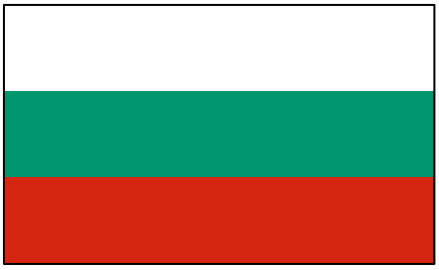
EU-MORE

EUropean MOtor
REnovation initiative



Bulgaria

Review of past and existing policy options for the acceleration of electric motor renovation

EU-MORE

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List of Acronyms

Acronym	Bulgarian	English
EERSF	Фонд "Енергийна ефективност и възобновяеми източници	Energy Efficiency and Renewable Sources Fund
ERDF	Европейски фонд за регионално развитие	European Regional Development Fund
OPIC	Оперативна програма "Иновации и конкурентоспособност"	Operational Programme "Innovations and Competitiveness"
SEDA	Агенция за устойчиво енергийно развитие	Sustainable Energy Development Agency

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1. Bulgaria

Introduction and description of the national policy framework and important related national programmes, measures and/or developments:

In Bulgaria there are several authorities responsible for overseeing and implementing various aspects of the policy framework:

- Ministry of Energy: main governing body responsible for formulating and implementing energy policies in Bulgaria.
- Sustainable Energy Development Agency (SEDA): implements state policies on energy efficiency and promotes renewable energy production and consumption.
- Energy Efficiency and Renewable Sources Fund (EERSF): acts as a lending institution, credit guarantee facility, and consulting company, supporting energy efficiency projects through technical assistance, financing, and guarantees.

The National Energy Efficiency Action Plan of Bulgaria sets out the country's targets for energy savings in the year 2020. The plan includes the following indicative targets[1]:

- Energy savings in final energy consumption: 716 ktoe/a
- Energy savings in primary energy consumption: 1,590 ktoe/a, with 169 ktoe/a specifically in the energy transformation, transmission, and distribution sectors.

To achieve these targets, Bulgaria relies on the implementation of strong energy efficiency policies and the optimal use of additional funds from various sources, including:

- European funds and programs
- Obligated persons (based on the energy efficiency obligation scheme for energy traders)
- Local sources
- State budget

The successful implementation of these targets will result in a reduction of primary energy consumption in 2020 from 18,460 ktoe (as projected in the reference scenario) to 16,870 ktoe. Furthermore, Bulgaria aims to achieve a 41% reduction in primary energy intensity by 2020 compared to the intensity levels recorded in 2005.

In accordance with the Energy Efficiency Act and Directive 2006/32/EC on energy end-use and energy services, Bulgaria has adopted a national indicative energy savings target of at least 9% of the average final energy consumption for the period 2001-2005. This target covers a nine-year period and has been supported by the development and implementation of the First (2008-2010) and Second (2011-2013) three-year action plans focused on improving energy efficiency in end-use energy.

Brief evaluation of the overall size and scope of national actions in relation to the replacement of electric motors and the EU-MORE project as a whole

Energy policy of the Republic of Bulgaria is fully consistent with the main objectives of energy policy of the European Union energy security, competitiveness and sustainable development. The Energy Strategy of the Republic of Bulgaria by 2020 is assumed that "energy efficiency is the highest priority in

[1] https://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-bulgaria.pdf

the energy policy of the country". On this basis, ambitious targets are set for improving energy efficiency[2].

1.1 Measure 1: Innovations and Competitiveness

	Overview
Short Description	Operational Programme "Innovations and Competitiveness" (OPIC) is the main program in Bulgaria that provides support to businesses through the European Structural and Investment Funds (ESIF) for the period 2014-2020. Its measures aim to foster innovation, entrepreneurship, and the growth of small and medium-sized enterprises, while promoting energy and resource efficiency in businesses to create sustainable competitive advantages.
Responsible Authority	Ministry of Innovations and Growth
Status	Ongoing
Issue Date	
Start Date	2014
Ending Date	
Duration	
Reference:	https://www.eufunds.bg/bg/opic

1.1.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

The Operational Programme **"Innovations and Competitiveness" 2014-2020 (OPIC)** is the main programmatic document at the national level outlining the support for Bulgarian businesses from the European Structural and Investment Funds for the period 2014-2020. OPIC is aimed at addressing the needs, overcoming challenges, and harnessing the opportunities for development in the Bulgarian economy. The measures outlined in the program aim to contribute comprehensively to the creation of sustainable, long-term competitive advantages for Bulgarian enterprises and to accelerate the transition to a knowledge-based economy. The support is focused on innovation development, entrepreneurship, capacity growth of small and medium-sized enterprises (SMEs), and the energy and resource efficiency of enterprises[3].

