MACEDONIAN ACADEMY OF SCIENCES AND ARTS

PROGRAM FOR REALIZATION OF THE ENERGY DEVELOPMENT STRATEGY IN THE REPUBLIC OF MACEDONIA FOR THE PERIOD 2013 - 2017

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ACRONYMS AND ABBREVIATIONS

GDP	Gross Domestic Product
EEAP	Energy Efficiency Action Plan
EARM	Energy Agency of the Republic of Macedonia
WPP	Wind Power Plant
HV	High Voltage
TPEC	Total primary energy consumption
TFEC	Total final energy consumption
UL	Upper limit
MCS	Main coal seam
LL	Lower limit
SSO	State Statistical Office
LCV	Lower calorific value
EE	Energy efficiency
EPS	Electric and Power System
EC	European Commission
ELEM	"Elektrani na Makedonija" (Power Plants of Macedonia)
ULSG	Units of local self-government
ESCO	Energy Services Company
EU	European Union
LCPPP	Law on Concessions and Public-Private Partnership
IRENA	International Renewable Energy Agency
SEE	Southeasters Europe
PE	Public Enterprise
PPP	Public Private Partnership
KOGEL	Gas fired combined heat and power plant
MEPSO	Macedonian electricity transmission system operator
MoE	Ministry of Economy
IFI	International financial institution
NEEAP	National energy efficiency action plan
OECD	Organization for Economic Co-operation and Development
RES	Renewable energy sources
UN	United Nations
BS	Basic Scenario
PV	Planned value
UCS	Underlying coal seams
SE	Surface excavation
CP	Clean production

FEC	Final energy consumption
ERC	Energy Regulatory Commission of the Republic of Macedonia
TPP	Thermal Power Plant
CHP	Combined heat and power plant
LPG	Liquid Petrol Gas
SS	Substation
HPP	Hydropower plant
TAR RES	Target percentage for total energy from RES
TAR RES - EE	Target percentage for total electricity from RES
ACER	Agency for Cooperation of Energy Regulators
BAT	Best Available Technologies
CDM	Clean Development Mechanism
CIDA	Canadian International Development Agency
EAR	European Agency for Reconstruction
EIB	European Investment Bank
EBRD	European Bank for Reconstruction and Development
ERGEG	European Regulators' Group for Electricity and Gas
GHG	Greenhouse gases
IEA	International Energy Agency
KfW	Kreditanstalt für Wiederaufbau (Reconstruction Credit Institute)
SCADA	Supervisory Control and Data Acquisition
USIAD	United States Agency for International Development
WB	World Bank

Chemistry symbols

CO	carbon monoxide
CO_2	carbon dioxide
CO_2-екв.	carbon dioxide methane equivalent
CH_4	methane
N_2O	dinitrogen oxide
NO_X	nitrogen oxides
SO_2	sulfur dioxide

Pursuant to Article 11 paragraph (1) of the Law on Energy ("Official Gazette of the Republic of Macedonia" no. 16/11 and 136/11), the Government of the Republic of Macedonia on the meeting held on 26.3.2013 adopted the

PROGRAM FOR REALIZATION OF THE ENERGY DEVELOPMENT STRATEGY IN THE REPUBLIC OF MACEDONIA FOR THE PERIOD 2013 - 2017

INTRODUCTION

This program stipulates the measures, conditions, manner and dynamics of implementation of the Strategy, as well as the obligations of the state authorities, the local self governments and the conductors of energy activities that have an obligation to provide a public service. In addition, the necessary financial resources for its implementation are determined, as well as the sources and the manner of providing the funds. The program includes 2 appendices that are an integral part of the Program.

The Program is based on the Energy Development Strategy in the Republic of Macedonia until 2030, the Strategy for Renewable Energy Sources Utilization in the Republic of Macedonia until 2020 and the Strategy for Promoting Energy Efficiency in the Republic of Macedonia until 2020. As databases are used the data obtained from: the Ministry of Economy, the State Statistical Office, IEA, AD MEPSO, AD EVN Macedonia, AD ELEM, AD OKTA Crude oil refinery, the Energy Regulatory Commission of RM, Customs and others. The development plans of AD ELEM, AD MESPO, AD EVN Macedonia, AD OKTA, Lukoil, Makpetrol AD Skopje, AD GAMA, CHP AD Skopje, CHP Kogel, Toplifikacija AD Skopje, AD TPP Negotino, large consumers (FENI, Makstil Skopski leguri, Silmak, Bucim, Titan) have been analyzed, as well as a number of relevant projects, feasibility studies and analyzes made for the needs of companies listed.

In the development of the program, a comparative analysis of the current energy situation in the country in relation to the planned Strategy, and analysis of the current and expected energy consumption over the period to 2020 and afterwards, have been carried out and then the preparation of the Program has started.

During the preparation of the Program the mini-DELPHI technique or the Estimate-Talk-Estimate (ETE) technique were used, and meetings were held (face to face) in the decision-making process. At the experts meetings, all issues of interest and all possible alternatives for decision making were considered.

Especially it should be emphasized that the development process of the Program and the decision making on the alternatives was done extremely transparently and the Program was published on the website of the Ministry of Economy and everyone could have given their contribution in writing to the developers, i.e. the expert team. A public discussion was organized, on which all interested governmental and non-governmental organizations were present. The suggestions to improve the text of the Program were also reviewed by the team, where the positions on certain issues were harmonized. Also, for the Program and the Report on Strategic Environmental Assessment has been developed in accordance with the Law on Environment.

The program package MARKAL (MARKal Allocation) was used as a support and assistance in the decision making process during the preparation of the program. MARKAL is a complex model for planning the overall energy development of local, national and / or regional level. Different parameters such as energy and fuels prices, prices of power plants and their characteristics, features of buildings, etc. are input data on the basis of which the program selects the optimal technological mix to meet the energy demand at minimal cost. With the program package MARKAL a large number of different scenarios were analyzed, such as the varying penetration of RES, different degrees of energy efficiency, different degrees of reduction of greenhouse gases, changes in prices of fuels and technologies used, different degrees of penetration of modern technologies and others. However, it should be emphasized that in the application of the program packages for energy planning there are some open issues concerning the accuracy and the uncertainty of the input data on the basis of which the results are obtained, so, the obtained results should be reviewed and analyzed critically. The team experts that prepared the Program have an extensive experience in using the program package MARKAL. Accordingly, they succeeded to transmit the large number of results obtained in the different variants into a single Energy Development Program in Macedonia until 2017.

1 ENERGY NEEDS AND PLAN FOR PROVIDING THE NECESSARY ENERGY FOR FOR THE PERIOD 2013 - 2017

According to the baseline scenario and the scenario with strengthened energy efficiency measures in the period to 2017 the final energy consumption will grow at an average annual rate of 3,8% and 2,7% respectively and in 2017 it will amount to 2354 ktoe (27377 GWh), or 2224 ktoe (25865 GWh).

According to the share of different energy sources to meet the needs of final energy in 2017, the largest share is of oil products with about 41% (975 ktoe), followed by electricity with 34% (791 ktoe), biomass, 9% (222 ktoe), coal, 8% (190 ktoe), heat energy, 3,4% (80 ktoe), natural gas, 3,1% (73 ktoe), geothermal energy, about 1% (20 ktoe), and solar energy, 0.1% (4 ktoe).

When we add the own consumption and losses in distribution and transmission, in 2017 will be required 10010 – 10620 GWh of electricity according to the scenario with energy efficiency and the baseline scenario, respectively. Of that, at average hydrology, 8686 GWh will be provided by domestic production capacities (5100 GWh from lignite TPP, 1600 GWh from natural gas CHP, 1485 GWh from large HPP, 500 GWh from other RES) and the rest from import. Depending on the hydrology, the domestic production of electricity can vary up to nearly 1000 GWh, plus or minus.

TPP Bitola and TPP Oslomej have been considered from the thermal power plants. TPP Negotino is envisaged to serve as a cold reserve. From the power plants on natural gas CHP Skopje and CHP Kogel are operating. Besides the existing large hydro power plants (Vrutok, Raven, Vrben, Tikvesh, Glabochica, Spilje and Kozjak) last year the HPP St. Petka started operating. From the RES, despite the existing small hydro power plants, by 2017 are envisaged additional 208 GWh from small HPP, 130 GWh from wind power and 16 GWh from photovoltaic systems.

The heat energy by 2017 will be provided from CHP Skopje and CHP KOGEL and from the existing public and industrial boilers. Additional construction of small cogeneration plants for producing electricity and heat using natural gas is envisaged.

The total consumption of primary energy in 2017 will amount to 3637 ktoe. In 2017 the share of coal will be 43%, the share of oil products and biofuels, 30% and of natural gas, 12%. The biomass combustion will contribute with 6% and hydropower with 4%. Solar, wind and geothermal energy will contribute to the production of primary energy with 0,1%, 0,3% and 0,6% respectively. The imports of electricity will be 4,6% of the total primary energy consumption.

Utilization of coal is especially important in the production of electricity. The Suvodol mine UCS will be opened in 2013 to meet the needs of TPP Bitola and the planned capacity of 3 million tons per year will be reached during 2013. The Brod-Gneotino mine capacity of 2 million tons per year was achieved in 2012. In the period from 2013 the mine SM Suvodol MCS will be used with a capacity of 1,5 million tons per year.

For the purposes of TPP Oslomej in 2016 the coal potential of the site Popovjani will be included.

Macedonia is linked with only one main gas pipeline. The total amount of natural gas is imported from Russia via the International corridor 8 passing through Ukraine, Moldova, Romania and Bulgaria. The pipeline has a capacity of 800 million Nm^3 per year

with an option to increase to 1200 million Nm^3 per year with construction of a compressor station at the beginning of the pipeline.

The total demand for natural gas in the period until 2017 is estimated at about 500 million Nm^3 per year. However, commissioning of new natural gas CHP is planned for 2018, which imposes the need for sustained efforts in the analyzed period, for connecting the region to new sources and routes of supply of natural gas, above all towards the South stream corridor.

The planned consumption of petroleum products of 1090 ktoe in 2017 is lower than the capacity of the OKTA refinery. The established market conditions allow and import of petroleum products.

Concerning the renewable energy sources (RES), in addition to the above mentioned for electricity production, in the reviewed period will be used also the solar energy as heat energy, amounting 35 – 47 GWh (approximately 40000 installations), biomass for combustion in the amount of 2560 – 2605 GWh (about 870000 m^3 of timber), geothermal energy in the amount of 218 – 265 GWh (795 to 963 TJ).

Од обновливите извори на енергија (ОИЕ), покрај горе наведените за производство на електрична енергија, во разгледуваниот период ќе се користи и сончева енергија како топлинска, во износ од 35 – 47 GWh (околу 40000 инсталации), биомаса за согорување во износ од 2560 – 2605 GWh (околу 870000 m^3 дрвна маса), геотермална енергија во износ од 218 – 265 GWh (795 до 963 TJ).

Biofuels in the total amount of fuel for transport in the Republic of Macedonia will participate with about 4,5% (about 24 ktoe).

This chapter is explained in more details in Appendix 1, which is an integral part of this Program.

2 MEASURES TO IMPLEMENT OF THE STRATEGY FOR ENERGY DEVELOPMENT IN THE PERIOD 2013-2017

2.1 CONSTRUCTION OF INFRASTRUCTURE FACILITIES

In the period until 2017 the following investment activities will be realized:

2.1.1 THE POWER SECTOR AND THE COAL SECTOR

The activities planned on the current energy infrastructure and the construction of new energy plants in the power sector include the following activities: opening of new mines, construction of new power plants, revitalization, upgrade or reconstruction of the current plants, activities in the transmission network, activities in the distribution network, as well as activities in the area of renewable energy sources.

In the generation of electricity in Macedonia, the lignite thermal power plants are dominant. The plan is to use the current lignite thermal power plants (TPP Bitola and TPP Oslomej) by 2030. The following measures have to be implemented in order to realize this scenario:

- secure the required quantities of coal by 2030,
- extend the operational life of the thermal power plants and improvement of their energy efficiency,
- modernization of the thermal power plants in accordance with the current directives on large thermal power plants[1,2].

By 2018 a construction of a one to two combined CHP with a total installed capacity of 230-270 MW for electricity production and 160 - 190 MW for heat production.

The plan in the upcoming period is to continue the revitalization of the current large hydro power plants in aditional two phases. The planned revitalizations will increase their energy efficiency and operational life and in the same time the costs for maintenance of the hydro power plants will be reduced.

Concerning the investments for construction of new power plants, in the period until 2017, a large part refers to the construction of new hydro power plants. Among them are: HPP Boskov Most (2013 - 2017), the accumulation Lukovo Pole with HPP Crn Kamen (2014 - 2018), HPP Chebren (2014 - 2021). In the period up to 2017 the preparatory activities will be conducted for the construction of hydro power plants after 2017: HPP Galishte and HPP on Vardar River.

In terms of renewable energy sources, apart from the large HPPs, a construction of new small hydro power plants is planned, as well as of wind power plants, photovoltaic systems, thermal power plants on waste biomass, power plants on biogas from biomass, solar hot water systems. These activities will be further stimulated with adequate feed-in tariffs for the produced electricity and with subsidies for the solar hot water systems.

[1] Directive 2001/80/EC of the European Parliament and of The Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants

[2] Directive 2008/1/EC of the European Parliament and of The Council of 15 January 2008 concerning integrated pollution prevention and control

During this period activities will also be carried out for increased utilization of geothermal energy.

In accordance with the increase in the capacities of the current energy plants and the construction of new plants in Macedonia as well as in the neighboring systems, it is also necessary to improve the infrastructure of the current transmission network in Macedonia. The investments in the transmission network include construction of new interconnection transmission lines, reconfiguration of the network, revitalization of specific transmission lines and substations, construction of new substations, etc.

The investments in the distribution network aim to reduce the losses of electricity (which includes replacement of the meters and identification of the illegal connections to the electrical network) and increasing the reliability of the distribution network.

In order to increase the reliability and efficiency of electricity transmission and distribution systems, a complete implementation of modern SCADA systems is foreseen.

2.1.1.1 Securing the coal quantities required for the thermal power plants TPP Bitola and TPP Oslomej by 2030

Securing coal for the TPP Bitola

Recommended scenario:

In accordance with the analyses stipulated in Apendix 2 (A 2.3.1), in order to secure coal for the TPP Bitola the following is required:

- implementation of the planned dynamics of exploitation of the mines SE Suvodol, SE Suvodol UCS and SE Brod Gneotino, in accordance with the developed project3

The prolonged start of exploitation of the SE Suvodol UCS will result in increased coal consumption by the SE Suvodol – main coal seam and reduction of its operational life, thus making it difficult for the opportunities for securing the coal required for smooth running of TPP Bitola in accordance with the planned capacity.

Required funds: 42 million EUR. The funds have been provided by ELEM (own funds and loan arrangement). This project is in implementation phase.

Implementation period: 2013-2017

- development of study for supply of TPP Bitola with coal for the period beyond 2020

Since the time period for opening of new mines with underground exploitation is greater than 5 years, a study will be prepared by 2014 on providing coal supply for TPP Bitola after 2020 and a dynamics for opening of the Zhivojno and Mariovo mines. This study should also include the entire complex of mines, the present and new power plants in the Pelagonia and Mavrovo region.

Required funds: 100 thousand EUR. Donation and/ or ELEM

Implementation period: 2013, 2014

- If the above study confirms the justification, the Zhivojno mine will be opened to meet the needs of the revitalized TPP Bitola by 2030 and the supply of new power plant in the period beyond 2030

[3] Additional mine project for coal supply of TPP Bitola from the following mines: SE Suvodol, SE Brod-Gneotino and SE UCS for the 2011-2016 period, RI RUDING DOO Skopje, September 2011

Required funds: 100 million EUR. Public private partnership, full capitalization by ELEM

Implementation period: 2015-2022

Securing coal for the TPP Oslomej

According to the dynamics of coal supply for TPP Oslomej in the Strategy for Energy Development of the Republic of Macedonia, already from 2016 we can expect that the coal potential from the Popovjani site can be also included. This will satisfy the required quantities of coal for TPP Oslomej by the end of 2024. Since the Popovjani site has not been sufficiently researched and its exploitation is not certain because of the disagreement with the local population, the following will be done:

- development of elaboration on the coal reserves in the Popovjani mine as well as a feasibility study for its possible exploitation, including the measures for motivation of the local population. The study should give answers on the possible alternatives in the period after 2016 and securing coal after 2024;

  Required funds: 200 thousand EUR. Donation and/ or ELEM.
  Implementation period: 2013

- opening of the Popovjani mine for satisfing the needs of the TPP Oslomej by 2024, if the above study confirms the justification and the feasibility.

  Required funds: 40 million EUR. ELEM with loan or with further capitalization.
  Implementation period: 2013-2016

2.1.1.2 Modernization of the thermal power plants in accordance with the current directives on large thermal power plants

- Using the best available technologies (BAT), the plan is to modernize the TPP Bitola which will be done in two phases;

The first phase will include modernization of the boilers by reducing the NO_x emissions within acceptable limits in accordance with the above directives and revitalization of the cooling towers. Funds have been secured and contract has been signed for implementation of this activity.

The second phase will include installation of desulphurization system thus additionally reducing the particle emissions.

Foreseen scenario:

Finalization of the modernization of TPP Bitola

Required funds: around 60 million EUR for the first phase and 120 million EUR for the second phase. ELEM with loan

Implementation period: first phase 2013-2014. The period of realization of the second phase depends of obligations which Republic of Macedonia will adopt for emission reduction;

- The modernization of the TPP Oslomej will result in extended operational life of this power plant, improved energy efficiency and compliance to the current directives on large thermal plants. This is planned to be implemented in a single phase once the possibility for coal supply at economically justified prices has been identified depending of adopted emission reduction obligations.

Foreseen scenario:

Modernization of TPP Oslomej

Required funds: 40 million EUR

2.1.1.3 Potential consequences in a case of non-implementation of the scenarios foreseen in items 2.1.1.1 и 2.1.1.2

With the foreseen finalization of all activities for normal operation of the TPP Bitola by 2030 and with the closure of the TPP Oslomej in 2016 an additional import of electricity of 600 GWh per year will be required in the period in which the TPP Oslomej could operate, until 2030.

Required funds for additional import of electricity during 15 years: 700 million EUR.

With the gradual closure of the TPP Bitola due to the untimely supply of coal an additional import of electricity of 1500 GWh per year will be required for each closed block. With the closing of the first block in 2023, the second block in 2026 and the third in 2028, there will be a need for additional import of electricity of 20 thousand GWh.

Required funds for additional import of electricity: 1,6 billion EUR. Total funds required for import of electricity in order to compensate for the generation from the TPP Oslomej and TPP Bitola: 2,3 billion EUR

2.1.1.4 Thermal power plants – heat generating plants fired by natural gas (CHP)

In the period until 2017, it is planned to begin with the construction of a large CHP fired by natural gas in Skopje, with installed capacity of 230 MW for generation of electricity and 160 MW for generation of heat energy, and one smaller CHP with installed power of 40 MW for generation of electricity and 30 MW for generation of heat energy. It means requirement of additional 350-450 million Nm^3 of gas per year which, together with the planned more than 500 million Nm^3 per year for the current plants and for the final consumption, is beyond the capacity of 800 million Nm^3 per year.

The above facts impose the need for continuous efforts for connecting the region to new sources and directions of supply with natural gas, including the planned terminals for liquefied natural gas.

Foreseen scenario:

Construction of one to two CHPs fired by natural gas with total capacity of 230 – 270 MW.

Required funds: 250 – 300 million EUR. Public private partnership or private investment.

Implementation period: 2015 – 2018

For this purpose the following will be done: За таа намена ќе се:

- implementation of continuous activity for connecting Macedonia to another source of natural gas supply,
- preparation of a feasibility study on the technical and financial capabilities to increase the capacity of the existing pipeline to 1200 million Nm3 per year, which will include opportunities for the capacity of the pipelines to the Macedonian-Bulgarian border.

During 2013 and 2014 a comparative analysis on feed-in tariffs for highly efficient CHPs will be prepared.

2.1.1.5 Renewable energy sources

Hydro power plants

The large hydro power plants play important role in balancing the electricity. Their role will grow even more with the construction of the wind power plants. This imposes the need for their modernization and construction of new ones.

