REPUBLIC OF BULGARIA

Ministry of Energy

NATIONAL ENERGY EFFICIENCY ACTION PLAN 2014-2020

Sofia, June 2017

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ABBREVIATIONS USED

AOP	Public Procurement Agency
AUER	Agency for Sustainable Energy Development
GDP	Gross domestic product
DHW	Domestic hot water supply
GVA	Gross value added
HECG	High-efficiency cogeneration
RES	Renewable energy sources
RES(e)	Electricity from renewable energy sources
RES(h)	Heat from renewable energy sources
WSS	Water supply and sewerage services
VNPDEE	Second National Energy Efficiency Action Plan
EPC	Energy performance contracts
VAT	Value-added tax
MS	Member State
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
EC	European Commission
EU	European Union
ESCO	Energy Services Companies
ESM	Energy-saving measures
EC	European Community
ERDF	European Regional Development Fund
ZE	Energy Act
ZEVI	Renewable Energy Sources Act
ZEE	Energy Efficiency Act
ZID	Act amending and supplementing an existing act
ZOP	Public Procurement Act
ZOOS	Environmental Protection Act
ZUES	Condominium Ownership Management Act
ZUT	Territorial Planning Act
KEVR	Energy and Water Regulatory Commission
FEI	Final energy intensity
FEC	Final energy consumption
MoE	Ministry of Energy
MI	Ministry of Economy

MOSV	Ministry of Environment and Water
MV	Motor Vehicle
MRRB	Ministry of Regional Development and Public Works
CoM	Council of Ministers
SME	Small and medium-sized enterprises
MTITS	Ministry of Transport, Information Technology and Communications
KIDSF	Kozloduy International Decommissioning Support Fund [in Bulgarian 'MFK']
NTEF	National Trust Ecofund
NEK	National Electricity Company
NPDEVI	National Renewable Energy Action Plan
NPDEE	National Energy Efficiency Action Plan
NPDIK	National Climate Change Action Plan
NGO	Non-governmental organisation
NSI	National Statistical Institute
HVAC	Heating, ventilation and air-conditioning
OPIC	Operational Programme 'Innovations and Competitiveness'
OPRD	Operational Programme 'Regional Development'
OPTTI	Operational Programme 'Transport and Transport Infrastructure'
GHG	Greenhouse gases
PEI	Primary energy intensity
PEC	Primary energy consumption
PNPDEE	First National Energy Efficiency Action Plan
RDP	Rural development programme
IS	Industrial systems
TFA	Total floor area
OAs	Owners' associations
ETS	Emissions trading scheme
TPP	Thermal power plants
FEEVI	Energy Efficiency and Renewable Sources Fund
FEEI	Energy and Energy Savings Fund
CHPP	Combined heat and power plants

1. INTRODUCTION. EUROPEAN AND NATIONAL ENERGY EFFICIENCY POLICIES. CHANGES IN ENERGY CONSUMPTION. MACROECONOMIC FACTORS

Directive 2012/27/EU on energy efficiency is aimed at establishing a common framework to promote energy efficiency within the Union in order to ensure the achievement of the objective of saving 20% of the Union's primary energy consumption by 2020, and to set up conditions for further energy efficiency improvements after 2020. In accordance with the provisions of this Directive, in 2014 the Republic of Bulgaria developed and presented to the European Commission a National Energy Efficiency Action Plan 2014-2020 [NPDEE].

In 2015 and 2016 the work on achieving the energy efficiency targets set out in the National Action Plans for 2008-2016 continued. They were developed in accordance with the requirements of Directive 2006/32/EC of the European Parliament and of the Council on energy end-use efficiency and energy services.

This updated version of the National Energy Efficiency Action Plan 2014-2020 has been developed in implementation of the provisions of Article 7(1) item 2 and Paragraph 17(1) of the Transitional and Final Clauses of the Energy Efficiency Act and in conformity with the requirements of Article 24(2) of Directive 2012/27/EU.

The energy policy of the Republic of Bulgaria is fully aligned with that of the European Union in terms of energy security, competitiveness and sustainable development. The Energy Strategy of the Republic of Bulgaria for the period to 2020 confirms that 'energy efficiency has the highest priority in the country's energy policy'. This has served as a basis for setting ambitious energy efficiency improvement targets..

Macroeconomic factors

The impact of the economic crisis meant that the forecasts underlying the Energy Strategy of the Republic of Bulgaria were largely missed in the years following its adoption: GDP growth was much lower than expected, and primary energy intensity [PEI] in the period 2009-2015 practically remained at the same level. Now, a slow economic recovery is expected following the end of the economic crisis.

According to the reference scenario adopted by the NPDEE, GDP is expected to grow by up to 2.2 % p.a. between 2014 and 2020. In the first two years of the NPDEE period, actual GDP slightly exceeded the forecast value, and in 2015 it was 5 % higher than the 2013 figure.

The deep impact of the economic crisis on all business entities and the subsequent slow recovery in the living standards of Bulgarian households were taken into consideration when setting the energy efficiency targets, which take into account the limited local funding sources.

Impact of the economic crisis

As a result of the economic crisis, a decline in local energy consumption was reported in 2009, as national GDP dropped by 4.4 % for one year. The crisis put an end to the seven-year process of economic growth and sustainable improvement of energy efficiency. In 2013, once again there was a significant decrease in primary energy consumption, which was even below the value for 2009. This was primarily due to the reduced consumption of solid fuel and nuclear energy because of reduced exporting of electricity as well as a decline in the consumption of petroleum products at FEC level by transport due to the higher price of fuels.

In the period 2009-2015, final energy intensity and primary energy intensity remained almost at the same levels as at the beginning of the period. The trend in the first two years of the implementation of NPDEE was also negative, with PEI and FEI showing only minimal growth. In 2015, nearly all sectors of final energy consumption showed a deterioration of EE indicators.

The main reasons for this negative trends are reviewed in more detail in the Annual Report on the implementation of NPDEE in 2016.

Changes in energy consumption

The changes in primary energy consumption in the period 2001-2015 are shown in Fig. 1-1.

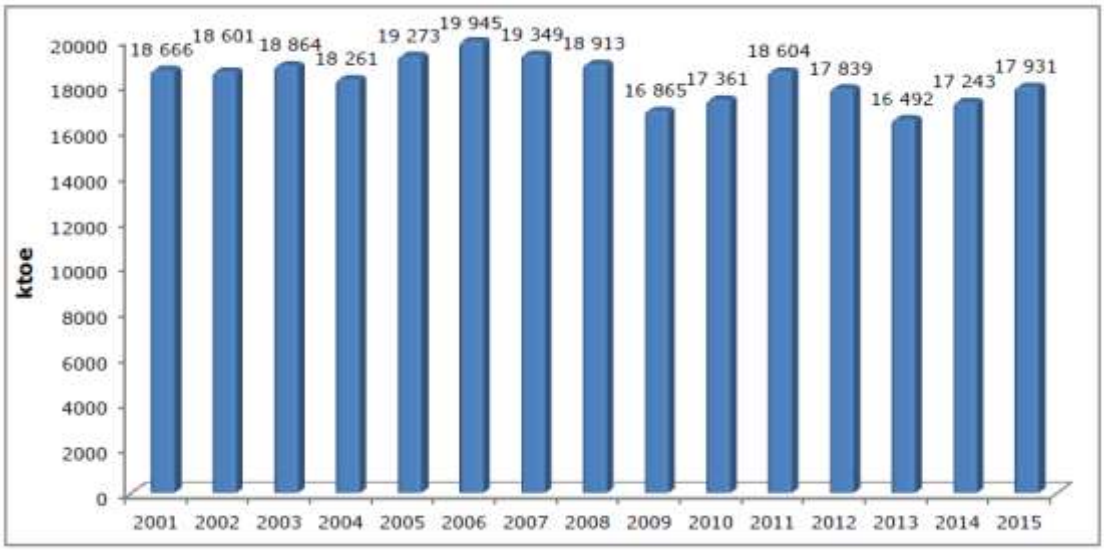

Fig. 1-1: Primary energy consumption[1], 2001-2015, ktoe

Primary energy consumption did not exhibit a constant upward trend in the period 2001-2015. In 2015, the primary energy consumption of Bulgaria amounted to 17 931 ktoe. There was a decrease in 2009 due to the impact of the economic crisis, and after that it began to rise until 2011, followed once again by a decline, reaching the lowest level of 16 492 ktoe in 2013. In the first two years of the implementation of the NPDEE, however, PEC increased to 17 931 ktoe in 2015, thus remaining significantly below the level of the pre-crisis year 2008.

The increased use of energy from RES is a positive trend, reaching 1 992 ktoe in 2015. The RES share in PEC reached 11.1 % in 2015. The changes in FEC in the period 2001-2015 are shown in Fig. 1-2.

1 *Source: NSI*

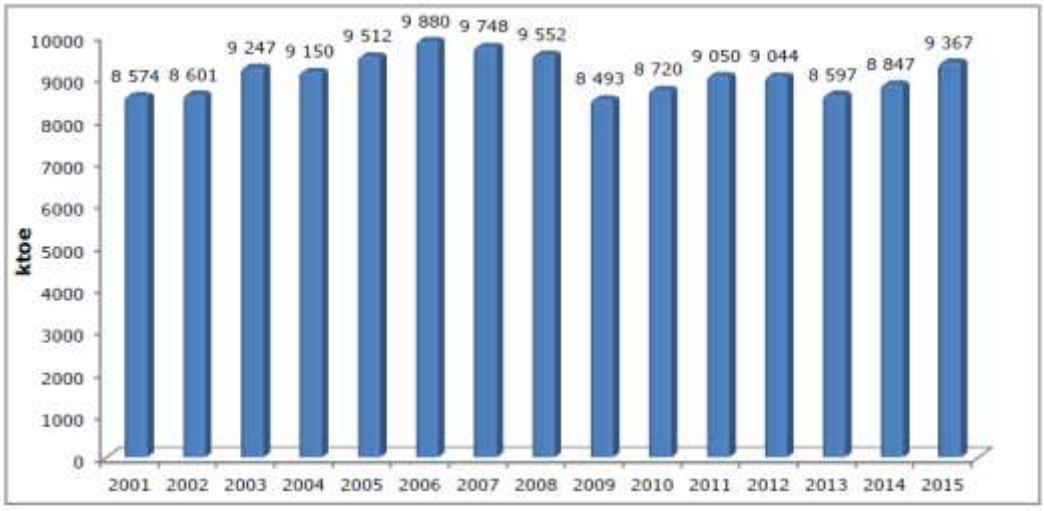

Fig. 1-2: Final energy consumption[2], 2001-2015, ktoe

FEC dropped to its lowest value of 8 493 ktoe in 2009. In 2015 it stood at 9 367 ktoe, growing in the two years of implementation of the NPDEE but still not exceeding its level of 2008.

Energy intensity

Energy intensity is the main indicator of how efficiently energy is used. It is determined in the NPDEE as the amount of energy used per GDP unit at fixed prices for 2010. The changes in primary and final energy intensity are the two main indicators for assessing energy efficiency at macro level. The changes in these two indicators during the period 2001-2015 are shown in Fig. 1-3.

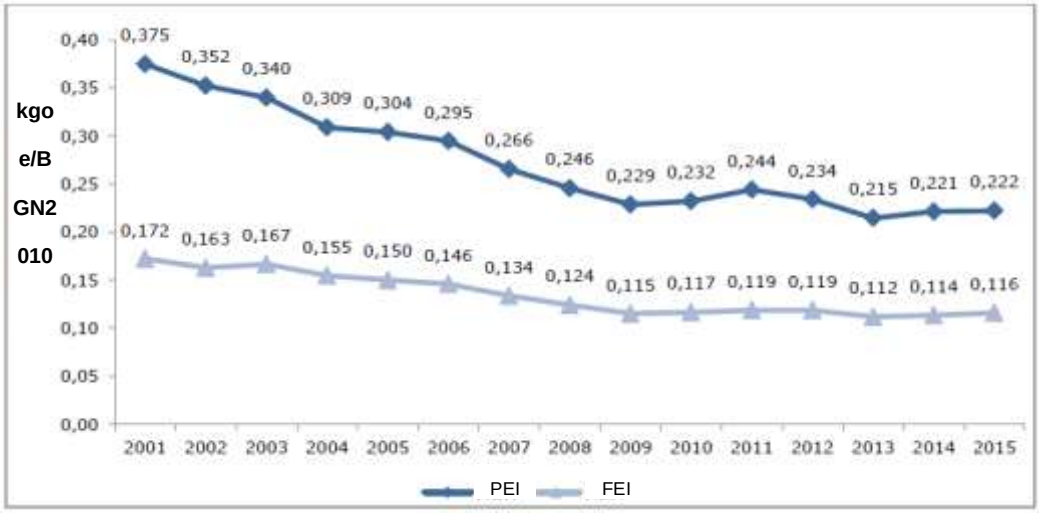

Fig. 1-3: Final and primary energy intensity[3], 2001-2015, ktoe/BGN, 2010.

In the 2001-2008 period there was a steady trend of relatively rapid decrease in primary and final energy intensity in Bulgaria, as well as an increase in the ratio between FEC and PEC.

2 *Source: NSI*

3 *Source: NSI*

This is an indicator of improved EE in final consumption, as well as in the transformation, transmission and distribution of energy.

Energy intensity and the ratio between final and primary consumption varied much less in the period 2009-2015, remaining practically at their level at the beginning of the period.

In 2014 and 2015, there was a negative trend in terms of an increase in energy intensity in comparison with its lowest level in 2013.

Final energy consumption, final energy intensity

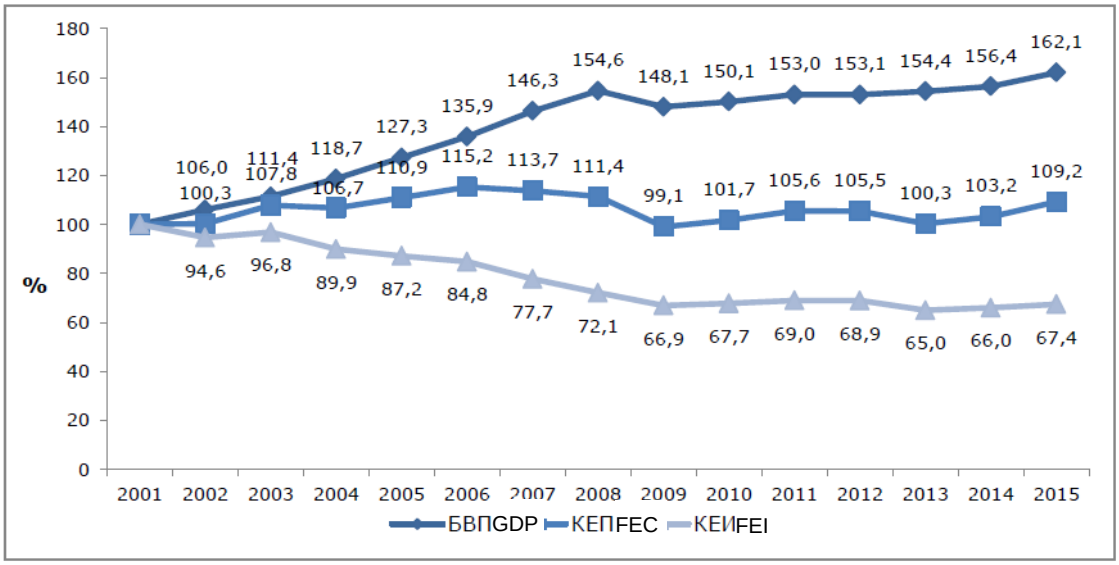

Fig. 1-4: Gross domestic product, final energy consumption and final energy intensity in the period 2001-2015, indices[4] 2001 =100 %

FEC increased to 9 367 ktoe in 2015, up 5.9% from 8 830 ktoe in 2014. The same trend was observed with FEI where the increase was from 0.1136 ktoe/BGN_{2010} in 2014 to 0.1160 ktoe/BGN_{2010} in 2015, or 2.2 %.

The increase in energy intensity and growth in final consumption reflect two factors:

- A change in sectoral shares in the creation of value added due to the great difference in energy intensity between industry and the services sector.
- An increase in energy intensity within the individual sectors, including Transport and Households.

In 2015, the shares of the Industry and Services sectors in gross value added remained unchanged compared to the previous year 2014, indicating that this factor had no impact on FEI and FEC. The increase in energy intensity observed in 2015 spanned all sectors of final consumption, and the trend over the period 2001-2015 is shown in Fig. 1-5.

4 *Source: NSI, AUER - Annual report on the implementation of NPDEE, March 2017*

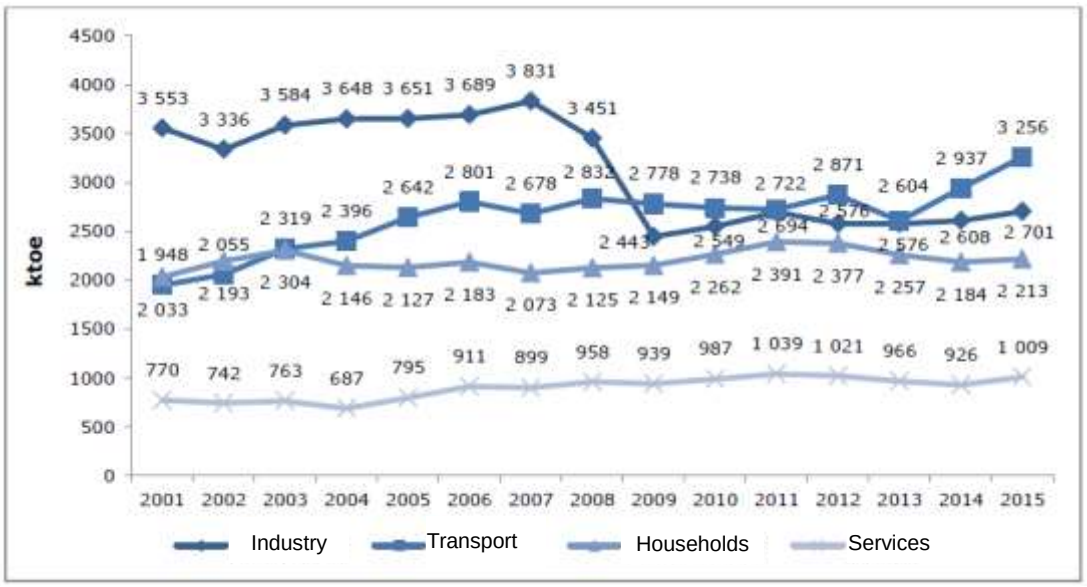

Fig. 1-5: Final energy consumption by sector[5] 2001-2015.

In the period 2001-2015, energy consumption increased in all main sectors with the exception of Industry. The economic crisis after 2008 had its most severe impact on Industry, and consumption decreased by more than 1 ktoe in just two years. The sector thus ceded its leading position in energy consumption nationwide to the Transport sector.