One of the project selection procedures of OPIC is **the "Rebuilding SMEs by improving energy efficiency" - BG16RFOP002-6.002**. The following text describes the criteria for selecting a project.

Eligible candidates:

- Micro, small, or medium-sized enterprises registered under the Commercial Act or the Cooperative Act.

[2] https://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-bulgaria.pdf
[3] https://www.eufunds.bg/bg/opic/node/553

- Candidates who have concluded financial years in 2018, 2019, and 2020.
- Candidates should engage in their primary economic activity in sector C "Processing Industry" according to the Classification of Economic Activities (CEA-2008).

The list of eligible categories of materials and equipment includes **possible expenditures for the acquisition of** machinery, facilities, equipment, systems representing durable assets, and materials. To be eligible for funding, candidates must meet certain requirements such as:

- Investments in energy production systems can be funded, provided that the energy produced is solely for self-consumption.
- Materials and equipment
- For all investments in materials and equipment from the List of eligible categories of materials and equipment, beneficiaries are required to annually provide energy consumption data for a period of three years after project completion.

In this regard, candidates can:

- Fund the acquisition of a new energy monitoring system using funds from the current procedure, including such expenses in the project.
- Fund the upgrade of an existing energy monitoring system to cover the energy consumption of the materials and equipment acquired through the project, using funds from the current procedure, including such expenses in the project.
- Not allocate funding for either of the two aforementioned options and ensure the possibility of submitting energy consumption data for the materials and equipment acquired through the project using their own resources.
- BDS EN ISO 50001 (Energy Management Systems)/EN ISO 50001 standard - up to BGN 9,000.00.

It is permissible to purchase technology/equipment through this procedure. When choosing technology/equipment from the List, candidates may include auxiliary materials and equipment necessary for their assembly and/or commissioning as functional units.

These **equipment groups** are established based on the following criteria:

- New energy-efficient systems and equipment available on the Bulgarian market.
- New energy-efficient systems and equipment based on Best Available Techniques (BAT).
- Operational characteristics compliant with national standards and regulations.
- Compliance with European and/or Bulgarian standards (e.g., DIN, ISO, CE marking, etc.).

List of eligible materials and equipment[4]:

1. Climate chambers with highly efficient heat/cold/moisture regeneration - Criteria
   - Standard for energy efficiency of electric motors: IE3 or IE4
   - Indoor air quality compatible with VDI 6022 hygiene guidelines
   - BDS EN 14825:2019: Energy efficiency class for heat pumps A+++, which correspons to the following Seasonal Coefficient of Performance (SCOP):
     - SCOP at high temperature (+40°C) ≥ 3.75
     - SCOP at low temperature (-15°C) ≥ 4.38
     - SCOP of the refrigeration cycle ≥ 3.80
     - $SCOP_{net}$ of the entire system ≥ 5.00
   - Monitoring requirement
     - Minimum measurement points include:
       - Power meter for each climate chamber

[4] https://opic.bg/news/uo-na-opik-obyavyava-za-obshchestveno-obszhdane-protsedura-za-podbor-na-proekti-bg16rfop002-6002-vzstanovyavane-na-msp-chrez-podobryavane-na-energiynata-efektivnost (conditions for application - appendix 18)

- Temperature measurement of the four airflows: exhaust, supply, ambient, and exhaust air.