Foreseen scenario:

- Implementation of the second phase of the revitalization of the large hydro power plants which will improve their energy efficiency and will extend their operational life,

  Required funds: 21 million EUR. ELEM with loan
  Implementation period: 2013-2014

- Implementation of the third phase of revitalization of the large hydro power plants, including upgrade of the HPP Shpilje

  Required funds: 72 million EUR. ELEM with loan
  Implementation period: 2014-2018

In the period up to 2017 it is planned to begin a construction of new hydro power plants.

Foreseen scenario:

- Construction of the HPP Boshkov Most with installed capacity of 68 MW;

  Required funds: 104 million EUR. ELEM with loan
  *Implementation period***:** 2013 – 2017

- Construction of Lukovo Pole (which will allow for additional electricity production of 160 GWh per year of the existing plants Vrben, Vrutok and Raven and the new small HPP Crn Kamen with a power of 8 MW)

  Required funds: 80 million EUR. ELEM with loan
  *Implementation period***:** 2014 – 2018

- Construction of HPP Chebren

  Required funds: 338 million EUR. Public private partnership
  *Implementation period***:** 2014-2021

In the period until 2017 preparatory activities for the construction of new HPPs after 2017 will be carried out:

- HPP Galishte with installed capacity of 193 MW. 2018-2025,
- HPP on Vardar River.

There is an ongoing preparation of new technical and economic analysis of the utilization of the potential of the Vardar River.

Period of realization: 2013

With the construction of the planned hydropower plants (including HPP Veles and HPP Gradec on Vardar River) the installed capacity of the hydropower plants in

Macedonia will increase by about 730 MW, and the average annual production of the hydro power plants will increase by more than 1200 GWh.

The small hydro power plants contribute to the increased generation of electricity. The Ministry of Economy have implemented five tender procedures so far for construction of small power plants and has signed 70 contracts for water concession for construction of small HPs with total installed capacity of 60,2 MW and with annual generation at average hydrology of 240 GWh.

A public private partnership agreement for the implementation of the Boshava river project has been signed. Construction of 5 small HPPs on the water supply system with a total installed capacity of about 12 MW and an annual production of 33,5 GWh.

The construction of 3-5 small HPPs on the hydro system Lisiche is planned through PPP. The total installed capacity is estimated at 2 MW and total investment of 3 million EUR.

In addition, it is planned to build three HPP (6-7 aggregates) on the hydro system Zletovica with total installed capacity of 8 MW and an annual production of 56,4 GWh. There is an ongoing preparation of feasibility study, environmental impact study, economic analysis of the project and tender documentation. The preparation of these documents is funded by a grant provided by the Investment Framework instrument for the Western Balkans and it should be completed by April 2013. The value of the project is estimated at 19,4 million EUR and will be financed with a loan from the European Investment Bank.

Of primary importance for supporting the small hydro power plants is the simplification of the procedures for water concessions, which need to include a requirement for previously resolved manner of land use. The procedure needs to provide a priority right for obtaining concession to the owners of private land for construction of small hydro power plant.

The Agency for Energy should be authorized for precise monitoring of all the phases of preparation and construction of the first dozen of small hydro power plants as well as for provision of assistance in removal of the administrative and legal barriers for their quick implementation. Furthermore, on the basis of the acquired experience, the Agency for Energy should develop Guideline with clearly defined procedure for construction of small hydro power plants that will used by the investors.

Foreseen scenario:

- Implementation of the signed contracts for construction of the small HPP,
- Simplification of the procedure for construction of new small HPP,
- Maintaining acceptable feed-in tariffs.

Investors: Private companies - concessionaires

Wind power plants

In accordance with the Strategy for Utilization of Renewable Energy Sources we can realistically expect the construction of 90 – 180 MW wind power plants with generation between 180 – 360 GWh per year, by 2020. The lowest threshold is 5% of the capacities for generation of electricity in Macedonia in 2010 and, according to the experience so far, it will not be a particular problem in the power system. The highest threshold will depend on the realization of the planned construction of thermal power plants fired by gas as well as the hydro power plants with water reservoirs.

Macedonia should use the acceptable capacity of wind power plants. The parameters describing the current wind potential should be publicly available. For the

locations in Macedonia on which there are no quality data on the wind potential it is necessary to use the procedure of issuing authorizations to interested investors, issued by the Government of the Republic of Macedonia in accordance with the Law on Energy. In this case the investor should have the right not only to measure the wind potential but also the investor is to be provided with a guarantee to be able to build the wind power plant in case of positive wind potential, in the frames of the total power determined on national level in Macedonia. Macedonia needs to identify the overall wind potential. At the moment in Macedonia are installed 9 reference metering stations, 3 of which are not in function. It is also necessary to prepare and to install other metering stations that will systematically measure the wind potential and then on the basis of those data to prepare a feasibility study on the wind potential.

There is a construction in progress of the wind farm Bogdanci with installed capacity of 37 MW, which will be completed in 2013. By decision of the Government of the Republic of Macedonia, the total installed capacity of feed-in tariffs by 2016 is limited to 65 MW. Accordingly, in the period to 2016 is expected to start the construction of an additional 28 MW of wind power plants.

Foreseen scenario:

- Construction of the wind power plant Bogdanci (37 MW);
  Required funds: 55 million EUR. ELEM with loan
  *Construction period***:** 2012-2013

- Construction of additional wind power plants (28 MW).
  *Construction period***:** 2015 – 2017
  *Investors***:** Public private partnership, private companies or ELEM

Systematic measurement of the wind potential and development of more precise atlas of the winds in the Republic of Macedonia.

Repairing and systematic maintaining of the wind stations.

Photovoltaic systems

Taking into account the activities that have been started by large number of private companies who have already invested significant funds, the implementation of these systems should be made possible

Foreseen scenario:

- Construction of solar power plants with total capacity of at least 10 MW.
  Construction period: 2013 – 2017
  *Investors***:** private companies

Combined thermal and heating power plants fired by waste biomass

Cogeneration plants fired by biomass have great level of predictability of the primary fuel availability and they do not cause problems in the operation of the power system so there should be no global limitations for these plants.

In accordance with the Strategy on Renewable Energy Sources, the plan by 2020 is to build 10 MW with annual generation of 25 GWh. Since there are no visible results in

this area it is planned to provide additional incentives for their construction or increasing the amount of the feed-in tariffs until the first power plant is built.

Foreseen scenario:

- Study on the waste biomass available for energy needs and technical-economical analysis for its use and additional possibilities for stimulating the construction of thermal and heating power plants fired by waste biomass;

  Construction period: 2013 – 2016
  Carrier: Ministry of Economy
  Activities for finding grant assets for construction of pilot CHP plant on waste biomass.
  Period: 2013-2014
  Carrier: Ministry of Environment and Physical Planning and Ministry of Economy

- Construction of CHPs on waste biomass.
  Construction period: 2015 – 2017
  Investors: private companies

Power plants on biogas from biomass

According to Renewable energy strategy, until 2020, a construction of 7 MW is envisaged, with an annual production of 20 GWh.

Foreseen scenario:

- Construction of power plants on biogas from biomass
  Construction period: 2015 – 2017
  Investors: private companies

2.1.1.6 Transmission of electricity

The investments for construction of new inter-connection transmission lines at 400 kV are among the important investments to be made by the end of 2017

Foreseen scenario:

Construction of transmission lines at 400 kV:

- Macedonia (SS Shtip) and Serbia (SS Nish), 2013-2014
- Macedonia (SS Bitola 2) and Albania (SS Elbasan), 2013-2017
- Macedonia (SS Skopje 5) and Kosovo, 2016-2020
  Investor: MEPSO AD, Skopje

A part of the present 110 kV transmission lines will be revitalized and reconfigured by 2017.

In order to improve the transmission infrastructure in the Western part of Macedonia, the plan is to construct the 400/110kV substation Ohrid that will be connected to the 400kV inter-connection transmission line SS Bitola 2 – SS Elbasan. Until the implementationof this activity compensation devices to SS Ohrid 1 will be installed that

will resolve the problems related to the lack of local voltage-reactive power support which results in significant voltage drops in a case of failures.

The 110 / x kV substations will be revitalized (2013) and the equipment of four 400/110 kV substations will be reconstructed (2013-2014).

In this period, the implementation of a new management system for EPS (SCADA / EMS) will begin and the optical ring of the transmission network will be closed.

This also includes the activities for connection of the new hydro power plants, thermal power plants, combined thermal and heating plants as well as integration of the renewable energy sources.

2.1.1.7 Distribution of electricity

The measures in the distribution of electricity will be intensified in order to:

- reduce the losses in the distribution,
- increase the operational reliability of the distribution network.

Investor: EVN Macedonia
Implementation, continuous actions during the entire review period (2013-2017).

2.1.2 GENERATION, DISTRIBUTION AND SUPPLY OF HEAT ENERGY

2.1.2.1 Remote heat supply

The primary objective for the remote heating sector in the upcoming period should be to increase the efficiency of the following three segments: generation, distribution and supply of heat energy. This will provide lower price of the heat energy delivered as well as reduction of the total costs for meeting the heating needs.

Generation of heat energy

It is expected that by 2018 in Skopje two more plants will be built for combined generation of heat energy and electricity with total capacity for heat energy production of 190 MW, or alternatively, one plant with capacity of 160 MW for heat production. That way, the generation of heat energy for the central heating systems in the city of Skopje would be over 85% in highly efficient cogeneration plants.

This sector will also have one more important investment – the central heating for Bitola, Mogila and Novaci. This is a project of the Government included in the Program for Work of the Government of the Republic of Macedonia for 2011-2015[4] and according to the project it is planned an efficient utilization of the heat energy from TPP Bitola.

Foreseen scenario:

- Construction of CHP fueled by natural gas in Skopje, near TO Zapad (230 MW/160 MW).

  Required funds: 250 million EUR. Public private partnership or private investment
  Implementation period: 2015 – 2018

- Construction of CHP fueled by natural gas in Skopje, near TO Skopje Sever (40 MW/30 MW).

[4] http://www.vlada.mk/

Required funds: 40 million EUR. Public private partnership or private investment
Implementation period: 2015 – 2018

- Central heating for Bitola, Novaci and Mogila using the heat from TPP Bitola

Required funds: 40 million EUR. ELEM, Public private partnership, the municipalities
Implementation period: 2013 – 2017

- Revitalization and modernization of the equipment for the production of heat energy of Toplifikacija AD Skopje

Required funds: 5 million EUR
Implementation period: 2013– 2017

Distribution of heat energy

Priority in the distribution of heat energy is the introduction of systems for management and control of the heat substations thus achieving significant increase in the delivery efficiency of heat energy to the end users.

Very important for the heat energy distribution is the timely identification of the losses in the distribution network. This is important in order to reduce the heat losses in the network and to improve the reliability in the delivery of the heat energy to the end users. In order to reach this objective, the operator of the distribution network must be equipped with the appropriate equipment for identification of the losses and identify the loss spots in the distribution network.

All operators of distribution networks in Macedonia should possess:

Management and control systems of heat substations and

Appropriate equipment to detect losses and to locate the site of the losses in the distribution network.

Implementation period: 2013-2017

- Reconstruction of the distribution network in Skopje

Required funds: 4 million EUR
Implementation period: 2013– 2017

Supply of heat energy

Regarding the supply of thermal energy, in the following period it is necessary to provide competition among several suppliers in all central heating systems.

In the analyzed period, it will be introduced, in as much buildings as possible, the possibility of sharing the heating costs at an end user level depending on the actual energy consumed at a consumer level and the possibility to regulate the heat energy consumption at an end user level.

Required funds: 250 EUR for an average apartment of 60 m^2
Implementation period: 2013 – 2017

2.1.2.2 Biomass combustion

These are the promotional activities for the biomass combustion:

- Development of Program for stimulating small and medium industries for production of devices used for biomass combustion with high efficiency coefficient;

  Ministry of Economy
  Period: 2013 – 2017

- Development of Program for subsidizing the replacement of the obsolete and purchase of new efficient combustion devices, especially for the socially vulnerable households;

  Ministry of Economy
  Period: 2013 – 2017

- Development of Program for reduction of the losses caused by illegal logging and Program for reduction of the unregistered consumption of wood.

  Public enterprise "Macedonian Forests"
  Period: 2013 – 2014

2.1.2.3 Solar thermal systems

Among the investment in renewable energy sources are also the subsidies for solar collectors, and until now 500 households were subsidized in 2007 and 500 in 2009, 421 in 2011 and 481 in 2012. The Budget for 2013 provides new 6.000.000 denars for this purpose.

The promotion of this technology should include measures aimed to provide incentives both for the producers. It is recommended to subsidize the producers of the solar thermal systems for each system they sell (in proportion to the size of the system) and especially provide financial support for production of large systems intended for export.

Concerning the compulsory use, a legal obligation should be complemented for installation of the solar thermal systems in new buildings of public interest as well as in a case of important reconstructions of such buildings.

Implementation period: 2013 – 2017

2.1.2.4 Geothermal energy

In accordance with the new Law on Energy, the local self-government is in charge for the geothermal energy. This can be a constraining factor for quicker development of the exploitation of this energy resource. The different policy towards this resource by different municipalities can be problematic when it comes to normal utilization of the current resources.

Presently there are 12 active sites in Macedonia for use of the geothermal energy. Four of these (Bansko – Strumica, Podlog – Kochani, Istibanja – Vinica and Smokvica – Gevgelija) have the capacity of 662 l/s, from the total capacity of all 12 sites which is 971 l/s.

The geothermal energy is now mainly used in the agriculture for heating the greenhouses; a smaller part is used in the geothermal spas and it is least used for heating of public and industrial buildings.

Regarding the sources of geothermal water (steam), additional coordination activities are necessary by the local self-government units and the state institutions. The potential for use of the geothermal energy for heating of the greenhouses needs to be put into correlation with the agricultural development.

In order to increase the use of this resource, the local self-governments need to define the conditions for use of the current resources and the conditions for investigating new resources. On the basis of the defined conditions they need to publish an open call to all interested users of these resources, or to those interested to investigate new sources.

In cooperation with the relevant Ministries for these types of resources, the local self-governments can implement these open calls to also address the potential investors that could be interested to use this resource and ensure stable conditions for its exploitation. By doing so, the local self-government will make additional revenues from the use of the current resource. One portion of the additional revenues obtained from the new users of the geothermal resources can be invested by the local self-government in investigations for new resources – alone or in cooperation with private investors, in accordance with the acts regulating the public private partnership.

The basic task of the local self-government and the relevant Ministries in the period under consideration should be the defining of common principles and requirements according to which the current geothermal resources will be used as well as investigations for new ones, in all possible forms of investment.

Implementation period: 2013 – 2015

2.1.3 OIL, PETROLEUM PRODUCTS AND BIOFUELS

- The investment activities will be focused towards construction of new petrol stations. The Government will continue to support this trend by providing appropriate locations and by simplifying the procedures for obtaining the necessary documentation;

Foreseen scenario:

Construction of new petrol stations and modernization of the existing ones
Investors: private companies

- Concerning the OKTA refinery, the plan is to further revitalize and modernize the equipment of this refinery in order to meet the requirements of the Directives and to improve the energy efficiency;

Foreseen scenario:

Continuous modernization and revitalization of the OKTA refinery equipment

- Within the Program of Makpetrol AD Company, which is aimed at development and use of biofuels, it is planned to continue with the production of diesel and biodiesel mixtures as well as construction of plants for other types of mixtures of fuels and biofuels. There are also activities to initiate the production of other types of biofuels;

Foreseen scenario:

Comparative analysis that will determine the annual percentage of biofuels in the total fuel quantities used for transportation in the Republic of Macedonia which will introduce obligation that only diesel-biodiesel mixtures can be sold in the future and later petrol-bioethanol mixtures.

This decision will provide incentives for production of biofuels.

Implementation period: 2013

Furthermore, in the frames of the programs for development of agriculture, it is necessary to provide incentives for production of local raw materials for biofuels by providing support to the biofuel producers for investing in agricultural production of raw

materials, guaranteed purchases, favorable credits, etc. In this regard the acquired experiences from the support to the production of biofuels and other raw materials will be used, maintaining at the same time the quality standards of the final product. The stimulation of the production of local raw materials for biofuels should be aimed towards the increase of the overall agricultural production and use of the unused land, which would not reduce the production of food and other agricultural products.

Foreseen scenario:

Study to define the potential of the Republic of Macedonia for the production of biofuels

Implementation period: 2014 – 2016

- Within this sector it is planned to build the AMBO oil pipeline which should connect the Bulgarian port of Burgas on the Black Sea and the Albanian port of Vlore on the Adriatic Sea, via Macedonia. The length of this oil pipeline should be around 870 kilometers with over 100 thousands tons of oil per day. Albania, Macedonia and Bulgaria have already identified the points of entry and exit at their borders and have signed the Convention for Construction, Use and Maintenance of the Oil Pipeline, ratified by the respective parliaments. The funds required for construction of this pipeline are estimated at around 1,75 billion USD. The project is supported by the United States Government, which financed the development of the feasibility study.

There are multiple benefits from the construction of the AMBO oil pipeline: additional reliability in the oil supply, collection of the transit fee and engagement of the local companies in the construction activities.

As a result of the Caspian Pipeline Consortium project expansion, the quantity of Caspian oil that reaches the Black Sea will significantly increase after 2013. This makes it imperative to implement at least one of the routes planned that intend to bypass the overcrowded Bosporus.

Planned actions

Macedonia should continue supporting the AMBO project. Very important for implementation of these types of projects is they are accepted by the wider public. In that sense, the Government of the Republic of Macedonia will initiate the re-establishment of the Inter-governmental commission in accordance with the signed Convention for Construction, Use and Maintenance of the Oil Pipeline which, in cooperation with the company contracted for the project, should timely perform all the activities necessary for proper start and implementation of the construction. This will also send clear signal to the potential investors about the interest and readiness of the three governments for quick and efficient implementation of the project.

Implementation period: 2013 – 2017

2.1.4 NATURAL GAS

The development of the main branches of the natural gas transmission network in the Republic of Macedonia is in accordance with the expected consumption in specific parts of the country.

The first investment, which has already started and has progressed significantly, in the gas pipeline system of the Republic of Macedonia is the closure of the gas ring in the City of Skopje. Once the ring is done it will be possible to use the natural gas in the Southern and Western part of the city.

Implementation period: 2013

The two main activities in this sector that would implement the two national strategic priorities are:

- construction of a national gas supply system, and
- inclusion of Macedonia into the international gas corridors.

The construction of national gas supply system is of special interest and will be carried out in three phases.

The first phase includes the construction of the section Klechovce – Shtip – Negotino, with a branch to TPP Negotino

Implementation period: 2013 – 2015

The first phase will be implemented with the funds from the clearing debt of the Russian Federation, with co-financing from the budget of the Republic Macedonia. Other sections of the gas system in Macedonia will be financed both from the Budget and credits from EIB and EBRD.

The second phase will include the construction of the following sections: Shtip – Strumica – Greek border; Skopje – Tetovo – Gostivar; Negotino – Kavadarci – Prilep – Bitola – Greek border.

Implementation period: 2015 – 2018

By connecting the cities, the pipeline expansion in Skopje and the connection of a large number of consumers, as well as the construction of at least one natural gas CHP, the capacity of the existing pipeline of 800 million Nm^3 will be exceeded. Therefore, the increase of the capacity of the natural gas supply for Macedonia is crucial. Two activities will be carried out:

- Develop a study on real opportunities to increase the capacity of the existing main pipeline to 1200 million Nm^3 per year

  Implementation period: 2013 – 2014

- Designing and connecting Macedonia to the South Stream gas pipeline corridor

  Implementation period: 2013 – 2017

Part of the smaller cities will be supplied through the so called virtual gas pipelines (transportation of a natural gas under pressure using cisterns), a system that is already used in the neighboring countries and its implementation has started in Macedonia, i.e. in Strumica.

Concerning the gas sector, the most important task in the reviewed period will be the development of the natural gas distribution in the cities where the natural gas is available through the transmission distribution network.

In accordance with the Law on Energy, the relevant Ministry is in charge of awarding concessions for natural gas distribution.

Foreseen actions:

The relevant Ministry, together with the local self-government in the cities where the natural gas is available, should carry out as soon as possible the procedures for development of the natural gas distribution systems.

The relevant Ministry will develop regulations that determine the natural gas distribution.