In 2015, consumption grew in all sectors. A detailed analysis of the state of the economic sectors is provided in the Annual report on the implementation of the NPDEE in 2016. The main reasons for the increased energy consumption in 2015 included:

Industry Sector

- A 4.1% increase in value added produced;
- In 2015, the prices of fuels, such as natural gas and petroleum derivatives, which account for more than 40% of the sector's consumption, were significantly lower.

Transport Sector

- Growth in the number and use of personal vehicles at the expense of other more energy-efficient types of transportation;
- Very high and continuously increasing share of old vehicles;
- Poor technical condition of a large part of the motor vehicle fleet;
- Increasingly prolonged and large-scale congestion in the centres of big cities where motor vehicle traffic is concentrated.

Households Sector

- Growth of financial expenditure by 5.5 %;

5 *Source: NSI, AUER - Annual report on the implementation of NPDEE, March 2017*

- Lower average winter temperatures as compared to 2014;
- Increase in the number of electric appliances at home, in particular increased sales of air-conditioning systems by 6.4 %, and of dish-washers by 4.4 % for just one year;
- Higher level of heating comfort in homes in both winter and summer.

Services Sector

- A 3.3 % increase in the sector's GVA ;
- A more than two-fold increase in the consumption of liquid fuels (from 17 ktoe in 2014 to 38 ktoe in 2015) triggered by the lower price of liquid fuels on the market in 2015;
- Lower average winter temperatures as compared to 2014;
- Higher level of heating comfort in public buildings in both winter and summer.

2. OVERVIEW OF NATIONAL ENERGY EFFICIENCY TARGETS AND SAVINGS ACHIEVED

2.1. National energy efficiency targets for 2020

In line with the provisions of Article 3 of Directive 2012/27/EU, Bulgaria set the following national indicative energy savings targets for 2020:

Table 2.1-1: National indicative energy savings targets

National indicative targets	***2020***
Energy savings at FEC level	***716 ktoe/y***
Energy savings at PEC level	***1 590 ktoe/y*** of which ***169 ktoe/y*** in energy transformation, transmission and distribution processes

Method for determination of the National energy efficiency target

The national energy efficiency target is determined using a 'bottom-up' method on the basis of the following:

1. Bulgaria's reference energy consumption scenario as set out in the report *'Bulgaria: Reference scenario - Detailed Analytical Results*' developed by the National Technical University of Athens (7 January 2013). The forecasts in the report are based on the energy forecasting method PRIMES Ver. 4.;

2. An assessment of the available economic energy saving potential under the reference scenario.

The available economic potential for additional energy savings for the period up to 2020 was assessed using:

- Data additional financial resources available for improving energy efficiency;

- Data on investment required per unit of saved energy based on audits of buildings and industrial systems under the Energy Efficiency Act;

- Assessment, by final-consumption sector, of the available economic energy-saving potential under a policy that places high priority on energy efficiency (Economic Potential - High Policy Intensity from the report *'Study on the Energy Savings Potentials in EU Member States, Candidate Countries and EEA Countries: Final Report'* developed by the Fraunhofer-Institute for Systems and Innovation Research; ENERDATA (Grenoble, France); the Institute of Studies for the Integration of Systems, ISIS (Rome, Italy); Vienna University of Technology (Vienna, Austria); and the Wuppertal Institute for Climate, Environment and Energy, WI (Wuppertal, Germany)).

The additional energy savings at FEC level were determined assuming a strong EE policy and optimal use of the additional financial resources available to Bulgaria from various sources, namely from EU funds and programmes; an energy efficiency obligation scheme

under Article 7 of Directive 2012/27/EU - obligation of energy traders and alternative measures; local sources; national budget.

Table 2.1-2: Contribution of sources for financing energy efficiency measures

National target at FEC level	***716 ktoe/y***
from optimal use of financial resources available	230 ktoe/y
from energy efficiency obligation scheme under Article 7 of Directive 2012/27/EU	486 ktoe/y

The specified estimates include the energy-saving effects achieved by optimising the national budget's involvement in the absorption of financial resources from EU programmes and funds, as well as by maximising the involvement of local financial sources in the absorption of financial resources from EU programmes and funds, and also in supporting energy traders in their efforts to accomplish their individual targets under the obligation scheme.

The achievement of the above national indicative energy-saving and energy-efficiency targets by 2020 will reduce PEC in the year 2020 from 18 460 ktoe, as per the reference scenario, to 16 870 ktoe.

The national indicative energy-efficiency target is calculated on the basis of the achievement of the above energy-saving targets and is defined as a 41 % reduction of PEI in Bulgaria in 2020 as compared to 2005.

Table 2.1-1: Primary and final energy consumption expected under the reference and target scenarios, ktoe

Indicator	***2012***	***2016***	***2020***
PEC - reference scenario	18 305	18 382	18 460
PEC - target scenario	-	17 587	16 870
FEC - reference scenario	9 044	9 200	9 355
FEC - target scenario	-	8 842	8 639
FEC saving target	-	358	716
PEC saving target	-	795	1 590

Table 2.1-4: Energy production and consumption forecast, ktoe

Indicator	***2020***
Total primary energy consumption	16 870
Fuel and energy input for transformation at TPPs	7 230
Electricity produced by transformation at TPPs	2 656
Fuel and energy input for transformation at CHPPs	2 355
Heat produced by transformation at CHPPs	1 098
Electricity produced by transformation at CHPPs	668
Energy distribution losses (all fuels)	397
Total final energy consumption	8 639
Final energy consumption - Industry	2 585
Final energy consumption - Transport	2 554
Final energy consumption - Households	2 245

Final energy consumption - Services and Agriculture	1 255

2.2. Additional energy efficiency targets

2.2.1. Individual targets for owners of building and industrial systems

Period 2014-2016 - accomplished targets with ongoing impact

A major factor in the accomplishment of the indicative national energy-savings target in the period 2014-2016, defined in accordance with the requirements of Directive 2006/32/EC and Directive 2012/27/EU, is the fulfilment of the individual energy-saving targets allocated to several groups of obligated parties. The measure was introduced by ZEE in 2008 and sets individual targets for three groups of obligated parties:

- energy traders;
- building owners - government institutions and municipal administrations;
- owners of industrial systems consuming more than 3 000 MWh of energy per annum.

The list of obligated parties and the values of the individual energy-saving targets allocated to them are adopted by the Council of Ministers and annexed to the National Energy Efficiency Action Plan (*Annex 3*). § 4 of the Transitional and Final Provisions of ZEE adopted in 2015 retains the obligation for accomplishment of individual energy-savings targets up to 2016 for owners of building and industrial systems.

The total amount of the target for the obligated parties up to 2016 is 5 984 GWh (516 ktoe) allocated as follows:

- energy traders - 4 644 GWh/y;
- owners of buildings, government and municipal administrations - 521 GWh/y;
- owners of industrial systems consuming more than 3 000 MWh per annum - 839 GWh/y.

Evaluation of the implementation

Table 2.2.1-1: Accomplishment of individual targets of building owners, industrial systems owners and energy traders

Obligated parties	***Individual targets 2016, GWh/y***	***Implementation 2008-2016, GWh/y***	***Implementation rate, %***
Building owners	521	1 192	229
IS owners	839	650	77.5
Energy traders	4 644	2 010.8	43.4

Following the entry into force of ZEE in 2015 and its amendments from 2016, the obligated parties - energy traders have been assigned new targets described in details in Item 3.1.1 of this Plan.

2.2.2. National targets for nearly zero energy buildings

The national definition for nearly zero energy buildings is laid down in ZEE and reads as follows: A nearly zero energy building is a building, which simultaneously meets the following conditions:

a) the building's energy consumption, defined as primary energy, corresponds to class A on the scale of energy consumption classes for the relevant type of buildings;
b) no less than 55 % of the necessary (delivered) energy for heating, cooling, ventilation, hot water for household purposes and lighting is energy from renewable sources located on-site at the level of the building or close to the building.

The minimum energy performance requirements for buildings or parts thereof, with regard to reaching the cost-optimal levels, energy efficiency requirements and indicators, and method/standards for determining the annual energy demand in buildings, including the nearly zero energy buildings, are set out in *Regulation No 7 of 2004 on energy efficiency of buildings*.

National targets for nearly zero energy buildings are defined in the National Plan for nearly zero energy buildings adopted by Decision No 1035 of the Council of Ministers in the end of 2015 and presented to the European Commission on 1 February 2016 *(Annex 3*).

The National Plan includes targets, which vary according to the category of the buildings in line with their purpose.

Table 2.2.2-1. National interim targets for setting up new nearly zero energy buildings

Year	***Target as per cent of all newly constructed buildings***		
	office buildings	residential buildings	other buildings
2015	-	-	-
2016	5 %	-	-
2017	15 %	0.2 %	1 %
2018	35 %	0.5 %	1.5 %

Year	***Target as per cent of all newly constructed buildings***		
2019	100 %	1 %	2 %
2020	100 %	1.5 %	2.5 %

Table 2.2.2-2. National interim targets for renovation of existing public service buildings (state- and municipality-owned) into nearly zero energy buildings

Year	***Target as per cent of all renovated buildings***
2015	-
2016	-
2017	0.50 %
2018	1.00 %
2019	1.22 %
2020	1.54 %

2.2.3. National target for improving the energy performance of heated and/or cooled buildings – owned by the state, used by the public administration

According to the requirements of Article 5 of Directive 2012/27/EU, all Member States shall ensure that, as from 1 April 2014, a minimum of 3 % of the total floor area of heated and/or cooled buildings owned and occupied by its central government is renovated each year. The Republic of Bulgaria, through the provisions of ZEE, has accepted an even more ambitious target of 5 %, which covers not only the central government buildings but also a part of those occupied by the territorial administration.

In accordance with the requirements of Article 7(1)(4) and § 19 of the Transitional and Final Provisions of ZEE, a National Plan for improvement of energy performance of heated and/or cooled buildings, owned by the state and used by the public administration has been developed (*Annex 1*). The Plan has been developed by a research team of the Sofia Technical University following an assignment by the Ministry of Regional Development and Public Works, which was initially responsible for its development.

The National Plan sets out cost-efficient methods for improvement of energy performance of these buildings. The implementation of the Plan will contribute to the accomplishment of the national energy efficiency target of the Republic of Bulgaria to 2020.

2.3. Primary energy savings

The primary and final energy savings achieved and projected are given in Table 2.3-1.

Table 2.3-1: Overview of achieved and projected PEC and FEC savings

Period	***Energy savings at PEC level, ktoe***	***Energy savings at FEC level, ktoe***
2006-2012 - achieved	906.6	446.8
2014-2016 - achieved[6]	602.9	303.8
2014-2020 - projected	1 590.0	716.0

- The FEC savings achieved by 2016 are estimated using the 'bottom-up' method and the corresponding primary energy savings are estimated using the real final-to-primary consumption ratio in 2016;

- The projected FEC and PEC savings are estimated using the 'bottom-up' method. A more detailed description of the method and of the data used, including savings in the energy transformation, transmission and distribution processes, is provided in Table 2.4.2.

6 *The estimate includes only PEC savings as a result of estimation of FEC savings and excludes estimation of energy savings in the sector of energy transformation, transmission and distribution.*

2.4. Final energy consumption savings

2.4.1. Final energy consumption savings achieved

Implementation of the National energy savings target defined in accordance with Directive 2006/32/EC

Table 2.4.1-1: Implementation of the National energy savings target for the period 2008-2016

Period	Target for the period		Savings achieved	
	%	GWh/y	%	GWh/y
2008-2010	3	2 430	4.40	3 549
2008-2013	6	4 860	6.76	5 472
2008-2016	9	7 291	12.4	10 033.9

The results of fulfilment of the national target under Directive 2006/32/EC indicate that at moment the country has overachieved the conditional target for the period 2008-2016 by 3.4 %.

Implementation of the National energy efficiency target defined in accordance with Directive 2012/27/EU

Table 2.4.1-2: Implementation of the national energy savings target for the period 2014-2016

National target 2014-2020	**8 325.6**	**GWh/y**
Implementation 2014-2016	3 532.2	GWh/y
Execution Rate of the target	42.4	%

2.4.2. Methods used for the calculation of savings

The calculation of the achieved savings is made by using both the ‘top-down’ and ‘bottom-up’ methods.

Top-Down Method

The generic methodology recommended by the EC was used to calculate the energy savings achieved using the ‘top-down’ method. The calculation is part of the analysis of the energy efficiency situation in Bulgaria drafted by AUER and included in the Annual Report on the implementation of NPDEE. The Report includes basic statistical data and analyses the energy efficiency situation and trends at national level in the past year for which there is official statistical data available. The different economic sectors are subject to review by recording the changes in key indicators, such as gross value added, energy consumption and energy intensity.

Bottom-Up Method

This method is used to estimate the energy savings achieved as a result of the implementation of specific measures of NPDEE, projects and programmes aimed at improvement of the energy efficiency, based on:

- Savings declared by the relevant obligated parties in the annual reports submitted to AUER, according to Articles 12, 63 and 68 from ZEE;

- Data on the effective financial mechanisms for financing of energy efficiency improvement measures by the responsible institutions and managing bodies of the operational programmes;

- Information from the AUER information system on energy audits and control of energy efficiency.

The verification of the achieved energy savings by the 'bottom-up' method is stipulated for in *Regulation on the methods of establishing the national energy efficiency target and of determining the overall cumulative target, the introduction of a scheme for energy savings obligations, and the allocation of individual energy savings targets between obligated parties*.

Energy savings achieved by the end users after the introduction of energy efficiency improvement measures are verified through:

1. assessment of the energy savings achieved after an energy efficiency audit of a building, establishment, industrial system or exterior artificial lighting system, or after inspection of a heating plant with water-based heater or air-conditioning system, provided that the audit or inspection is carried out not earlier than one year after the introduction of the measures, or

2. use of specialised calculation methodologies.

The specialised calculation methodologies are developed under the procedure of *Regulation No E-РД- 04-3 of 4 May 2016* and are approved by the Minister for Energy.

A detailed description of the application of both methods for verification of energy savings and the provisions of the subordinate legal acts with regard to the rules and procedures for their implementation is included in this NPDEE, in the relevant specific measures.

All measures provided for in the National Energy Efficiency Action Plan shall be implemented in compliance with the rules on state aid.

3. POLICY MEASURES IMPLEMENTING DIRECTIVE 2012/27/EU

3.1. Horizontal measures

3.1.1. Energy efficiency obligation schemes and alternative policy measures (Article 7 and Annex XIV, Part 2, Item 3.2 of Directive 2012/27/EU)

To facilitate the achievement of the national energy efficiency target and in compliance with the requirements of Article 7 of Directive 2012/27/EU, Bulgaria has introduced:

- energy-saving obligation scheme; and
- alternative measures

which shall ensure the achievement of the overall cumulative energy-savings target at FEC level by 31 December 2020.

The overall cumulative energy-savings target represents the annual accumulation of new energy savings of end users for the period 2014-2020. The overall energy-savings cumulative target may not be less than 1.5 % per annum of the average annual value of the overall amount of annual energy sales, including fuels, to end users within the country in 2010, 2011 and 2012 , excluding the amounts sold in the Transport Sector under Code 'B_101900' of Eurostat. The amounts of energy sales used in industrial activities under Annex 1 of the Law on Climate Change Mitigation are also excluded from the target.

The tables below show how the overall cumulative target is determined.

Table 3.1.1-1. Average energy sales to end users for the period 2010 -2012, ktoe

Indicator	***2010***	***2011***	***2012***	***Annual average FEC for the period 2010-2012***
FEC, Transport excluded	5 990	6 337	6 173	6 167

Bulgaria used the maximum admissible reduction of 25 % under Article 7(2) of Directive 2012/27/EU by combining the assumptions of Article 7(2), letters a), b) and d).

Table 3.1.1-2. Overall energy-savings cumulative target for 2020

Annual average FEC for the period 2010-2012	***Obligations excluding transport and taking into account the complete utilisation of the admissible reduction of 25 % under Article 7(2)***	
ktoe	% of FEC	Ktoe
6 167	31.5	1 942.7

Table 3.1.1-3. Distribution of the overall cumulative target by year for the period 2014 -2020, ktoe

Year	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***
2014	61.7	61.7	61.7	61.7	61.7	61.7	61.7
2015		61.7	61.7	61.7	61.7	61.7	61.7
2016			75.2	75.2	75.2	75.2	75.2
2017				75.2	75.2	75.2	75.2
2018					77.1	77.1	77.1
2019						77.1	77.1
2020							78.3

Energy efficiency obligation schemes

Description of the measure

The individual energy-saving targets represent the annual energy savings for end users for the period from 1 January 2014 to 31 December 2020. Individual targets are determined as the difference between the calculated annual cumulative target and the estimate of energy savings from alternative measures is assigned proportionately, based on the energy amounts sold by any obligated party in the previous year, between the following obligated parties:

1. end suppliers, suppliers of last resort, traders with issued licence for the business 'trade in electricity' selling electricity of more than 20 GWh p. a. to end customers;

2. heat transmission enterprises and heat energy suppliers selling heat energy of more than 20 GWh p.a. to end customers;

3. end suppliers and traders selling natural gas in amounts exceeding 1 million m^3 natural gas p.a. to end customers;

4. liquid fuel traders selling liquid fuels in amounts exceeding 6.5 kt p.a., excluding transport fuels, to end customers;

5. solid fuel traders selling solid fuels in amounts exceeding 13 kt p.a. to end customers.

According to the requirements of Article 19(1) ZEE, the list of obligated parties and the targets assigned to them is in ***Annex 3*** to this NPDEE.

The annual individual targets of obligated parties are established by AUER based on the submitted declarations for amounts of fuels and energy sold to customers at final energy consumption level in the previous calendar year. Declarations shall be submitted to AUER by 1 March each year. The list of obligated parties and their individual annual targets shall be updated annually taking into account the amounts sold by the respective obligated party against the overall amount sold by all obligated parties for the previous year. The update of the list is made together with the annual reports on the implementation of NPDEE, drafted by AUER.

Legal basis

- *Energy Efficiency Act (promulgated in SG, No 105 of 30 December 2016)*
- *Regulation on the methods of establishing the national energy efficiency target and of determining the overall cumulative target, introduction of a scheme for energy-saving obligations, and allocation of individual energy-saving targets between obligated parties*

Target sectors and territorial scope

The measure shall be applied to fuel and energy traders on the whole territory of the country.

Implementation of the measure up to 2016

On the grounds of ZEE, which was repealed in 2015, the implementation of the measure 'Individual energy saving targets for energy traders' (for traders selling energy of more than 75 GWh/y, with staff of over 10 people, or annual turnover above BGN 4 million) continued until the end of 2016. To report the implementation of the measure, each year traders submit data of the activities and energy efficiency improvement measures for end users carried out by them to AUER, and the deadline to submit information is the 1st of March of the year following the year of fulfilment of the regulatory obligations.

Based on the data received in AUER by the 1st of March 2017, a partial calculation of the achieved and expected savings of fuels and energy has been made by the 'bottom-up' method. The obligated parties trading in energy with targets assigned under Directive 2006/32/EC are 56 in total, including traders of more than one type of fuel. The overall target for energy traders, set in 2010 to be achieved by 2016, is 4 644 GWh.