2. Pumps – Criteria:
   - Standard for energy efficiency of the motor: IE3 or IE4
   - Minimum Energy Efficiency Index (MEI) ≥ 0.70
   - Minimum Efficiency Index (IEE) for circulation pumps ≤ 0.20
   - Built-in electronic control
   - Monitoring requirement
     - Minimum measurement points include: Power meter for each pump or group of pumps with a common power supply line and total installed electrical power above 15 kW.
3. Compressors for compressed air – Criteria:
   - Energy efficiency standard for the main motor with nominal power 2 ÷ 18 kW: ≥ IE3
   - Energy efficiency standard for the main motor with nominal power 19 ÷ 75 kW: ≥ IE4
   - Operating pressure: 7.5 ÷ 13 bar
   - Piston compressors:
     - Up to 10 bar: 7.3 ÷ 10.3 kW/m^3/min
     - 10 ÷ 15 bar: 8.7 ÷ 13.0 kW/m^3/min
   - Rotary compressors:
     - Up to 7.5 bar:
       - 2 ÷ 18 kW: 6.2 ÷ 8.2 kW/m^3/min
       - 19 ÷ 75 kW: 5.4 ÷ 6.3 kW/m^3/min
     - 7.5 ÷ 10 bar:
       - 2 ÷ 18 kW: 7.3 ÷ 10.3 kW/m^3/min
       - 19 ÷ 75 kW: 6.4 ÷ 7.2 kW/m^3/min
     - 10 ÷ 13 bar:
       - 2 ÷ 18 kW: 8.7 ÷ 13.0 kW/m^3/min
       - 19 ÷ 75 kW: 7.8 ÷ 8.8 kW/m^3/min
   - Monitoring requirement:
     - Minimum measurement points include: Power meter for each new compressor.
4. Systems for Motor Speed Control with Frequency Converters/Inverters and Soft Starters - Criteria
   - Maximum motor power not exceeding 300 kVA
   - Built-in communication capabilities
   - Built-in EMC (Electromagnetic Compatibility) filter
   - Requirement for monitoring
     - The minimum measurement points include: Power meter for each frequency converter/soft starter or a group of frequency converters/soft starters with a common power supply line and a total electrical power exceeding 15 kW

* There are 19 more different categories which do not consider any motor measures.

<table>
<tr><th></th><th>Characteristics</th></tr>
<tr><td>Budget</td><td>

The budget for OPIC program deviates from year to year. The whole budget from 2014 up to 2022 was BGN 3.250 Mio. (€ 1.662 Mio.). Projects are financed around 87% through EU fund and 13% through national fund[5]

<table>
<tr><td></td><td>2014</td><td>2015</td><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td><td>2021</td><td>2022</td></tr>
<tr><td>Budget in Mio. [BGN]</td><td>331</td><td>400</td><td>299</td><td>337</td><td>434</td><td>315</td><td>673</td><td>271</td><td>190</td></tr>
<tr><td>Budget in Mio. [EUR]</td><td>169</td><td>204</td><td>153</td><td>172</td><td>221</td><td>161</td><td>343</td><td>138</td><td>97</td></tr>
</table>

Total budget for the project procedure “Rebuilding SMEs by improving energy efficiency” - BG16RFOP002-6.002 is BGN 136 Mio. (€ 70 Mio.)[6]

Project size: minimum BGN 25.000 (€ 12.800) and maximum BGN 150.000 (€ 76.850)
Funding rate: max. 50%

</td></tr>
<tr><td>Financing of the measure</td><td>European and national funds</td></tr>
<tr><td>Policy focus</td><td>Physical intervention</td></tr>
<tr><td>Intervention Type</td><td>Equipment upgrade</td></tr>
<tr><td>Main Barriers Addressed</td><td>High initial cost, return on investment, emission reduction</td></tr>
<tr><td>Key Driver(s)</td><td></td></tr>
<tr><td>Replicability</td><td>High</td></tr>
<tr><td>EU Inclusion</td><td>Yes</td></tr>
<tr><td>Related Characteristics</td><td></td></tr>
</table>

[5] https://2020.eufunds.bg/bg/5/0/OPProfile

[6] https://opic.bg/news/uo-na-opik-obyavyava-za-obshchestveno-obszhdane-protsedura-za-podbor-na-proekti-bg16rfop002-6002-vzstanovyavane-na-msp-chrez-podobryavane-na-energiynata-efektivnost

1.1.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

A total of 842 projects were submitted, out of which 795 contracts were approved. Out of these approved contracts, 127 projects have been completed while 668 projects are still ongoing[7].

The total value of all the projects is BGN 159 Mio. with 50% funding.

The program is still ongoing and no evaluation for the saved energy or saved CO_2 emissions was found.