2.2 PREPARATION OF PROPOSAL PROJECTS, STUDIES AND OTHER ACTIVITIES

The following proposal projects, studies and other materials will be developed in the period until 2017:

2.2.1 ELECTRICITY SECTOR

- Study for supplying TPP Bitola with coal for the period after 2020, 2013 – 2014;
- Study for supplying TPP Oslomej with coal in the period after 2016 and after 2024, 2013;
- Development of a new technological analysis for the exploitation of the potential of the Vardar River, 2013;
- Simplification of the procedure for construction of small HPPs and preparation of a brochure, 2013 – 2014;
- Study for the waste biomass available for energy purposes with the possibilities for additional measures for stimulating construction of CHP on waste biomass, 2013 – 2016;
- Activities for construction of a pilot CHP on waste biomass (Finding grant funds, potential investors and credit lines), 2013-2014;
- Additional measurements of the wind potential in Macedonia and development of a feasibility study of the wind potential based on those data. Systematic maintenance of the reference measuring stations for measuring the wind potential, 2013-2017;
- Comparative analysis of the feed-in tariffs for highly efficient facilities, 2013 - 2014;
- Defense plan, 2013;
- Study on the transmission network reliability, 2013;
- Study on the forecast of balance of electricity and power for a long-term period, 2013;
- Study on the voltage management and reactive power production of the EPS of the Republic of Macedonia, 2013;
- Study on the use of the reserves of the primary, secondary and tertiary reserve, 2013-2014;
- Study on the development of the transmission network in the Skopje region on a long-term period, 2014-2015;
- Study on the feasibility of a 400 kV interconnection power line Skopje – Kosovo, 2014-2015.

2.2.2 HEAT ENERGY PRODUCTION SECTOR

- Program for stimulating small and medium industries for production of biomass combustion facilities with high efficiency coefficients, 2013 – 2017;

- Program for subsidizing the replacement of old with new combustion facilities, especially for vulnerable households, 2013 – 2017;
- Program for reducing the losses from wood cutting, 2013 – 2014;
- Program for reducing the unaccounted consumption of wood, 2013 – 2014;
- Program for supporting greater use of solar thermal systems, 2013 – 2017;
- Defining principles and conditions for using the existing geothermal resources, and, in addition, the possibilities to find new resources and forms of investment in this area will be investigated, 2013 – 2015;

2.2.3 NATURAL GAS

- Study on natural gas distribution in Macedonia, 2013;
- Study on the real possibilities for increasing the capacity of the existing main gas line up to 1200 millions Nm^3 per year, 2013 - 2014.

2.2.4 OIL

- Examining the possibilities for reviving the activities of the Intergovernmental commission on construction, operation and maintenance of the AMBO pipeline, 2013-2017;

2.2.5 BIOFUELS

- Comparative analysis for determining the annual percentage share of the biofuels in the total quantities of transport fuels and the method for implementation of these stipulations, 2013;
- Study on defining the potential of the Republic of Macedonia for the production of biofuels, 2014-2016.

2.2.6 ENERGY EFFICIENCY

- Realization of the first Energy Efficiency Action Plan of the Republic of Macedonia according to the Energy Efficiency Strategy, 2013-2017;
- Development and implementation of the National program for energy efficiency in public buildings in the Republic of Macedonia, 2013-2017;
- Organizing a campaign for energy efficiency, 2013-2017.

2.3 OTHER MEASURES

In accordance with the Strategy on Energy Development, the Republic of Macedonia should be active in attracting foreign capital in the energy sector. The increase of the competitive pressure in the energy sector and the improvement of its economic efficiency mean more intensive activity for attracting foreign capital in the sector. On one side, this is an imperative for a small country with limited resources due to the fact that the maintenance, modernization and development of the energy system require large capital

investments. On the other side, the reliance on foreign capital has many advantages for the economic development. Therefore, the entry of private capital (both local and foreign) in the erection of new generation plants, new thermal power plants and coal mines, natural gas-fired combined plants, small hydro power plants, wind power plants and other energy plants – should be stimulated and supported with the measures of the economic policy (especially when it comes to the use of renewable energy sources).

Realistically speaking, Macedonia is forced to use all possible sources of financing in the energy sector: the public private partnership (PPP), financing with own capital, indebting, state grants, further capitalization, concessions and other innovative approaches. The selection of the specific form of financing depends on the characteristics of the particular project and from the SWOT analysis.

This Chapter provides an overview of the specific measures and projects necessary to create a favorable environment for implementation of the projects elaborated in the previous chapter. In the same time it will open the door for greater participation of the private sector at the energy market in the country thus developing the individual-private initiative and entrepreneurship in the sector, its further liberalization and demonopolization

2.3.1 INSTITUTIONAL CAPACITIES BUILDING

In order to ensure efficient enforcement of the new legal framework in the energy sector, which establishes a series of obligations for the Ministry of Economy, the Regulatory Commission, the Energy Agency and the local self-government units – it is necessary that they strengthen their capacities.

Having in mind the importance of the energy in the overall economic development of Macedonia, special attention needs to be paid to the Energy Sector under the umbrella of the Ministry of Economy. The importance of the energy is emphasized by some of the regional countries by integrating it into the name of the relevant Ministry.

In addition to the increase of professional staff in the Energy Sector, the Ministry of Economy also needs to establish professional advisory bodies on investments in energy and on other important activities. The building of the Energy Sector would significantly strengthen the negotiation capacities of Macedonia in the energy area, once the EU accession negotiations start.

The need for capacity building especially goes for the operation of the Energy Agency.

Regarding the Regulatory Commission, in addition to ensuring its greater independence, which is provided by the Law on Energy from 2011, further capacity building and additional mandate will be required in the upcoming middle-term period, in accordance with the new requirements related to the adoption of the Third EU Energy Package by the Energy Community.

In order to carry out the legal obligation for organizing, efficient functioning and development of the electricity market, and especially for implementation of the balance mechanism which should be introduced with the Market Rules on Electricity, it will be necessary to invest serious efforts in capacity building of the market operator within MEPSO, in terms of human resources and their training.

Capacity building is also necessary for the institutions and companies dealing with scientific-research, applicative and educational activity in the area of energy.

In accordance with the National Program for the Adoption of the EU Acquis of the Government of the Republic of Macedonia, during 2011 an evaluation started for expression of interest in relation to the Project for Building the Administrative Capacity in the Energy Sector under the umbrella of the Ministry of Economy and the Energy Agency

of the Republic of Macedonia in the frames of the IPA Component 1, which is expected to start at the beginning of 2013. In the same time, the implementation of the IPA Project for Technical Assistance to the Energy Regulatory Commission and the twinning Project for Capacity Building of the Energy Regulatory Commission continued. Furthermore, the implementation of the project "Support to the Energy Regulatory Commission for Introduction of the EU Legislation for Efficient Energy Market in the Republic of Macedonia" supported by the Kingdom of Norway, started in March 2012.

The building of administrative capacities of the state institutions in the energy sector[5] should include at least the following employments and/or trainings:

- Ministry of Economy - Energy Sector: capacity building and personnel training in the area of reliability in supply and internal energy market and or monitoring of the inclusion of renewable energy sources in the energy consumption in the state in the period until 2014, for which new employments will be necessary;

- Energy Regulatory Commission: According to the financial plan of the Energy Regulatory Commission, approved by the Parliament of the Republic of Macedonia, the ERC should be strengthened with 9 new employments by 2014 especially to monitor the energy markets, 2 new employments are necessary in 2013 as well as 2 additional employments in 2014;

- Energy Agency of the Republic of Macedonia: In order to fulfill the obligations arising from the Energy Law, capacity building and strenghtening of staff are needed, especially in the area of renewables and energy efficiency. Furthermore, in order to reinforce the administrative capacity required to perform obligations, new employments are necessary in 2013 and 2014;

- The Directorate of Compulsory Reserves of Oil and Oil Derivates: additional employments are planned on middle-term in order to complete the necessary full staffing required;

- Maintaining of the dynamics of new employments during the period which is subject to this Program.

Increasing the number of employees in the relevant institutions is not the only prerequisite for effectively dealing with the challenges posed by the obligations of the Energy Law, the strategic and planning documents. Special attention needs to be paid to the continuing training of the staff in these institutions in the areas that are the subject of their work.

In order to ensure continuous upgrading of knowledge the Government will adopt a Program for staff training in the institutions responsible for energy. The training would be carried out at least once in every two years, and if necessary (during or prior to the reaching of important law or bylaws) and more frequent. The program should be prepared by the Ministry of Economy and it should cover the contents of the training, and the way of their implementation. For a successful implementation of the training, the Ministry of Economy should establish a platform for long-term cooperation with academic institutions and with non-governmental organizations. When proposing projects funded by international donor organizations in particular should be taken into account the knowledge transfer component to have a significant share in the projects as follows:

[5] Secretariat on European Affairs, Government of the Republic of Macedonia, National Program for Adoption of the EU Acquis, revision 2012, 16 December 2011, http://www.sep.gov.mk/content/Dokumenti/MK/NPAA%20Revizija%202012%20Narativen%20del.pdf

- Development and adoption of a continuous training Program for staff in relevant institutions.
- Establishing a platform for long-term cooperation with academic institutions and with non-governmental organizations for implementation of the continuous training Program.
- Capacity building components to have a large share in international donor projects.

2.3.2 LEGAL FRAMEWORK AND BYLAWS

2.3.2.1 Systematic and strategic documents

The Law on Energy sets an obligation for the Government of the Republic of Macedonia, on a proposal by the Ministry of Economy and following an initially obtained opinion from the Energy Regulatory Commission, to adopt Energy Balance for a five-year period, by the end of each calendar year.

The Republic of Macedonia is obliged to update its Statement on Supply Reliability on every two years. The last statement was sent to the Secretariat of the Energy Community in 2011. There are obligations to submit such Statement on Supply Reliability in the Republic of Macedonia in 2013 and 2015.

The first Action Plan on Renewable Energy Sources for a period of ten years, the simplified version of which has already been developed and submitted to the Energy Community for consideration, is planned to be adopted by the end of June 2013. Furthermore, the Ministry of Economy must prepare report on every two years, on the implementation of the Action Plan on Renewable Energy Sources for the past period. If, on the basis of the Report findings, it was ascertained that the foreseen annual dynamic of involvement of the renewable energy sources is not implemented, the Ministry should propose additional measures to the Government of the Republic of Macedonia as well as appropriate changes in the Action Plan.

In the 2013 it is necessary to start the development of the Second Action Plan on Energy Efficiency of the Republic of Macedonia.

In accordance with the Law on Energy and the Energy Development Strategy, on every 5 years a new Energy Development Strategy of the Republic of Macedonia should be adopted. In a period of one year, a Program for realization of the Strategy should be adopted, too. Also, pursuant to the Law on Energy on every 5 years a new Strategy for the exploitation of the renewable energy sources in the Republic of Macedonia should be adopted.

- Energy balances for a period of 5 years to be prepared and adopted at the end of every calendar year;
- The Statement on Supply Reliability of Energy for 2013 and 2015 to be prepared and submitted to the Secretariat of the Energy Community.
- The Action Plan on Renewable Energy Sources to be developed and adopted in 2013.
- The report on implementation of the Action Plan on Renewable Energy Sources to prepared in 2014.
- The second Action Plan on Energy Efficiency to be developed and adopted in 2013.

- The Reports on the implementation of the Action Plan on Energy Efficiency to be prepared by March every year.
- The Energy Development Strategy of the Republic of Macedonia to be developed in 2014 and 2015 and to be adopted in 2015.
- The Strategy for the exploitation of the renewable energy sources in the Republic of Macedonia to be developed in 2014 and 2015 and to be adopted in 2015.
- The Program for implementation of the Energy Development Strategy to be developed and adopted in 2015.

2.3.2.2 Bylaws

Basic prerequisites for the efficient functioning of the markets for electricity and natural gas and their further liberalization, and thus improvement of the investment climate, is finalizing the legislation.

The adoption of bylaws provided with the Law on Energy, as well as the appropriate restructuring of operators of the transmission and distribution system of network energy, will create the basic preconditions for opening of the energy markets. However, in the period 2013 - 2014, it will be required to further work on the implementation of the Law on Energy in order to enable the actual opening of the markets for electricity and natural gas.

Due to greater transparency and better informing, an attention has to be paid to the editing of the web sites of the ministries and the enterprises participating in the energy markets.

By the end of 2013 all bylaws provided with the Law on Energy are to be adopted.

The list of bylaws within the competence of the Government and the Ministry of Economy follows:

- Regulation on the criteria and requirements for declaring crisis in the supply of natural gas,
- Rulebook on control of the electricity quality,
- Rulebook on control of the liquid fuels quality,
- Decision setting the annual percentage of biofuels in the total quantities of fuels used for transportation in the Republic of Macedonia,
- Rulebook on the energy properties of the buildings,
- Rulebook on energy control,
- Rulebook on the format and content of the request for authorization for construction or reconstruction of the buildings,
- Rulebook on the requirements that must be met by the handlers, the program and the manner of passing the professional training exam for the operators of energy installations and equipment,
- Technical regulations for construction, maintenance and safe operation of energy buildings, devices and installations

List of bylaws adopted by the Energy Regulatory Commission:

- Rulebook on monitoring of the operation of the energy markets,

- Rulebook on natural gas markets,
- Tariff system for selling electrycity to consumers supplied by the last resort supplier,
- Rulebook on prices for heat energy and system services,
- Tariff system for distribution of heat energy,
- Rulebook on setting the prices of oil derivates and fuels used for transport.

List of bylaws approved by the Energy Regulatory Commission

- Network regulation on electricity transmission,
- Network regulation on natural gas transmission,
- Network regulation on natural gas distribution,
- Network regulation on heat energy transmission.

2.3.2.3 Gradual opening of markets for electricity and natural gas

The Energy Law of the Republic of Macedonia, in the transitional and final provisions concerning the electricity market, provides its gradual liberalization, which should be finalized by opening the market to all consumers, including households and small consumers, in January 2015. Accordingly, the activities to fulfill this legal solution fully fit within the term of this program.

The opening process is conditioned by the adoption and implementation of a series of bylaws that have already been referred to in the text, but also with the structural, organizational, investment and personnel measures that should be undertaken by the network operators and the market operator.

Among the laws that are important for achieving the stated purpose are included the following documents:

- Electricity market rules and Rules for the natural gas market,
- Tariff systems for transmission and distribution of electricity and natural gas,
- Regulations and tariff systems for the last resort suppliers for electricity and natural gas,
- Rules for the supply of electricity and natural gas,
- Rules for granting cross-border transmission capacities for electricity.
- The key regulations on natural gas (Market Rules and tariff systems) are in the final stages of adoption, and are planned to be adopted in the first half of 2013.

Electricity market rules

The electricity market rules were adopted by the Energy Regulatory Commission of the Republic of Macedonia in May 2012.

This paper, for the first time since the introduction of market relations in the energy sector of the Republic of Macedonia, introduces balance responsibility and establishes the rules for the functioning of the electricity market with bilateral contracts, the market balancing energy and the system services market.

The bilateral agreement markets and system services markets should be active in 2013, whereas the system services market will become operational from 1 January 2015. In

order to implement this regulatory solution, it is necessary that individual participants and stakeholders in the electricity market complete the respective activities by the end of 2012, namely:

- EMO and ETSO are obliged to prepare all the documents provided by FEP
- ETSO is obliged on all measuring points of all points of receipt and delivery to and from the transmission network to provide technical conditions for measuring the electricity on an hourly level, including the system services
- DSO is obliged on the measuring points to provide technical conditions for electricity metering on an hour level for the electricity producers connected to the distribution system
- ETSO, EMO and DSO are obliged to jointly develop a Protocol for submission and exchange of data and information in accordance with the FEP, which should be approved by the ERC, and to sign respective mutual agreements

Obligations that have an extended period until the full opening of the electricity market on January 1, 2015, are as follows:

- DSO is obliged within the term specified in the Plan for incorporating computational meters with an opportunity for hourly and remote reading in consumers connected to the distribution network, to incorporate the corresponding computational units
- Until the incorporation of computational meters with an opportunity for hourly and remote reading for each point of connection in eligible consumers connected to the distribution network with installed capacity greater than or equal to 500 kW; in the calculation of deviations the standard daily load curves shall apply, which also need to be prepared and approved by the ERC
- DSO is obliged to prepare and submit for approval to the ERC the standard daily load curves for households and small consumers

ERC is required to perform regular audit of the FEP on every two years. In exceptional cases, extraordinary audit of FEP can be can arranged at the request of the electricity market participants.

Rules for granting cross-border transmission capacities

The rules for granting cross-border transmission capacities were adopted by MEPSO and were approved by the Energy Regulatory Commission in 2011.

The rules for granting cross-border transmission capacities (RGCTC) specifically regulate the manner of calculation of the available cross-border capacities, the method of granting cross-border transmission capacities taking into account the blocking of the transmission system, the payment method when using the cross-border transmission capacities in case of blocking of the interconnection lines and the manner of data disclosure. These rules introduce jointly explicit auctions of the cross-border transmission capacities with the neighboring operators of PEES (Bulgaria, Greece and Serbia) yearly, monthly, weekly, daily and on within daily level, as well as payment of the granted capacities in the event of blocking according to the marginal cost. According to the RGCTC, MEPSO is responsible, along with the relevant neighboring ETSO to prepare

Rules on joint auctions and to submit them to the ERC for approval. The payments concerning the granted rights of use in common auctions should be invoiced by the involved ETSO, in the ratio 50:50, where MEPSO is obliged to add the VAT value to the sum of its part, according to the legal provisions of the Republic of Macedonia.

Newly introduced principles correspond to the minimum requirements set by Regulation 1224/2003 and MEPSO membership in the Association of European electricity transmission system operators (ENTSOE). However, the last provision for compulsory VAT invoicing currently prevents the application of the RGCTC, as well as the drafting and signing of appropriate Rules on joint auctions with neighboring ETSO. The neighboring ETSO do not want to take responsibility for payment of the Macedonian VAT. Until the removal of the specified constraint for application of the RGCTC in force are the Interim rules for granting the available cross-border transmission capacities of the interconnections of the electricity system of the Republic of Macedonia on annual basis[6] and the Interim rules for granting the available cross-border transmission capacities of the interconnections of the electricity system of the Republic of Macedonia on monthly and weekly basis[7], according to which MEPSO conducts annual, monthly and weekly explicit auctions for granting half of the available interconnection capacities with the neighboring electricity systems. The remaining capacities on daily and within daily level are assigned on a "first come - first served" principle.

Therefore, it is necessary as soon as possible to achieve:

- The Ministry of Finance of the Republic of Macedonia to prepare and propose amendments to the VAT Law, that will exempt from VAT the financial transactions for payment of the granted cross-border transmission capacities
- ERC should suggest MEPSO to prepare the Rules for joint auctions, in order to be ready for approval and signing immediately after the removal of the problem with VAT

2.3.2.4 Obligations deriving from the adoption of the Third EU Energy Package

The Third EU Energy Package (Directives 2009/72/EC, Directive 2009/73/EC, Regulation (EC) 714/2009 and Regulation (EC) 715/2009 and the amendments of Articles 11 and 59 of the Treaty on Energy Community[8]) will have to be implemented no later than 1 January 2015.

Having in mind that the adoption of the new Law on Energy together with the corresponding bylaws is a long process, the process and the procedure for adoption of the new law should begin by the end of 2013 at the latest. Prior to the adoption of the new Law, the Government (by the end of the 2013) is to adopt a platform and an action plan for the implementation of the Third Energy Package. The platform would define the basic principles of the Law and the position of the energy markets, while the action plan would define the dynamics of the adoption of the Law and the relevant bylaws.

In addition to the timely implementation for changes in the Law on Energy the relevant institutions in the Republic of Macedonia will have to dedicate their efforts on practical implementation of all the above criteria for effective opening of the Internal market for electricity and gas which will take place by the end of the middle-term period covered by this Program, namely:

[6] http://www.mepso.com.mk
[7] http://www.mepso.com.mk
[8] Decision of the Council of Ministers of the Energy Community from 6 October 2011, http://www.energy-community.org/pls/portal/docs/1146182.PDF

- Adoption of the platform and the action plan of the new Law on Energy in line with the third energy package by the end of 2013,
- Preparation of the Law on Energy by the middle of 2014,
- Preparation of the bylaws by the end of 2014.