Table 3.1.1-4: Summary assessment[7] of the effect from the implementation of the measure

	PNPDEE 2008-2010	***VNPDEE 2011-2013***	***NPDEE 2014-2016***	***Total***
Energy savings, GWh/y	809.0	934.4	557.5	***2 300.9***

The fulfilment of the activities and measures by energy traders contributes to the implementation of the national energy efficiency target set out by both Directives, and Table 3.1.1-4 provides analysis of individual targets of energy traders as defined by Directive 2006/32/EC.

7 *Source: AUER - Annual report on the implementation of NPDEE, March 2017*

Methods of calculation and system for monitoring and verification of savings

The energy savings achieved are calculated by using the 'bottom-up' method.

Each year by the 1st of March, the obligated parties declare the activities and energy efficiency improvement measures before AUER and present an assessment of the effect thereof. The progress in the fulfilment of individual targets of obligated parties is evaluated by AUER and is included in the Annual report on the implementation of NPDEE.

Energy savings at the level of end users achieved after the introduction of energy efficiency improvement measures are verified through:

1. calculation of the achieved energy savings after energy efficiency audit of a building, establishment, industrial system or exterior artificial lighting system, or after inspection of a heating plant with water-based heater or air-conditioning system, as the audit or inspection is carried out not earlier than one year after the introduction of the measures; or

2. application of specialised calculation methods:

   - The verification of the energy savings achieved is performed by persons who are entered in the public registers of AUER and are authorised to carry out energy efficiency audits of buildings, establishments, industrial systems or exterior artificial lighting systems;

   - The control of the methods used to assess the effect of the various types of implemented energy efficiency improvement measures - energy efficiency audit or specialised methodology, is carried out by AUER;

   - *The specialised calculation methods are approved by AUER following the procedures of Regulation No E-РД- -04-3 of 4 May 2016 and are subsequently approved by the Minister for Energy;*

   - To confirm the fulfilment of the individual energy saving targets, AUER shall deliver a Certificate according to the procedure set out in *Regulation No E-РД-04-3 of 4 May 2016*.

Alternative measures

In accordance with the provisions of the effective legislation, the following alternative measures shall be eligible:

1. energy taxes or carbon dioxide taxes, with the effect of reducing the final energy consumption;

2. financing schemes and instruments or fiscal incentives that lead to the application of energy-efficient technology or techniques and have the effect of reducing the final energy consumption;

3. regulations or voluntary agreements that lead to the application of energy-efficient technology or techniques and have the effect of reducing the final energy consumption;

4. standards and norms that aim at improving the energy efficiency of products and services, including that of buildings and vehicles, except where these are mandatory and applicable in Member States under Union law;

5. energy labelling schemes, with the exception of those that are mandatory and applicable in the Member States under Union law;

6. training and education, including energy advisory programmes, that lead to the application of energy-efficient technology or techniques and have the effect of reducing the final energy consumption.

The evaluation of the possible approach for the fulfilment of the overall cumulative target under the obligation scheme for the period 2014-2020 in Bulgaria has been performed by applying alternative measures with the following preconditions:

- The minimum cumulative target at FEC level after completely utilizing the reduction of 25% is 1 943 ktoe for the period 2014-2020;
- Traders of fuels and energy included in the obligation scheme, according to a preliminary study, are expected to cover not more than 60 % of FEC;
- In the period 2010-2016, Bulgaria has an existing scheme of individual targets for annual energy savings which covers a greater number of obligated parties;
- The above individual targets are not included in the new obligation scheme for the period 2016-2020 that had to replace the old obligation scheme, and where the intention is to have only energy traders as obligated parties. The old obligation scheme was the only one in force in the period 2014-2016 due to the delayed adoption of the amendment to the ZEE and the regulations thereto, including the Regulation on the assignment of new individual targets to energy traders;
- Owners of industrial systems, government and municipal buildings are not obligated parties in the period 2016-2020.

Legal basis

- *Energy Efficiency Act (promulgated in SG, No 105 of 30 December 2016)*
- *Regulation No E-РД-04-3 of 4 May 2016 on the eligible measures to carry out energy savings at final consumption level, methods to verify the achieved energy savings, requirements to the methods of their calculation and verification.*

Alternative measure 1: Individual energy saving targets for owners of industrial systems, and government and municipal buildings

Description of the measure

According to the provisions of ZEE, in the period 2014-2016, in addition to traders of fuels and energy, there are two other groups of obligated parties assigned individual energy saving targets:

- owners of government and municipal buildings;

- owners of industrial systems consuming more than 3 000 MWh of energy per annum.

The period of validity of these targets is 2010-2016, however for the purpose of the alternative approach in the fulfilment of the obligation scheme, only savings achieved in the last three-year period from 2014 to 2016 shall be accounted for.

The list of the obligated parties and the values of the individual energy-saving targets allocated to them are adopted by the Council of Ministers and their distribution is as follows:

Table 3.1.1-5: Values of energy saving targets of building owners and owners of industrial systems

Obligated parties	***Energy saving target for the period 2010-2016***		***Energy saving target within the alternative approach for the period 2014-2016***	
	GWh/y	***ktoe/y***	***GWh/y***	***ktoe/y***
Owners of government and municipal buildings	521	44.8	260.5	22.4
Owners of industrial systems consuming more than 3 000 MWh of energy per annum.	819	70.4	409.5	35.2
Total	***1 340***	***115.2***	***670***	***57.6***

Implementation of the measure 2014-2016

Table 3.1.1-6: Progress in the implementation of the alternative measure 'Individual energy saving targets for owners of industrial systems, and government and municipal buildings'

Obligated parties	***Individual target 2016, GWh/y***	***Implementation 20102016, GWh/y***	***Implementation 2014-2016, GWh/y***
Building owners	521	1 192	176.7
IS owners	819	588	332.5
Total	***1 340***	***1 780***	***509.2***

The results of the implementation of the energy efficiency measures are based on the energy savings declared by the obligated parties to AUER, by the 1st of March each year. The energy savings for the period 2014-2016 verified through certificates issued to both groups of obligated parties are:

- building owners: 121 certificates of energy savings, amount of proven savings - 12 GWh.
- Industrial systems owners: 23 certificates of energy savings, amount of proven savings - 15 GWh.

Distribution of responsibilities - participating and executing parties

- *Obligated parties* - execute and report annually the progress in the implementation of the measure to AUER*;*

- *Energy efficiency consultants entered in the public register of AUER* - carry out energy efficiency audits prior to and after application of measures, or make an assessment of the achieved energy savings by specialised methods approved under the procedure of Regulation No Е-РД-04-3 of 4 May 2016; draft an evaluation report on the savings achieved*;*

- *AUER* – monitors the implementation of the measure by summarising, analysing, and assessing its overall implementation on the basis of the reports submitted by obligated parties; performs control on the qualification and work of the energy efficiency consultants, on the application of specialised methods and on the reports with evaluation of the energy savings achieved; verifies the energy savings achieved by the obligated parties by issuing certificates; maintains array database referring to the implementation of the measure*.*

Methods of calculation and system for monitoring and verification of savings

The achieved energy savings are calculated by using the 'bottom-up' method.

Alternative measure 2: 'National programme for energy efficiency of multi-family residential buildings'

Description of the measure

The national programme for energy efficiency of multi-family residential buildings was adopted in 2015, and it is aimed at the renovation of multi-family buildings through implementation of energy efficiency measures.

http://dv.parliament.bg/DVPics/2015/10 15/prilogenia_11_71.pdf

Table 3.1.1-7. Comparison of individual targets of obligated persons in the application of a basic and combined approach for implementation of Article 7 of Directive 2012/27/EU, ktoe/y

Year	Obligation scheme - basic approach	Existing obligation scheme[8]	National programme for energy efficiency of multi-family residential buildings[9]	Remainder for the obligated parties
2014	61.7	29.1	-	32.6
2015	61.7	20.8	-	30.9
2016	75.2	20	7.6	47.6
2017	75.2	-	23.44	51.76
2018	77.1	-	16.5	60.6
2019	77.1	-	16.5	60.6
2020	78.3	-	16.5	61.8

8 *Figures are based on the annual reports on the implementation of NPDEE in the period 2014-2016.*

9 *Figures are based on savings accounted for by the Managing body and an engineering assessment according to the projected investments under the programme. Source: MRRB*

Total 2014-2020	***506.3***		***355.86***
Cumulative 2014-2020	***1 942.7***		***1 283.44***

The National programme for energy efficiency of multi-family buildings is aimed at the renovation of multi-family residential buildings, the main objective being, through the implementation of energy efficiency measures, to provide better living conditions to the occupants of multi-family buildings, heat comfort, and higher quality of living environment. Under the Programme, financial and organisational support is provided to owners' associations in multi-family buildings registered under the procedure of the Condominium Ownership Management Act for energy efficiency improvement of the buildings they live in.

Aid and support is given to national owners' associations whose buildings meet the relevant eligibility criteria. The owners' associations apply before the municipality, and selection criteria provide that all applicants meeting the requirements, by order of submission and approval of applications, receive 100 % grant and organisational support for renovation until the funds allocated under the Programme are exhausted.

Municipalities are in charge of receiving the application documents, of their assessment, approval, provision of financing, monitoring of the implementation of the energy efficiency measures on buildings. The mayor of each municipality is responsible for the execution of the overall process of renovation of residential buildings on their territory and of the selection of contractors under the procedure of ZOP for carrying out the separate activities on buildings.

✓ *Territorial scope of the Programme*

Activities under this Programme are carried out on the territory of the Republic of Bulgaria within 265 municipalities.

✓ *Financial resource*

The Programme is executed with funds amounting to BGN 2 billion. If additional funds are provided, the Programme financial resources may be increased.

✓ *Eligibility criteria of buildings under the Programme*

All multi-family residential buildings erected by the following industrial methods are eligible: Large-panel system building; lift-slab construction; monolithic in-situ cast concrete structures; climbing formwork and varieties thereof, with minimum 36 independent living units.

As of 2016, the following also become eligible:

- multi-family residential buildings erected by the following industrial methods: Large-panel system building; lift-slab construction; monolithic in-situ cast concrete structures; climbing formwork and varieties thereof which do not fall within the scope of the National Programme – with up to 36 independent living units located in municipalities which are not eligible beneficiaries under OPRD 2014-2020;

- multi-family residential buildings (massive buildings) designed before April 1999, located in municipalities, which are not eligible beneficiaries under OPRD 2014-2020.

✓ *Financial aid*

Buildings with approved applications will receive up to 100 % grant. Owners' associations, which exercise business activities, are entitled to minimum support according to the mechanism of the minimum support scheme. There are provisions for the cases in which minimum aid is not allowed and in which the building owners bear the respective part of the costs.

Implementation[10] of the 2016 measure

Table 3.1.1-8: Indicators for the implementation of the National programme for energy efficiency of multi-family buildings

Indicator	***Value***
Registered OAs, number	5 716
Concluded contracts between a municipality and OA, number	4 057
Applications for financing submitted to the Bulgarian Development Bank, number	3 977
Concluded contracts for financing between municipality, regional governor and the Bulgarian Development Bank, number	2 022
Expected improved residential infrastructure (for all 2 022 buildings), m^2	11 361 795
Block sections to be renovated, number	3 983
Apartments to be renovated (for all 2 022 buildings), number	147 761
Occupants to benefit from the improved infrastructure (for all 2 022 buildings), number	340 705
Expected energy savings from renovated residential buildings (for all 2 022 buildings), MWh/y	924 681
Expected annual reduction of GHG emissions (for all 2 022 buildings) kt $C0_2$/p.a.	302
Buildings with started works, number	1 921
Buildings with approved and registered energy efficiency audits at AUER, number	1 681
Buildings renovated and commissioned into service, number	214
Buildings under construction, number	548
Total buildings under construction and commissioned into service, number	762
Improved residential infrastructure, m^2	1 125 915
Renovated apartments, number	12 460
Apartments benefiting from the improved infrastructure, number	26 410
Expected energy savings from renovated residential buildings, MWh/y	88 153
Expected annual reduction of GHG emissions kt $C0_2$/y	29.49
Expected improved residential infrastructure, m^2	2 985 227
Apartment units to be renovated, number	35 147

10 *Source: MRRB*

Occupants to benefit from the improved infrastructure, number	72 279
Expected energy savings from renovated residential buildings, MWh/y	272 591
Expected annual reduction of GHG emissions kt $C0_2$/p.a.	81.18

Distribution of responsibilities - participating and executing parties

✓ *Programme coordinator: The Ministry of Regional Development and Public Works* - coordinates the process and issues the required methodical guidelines and also drafts the necessary forms for application to the municipality. MRRB, through the Housing Policy Directorate, provides support to municipalities in the implementation of the Programme. MRRB also:

- Provides methodical guidance with regard to the non-financial aspects of the Programme;
- Monitors the process of implementation of the Programme;
- Plans, within the budget procedure for the corresponding year, the funds for the aid to be included in the state budget and the medium-term budgetary forecast.

✓ *Ministry of Finance* - responsible for the methodical guidance in respect to the budgetary and reporting aspects of the scheme; for the relevant actions for issuance of the State guarantee under Article 100 of the State Budget Act of the Republic of Bulgaria.

✓ *Bulgarian Development Bank* - takes part in concluding the agreement(s) for provision of loans to BDB for the provision of financial resources for the implementation of the Programme, for which there will be a State Guarantee according to Article 100 of the State Budget Act of the Republic of Bulgaria for 2015. The Bank concludes contracts for targeted funding with the mayor of the respective municipality and with the regional governor.

✓ *Municipal mayors* - responsible for the overall technical and financial administration of the Programme on their territory. The Municipality:

- Receives applications from OAs and the municipal mayor concludes a contract with the relevant associations for providing aid and funding;
- Concludes contracts and pays for all renovation activities;
- Concludes contracts for targeted funding with BDB and the regional governor.
- Keeps a public register of OAs: The municipal mayor or an authorised person checks (pursuant to Article 46(2) ZUES) whether the requirements of ZUES are met in the entry of the association, provides a certificate of registration (pursuant to Article 46a ZUES) to the association;
- Issues building permits;
- In the cases of apartments owned by the municipality in buildings where OAs initiate application, the municipalities take part in the General meeting of OA and decisions thereof through an authorised representative;

- Carries out information/awareness campaigns - meetings with house managers, dissemination of information materials at suitable public places and in the residential districts, etc.;

- Exercises investor control.

✓ *Regional governors* - as government representatives they sign contracts for targeted funding with the municipal mayor and BDB; monitor the process of renovation of residential buildings on their territory as part of the implementation of the targeted funding contract

✓ *Owners' associations* - established under the procedure of Article 25(1) ZUES:

- Submit letters of interest and applications for financial aid to the municipality;

- Carry out control on the implementation of energy efficiency measures in the respective residential building through an authorised technical expert;

- Conclude a contract with the municipal mayor.

✓ *Contractors* - selected by the municipality under the terms and conditions of an open tender procedure as per ZOP:

- Complete audits to establish the specifications related to the requirements of Article 169(1)(1-5) and (2) ZUT;

- Complete energy efficiency audits and give instructions for the necessary energy-saving measures in accordance with the legal requirements for energy efficiency under the procedure of ZEE and the regulations thereto;

- Prepare work projects and carry out author's supervision;

- Carry out construction and assembly works;

- Make conformity assessments of investment projects and exercise construction supervision;

- Exercise investor control.

✓ *AUER* - on the basis of annual data for the implementation of the Programme in the previous year and the forecast of the activities and investments planned for the next year, it makes an evaluation of the projected savings and calculation of the obligation scheme as pursuant to ZEE; each year it prepares an analysis and assessment of the progress achieved in the implementation of the measure as part of the Annual report on the implementation of NPDEE.

Methods of calculation and system for monitoring and verification of savings

The achieved energy savings are calculated by using the 'bottom-up' method.

The energy-demand parameters, energy performance of establishments, industrial systems or exterior artificial lighting systems, as well as the terms and arrangements for carrying out energy efficiency audit and assessment of energy savings are set out in *Regulation No E-РД-04-05 of 8 September 2016.*

The terms and conditions to carry out energy efficiency inspection of water-based heaters and air-conditioning systems are set out in *Regulation No РД-16-932 of 23 October 2009.*

The energy efficiency audit, certification and calculation of energy savings in buildings are set out in *Regulation No Е-РД-04-1 of 22 January 2016.*

The eligible measures for the performance of energy savings at final consumption level, the methods to verify the achieved energy savings, the requirements to the methods of their calculation and verification are set out in *Regulation No Е-РД-04-3 of 4 May 2016.*

3.1.2. Energy audits and management systems (Article 8 of Directive 2012/27/EU)

Description of the measure

All of the following are subject to mandatory energy efficiency audit:

1. Production enterprises which are not small and medium-sized enterprises within the meaning of Article 3 of the Small and Medium-sized Enterprises Act;

2. Enterprises for delivery of services which are not small and medium-sized in the meaning of Article 3 of the Small and Medium-sized Enterprises Act;

3. Industrial systems consuming more than 3 000 MWh of energy per annum;

4. Exterior artificial lighting systems located in settlements of more than 20 000 people.

The audit shall be carried out at least once every 4 years.

The enterprises and owners of industrial systems implementing an energy or environment management system, subject to certification by an independent authority for compliance with the European or international standards, shall be exempt from the requirements for mandatory energy efficiency audit provided that their management system includes energy audit of the respective enterprise or industrial system.

The application of an energy or environment management system and evidences that their management system meets the minimum requirements for energy audits shall be submitted to AUER within one month from receipt of the certificate.

The owners of enterprises, IS and exterior artificial lighting systems must carry out energy efficiency management. Energy efficiency management shall be carried out by maintaining databases of monthly production and consumption by type of energy, preparing annual analyses of the energy consumption, and implementing other measures, which lead to energy savings. With regard to energy efficiency management, the obligated parties prepare annual reports according to a form drawn up by AUER, which are presented to the Agency no later than the 1st of March of the year following the year of reporting.

Bulgaria has introduced a system for energy efficiency audit and certification of operating buildings with TFA above 250 m^2, implementing the provisions of Directive 2010/31/EU. The certificate of energy performance of an operating building shall be updated upon conduct of the following activities resulting in altered energy performance of that building:

1. Modification;

2. Reconstruction, general renovation or capital repair which covers 25 % of the area of outer enclosure structures and building elements.

The owners of building with TFA above 250 m^2 must implement the measures for acquisition of the minimum required class of energy consumption prescribed by the first audit, within 3 years from receipt of the audit results.

The owners of buildings for public services - government and municipal administrations, are obliged to carry out energy efficiency management. The management is performed by implementing programmes, activities and measures for energy efficiency improvement and preparing analyses of energy consumption each year. With regard to energy efficiency management, the owners of buildings, similarly to the owners of enterprises, also prepare annual reports according to a form drawn up by AUER, which are presented to the Agency no later than the 1st of March of the year following the year of reporting.

