



**EXPERT EVALUATION NETWORK
DELIVERING POLICY ANALYSIS ON THE
PERFORMANCE OF COHESION POLICY 2007–2013
YEAR 1 – 2011**

**TASK 1: POLICY PAPER ON RENEWABLE ENERGY AND
ENERGY EFFICIENCY OF RESIDENTIAL HOUSING**

BULGARIA

VERSION: FINAL

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**A report to the European Commission
Directorate–General Regional Policy**

CONTENTS

1. EXECUTIVE SUMMARY	4
2. NATIONAL POLICY	5
3. ERDF AND COHESION FUND SUPPORT AND CONTRIBUTION TO NATIONAL POLICY	7
4. RATIONALE FOR PUBLIC INTERVENTION	9
5. RATE OF SUPPORT AND PROFITABILITY	10
6. COSTS, PUBLIC SUPPORT AND PRICES	11
7. CONCLUSIONS	13
REFERENCES	15
INTERVIEWS	16
TABLES AND FIGURES	16

LIST OF ABBREVIATIONS

- ASED – Agency for Sustainable Energy Development
- BEERECL – Bulgarian Energy Efficiency and Renewable Energy Credit Line
- BEEF – Bulgarian Energy Efficiency Fund
- EE – Energy Efficiency
- EEA – Energy Efficiency Act
- EEN – Expert Evaluation Network
- ERDF – European Regional Development Fund
- ERSA – Energy from Renewable Sources Act
- ESF – European Social Fund
- KIDSF – Kozloduy International Decommissioning Support Fund
- kWh – Kilo Watt Hour
- MWh – Mega Watt Hour
- NLTPEE – National Long-Term Programme on Energy Efficiency 2005–2015
- NDPVEI – National Long-Term Programme for Encouraging the Use of Renewable Energy Sources 2005 – 2015
- NPRRB – National Programme for Renovation of Residential Buildings
- OP – Operational Programme
- OPRD – Operational Programme Regional Development
- RAESBA – Renewable and Alternative Energy Sources and Biofuels Act
- REA – Renewable Energy Act
- REECL – Residential Energy Efficiency Credit Line
- RES – Renewable Energy Sources
- SEWRC – State Energy and Water Regulatory Commission

1. EXECUTIVE SUMMARY

Bulgaria aims to supply 16% of gross final energy consumption in the country from renewable energy sources (RES) by 2020. The quantities of renewable energy needed to achieve the national and EU “20–20–20” target primarily depend on progress in increasing efficiency in energy use, the transmission/distribution of electricity and heat and the consumption of electricity for power plant' own needs¹. The rationale for public support of renewables (mainly through feed-in tariffs) is that currently energy production from renewables is not yet competitive with energy generated from fossil fuels². Another common concern is the energy sustainability and security of supply, which calls for diversification of energy sources away from traditional sources. Although measures for support of RES are already in place, the profitability rate of each electricity producer differs, since it depends on their efficiency, as well as the received preferential prices and the price for connecting to the national power grid – two factors that vary with the type of RES, the technology used, location, investment expenditure, labour costs and so on. The Energy Strategy of Bulgaria up until 2020 (as at June 2011) foresees improvements in energy efficiency (EE) amounting to a 50% saving of primary energy. The latter translates into an annual reduction in imports of energy sources of EUR 6 billion. Action in two areas is anticipated:

- Energy savings in final consumption (households, industry, transport and the service sector). Typically, buildings account on average for 40% of the total energy consumption in both the EU and Bulgaria. Such a substantial percentage implies significant potential for increases energy efficiency and cost reductions;
- Energy savings in generating and transforming energy.

ERDF support for the promotion of renewable energy sources and energy efficiency in residential housing is limited (5.12% of the total ERDF funding³). The support for the use of RES amounts to less than 3% of Operational Programme (OP) Competitiveness and 4% of OP Regional Development (OPRD), though this covers more than just RES development. As regards of energy efficiency in residential housing, support is even smaller. Operation 1.2 Housing, which is the most substantial measure supporting energy efficiency of residential housing, amounts to 2.5% of OPRD, however no actual allocation of funding has occurred yet⁴. These shares understate the importance of ERDF funding in total national support for RES and energy efficiency since the Government has reduced the amount of national funding allocated to these areas since 2007.

¹ Energy Strategy of the Republic of Bulgaria until 2020, Promulgated in *State Gazette* No 43/June 7, 2011.

