



Prepared by: Black Sea Energy Research Centre

Interlinkage and synergies between selected other policy areas and energy efficiency

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Part of work package 1: Mapping of energy efficiency policy instruments and available technologies in buildings and transport

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ACRONYMS

COP	Coefficient of performance
EC	European Commission
EEA	Energy Efficiency Act
EER	Energy efficiency ratio
EU	European Union
EVs	Electric vehicles
GHG	Green house gases
kg	kilogram
ME	Ministry of Energy
MEE	Ministry of Economy and Energy
MOEW	Ministry of Environment and Water
MRDPW	Ministry of Regional Development and Public Works
MTITC	Ministry of Transport, Information Technology and Communications
NZEB	Nearly zero energy building
PV	Photovoltaics
R&D	Research and development
REECL	Residential Energy Efficiency Credit Line
RES	Renewable energy sources
SG	State Gazette

EXECUTIVE SUMMARY

The BSERC's team performed research to ascertain the interlinkage between other policy areas and energy efficiency. Direct and indirect connection has been identified and split into buildings and transport sectors. Despite the importance of the topic, no official studies have been performed so far.

Buildings

The Bulgarian national definition of NZEB has been introduced with the new Energy Efficiency Act and it combines requirements for use of RES (not less than 55 percent of the energy consumed (supplied) for heating, cooling, ventilation, domestic hot water and lighting) and high energy efficiency (class A) of all buildings constructed after 2020.

The implementation of the national NZEB policy will lead to major reduction of energy consumption in new buildings. For example, the primary annual energy consumption in class A is less than 50% of the consumption in class B, which is mandatory for the commissioning of new buildings at present. Respectively, the energy consumption of all new public buildings after 2018 and all new residential buildings after 2020 will be reduced more than two times and more than a half of this reduced energy demand will be from renewable sources.

The Regulation on the labelling and provision of standard information by household appliances is a typical information policy instrument, indirectly linked to energy efficiency, which determines:

- The procedure for providing information to consumers through labelling and information sheets on the consumption of energy and other resources.
- The obligations of producers and traders to provide labelling of household appliances.

A barrier to the amplification of the effect of the measure is the lack of direct information about the reduction of energy costs. Consumers should do the corresponding calculations and compare the financial savings with the difference in the prices of appliances.

Transport

The policy, directed towards the promotion of environmentally friendly vehicles aims at the reduction of harmful emissions (including CO₂) and at energy efficiency improvement and reduction of the dependency on the import of fossil energy resources.

Electric mobility is expected to be one of the key technologies that will contribute to the attainment of these aims, and in addition it will encourage the use of intermittent RES (solar PV and wind) in transport and enhance local employment and economic growth in the coming decades.

The primary objective of the regulatory policy instruments in the transport sector, such as the mandatory periodical technical inspections of vehicles and maximal speed limitations, is the safety of the but they have also substantial impact on the reduction of emissions and improvement of energy efficiency of the road transport.

CHAPTER 1: ACHIEVING ENERGY EFFICIENCY THROUGH INTEGRATION IN OTHER POLICY AREAS

1.1 POLICY INSTRUMENTS WITH A DIRECT LINK TO ENERGY

1.1.1 Case study for the buildings sector

Introduction

National definition for nearly zero energy consumption buildings (NZEB)

According to the Directive 2010/31/EC (Directive 2010/31/EU, 2010), after 2018 all new public buildings, and after 2020 all residential buildings in the EU Member States, must meet the requirements for the nearly zero energy buildings.

The Bulgarian national definition for a building with nearly zero energy consumption has been formulated considering:

- the NZEB definition and requirements, provided by the Directive 2010/31 /EC;
- the characteristics of the existing national legal framework for assessment of the energy performance of buildings;
- the specific economic and social conditions in Bulgaria;
- the influence of local climatic conditions.

The objectives of the national definition are as follows:

- reduction of the energy demand of buildings by improving the energy performance of their envelopes, of the systems providing the necessary microclimate parameters, and of the other energy related systems and appliances;
- utilization of renewable energy generated in the building or in its immediate vicinity.

The requirements for improvement of the energy performance of the systems to provide the microclimate in buildings are:

- minimum seasonal coefficient of performance of heat pumps - 3,5;
- mandatory use of condensing boilers;
- water heating systems with temperature of water not higher than 60°C.

Based on the above considerations, the following definition for a “Nearly zero energy consumption building” was adopted with the new Energy Efficiency Act (EEA 2015):

“Nearly zero energy consumption building” is a building that meets both of the following conditions:

- energy consumption of the building, defined as primary energy, corresponds to class A of the scale of energy classes for the type of buildings;
- not less than 55 percent of the energy consumed (supplied) for heating, cooling, ventilation, domestic hot water and lighting is energy from renewable sources produced on-site at the building level or near the building”.