The national legislation also provides for energy efficiency inspections and optimisation of the operation of water boilers and air-conditioning systems in public buildings. Depending on the installed capacity and type of energy used, the frequencies of the mandatory periodic energy efficiency inspections of water boiler heating systems are:

1. every 6 years for water boiler heating systems running on natural gas if the rated capacity of each boiler is 20 to 100 kW inclusive;

2. every 4 years for water boiler heating systems running on liquid or solid fuels if the rated capacity of each boiler is 20 to 100 kW inclusive, and on natural gas with rated capacity above 100 kW;

3. every two years for water boiler heating systems running on liquid or solid fuels if the rated capacity of each boiler is over 100 kW.

The air-conditioning systems in buildings with rated capacity above 12 kW are subject to mandatory periodic energy efficiency inspections once every 4 years.

Legal basis

- *Energy Efficiency Act;*
- *Regulation No Е-РД-04-05 of 8 September 2016 setting out energy-demand parameters, energy performance of establishments, industrial systems or exterior artificial lighting systems, as well as terms and conditions to carry out energy efficiency audit and make calculation of energy savings;*
- *Regulation No Е-РД-04-1 of 22 January 2016 on energy efficiency audit, certification and calculation of energy savings in buildings;*
- *Regulation No Е-РД-04-2 of 22 January 2016 for energy-demand parameters and energy performance of buildings;*
- *Regulation No 5 of 28 December 2006 on technical passports of constructions;*
- *Regulation No 7 of 2004 on energy efficiency of buildings;*
- *Regulation No РД-16-932 of 23 October 2009 on the terms and conditions to carry out energy efficiency inspections of water-based heaters and of air-conditioning systems as*

pursuant to Article 27(1) and Article 28(1) ZEE, and on setting-up, maintenance and use of database thereof.

Target sectors and territorial scope

The measure shall be applied in all sectors of the economy and on the whole territory of the country.

Implementation of the measure 2014-2016

Table 3.1.2-1: Audit of enterprises and industrial systems

Year	***Number***	***Energy savings, GWh/y***
2014	15	8.5
2015	58	21.7
2016[11]	208	82.7
Total	***281***	***112.9***

Table 3.1.2-2: Audit of exterior artificial lighting systems[12]

Indicator		
Audited exterior artificial lighting systems	Number	12
Energy savings	GWh/y	8.687
Savings of CO_2 emissions	ktoe/y	7.068
Funds saving	BGN million/y	1.706

Table 3.1.2-3: Audit and certification of public buildings

Year	***Number***	***Energy savings, GWh/y***
2014	720	119.0
2015	1 191	327.4
2016	774	173.9
Total	***2 685***	***619.9***

Table 3.1.2-4: Energy efficiency inspection of water-based heaters and air-conditioning systems in public buildings

Period 2014-2016	***Nr***	***Installed capacity, MW***	***Energy savings, GWh/y***
Water-based heaters	531	300	60.0
Air-conditioner appliances	191	25.5	9.2
Total	***722***	***325.5***	***69.2***

11 *2016 data is based on the information as of 31 December 2016 entered in the AUER information system*

12 *The mandatory audit of exterior artificial lighting systems in settlements of more than 200 thousand people was introduced in ZEE in the middle of 2015. Data on actual implementation of the measure covers 2016.*

Methods for calculation of savings

The achieved energy savings are calculated by using the 'bottom-up' method. Energy savings are calculated with the help of energy efficiency auditing under the procedure of ZEE and the relevant regulations thereto. The calculation is carried out by persons entered in the public register of AUER.

3.1.3. Metering and billing (Articles 9+11 of Directive 2012/27/EU)

Description of the measure and legal basis

Metering of electricity

In accordance with the *Energy Act*, the electricity delivered to final users is measured by commercial metering devices (CMDs) owned by the operator of the transmission network or by the relevant distribution network and situated within or at the boundary of the property. Electricity users should not be charged any fees for the commercial metering devices.

The electricity market structure and terms for participation in the electricity market are regulated by *Rules for trade in electricity* drafted by the Energy and Water Regulatory Commission.

Metering of heat

One of the main methods to meter the heat used by households is the 'heat accounting' system introduced in Bulgaria by ZE in 1999 as one of the energy efficiency measures provided for in the conditions of accession of the Republic of Bulgaria to the European Union. By means of private distribution devices (distributors, water meters, apartment heat meters), the total energy used for heating and water heating may be distributed between the separate properties. Heat distribution in a condominium is calculated by a methodology, an annex to *Regulation No 16334 on heat supply*. Heat substations within the country are equipped with heat meters and their recordings are taken at the end of each month. The measured heat is allocated between users based on the consumption of each property in the previous heating season, and each month the heating company sends bills with this data to consumers. After taking the data recorded by the devices at the end of the heating season, the heat accountant draws up a reconciliation bill. It is estimated on the basis of the actual consumption for each individual property.

Following the introduction of this measure, individual distributors and devices for heat regulation have been installed in practice on every single radiator.

With regard to the available common heat and domestic hot water (DHW) systems in most of the buildings, the regulatory framework ensures, apart from transparency and accuracy of individual metering, also clear rules for the allocation of heat and DHW costs in multi-family buildings supplied from a central heat source.

The heat installations of customers are connected to the heat transmission network by means of a connecting heating main and a heat sub-station. When a new building is connected to the network, a competitively priced individual heat meter must be installed in each property in the building. When existing building is connected after a major renovation

and conversion of building heating systems from vertical to horizontal distribution, a competitively priced individual meter shall be installed in each property of the building.

Metering of energy from natural gas

The metering of the volumes of natural gas carried over the gas transmission network is executed at the gas measuring points owned by the transmission enterprise and located in the gas transmission network which is compliant with the legal requirements in terms of its design, construction and operation:

- *Regulation on the organisation and safe operation of transmission and distribution gas pipelines, installations and devices for natural gas;*
- *Regulation No 6 on the technical rules and standards for design, construction and use of the facilities and equipment for transmission, storage, distribution and delivery of natural gas;*
- *Regulation No 4/2001 on the scope and content of investment projects;*
- *Regulation No 1з-1971/29.10.2009/SG No 96/04.12.2009 on the construction-and-technical rules and norms for ensuring fire safety;*
- *Territorial Planning Act;*
- *Regulation No 16 on the easements of energy facilities;*
- *Regulation No 8 on the rules and norms for deployment of technical conduits and facilities in settlements;*

Measurement of the volumes of natural gas carried over the gas distribution network is made at the gas metering device mounted before the user and owned by the gas distribution network. Maintenance of the commercial measuring devices of the gas transmission and gas distribution network is a responsibility of the relevant network operator in compliance with the regulatory framework for commercial measurements: *Measurement Act* and *Rules for trade in natural gas*.

Billing

Terms and conditions of billing to final users are regulated in ZE. The energy companies are required to provide users of their energy services with the following types of information:

1. methods of payment, tariffs for disconnection or reconnection of supply, tariffs for maintenance services or other services related to the licensed activity;
2. procedures for switching suppliers and notice that the users of energy services are not charged additional fees when changing supplier;
3. volumes actually used and costs incurred with no obligation of additional charge for this service;
4. final reconciliation bill following any change of supplier;
5. the share of each energy source in the overall energy mix from the supplier during the previous calendar year, in an understandable and easily comparable form;

6. existing sources of publicly available environmental impact information at least in respect to the carbon dioxide emissions and radioactive waste generated by the production of electricity from the various energy sources within the supplier's overall energy mix in the previous calendar year;

7. mediation procedure.

This information must be provided in the bills or in information materials accompanying them and on the websites of the energy companies. In the same way, energy or natural gas suppliers must also provide the users of energy services with a checklist, approved by the European Commission, containing full information about their rights.

The Energy Act requires that the final supplier inform the client, together with the bill for the last month of each semester, if the reported consumption of electricity or natural gas of the final customers for this semester is more than 50 % higher than the reported consumption for the same semester of the previous calendar year.

In addition, most of the energy suppliers maintain a detailed information on the content of bills to the final user on their websites, and some of them also undertake further actions, such as sending letters (by e-mail and hard copy) to their customers explaining the data of used energy contained in the bill.

Target sectors and territorial scope

The measure shall be applied across all sectors of the economy and on the whole territory of the country.

Evaluation of the effect - 2016

The measure has no direct energy-saving effect. Nevertheless, with heat distribution specifically, an engineering evaluation may be performed referring to energy savings achieved from the introduced measure. Expert evaluations show that the actual effect is in the range of 30 % less consumption of heat. Of them, not less than 15 % represent savings with no deterioration of heat comfort, and achieved only through regulation of energy consumption. Based on approximately 3 872 GWh of heat consumption in heat supplied buildings in the Households sector in 2016, energy savings are calculated at not less than 580.8 GWh/y resulting from the introduction of heat distribution and individual accounts, according to an engineering evaluation.

Methods for calculation of savings

The energy savings achieved are calculated using the 'bottom-up' method: weighted energy savings in accordance with Item 1c of Annex V of Directive 2012/27/EU.

3.1.4. Consumer information programmes and training (Articles 12 and 17 of Directive 2012/27/EU)

Description of the measure and legal basis

The measure is aimed at ensuring better consumer awareness for the electricity, heat and natural gas used by them, as well as regarding the benefits from the implementation of the energy efficiency measures. On their websites, energy traders publish information about

energy-saving methods and maintain online archives of electronic bills. The companies work with energy efficiency consultants who help customers reduce their use of energy without expensive investments and complex repairs.

In addition to the application of the measure by the energy traders at national level as part of their information campaigns and initiatives, its implementation is further supported by the local regional and municipal administrations. Various initiatives to raise the consumer awareness are included in the energy efficiency improvement programmes of the regional and local authorities drawn up in fulfilment of their obligations according to Article 12 ZEE. The initiatives involve establishment of consumer councils, organisation of Consumer day, as well as numerous campaigns in the regional and municipal centres where customers may become familiar with the methods of energy saving.

The information campaigns, as well as the application of various behavioural measures, are included as eligible measures in *Regulation No E-РД-04-3 of 4 May 2016 on the eligible measures to carry out energy savings at final consumption level, methods to verify the achieved energy savings, requirements to the methods of their calculation and verification*.

To help implement the measure, specialised methodologies are developed for calculation of energy savings following the application of various behavioural measures under the procedure of Regulation No E-РД-04-3 of 4 May 2016. The methodologies are drafted according to a form approved in the Regulation and then they are subject to discussion by expert groups specially formed by AUER, again under the procedure of the same regulation.

Target sectors and territorial scope

The measure shall be applied across all sectors of the economy and on the whole territory of the country.

Evaluation of the effect - 2014-2016

The measures of the information and training programmes for consumers of electricity, heat and natural gas have both indirect and direct energy-saving effect.

Pursuant to Regulation No E-РД-04-3 of 4 May 2016, in the implementation of the measure, three expert working groups have been formed in the fields of electricity, heat and fuels at final consumption level. Traders of energy and/or fuels and their organisations, energy efficiency consultants, scientific organisations and higher schools take part in the expert groups. The expert working groups review the specialised methodologies for calculation of energy savings submitted to AUER and present an expert opinion to the Executive Director of the Agency. This opinion refers to the proposal for methodology, and where necessary makes a proposal for amendments and/or supplements thereto. In the implementation of that specific measure, AUER received the following for consideration:

1. Methodology of calculation of energy savings in the application of a programme for behavioural changes aimed at energy savings by sending reports on domestic energy consumption and providing access to an online platform;

2. Methodology of calculation of energy savings in the organisation of thematic quizzes and competitions on ‘energy efficiency for children’;

3. Methodology of calculation of energy savings in the organisation of a competition on energy efficiency of Bulgarian households;

4. Methodology of calculation of energy savings in the implementation of thematic information campaigns on ‘Energy efficiency at home’ and focus on final energy consumption;

5. Methodology of calculation of energy savings in the implementation of a training programme ‘Energy efficiency at school’;

6. Methodology of calculation of energy savings in the organisation of energy consultation - presentation of a report on energy consumption in households for a certain period of time;

7. Methodology of calculation of energy savings in the provision of electronic bills and messages.

The submission of the specialised methodologies completed by the joint work of expert working groups and AUER for evaluation of information and behavioural measures to be approved by the Minister for Energy is pending.

Methods for calculation of savings

The measure is evaluated by using the ‘bottom-up’ method: monitored energy savings in accordance with Item 1d of Annex V to Directive 2012/27/EU.

3.1.5. Availability of qualification, accreditation and certification schemes (Article 16 of Directive 2012/27/EU)

Description of the measure

The conditions and procedures for the acquisition and recognition of a qualification in energy efficiency audits of buildings and industrial systems and in certification of systems are set out in the ZEE. The activities related to energy efficiency audits, certification of buildings, conformity assessments of investment projects and energy-saving assessments are performed by persons registered in public registers maintained by the AUER. The Energy Efficiency Act sets out the requirements for these persons, whereas the detailed provisions are set out at secondary legislation level in *Regulation No РД-16-301 of 10 March 2014 on the information liable for registration in the registers of persons performing audits and certification of buildings and energy efficiency audits of industrial systems, the procedure for obtaining information from the registers, the terms and arrangements for the acquisition of a qualification and the technical devices required for the performance of audit and certification*.

- *Energy efficiency audits, certification of buildings, conformity assessments of investment projects and energy-saving assessments for buildings:*

The persons entered in the public register under Article 44 of the ZEE may be traders within the meaning of the Commerce Act, or the legislation of another state, or physical persons, and should have secondary technical education, higher education or acquired scientific degree in the field of higher education ‘Technical sciences’, completed or recognised in the Republic of Bulgaria, or secondary technical education, higher education or acquired scientific degree in an equivalent area of higher education in another country. Also, these persons must have a relevant professional experience after graduation - not less than 6 years for persons with secondary technical education, not less than 3 years for persons with a Bachelor’s degree, and not less than 2 years for those with a Master's degree and a scientific degree;

The persons entered in the public register of AUER shall hold a certificate that they have passes successfully the exam for further training in the activities of auditing and certification of buildings with higher schools, educating experts in the field of higher education 'Technical sciences', professional fields 'Energy', 'Electrical engineering, electronics and automation' and 'Architecture, civil engineering and geodesy' accredited under the Higher Education Act, or in subjects of equivalent areas of higher education and professional fields accredited in accordance with the legislation in another country.

For buildings of category five, according to Article 137(1)(5) ZUT, except for buildings intended for public service within this category, the Energy Efficiency Act shall allow the audit and certification of buildings to be performed by physical persons, who are energy efficiency consultants. These persons should also meet the specific requirements, detailed in the above mentioned regulation, for education, relevant professional experience and a successfully passed examination in the respective higher schools in Bulgaria or abroad.

The professional qualification of persons performing energy efficiency audits of buildings and certification of buildings is divided into two levels, as follows:

1. The holders of a Level 1 qualification possess the competence required to perform energy efficiency audits of all categories of buildings as per the Bulgarian nomenclature of buildings and structures;

2. The holders of a Level 2 qualification possess the competence required to perform energy efficiency audits and certification of: buildings belonging to Category 5 as per the Bulgarian nomenclature of buildings and structures, without limitation to the type of heating, ventilation, cooling and DHW systems in these buildings; buildings of Category 4 as per the Bulgarian nomenclature of buildings and structures, provided that such buildings do not have ventilation or cooling systems.

- *Energy efficiency audits of enterprises, industrial systems and exterior artificial lighting systems, and energy-saving assessments:*

The persons, entered in the public register under Article 60 of the ZEE shall be traders within the meaning of the Commerce Act or according to the legislation of another state, should have the required technical means as described in *Regulation No E-РД-04-05 of 8 September 2016 setting out energy-demand parameters, energy performance of enterprises, industrial systems and exterior artificial lighting systems, as well as terms and conditions to carry out energy efficiency audits and make calculation of energy savings* and the annexes thereto, and should have the necessary staff of energy efficiency consultants who meet the requirements of the regulation. The consultants shall:

- have secondary technical education, higher education or acquired scientific degree in the field of higher education 'Technical sciences', completed or recognised in the Republic of Bulgaria, or secondary technical education, higher education or acquired scientific degree in an equivalent area of higher education in another Member State of the European Union, or in another country, a party under the Agreement of the European Economic Area, or in the Swiss Confederation;

- have a relevant professional experience after graduation - not less than 6 years for persons with secondary technical education, not less than 3 years for persons with a Bachelor's degree, and not less than 2 years for those with a Master's degree and a scientific degree;

- hold a certificate of successful examinations for further education in the relevant activities at higher schools which educate experts in the field of higher education 'Technical

sciences', professional fields 'Energy', 'Electrical engineering, electronics and automation' and 'Architecture, civil engineering and geodesy' accredited under the Higher Education Act, or in subjects of equivalent areas of higher education and professional fields accredited in accordance with the legislation in another country.

- *Training of the energy efficiency consultants entered in the public register of AUER for buildings and industrial enterprises:*

Energy efficiency consultants are trained in accordance with the certain minimum mandatory scope of the curricula. Qualification to carry out energy efficiency audit and certification of buildings for Level 1 is acquired after following training:

1. with a full set of classes according to a curriculum, annex to Regulation No РД-16-301 of 10 March 2014, or

2. with a restricted set of classes according to a curriculum, also annexed to the regulation, for energy efficiency consultants who acquired/renewed their qualification and competencies for Level 2.

Qualification to carry out energy efficiency audits and certification of buildings for Level 2 is acquired after following training with a full set of classes under a curriculum, according to an annex to Regulation No РД-16-301 of 10 March 2014, and after a successful examination for that level.

Qualification to carry out energy efficiency audits of industrial systems is acquired after conducted training with a full set of classes under a curriculum, according to the regulation, and after a successful examination at Bulgarian higher technical schools specialised in the professional fields 'Energy' and 'Electrical engineering, electronics and automation'.

Table 3.1.5-1: Allocation of class attendance according to a curriculum for acquisition of Level 1 and Level 2 of professional qualification for energy efficiency audit and certification of buildings and performance of energy efficiency audit of industrial enterprises

	Class attendance	***Number of hours***
Acquisition of Level 1 of professional qualification	Lectures	75
	Practical work - course project	40
Acquisition of Level 2 of professional qualification	Lectures	50
	Practical work - course project	30
Qualification to carry out energy efficiency audits of industrial enterprises	Lectures	45
	Exercises	15
	Practical work - drafting of a project	15

The list of universities, where training for certification in buildings and energy efficiency audits of buildings and industrial enterprises is carried out shall be published on the website of AUER.