² Energy and Good Governance in Bulgaria: Trends and Policy Options, Center for the Study of Democracy, 2011.

³ Data, provided by DG Regional Policy.

⁴ Information system for managing and monitoring of the EU structural instruments in Bulgaria, maintained by the Ministry of Finance, <http://umispublic.minfin.bg/>

2. NATIONAL POLICY

The Renewable and Alternative Energy Sources and Biofuels Act (RAESBA) passed in 2008 is the first piece of national legislation, entirely dedicated to the RES.⁵ The main support mechanisms, introduced by the law, provide for equal preferential treatment for producers of electricity; mandatory inclusion of utilities generating electricity from RES and biofuels into the national grid; establishing preferential prices for purchasing energy generated from RES; and reducing the administrative burden on producers (Annex Table D). The law resulted in a rapid development of RES (wind and photovoltaic), which put upward pressure on electricity prices. As a result in June 2011 the Bulgarian Parliament adopted the Energy from Renewable Sources Act (ERSA)⁶, which replaced RAESBA. The new legislation kept RES preferential treatment options but introduced a preference for energy from biomass and shifted the balance of power from RES producers to grid operators and allowed for a substantial reduction of the prices of energy from photovoltaic (PV)⁷.

Financial support for electricity produced from renewable energy sources is provided in the form of feed-in tariffs. Feed-in tariff rates amount to 80% of the average selling price of the Public Supplier in the previous calendar year plus a surcharge determined by the State Energy and Water Regulatory Commission (SEWRC). Each year, by 31 March, the regulator draws up a document setting the feed-in tariffs. According to Ecofys estimates⁸, the Bulgarian support to RES-electricity (the premium on top of the revenue) was EUR 18 million in 2009, though the support varies depending on the price of RES in the previous year (Annex Table C).

The national RES support measures do not vary between regions and location is not a factor while applying for grants. However the number of RES applications per region is affected by: a) the natural RES potential of the region and b) the presence of *Natura 2000* protected areas. For example the region with the most wind potential, the North-east region, has many *Natura 2000* protected areas, which has resulted in environmental conflicts with the installations of wind generators⁹.

Bulgaria has adopted a few legislative incentives to support and promote energy efficiency of residential housing. While these are gradually being taken up, most of them remain commitments only. The Energy Efficiency Act (EEA) of 2004 laid down the foundations. It

⁵ Renewable and Alternative Energy Sources and Biofuels Act – Prom. SG. 49/19.06.2007, amended SG. 98/14.11.2008, into force since 14.11.2008, <http://www.mi.government.bg/eng/gzakone/gzakone/docs.html?id=253701>

⁶ Promulgated in *State Gazette* Nr. 35/May 3, 2011.

⁷ Green Energy Governance in Bulgaria: at a Crossroads, Center for the Study of Democracy, 2011 (upcoming).

⁸ Source: Financing Renewable Energy in the European Energy Market, Ecofys, Fraunhofer ISI, TU Vienna EEG, Ernst & Young, 2 January 2011

⁹ Interview with a representative of the Bulgarian Ministry of Environment and Water, 28.04.2011.

created the Bulgarian Energy Efficiency Fund, which has a mandate to support a broad range of investments, from EUR 15,000 to EUR 1.5 million, and in practice provides support for a variety of measures. Its main beneficiaries are public buildings. The legislation also introduced Energy Service Companies (ESCO). The National Long-Term Programme on Energy Efficiency 2005–2015 (NLTPEE) substantiated the country's commitment to this, while the National Programme for Renovation of Residential Buildings (NPRRB)¹⁰ introduced a more specific plan for energy efficiency improvements in residential buildings. Particular measures for increasing EE in residential apartment buildings of more than three floors include thermal insulation, heating installation; double glazing and use of renewable energy sources. NPRRB operates under two sub-programmes. The first started in 2005, for a period of 11 years covering 105 000 residential buildings. The second programme became operational in 2008, for a period of 13 years and covers 579,676 buildings. A total of BGN 4,150 million (EUR 2,121.8 million) is estimated to be required for the completion of the programme. Of this, BGN 830 million (EUR 424.4 million) is intended to be met by a direct grant from Government, representing 20% of the cost of renovation projects in both sub-programmes.

