual capacity of 2500 thousand tonnes, which is more than enough to secure the domestic supplies as well as some export.

The oil market is dominated by three large companies: OKTA, Makpetrol and Lukoil, which operate along with a number of smaller oil traders. The three main oil companies possess the majority of the gas stations, but there is a small number of independents.

Most of the oil storage capability is located at the Skopje refinery that can hold around 470 thousand cubic metres. Makpetrol can store a further 75 thousand cubic metres. This would correspond to a total storage capacity of around 485 thousand tonnes.

Much of the oil storage capacity has been used to store crude oil and is at present not suitable for storing lighter products. It is reported that there is around 180 300 cubic metres of storage available at present. Current stocks are estimated at 57 days of average supply and this level cannot be increased at present owing to the lack of suitable storage.

<table>
<thead>
<tr>
<th>LPG</th>
<th>Gasoline</th>
<th>Kerosene</th>
<th>Diesel</th>
<th>Gasoil</th>
<th>HFO</th>
<th>Petrol Coke</th>
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<td>42.5</td>
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</table>

Source: State Statistical Office

5.4. COMPULSORY OIL RESERVES

The new Law for on Compulsory Oil Reserves ("Official Gazette of the Republic of Macedonia", No. 144/2014 and 178/2014) has transposed the Directive 2009/119/EC with the view to:

- meeting the obligation of the Republic of Macedonia to provide a high level of security of supply of crude oil and oil derivatives; and
ensuring the uninterrupted supply of the market with crude oil and/or oil derivatives in the event of impaired energy security caused by extraordinary disruption and significant and sudden decline in the oil supply.

This Law sets the terms and conditions of the scheme for the gradual establishment, storage and maintenance of minimum stocks of crude oil and/or oil derivatives in the form of compulsory oil reserves. Under this scheme, the total quantities of compulsory reserves for each type of oil derivative should reach coverage of realised average daily consumption of that oil derivative for a period of 90 days in the previous calendar year (or 25% of the total realised consumption of the relevant type of oil derivative in the previous calendar year). The scheme’s implementation is entrusted to the Macedonian Compulsory Oil Reserves Agency (MACORA) - an independent and non-profit state administration authority with the status of a legal entity – which is designated as the central body for storing compulsory reserves and which is the sole body that is authorised to establish, maintain, store and sell the compulsory reserves of the Republic of Macedonia. To this end, MACORA is responsible for:

- the creation, preservation, renewal and management of the compulsory reserves of the Republic of Macedonia;
- the purchase and sale of crude oil and/or oil derivatives in order to establish and replenish compulsory reserves;
- the conclusion of contracts for the optional purchase of crude oil and/or oil derivatives-tickets and/of contracts related to other financial instruments for establishing the compulsory reserves and/or limiting any market and price volatility exposures during the establishment and maintenance of the compulsory reserves;
- the calculating the stocks’ level of compulsory reserves on the basis of data from the relevant reference year;
- record keeping of the level, type and territorial distribution of the compulsory reserve stocks;
- the preparation and maintenance of a register of the compulsory reserves and the specific reserve stocks;
- the taking of insurance for the compulsory reserves stocks from risks;
- proposing a manner to determine and calculate the amount and the payment of the fee for compulsory reserves;
- collecting the fee for compulsory reserves;
- record keeping about the payment amount of the fee for compulsory reserves;
- caring for the earmarked expenditures of the funds for the operations of the Compulsory Reserves Agency;
- proposing a manner to determine and calculate the payment of the expenditures regarding the storage, preservation and maintenance of the compulsory reserves;
- monitoring the availability of the storage facilities for the storage of the compulsory reserves;
- building, upgrading and maintaining new and/or existing storage facilities;
- concluding contracts for the storage of the compulsory reserves and their registration;
- proposing the manner and procedure for the use, physical accessibility and availability of oil reserves in the event of any disruption of energy security in the country caused by large-scale disruptions in oil supply;
- releasing compulsory reserves in the event of some major supply disruption in the market;
- monitoring and managing the compulsory reserves that are stored in the Republic of Macedonia or in the territory of another State according to the provision of the Law on Compulsory Oil Reserves;
- monitoring the oil reserves of other countries, which - under bilateral agreements - are stored in the Republic of Macedonia;
- supervising the implementation of the regulations of the Law on Compulsory Oil Reserves;
- cooperating with the competent authorities and institutions and commercial entities in the Republic of Macedonia as well as with international institutions and
- regularly monitoring the domestic and international market of crude oil and oil derivatives.