2.3.3 PRICE POLICY IN ENERGY

Apart from the legal institutional framework, the functioning of the energy sector on the basis of market principles is the second most important precondition for investment in the energy sector.

Prices and the manners in which energy and fuels prices are formed are an important feature of energy markets.

Prices of oil derivates, natural gas and heat energy (although regulated), as well as the prices of firewood are at market level. However, it can not be said for the electricity prices, which largely (for small consumers) are regulated and are at the level which is lower than the level that would match the market prices. In addition, there is a disproportion of electricity prices (MKD/kJ) and the prices of the remaining energies and fuels.

By increasing the level of liberalization of the electricity market, more and more consumers will be able to purchase electricity on the free market. However, by 2015 the households will be tariff consumers with regulated price. After 2015, electricity and natural gas at regulated price will be supplied to households and small consumers only by last resort suppliers.

The ERC determines the price at which the suppliers of tariff consumers provide the electricity intended for tariff consumers, by based on the production costs in ELEM and the procurement costs on the open market in cases when ELEM is unable to provide the necessary quantities. Although the price of electricity is determined based on a methodology that is in line with the Law on Energy, primarily due to the low value of the assets of ELEM, the price of electricity produced by ELEM is far lower than the price of wholesale electricity in the region.

As a result of the relatively low cost of electricity, many consumers of heat energy are disconnecting from the heat systems and use electricity for heating.

Among other reasons, the disproportion between the price of electricity and natural gas is one of the factors that the distribution of natural gas is not developed according to the desired pace.

Finally, the low cost of electricity adversely affects the investments in improving energy efficiency in the industry and the households.

In order to overcome the aforementioned problems and to provide a gradual transition to a fully liberalized electricity market, it is necessary the price of electricity for tariff consumers (and after 2015 for the consumers that will be supplied by last resort suppliers) to approach gradually to the market price. This can be achieved with a higher rate of return on equity for ELEM and the inclusion of an appropriate concession fee. This will increase the investment potential of ELEM, and will give a clear signal and an incentive for other (private) investors to invest in the energy sector (power plants, natural gas distribution and cogeneration plants), and in other sectors to increase the energy efficiency.

Increasing the price of electricity, primarily for households, may lead to a situation that socially vulnerable categories will not be able to bare those prices. It is therefore necessary to take the following actions:

- Gradual transition towards fully liberalization of the electricity market,
- Promotion and education on energy efficiency,
- Financial assistance (soft loans and / or tax relief) for households that are willing to invest in energy efficiency or for the purchase of highly efficient devices and appliances,
- Financial assistance (soft loans and / or tax relief) to invest in the production of efficient devices (highly efficient biomass stoves, solar panels, etc.).
- Tax relief.
- Increasing the fee for subsidy in the Program for subsidizing energy consumption.

2.3.4 ADDITIONAL OTHER MEASURES

Efficient operation of the energy systems is another prerequisite for intensifying the investments in energy and reducing the energy consumption per unit of gross domestic product.

One of the ways of improving the energy efficiency of the energy system and reducing the energy consumption per unit of gross domestic product is the construction of highly efficient combined heat and power plants for the production of electricity and heat. As a rule, the combined plants with great nominal power can survive on the market of electricity (and heat energy) without additional incentives. But that does not necessarily refer to smaller plants and therefore it is necessary to stimulate investments in their construction by

- introducing feed-in tariff for high-efficiency cogeneration plants for which there is a basis in the Law on Energy.

2.3.4.1 Electricity sector

In the last fifteen years the electricity losses in the largest distribution system have increased to an unacceptably high level as a result of the reduced investments in the distribution networks, but also because of the increased electricity thefts. Electricity thefts on the other hand, are largely a result of the mild penalties and the inefficient judicial system.

In order to reduce electricity losses and to bring them to the level of technical losses, measures will be taken that will result in the following:

- Replacement of electric meters owned by the consumers and their dislocation from the posts / facilities owned by consumers and introducing sophisticated meters with the possibility of advance payment,
- Increase the investments in order to strengthen the distribution network which will improve the quality of electricity,
- In order to achieve the above mentioned goals related to investments, obligations of the distribution system operator for investments should be created, but also conditions for returning the investments.

The security in supply of electricity will be significantly improved by the establishment of a regional electricity market. One of the preconditions for the functioning

of the regional market is the existence of mechanisms for transparent allocation of cross-border capacities in the region.

According to the decision of the Ministerial Council of 11 December 2008, on 13 July 2012 in Montenegro was formed the PTC – Project Team Company with the task to prepare the SEE CAO – South East Europe Coordinated Auction Office to be operational by legal, technical and organizational aspects. The PTC was founded by 10 Transmission System Operators of the 8th Region in order to meet the principles set out in the Treaty establishing the European Energy Community on the harmonization of the methods for dealing with congestion in the transmission network and establishing rules for the internal electricity market. By the end of 2013, the PTC will prepare all the necessary legal, financial and technical conditions for the start-up of the SEE CAO. The first auction conducted by the SEE CAO is expected to be realized in the last week of November or the first week of December 2013 on the Cross-border transmission capacity from 2014.

In this regard:

- MEPSO, with the support of relevant institutions, should continue to actively work and support the project for the establishment of a regional house for coordinated auctions of cross-border capacities;
- The competent state institutions to be actively involved in projects for the establishment of a regional electricity market.

2.3.4.2 Heat energy

In the recent years, heat energy suppliers have been facing with an increasing number of cancellations by customers. This should be not allowed for several reasons:

- The investments in the production and distribution infrastructure has included all residential and business premises in the buildings connected to the remote heating systems;
- The losses in the network (and in the objects) are divided into a smaller number of consumers;
- In the buildings connected to the remote heating system there are cases when certain residential or business premises are disconnected, and then they use a large part of the heat supplied through the hallways and through the walls of the neighboring residential or business premises that is paid by the other users in the building;
- There is a significant number of consumers who, after disconnecting from the system, connect to it again, without authorization, and thus cause a direct damage to all the consumers connected to their meter.

Because of the abovementioned reasons, the price for the other consumers becomes too high, so they disconnect as well.

Introduction of heating costs allocation at consumer level according to the energy consumption at consumer level is an imperative for suppliers of heat energy. In the past period one of the main disadvantages of the remote heating system was the inability for the consumer in a collective object to decide on the amount of heat that he/she will use, and thus to decide about the amount to pay for heating in a certain period.

According to the acts that currently regulate this area, in order to realize the cost allocation at consumer level in collective object, it is necessary at least 80% of the consumers to be willing to have an allocation system.

In addition, amendments to the regulations are necessary that would allow a control of the unauthorized connected consumers and appropriate sanctions through:

- Introduction of devices for local distribution of heat energy consumption in end consumers,
- Prediction that each newly built building which is connected to the remote heating system must be fitted with a system for measuring and regulation of heat energy consumption at an apartment level,
- Introduction of a competition among multiple suppliers.

2.3.4.3 Natural gas

There are several reasons why the construction of natural gas distribution systems is not developed according to the desired dynamics. Despite the uncompetitive price of natural gas compared to electricity, the disinterest of the investors is due to the fact that the number of households and small consumers that would be connected to the natural gas system would be relatively small having in mind the additional costs that consumers would have for the transfer from electricity to natural gas (connection costs and costs for the purchase of new appliances). Due to that it can occur the costs of using distribution networks (distribution tariffs) to be relatively high. If the number of potential customers is small there may not be much interest by the private sector to invest in networks. In order to attract investments for the development of the distribution networks, the Government will consider opportunities for providing additional benefits (tax relieves, state aid measures in order to reduce distribution tariff, etc.). Also, the Government with the assistance of the international financial institutions will endeavor to provide credit lines to finance the consumer connections and purchasing new appliances. In order to implement this measureit is necessary to take a number of measures such as the provision of soft loans to consumers and / or additional benefits that would be in accordance with the Law on Concessions and Public-Private Partnership and other laws in the Republic of Macedonia.

2.3.4.4 Oil and oil derivates

According to the Law on Compulsory Reserves of Oil and Oil Derivatives Republic of Macedonia has an obligation the compulsory reserves of oil and oil products to reach a coverage of the average daily consumption of oil and oil derivatives in the preceding calendar year for a period of 90 days or 25% of the realized consumption in the previous year. In addition, according to the Law on Energy, wholesalers with oil, oil derivates, biofuels and fuels for transport have an additional obligation to keep reserves for covering a five-day average trading volume, calculated on the basis of the realized trading volume for each derivative separately in the previous year.

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- During the drafting of the new Law on compulsory reserves of oil and oil products to consider options for more optimal use of stowage facilities available to the Republic of Macedonia, as well as construction of new storage facilities in accordance with the obligations arising from harmonization with European legislation

- Given that the Republic of Macedonia has a refinery crude oil part of the reserves can be stored in the form of crude oil.

2.3.5 RECOMMENDATIONS FOR IMPLEMENTATION OF THE PUBLIC PRIVATE PARTNERSHIP

Having in mind the strategic goal[9] of increasing the participation of the private sector and attracting foreign capital into the country's energy market, which on one hand is a necessity for a small country with limited financial resources, and on the other hand allows an increase in the investment activity in the country and acceleration of the overall economic development, in Chapter 9 of the Strategy it is stated that Macedonia, objectively, will be forced particularly to use the concessions and the public-private partnerships (PPP). This gives us the right to conclude that the statutory regulation of the PPP and the giving under concession is a prerequisite for attracting private investments in the energy sector, particularly in the production of electricity and heat, as well as in the distribution and supply of electricity, heat and natural gas.
The Law on Concessions and Public-Private Partnership[10] (hereinafter: LCPPP) determines that the PPP is a form contractually regulated, long-term cooperation between the public partner and the private partner, where the private partner assumes the obligation to provide a public service for the end users in the areas of competence of the public partner and / or to provide for the public partner necessary preconditions for the provision of public services to the end users and / or activities within its jurisdiction. For this purpose, the private partner may undertake an obligation to:

- finance, design, build and / or reconstruct / renovate building public infrastructure or
- operate and maintain a new facility and / or reconstructed / renovated building of a public infrastructure, or
- use, manage and maintain the existing building of a public infrastructure or
- any meaningful combination of commitments aimed at meeting the objectives of public-private partnerships.

The LCPPP determines that the procedure for granting concession of goods of general interest and the contract for establishing a PPP agreement is implemented in accordance with the principles of transparency, non-discrimination, proportionality, efficiency, equal treatment and mutual recognition. According to Article 15 of the LCPPP, the provisions of the Public Procurement Law[11], relating to the procedures for granting contracts for public procurement of works and contracts for public procurement of services, shall correspondingly apply to the procedures for granting contracts for PPP establishment, unless it is otherwise provided by the law itself.

According to the LCPPP the private partner usually takes the most significant part of the risks associated with financing, construction, management, maintenance, and technical risks. Namely, the Law stipulates that each partner in a PPP for the duration of the PPP:

[9] Strategy for energy development in the Republic of Macedonia until 2030, Chapter 11.
[10] Official Gazette of the Republic of Macedonia No. 6/2012
[11] Official Gazette of the Republic of Macedonia No. 136/2007; 130/2008; 97/2010; 53/2011 and 185/2011

- will take responsibility for risk events that are within its sphere of influence, or
- the responsibility is shared in order to achieve optimal risk management for the duration of the partnership.

Due to the balance of risk in the relationships between public and private partners, especially in cases when the necessary level of price efficiency of private participation can not be achieved which should provide a reasonable return on investment, Article 5 of the LCPPP provides the opportunity, in exchange for undertaken commitments, the private partner to:

- be granted public works concession or a public service concession, or
- be provided offset by payment, or
- be allowed to perform certain commercial economic activities, in addition to the obligations arising from the objectives of the partnership established in the contract.

PPP is established by a contract concluded for a period until 35 years from the date of conclusion of the contract, i.e. from the date of entry into force of the contract, unless otherwise provided in a special law, taking into account the financial and economic indicators and technical and / or technological specifics of the subject of the PPP contract. The PPP contracts are drafted in accordance with the tender documents, advertisement or public announcement and the decision to choose the best offer. Although in the LCPPP are not listed the elements of the contract, in certain of its provisions it is stated that certain relations between public and private partners will be arranged by contract, and Article 40 determines the obligation for the government to regulate the content of the contract. Prescribing the contents of the agreements by the government, instead of the basic elements of the contract to be prescribed by law, may create legal uncertainty for the investors.

2.3.5.1 Public-private partnership in performing energy activities

In the area of energy PPP contracts can be concluded for performing energy activities associated with the production, distribution and / or supply of electricity or heat energy, as well as distribution and supply of natural gas. The parties to the contract shall be determined under the provisions of the Energy Law in which precisely is defined which persons can perform regulated or unregulated energy activities, and whether the organization of the provision of appropriate public service through the PPP contract is the responsibility of the central or the local authorities. Also, when granting the PPP contracts it should be taken into account that a person can be given the right to perform regulated and unregulated energy activities, provided that the conditions in the Law on Energy[12] are met.

Having in mind that in the performance of energy activity the private partner may assume the obligation to construct or finance the construction of new, or to reconstruct or renovate permanent energy facility for energy production or distribution of energy or natural gas, or to use, manage and maintain an existing facility for the distribution of

[12] According to Article 95, paragraph (4) of the Law on Energy, in the natural gas distribution systems with less than 100,000 users the natural gas distributor may have licenses also for natural gas supply. Similarly, according to Article 121, paragraph (3) of the Law on Energy, if a heating system is with total installed capacity of consumers of less than 80 MW, the licenses for performing activities of production or activities of regulated production of heat, distribution system operator of heat energy and heat supply can be assigned to one person.

energy or natural gas, in order through these facilities to provide public service and to charge certain tariff, in order to ensure attractiveness of the PPP in performing the regulated energy activities, it is necessary the provisions of the LCPPP to correspond to the following provisions of the Law on Energy:

- Article 6, paragraph (4), according to which the prices and tariffs for services provided by the supplier of regulated energy activities need to reimburse eligible costs and provide a reasonable return on equity of service of providers of regulated energy activities in the provision of public services, including and costs for efficient use of energy resources and environmental protection and improvement;

- Article 6, paragraph (5), according to which, if the providers of energy activities that have an obligation to provide a public service are granted financial compensation, other forms of compensation and / or exclusive rights in order to perform obligations defined in the law, the granting should be done in a transparent and non-discriminatory manner, and the granted compensation must not exceed the costs incurred in providing public service increased by a reasonable profit, and reduced by the profits from the provision of the service, and

- Article 24, paragraph (4) item 4) according to which the regulations and methodologies for establishing service tariffs for regulated energy activities should provide the providers of regulated energy activities to recover the reasonable costs of performing the energy activity and the appropriate return of capital.

It is evident that the LCPPP emphasizes that with the PPP a level of price efficiency has to be reached, which should provide the private participation a reasonable return on investment, while the Law on Energy specifically states that in addition to the return on capital and operating costs, it is also necessary to achieve an appropriate return on equity, i.e. a reasonable profit.

A special problem that can occur with the private partner as an investor in performing energy activity is the provision of Article 11 of the LCPPP, according to which the facilities built on the basis of PPP, including the additions and improvements are owned by the public partner, unless otherwise provided in the contract. This provision could lead the private partner:

- not to be able to fully return the capital investment costs because the energy facility built under contract for regulated energy activity is not its possession and the regulatory body will not recognize it in the value of fixed assets, as one of the important components on which is determined the maximum allowable income that private partner should have through the activity, and

- not to be able to exercise the right referred to in Article 42 paragraph 2 of the LCPPP allowing in the contract on PPP to be foreseen transfer of rights and obligations under the contract to the private partner for the benefit of the lenders, as a means for providing their claims on the private partner, provided it does not threaten the continued operation and / or the provision of the service, quality performance of the activity, as well as the price, having in mind that the private partner is not guaranteed by law the right of ownership of the facilities that it has built for providing a public service.

The LCPPP is an attempt for simplification of the legal framework on the basis of which is to ensure the participation of private investors in the construction of facilities of the energy infrastructure and the provision of public services in the field of energy. The

reference to the Public Procurement Law further complicates the application of this law, and it makes it unclear to investors.

The LCPPP does not regulate the basic requirements of investors, relating to the allocation of risk, providing access to land, the obligation to obtain necessary permits, approvals and consents for the construction or reconstruction of energy facilities that are subject to the partnership, the method of calculating fees that are paid by the private partner, the charging of the public services provided by the private partner, etc.., leaving them to be regulated in the contract in accordance with the tender documents. This can create legal uncertainty for investors in the energy sector.

2.3.5.2 Access to construction land

Due to the limitation of land as a resource, the right to its use is a critical element in the process of making a decision to invest in the construction of new energy facilities. Hence, the legal and regulatory framework should provide the investor reasonable terms and transparent, non-discriminatory, competitive and predictable procedures for access to land on which it can build an energy facility. Although, Chapter V of the Law on Energy, precisely regulates the procedures for construction of new energy facilities, and in particular the construction of new facilities for the production of energy, the developer is not provided access to the land nor is received an authorization for the construction of the energy facility (issued in accordance with the provisions of Articles 49 to 58 of the Law), not the decision on the selection of the best bidder which, after the announced public call, will be granted the right of the construction of the energy facility (issued in accordance with the provisions of Articles 59 and 60 of the Law). Moreover, according to Article 57 of the Law on Energy, the authorization for the construction of the energy facility shall cease to have effect if the holder of the authorization within three years does not provide approval for construction of the facility, whose issuance, according to Article 59 of the Construction Law[13], compulsory a proof of the right to a build is submitted or a property list with recorded property right or right of long-term lease or easement of urban land. Hence, the investor needs to provide the right to build on the land where the energy facility will be built, and in some cases through parallel implementation of several procedures, such as the conversion of agricultural land into a construction one, the initiation of a procedure for the adoption of new or amendment of the existing urban and planning documentation, acquiring the right to use construction land (acquisition of right of ownership, long-term lease or right of permanent use), as well as procedures for expropriation or acquisition of the easement.

The Law on Construction Land[14] defines the construction land as constructed and non-constructed land, planned with an urban plan or urban planning documentation in accordance with the Law on Spatial and Urban Planning. Having in mind the provisions of the Construction Law, according to which proof of right to build is a property list with recorded property right or right of long-term lease or easement, the investor must buy or otherwise acquire the right to own the construction land or to obtain the right to use it based on long-term lease agreement that it would conclude with the owner (the Republic of Macedonia, a unit of local self government or a domestic or foreign natural or legal person).

According to Article 14 of the Law on Construction land, the construction land owned by the Republic of Macedonia, on behalf of the Republic of Macedonia is managed by the Government of the Republic of Macedonia and the same can be conveyed to a use

[13] Official Gazette of the Republic of Macedonia No. 39/2012, consolidation
[14] Official Gazette of the Republic of Macedonia No. 17/2011 and 53/2011

for the concession or PPP, to be given on long term lease, short term lease, to be exchanged and to establish other rights over it, in a manner and under the conditions determined by law.

Article 15, paragraph 2 of the Law on Construction Land determines that the construction land in ownership of the Republic of Macedonia may be conveyed and let under a long term and short term lease, with public bid and a direct settlement, if the urban plan or urban planning documentation of the building plot envisages the construction of buildings of public interest established by law, if the competent state authority waives the need for the construction of buildings of public interest determined by law, which is determined by a decision of the Government of the Republic of Macedonia. The paragraph 5 of the same article stipulates that over a direct settlement the construction land in ownership of the Republic of Macedonia may be let under a long-term lease for the construction of facilities of public interest determined by law, upon a prior consent of the Government and the decision of the Council of the Local Self Government Units in whose territory the land is located.

In determining the energy facilities of public interest the following should be taken into account:

- in accordance with Articles 6 and 7 of the Law on Expropriation[15],
  - public interest of importance for the Republic of Macedonia shall be established for:
    - construction of nuclear power plants, thermal power plants and hydro power plants with a capacity of and over 1MW,
    - construction of transmission lines with voltage level of and over 35kV,
    - construction of facilities for electricity production from renewable sources with a capacity of and over 1MW,
    - construction of substations with voltage levels of and over 10kV and dams with reservoirs,
    - construction of pipelines, product pipelines, main gas pipelines, gas metering stations,
    - construction of a secondary gas network.
  - public interest of local importance is determined for construction of transmission lines with a voltage level up to 35 kV and substations with voltage levels up to 10 kV,

- in accordance with Article 49, paragraph (8) of the Law on Energy, for improvement and environmental protection, the facilities for electricity production from renewable energy sources, as well as high-efficiency cogeneration plants are objects of public interest.