The Bulgarian Energy Efficiency Agency, in collaboration with the European Commission and the European Bank for Reconstruction and Development, has established a EUR 50 million Residential Energy Efficiency Credit Line (REECL) facility to provide loans to householders for specific energy efficiency measures.¹¹

The global financial and economic crisis has had a marked effect on the Bulgarian economy. It has generally resulted in a reduction of activity in RES and energy efficiency as it has reduced the ability of businesses and households to participate in such schemes. Falling energy demand has pushed energy prices down and has resulted in less economic incentives for energy saving. As RES, in particular PV, remain uncompetitive and are viewed by consumers as expensive in comparison to other sources of energy, there has been a natural backlash from Bulgarian consumers towards RES development in 2010 and 2011. The crisis could affect to some extent the future allocation of resources, though any future developments are more likely to be technology and policy-driven. It is expected that feed-in tariffs and preferential prices for RES will decline with advances in technology. At the same time, EE measures will gain momentum.

¹⁰ National Programme for Renovation of Residential Buildings in the Republic of Bulgaria ('NPOGBR'), 2005, <http://www.mrrb.government.bg/index.php?lang=bg&do=law&type=4&id=225>

¹¹ Source: Website of the Residential Energy Efficiency Credit (REECL) Facility, <http://www.reecl.org/indexen.php>

3. ERDF AND COHESION FUND SUPPORT AND CONTRIBUTION TO NATIONAL POLICY

Since national funds are scarce, ERDF support is fundamental for RES and EE in Bulgaria. Even if the latter represents a small share of the OP budgets (5.1% of the total ERDF and Cohesion funding), the absolute value of ERDF support for the two areas (EUR 281.2 million) is substantially higher than any potential allocation from the national budget. Even the most strategic plans such as the Bulgarian Energy Strategy up until 2020 and various Action Plans depend heavily on EU support. Most of the national support consists of indirect measures relating to the requirements of EU Directives, as well as support to credit lines, while ERDF support is provided in the form of grants. Hence, the two mechanisms complement each other, the difference being not in the type of RES and EE supported but in the form of support. However, this allows overlap of support from national and ERDF sources in the case of not properly administered measures.

RES and EE represent a modest share of all ERDF support in the activities of the respective OPs – RES take 3% of the total budget of OP Competitiveness, while OP Regional Development (OPRD) envisages 4% for efficient energy resources and 1% for energy efficiency measures in municipal infrastructure (See Annex Figure 1, 2, 3 and 5). Additionally, OPRD plans to launch two EE schemes for residential housing in the Autumn which will represent 2.5% of the total OP budget. The scale of national support is difficult to calculate since most of it is indirect and the SEWRC does not provide data on distributed support in terms of feed-in tariffs. Accordingly, there is currently no official data available on the precise amount of national funding. An external evaluation on national support to RES–Electricity for 2009 is presented in Table B below, though it cannot be compared with ERDF support. A list of the national measures is presented in Annex Table D. The ERDF and national support does not vary between regions.

Support for RES from the ERDF comes mainly through two Operational Programmes – OP Competitiveness and OP Regional Development. Priority Axis 2 of OP Competitiveness: Introduction of Energy-Saving Technologies and Renewable Sources is the only area of intervention which is substantially aimed at supporting the use of RES. This has an indicative funding of EUR 205.8 million, which represents nearly 18% of the total budget for the entire OP. Of this, EUR 34.2 is the amount reserved solely for renewable energy, which is just under 3% of the total indicative budget of the Programme¹². The process of allocating funding is set to begin in the second quarter of 2011 and therefore no actual allocation has occurred yet. The vast majority of companies are targeted since potential beneficiaries include micro, small, mid-size and large firms. The measures from which the companies

¹² EU Structural Funds Single Information Webportal, <http://eufunds.bg/en/page/14>

would be able to benefit are wide-ranging including the introduction of energy-saving technologies and RES, reducing energy losses and improving energy management¹³. All forms of RES are eligible, although the OP mostly envisages the use of solar and wind power.

The RES component of the already concluded contracts in OP Regional Development (OPRD) as at the end of 2010 (mostly installation of solar panels in municipal buildings and schools) is very small – BGN 7.3 million (EUR 3.7 million) or 0.2% of the OP budget¹⁴. Some RES measures are also foreseen in Operation 2.3 Access to Sustainable and Efficient Energy Resources, which has a budget of EUR 60 million (4% of the total OPRD budget). Its objective is to provide access to the national gas distribution network and the construction of RES installations in municipalities which do not have gas distribution licenses¹⁵. No schemes have been launched yet (with the exception of a call for a feasibility study for the gas interconnector between Bulgaria and Serbia) and no actual allocation of funding has occurred¹⁶.