Relation to energy efficiency

The introduction of the national NZEB definition will lead to a major reduction of energy consumption in new buildings. For example, the primary annual energy consumption in class A is less than 50% of the consumption in class B, which is mandatory for the commissioning of new buildings at present. Respectively, the energy consumption of all new public buildings after 2018 and all new residential buildings after 2020 will be reduced more than two times and more than a half of this reduced energy demand will be of renewable sources.

Suggestions for improving the energy performance of buildings and for increasing the number of buildings with nearly zero energy consumption will be made in the following years and after in-depth analyses of statistical data for the energy consumption of the first NZEBs in Bulgaria. One of the unsolved problems, which needs further addressing, is the definition of the “renewable source produced near the building”. It is proposed that this distance corresponds to that of the delivery of heat energy from district heating.

The potential benefits of this measure will depend on the scale of the construction of new residential buildings after 2020 and the refurbishment of existing buildings to the standard of NZEB. The consumers will benefit from the reduced energy costs.

Interaction between objectives

The NZEB requirements will interact directly with the legislative requirements for the insulation of buildings towards reaching of class A on the scale of energy classes of buildings.

Both instruments aim at the drop-off in fossil fuels' consumption and reduction of GHG emissions.

In this case the two policy instruments can be implemented only linked.

Interaction between target groups

Both policy instruments address consumers, construction companies, producers of energy efficient materials, RES equipment etc.

Interaction between rules-influencing mechanisms

Both policy instruments are regulatory and interact directly.

The legislative requirements for buildings' insulation determine the primary energy consumption for class A, which constitutes the basis for defining of the required for NZEB amount of energy from RES.

Interaction between the Implementation Network / governance structures

Both policy instruments are implemented by the Ministry of Regional Development and Public Works (MRDPW), which is responsible for the enactment of the requirements for insulation of all new buildings.

The Ministry has the capacity to ensure the adequate implementation of the instrument. The administrative burden and costs will not increase significantly. As it has already been mentioned, the only problem to be resolved is the control of RES energy consumption „near the building“.

1.1.2 Case study for the transport sector

Introduction

National action plan to promote production and penetration of environmentally friendly vehicles including electrical mobility in Bulgaria 2012-2014

Bulgaria is one of the nine EU countries that supported the Joint Declaration on Electric Mobility in Europe (European Council 2010). With this act EVs were put in the spotlight and the countries called for supporting the creation of a common EU standard through financing of pilot projects in electric mobility.

The strategic goals laid out in the EU documents and the objectives and priorities of the Bulgarian national policy for sustainable economic development and environmental protection, form the objectives of this first action plan to promote the introduction and development of sustainable road transport, including electrical mobility in our country for the period 2012-2014 (Council of Ministers 2012), as well as the expected benefits of their implementation, namely:

- Encouraging the production of electric and other environmentally friendly vehicles in Bulgaria, including equipment items and parts. Their production is a relatively new industry that has yet to be developed. EVs represent a new market niche, thus creating conditions for inclusion of new operators in the market. On the other hand, this sector is based on innovative technologies that bring greater added value to our economy. Meanwhile, the development of the automotive industry will accelerate the expansion of other innovative sectors such as information and communication technologies, smart grids, as well as the services sector. As part of the "smart" networks, they will support the energy system by smoothing peaks in electricity consumption and compensate for irregular work of some renewable energy technologies.
- Stimulating of R&D for the elaboration of environmentally friendly vehicles and charging systems. The aim is to provide financial support to promote research into new materials and technologies related to the development of sustainable mobility.
- Stimulating the demand for new environmentally friendly vehicles. Bulgaria needs renewal of the fleet, the status of which is unsatisfactory. Currently more than 50% of the cars are over 15 years old. In addition, this involves significant financial resources for fuels, lubricants and service. The outdated vehicle fleet causes significant environmental pollution and risks to human health. Bulgaria is interested in putting in place measures to achieve the objectives in the field of renewable energy, namely by 2020 to increase the share of biofuels and other RES fuels in the energy consumption of transport to 10%.
- Accelerated construction of charging infrastructure. Building of charging infrastructure is a powerful factor for accelerating the deployment of electric and hybrid vehicles.
- Raising the awareness and capacity of stakeholders and the public on the nature, purpose and benefits from the development of sustainable mobility. In this policy's implementation it is important to raise the awareness of the parties of the benefits from choosing environmentally friendly vehicles and to focus on costs throughout the life cycle of these products.
- Encouraging the development of sustainable urban mobility. Promoting the development of electric mobility in cities. Introducing innovative low-carbon and energy efficient transport technologies and management systems by local authorities, thus providing sustainable future for the public transport. Reducing the dependence on fossil fuels and the generation of greenhouse gases and other pollutants.