Legal basis

- *Energy Efficiency Act*

- *Regulation No РД-16-301 of 10 March 2014 on the information liable for registration in the registers of persons performing audits and certification of buildings and energy efficiency audits of industrial systems, the procedure for obtaining information from the registers, the terms and arrangements for the acquisition of a qualification and the technical devices required for the performance of audit and certification.*

Implementation of the measure

Public registers are published on the website of AUER. As of January 2017, the registered certified persons authorised and qualified to carry out audits of buildings and industrial systems include:

- Companies entered into the register according to Article 44(1) ZEE: 299
- Energy efficiency consultants entered into the register according to Article 44(1) ZEE: 15
- Companies entered into the register according to Article 60(1) ZEE: 54

3.1.6. Energy services (Article 18 of Directive 2012/27/EU)

Description of the measure

Delivery of energy services is regulated in the Energy Efficiency Act. According to the Energy Efficiency Act, energy services are designated to combine the supply of energy with energy-efficient technology, and/or action, which covers the operation, support and management necessary to deliver the service, or lead to verifiable, measurable or calculable energy efficiency improvement and/or primary energy resources savings. Energy services are delivered on the grounds of written contracts concluded with final energy consumers. ZEE also sets out the persons entitled to deliver energy services, i.e. physical or legal persons, traders within the meaning of the Commerce Act, or within the meaning of the laws of an EU Member State, or of another state which a party under the Agreement of the European Economic Area.

The execution of energy performance contracts (EPC) plays an important role for promoting the energy services market. With these contracts, the funds for repaying the investment and paying the remuneration due to the contractor (ESCO company) come from the energy savings achieved. They give guarantee for their own performance, and for the savings, respectively, which will be achieved following the implementation of the project.

For government- and municipal-owned buildings, which are subject to EPC, there is a special *Regulation No РД-16-347 of 2 April 2009 on the terms and conditions establishing the amount and payment of the planned funds under energy-saving performance contracts leading to energy savings in buildings, government and/or municipality owned*. AUER participates in the review and approval of funds for implementation of energy performance contracts in public buildings, sends a reasoned proposal for funding and payment of such funds to the Ministry of Finance, and certifies that for the respective building there is no certificate delivered for activities executed under other programmes.

The EPC model is well known in Bulgaria; however, it is not adequately spread. The observations of the development of ESCO services market lead to some basic conclusions:

- Despite the available great potential for energy savings in both the public and private sector, the progress of ESCO market in Bulgaria is slow.
- The limited experience, lack of certification of ESCO and insufficient number of standard bids and contracts lead to a relatively low level of confidence, which is amongst the main obstacles to the implementation of EPC projects.
- Most of the projects on the Bulgarian market are in the public sector. It is also necessary to raise the awareness of the ESCO mechanism in the private sector.
- Official information on ESCO, main types of EPC and implemented EPC in the public sector is not maintained at national level.
- The amendment of Article 17b of the Municipal Debt Act adopted in 2015 refers to limiting EPC to 15 % of the average annual capital cost and is a significant obstacle for many municipalities.
- Other obstacles to the development of EPC market include the following: lack of support to identify suitable projects (e.g. through consultants); no ESCO association; the maximum time period of contracts with public clients set out in ZOP, etc.

AUER is a national administrator of the European Code of Conduct for EPC. The Code has been created within the 'Increasing Transparency of Energy Services Markets (Transparense)' project financed by the European Commission under the Intelligent Energy for Europe Programme. It represents a set of values and principles required for the successful preparation and implementation of projects in the field of EPC in the European countries and sets out the principles of conduct, in particular for the suppliers under EPC. The website of AUER contains *documents* related to the Code.

In addition to the above and in support of that measure, a number of other projects are implemented at national level, aiming to raise the awareness and improve the capacity of stakeholders in terms of entering into, implementing and monitoring of energy performance contracting. Some examples of such projects include:

- *Project EESI 2020* - The European Energy Service Initiative towards the EU 2020 energy saving targets funded by the European Commission under the Intelligent Energy for Europe Programme.

- *Project EPC+* - Energy Performance Contracting plus funded under the EU Horizon 2020 Programme.

Legal basis

- *Energy Efficiency Act*

- *Regulation No РД-16-347 of 2 April 2009 on the terms and conditions establishing the amount and payment of the planned funds under energy saving performance contracts leading to energy savings in buildings, government and/or municipality owned*

Target sectors and territorial scope

The measure shall be applied across all sectors of the economy and on the whole territory of the country.

Implementation of the measure and method of evaluation of the effect

The measure has no direct energy-saving effect. The savings achieved from projects financed through EPC are calculated by using the 'bottom-up' method and are added to the overall evaluation of the relevant sector where they are achieved.

3.1.7. Other horizontal measures

Project 'Demand Side Residential Energy Efficiency through Gas Distribution Companies in Bulgaria' (Project DESIREE GAS)

Description of the measure

In 2016, the Ministry of Energy signed a Memorandum of Understanding with the local gas distribution companies for gasification of residential buildings as an energy efficiency measure. Under the National Programme for accelerated gasification, the Ministry of Energy had the support of the Kozloduy International Decommissioning Support Fund, administered by the European Bank for Reconstruction and Development, for connecting households to the gas distribution network. This support to the residential sector will be provided by implementing the project DESIREE GAS. The project, which received funding amounting to BGN 20 million from the KIDSF, will enable the replacement of the heating systems of apartments using energy intensive sources, such as electricity, coal, biomass or naphtha, with natural gas. The main objective of the Project is to provide a special and efficient mechanism to support the gasification of Bulgarian households.

Provisions are made that the grant given by EBRD will cover the financing of more than 10 thousand households as indicated by estimates under the project.

Applications will be made by the individual owners of apartments and will be possible until the funds of the grant are exhausted. The grant provided by KIDSF will cover 20 % of the cost of the projects for replacement of heating systems of households with heating systems using natural gas. To provide 80 % as own funds, the households may take advantage of the preferential bank loans especially developed for this project. This is not an obligatory measure but just an additional opportunity in support of consumers.

In particular, the benefits from the Project will be measured against the implementation of the following targets:

- Support for the gasification and installation of highly efficient boilers in about 10 000 households;
- Saving of electricity equivalent to 142 000 MWh/y;
- Achievement of further saving of electricity of 70 000 MWh/y as a result of transition from coal, biomass and oil to natural gas due to the higher efficiency of burning;
- Saving of about 213 kWh for every BGN 2 of the grant for the average economic life of 15 years of the installed equipment;
- Reduction of GHG emissions of 70 kt $C0_2$/y, or above 1 million tonnes CO_2 for the economic life of the installed equipment.

In a broader sense, at national level the gasification of households will contribute to the improvement of the security of electricity supplies by savings in the direct use of electricity and energy efficiency improvement within the system of heating and supply of hot water.

More information is available at *http://desireegas.bg.*

Legal basis

This measure is financial.

Target sectors and territorial scope

The measure shall be applied in the Households sector on the territory of the whole country in conformity with the territorial allocation of licences of the involved gas distribution companies.

Methods of evaluation of the effect

The measure is evaluated by using the 'bottom-up' method. To avoid double accounting, the achieved energy savings are included in the evaluation of the measures implemented by the natural gas traders within the obligation scheme. The applied specialised methodology for calculation of energy savings following gasification has been adopted by an Order of the Minister for Energy.

3.2. Energy efficiency measures in buildings

3.2.1. Implementation of the requirements of Directive 2010/31/EU

Calculation of the optimal cost levels in connection with the minimum requirements for energy performance

In accordance with the requirements of Article 5(2) of Directive 2010/31/EU, in 2013 a report titled 'Calculation of optimal cost levels in relation to the minimum requirements for energy performance of buildings in the Republic of Bulgaria' was drafted and published on the website of the European Commission:

https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings.

At the request of the European Commission, in 2015 the National Report was supplemented.

List of measures and instruments in support of the achievement of the objectives of Directive 2010/31/EU (according to Article 10(2))

Table 3.2.1-1 List of the existing measures and instruments, other than those required by Directive 2010/31/EU, which help achieving the objectives of Directive 2006/32/EC and Directive 2012/27/EU

Type of measure	***Title***	***Description of the measure***
Legislative measures	Energy efficiency management Energy consumption management	see item 3.3.2. Buildings of other public bodies
	Delivery of energy-efficient services Implementation of EPC services	see item 3.1.6. Energy services
Financial measures and instruments	Energy Efficiency and Renewable Sources Fund	see item 3.8.1 Energy Efficiency and Renewable Sources Fund
	National programme for energy efficiency of multi-family buildings	see item 3.1.1 Obligation schemes and item 3.8.4. National programme for energy efficiency of multi-family buildings
	Operational programme 'Regions in Growth' 2014-2020	see item 3.8.3 Operational Programme 'Regions in Growth' 2014-2020
	Energy efficiency credit programme for households	see item 3.8.7 Energy efficiency credit facility for households
	National Trust Ecofund	see item 3.8.5 National Trust Ecofund - Investment programme for climate
Fiscal incentives	Exemption for existing buildings, or parts of property therein, from property tax *(Law on Local Taxes and Fees)*	Existing buildings, or parts of property therein, with energy classes B, C or D are exempted from property tax for 3, 5, 7 or 10 years depending on: - the date of commissioning; - the energy class written down in the energy performance certificate of the building; - application of measures to utilise RES for energy production to meet the needs of the building. The tax exemption is not applied in cases where the building has received an energy-class certificate as a result of undertaken energy efficiency measures financed with public funds.

3.2.2. National long-term programme for promotion of investments in the implementation of measures to improve the energy performance of buildings of public and private national residential and commercial building stock

The development of the National long-term programme for promotion of investments in the implementation of measures to improve the energy performance of buildings of public and private national residential and commercial building stock is regulated in Article 7(1)(5) and § 20 of the Transitional and Final Clauses of ZEE.

The Programme has been developed by a research team at the Sofia Technical University following an assignment by the Ministry of Regional Development and Public Works, initially responsible for its development. The Programme is presented as *Annex 2* to this updated version of the NPDEE.

3.2.3. Energy savings as a result of energy efficiency measures in the buildings sector

Table 3.2.3-1: Energy savings as a result of energy efficiency measures in the buildings sector

Title of the Measure	***Energy savings until 2016, GWh/y***	***Projected effect 2017-2020, GWh/y***
Implementation of measures after an obligatory audit and certification of buildings for public service	873.6	388.4[13]
Implementation of energy efficiency improvement measures after an obligatory audit and certification of buildings of public administration	833.2	358.8[13]
Annual renovation of 5 % of the total TFA of all heated and/or cooled state-owned buildings used by public administration	83.9	The evaluation is made annually and is included in the analysis of the implementation of NPDEE
Financing projects of the Energy Efficiency and Renewable Sources Fund in buildings	6.3	The evaluation is made annually depending on the number of financed projects and is included in the analysis of the implementation of NPDEE

13 *The forecast has been made on the basis of the effect from the audits carried out by 2016 and based on TFA of still not audited buildings which do not meet the minimum energy performance requirements.*

Energy efficiency credit line for households	34.1	The evaluation is made annually depending on the number of financed projects and is included in the analysis of the implementation of NPDEE
Implementation of projects under Operational programme 'Regional Development' 2014-2020	140.6	The evaluation is made annually depending on the number of financed projects and is included in the analysis of the implementation of NPDEE
Implementation of projects under the National programme for energy efficiency of multi-family buildings	88.2	924.7

3.3. Energy efficiency measures for public bodies (Articles 5 and 6 of Directive 2012/27/EU)

3.3.1. Buildings of the central government

Information on the published list of heated and cooled buildings of the central government

The measure is implemented in compliance with the requirements of Article 5(1) of Directive 2012/27/EU, according to which 3 % of the total floor area of heated or cooled buildings owned and used by the central government should be renovated each year.

Bulgaria has accepted a higher value of the obligation and pursuant to the provisions of ZEE on the support for the implementation of the national energy efficiency target in all heated and/or cooled state-owned buildings used by the government administration, the energy efficiency improvement measures shall be undertaken annually on at least 5 % of the total TFA.

To meet the requirements of Directive 2012/27/EU for drafting a list of heated and cooled buildings of the central government with total useful floor area above 250 m^2, Bulgaria has developed a form for the provision of the required data by the obligated owners of buildings which contains the data defined in the Guidelines to the template of the National Plan adopted by the European Commission, as well as guidance on the completion thereof, including the energy performance of buildings. The form for provision of data was completed as early as 2013 by all administrations referring to the buildings with TFA above 250 m^2 they owned, and summarised by AUER, and the list was published on the website of the Ministry of Energy according to the requirements of the Directive.

In addition, according to the requirements of Article 5 of Directive 2012/27/EU, and on the grounds of the provisions of Article 11(6)(5) ZEE, the Executive Director of AUER shall publish annually, by 31 March, a list of the buildings under Article 27(1)(4) ZEE which, as of 1 January of the corresponding year, do not meet the minimum energy performance requirements set out in *Regulation No 7 of 2004 on energy efficiency of buildings*.

The list can be found at *http: //www.seea.government.bg/bg/spisaci*.

Table 3.3.1-1 presents a list, summarised by institution, of heated and/or cooled state-owned buildings used by the government administration, with TFA above 250 m^2.

Table 3.3.1-1: List of heated and/or cooled state-owned buildings used by the government administration, with TFA above 250 m^2

Administration	***Energy class***	***Number of buildings***	***TFA, m^2***
Ministry of the Interior	*No certificate*	*437*	*646 202*
	G	1	2 226
	F	3	1 052
	E	8	12 950
	D	6	18 202
Ministry of Finance	*No certificate*	*134*	*203 563*
	G	1	1 506
	D	2	15 802
	C	4	16 709
	B	1	4 003
Ministry of Regional Development and Public Works	*No certificate*	*58*	*56 290*
	G	6	5 467
	F	5	4 341
	E	9	18 063
	D	9	4 348
	C	1	792
	B	1	1 026
Ministry of Health	*No certificate*	*55*	*84 422*
	G	1	623
	F	1	4 561
	E	3	3 270
	D	1	4 255
	C	3	3 742
	B	1	491
Ministry of Education and Science	F	2	4 429
	E	1	627
Ministry of Economy (and Energy)	*No certificate*	*20*	*71 117*
	F	3	16 158

Administration	***Energy class***	***Number of buildings***	***TFA, m^2***
	E	1	4 456
	D	1	12 622
	C	2	15 131

	B	1	3 635
Ministry of Transport, Information Technology and Communications	*No certificate*	*17*	*29 567*
	F	1	610
	E	4	22 885
	D	4	19 525
	B	1	7 390
Ministry of Environment and Water	*No certificate*	*22*	*29 115*
	E	1	2 078.2
	D	1	7 503.3
	C	1	266.08
	B	1	454.13
Ministry of Youth and Sport	*No certificate*	*1*	*4 581*
	D	1	12 320
Ministry of Defence	*No certificate*	*93*	*232 003*
Ministry of Labour and Social Policy	*No certificate*	*73*	*97 874*
Ministry of Foreign Affairs	E	1	44 420
Ministry of Agriculture, Food and Forestry	G	1	1 786
	D	1	768
	B	3	5 042
	A	1	1 782
Ministry of Justice	*No certificate*	*133*	*298 727*
	C	1	9 081
	B	2	3 705
	A	1	1 395
Council of Ministers	B	1	45 692
National Assembly	*No certificate*	*2*	*18 504*

Administration	***Energy class***	***Number of buildings***	***TFA, m²***
	E	1	1 080
	D	2	97 368
State Agency ‘Archives’	G	4	6 976
	F	2	3 495
	E	13	27 487
	D	3	3 277

	C	1	1 376
National Insurance Institute	F	1	2 574
	E	3	28 415
	D	5	9 962
	C	5	12 623
	B	4	15 596
Ministry of Finance - National Revenue Agency	F	1	718
	E	1	1 697
	D	1	6 968
	C	1	5 364
	B	2	6 418
State Commission on Information Security Information Services AD	C	1	14 291
	B	1	1 791
	F	2	6 328
	E	1	7 694
	D	4	15 149
	C	6	21 882
	B	4	14 884
Commission for Disclosure of Documents and Establishment of Affiliation to the former State Security	B	2	13 446

Legend:

Big potential for energy savings
Medium potential for energy savings
Small potential for energy savings

The following table shows the results of the annual renovation of state-owned buildings in the period 2014-2016. It includes data of all state-owned buildings within the country.

Table 3.3.1-2: Results[14] of the annual renovation of state-owned buildings in the period 2014-2016.

State-owned buildings (as per NPDEE 2014)		***Certified buildings, 2014-2016***		***Buildings meeting the minimum energy performance requirements***		***Share of the total TFA of all state-owned buildings***	***Buildings which do not meet the minimum energy performance requirements***		***Expected savings from the implementation of measures in buildings with low energy efficiency class***			
number	TFA, m^2	number	TFA, m^2	number	TFA, m^2	%	number	TFA, m^2	Energy savings, GWh/y	Savings in emissions, $ktCO_2/n$	Savings in funds, BGN thousand/y	Required investments, BGN million
2 329	7 522 284	662	3 097 246	150	817 853	10.9	512	2 279 393	178.25	63	26.42	187.5
According to the requirements of Article 24(1) and Annex XIV, Part 1c of Directive 2012/27/EU, each year Member States shall report on TFA of the state-owned buildings used by the government administration, which, as of 1 January 2017, do not meet the energy performance requirements under Article 5(1) of Directive 2012/27/EU.												
Table 3.3.1-3: 'Additional requirements according to Article 24(1) Annex XIV, Part 1c of Directive 2012/27/EU'[15]												
TFA of the state-owned buildings used by the government administration which, as of 1 January 2017, do not meet the energy performance requirements under Article 5(1) of Directive 2012/27/EU								***2 219 503 m^2***				

14 *Source: AUER Information System, AUER - Annual report on the implementation of NPDEE, March 2017*

15 *[15] The table further includes data of TFA of not audited state-owned buildings used by the government administration within the country. AUER Information System; Annual report on the implementation of NPDEE, March 2017*

Information on the calculation of the renovation obligation

While updating the list, the following was taken into account:

- According to Article 5(1) of Directive 2012/27/EU, Bulgaria looks at the buildings as a whole, including the outer enclosing elements of the building, its equipment, operation and maintenance.

- Bulgaria exempts from the requirements for annual renovation of the building stock the following buildings:

1. buildings considered cultural heritage property under the scope of the Cultural Heritage Act, insofar as the fulfilment of certain minimum energy performance requirements results in a violation of the architectural and/or artistic features of the building;

2. buildings owned by the armed forces or by the administration, which serves for national defence purposes, apart from military living quarters or office buildings for the armed forces and other staff employed by the national defence authorities.

- When, within one year, there is improvement in the energy performance of more than 5 % of the total floor area of the heated and/or cooled buildings, owned by the state and used by the public administration, the surplus may be transferred to each of the preceding three years, or to each of the following three years.

- For the implementation of the measure, there is a set of criteria applied for the selection of buildings with priority application of energy efficiency improvement measures, as the highest priority is given to the buildings with the poorest energy performance against the minimum energy performance requirements

3.3.2. Buildings of other public bodies (Article 5 of Directive 2012/27/EU)

Measures taken to demonstrate the role of public authorities, which are not part of the central government

- *The obligatory drafting of programmes for energy efficiency improvement by the bodies of the state and local government*

The measure is set in ZEE and has been implemented in the country since 2008. The programmes are developed taking into account the strategic objectives and priorities of the regional plans for the development of the relevant regions of the Regional Development Act and their prospects for sustainable economic development. Funds for the implementation of the programmes are granted within the budgets of the state bodies and the municipalities.