Having in mind that, according to Article 7 paragraph (1), item 3) of the Law on Energy, the reliability in the supply of a particular type of energy or fuels is provided by taking measures for the construction of new energy facilities, or facilities for the generation, transmission and distribution of electricity and natural gas, there is no doubt that the facilities used to provide public service should receive legal treatment facilities of public interest facilities. In this sense, it is necessary the Law on Construction Land to anticipate that the construction land which is planned for construction of energy facilities of public interest, upon prior approval by the Government of the Republic of Macedonia may be given by a direct settlement to an investor, who, pursuant to the Law on Energy has obtained the authorization for the construction of the energy facility, or who is chosen as

[15] Official Gazette of the Republic of Macedonia No. 95/2012

the best bidder on an open public call for construction of the energy facility. With this, the investors which in the preliminary procedure conducted by the Government of the Republic of Macedonia, under the provisions of Title V of the Law on Energy, has proved its organizational and financial capacity as well as the clear intention to construct build energy facility, will be relieved from the uncertainty of the public bidding for the acquisition of ownership or the right to long-term lease of the construction site. At the same time, the procedure will be simplified and the time will be shortened to obtain a construction permit because they will have the proof of right to build.

According to Article 42 of the Law on Construction Land, the construction land owned by the Republic of Macedonia may, based on a decision of the Government of the Republic of Macedonia to be given for permanent use and without compensation, to the state authorities, public enterprises and other entities established by the Parliament, the Government or the local self government units, if that land is intended for construction of facilities for their needs. It is evident that in this group of subjects, as possible beneficiaries of the land on the basis of the right to permanent use, are not included other commercial private and legal entities that have an obligation to provide a public service, i.e. that perform activities of public interest, and which are not public companies or trade companies established by the Parliament, Government or the local self government units. In order to avoid the discriminatory treatment towards the providers of regulated energy activities that construct facilities for the purpose of performing their activity, it is necessary the specified statutory provision to be supplemented with the entities which in the performance of their activities have an obligation to provide a public service, or perform activities through which the public interest is realized.

In this regard we point out that it is necessary to provide internal consistency of the provisions of the Law, in particular having regard to the provisions of Article 17, paragraph 1, according to which the construction land owned by the Republic of Macedonia for construction of infrastructure facilities is given under a long-term lease, or for permanent use in accordance with the same law, on the basis of the infrastructure project. Pursuant to Article 2, point 6 of the Law, an infrastructure facility is underground or above ground installation and construction in the field of electrical installations, gas pipelines and heating installations. In this context, the Law should accurately determine whether the performers of the regulated energy activities that perform their activity through infrastructure networks and systems, and which are not public companies or established by the Parliament or the Government, or the local self government units, have the right to acquire the right to permanent use and without compensation to build facilities for their needs, or the facilities they use to perform their activities through which they exercise their obligation to provide public service.

The Law on Expropriation[16] provides for an efficient procedure for the realization of the right to use land for construction of energy facilities in the interest of the investors. However, the provision contained in Article 6, paragraph (2) of the Law, according to which the public interest of importance for the Republic of Macedonia is determined to expropriate buildings, plants and lines for production, transmission and distribution of electricity or transmission and distribution of natural gas, plants and systems for the production and distribution of heat energy for the purpose of providing a public service, is contrary to the Law on Energy, because the activities of the production of electricity and heat energy are not regulated energy activities, i.e. through them the obligation of public service is not performed. Hence, every legal opportunity for the facilities through which

[16] Official Gazette of the Republic of Macedonia No. 95/2012

these activities can be performed may be the subject of expropriation although through them public service is not provided, and may create legal uncertainty for investors.

2.3.6 RESEARCH AND DEVELOPMENT

The national priorities for scientific and research activities in the field of energy are established in a way that enables:

- Realization of the main strategic objectives in the energy sector, both at national level and in the wider context, at the Energy Community level;
- Mobilizing the existing scientific and research capacities and their upgrading and creating new capacities, and thus, an easier integration into the European Research Area[17].
- Creating partnerships like "Science and Industry" and "Science-building policies."
- Mobility of researchers between different sectors, and geographical mobility, to and from Macedonia.

These conditions satisfy the following priorities:

Priority 1: Tools for scientific support of energy policies creation

The focus should be placed on development and application of energy system planning and optimization models which will enable scientific and competent analyses as a base for the Government decisions regarding:

- Liberalization of the energy markets,
- Reducing the greenhouse gases emissions (placing quantified goals),
- Improving the energy efficiency,
- Increasing the renewable energy sources share.

Priority 2: Energy efficiency

The focus should be placed on the energy efficiency in buildings (residential, public and commercial) because this sector has relatively high potential for savings in final and primary energy consumption and which can be achieved with direct actions by the Government. This potential should be realized through research in optimization and validation of the existing and demonstration of new concepts and technologies in buildings. That includes combination of sustainable strategies and technologies for increased energy efficiency, use of renewable energy sources and co- and poly-generation, as well as measures for management of demand and of consumption devices. Energy efficiency is closely related with smart networks (priority 4) since the real value of the smart networks cannot be realized if energy efficient buildings are not connected to such networks.

Priority 3: Renewable energy sources

The focus should be placed on solar thermal energy, biomass and biofuels. In the case of solar thermal energy there are relatively well developed research capacities in the industry (several small and medium sized enterprises) and relatively high potential for global application of the solar thermal systems. Biomass, as a result of its significant share

[17] ERA – European Research Area

in the energy mix, is a very important energy source to meet the goal of the renewable energy sources. The same applies to biofuels with the special goal for biofuels for the European transport sector.

The research in the first area should be directed toward development of more efficient and cheaper solar systems with high performance collectors (for example, use of plastic material with high thermal and optic performances). Research in the second area should focus on the assessment of the potential of the various biomass types, defining the manners of efficient utilization of the various biomass types as well as development of advanced technologies and practices for biomass utilization, including co-generation and co-combustion. The third theme should focus on domestic production of biofuels.

Priority 4: Smart grids

The main goal of the electric networks is transformation of the existing networks in resilient and interactive (consumers/operators) service network, with real time control, demand management and removal of mass use barriers and selective installation of renewable energy sources and distributed production. Smart networks will also help the integration of the electrified transport. All this requires research and development of innovative information and communication technologies, renewable sources storage technologies, energy electronics and superconductor devices, as well as new control tools and strategies for electric power systems reliability.

- In coordination with the Ministry of Education and Science, the established energy priorities need to be included in the scientific priorities of the country, and respectively, part of the budget funds to be allocated for scientific and research activities.

- The academic sector to be encouraged, in collaboration with the industries, municipalities and other institutions of the governmental and non-governmental sector, to apply for projects of relevant European and other international programs and funds (FP 7 and the upcoming "Horizon 2020", "Intelligent Energy – Europe"). The motivation will be done by co-financing the preparation of the project proposal.

- Overall, considering that most of the financing of the scientific and research activities should come from outside, the criteria for career advancement of scientific workers should properly value the participations in international projects.

2.4 CONDITIONS, MANNER AND DINAMICS OF INFRASTRUCTURE FACILITIES IMPLEMENTATION IN THE PERIOD 2013 - 2017

2.4.1 INFRASTRUCTURE PROJECTS

Summary overview of the above-mentioned infrastructural projects that will be implemented or whose implementation will start until 2017 is given in table 2.4.1.1.

Table 2.4.1.1. Infrastructural activities in the period 2013-2017

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
ELECTRICITY SECTOR ***Production capacities***										
Revitalization of TPP Bitola The boilers of Blocks 2 and 1 by reducing the NOx and the cooling towers						2014	60	ЕЛЕМ	ELEM (15%), loan (85%)	Revitalization of Block 3 is commpleted
Exploitation of Suvodol UCS with 3 million tons annually						2013-2028	42	ЕЛЕМ	ELEM (15%), loan (85%)	
Exploitation of Brod-Gneotino with 2 million tons annually						2013-2026		ЕЛЕМ		Actual operation (fuel price)
Opening of Suvodol UCS and initial exploitation of 1.5 million tons						2013-2023		ELEM		Actual operation (fuel price)
Opening of the Zhivojno lignite mine						2022	38	ELEM	PPP or ELEM (15%), loan (85%)	
Opening of the Popovjani lignite mine						2016	40	ELEM	ELEM (15%), loan (85%)	

[18] Даденото процентуално учество на инвеститорите во финансиската конструкција на одделните проекти е проценато. Точното учество на инвеститорите како и начинот на обезбедубање на финансиските средства ќе се определи при подготовка на проектни активности

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
Exploitation of the Popovjani lignite mine						2016-2024		ELEM		Actual operation (fuel price)
Construction of gas fired CHP, 230/160 MW						2018	170	ELEM or private investor	PPP or Private investor	GRM provides institutional support
Construction of gas fired CHP, 40/30 MW						2018	30	ELEM or private investor	PPP or Private investor	GRM provides institutional support
Revitalization of the large hydro power plants – Phase II						2014	21	ELEM	ELEM (15%), loan from KfW bank (85%)	
Revitalization of the large hydro power plants – Phase III						2018	67	ELEM	ELEM and loan assets	Including the upgrade of HPP Shpilje
Preparatory activities for Construction of HPP Boshkov Most						2017	104	ELEM	ELEM (15%), loan from EBRD (85%)	
Construction of Lukovo Pole and HPP Crn Kamen						2018	65	ELEM	ELEM (15%), loan from WB (85%)	
Preparatory activities for Construction of HPP Chebren						2021	170	MESP ELEM	PPP	GRM provides institutional support
Construction of WPP Bogdanci 37.2 MW						2013	55	ELEM	ELEM (41%), loan from KfW (59%)	
Construction of other WP						2017	40	ELEM or private investors	ELEM, PPP or Private investors	ELEM has an authorization for total 45 MW Total limitation until 2016 is 65 MW GRM, MEPP,

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
										EARM provide institutional support
Construction of small HPPs						Regular activities	90	Investors / concessionaires	Investors / concessionaries	EARM provides institutional support
Construction of photovoltaic systems with total capacity of at least 10 MW by 2017						Regular activities	20	Investors / concessionaires	Private investors	EARM provides institutional support
Construction of CHP on waste biomass						Regular activities	6	Private investors	Private investors	GRM, MEPP, EARM provide institutional support
Construction of plants on biogas from biomas						Regular activities	5	Private investors	Private investors	GRM, MEPP, EARM provide institutional support
ENERGY SECTOR ***Transmission system***										
Construction of 400 kV interconnection transmission lines						2014	54,9	MEPSO	MEPSO (30%), loan (70%)	SS Shtip – SS Nish (RS) (19,2)
						2017				SS Bitola 2 – SS Elbasan (AL) (29,2)
						2020				SS Skopje 5 - Kosovo (1,4)
Revitalization and reconfiguration of 110 kV transmission lines						2017	33,5	MEPSO	MEPSO (40%), loan (60%)	Revizatilazation (24,25)
						2014			MEPSO (30%), loan (70%)	SS Sk1 – SS Jugohrom – SS Te1 (7,36)
						2015				Crossing TL Vrutok – SS Sк1 and connecting to SS Te2 (1,9)
Reconstruction and revitalization of						2017	28,85	MEPSO	MEPSO (30%),	SC Охрид

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
substations									loan (70%)	400/110 kV (8)
						2015				Alternative-compensation devices of SS Ohrid 1 (2x25 Mvar) (1,5)
						2013				Revitalisation of 110/x kV SS (0,7)
						2014				Reconstruction of 400/110 kV SS (1,5)
						2017			MEPSO (40%), loan (60%)	New equipment for SS (7,4)
						2017				Monitoring of SS (4,9)
Transmission system management						2014	9,3	MEPSO	MEPSO (50%), loan (50%)	New SCADA/ EMS system (6,4)
						2017			MEPSO (40%), loan (60%)	Closing the optical ring (2,9)
ELCETRICITY SECTOR ***Distribution system***										
Reduction of losses in the distribution (replacement of meters, and their dislocation outside the facility, detecting unauthorized use of electricity, introduction of sophisticated meters)						Regular activities		EVN		
Increase reliability in the operation of the distribution network (replacing mechanical regulation with automatic, new directed radio links, the full implementation of SCADA)						Regular activities		EVN		
Development of the energy distribution system						Regular activities		EVN		

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
HEAT SECTOR										
Revitalization and modernization of the heat production faciliies						Regular activities	5	Holder of license for heat production		
Reduction of the distribution losses, increased competence and controlled delivery at an apartment level						Regular activities	4	Holder of license for heat production		
Installation of solar systems for hot water						Regular activities	18	Private investors (17,5) и budget (0,5)		30000 installations
Studying and utilizing geothermal energy						Regular activities	10	Local self-government and concessions		
Central heating system in Bitola, Novaci and Mogila from TPP Bitola						Regular activities	40	ELEM PPP Local self-governments		
SECTOR FOR OIL AND PETROLEUM PRODUCTS										
Revitalization and modernization of the OKTA Refinery equipment						Regular activities		OKTA		
Modernization of the present and construction of new petrol stations						Regular activities		Private investors		

	2013	2014	2015	2016	2017	Foreseen realization period	Funds required in the period 2013-2017 (million EUR)	Activity carrier	Manner of providing assets[18]	Note
GASIFICATION										
Construction of gas pipeline system in Macedonia						2015	58	MEP	Russian Federation (46 – clearing debt), Budget (12)	Klechovce – Shtip - Negotino – branch to TPP Negotino
						2018	60		Budget and loans from EIB/EBRD	Shtip – Strumica – Greek border Skopje – Tetovo - Gostivar Negotino – Kavadarci – Prilep – Bitola and TPP Bitola – Greek border
Finalization of the gas ring around Skopje						2013	2	GAMA		
Projecting and connecting to the main gas pipeline South stream						2017		MEP		
Construction of a distribution network in the Republic of Macedonia						Regular activities		Local self-government units and/or Private investors	PPP	GRM provides institutional support

2.4.2 PREPARATION OF PROPOSAL PROJECTS, STUDIES AND OTHER ACTIVITIES

Table 2.4.2.1. gives a summary of the above mentioned preliminary designs, studies and other activities that will be implemented by 2017.

Табела 2.4.2.1. Poposal projects, studies and other activities in the period 2013-2017

	2013	2014	2015	2016	2017	Activity carrier
ELECTRICITY SECTOR						
Study on coal supply for the TPP Bitola for the period beyond 2020						ELEM
Study on coal supply for the TPP Oslomej for the period beyond 2016 and beyond 2024.						ELEM
Development of a new technological-economic analysis for the exploitation of the potential of Vardar River						ELEM
Simplification of the procedure for construction of small hydro power plants and designing of brochure						GRM MEPP EARM
Study on the waste biomass available for energy needs. Additional measures to stimulate the construction of CHP on waste biomass						Ministry of Economy
Activities for finding grant funds to build a pilot CHP on waste biomass						Ministry of Environment and Physical Planning and Ministry of Economy
Additional measuring of the wind potential in Macedonia and use of the data for development of feasibility study on the wind potential. Systematic maintenance of reference metering stations of the wind potential						EARM
Comparative analysis of feed-in tariffs for high efficient cogeneration plants						Ministry of Economy
Defence Plan						MEPSO
Stady on reliability of transmission network						MEPSO
Stady on forecast of electricity and power balans for long period						MEPSO
Study on managing voltage and reactive power production of EPS in RM						MEPSO
Study on the use of reserves for primary, secondary and tertiary reserve						MEPSO
Study on development of transmission network in Skopje region for long						MEPSO

	2013	2014	2015	2016	2017	Activity carrier
period						
Study the feasibility of a 400 kV interconnection line Skopje - Kosovo						MEPSO
SECTOR FOR GENERATION OF HEAT ENERGY						
Program for stimulating small and medium sized industries for production of devices for biomass combustion with high energy efficiency						Ministry of Economy
Program for subsidizing the replacement of the obsolete with of new efficient combustion devices, especially for the socially vulnerable households						Ministry of Economy
Program for reduction of the losses caused by illegal logging						Public enterprise "Macedonian Forests"
Program for reduction of the unregistered consumption of wood						Public enterprise "Macedonian Forests"
Program for support of the greater use of solar thermal systems						Ministry of Economy
Defining principles and requirements according to which the current geothermal resources will be used and new ones will be investigated in all possible forms of investment						Relevant Ministries and the local self-government
NATURAL GAS						
Study for natural gas distribution in Macedonia						Relevant Ministry
Study on the real possibilities to increase the capacity of the existing main pipeline up to 1200 million Nm^3 per year						GAMA or MEP
OIL						
Examining the possibilities for reviving the activities of the Intergovernmental commission on construction, operation and maintenance of the AMBO pipeline						Ministry of Economy
BIOFUELS						
Comparative analysis that will determine the annual percentage of biofuels in the total fuel quantities used for transportation and the manner of implementation						Ministry of Economy
Study on defining the potential of the Republic of Macedonia for biofuels						Ministry of Economy Ministry of agriculture, forestry and water economy

	2013	2014	2015	2016	2017	Activity carrier
ENERGY EFFICIENCY						
Implementation of the First Action Plan on Energy Efficiency						According to the Energy Efficiency Strategy
Preparing and implementation of the National Program on Energy Efficiency of public buildings in the Republic of Macedonia						Ministry of Economy
Organizing campaign on energy efficiency						EVN

In addition to mentioned funds, from the budget of the Republic of Macedonia funds allocate for the implementation of the Program for subsidizing energy consumption and the Program for compensation a part of the cost of purchased and installed solar thermal collector systems for households.

The Government of the Republic of Macedonia, for the first time, adopted Program for subsidizing energy consumption in August 2010, followed by an Annual program for subsidizing energy consumption in January 2011. As part of this program, in 2012 around 74 million MKD of budgetary funds have been placed. Users of the assets were households that were recipients of social security, which were receiving 700 MKD / month to cover their energy needs. This assistance from the Government continues in the following years.

In the budget of the Republic of Macedonia in 2013 74 million are planned for this purpose.

Among the investment in renewable energy sources are also the subsidies for solar collectors, and until now 500 households were subsidized in 2007 and in 2009, 421 in 2011 and 481 in 2012. The Budget for 2013 provides new 6,000,000 denars for this purpose.

For the realization of the Project for gasification of the Republic of Macedonia in the budget for 2013 are projected 244.2 million MKD of which 5 million are earmarked for compensation to tenants of agricultural land, 189.2 million MKD for the payment of prepared project documentation and for construction the National gas system of the Republic of Macedonia and 5 million for the payment of compensation for expropriation of land for starting construction.

This chapter is explained in more details in Appendix 2, which is an integral part of this Program.

3 METHODS FOR MONITORING OF PROGRAM IMPLEMENTATION

Monitoring is a periodic supervision in the implementation of some activity, project or program. The monitoring determines whether investments, activities undertaken and quality thereof, as well as achieved results are being realized according to the plan. It encompasses regular data collection and analysis which assist timely decision making, provides relevant reports and creates evaluation base. Evaluation is a process which has a goal to identify, in a most objective and systematic manner, the relevance, efficiency, effectiveness, value, sustainability and impact of the program or project. It has to provide useful information important for management and to assess the activities undertaken. Decisions on the future activities are made based on the evaluation.

Monitoring and evaluation using well defined relevant indicators is an important prerequisite for the implementation of the Program for Realization of the Energy Development Strategy in the Republic of Macedonia for the Period until 2017.

According to article 11 of the Law on Energy[19], the Ministry of Economy prepares, each year, a report about the realization of the Program during the previous year and submits this report to the Government of the Republic of Macedonia no later than the 31st of July. The other relevant ministries (Ministry of Environment and Physical Planning and the Ministry of Transport and Communications) should also participate in the process of monitoring and evaluation of the application of the Program for Realization of the Strategy for Energy Development.

For the purposes of the Ministry of Economy, the Energy Agency prepares the annual reports on the realization of the program and by the end of February at the latest, the agency submits the report to the Ministry of Economy.