The following groups of ecological vehicles will be treated with preferentiality:

- electric vehicles - that use an electric motor with full power and do not have an internal combustion engine;

- hybrids vehicles that use two or more drive systems of different types - the electric motor and an internal combustion engine (gasoline or diesel);
- passenger cars emitting CO₂ emissions up to 120 g/km; minibuses - up to 175 g/km; buses - the requirements of EURO V.

At this stage hydrogen technologies have not reached the required level for marketing that is why the primary focus of this segment is put on stimulation of research and development.

Preferences will be given to vehicles used for the transport of people and goods.

Relation to energy efficiency

In 2014 the number of the electric cars in Bulgaria was 497 and of the hybrid cars – 1031 (MEE & MOEW 2015)

The elaboration of the action plan was the first step; based on the experience gained, a policy for promotion of efficient vehicles will be developed.

Electric mobility is expected to be one of the key technologies that will contribute to the improvement of energy efficiency in transport, promotion of the use of intermittent RES (solar PV and wind), reduction of the uneven load of the electricity grid, reduction of the emissions and of the dependence on import of fossil fuels, enhancement of local employment and economic growth in the coming decades.

The instrument has direct effect on consumers of transport fuels, producers and traders of electric and hybrid cars, storage batteries, electricity etc.

Interaction between objectives

The primary objectives of this policy instrument are identical to those of all the other policy instruments in the transport sector: protection of the environment (including the reduction of CO₂ emissions), energy efficiency improvement, reduction of the import of fossil energy resources and increased security of supply (more than 90% of the energy sources used in the Bulgarian transport are imported) (NSI 2015).

Interaction between target groups

The national action plan for electrical mobility addresses the private cars. The other policy instruments in the sector are directed towards the transport infrastructure, rail and public urban transport. The measure is considered as a complementary to the other measures in the sector.

Interaction between rules-influencing mechanisms

The measures to promote the use of electric and other environmentally friendly vehicles, components and parts include:

- Exemption from annual tax for the owners of environmental vehicles for a period of 5 – 10 years. Introduction of preferential fees for initial registration of electric and hybrid cars and introduction of additional "green" component for the other vehicles on the basis of the CO₂ emissions generated;
- Relief of tolls for all environmental vehicles for the use of road infrastructure;
- Single grant for the purchase of new vehicles – 2 500 EUR for new electric car and 1 250 EUR for new hybrid car.

The interaction between influencing mechanisms for this instrument is financial (tax exemption, toll relief for the use of the road infrastructure and grants for the purchase of new vehicles).

The other measures in the transport sector are subsidized through the Operational Programmes with EU financing.

Interaction between the implementation network / governance structures

The principal institutions responsible for the building of low carbon economy and sustainable development in Bulgaria are:

- Ministry of Energy;
- Ministry of Economy;
- Ministry of Environment and Water;
- Sustainable Energy Development Agency.

The institutions in charge of the management, coordination and control of the state / local policy in areas related to sustainable road transport, including this action plan and electric mobility in Bulgaria, are:

- Ministry of Transport, Information Technology and Communications;
- Ministry of Finance;
- Ministry of Interior;
- Ministry of Regional Development and Public Works;
- Ministry of Education and Science;
- Local authorities.

The administrative burden is relatively low. The limiting factor at this stage is the financial feasibility of the large-scale promotion of electric cars due to the vehicles' high price and the building of a network of charging stations.

1.2 POLICY INSTRUMENTS WITH AN INDIRECT LINK TO ENERGY

1.2.1 Case study for the buildings sector

Introduction

Regulation on the labelling and provision of standard information about the consumption of energy and other resources by products consuming energy

This Regulation of the Council of Ministers has been in force since 20.07.2011 but the measure on labelling of household appliances has been implemented since 2006 (Council of Ministers 2015).

This Regulation determines:

- The procedure for providing information to consumers through labelling and information sheets on the consumption of energy and other resources, as well as other information about energy related products.
- The obligations of producers and traders to provide labelling of household appliances.

The Regulation applies to appliances, which have a significant direct or indirect impact on the consumption of energy and other resources.

The household appliances covered, are:

- Refrigerators and freezers;
- Washing machines;
- Drying machines;
- Combined washing/drying machines;
- Dishwashers;
- Lamps;
- Air-conditioners;
- Electric ovens.

The purpose of this Regulation is the provision of consumers with important and accurate information, which would enable them to make a correct choice.