Each year the state and local authorities present reports on the implementation of the programmes for energy efficiency improvement to AUER. These reports are completed according to a form drafted and approved by AUER containing description of the activities and measures, and indicating the volume of the achieved energy savings. They are presented to AUER no later than the 1st of March of the year following the year of implementation of the relevant activities and measures. In addition, the reports on the implementation of the energy efficiency programmes of the state and local authorities are published on the websites of the relevant administrations. Summary and analysis of the

implementation of the measure is made by the Agency as a part of the Annual report on the implementation of NPDEE.

In 2017, 14 bodies of the central government presented reports to AUER on the implementation of the energy efficiency programmes during the preceding year. For regional administration, it was 25 out of the 28 regions who sent reports. The greatest number of reports (236) under Article 12 ZEE were received from the municipal administrations. According to data received from the obligated parties in 2016, a total of 121 projects were implemented by the bodies of the central government, as well as 968 energy efficiency improvement measures by the municipal and regional administrations, and the applied measures involved not only buildings but also municipal exterior artificial lighting, fleet, etc.

The analysis of the results of the implementation of energy efficiency improvement programmes is given in Item 3.1.1 of this Plan.

The Initiative ‘Covenant of Mayors’ is applied in the implementation of this measure in order to provide support to municipalities. The Covenant of Mayors is the main European movement with the participation of local and regional management authorities, which are involved, voluntarily in the energy efficiency improvement and the use of energy from RES on their territory. Taking on the above responsibility, the signatories to the Covenant want to achieve and exceed the EU targets for CO_2 emission reduction by at least 20 % by 2020. With a view to converting the policy engagement into specific measures and projects, the signatories to the Covenant undertake to prepare a Baseline Emission Inventory, as well as to provide within one year of signing the Covenant a Sustainable Energy Action Plan outlining the key actions that they plan to take. The total number of local municipalities, which signed the Covenant, is 25:

Table 3.3.2-1: Municipalities signatories to the Covenant of Mayors[16]

Signatories	Population	Commitments	Status
Aksakovo, BG	8,600	2020	
Asenovgrad, BG	59,953	2020	
Burgas, BG	226,000	2020 ADAPT	
Chepelare, BG	5,547	2020	
Dimitrovgrad, BG	61,564	2030 ADAPT	
Dobrich, BG	93,500	2020	
Gabrovo, BG	63,903	2020	
General Toshevo, BG	17,500	2020	
Ihtiman, BG	13,458	2020	
Karlovo, BG	25,793	2020	
Kostinbrod, BG	17,846	2020	
Kozloduy, BG	13,058	2020	
Krivodol, BG	3,421	2020	
Krushari, BG	4,510	2020	
Lom, BG	29,981	2020	
Mezdra, BG	10,896	2020	
Mizia, BG	3,289	2020	
Oryahovo, BG	11,522	2020	
Pavlikeni, BG	23,869	2020	
Petrich, BG	54,006	2020	
Smolyan, BG	40,941	2020 ADAPT	
Sofia, BG	1,378,000	2020	
Tran, BG	4,053	2020	
Varna, BG	356,481	2020	
Vratsa, BG	73,443	2020	

In support of the implementation of the measure, AUER regularly organises training of local authorities. In 2015 and 2016, there were training seminars conducted for all municipal and regional administrations within the country on the fulfilment of the obligations under ZEE and ZEVI. Experts of AUER introduced the seminar participants to the various aspects of the implementation of energy efficiency improvement policies and promotion of the use of energy from RES at local level, to the processes and stages in the planning of energy efficiency improvement and RES utilisation activities and measures, to the opportunities to finance the implementation of municipal programmes, to the processes of certification of municipal building stock, the methods of calculation and verification of the achieved energy savings, the completion of reporting forms under both acts, etc. The 2015 and 2016 trainings were attended by a total of 184 experts of the municipal and regional administrations in the country.

- *Obligatory energy efficiency management in buildings*

The measure is set in ZEE and has been implemented in the country since 2008. The management is carried out by organizing the implementation of the energy efficiency improvement programmes of the bodies of the central government and local government, as well as other measures, which lead to energy savings and through annual completion of energy consumption analyses. Energy efficiency management is also reported annually according to a form drawn up and approved by AUER and the reports are presented to the Agency no later than 1 March of the year following the year of implementation. The template of the reporting form for implementation of energy efficiency improvement programmes and

16 *Source:* http://www.covenantofmayors.eu/; *AUER- Annual report on the implementation of NPDEE*

for energy efficiency management is one and the same and includes detailed information about the respective administration, on the existence of a certificate of energy performance of buildings held by the relevant obligated party, the implementation of energy efficiency improvement activities and measures, the amount and sources of their financing, etc.

3.3.3. Purchasing of products, services and buildings of high energy performance by public bodies (Article 6 of Directive 2012/27/EU)

The Bulgarian legislation in the field of public procurement is completely harmonised with Directive 2004/17/EC on coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors, and Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts, involving also the relevant provisions for green public procurement. *The Public Procurement Act* (ZOP) is the main legal act, which governs the procurement rules for amounts based on the established European thresholds, as well as for amounts below them.

In addition, the measure is also regulated in Article 30a of the ZEE, which states that that public contracting authorities purchase the following energy-related products:

1. products complying with the criterion of having the highest possible energy efficiency class, taking into account the need to ensure sufficient competition in cases where the product is included in the subject of the regulation under Article 12(1) of the Consumer Protection Act on labelling requirements and the provision of standard information on energy-related products in terms of use of energy and other resources;

2. products complying with the energy efficiency indicators where the product does not fall within the scope of Item 1, but is still included in an implementing measure pursuant to the Regulation on additional measures related to the implementation of regulations adopted in accordance with Article 15 of Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products;

3. office equipment, selected and meeting the requirements of Annex B of the Agreement between the Government of the United States of America and the European Union on the coordination of energy efficiency labelling programmes for office equipment;

4. tyres that comply with the criterion of having the highest fuel energy efficiency class, as defined by Regulation (EC) No 1222/2009 of the European Parliament and of the Council of 25 November 2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters.

In the award of a public service contract, the public contracting authority demands from the contractor to use only products meeting these requirements in the implementation of the contract. The requirements are not applied if they contradict to the cost-effectiveness, the economic feasibility, the sustainability in a broader sense, the technical feasibility, and the presence of sufficient competition. The Minister for Economy drafts and publishes on the website of the Ministry of Economy the lists of products that comply with the above-mentioned criteria. The lists can be found under the relevant categories via the following link:

http://www.mi.government.bg/bg/pages/energiino-efektivni-produkti-143.html

On the website of the Public Procurement Agency are also published *the EU criteria* of green public procurement for a number of goods and services, such as copy and graphic paper, detergents and cleaning services, computer office equipment, construction, transport, etc.

The executive directors of AUER and AOP jointly delivered the *Guidelines on the application of energy efficiency and energy-saving requirements when awarding public contracts for the supply of equipment and vehicles to minimise the cost of their service life*. The Guidelines are intended to make it easier for the contracting authorities under Article 7 of ZOP when they apply the green public procurement requirements. The list of the elements and values that contracting authorities may use to define the requirements, as well as the relevant sources of information, are provided in an Annex to the Guidelines. The Guidelines published on the website of AUER and on the Public Procurement Portal of AOP were last updated in the middle of 2016.

3.3.4. Energy savings as a result of the measures of central government and other public bodies

The evaluation of the effect of the measures implemented by the central administration and the other public bodies is given in Table 3.2.3-1 of this Plan.

3.4. Energy efficiency measures in industry

Funding energy-saving and RES projects under Operational Programme 'Development of the competitiveness of the Bulgarian economy 2007-2013'

Description of the measure

The enterprises are funding energy-saving and RES projects under *Operational Programme 'Development of the competitiveness of the Bulgarian economy 2007-2013' (OPC)* and *Operational Programme 'Innovations and competitiveness 2014-2020' (OPIC).* Both operational programmes are co-financed by the European Union through the European Regional Development Fund.

OPC

Implementation of energy efficiency projects under this programme falls under Priority Axis 2 'Increasing efficiency of enterprises and promoting a supportive business environment'. The specific objectives of this priority axis include reduction of energy intensity and diversification of energy sources. Introduction of environmentally friendly, low-emission, energy-saving production technologies and RES is encouraged to reduce energy intensity and negative environmental impacts. 465 projects have been implemented under the programme, with a total grant amount of BGN 327.7 million. Beneficiaries under the contracts are small and medium-sized enterprises and large enterprises of the Industry and Services sectors.

The programme funds are provided under two procedures:

- Procedure BG161P0003-2.3.01 'Investments in green industry': the main objective is to provide investment support to large enterprises in Bulgaria to promote the implementation of projects directly related to the reduction of their energy and resource intensity. The implementation of projects under the procedure ended in 2015;

- Procedure BG161P0003-2.3.02 ‘Energy efficiency and green economy’: the main objective is to provide investment support to Bulgarian micro-, small and medium-sized enterprises in their transition to a green economy by promoting the implementation of projects directly related to the introduction of energy-saving technologies and renewable energy sources. The implementation of projects ended in 2016.

OPIC

Energy efficiency projects under OPIC are funded within Investment Priority 3.1 ‘Energy Technologies and Energy Efficiency’ under Priority Axis 3: ‘Energy and Resource Efficiency’. Beneficiaries are the existing enterprises outside the sectors of trade and services. The funds provided for the implementation of the projects under OPIC during the 2016-2020 period amount to BGN 446.04 million (EUR 228.01 million). Further information of the measure is included in Point 3.8 Financial mechanisms to promote measures for energy efficiency improvement.

Legal basis

The measure is a financial one.

Allocation of responsibilities

- *Managing authority* - General Directorate ‘European Funds for Competitiveness’ at the Ministry of Economy: organises and coordinates the activities related to the fulfilment of the Ministry’s tasks provided for in the European and national laws for implementation of the Community cohesion policy; takes part in the development of forecasts and draft budget of the Ministry, as well as in the implementation of the programmes within the programme budget of the Ministry with regard to its functional competence. Each year the Managing authority presents an assessment of the progress in the implementation of the Operational Programme required for the Annual Report on the implementation of NPDEE.

- *Energy efficiency consultants* - companies entered into the public register of AUER under Article 60 of the ZEE. The companies carry out energy efficiency audit for the calculation of savings expected from the implementation of each project.

Implementation of the measure 2014-2016

The results of the implementation of the projects under the above two procedures for the period 2014-2016 are:

Table 3.4-1: Savings as a result of the implementation of projects funded by the Operational Programme ‘Development of the competitiveness of the Bulgarian economy 2007-2013’ for the period 2014-2016, GWh/y

Year	***2014***	***2015***	***2016***	***Total 2014-2016***
Investments in green industry	71.26	25.57	-	96.83
Energy efficiency and green economy	31.91	118.11	0.7	150.7
Total	***103.17***	***143.68***	***0.7***	***247.6***

Method of evaluation of the effect

The measure is evaluated by the 'bottom-up' method based on the energy efficiency audits carried out to apply under the procedures. The terms and conditions to carry out energy efficiency audit and make calculation of energy savings of enterprises, industrial systems and exterior artificial lighting systems are set out in *Regulation No E-РД-04-05 of 8 September 2016.*

Obligatory energy efficiency audit of enterprises and industrial systems

The measure is described in item 3.1.2. 'Energy audits and management systems' of this Plan. Until 2016 the measure was directly related to the achievement of individual energy-saving targets by the IS owners (see item 3.1.1). In the programming period 2017-2020, the measure will support energy efficiency improvement of the Industry sector, and the annual quantitative analysis of the results of the energy efficiency audits carried out by that group of obligated parties will be performed by AUER within the Annual report on the implementation of NPDEE.

Obligatory energy efficiency management in enterprises and industrial systems

The measure is regulated in Article 63 of the ZEE and described in item 3.1.2. 'Energy audits and management systems' of this Plan. As indicated in the description of the measure, the execution of the energy efficiency improvement activities and measures in enterprises within the obligatory energy efficiency management is reported annually to AUER by 1 March of the year following the year of the implementation of the measures.

For the period 2014-2016, the energy efficiency management in enterprises and industrial systems was reported as follows:

- 2014 - 247 reports on energy efficiency management; 224 implemented energy efficiency improvement measures;
- 2015 - 223 reports on energy efficiency management; 135 implemented energy efficiency improvement measures.
- 2016 - 273 reports on energy efficiency management; 112 implemented energy efficiency improvement measures.

Until 2016 the measure was directly related to the achievement of individual energy-saving targets by the IS owners (see item 3.1.1). In the programming period 2017-2020, the measure will support energy efficiency improvement of the Industry sector, and the annual quantitative analysis of the reports on energy efficiency management of that group of obligated parties will be made by AUER within the Annual report on the implementation of NPDEE.

3.5. Energy efficiency measures in transport

The energy efficiency policy in transport is focused on:

- Improving the transport infrastructure;
- Renovation of the transport fleet;

- Improving the organisation and extending the scope of intermodal transport;
- Promoting increase of the share of energy-efficient types of transport (railway, inland waterway and maritime transport);
- Promoting the use of public transport;
- Improving traffic organisation and regulation and reducing the number of traffic jams in settlements;
- Promoting the use of biofuels meeting the criteria of sustainability, as well as of new-generation biofuels;
- Development of the market for alternative fuels and deployment of the respective charging infrastructure;
- Effective control of the condition of engines;
- Improving the professional skills of vehicle drivers.

Rehabilitation and modernisation of existing road infrastructure

Description of the measure

The measure provides for rehabilitation and modernisation of the existing road infrastructure under the Trans-European Transport Network with funds from Operational Programme 'Transport and Transport Infrastructure', and of the local road infrastructure with funds of the state and municipal budgets.

Under OPTTI, construction and modernisation of sections of the road infrastructure is planned for the removal of 'bottlenecks' along the existing road infrastructure of the Trans-European Transport Network. The implementation of the planned activities will provide more optimal vehicle speed and also more optimal operating regime for automotive engines.

Legal basis and provided funding

According to the Third NPDIK to 2020, the funding provided from European funds, the state and municipal budgets is BGN 240 million.

Institutions responsible for the implementation of the measure

MTITS, MRRB, Road Infrastructure Agency.

Methods of evaluation of the effect

The calculation of energy savings is made on the basis of the expected reduction of GHG emissions following application of the said measure.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the implementation of the measure is for energy savings at the rate of 290.3 GWh/y by 2020.

Introduction of intelligent transport systems on national roads and in urban environments

Description of the measure

The measure provides for the introduction of intelligent transport systems for more efficient use of the existing transport infrastructure that will lead to reduction in the fuel consumption. Intelligent transport systems in urban environments will involve traffic forecast and management, information for travellers, fare management, etc.

OPRD 2014-2020 sets out the Development of Environmentally Friendly and Sustainable Urban Transport as a specific objective. To achieve this objective, funding is provided for the development of traffic management plans and the introduction of Intelligent Transport Systems, including automated traffic management and control systems, motor vehicle detection, localisation and ensuring priority to public transport vehicles, real-time passenger information systems, automated ticketing systems, connection subsystems, video surveillance systems for urban mobility centres, etc. It is also envisaged to improve the accessibility of public transport stops and the infrastructure (underpasses and overpasses) leading thereto, such as: platforms and lifts for disabled people, removal of orientation and information obstacles, light and sound announcement of stops, clear visual indication of lines and schedules, information that is understandable and suitable for visually impaired or blind people, etc.

The implementation of the planned activities will reduce the urban traffic load and the fuel overrun from idling engines.

Legal basis and provided funding

According to the Third NPDIK, the projected funding amounts to BGN 410 million to 2020 from the European funds, the state and municipal budgets.

Institutions responsible for the implementation of the measure

MTITS, MRRB, Road Infrastructure Agency, Municipal administrations.

Methods of evaluation of the effect

The calculation of energy savings is made on the basis of the expected reduction of GHG emissions following application of the measure referred to in the Third NPDIK.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 544.2 GWh/y by 2020.

Increasing the share of electric and hybrid vehicles and of the respective charging infrastructure in urban environment

Description of the measure

The measures provides for the increase of the share of electric and hybrid vehicles used by the business and the population as well as of the respective infrastructure for their charging. Until 2020, the efforts will be focused on the development of the urban infrastructure, a prerequisite for the increase in the share of electric and hybrid (plug in) vehicles and for the development of sustainable urban mobility.

In compliance with Article 3 of Directive 2014/94/EU of the EP and the Council for the deployment of alternative fuels infrastructure, the 'National Policy Framework for the market development of alternative fuels in the Transport Sector and for deployment of the respective infrastructure'. In relation to the requirements of the Directive, the National Framework sets out the respective projected targets for the construction of charging stations. Within the period of entry into force of the NPDEE 2020, it is provided that in the 'Public access' points there will be 2500 charging points constructed, and in the 'Non-public assess" points a total of 2000 charging points.

The adopted targets are also directly related to the implementation of the targets defined in the area of energy and climate, including at the Third NPDIK up to 2020, as well as in the National Development Programme: Bulgaria 2020. The development and introduction of clean technologies and transportation systems, based on alternative fuels, among which the leading place is taken by the development of electric mobility, is an element of one of the four priority areas for economic development according the Innovation Strategy for Smart Specialization of Bulgaria for the period 2014-2020. The Strategy is finally adopted with a Decision of the Council of Ministers No 857/03.11.2015.

Legal basis and provided funding

The legal basis has been described in detail in the previous section. The funding needed for the construction of the charging infrastructure is partially provided for.

Institutions responsible for the implementation of the measure

MTITS. MRRB, MI, NTEF, Municipal administrations.

Methods of evaluation of the effect

The calculation of energy savings is made on the basis of the projected number of electric vehicles as of 2020 according to the National Framework (with annual mileage of 10 thousand km), adopted by Decision of the Council of Ministers No 87/26.01.2017

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 42 GWh.

Development and promotion of cycling

Description of the measure

The measure provides for:

- Design and construction of a new infrastructure for cycling (bicycle lanes);
- Development of systems to use municipal bicycles.

Development of non-motorised transport will replace the use of personal vehicles and will lead to fuel savings for transport.

Legal basis and provided funding

According to data from the Third NPDIK, the projected funding amounts to BGN 150 million to 2020, including BGN 150 million for bicycle lanes and BGN 50 million for a system for use of municipal bicycles. The funds are planned to be provided by the European funds, the state and municipal budgets.

Institutions responsible for the implementation of the measure

MRRB, MOSV, Municipal administrations, NGOs.

Methods of evaluation of the effect

The calculation of energy savings is made on the basis of the expected reduction of GHG emissions following application of the measure referred to in the Third NPDIK.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 476.2 GWh/y by 2020.

Increasing the share of public electric transport — railway, trolley, tram transport, metro, bus

Description of the measure

The measure provides for:

- Improving the infrastructure of the electric railway transport.
- Renovating the rolling stock of the electric railway transport.
- Improving the infrastructure and renovating the vehicles of the electric public transport.

Under Priority Axis 'Development of railway infrastructure along the Trans-European Transport Network' within OPTTI, construction, modernisation, rehabilitation, electrification is planned, as well as implementation of signalling and telecommunications on railway sections of the railway infrastructure under the 'core' Trans-European Transport Network.