The structure of the annual report should contain the following:

1. Quantitative indicators for implementation of the Program

2. An assessment of the implementation of the Program

- compliance with the time schedule
- financial report (funds, resources utilization)
- capacity building development
- achievement of the objectives

3. Barriers to implementing the Program

- external influences
- report of barriers related to administrative procedures
- other barriers

4. Recommendations on how to improve the implementation of the Program on all levels

[19] Official Gazette of the Republic of Macedonia, no. 16 from 10.02.2011

5. A short overview of strategic studies and analyses prepared during the reviewed year

6. Summary of comments from public discussions to the draft report

In 2014 the Ministry of Economy will provide funds from donor technical assistance for development of the first Annual report on the implementation of the Program in the amount of EUR 80 000. In addition to the standard contents, this document in details and precisely will define the data collection procedures, methods for calculation of derived data, the ways and forms of reporting and archiving, as well as the institutions with specified tasks and deadlines.

Relevant annual indicators for monitoring the degree of achievement of objectives will be used to assess the implementation and the effects of the Program for realization of the energy development strategy. The following annual indicators and targets have been defined:

- Energy savings targeted at achieving 9% energy savings by 2018, in accordance with the time schedule envisioned in the National Energy Efficiency Action plan (NEEAP);
- The share of renewable energy sources in the total final energy consumption as well as the share of renewables in each of the subsectors (electricity, heat generation, transport). In accordance with the decision of the Ministerial Council of the Energy Community of South East Europe for the implementation of Directive 2009/28/EC to promote the use of energy from renewable energy sources, the Government expects that the according to the available potential in the country around 23% share of the renewable energy sources in 2020 can be achieved.
- GHG emissions from combustion engines (including the GHG emissions in each subsector) with a view to reduce such emissions;
- NO_x, SO_2 and particle emissions from fuel combustion, with a view of reducing the emissions;
- Import dependence, with a view of increasing the independence and thereby improve the strategic reliability of supply;
- The supply structure, with a view of diversifying the sources of primary energy, thus improving the strategic reliability of supply;
- The energy supply intensity, in order to improve the energy efficiency and the overall competitiveness of the economy;
- The natural gas and electricity price differences between the Republic of Macedonia and EU 27 for industrial and household consumers, with a view of providing for a transparent market;
- Annual monitoring of the efficiency of the preparations and implementation of the key measures and projects identified in the Program, in order to ensure that they are properly implemented;
- The support provided by the state for energy efficiency and renewable energy sources

- Specific value of savings, production, and greenhouse gas emission reduction in order to promote a concept involving sustainable development, energy efficiency and renewable energy sources.

3.1 QUANTITATIVE INDICATORS

In order to assess the implementation and effects of the Program for implementation of the Strategy for Energy Development in the Republic of Macedonia for the period 2013-2017, the quantifiable indicators for monitoring listed below will be used.

3.1.1 IMPROVING ENERGY EFFICIENCY

With the promotion of energy efficiency measures significant reductions in energy consumption in the country can be achieved, which would lead to a reduction in energy costs, as well as increased competition in the energy sector.

According to the Strategy for Improving the Energy Efficiency of the Republic of Macedonia until 2020, through the measures proposed in the First National Energy Efficiency Action Plan until 2018 (first NEEAP) it is estimated that by 2018 energy savings would be over 9% of the average consumption in the period 2002-2006, i.e. about 1710 GWh (147 ktoe). With the development of additional measures for rational use of energy, particularly of electricity, it is planned to increase savings in the coming period of 2018-2020. According to the predicted dynamics in Strategy for Promoting Energy Efficiency the Republic of Macedonia in 2020 is expected to achieve savings of 14.5% which will bring it closer to the EU's stated objective.

Indicator

Realized annual energy savings, total, by sector and by realized measures, expressed in ktoe, and degree of realisation (%) of the planned savings according NEEAP.

Competence

Measurement and verification of these savings is one of the responsibilities of the Ministry of Economy and the Energy Agency, which need to monitor this indicator each year.

Monitoring objectives and methodology are set within the NEEAP.

3.1.2 INCREASING THE SHARE OF RENEWABLE ENERGY SOURCES

Another important indicator is the share of renewable energy in total energy consumption. As part of the procedure for acceptance and implementation of EU legislation (acquis communautaire) is the implementation of Directive 2009/28 to promote the use of RES. In accordance with the methodology defined in this Directive the target percentage share of RES in total final energy consumption in 2020 for each member separately is set.

If actions to increase the share of renewable sources are carried out in parallel with the activities for increasing the energy efficiency in the final energy consumption, the target percentage share of renewable sources in the final consumption would be met easily. This would reduce the cost of energy, which would improve the competitiveness of the economy.

The share of renewable energy sources in electricity production is not quantified as an obligation, but an important indicator taking into account the share of the electricity production sector in the GHG emissions.

Due to the abovementioned reason, the monitoring of the share of renewable energy sources in the energy consumption in transport is of particular importance.

Indicator

According to the abovementioned, the following of the increase of the RES utilization will be accomplished through three indicators that express the share of the RES in:

- total final energy consumption [%],
- electricity production [%],
- energy consumption in transport [%].

Competence

The Ministry of Economy and the Energy Agency are responsible for monitoring these indicators annually.

The objectives and the dynamics shall be set in the First action plan for renewable energy sources that should be adopted by the Ministry of Economy, in accordance with the established target for the share of the RES at the Energy Community level.

The plan will determine the methodology for monitoring of the RES.

3.1.3 REDUCING THE NEGATIVE ENVIRONMENTAL IMPACTS OF THE ENERGY SECTOR

Production, distribution and use of energy creates an additional burden on the environment, both locally and globally. The environmental impact very much depends on how energy is produced and used, on the energy mix, as well as on the structure of the energy system.

About 80% of the primary energy consumption in Macedonia is produced from fossil fuels, mainly lignite and oil products, and as a result, the energy sector accounts for high percent of the total emissions of greenhouse gases, and similar share is also in the local pollution.

Thermal power plants pollute the air with particles and gases (SO_2, NO_x, CO) with a direct negative impact on wildlife and materials in their environment, and gases (CO_2, CH_4, N_2O), with globally negative impact through greenhouse effect.

Macedonia is among countries not included in Annex I, i.e. in countries which do not have quantified commitments for the reduction of greenhouse gas emissions, but as candidate for EU membership it the will have to be included in the joint European efforts and objectives related to climate change.

Indicator

Monitoring the reduction of negative environmental impacts of the energy sector will be implemented through four indicators that express emissions of:

- greenhouse gas emissions from the energy sector [kt],
- NO_x [t],
- SO_2 [t],
- particles from combustion [t].

Competence

The Ministry of Economy and the Ministry of Environment and Physical Planning and the Energy Agency are responsible for monitoring these indicators annually.

The monitoring of greenhouse gas emissions annually, by sectors and sub sectors is the responsibility of the Ministry of Environment and Physical Planning. Greenhouse gas emissions are reported according to the methodology for inventory of the Intergovernmental Panel on Climate Change (IPCC). In near future, additional reporting obligations of the GHG emissions are expected within the European legislation on climate change.

Having regard the ongoing negotiations on an international and on European level with regard to the possible quantified targets for greenhouse gas emissions, the Ministry of Environment is to coordinate the participatory process of analysis and setting appropriate and achievable goals for greenhouse gas emissions. Extremely important is conducting analyzes on the potential for reducing greenhouse gas emissions from technical (how?), environmental (how much?) and economic (at what cost?) aspect. The results of these studies will be aimed at creating scientifically based national policies in the field of climate change, as well as building the country's positions in the negotiating process at European and international level.

The Ministry of Environment and Physical Planning is responsible for monitoring the air quality and for this purpose a National air quality portal of the Republic of Macedonia[20] is formed, which contains information about the current state of the ambient air in the country, as well as information on pollutants, health effects and legislation on quality air. The Ministry prepares a report on the air quality assessment in terms of concentrations of SO_2, NO_x, CO, PM10 and O_3. This will be the main sources of data for monitoring the indicators of local pollutants.

3.1.4 IMPROVING THE RELIABILITY OF ENERGY SUPPLY

Improving the reliability of energy supply is provided primarily by reducing the dependence on energy imports, increasing the diversity of energy sources.

In terms of reliability of energy supply, Macedonia is in the group of *import dependent* countries. The total demand for oil, natural gas and high quality coal is provided from imports. The percentage share of imports in the consumption of primary energy in 2010 reached 44%.

In order to ensure energy reliability, according to the Strategy for development of the energy sector in the Republic of Macedonia, a greater diversity of energy resources by type, sources and suppliers is planned. In this sense, an active role of the regional energy market is envisaged and reducing the high energy import dependence of Macedonia with the maximum possible utilization of domestic resources.

In terms of the structure of supply, the Program provides diversification of various primary energy sources. Thus, in the reference period[21], it is expected oil and oil products to reduce the share of 31% in 2011 to 30% in 2016, the share of coal in the period 2011 - 2016 will be reduced from 53% to 45% in 2016, while the share of natural gas, from 4% in 2011 is forecasted to increase to 12% in 2016. The share of the RES in the provision of primary energy in the reference period will rise from 12% to 13%.

With the implementation of the envisaged dynamics of construction of new production facilities, the diversity will improve and thus the reliability of supply of

[20] http://airquality.moepp.gov.mk/

[21] Program for implementation of the Strategy for Energy Development of the Repubplic of Macedonia, for the period until 2016, Volume 2, Appendices

electricity. In the previous period, with average hydrology, 80% of the electricity was produced in coal fired thermal power plants and 20% from renewable energy sources (hydro power plants). In 2016 the production of electricity from coal fired thermal power plants is planned to be accounted for 59%, of natural gas fired CHP 19% and from renewable energy sources 22%.

Indicator

The Monitoring of improving the reliability of energy supply will be carried out through the following indicators:

- participation of fuels in primary energy consumption [%]
- energy imports by fuels [KWh, t, KJ, Nm3].

Competence

The annual monitoring of these indicators is the responsibility of the Ministry of Economy and the Energy Agency.

The data will be obtained from national statistics on energy balances.

The trend in the last five years will be followed and there will be a comparison to predictions of this Program. In the monitoring of energy imports by fuels, data from the Customs Administration and MEPSO will be used.

3.1.5 IMPROVING THE OVERALL COMPETITIVENESS OF THE ECONOMY

With regard to the developed European countries Macedonia has a high consumption of primary energy and of the final energy consumption per unit of GDP, despite the low energy consumption per capita, due to the low gross domestic product. In the past period, the final energy consumption per unit of GDP shows a slow decrease. According to the Energy Development Strategy for the period until 2020 a significant reduction in energy intensity is foreseen.

Indicator

The following indicators are important for monitoring the energy intensity:

- primary energy consumption per unit of GDP [toe / EUR],
- final energy consumption per unit of GDP [toe / EUR].

Competence

The annual monitoring of these indicators is the responsibility of the Ministry of Economy and the Energy Agency.

The data will be obtained from national statistics.

The trend in the last five years will be followed and there will be a comparison to predictions of the Strategy and of this Energy Development Program.

3.1.6 ESTABLISHING FUNCTIONAL ENERGY MARKETS

The prices of primary and final energy are of particular importance for the standard of citizens, the competitiveness of the economy and the motives for investment in the energy sector and the economy as a whole. Their comparison per unit of energy and their comparison with the European countries is a basic indicator of the functioning of the energy market in the Republic of Macedonia and the region.

Indicator

- primary energy prices [EUR / natural unit] and [EUR / toe]
  - domestic production,
  - import of energy,
- ratio of primary energy prices [EUR / toe] and [%]
- primary energy price comparison with EU27 [EUR / toe] and [%]
- final energy prices (average and by sectors) [EUR / natural unit] and [EUR / toe],
- ratio of final energy prices [EUR / toe] and [%]
- final energy price comparison with EU27 [EUR / toe] and [%]
- amount of electricity delivered to the final consumers by the suppliers of the free market, in terms of the total electricity consumption [%]
- quantity of natural gas delivered to end-users by the suppliers of the free market, in terms of the total consumption of natural gas [%]
- number of customers who purchase electricity through free-market suppliers, in terms of the total number of consumers of electricity [%]
- number of consumers who are supplied with natural gas through free-market suppliers in relation to the total number of consumers of natural gas [%].

Competence

The annual monitoring of these indicators is the responsibility of the Ministry of Economy and the Energy Agency.

Data will be provided by the Energy Regulatory Commission.

The trend in the last five years will be followed.

3.1.7 INCREASING THE SUPPORT FOR SUSTAINABLE ENERGY DEVELOPMENT

The state support for sustainable development in the energy field is estimated, primarily through measures and laws and bylaws for direct support and a variety of incentives to improve the energy efficiency and greater use of renewable energy sources through the establishment of appropriate funds, prescribing feed-in tariffs, tax relieves, and other incentives.

Indicator

- support for the energy efficiency [EUR / year]
- support for renewable energy sources [EUR / year].

Competence

The annual monitoring of these indicators is the responsibility of the Ministry of Economy and the Energy Agency.

Data will be provided by the Energy Regulatory Commission and the Ministry of Finance.

There will be reporting on the amount of funds disbursed for the implementation of the decisions on feed-in tariffs, paid assets from funds for energy efficiency and direct budget support.

3.1.8 SUMMARY OF QUANTITATIVE INDICATORS FOR MONITORING

The summary of the abovementioned and elaborated quantitative monitoring indicators is given in Table 3.1.8

Табела 3.1.8. Quantitative monitoring indicators of the Program for realization of the Energy Development Strategy in RM for the period until 2017

Strategic goal / priority	Indicator [units]	Data source
Improving energy efficiency	Energy savings [ktoe]	Ministry of Economy Energy Agency
Increasing the share of renewable energy sources in total final energy consumption	RES share in: - the total final energy consumption [%] - electricity production [%] - energy consumption in transport [%]	Ministry of Economy Energy Agency
Reducing the negative environmental impacts of the energy sector	- Greenhouse gas emissions from the energy sector [kt] - NO_x [t] emissions - SO2 [t] emissions - Emissions of particles from combustion [t]	Ministry of Environment and Physical Planning
Improving the reliability of energy supply (reducing dependence on energy imports and increasing the diversity of energy sources)	Imports of energy by fuels [KWh, t, KJ, Nm3]	Ministry of Economy MEPSO Customs administration
	Energy distribution - share of fuels in primary energy consumption [%]	Ministry of Economy
Improving the overall competitiveness of the economy - energy intensity	- Primary energy consumption per unit of GDP [toe / EUR] - Final energy consumption per unit of GDP [toe / EUR]	Ministry of Economy State Statistical Office
Establishing functional energy markets	- Prices of primary energy (domestic production and imports) [EUR / natural unit] and [EUR / toe], their ratio and their comparison to EU27 - Prices of final energy consumption (by sector) [EUR / natural unit] and [EUR / toe] and their comparison to EU27 - Quantity of electricity delivered to final consumers by suppliers of the free market, in terms of total electricity consumption [%] - Quantity of natural gas delivered to end-users by suppliers of the free market , in terms of the total consumption of electricity or natural gas [%] - Number of customers who are supplied with electricity by suppliers of the free market , in terms of the total number of consumers of electricity [%] - The number of consumers who are supplied with natural gas by suppliers of the	Energy Regulatory Commission Customs administration

	free market in relation to the total number of consumers of natural gas [%].	
Increasing the support for sustainable energy development	Support by the state for energy efficiency and renewable energy sources [EUR]	Ministry of Economy MEPSO Ministry of Finance

3.2 ASSESSMENT OF THE IMPLEMENTATION OF THE PROGRAMME

Based on the values of the quantified indicators and the comparison with the plans of the Program itself, this chapter will address:

- the compliance of the activities undertaken in the reporting year with the timeframe outlined in the Program (Table 2.4.1.1. Infrastructure activities in the period 2013-2017);
- the financial report for capital investment, fuel costs, use of resources and incentives;
- the report on investments in institutional and human capacities (development of existing and building new ones) - opening new jobs, training and advancement, creation and / or strengthening of institutions; and
- the evaluation of the progress towards achieving the targets set out in the national energy policy (on energy efficiency, renewable energy sources, and other objectives that will be adopted in future).

3.3 BARRIERS TO IMPLEMENTATION OF THE PROGRAMME

Especially important for the fulfillment of the Program is the establishment of barriers due to the presence of which some of the planned activities have not bee met or have been slowed down. This chapter should include precise identification of barriers by types: external influences, flawed administrative procedures and legislation, institutional and personnel shortages.

3.4 RECOMMENDATIONS FOR IMPROVING THE IMPLEMENTATION OF THE PROGRAM ON ALL GROUNDS

Based on the estimates for the implementation of the Program and the identified barriers, in this chapter corrective actions need to be suggested that will enable realization of the planned activities and dynamics with the least possible deviations. The implementation of the corrective actions should also be subject to assessment in the next annual reports.

3.5 SUMMARY OF STRATEGIC STUDIES AND ANALYZES MADE IN THE REPORTING YEAR

In this chapter a review of the realized studies and analyzes planned with the Program shall be done (Table 2.4.2 Preliminary projects, studies and other activities in the period 2013-2017), as well as of the realized additional studies and analyzes, a brief description of the results will be given and the impact will be determined on the specific activities or dynamics envisaged in the Program (Table 2.4.1. and Table 2.4.2.). If necessary, based on the results, corrective actions will be proposed as part of the Program in the period until its completion.

3.6 SUMMARY OF COMMENTS ON THE DRAFT REPORT BY STAKEHOLDERS

Before being handed over to the Government, the report should be available for comments by stakeholders in the energy sector. In this chapter the comments should be summarized and the appropriate changes in the text of the Report to be explained.

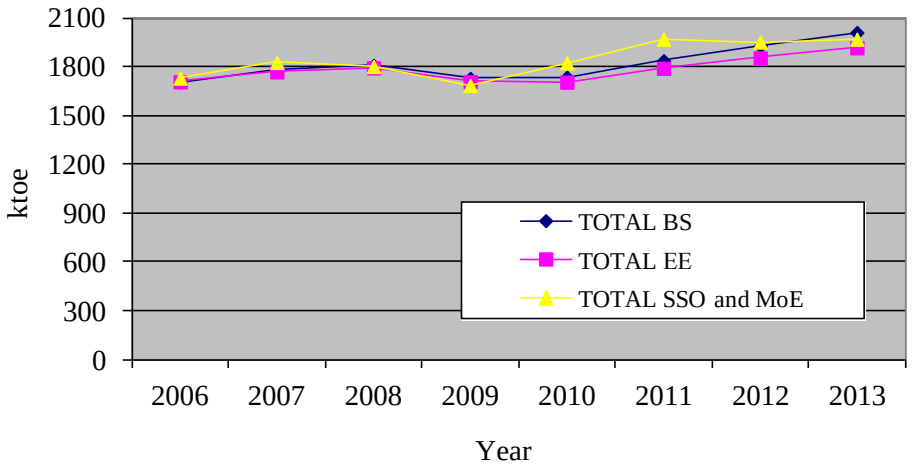
APPENDIX 1

A1 ENERGY NEEDS AND MODALITIES FOR PROVIDING THE NECESSARY ENERGY FOR THE PERIOD 2013-2017

A 1.1 COMPARATIVE ANALYSIS OF THE PREDICTED AND REALIZED CONSUMPTION OF ENERGY IN THE PERIOD UNTIL 2013

At the time of the preparation of the Strategy there was the global economic crisis, which is relatively well foreseen in the planning of the energy needs in the period of the base 2006 until the 2009. During 2010 and 2011 the Macedonian economy quickly recovered in terms of the predictions of the Strategy and consequently reached final energy consumption greater than predicted. However, due to the impact of the European monetary crisis, in 2012 there was stagnation in the final energy consumption which is expected during 2013. As a result of the above-mentioned developments, there is a certain difference in the realized and planned consumption in the last period, however, summarized, the final energy consumption in 2013 and thus in the period 2013-2017 is expected to be at a level between the projected consumption of final energy consumption according to the baseline scenario (OS) and the scenario with strengthened energy efficiency measures (EE), (Figure A 1.1.1)[22]

[22] The data until 2011 are according to the SSO (for 2011 - preliminary) and for 2012 according to the energy balance of the MOE for the period 2013-2017



Слика А 1.1.1. Final energy consumption in the Republic of Macedonia

A 1.2 PROJECTION OF THE FINAL ENERGY CONSUMPTION IN THE PERIOD 2013-2017

Figure A 1.2.1 shows the comparison the projected final energy consumption in the Strategy according to the baseline scenario and the scenario strengthened energy efficiency measures for the period 2013-2017. The expected average annual growth of the final energy consumption in the period 2012-2017 is 3.8% for the baseline scenario and 2.7% for the scenario with strengthened energy efficiency measures. It is primarily due to relatively low consumption in 2012 and the anticipated rapid development of the economy after 2013. The growth of final energy consumption in 2017 compared to 2012 will be 21% for the baseline scenario and 14% for the scenario with strengthened energy efficiency measures.