Support for energy efficiency is financed mainly under OP Regional Development (Operation 1.2 Residential Policy form Priority Axis 1) with an indicative budget of EUR 40 million. So far the OP has been focused on EE in public buildings (schools and municipalities). All the residential housing measures are still to be initiated. They will include EE renovation and construction, insulation, heating systems (incl. gas) and use of RES.

The Ministry of Regional Development and Public Works plans launched two schemes under Operation 1.2. Residential Policy in June 2011 – the first for the construction of new buildings, including EE measures, for groups at risk and people with low incomes in one or two municipalities (BGN 16 million or EUR 8.2 million), and the second one – for condominium associations (BGN 63 million or EUR 32.2 million) to improve EE in about 530 apartment buildings. The schemes will provide up to 50% finance for energy audits and construction/renovation works. The two schemes account for 2.5% of the total OP budget¹⁷.

Another scheme, Support for Energy Efficiency Measures in the Municipal Educational Infrastructure of Urban Agglomerations, has been more successful since the current allocated budget amounts to EUR 42.6 million. However, even though there are measures for energy efficiency of residential housing and RES included in it, the 23 signed contracts

¹³ Additional information on the procedure “Introduction of energy-saving technologies and renewable sources” from ecomedia.bg, <http://ecomedia.bg/business/finance/article/5767>

¹⁴ Interview with a representative of the Ministry of Regional Development and Public Works, 09.05.2011.

¹⁵ EU Structural Funds Single Information Webportal, <http://eufunds.bg/en/page/8>

¹⁶ Information system for managing and monitoring of the RU structural instruments in Bulgaria, maintained by the Ministry of Finance, <http://umispublic.minfin.bg/opPriorityLines.aspx?op=3>

¹⁷ Interview with a representative of the Ministry of Regional Development and Public Works, 09.05.2011.

(up to 5 April 2011) only involve municipalities and the renovation of public buildings¹⁸. Some support is also foreseen in Priority Axis 4 Local Development and Cooperation and Support for Energy Efficiency Measures in the Education System of 178 Small Municipalities scheme, which is part of it.

All already concluded EE contracts (for public, non-residential buildings) under OP Regional Development have been specifically launched to counter the effects of the economic crisis. The EE measures for residential housing however were planned in 2007 and are not related to the economic downturn.

No full mid-term results of OPs have been made publicly available as of June 2011 and this makes it hard to assess the actual situation. An exception is the Executive Summary of the Final Report to the Mid-Term Evaluation of Operational Programme Regional Development 2007–2013¹⁹, which however is not focused on EE or RES. What can be stated with some certainty is that, despite some acceleration over the past year, Bulgaria is seriously lagging behind in terms of spending, the actual allocation of funds and the undertaking of projects. This is primarily due to administrative obstacles, slow administration of support schemes, and inappropriate project management. With no clear basis for assessing progress, no adjustments are currently being made to the indicative allocation of grants, though there is a general trend towards accelerating the start-up of pre-defined schemes.

4. RATIONALE FOR PUBLIC INTERVENTION

All strategic documents in support of RES and EE present as their rationale the increase in economic welfare which is likely to result and the need to comply with European standards. Market failure is the prime rationale for public intervention in the case of RES. Production of energy from renewable sources is still more expensive than from fossil fuels, which naturally results in higher consumer prices. Feed-in tariffs are the means introduced to balance prices of energy produced from RES with those of energy produced from conventional sources.