To implement these activities, within this priority axis of OPTTI 2014-2020, it is provided to finance the following investment projects:

- Rehabilitation and modernisation of railway section Plovdiv-Burgas, Phase II (including railway junction Plovdiv and railway junction Burgas); The total length of restructured or modernised railway lines is 111 km. (including 29 km double line). The project includes construction of an European train control system along the railway section Plovdiv-Burgas with a length of 293 km;

- Modernisation of the railway line Sofia-Septemvri in the section Elin Pelin-Ihtiman and Ihtiman-Septemvri with a total length of 79 km, entirely double-lined.

Under Priority Axis 'Improvement of intermodal transport services for passenger and freights and development of sustainable urban transport', within OPTTI, two thematic objectives are combined. Optimal conditions for the integration of different types of transport are created through the construction of intermodal terminals. Through the reconstruction of key railway station complexes, conditions are set to deliver high-quality services to users (railway operators and passengers) as part of the multi-modal transport system. The metro in the city of Sofia provides intermodal connection between the national railway system (metro station Central Railway Station and metro station Iskarsko Shose) with the passenger aviation system (metro station Sofia Airport), and connections with the tram and bus network.

The activities under the priority axis include: Expanding the metro in the city of Sofia (including the purchase of rolling stock and construction of a depot) and setting up new intermodal connections for passengers within the public transport system of the city of Sofia, including:

- Construction of III^{-rd} Metrodiameter of the metro in the city of Sofia, 'bul. Botevgradsko Shose - bul. Vladimir Vazov - central city district - Residential District (RD) Ovcha Kupel'. The project of III^{-rd} Metrodiameter is based on underground deployment in the central city district, and where appropriate conditions exist, in the open (in the periphery of the city), of separate tracks against the other transport; capacity: comparable with the classic metro. Total length of III^{-rd} Metrodiameter is 16 km and includes 18 metro stations. OPTTI will finance the construction of metro Line 3 section from the beginning of metro station 5 situated under bul. Vladimir Vazov in the area of its crossing with Panayot Hitov str., through the central city district to the last metro station (metro station 18) of the line in RD Ovcha Kupel, purchase of the required rolling stock for the service in the section, and construction of a depot. The section is 12 km long and includes 12 metro stations (11 underground metro stations and 1 overground station, on an overpass) as the track is predominantly underground.

- Expanding the second metrodiameter starting from metro station James Bourcher to the crossing of bul. Cherni Vrah with bul. Henrik Ibsen and Srebarna str. (metro station Vitosha) - the project has been developed with regard to the necessity to provide speedy and efficient transport for the densely populated south part of Lozenets District, and the need of connection with the well-developed input urban transport to bul. Cherni Vrah from the districts of Krastova Voda, Dragalevtsi, Gotse Delchev, Hladilnika, etc. The intended length of the section is 1.3 km and includes 1 metro station, as well as a subsequent direction change facility. The activities provided for funding under OPTTI 2014-2020

include finishing the site for its commissioning, including setting up the structure of the direction change tunnel in the part after the crossing of bul. Cherni Vrah with bul. Todor Kableshkov; complete architectural design of metro station Vitosha; railway track and contact rail with a length of 1.3 km; management systems; radio communication system; power supply system; movement automation systems and train speed control; complex audiovisual systems and low-flow subway systems for a track with a length of 1.3 km, etc.

In the Operational Programme 'Regional Development 2014-2020', 'Development of Environmentally Friendly and Sustainable Urban Transport' is referred to as one of the specific objectives. To achieve this objective, funding is provided for:

- renovation of the transport infrastructure of the electric public transport, such as: socket and contact network, improvement of stops, depots, repair, maintenance and equipment facilities;

- development of the infrastructural route network with new destinations to more distant residential districts;

- development and improvement of public urban transport systems, including the purchase of a new rolling stock for the needs of the urban electric transport.

The implementation of the planned activities is expected to achieve increase of passenger and freight transport by railway, and an increase in travelling with electric urban public transport, including metro. Energy savings result from the replacement of passenger transport with personal vehicles or public passenger and freight road transport with railway and urban public electric transport, which is much more effective.

Legal basis and provided funding

According to data from the Third NPDIK, the projected funding is in the total amount of BGN 870 million to 2020 from the European funds, the state and municipal budgets.

Institutions responsible for the implementation of the measure

MTITS, MRRB, National Railway Infrastructure Company, Municipal administrations.

Methods of evaluation of the effect

The calculation of energy savings is made on the basis of the expected reduction of GHG emissions following application of the measure referred to in the Third NPDIK.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 761.9 GWh/y by 2020.

Training of vehicle drivers for fuel-efficient driving

Description of the measure

According to the Training documentation for driving licence applicants, during the training, the applicant must acquire knowledge about the operating rules for motor vehicles related to environmental protection and optimal fuel consumption.

To be admitted to the activity 'driving vehicles for passenger or freight transport', drivers must undergo training courses of initial qualification or periodic training. The courses also include a 'rational vehicle driving' module that, on the basis of safety requirements, includes topics on fuel efficiency optimisation through better use of the vehicle's construction features and more efficient vehicle driving.

Legal basis

The requirements of Directive 2003/59/EC on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers have been implemented in the Bulgarian legislation by *Regulation No 41 of 4 August 2008 on the terms and conditions for conducting training of drivers of passenger and freight vehicles, and on the terms and conditions for conducting examinations for acquisition of initial qualification*.

Institutions responsible for the implementation of the measure

MTITS, Executive Agency 'Automobile Administration'.

Methods of evaluation of the effect

By expert assessment, training of drivers for fuel-efficient driving can lead to energy savings and reduction of harmful emissions in road transport by at least 0.6 % per year.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 211.2 GWh/y (18.2 ktoe) based on the energy consumption of road transport in 2015.

Effective control on the condition of car engines

Description of the measure

The Executive Agency 'Automobile Administration' carries out technical roadside inspections of commercial vehicles for passenger or freight transport. With regard to vehicle engines, technical roadside inspections include inspection of the engine exhaust system, measurement of smoke and pollutant emissions contained in the exhaust gases, and check for fuel and/or oil leakage.

Legal basis

The measure is applied in accordance with the requirements of Directive 2000/30/EC of the European Parliament and of the Council on the technical roadside inspection of the

roadworthiness of commercial vehicles circulating in the Community, and Article 91a of the *Law on Road Transport*.

Institutions responsible for the implementation of the measure

MTITS, Executive Agency 'Automobile Administration'.

Methods of evaluation of the effect

By expert assessment, the effective control of engines results in energy savings of 2 % per year of the energy consumption of road transport.

Anticipated effect of the implementation of the measure

The evaluation of the effect of the measure is energy savings at the rate of 705 GWh/y (60.5 ktoe) based on the energy consumption of road transport in 2015.

Implementation of programmes for energy efficiency improvement of companies within MTITS

Description of the measure

The companies within MTITS carry out energy audits and implement programmes for energy efficiency improvement. Some of the applied measures include:

- Repair and reconstruction of transformer substations, cable lines, etc.;
- Modernisation and rehabilitation of pylon and platform lighting;
- Modernisation and installation of new power supply of railway infrastructure electric equipment;
- Reconstruction of railway stations (replacement of window frames, wall insulation, energy saving measures on measuring, control and management devices, building installations and lighting);
- Optimisation of the traffic schedule of fast and passenger trains;
- Optimisation of shunting at railway stations;
- Improving the efficient use of diesel locomotives by regular control of their operation and normalisation of fuel consumption.

In the OPRD 2014-2020, 'Development of Environmentally Friendly and Sustainable Urban Transport' is referred to as one of the specific objectives. To achieve this objective, funding is provided for the following indicative eligible activities:

- Development of traffic management plans and the introduction of Intelligent Transport Systems, including automated traffic management and control systems, motor vehicle detection, localisation and ensuring priority to public transport vehicles, real-time passenger information systems, automated ticketing systems, connection subsystems, video surveillance systems for urban mobility centres, etc. Improvement of the

accessibility of public transport stops and the infrastructure (underpasses and overpasses) leading thereto, such as: platforms and lifts for disabled people, removal of orientation and information obstacles, light and sound announcement of stops, clear visual indication of lines and schedules, information that is understandable and suitable for visually impaired or blind people, etc.

- Construction/renovation/reconstruction of pedestrian alleys and sidewalks, pedestrian zones, bicycle lanes, bicycle parking areas, underpasses, overpasses, transport infrastructure, including related activities, such as placing of road signs, information signs, markings, etc. as part of the integrated urban transport system;

- Improvement of the connections between the integrated urban transport, intercity bus, railway, air, inland waterways and maritime transport as part of the intermodal transport, renovation of municipal bus stations and the corresponding adjacent communal areas, bus stops for public transport providing easy transfer to the next mode of transport and logical connections between the infrastructure elements, etc.;

- Construction/renovation/reconstruction of parking areas and other measures for organisation of parking in the vicinity of key junctions of public urban transport outside the city centre.

Wide range of eligible activities is provided that will enable the implementation of integrated projects for sustainable urban transport. The support for the public urban transport aims at increasing its use by passengers and reducing road traffic since, within the transport sector, GHG emissions in the air are mainly due to personal vehicles and heavy goods vehicles. The implementation of the activities under the investment priority aims at promoting multi-modal sustainable urban mobility by creating opportunities for alternative forms of transport and their appropriate combination, including public transport, cycling, walking, connections with other modes of transport.

Legal basis

ZEE and the Operational programme ‘Regional Development 2014-2020’

Institutions responsible for the implementation of the measure

MTITS, BDZ, National Railway Infrastructure Company.

Implementation of the measure

Table 3.5-1: Evaluation[17] of the implementation of energy efficiency measures in transport, for the period 2014-2016

Indicator	***Value***
Saved energy, MWh/y	3 603.3
Saved emissions, t CO^2/y	379.8

17 *Source: MTITS, AUER - Annual report on the implementation of NPDEE*

Methods of evaluation of the effect

The evaluation of the effect is made by the 'bottom-up' method based on the annual reports on the implementation of energy efficiency improvement programmes under Article 12 and energy efficiency management programmes under Article 63 of the ZEE, submitted to AUER each year.

3.6. Promotion of energy efficient heating and cooling (Article 14 of Directive 2012/27/EU)

With regard to the requirement of Article 14(1) of Directive 2012/27/EU, the Republic of Bulgaria has developed and presented to the EC a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling systems:

(https://ec. europa. eu/energy/sites/ener/files/documents/bul chp.pdf).

Based on the analysis performed and the information collected, a National Heat Map has been developed containing data of heat consumption and technologies to satisfy these needs in the different municipalities. It gives a visual presentation of the areas with the highest heat consumption and the respective location of the large heat suppliers, which use cogeneration:

(http://maps. trimbul.com/bulgaria-heatmap/).

In a comprehensive assessment, based on the actual annual heat demand for 2014, the available national technical potential for the application of high-efficiency cogeneration has been determined. After identifying the existing high-efficiency cogeneration capacities, they are compared with the available heating and cooling needs.

An assessment has been made of the possibility for replacing the existing cogeneration capacities with a new high-efficiency cogeneration to cover the annual heat consumption by industry and households.

The technical potential for introducing new high-efficiency cogenerations to provide heat to existing heat supply networks, industrial installations, public and residential buildings that currently do not have a cogeneration system is also being calculated. These calculations are made for two different scenarios:

- using the existing heating network;
- setting up new district heating networks that will supply heat to public and residential buildings, which are not connected to central heating.

Table 3.6-1: Available capacity[18] for high-efficiency cogeneration

Parameter		***Value***
Total installed capacity for electricity production	MWe	13 563
Installed electricity capacity of large power plants and cogeneration plants	MWe	8 585
Installed electricity capacity of cogeneration plants with certified high-efficiency production	MWe	814

Most of the installed capacities of the power plants are also able to produce heat (63 %), i.e. they can operate in cogeneration mode, but only 814 MWe of their heat production capacity can be defined as high-efficiency cogeneration.

The approach adopted for promoting high-efficiency cogeneration in Bulgaria is by setting a preferential price for the electricity produced. The national policy for support of high-efficiency cogeneration is regulated by the Energy Act, the Regulation on determining the quantity of electricity produced from cogeneration, and the Regulation on the issuance of certificates of origin for the electricity produced from renewable energy sources and/or cogeneration.

Under the current legislation, the public supplier or the final supplier of electricity is obliged to purchase from the producer connected to the respective network all the electricity from high-efficiency cogeneration of heat and electricity registered with a monthly certificate of origin. Electricity is purchased by the producer at preferential prices, except for the amount of electricity:

- necessary to ensure the operational reliability of the main facilities, produced above the amount of electricity from cogeneration;
- used by the producer for their own needs and consumption;
- for which signed contracts to participate in the balancing electricity market are available;
- consumed by non-household customers, which do not receive allowances and whose heating is supplied by a producer of thermal energy for industrial purposes.

The quantities of electricity from high-efficiency cogeneration shall be purchased up to the amounts determined by the KEVR's decision to set an individual price for the installations.

Another incentive for producers of high-efficiency cogeneration is the introduction of obligations in the Energy Act for the transmission and distribution network operators to provide guaranteed access to the respective network, to ensure the transmission and distribution and to give priority to the dispatching of electricity produced from high-efficiency cogeneration.

18 *Source: a comprehensive assessment of the potential for high-efficiency cogeneration and of efficient district heating and cooling systems*

Electricity produced from high-efficiency cogeneration is certified by certificates of origin whose form, content, terms and conditions for issuance are set out in *Regulation on the issue of certificates of origin for electricity produced from cogeneration* adopted by Decree of the Council of Ministers No 110 of 14 May 2007 on a proposal of KEVR (Promulgated in SG, No 41 of 22 May 2007, last amended in SG, No 85 of 29 October 2010). Each refusal to recognise a certificate of origin is notified to the European Commission.

With regard to the need to transpose the requirements of Directive 2012/27/EU concerning high-efficiency cogeneration, changes are made in the Chapter 'Promoting electricity production from cogeneration' of the Energy Act by the amendment of the ZEE of 30 December 2016.

The certificate of origin is an electronic document issued for 1 MWh electricity to a producer for the net production of electricity measured at the output of the power plant and fed to the respective power network upon compliance with the requirements for accuracy, reliability and absence of tampering. The certificate contains details of:

1. the name, location, type and total installed capacity of the power plant;
2. the start and end date of the period of electricity production;
3. the lower calorific value of the fuel source from which the electricity was produced;
4. the quantity of heat produced together with the electricity and the quantity of heat used;
5. the quantity of electricity produced from high-efficiency cogeneration as defined in the Regulation under Article 162(3) of the Energy Act;
6. the primary energy savings calculated according to the Regulation under Article 162(3) of the Energy Act;
7. the nominal efficiency of the cogeneration facility;
8. the investment support received for the construction of the cogeneration facility under a national or European support scheme;
9. any other support granted per unit of energy under a national support scheme;
10. the type of the national support scheme;
11. the date on which each of the installations of the energy facility was put into operation;
12. the date and country of issuance;
13. unique identification number.

For each unit of electricity produced from high-efficiency cogeneration, only one certificate of origin, which has a validity of 12 months from the production of the respective unit of energy, may be delivered.

The certificate of origin shall be issued at the request of the producer of electricity produced from high-efficiency cogeneration. It will serve to the producer to demonstrate that the electricity is produced from high-efficiency cogeneration.

On their website KEVR maintains monthly registers of the issued/transferred certificates of origin, thus providing public access thereto.

With the last amendments of the Energy Act, the terms and conditions for issue, transfer and cancellation of the certificates of origin for electricity from cogeneration are set out in an Regulation adopted by the Energy and Water Regulatory Commission.

3.7. Energy transformation, transmission, distribution, and demand response (Article 15 of Directive 2012/27/EU)

For the efficient use of energy in its production, transmission and distribution, the Energy Act provides for requirements, which the Energy and Water Regulatory Commission takes into consideration in establishing the prices of electricity, heat and natural gas. In the exercise of their authorities under this Act, KEVR:

- establishes the maximum value of technological costs in the production, transmission and distribution of electricity, in the production and transmission of heat, and in the transmission, distribution and storage of natural gas, which may be recognised when determining the prices according to the methodology or guidelines adopted by the Commission;

- requires from electricity and gas network operators to assess the energy efficiency potential of the respective networks by reducing technological costs, including analysis of load transmission, distribution and management, efficient network operation and the capability of joining distributed generation facilities;

- an obligation is imposed on network operators, when drawing up network development plans, to include measures and plan the corresponding investments for energy efficiency improvement in gas and electricity grids, as well as a schedule for their implementation;

It is also the responsibility of KEVR to assess the economic feasibility of introducing smart metering systems proposed by network operators. If such introduction is economically justified, KEVR prepares schedules for their installation ensuring interoperability of the smart metering systems in consideration of the appropriate standards, best practices and their importance for the development of the internal electricity and natural gas market.

In addition, the Energy Act regulates that in the exercise of their regulatory powers in the field of energy efficiency, KEVR is guided by the following general principles: promoting energy efficiency improvement in the production, transmission, distribution and final consumption of energy and natural gas, as well as creating stimuli for the operators of transmission and distribution networks to provide system services to end-users which enable them to implement energy efficiency improvement measures by introducing smart grids, taking into account the costs and benefits associated with each measure upon ensuring the security of the system.

With regard to price regulation, KEVR sets as its objective that electricity transmission and distribution prices should not be a restrictive factor for the energy efficiency improvement in the production, transmission and distribution of energy, for the inclusion of demand response in the efforts to balance markets and provide ancillary services, as well as the incorporation in network tariffs of reduced networks costs achieved by consumers, the optimisation of energy consumption, the decentralisation of production, the lowering of the cost of delivery or of network investment, and optimisation of network operation.

In terms of demand response, KEVR is guided by the principle that electricity transmission and distribution prices should allow increased end-user involvement in the improvement of efficiency of the power system by optimising consumption. Moreover, it makes efforts to encourage transmission and distribution network operators to offer system services for electricity demand response, demand management and distributed generation on organised electricity markets and improve the efficiency in networks design and operation, in particular:

- the shifting of the load from peak to off-peak times by end users taking into account the availability of renewable energy sources, energy from cogeneration and distributed generation;
- energy savings by demand response from decentralised sources of production through a combination of supply of energy efficiency services and participation in the balancing electricity market;
- reducing consumption by means of energy efficiency measures implemented by providers of energy efficiency services;
- connection and dispatchability of energy facilities for the production of electricity of medium and low voltage levels;
- connection of energy production facilities located closer to the points of consumption;
- providing access to networks of energy storage facilities.

Another objective is the introduction of dynamic pricing as a measure for electricity demand response by end-users through:

- time-of-use tariffs;
- critical peak pricing;
- real time pricing;
- peak time rebates.