	Impacts
Case level impact	Medium
Policy level impact	Medium
Size	No information
Energy	No information
Impact evaluation	

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

no information

[7] https://2020.eufunds.bg/en/5/0/Project/Search?Prior=CxCZITJVNBvv9OGjGBpwKw%3D%3D&Proc=YGXVoOcFbUYDyum8Dg4UHw%3D%3D&showRes=True

1.1.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. Also include (if applicable) the main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

no information

	Lessons Learnt
Key takeaways	
Recommendations	
Linked measures	
Reference(s)	https://opic.bg/news/uo-na-opik-obyavyava-za-obshchestveno-obszhdane-protsedura-za-podbor-na-proekti-bg16rfop002-6002-vzstanovyavane-na-msp-chrez-podobryavane-na-energiynata-efektivnost https://eumis2020.government.bg/bg/s/Procedure/Info/11f75244-8bb7-48c8-8525-073b27955aba https://2020.eufunds.bg/bg/5/0/OPProfile http://ope.moew.government.bg/bg/notice/noticedetail/from/noticecurrent/id/86/typeId/1
Other	
Thoughts, comments, considerations ...	

1.2 Measure 2: Energy Efficiency and Renewable Sources Fund

	Overview
Short Description	Energy Efficiency and Renewable Sources Fund (EERSF) as an entity that combines the functions of a lending institution, a credit guarantee facility, and a consulting company. It offers support to Bulgarian enterprises, municipalities, and private individuals by providing technical assistance for the development of energy efficiency investment projects. EERSF assists in securing financing or co-financing and can act as a guarantor for other financial institutions.
Responsible Authority	Government of Bulgaria (Ministry of Economy and Energy)
Status	Ongoing
Issue Date	2004
Start Date	2006
Ending Date	Ongoing
Duration	
Reference:	https://www.bgeef.com/en/

1.2.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

Eligible candidates[8] for funding are:

- Municipalities
- Corporate Clients
- Private individuals

Application process[9]:

1. Detailed Energy Audit

   A necessary condition for a successful application with the EERSF is the presence of a detailed energy audit allowing for an energy analysis and choice of energy saving measures.

2. The Project Cycle
   - Project identification (Project Developer)
   - Initial project screening (when necessary, EERSF/external consultancy company)
   - Completion of Initial Project Proposal (IPP) (Project Developer)
   - Submission of IPP and accompanying documents to EERSF (Project Developer)
   - Assistance in IPP and accompanying documents completion and improvement (EERSF)
   - Project appraisal and assessment (EERSF)
   - Formal decision for approval of EERS financing

[8] https://www.bgeef.com/en/energy-efficiency-measures/
[9] https://www.bgeef.com/en/application-procedure/application-process/

- Completion of negotiations for financing and disbursement of funds

Principal Eligibility Criteria[9]:

All energy efficiency projects approved and supported by the EERSF should meet the following eligibility criteria:

- The project should involve the application of well-proven technology;
- The project cost should range between BGN 30 000 and BGN 3 000 000 although exceptions are possible if strongly justified;
- The equity contribution of the Project Developer should be at least 10%;
- The repayment period is up to 10 years.

The **financial resources** of the Fund can be used to finance in the following six types of investment[10]:

1. Investments in improved energy efficiency (EE) in industrial processes, including but not limited to:
   - Purchase of equipment, machinery, and tools;
   - Installation of the purchased equipment; and
   - Training of staff in the proper use of the equipment and new technologies.
2. Rehabilitation of buildings in all sectors. The rehabilitation should be directed towards improving EE, including but not limited to:
   - Improvements to mechanical heating ventilation and air-conditioning;
   - Others
3. Improvements to heat sources and distribution systems,
4. Rehabilitation of municipal facilities, e.g., street lighting.
5. Other energy end-use applications, including but not limited to:
   - Energy management control systems;
   - Power factor correction measures;
   - Air compressors; and
   - Others
6. Demand-side off-grid renewable energy generation:

[10] https://econoler.com/wp-content/uploads/2021/01/Bulgarie2021.pdf

	Characteristics	
Budget	**Year**	**Secured budget**[11]
	2005-2008	BGN 21,9 Mio.
	2013	EUR 5 Mio.
	2014	EUR 5 Mio.
	○ The project cost should range between BGN 30 000 and BGN 3 000 000 although exceptions are possible if strongly justified	
Financing of the measure	Global Environment Fund (GEF), the Government of Bulgaria, the Government of Austria, European Bank for Reconstruction and Development (EBRD), Kozloduy International Decommissioning Support Fund (KIDSF) and from the Bulgarian private sector[11]	
Policy focus	Soft and physical interventions	
Intervention Type	Equipment upgrade	
Main Barriers Addressed	High initial cost, return on investment, ease of regulation and emission reduction	
Key Driver(s)	Energy Efficiency Act (EEA) in 2004 was a key driver	
Replicability	High	
EU Inclusion	Yes, it is a part of the NECP of Bulgaria	
Related Characteristics		

[11] http://citynvest.eu/sites/default/files/library-documents/Model%2019_Energy%20Efficiency%20and%20Renewable%20Sources%20Fund%20-EERSF_final.pdf

1.2.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation.