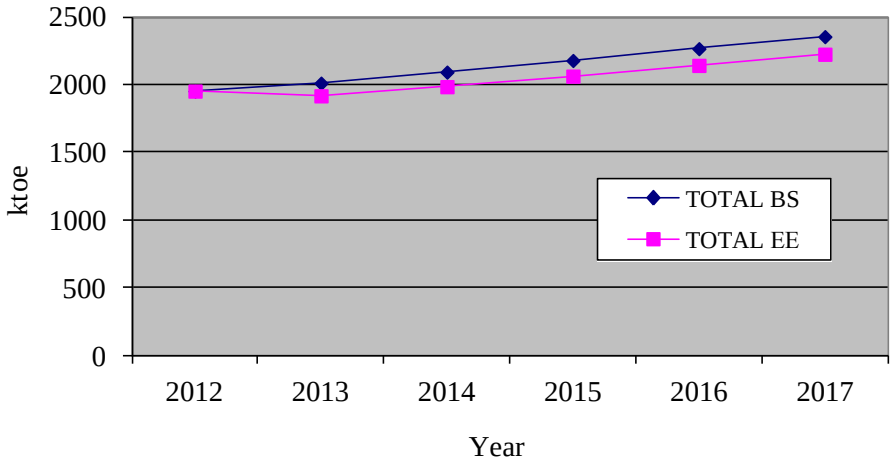


Figure A 1.2.1. Projected final energy consumption according to the Strategy (baseline scenario, BS, and scenario with strengthened energy efficiency measures, EE)

The final energy demand by fuels by 2017 according to the baseline scenario are given in Figure A 1.2.2.

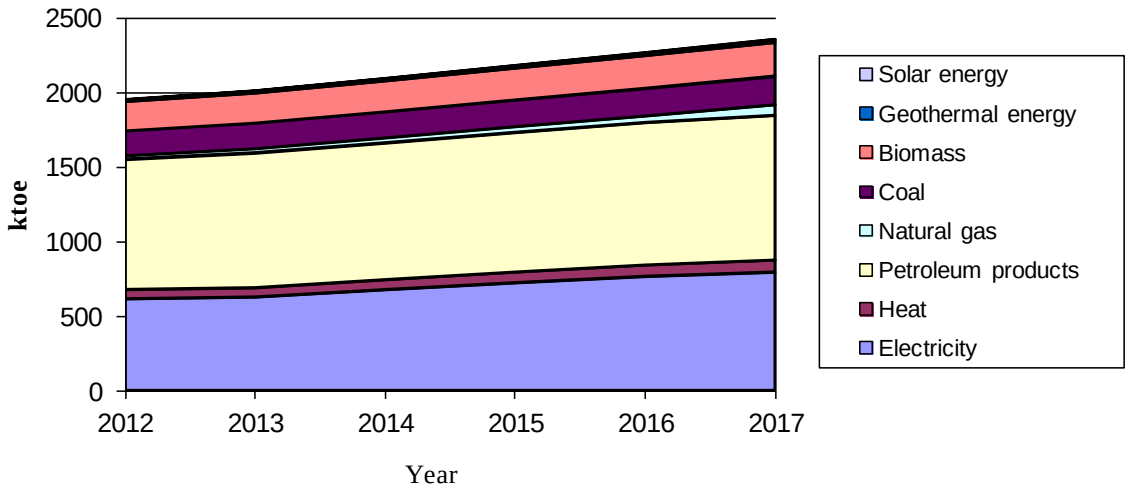


Figure A 1.2.2. Final energy demand by 2017, according to the baseline scenario

According to the percentage share of different fuels to meet the demand of final energy in 2012 (Figure A 1.2.3.), the largest share have the petroleum products with less than 45%, followed by electricity with 31,4%, biomass, 10%, coal 8,8%, heat 3,1, natural gas 1,3%, geothermal energy, about 0,5%, and solar energy, 0,1%.

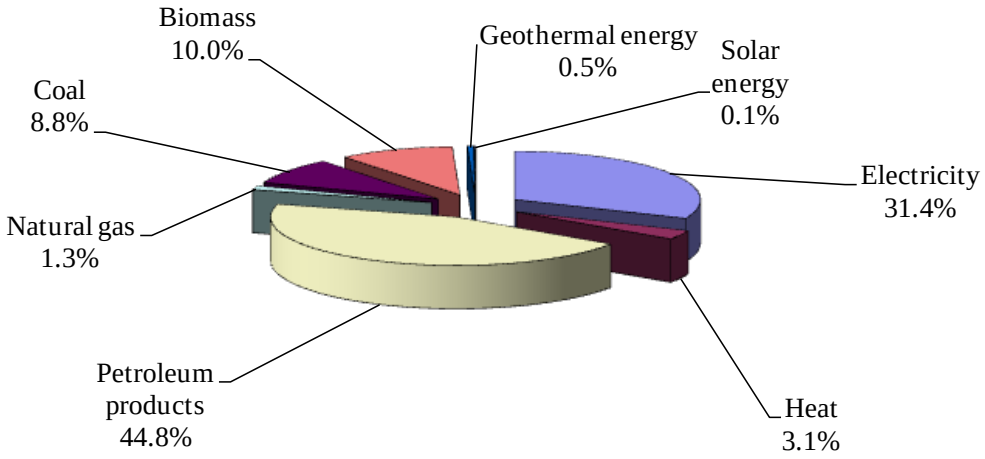


Figure A 1.2.3. Percentage share of different fuels in final energy consumption in 2012

A 1.2.1 ELECTRICITY

Figure A 1.2.1.1 shows the comparison between the final electricity consumption and the sum of the produced and imported electricity (total consumption), realized in the period 2006-2012. The expected total electricity consumption for the period until 2017 is given in Table A 1.2.1.1 and Figure A 1.2.1.1.

The expected relatively high average annual growth of electricity consumption in the period 2012-2017 was due primarily to the relatively low consumption in 2012 and the expected rapid growth of the economy after 2013.

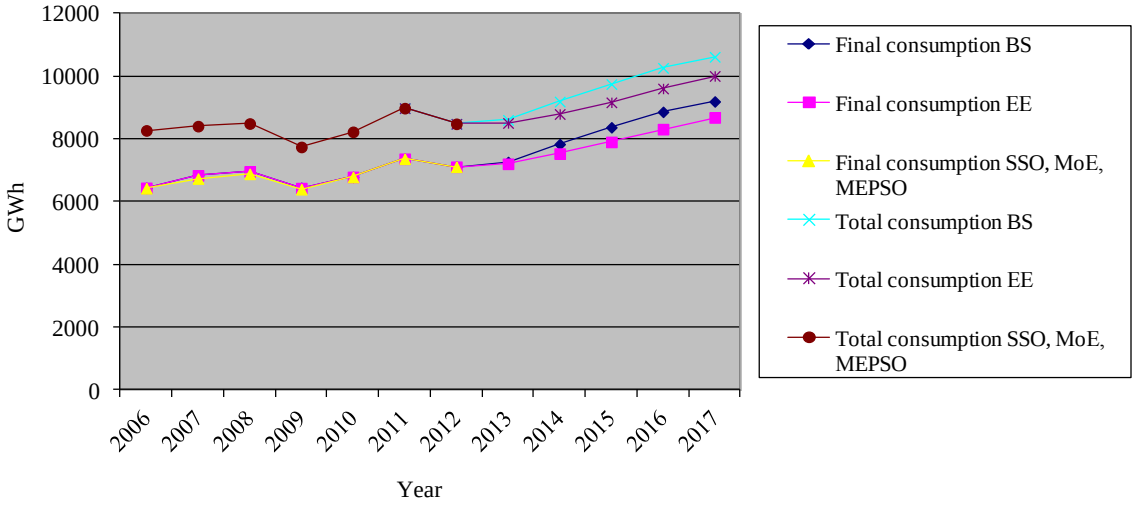


Figure A 1.2.1.1 Total electricity demand and final electricity consumption by 2017

Produced electricity means the energy delivered to the network. Part of it is spent in the mines. From the remaining, along with the imported electricity, part is consumed in the losses in the transmission and distribution network and part by sectors (industry, households, commercial and service sector, agriculture and traffic) as final consumption.

Table A 1.2.1.1 Electricity needs until 2017 (GWh)[23], average annual growth (P1), an overall increase in the reviewed period (P2) for the period 2012-2017

	GWh							%	
	2011	2012	2013	2014	2015	2016	2017	P1	P2
BASELINE SCENARIO									
Final consumption`	**7371**	**7116**	**7269**	**7839**	**8374**	**8866**	**9198**	**5,26**	**29,3**
Consumption in mines	156	133	170	170	170	170	170	5,03	27,8
Total losses	1457	1236	1171	1186	1209	1232	1253	0,28	1,4
Transmission losses	*207*	*195*	*198*	*211*	*224*	*236*	*244*	*4,59*	*25,2*
Distribution losses	*1250*	*1041*	*973*	*975*	*985*	*996*	*1009*	*-0,61*	*-3,03*
Производство и увоз	**8984**	**8485**	**8610**	**9195**	**9753**	**10268**	**10621**	**4,59**	**25,2**
SCENARIO WITH EN. EFF.									
Final consumption	**7371**	**7116**	**7211**	**7536**	**7908**	**8315**	**8688**	**4,07**	**22,1**
Consumption in mines	156	133	162	162	162	162	162	3,96	21,4
Total losses	1457	1236	1141	1100	1100	1134	1161	-1,23	-6,0
Transmission losses	*207*	*195*	*196*	*202*	*211*	*221*	*230*	*3,36*	*17,9*
Distribution losses	*1250*	*1041*	*945*	*897*	*890*	*913*	*931*	*-2,20*	*-10,5*
Production and import	**8984**	**8485**	**8513**	**8797**	**9170**	**9611**	**10011**	**3,36**	**17,9**

For covering the electricity demand for the period 2011-2017 the existing, ongoing and planned production capacities have been considered (Table A 1.2.1.2).

TPP Bitola and TPP Oslomej have been considered among the thermal power plants. Their annual production is in function and from the planned revitalizations and modernizations. TPP Negotino is envisaged to serve as a cold reserve.

[23] The electricity consumption for 2011 is taken according to mepso.com.mk, Dispatch report. The consumption and production data from other sources (ERC, MOE) differ at certain percentage, and the difference of the total production and the total consumption of electricity in the range of 0.6%.

CHP Skopje and CHP Kogel are in function from the natural gas fueled power plants. The produced amount of electricity from these two thermal power plants - heat plants will largely depend on the ratio of gas prices in Macedonia and the electricity in the region. If less electricity is produced than the projected capacity the net imports of electricity will be higher in the same amount.

Apart from the existing large hydropower plants Vrutok, Raven, Vrben, Tikves, Globochica, Shpilje and Kozjak, in 2012 the HPP St. Petka started operating and in 2013 it is planned its production of 66 GWh. In 2014, it is envisaged a completion of the revitalization of the Mavrovo HPPs with an additional production of 50 GWh and in the period until 2017 upgrade HPP Spilje with additional 45 GWh is planned.

In addition to existing small HPPs, by 2017 additional 208 GWh have been envisaged from small HPPs, 130 GWh from wind power plants and 16 GWh from photovoltaic systems that start functioning according to the dynamics given in Table A 2.2.1.2.

The hydropower is calculated according to average hydrology. The listed values can range up to nearly 1000 GWh in the plus or minus, depending on the hydrology.

Table A 1.2.1.2. Covering the electricity needs, according to the baseline scenario, in the period 2011 - 2017, at an average hydrology[24] (GWh)

	GWh						
	2011	2012	2013	2014	2015	2016	2017
1. DOMESTIC PRODUCTION	**6324**	**5811**	**7968**	**8191**	**8523**	**8606**	**8686**
1.1. Thermal power plants	**4855**	**4753**	**6400**	**6400**	**6700**	**6700**	**6700**
1.1.1. Lignite TPP (Bitola and Oslomej)	4781	4473	4800	4800	5100	5100	5100
1.1.2. Gas CHP (Skopje and Kogel)	74	280	1600	1600	1600	1600	1600
1.2. Large hydropower plants	**1273**	**878**	**1390**	**1440**	**1440**	**1485**	**1485**
1.3. Other RES (small HPP, photovoltaic systems, wind power plants)	**196**	**180**	**178**	**351**	**383**	**421**	**501**
Favored producers	9,6	18,1	53	226	258	296	376
Small HPP	8,5	15,3	49	146	174	208	230
Photovoltaic systems	1,1	2,8	4	6	10	14	16
wind power plants	0	0	0	74	74	74	130
2. NET IMPORT	**2661**	**2674**	**642**	**1004**	**1230**	**1662**	**1935**
TOTAL AVAILABLE	**8985**	**8485**	**8610**	**9195**	**9753**	**10268**	**10621**

With the realization of the scenario with strengthened energy efficiency measures, the electricity demand in 2017 would be by 610 GWh lower.

When analyzing the power requirements[25] it is shown that in 2016 Macedonia will lack about 300 MW in winter and about 120 MW in the rest of the year. That means that with a faster implementation of the planned CPP Skopje with 230 - 300 MW, Macedonia could achieve balanced import and export of electricity, if sufficient quantities of natural gas at affordable prices are provided.

[24] Except for 2011, for which the realized production and realized import have been considered (mepso.com.mk, Dispatch report)

[25] Томе Бошевски, Антон Чаушевски, Модел на оптимално снабдување на дистрибутивните и квалификуваните потрошувачи на електрична енергија, Стопанска комора на Македонија, Скопје, 12 април 2012

A 1.2.2 HEAT ENERGY

According to the baseline scenario in 2017 the total heat consumption will be 80 ktoe (930 GWh, 3350 TJ). Substantial increase in the consumption distribution in the analyzed period is not expected. For the purposes of heating households, a rapid and significant penetration of natural gas in all cities in Macedonia should be provided as soon as possible.

The required amount of primary energy for the production of heat energy is given in Table A 1.2.2.1. The consumption of natural gas of CHP Skopje is taken collectively with the consumption for production of electricity.

According to the scenario with strengthened energy efficiency measures, lower consumption of fuels is expected for heat production in 2017, amounting to 5 ktoe.

Табела А 1.2.2.1 Потреби од примарна енергија за производство на топлина до 2017 година, според основното сценарио (ktoe)

	ktoe					
	2012	2013	2014	2015	2016	2017
Natural gas	32	38	47	55	62	68
Petroleum products	53	45	42	39	36	34
Lignite	9	8	7	6	5	4
Biomass	2	2	2	2	2	2
TOTAL	**96**	**93**	**98**	**102**	**105**	**108**

Considering the fact that CHP Skopje and CHP KOGEL became operational and together with the reserved (existing) boilers of Toplifikacija AD Skopje which will cover the consumption of heat energy in Skopje as well as the capacities of the existing boilers in Macedonia, no problems are expected in covering the relevant increased heat consumption. We also envisage additional construction of small combined heat and power plants for production of electricity and heat from natural gas in the towns that will be covered with gasification or with natural gas under pressure as well as combined heat and power plants on biomass to cover the demand for heat in certain companies and/or distribution consumption in areas where it is economically feasible. For each of the city areas it is necessary to perform individual technical and economic analysis for the feasibility of construction of central heating system.

A 1.3 PROVIDING THE DEMAND FOR PRIMARY ENERGY

Figure A 1.3.1 shows the primary energy consumption according to the baseline scenario. The total primary energy consumption in 2017 will amount to 3637 ktoe. According to the scenario with stronger energy efficiency measures the primary energy consumption is 130 ktoe lower.

In 2017 the share of coal will be 43%, petroleum products with biofuels 30% and natural gas 12%. The biomass combustion will account for 6% and hydropower for 4%. Solar, wind and geothermal energy will contribute to the production of primary energy with 0.1%, 0,3 and 0,6% respectively. Imports of electricity will be 4,6% of the total primary energy consumption.

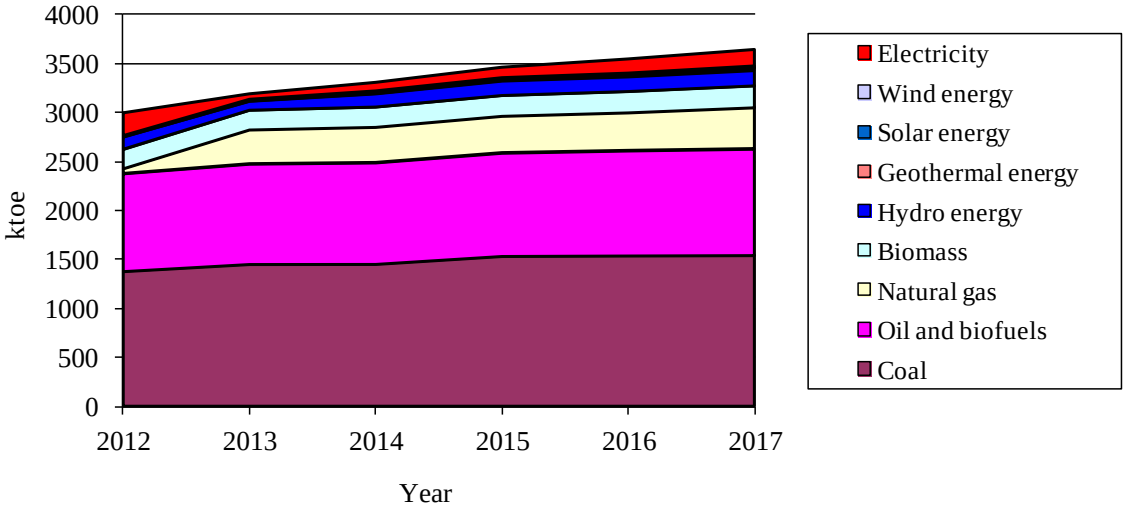


Figure A 1.3.1. Primary energy demand until 2017 according to the baseline scenario

A 1.3.1 COAL

A 1.3.1.1 Providing coal for the needs of the three blocks of TPP Bitola

The Energy Development Strategy on providing coal for TPP Bitola envisaged a parallel work on three surface mines: SM Suvodol-MCS, Brod-Gneotino and Suvodol-UCS. According to the established dynamics, the exploitation of coal from the mine Suvodol-UCS was to begin in 2010 and the planned capacity of 3 million tons per year was to be achieved in 2011. The exploitation of the surface mine Brod-Gneotino was to begin in 2009 and the full capacity of 2 million tons is to be reached in 2012.

However, due to certain technical problems and primarily due to the untimely providing of the necessary funds there was a prolongation of the projected dynamics of opening especially for Suvodol-UCS. Therefore, at the end of 2011 an Additional mining project on the dynamics of coal providing for the three blocks of TPP Bitola was prepared[26]. According to this Project, it is envisaged to achieve the capacity of 3 million tons per year by 2013. According to the situation on the terrain, the required capacity of the mine Suvodol-UCS will take place from July 2013. Accordingly, the provision of coal for TPP Bitola will be conducted according to the dynamics presented in Table A 1.3.1.1.

The capacity of the mine Brod-Gneotino of 2 million tons per year was accomplished in 2012.

In the period after 2013, it is planned to use coal from the mine SM Suvodol-MCS with a capacity of 1.5 million tons per year.

A homogenization is planned of the coal from the three mines and obtaining an average low caloric value (LCV) annually in the range of 7552 kJ / kg to 8096 kJ / kg and the average for the five years 7800 kJ / kg. The total energy value of the planned consumption of 6.5 million tons of coal would be an average for all analyzed quantities 50,7 PJ (14 080 GWh, 1211 ktoe). Considering the relatively high efficiency coefficient after the latest reconstructions, with the specified amount of coal, TPP Bitola can annually deliver to the network approximately 4500 GWh.