Relation to energy efficiency

For example, the label of an air-conditioner includes the following information:

- Producer, his authorized representative or market distributor (name / company name or trademark).
- Model identification number.
- Energy efficiency class of the unit.
- EU ecolabel, if available.
- Annual energy consumption, estimated on the basis of the total input power, multiplied by an average of 500 hours/year for models for cooling at full load.
- Cooling output - cooling capacity in kW at full load operation. Energy efficiency ratio (EER) of the unit in cooling mode at full load.
- Type of appliance - cooling only or cooling/heating.
- Type of cooling - air cooling, water cooling.
- Heating capacity - heat output in kW, in heating mode at full load.
- Class of energy efficiency in the heating mode, expressed on a scale from A (most efficient) to G (least efficient). Coefficient of performance (COP) in heating mode.
- Noise level.

So far, no quantification of the effect of this instrument on the energy efficiency is available due to the lack of data and methodology. A barrier to the amplification of the effect of the measure is the lack of direct information about the reduction of energy costs. Consumers should do the corresponding calculations and compare the financial savings with the difference in the prices of appliances.

The main beneficiaries of the improved energy efficiency are the consumers, but also the producers and traders of more efficient appliances.

Interaction between objectives

This policy instrument interacts most closely with the eco-design requirements for energy related products which set minimal energy efficiency standards for household appliances, and the Residential Energy Efficiency Credit Line (REECL 2015).

The common objectives of these policy instruments are the reduction of energy consumption, costs and harmful emissions.

For example, the eligible products that are supported by the Residential Energy Efficiency Credit Line must comply with the requirements for mandatory energy efficiency standards and labelling.

Interaction between target groups

The three policy instruments mentioned above target the same groups – consumers, producers and traders of energy related products.

Interaction between rules-influencing mechanisms

The labelling, energy standards and REECL interact with the rules on the same trading commodity – energy related products.

The influencing mechanisms, however, are different for each instrument.

Energy labelling and standards are regulatory instruments for the producers and traders of the energy related products. They must comply with the requirements or face administrative sanctions and restrictions.

For consumers, the energy labelling serves as an important information source, enabling them to make a choice.

REECL is a financial policy instrument, which supports with soft loans and grants energy efficient products.

Interaction between the implementation network / governance structures

The capacity of the implementation network of the energy labelling and standards of products is adequate. The control of the implementation is carried out by the Commission for Consumer Protection and the Ministry of Economy.

There is no official data regarding the administrative burden and financial costs for the implementation of this policy instrument. The expert evaluation shows that these costs are low and the capacity of the existing institutions is being fully utilized.

1.2.2 Case study for the transport sector

Introduction

Mandatory technical inspections of vehicles

The periodical technical inspection of all road vehicles has been mandatory since more than 30 years.

The Regulation №32 from 16.12.2011 of the Ministry of Transport, Information Technology and Communications specifies the periodical mandatory technical and emissions control of vehicles (MTITC 2014).

The inspection includes control of the proper maintenance of engines, transmissions etc. and vehicles exhaust gas emissions. It is carried out by public centres for Technical Control and only some categories of vehicles are excluded (military vehicles, vehicles produced before 01.01.1960). Public

transport vehicles must undergo tests once every 6 months; the rest of the vehicles – once every year.

The primary objectives of this policy instrument are the safety of transport and the reduction of emissions.

Relation to energy efficiency

The average age of the vehicles in Bulgaria is high and, therefore, the improved maintenance leads directly to a reduction of fuel consumption.

Considering the age and the technical conditions of the road vehicles, the expert evaluation shows that the achieved average annual decrease of specific fuel consumption as a result of the regular maintenance and control of emissions is not less than 3%.

Interaction between objectives

Fuel saving driving is part of the training courses for the drivers of motor vehicles. The common objectives of the technical inspections of vehicles and the training of drivers are the safety of travel and reduced emissions. The limits for emissions are specified in the Clean Ambient Air Act (MOEW 2011).

The effect of the parallel implementation of the two policy instruments on the attainment of the above objectives is that the proper maintenance of the vehicles is a necessary precondition for the safe and fuel saving driving.

Interaction between target groups

The common target group of the both policy instruments (technical inspections and training of drivers) are the owners of road vehicles.

Interaction between rules-influencing mechanisms

If a vehicle does not meet the technical requirements, it does not receive permission to be used on the roads. Drivers do not receive driving license if they do not pass the training.

Interaction between the implementation network / governance structures

The Ministry of Interior and the Ministry of Transport, Information Technology and Communications are responsible for the implementation of the two policy instruments. Implementation network already exists and the capacity is adequate. No additional administrative cost is necessary.

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