On this subject, it is worth noting that MACORA does not possess its own storage for petroleum products. Moreover, Macedonia has a limited capacity to store the total quantities of compulsory reserves that should be established in accordance with the requirements of the Law on Compulsory Oil Reserves for 90-days consumption. In order to overcome these difficulties, MACORA is authorised to build its own capacity and store the reserves in rented capacity outside its national borders on the territory of EU Member-States by concluding bilateral agreements between Macedonia and EU Member-States, or hold part of the stocks in the form of tickets.

The Directorate for Compulsory Reserves of Oil and Oil Derivatives is also entitled to make agreements with authorised trading and storage companies that hold a license for storing oil or petroleum products and which - under the Law on Compulsory Oil Stocks - are obliged to store the compulsory reserves. Furthermore, MACORA is authorised to perform inspection of the compulsory reserves, which are stored in the oil tanks of the licensed trade companies.

Added to this, the Law on Compulsory Oil Reserves regulates the maintenance and management of specific reserves. In this regard, it is stated that MACORA may maintain oil derivatives in the form of specific reserves, which shall be an integral part of the compulsory reserves, calculated in days of consumption pursuant to the conditions stipulated in the Law on Compulsory Oil Reserves. The specific reserves shall be maintained in order to provide an appropriate intervention by putting in circulation oil derivatives, which are necessary for an initial response in the events of special emergency or to overcome some local crisis which is not triggered by the changes in prices of the crude oil or oil derivatives, and which may relate to the supply disruptions with natural gas. These specific reserves shall be the property of the Republic of Macedonia and shall be managed by the MACORA.

As regards the financing of the compulsory oil stocks’ scheme, the Law on Compulsory Oil Reserves stipulates that the funds to be allocated for covering the costs of establishing, maintaining and storing the compulsory reserves and for ensuring the regular operations of MACORA shall be provided by:
- the fee for compulsory reserves of crude oil and/or oil derivatives;
- assets acquired on the basis of international cooperation for programmes and projects;
- credits; and
- other sources.

These funds shall represent income of MACORA and are to be paid into a separate account, which is held by the Treasury.

Finally, it needs to be mentioned that - in compliance with the requirements of the Law on Compulsory Oil Reserves - the Government of the Republic of Macedonia, on the proposal of MACORA, is in the process of formulating an Action Plan for the establishment of compulsory reserves, which shall provide a framework regulation for:
the dynamics of the formation of compulsory reserves as of 31.12.2022, expressed in days of crude oil and/or oil derivatives coverage,
the dynamics and the manner of recovery of the compulsory reserves,
the arrangement of the storage and territorial distribution of the compulsory reserves, and
the methods of the investments towards the renewal of the existing, and the construction of new, storage capacities.

Allied to that, the Government, on the proposal of the Ministry of Economy, is currently working on the drafting of the Decree that will specify the measures to be implemented in cases of some emergency disruption of the supply of the energy market with crude oil and oil derivatives.

As of 31 December 2018, the stored quantities of the compulsory oil reserves correspond to 57 days of the average daily consumption of oil derivatives in the Republic of Macedonia during the previous calendar year.
6. OVERALL CONCLUSIONS

The domestic energy production that Macedonia is forecasted to produce is clearly insufficient to satisfy the increasing consumption of energy, principally in the forms of imported fossil fuels and electricity. As a consequence, Macedonia will remain an importer of oil, gas and electricity and thus reliant on imports to satisfy the final energy demand. At present, the level of security of supply is not ideal with further diversification in supply needed; however, Macedonia has made significant steps toward addressing these challenges.

The electricity security of supply appears sound with an effectively controlled transmission and distribution network that is internationally connected to a diversity of suppliers.

The improved connection to Kosovo and the new high voltage link to Albania will improve an already robust security of supply.

As far as natural gas is concerned, gas Interconnection to Greece (PMI) and Serbia (PECI) will enhance the security in gas sector in Macedonia and will enable establishing further connections to the international gas networks and gas hubs (Southern Corridor, Turkish Stream, LNG terminals). If these projects are not realised, Macedonia will remain in a highly vulnerable position as far as security of natural gas supply is concerned.

The proposed expansion of the gas distribution network, whilst remaining dependent on a single supplier via a single pipeline will only serve to compromise the security of supply further.

The import of oil is flexible as all products are imported by road at present. Should intensive use be made of the single oil product pipeline, then this would have negative implications as far as security is concerned but at the same time would produce economic benefits. This reduction in security should be offset by increasing the oil storage capability to at least 90 days of average consumption for all oil products.

Macedonia has made significant efforts to transpose existing EU laws regarding security of supply into its own legislation so as to adhere to the EU acquis.

The country has made considerable efforts to make strategic partnerships but has been slowed down by geopolitical and economic issues outside its control.

Overall Macedonia looks well placed to meet the expected requirements that have been presented by the adoption of the EU energy acquis.