[26] Additional mine project for coal supply of TPP Bitola from the following mines: SE Suvodol, SE Brod-Gneotino and SE UCS for the 2011-2016 period, RI RUDING DOO Skopje, September 2011

Table A 1.3.1.1 Providing coal for the three blocks of TPP Bitola until 2017

	Suvodol-MCS		Brod-Gneotino		Suvodol-UCS		Total	LCV of homogenized coal
Year	Quantity	LCV	Quantity	LCV	Quantity	LCV	Quantity	
	10^6 t	kJ/kg	10^6 t	kJ/kg	10^6 t	kJ/kg	10^6 t	kJ/kg
2013	2,5	7987	2	6539	2	8054	6,5	7552
2014	1,5	7658	2	7192	3	8280	6,5	7807
2015	1,5	7786	2	7364	3	8740	6,5	8096
2016	1,5	7752	2	6141	3	8749	6,5	7715
2017	1,5	7658	2	7192	3	8280	6,5	7807

If the same annual scope of mining coal from three mines continues after 2017, taking into account the estimated exploitation reserves on 31.12.2011, of 20, 29 and 48 million tons for Suvodol MCS, Brod-Gneotino and Suvodol UCS, it turns out that SM Suvodol MCS will have coal until 2022, SM Suvodol-Gneotino until 2025-2026 and SM Suvodol UCS until 2027-2028.

Of particular importance is to ensure all the prerequisites for the realization of the established dynamics of exploitation of the mines. The time prolonging of the beginning with the exploitation of SM Suvodol UCS will lead to increased consumption of coal from the SM Suvodol - main coal seam and to shortening its working life by two years for each year of the delay with the exploitation of Suvodol UCS, and thus to complicating the possibilities of providing coal for uninterrupted production from TPP Bitola according to the projected capacity.

A 1.3.1.2 Providing coal for the TPP Oslomej

TPP Oslomej currently uses coal from the mine nearby Oslomej-west. According to the dynamics of coal supply for TPP Oslomej given in the Energy Development Strategy of the Republic of Macedonia, already in 2016 the coal potential of the site Popovjani should be included. This would allow the necessary quantities of coal for TPP Oslomej until 2024.

A 1.3.1.3 Providing coal for final consumption in sectors

The lignite used as a final energy in the sectors will be provided from our coal mines to produce consumer coal (surface mines BRIC Berovo and Drimkol - lignite) while the more quality coals will be provided by imports.

The surface mine BRIC Berovo has exploitation lignite reserves of approximately 1 million tons. The annual exploitation is according to the demands and ranges from 35 to 70 thousand tons.

The surface mine Drimkol - lignites realizes an annual exploitation almost identical to the BRIC Berovo. The coal is of lignite type with much higher carbonification degree in relation to the other plants in the country, which makes it closer to the brown coals.

A 1.3.2 NATURAL GAS

Macedonia is connected only to one main gas pipeline. The entire quantity of natural gas is imported from Russia through the International corridor 8 that passes through Ukraine, Moldova, Romania and Bulgaria. The main gas pipeline has a capacity of 800 million Nm^3 per year with a possibility to increase to 1200 million Nm^3 per year after the

construction of a compression station at the beginning of the main gas pipeline. This would certainly mean additional costs for the transport of gas.

Natural gas would be provided by further development of the transmission network and the construction of distribution networks. Part of the gas will be provided with transportation of compressed gas.

Considering that Macedonia imports more expensive gas than the countries in the region and much more expensive gas than the European countries, it is necessary to create preconditions for higher and annually planned use of natural gas.

The construction of new natural gas fired CHPs in Skopje (planned implementation until 2018) requires further 350 - 450 million Nm^3 gas per year, which together with the planned more than 500 million Nm^3 per year for the existing facilities and for the final consumption, exceeds the capacity of 800 million Nm^3 per year.

The previous facts impose the need for sustained efforts to connect the region to new sources and routes of natural gas supply, above all towards the South Stream gas corridor.

A 1.3.3 OIL AND PETROLEUM PRODUCTS

The planned consumption of petroleum products of 1090 ktoe in 2017 is lower than the projected capacity of the refinery OKTA and lower than the maximum capacity of 1,36 million tones achieved in 1988. Therefore, special problems in the provision of oil products are not expected.

The established market conditions allow the import of petroleum products.

A 1.3.4 RENEWABLE ENERGY SOURCES

From the available RES in Macedonia, so far are used the hydropower (for electricity production), biomass (mainly as firewood in households), geothermal energy (for heating greenhouses), solar energy (mostly for hot water in households, and in the recent years in small percentage are used the photovoltaic systems for electricity production) and biofuels. The introduction of feed-in tariffs for electricity generated from RES, as well as the governmental subsidies for solar thermal systems, have contributed in the recent years to increase the interest in the use of these energy sources. The further plans are towards the greater use of the aforementioned RES, as well as the use of wind energy for electricity generation, which as a resource has not yet been used enouhg in Macedonia.

One of the priority activities of the Strategy is the maximum utilization of RES as ecologically acceptable domestic resources

Hydropower. In terms of utilization of the hydropower potential in the country, in 2012 became operational the large hydro power plant, St. Petka, with installed capacity of 36.4 MW and an average annual production of about 66 GWh. In addition, in the analyzed period, according to planned revitalization of the Mavrovo system of hydro power plants, the electricity production will be further increased by 50 GWh and upgrade HPP Spilje will add further 45 GWh.

The Ministry of Economy has conducted five tenders for the construction of small power plants and has signed 70 contracts for water concession for the construction of small HPPs with a total installed capacity of 60,2 MW and annual production at average hydrology of 240 GWh. Also, a public-private partnership agreement has been signed for the project Boshava river. Construction of five small HPPs on the water supply system is envisaged, with a total installed capacity of about 12 MW and annual production of 33,5 GWh. There is plan for other small HPPs on the hydro systems Lisice, Zletovica etc.

The total production of the hydropower plants by 2017, including the current one is estimated at 1814 GWh (156 ktoe).

Wind energy. Based on previous studies for determining the wind energy potential in Macedonia and for the selection of the most suitable locations for the construction of wind power plants, until 2017 realistically can be expected an functioning of wind power plants with installed capacity of 65 MW and production of 130 GWh (11 ktoe).

Photovoltaic systems. The favorable climatic characteristics (satisfying solar potential) as well as relatively high feed-in tariffs for electricity generated from solar energy, make the photovoltaic systems more attractive. However, Macedonia does not have its own production of this technology and the cost of feed-in tariffs is fully borne by electricity consumers without indirect benefits to the economy. Due to that, a higher penetration of photovoltaic systems in Macedonia is not planned, despite the high interest in their construction. However, the prescribed limit for feed-in tariffs of 10 MW[27] needs to be moved in order to meet the requirements of all those who have started their activities before the adoption of the new Law on Energy. By 2017, a total of 10 MW photovoltaic systems with a production of 13 GWh per year are to be built.

Solar energy as heat energy. In the past period, the use of solar energy as heat energy has a modest place in the energy balance in Macedonia. With a total installed collector area of 25744 m^2 or installed capacity of 18 MW_{th}[28], in 2009 the solar energy in the final energy consumption accounted for 15,5 GWh (1,33 ktoe), which is almost double the share in 2006.

Since 2007, the Government financially supports the introduction of solar panels, and so far there were actions in which the installation of approximately 4500 m^2 of solar collectors was subsidized. However, this action is not sufficient for a massive introduction of this fuel in Macedonia. The main reason is the low cost of electricity, making the investments in the solar energy as heat in the households to have a return period of 10 years.

In the reference period, the use of solar energy as heat is foreseen only in households and in the commercial and services sector, amounting 3 to 4 ktoe (35 - 47 GWh), which would correspond to about 40000 installations.

Biomass combustion. Biomass combustion is an important fuel for meeting the energy demand in Macedonia with representation of 10.9% in the final energy consumption in 2011. The biomass is particularly represented in the households meeting 30 – 33% of the total energy demand. Of the total biomass used for energy purposes, the wood is the most represented. In the Republic of Macedonia are also used some of the vine branches, rice husks and branches of fruit trees for energy purposes, but much of the straw is mainly used as fertilizer, feed and for obtaining cellulose. Therefore it is not available for energy purposes.

According to the baseline scenario, the biomass combustion consumption in 2016 to be used as heating will be 224 ktoe (2605 GWh), while according to the scenario with energy efficiency measures 220 ktoe (2560 GWh) are needed.

Geothermal energy. Geothermal energy, as final, is planned at the level of 19 - 23 ktoe (218 - 265 GWh, 795 - 963 TJ) by 2017. In order to achieve this goal, in addition to

[27] According to the Decision on the total installed capacity of favored producers of electricity generated from each separate renewable energy source, the total installed capacity of the photovoltaic power plants to which the feed-in tariffs will be applied is limited to 10 MW (Official Gazette of RM No. 100/11).

[28] Werner Weiss, Franz Mauthner: Solar Heat Worldwide - Markets and Contribution to the Energy Markets and Supply 2009, Edition 2011. AEE INTEC, IEA Solar Heating and Cooling Programme, May 2011. p. 26 , http://www.iea-shc.org/publications/downloads/Solar_Heat_Worldwide-2011.pdf

the activities already undertaken for utilizing existing sources and finding new ones, additional actions by the Government are necessary.

Biofuels. With the adoption of the Decision that determines the annual percentage of biofuels in the total amount of fuels for transport in the Republic of Macedonia, it is expected the biofuels to participate in the amount of at least 4,4% of the total consumption of petrol and diesel in the transport by 2017. Thus, their consumption in 2017 will be around 24 ktoe. In Macedonia there is a biodiesel production factory owned by the private company Makpetrol, with a capacity of 30 thousand tons per year, which can meet the needs until 2017.

APPENDIX 2

A2 FINANCIAL ASPECTS OF THE REALIZATION PLAN

The envisaged activities with necessary funds and methods of their provision are summarized in the following table.

Table A 2.1. Funds for realization of the projects to be implemented or initiated in the period until 2017

Activity	Total fund (million EUR)	Separate funds (million EUR)	Needed funs by 2017 (million EUR)	Investor	Implementation period	Note
ACTIVITIES IN THE EXISTING ELECTRICITY GENERATION FACILITIES						
Revitalization of TPP Bitola		90	60	ELEM (15%) and loan funding (85%)	2013-2014	TPP Bitola 1 and 2, boilers, NO_x
Revitalization and upgrade of the existing HPP	104	32	21	ELEM (15%) and loan funding from KfW bank (85%)	2013-2014	HPP revitalization –phase II
		72	67	ELEM and loan funding	2014-2018	HPP revitalization –phase III with upgrade of HPP Shpilje
ACTIVITIES FOR CONSTRUCTION OF NEW MINES						
Coal mines			42	ELEM and loan funding	2013-2017	Underlying coal seam – Suvodol

Activity	Total fund (million EUR)	Separate funds (million EUR)	Needed funs by 2017 (million EUR)	Investor	Implementation period	Note
		100	20	PPP or ELEM and loan	2015-2022	Zhivojno
		40	40	ELEM (15%) and loan funding (85%)	2013-2016	Popovjani
		110		PPP or ELEM and loan	2018-2025	Mariovo
ACTIVITIES FOR CONSTRUCTION OF NEW ELECTRICITY GENERATION FACILITIES						
Large HPP		104	104	ELEM (15%) and loan funding from EBRD (85%)	2013-2017	HPP Boshkov Most
		80	65	ELEM (15%) and loan funding from World Bank (85%)	2014-2018	Lukovo Pole dam and HPP Crn Kamen
		538	170	ELEM (50) and partner (488)	Чебрен 2014-2021 Галиште 2018-2025	Chebren (338) Galishte (200)
		800		PPP/foreign investor	2017-2030	Hydro Power Plants on Vardar
Combined gas plants			170	PPP or private investor	2015-2018	CHP Energy 230 MW for electricity and 160 MW for heat energy
			30		2015-2018	CHP 40 MW for electricity and 30 MW for heat energy
OTHER RENEWABLE ENERGY SOURCES						
Wind Power Plants	55		27	ELEM (41%) and loan funding from KfW (59%)	2012-2013	Bogdanci (37,2 MW)
Wind Power Plants	40		40	PPP or private companies or ELEM and loan	2015-2017	Bogdanci or other location (25 MW)

Activity	Total fund (million EUR)	Separate funds (million EUR)	Needed funs by 2017 (million EUR)	Investor	Implementation period	Note
Solar Power Plants	20		10	Private companies	2013-2017	Up to total of 10 MW
Small Hydro Power Plants	90		90	Investors/ concessionaries	2013-2017	
Hot water solar systems	18		18	Private investors 17.5 Budget 0.5	2013-2017	30 000 installations
CHP on waste biomass	6		6	Private companies	2015-2017	
Plants on biogas from biomass	5		5	Private companies	2015-2017	
Geothermal	10		10	Local self-government and concessions	2013-2017	
DEVELOPMENT OF THE ELECTRICITY TRANSMISSION NETWORK						
400 kV interconnection power lines	54,9	19,2	19,2	70% international finance institutions/ 30% MEPSO	2013-2014	SS Shtip – SS Nish (RS)
		29,2	29,2		2013-2017	SS Bitola 2 – SS Elbasan (AL)
		6,5	1,4		2016-2020	SS Skopje 5 - Kosovo
Reconfiguration of network	12,56	2	2	70% international finance institutions/ 30% MEPSO	2013	Reconstrcution of 110 kV PLs Vrutok - Tetovo
		7,36	7,36		2013-2014	Reconstrcution and construction of 110 kV PL SS Skopje 1 – SS Jugohrom - SS Tetovo 1
		3,2	3,2		2013	Bitola region
Revitalization of power lines on 110 kV voltage level	24,25	24,25	24,5	60% international finance institutions/ 40% MEPSO	2013-2017	

Activity	Total fund (million EUR)	Separate funds (million EUR)	Needed funs by 2017 (million EUR)	Investor	Implementation period	Note
Replacement of existing conductors ACSR 150/25 mm² of 110 kV PL SS Skopje 1 – SS Kumanovo 1 with so called "hot" conductors	1,3	1,3	1,3	70% international finance institutions/ 30% MEPSO	2013	
Revitalization of 110/x kV substations	1,5 (за преостанати активности)	1,5	0,7	70% international finance institutions/ 30% MEPSO	2013	
Substation 400/110 kV Ohrid	14,3	14,3	14,3	70% international finance institutions/ 30% MEPSO	2013-2017	SS Ohrid (connected to 400 kV interconnection power line SS Bitola 2 – SS Elbasan (AL))
Reconstruction of the equipment of four 400/110 kV substations	1,5 (за преостанати активности)	1,5	1,5	70% international finance institutions/ 30% MEPSO	2013-2014	
New SCAD/EMS system	6,4	6,4	6,4	50% international finance institutions/ 50% MEPSO	2013-2014	
New equipment for substations	7,4	7,4	7,4	60% international finance institutions/ 40% MEPSO	2013-2017	
Monitoring of substations	4,9	4,9	4,9	60% international finance institutions/ 40% MEPSO	2013-2017	
Closing the optical ring of the transmission network	2,9	2,9	2,9	60% international finance institutions/ 40% MEPSO	2013-2017	
Compensation devices in SS Ohrid 1 (2x25 Mvar)	1,5	1,5	1,5	70% international finance institutions/ 30% MEPSO	2015	This investment will be realized if by 2015 the 400/110 kV SS Ohrid is not begun for construction
Disconnecting the 110 kV PL HPP Vrutok – SS Skopje 1 and connecting with input – output	1,9	1,9	1,9	70% international finance institutions/ 30% MEPSO	2015	

Activity	Total fund (million EUR)	Separate funds (million EUR)	Needed funs by 2017 (million EUR)	Investor	Implementation period	Note
in SS Tetovo 2						
ACTIVITIES IN HEAT ENERGY INFRASTRUCTURE						
Revitalization and modernization of the heat generation equipment	5	5	5	Holder of the license for heat generation	2013-2017	
Construction of new generation facilities				PPP or private investor	2015-2018	CHP plants have been taken into account in the electricity sector
Reducing the distribution losses, increasing the reliability and enabling controlled delivery at an apartment level	4	4	4	Holder of the license for heat distribution	2013-2017	
District heating for Bitola, Novaci and Mogila from TPP Bitola	40	40	40	ELEM PPP Municipalities	2013-2017	Through PPP Funds for network amortization
GASIFICATION						
Construction of gas system in the Republic of Macedonia	290	58	58	Russian Federation (46) (clearing debt) Budget (12)	2013-2015	Klechovce – Shtip - Negotino – branch to TPP Negotino
		86	60	Budget and EIB/EBRD loans	2015-2018	Shtip – Strumica – Greek border Skopje – Tetovo - Gostivar Negotino – Kavadarci – Prilep – Bitola and TPP Bitola – Greek border
Skopje gas ring	2	2	2	GAMA	2013	

As emphasized in the Strategy for Energy Development in the Republic of Macedonia until 2030, there are many possible ways of finding these significant funds:

- Through significant allocations of funds from the regular operations of energy sector companies;
- Through additional loans taken by the energy sector companies from international financial institutions or domestic and foreign commercial banks;
- Through recapitalization of the energy sector companies using state capital;
- Through direct allocations for these purposes from the state budget or indirectly, by having the state provide guarantees which the energy sector companies that are mostly state owned, can use to get loans;
- Through public – private partnerships;
- Through energy sector investments by foreign or domestic investors that will be awarded concessions to use public goods (land, water or coal) or that will be purely independent energy producers.

Regardless of which option is used, these investments have to be guaranteed, i.e. the return on the investment has to be guaranteed by adequately defining the price for the products – in this case the generated energy. Therefore, we cannot speak about serious investments in the energy sector without appropriately defining the price policy that will make these investments realistic and possible. It is a fact that energy is a good that is of public interest and which is very important to the development of the entire economy of any given country.

Maintenance, modernization and development of the energy sector requires large capital investments, due to what it is indispensable to increase the participation of the private sector and attracting foreign capital into the country's energy market, which on one hand is a necessity for a small country with limited financial resources, and on the other hand will increase the country's investment activity and more dynamic overall economic development.

Apart from this way of investing, with a special decision by the Government, other financing methods in the energy sector can be accessed, such as:

- Selling minor stakes on the capital market of state-owned energy companies to interested domestic legal and natural persons and using these funds for additional investments in the sector;
- Identifying energy facilities for whose construction the companies (or the state) would issued shares (project investment), which, would make these new facilities to be partly state owned and partly owned by other investors – the principle of the public-private partnership;
- Financing new energy projects through the state budget funds raised by issuing concessions for other energy (or non-energy) projects, etc.

Anyway, an entry of fresh foreign capital in the energy sector is requires, something that has not been achieved, and the reasons for it were the poor investment climate in the country and the large number of documents required to be provided by foreign investors to start their own business. On the other hand, Macedonia is a small

country with a small number of power users, which is an additional obstacle, but with the liberalization of the electricity market it is expected that it will no longer represent a serious obstacle.

In the last few years extensively has been worked on improving the investment climate in the country which resulted in the ascent to the 22 position on the Doing Business list for 2012 compared to 78 position in 2008 as a result of the implemented 21 reforms to ease the way for starting business. Thus, Macedonia is first in the region.

As an additional criterion for improved investment campaign by the Government is the adoption of the Law on Concessions and Public-Private Partnership. However, when it comes to investing in the energy sector, this law needs to be improved in accordance with chapter 2.3.2.

In addition to mentioned funds, from the budget of the Republic of Macedonia funds allocate for the implementation of the Program for subsidizing energy consumption and the Program for compensation a part of the cost of purchased and installed solar thermal collector systems for households.

The Government of the Republic of Macedonia, for the first time, adopted Program for subsidizing energy consumption in August 2010, followed by an Annual program for subsidizing energy consumption in January 2011. As part of this program, in 2012 around 74 million MKD of budgetary funds have been placed. Users of the assets were households that were recipients of social security, which were receiving 700 MKD / month to cover their energy needs. This assistance from the Government continues in the following years.

In the budget of the Republic of Macedonia in 2013 74 million are planned for this purpose.

Among the investment in renewable energy sources are also the subsidies for solar collectors, and until now 500 households were subsidized in 2007 and in 2009, 421 in 2011 and 481 in 2012. The Budget for 2013 provides new 6,000,000 denars for this purpose.

For the realization of the Project for gasification of the Republic of Macedonia in the budget for 2013 are projected 244.2 million MKD of which 5 million are earmarked for compensation to tenants of agricultural land, 189.2 million MKD for the payment of prepared project documentation and for construction the National gas system of the Republic of Macedonia and 5 million for the payment of compensation for expropriation of land for starting construction.