From its initial launch in mid-2006 to the end of 2020, EERSF granted energy efficiency loans of a total of 212 projects, representing a combined project investment exceeding USD 57.7 million. Additionally, during this time period, the Fund provided partial credit guarantees or portfolio guarantees to 33 projects, with a total project investment valued at USD 14.7 million.

By the end of 2014, the energy efficiency investments supported by EERSF had achieved a total energy savings of 95,4 MWh/year and a reduction of 75 kt/year of CO_2eq emissions[12].

By the end of 2020, the energy efficiency investments supported by EERSF had resulted in a significant impact, with a total energy savings of 129,160 MWh/year and a reduction of 93,052 kt/year of CO_2eq emissions[13].

	Impacts
Case level impact	Medium
Policy level impact	Medium
Size	212 projects
Energy	Energy savings of 129,160 MWh/year and a reduction of 93,052 kt/year of CO_2eq emissions
Impact evaluation	The achievements of EERSF showcase the effectiveness of its concept and the value it brings to the energy efficiency sector. Despite facing financial constraints, the fund has been able to deliver tangible results, demonstrating the demand and necessity for innovative approaches in promoting energy efficiency. The positive outcomes achieved by EERSF provide valuable insights and inspiration for other regions and countries seeking to develop similar initiatives and implement sustainable business models to drive energy efficiency advancements[13].

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

no information

[12] http://citynvest.eu/sites/default/files/library-documents/Model%2019_Energy%20Efficiency%20and%20Renewable%20Sources%20Fund%20-EERSF_final.pdf
[13] https://econoler.com/wp-content/uploads/2021/01/Bulgarie2021.pdf

1.2.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. Also include (if applicable) the main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

EERSF did not fulfil the initial expectations of funders regarding its role in the energy efficiency financing market in Bulgaria, as indicated by a World Bank midterm review. EERSF demonstrated its success by identifying an alternative market niche, focusing on providing loans and guarantees to public-sector EE projects and actively supporting project preparation. EERSF initially assumed that commercial banks would require partial credit guarantees as a condition for entering the EE finance sector. However, the Bulgarian finance community did not perceive such guarantees as necessary for financing EE projects. Instead, public-sector borrowers had a strong repayment track record, and corporate sector loans were provided based on balance sheets and previous lending experience. Consequently, significant effort was required to persuade banks in Bulgaria to engage in purchasing partial credit guarantees through extensive sales efforts conducted by the Fund[14].

	Lessons Learnt
Key takeaways	The following principles have been identified as critical to EERSF's success[14]: 1. Flexible funding operations 2. Rely on ESCOs' support to develop the market 3. Market transformation 4. Identifying of unaddressed niches
Recommendations	
Linked measures	
Reference(s)	
Other	
Thoughts, comments, considerations ...	

[14] https://econoler.com/wp-content/uploads/2021/01/Bulgarie2021.pdf

Table 1: National Policy Measure Overview – Bulgaria

#	Measure Title	Short Description	Type of Measure	Start Year	End Year	Duration	Target Groups	Source link / Reference	Case Level Impact of the measure
1	Innovations and Competitiveness	The main objective of the European Regional Development Fund (ERDF) support within the Operational Programme "Innovation and Competitiveness" (OPIC) 2014-2020 is to cater to the requirements, overcome the obstacles, and capitalize on the prospects for the advancement of the Bulgarian economy.	Equipment upgrade	2014	ongoing		Micro, small, or medium-sized enterprises	Link	Medium
2	Energy Efficiency and Renewable Sources Fund	Energy Efficiency and Renewable Sources Fund (EERSF) as a entity that combines the functions of a lending institution, a credit guarantee facility, and a consulting company. It offers support to Bulgarian enterprises, municipalities, and private individuals by providing technical assistance for the development of energy efficiency investment projects. EERSF assists in securing financing or co-financing and can act as a guarantor for other financial institutions.	Equipment upgrade	2006	ongoing		Municipalities, Corporate Clients, Private individuals	Link	Medium