Measures with gas distribution companies

Energy efficiency measures applied by gas distribution companies include:

1. Measures related to the control and diagnostics of the technical condition of networks:
    - Grouping of gas pipelines by age from commencement of commissioning, with a shorter control period for diversion and search for natural gas leakage in the older sections;
    - Grouping of pipelines by frequency of breakthroughs and leakages recorded per meter of length, with a shorter control period for diversion and search for natural gas leakage for the sections with a higher number of registered natural gas leakages;
    - An analysis of the input-output balance of the gas distribution network;

- Localisation of the gas leakage on the basis of data from the analysis made under the preceding sentence, by segmenting the grid with the installation of an individual meter.

2. Measures related to preventing damages caused by third parties: analysis and prevention of third party actions related to disruption of network integrity resulting in natural gas leakage - restriction of access and security of sites;

3. Measures during the construction and filling the gas distribution networks - use of certified materials and contractors;

4. Operational measures:

   - Pressure control - limits the risk of natural gas leakage and prolongs the service life of network elements;

   - Odorising the natural gas in order to localise leakages at an earlier stage and eliminate them;

   - Regular walking through the gas distribution network;

   - Setting up a system for remote monitoring of electrochemical protection values of metal gas pipelines;

   - The inclusion of new subscribers is carried out by pressure cutting to reduce technological losses;

5. Measures related to energy efficiency management - implementation of smart metering systems in gas distribution networks, after assessment of economic feasibility.

Measures with electricity distribution companies

With regard to measures to reduce the technological costs of electricity transmission and distribution over the electricity distribution network, the following is carried out by the network operators:

1. Reducing technical losses in the transmission and distribution of electricity by:

   - Increasing the cross section of medium and low voltage conductors with cable and overhead grids;

   - Construction of new transformer posts which reduces the length of terminals for low voltage grids and/or redistributes electrical loads;

   - Replacement of the installed power transformers with new ones, with low power losses in no-load and short-circuit;

   - Thermal imaging of transformers, medium voltage and low voltage devices, to detect problematic areas characterised by higher temperature.

2. Increasing the reliability in metering the quantities of electricity entering or leaving the electricity distribution network and limiting the possibility of unauthorised use by:

   - Replacement of commercial metering devices;

- Safeguarding and exporting the commercial metering devices on the property border.

Measures with heating companies

The energy efficiency potential of the central heating and cooling infrastructure is in the rehabilitation of heat transmission networks and replacement of outdated direct substations with modern high-efficiency automated indirect substations, which will reduce heat transmission and distribution losses and GHG emissions. The best practices related to the use of preliminary insulated pipes for the district heating systems lead to reducing heat losses by 3 %. Such level of losses may be achieved for systems of high power density. In the context of the national conditions for the Republic of Bulgaria, it is assumed that the average power density of district heating systems will allow the reduction of heat losses down to 10 % using the best available technology.

To reduce losses down to 10 % (with current average losses of 23.7 %), district heating networks need to be modernised so that annual losses are reduced from 2.77 TJ/km to 1.17 TJ/km. As the length of the heat transmission network (1 898 km) is closely related to the cost of losses during transmission, it may be assumed that the requirement for the reduction of losses per kilometre of the network to 1.17 TJ/km should be applied to all heating systems in the country. The potential, as a result of energy efficiency improvement of heating systems, is estimated at 1.6 TJ representing 30.3 % of the heat that is currently lost in the transport of the heat carrier.

3.8. Financial mechanisms to promote measures for energy efficiency improvement

3.8.1. Energy Efficiency and Renewable Sources Fund

FEEVI was established by the Energy Efficiency Act of 2004 as a legal entity which is independent from the government institutions. The Fund operates in accordance with the provisions of the Energy Efficiency Act, the Energy from Renewable Sources Act and the agreements concluded with its donors, and is not part of the consolidated national budget. FEEVI was originally capitalised entirely with grants, and its main donors are the UN Global Environment Fund through the International Bank for Reconstruction and Development (the World Bank) with a contribution of USD 10 million, the Government of Austria with EUR 1.5 million, the Government of Bulgaria with BGN 3 million, and private Bulgarian sponsors.

FEEVI is structured as a self-financing trade mechanism (revolving fund) and focuses its efforts on helping to identify, develop and finance feasible energy efficiency improvement projects that reduce GHG emissions in the air, contributing to foster the development of a functioning energy efficiency market in Bulgaria.

The Fund operates as a financing institution by providing loans or loan guarantees, and as a free consultation centre. FEEVI provides assistance to Bulgarian companies, municipalities and private entities in the implementation of energy efficiency investment projects, provided that they meet the main criteria of funding.

Any energy efficiency project approved and supported by FEEVI should comply with the following requirements:

- The project should introduce an established technology;
- The cost of the project should be between BGN 30 thousand and BGN 3 million;

- The share of the borrower should not be less than 10 %;

- The loan repayment term should be up to 7 years.

The main principle in the management of the FEEVI is the public-private partnership. The Fund operates in accordance with arrangements and rules developed with the technical assistance of the World Bank and approved by the Bulgarian government.

As of 31 December 2016, the Fund has financed 218 investment projects for a total of BGN 99.9 million where the total amount of resources granted by the Fund amounts to BGN 57 million.

3.8.2. Operational Programme 'Innovation and Competitiveness 2014-2020' (OPIC)

OPIC 2014-2020 is co-financed by the European Union through ERDF. The implementation of energy efficiency projects under this Programme falls in Investment Priority 3.1 'Energy Technologies and Energy Efficiency' under Priority Axis 3: 'Energy and Resource Efficiency' in conformity with Thematic Objective 4 'Supporting the shift to a low-carbon economy in all sectors'. The specific objective of this priority axis is reducing the energy intensity of the economy. The support under this investment priority will be concentrated in an indicative group of energy efficiency improvement activities in enterprises.

The beneficiaries are the existing enterprises on the territory of the country outside the sectors of Trade and Services. The support for energy efficiency improvement includes the following:

- completing energy efficiency audits in the enterprises;

- follow-up application of the measures recommended in the audit reports;

- investments in long-term tangible and intangible assets, energy management systems, including energy efficiency management systems based on information-and-communication technologies;

- reuse of residual heat in industry and support of high-efficiency micro and small cogeneration plants and modernisation of networks, etc.;

- associated activities and those related to the use of renewable energy sources for own consumption (electricity, heating and cooling energy);

- complementary support for construction works to improve the energy and heat performance of the building stock of factory buildings will also be provided when proving the effect of and the link with these activities;

- projects in the field of 'blue' growth if the demand and potential for developing 'blue' energy are proven.

For the implementation the energy efficiency projects in OPIC 2014-2020, there are funds amounting to BGN 446.04 million (EUR 228 million)which would allow for making investments with a total estimated value of around BGN 637.2 million (EUR 325.8 million). The achieved energy savings in enterprises as a result of the implementation of the projects are estimated at 132 044 MWh/y, and the reduction of GHG emissions at 40 405 t CO_2 eq.

3.8.3. Operational programme 'Regions in Growth' 2014-2020

OPRD 2014-2020 is co-financed by the European Union through the European Regional Development Fund. The implementation of energy efficiency projects and such for renovation of existing buildings falls in Investment Priority 'Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector' under the following priority axes:

- Priority axis 1: Sustainable and integrated urban development; and
- Priority axis 2: Support for energy efficiency in supporting centres in outlying areas.

The beneficiaries are:

- town authorities (municipalities);
- organisations applying the financial instruments;
- house owners - for one-family residential buildings;
- associations of apartment owners - for multi-family residential buildings;
- government institutions - for administrative buildings of the state administration;
- higher schools and legal entities managing student hostels - for student hostels.

The support for achieving the specific objectives includes exemplary eligible activities in residential buildings, student hostels, administrative buildings of the government and municipal administration, and in municipal public buildings from the educational, cultural and social infrastructure, as follows:

- Implementation of energy efficiency measures in the above buildings, such as: insulation of outer enclosing elements, replacement of window frames, renovation of microclimate maintenance systems, technical installations, local installations and/or connections for heating, gas supply, installation of individual counters, as well as accompanying construction works related to the implementation of the energy efficiency measures, including constructive reinforcement (when prescribed as mandatory in constructive investigation);
- Implementation of the above mentioned energy efficiency measures accompanied by general renovation of buildings, including of the associated construction and assembly works, constructive reinforcement (when prescribed as mandatory in the constructive investigation), as well as repair and reconstruction of different parts of the building, provided that energy savings for the building of more than 60 % are achieved;
- Energy efficiency audits and constructive investigations of existing buildings;
- Evaluation of the cost-effectiveness for the investment;
- Commissioning of renewable energy installations for the above mentioned buildings to meet their own energy needs, if technically possible and economically feasible;
- Providing loans and/or guarantees for renovation of residential buildings and student hostels.

Funding will be needs based:

- Only buildings designed prior to 1999 will be eligible for support;

- Energy efficiency measures will be carried out only on the basis of an energy efficiency audit of the respective building;

- Only projects, which lead to energy-demand class C, will be financed, or projects leading to energy savings for more than 60 %, provided that the energy efficiency measures are accompanied by general renovation.

To implement the energy efficiency projects, OPRG 2014-2020 provides support from ERDF in the amount of EUR 287.8 million that will enable the implementation of investments with a total project cost of more than EUR 338.6 million, including EUR 208.1 million in the housing sector and EUR 130.5 million in public buildings. The achieved energy savings in public buildings as a result of the implemented projects are estimated at 140 645 MWh/y, and reduction of GHG emissions at 129 467 t CO_2 eq.

3.8.4. National programme for energy efficiency of multi-family buildings

The National programme for energy efficiency of multi-family buildings is intended for renovation of multi-family residential buildings and through the implementation of energy efficiency measures generally aimed at providing better living conditions to occupants of multi-family buildings, heat comfort, and higher quality of living environment. The Programme is Alternative Measure 2 of the energy efficiency obligation scheme established in accordance with the requirements of Article 7 of Directive 2012/27/EU (see Item 3.1.1 of this Plan).

The activities under this Programme are carried out on the territory of 265 municipalities. Owners' associations registered under ZUES in buildings eligible for funding are entitled to a grant of up to 100 %.

All multi-family residential buildings erected by the following industrial methods are eligible: Large-panel system building; lift-slab construction; monolithic in-situ cast concrete structures; climbing formwork and varieties thereof, with minimum 36 independent living units.

Since 2016, the following are also eligible:

- multi-family residential buildings erected by the following industrial methods: Large-panel system building; lift-slab construction; monolithic in-situ cast concrete structures; climbing formwork and varieties thereof - on 3 or more floors, with a minimum of 6 to 36 independent living units;

- multi-family residential buildings (massive buildings) designed prior to April 1999, on 3 or more floors, with 6 or more independent living units.

The above-mentioned buildings are eligible for funding only where they fall outside the scope of the project proposals of the municipalities under OPRD 2014-2020.

The activities, eligible for funding, are:

- Constructive restoration/reinforcement/general repair depending on the damages occurred during the operation of the multi-family residential buildings, which are prescribed as mandatory for the building in the technical audit;

- Renovation of the common parts of multi-family buildings (roof, facade, staircase, etc.);

- Implementation of energy efficiency measures that are prescribed as mandatory for the building in the energy efficiency audit, including accompanying construction works related to the implementation of energy efficiency measures and the corresponding restoration of the original condition of the common parts of the building within the independent unit, damaged as a result of their renewal.

The Programme funds the most effective package of energy-savings measures from an economic perspective, which is used to achieve energy efficiency class C in compliance with *Regulation No 7 of 2004 on energy efficiency of buildings*.

Initially, the Programme was implemented with a financial resource of BGN 1 billion, but after providing additional funds, the Programme's financial resources increased to BGN 2 billion. Application under the Programme was carried out constantly within 2 years: 2015 and 2016. The duration of the Programme may be prolonged if there is free financial resource available.

3.8.5. National Trust Ecofund - Investment programme for climate

National Trust Ecofund was established in October 1995. The Fund manages resources earmarked by the state budget, including through swap transactions to replace Debt for Environment and Debt for Nature, from international trade in prescribed emission GHG units, from GHG emission allowance sales for aviation activities, and from governments and international financial institutions and other donors, intended to protect the environment in the Republic of Bulgaria.

The resources from the Fund are spent on environmental projects and activities in accordance with the conditions of the donors and the priorities of the national environmental strategies and programmes. The Fund contributes to the implementation of the Bulgarian government's policy and the country's international commitments in the area of environmental protection.

In addition to the implementation of the 2017 electric vehicle incentive scheme, the NTEF launched the implementation of pilot projects for energy efficiency improvement by combining a grant with other sources of funding. Through combined financing, projects will be implemented for several types of sites: street lighting, hospitals, and large state and municipal sites.

The Climate Investment Programme is the latest NTEF programme to contribute to climate change mitigation. It is a kind of continuation of the National Green Investment Scheme. The aim of the Programme is to encourage initiatives leading to mitigation of climate change – reduction of GHG emissions into the air. It will finance projects related to energy efficiency improvement in buildings and other sites, public governmental or public municipal property,. Beneficiaries under these projects may be Public institutions, registered religious denominations, persons registered under the Non-Profit Legal Entities Act, and other legal entities created for the satisfaction of public interests (scientific organisations, cultural institutes, library clubs, professional chambers, etc.). For public institutions and NGOs, the funding can reach up to 85 % of the investment costs.

3.8.6. Rural Development Programme 2014-2020

RDP 2014-2020 is financed by the European Agricultural Fund for Rural Development. One of the main objectives of the Programme is to protect ecosystems, ensure sustainable management and use of natural resources, prevention and adaptation to climate change.

Within this objective, the interventions are programmed under Priority 5 'Promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors'. Under this priority, the RDP includes measures addressing the objectives and priorities set by the Third NPDIK 2013-2020 for the agriculture, land use and forestry and industry sectors. Interventions are planned in the following focus areas:

- Focus Area 5B 'Increasing efficiency in energy use in agriculture and food processing' aimed at introducing energy-saving technologies amounting to EUR 217 million in the production and processing of agricultural products and their marketing. A budget of EUR 123 million is allocated for this objective, or 4.2 % of the total programme budget.

- Focus Area 5C 'Facilitating the supply and use of renewable sources of energy, of by-products, wastes and residues and of other non-food raw materials, for the purposes of bio-economy' is aimed at investing EUR 150 million in measures for production of energy from RES for own consumption from the processing of by-products, wastes, residues and other raw materials in bioenergy. The allocated budget is EUR 115.2 million, or 4 % of the total programme budget.

3.8.7. Energy efficiency credit programme for households

On 1 September 2016, the European Bank for Reconstruction and Development opened the third programming period of the *Residential energy efficiency credit line (REECL III)*. which started on the Bulgarian market in 2005. The objective is for the positive effect of the Programme achieved so far to continue and to meet the need of further energy efficiency improvement measures in the housing sector in Bulgaria.

The program will contribute to the development of the economy by: 1) demonstrating the best energy efficiency technologies and complete renovation in the housing sector; expanding the market and increasing competition in the supply of these products and services; 2) developing financial intermediation with owners' associations as well as with service providers; 3) developing the capacity of the financial institutions involved to finance companies providing energy efficiency projects in the housing sector, as well as the capacity of companies providing such services in the structuring of energy efficiency projects; and 4) supporting Bulgaria in its efforts to reduce carbon emissions.

The credit line is a financial mechanism for energy efficiency funding in the housing sector, amounting to EUR 20 million. These funds are provided to established Bulgarian commercial banks for lending to individuals, associations of apartment owners and private providers of services related to energy efficiency projects in the housing sector. Energy-saving measures involved in the individual projects include: energy efficient windows; insulation of walls, floors and roofs; efficient biomass stoves and boilers; solar water heaters; efficient gas boilers and gasification systems; heat pump air conditioning systems; photovoltaic systems integrated in the building; substations and building installations; recuperation ventilation systems and energy-efficient lifts.

In order to stimulate the introduction of energy-saving measures at home, an additional 10 % grant is foreseen in the case of implementation of eligible projects in houses with one and two independent apartments, and 20 % for projects in multi-family residential buildings with more than three independent apartments. The funds are paid after completion of the installation works and after verification of their performance by an independent consultant. Grant funds in the amount of EUR 4.4 million are provided by the Kozloduy International Decommissioning Support Fund [in Bulgarian 'MFK'].

3.8.8. Operational programme 'Transport and Transport Infrastructure' 2014-2020

OPTTI 2014-2020 is co-financed by the European Union through the ERDF. The implementation of energy efficiency projects under this programme falls under Investment Priority 4E 'Promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures' within Priority Axis 3: 'Improvement of intermodal transport services for passengers and freights and development of sustainable urban transport', in compliance with Thematic objective 4 'Supporting the shift towards a low-carbon economy in all sectors'. A specific objective of this priority axis is the increase in the use of the metro by extending the metro system in the city of Sofia (including the purchase of rolling stock and construction of a depot) and setting up new intermodal connections for passengers within the public transport system of the city of Sofia. With the implementation of the planned activities, the following results will be achieved:

- Increased number of passengers transported by the metro system;
- Increased share of journeys by electric transport within the total number of public transport journeys.

The aim is to increase the attractiveness of public transport which will contribute to reducing road traffic and, hence, reducing hazardous GHG emissions and improving air quality.

The potential beneficiary is Metropoliten EAD. Under this Programme, a grant of EUR 401.5 million is provided for the extension of the metro system in Sofia city.

3.8.9. Financial mechanism of the European Economic Area 2014-2021

In December 2016, Bulgaria signed a Memorandum of Understanding on the implementation of the European Economic Area Financial Mechanism (EEAFM) for the period 2014-2021. With financial resources of EUR 115 million provided by Iceland, Liechtenstein and Norway (the donors) will be financed projects for local development and poverty reduction, energy efficiency and security, environmental protection and development of entrepreneurship in the field of culture.

In the programme area 'Renewable Energy, Energy Efficiency, Energy Security', there is financial aid of approximately EUR 33 million provided (EUR 28 million as a grant from the EEA Financial Mechanism and EUR 4.9 million in national co-financing) for projects in the following areas:

- Energy efficiency improvement in production, distribution and/or final energy consumption (in the Industry and Households sectors);
- Production of energy from renewable sources (mainly hydroelectric and geothermal energy) and/or distribution thereof;
- Energy recovery from waste in industrial processes;
- Security of energy supply through diversification;
- Policies for the use of energy from renewable sources in all sectors of the economy;
- Development of energy markets and improvement of gas and electricity infrastructure.

The programme aims at reducing and/or eliminating GHG emissions by implementing energy efficiency measures at reasonable cost - the grant support is planned to be no more than EUR 150 per t CO_2 eq./year of reduced/eliminated GHG emissions.

Priority will be given to bilateral partnerships offering value added.

All measures provided for in the National Energy Efficiency Action Plan shall be implemented in compliance with the rules on state aid.

Annex 1: National plan for improving the energy performance of heated and/or cooled buildings – owned by the state, used by the public administration

Annex 2: National long-term programme for promotion of investments in the implementation of measures aiming to improve the energy performance of buildings from the public and private national residential and commercial building stock

Annex 3: List of obligated parties under Art.14 para 4 of ZEE and the individual energy-saving targets assigned to them