One of the main concerns expressed in energy-related strategy documents is the high energy-consumption rate of the Bulgarian economy, which urgently calls for energy efficiency and energy-saving measures. Another common concern is energy sustainability and security of supply, which calls for diversification of energy sources. The National Renewable Energy Action Plan, formulated by the Ministry of Economy, Energy and Tourism, also presents a rationale for public intervention, based on various forecasts, which stresses

¹⁸ Information system for managing and monitoring of the RU structural instruments in Bulgaria, maintained by the Ministry of Finance, <http://umispublic.minfin.bg/>

¹⁹ Mid-Term Evaluation of Operational Programme Regional Development 2007–2013. Executive Summary of Final Report, 28 February 2011, KPMG, http://www.bgregio.eu/FCKeditor/UserFiles/File/ExSUM_%20final%20report-EN.pdf

the uneven distribution between the various types of RES. No explicit projections have been made in terms of profitability, but extensive analysis has been undertaken to investigate the existing and future potential of energy from renewables. The Energy from Renewable Sources Act (in force from 3 May 2011) established rules which are meant to ensure equal preferential treatment and profitability opportunity for all RES types. As the law entered into force only recently, it is too early to say whether it will actually support all RES equally. Some investors have voiced concerns that biomass might receive higher rates of implicit subsidy, allowing a higher rate of return, than wind and PV. The actual profitability of RES plants will depend very much on the dynamics of RES preferential prices, which are set annually by SEWRC. Studies have shown that Bulgaria's existing technical potential is sufficient to ensure the achievement of the national target of 16 % by 2020.

As regards housing, which is a highly energy-intensive, the majority of residential buildings are old and not well maintained. This results in high electricity bills. This was explicitly recognised in the NPRRB²⁰. In terms of EE in housing, profitability is not the primary objective, since support will be provided on the basis of EE audits of buildings, their state and needs. The aim is a social one – of improving the living conditions of the people in the oldest and most energy inefficient buildings. Environmental returns are taken into account in the deployment of both ERDF and national support, but they are far from being the main consideration²¹.

5. RATE OF SUPPORT AND PROFITABILITY

In the Ordinances²² for regulating the prices of electricity (proposed by the SEWRC and approved by the Council of Ministers), the rate of return is among the key factors for setting future electricity prices, including from RES. The SEWRC also regulates the surcharge included in the feed-in tariffs (80% of the average selling price of the previous year) for RES electricity. The surcharge differs with the type of technology used, size of installed capacity, available resources of primary energy and scale of investment. The support measures (feed-in tariffs and preferential prices) are decided at national level and are uniform across regions. The National Energy Strategy up until 2020 stipulates that energy from RES will be the only one for which prices will decline in the longer term with the advance of technology. Over the next decade, however, it is not expected that the support for renewables will be abolished. Before 2011, it was not possible for there to be any sharp decline in RES prices due to a clause that forbade SEWRC to amend the surcharge for any particular RES type by

²⁰ National Programme for Renovation of Residential Buildings in the Republic of Bulgaria, 2005, <http://www.mrrb.government.bg/index.php?lang=bg&do=law&type=4&id=225>

²¹ Interview with a representative of the Ministry of Environment and Water, 28.04.2011.

²² An example is the Ordinance for Regulating the Prices of Electricity (2004, amended 2007), http://www.dker.bg/files/DOWNLOAD/ordinance_electro.pdf

more than 5% of its value in the previous year (Art. 21 of the Renewable and Alternative Energy Sources and Biofuels Act, 2007²³). This rule was scrapped by the Energy from Renewable Sources Act (May 2011), which resulted in a substantial fall in the level of support for PV and an increase in support for biomass from farm waste from June 2011. The rate of support for wind energy remained unchanged.

The financing schemes relating to the energy efficiency of residential housing are relatively new and changes in the level of support cannot be attributed to changes in the cost of electricity or heating or the potential for self-financing. The National Renewable Energy Action Plan (June 2010)²⁴ lists the specifics of EE support and even for the future sets a fixed rate of support for planned measures. The existing residential energy efficiency credit lines also provide assistance at fixed rates (share of the loan).

As regards ERDF support, the obligatory energy audits introduced, in particular by OP Regional Development, specify the necessary types of EE measures and the budget needed for each building to be renovated. Hence, applicants cannot overstate the energy efficiency potential or declare larger co-financing capacity in order to increase their chances of being supported. The financing depends primarily on the outcome of the energy audit and on technical parameters such as the age of the building²⁵.

6. COSTS, PUBLIC SUPPORT AND PRICES

Statistical data on the public support provided to each type of RES are scarce and hard to calculate. An estimate by Ecofys (Table B) shows that Bulgaria lags considerably behind in terms of national support to RES–electricity not only in absolute terms, but also per MWh. The specific measures to fulfil the requirements under Directive 2009/28/EC are described in the National Renewable Energy Action Plan and presented in the Annex (Annex Table D), along with the prices of the various types of RES (Annex Table C). A favourable business environment and the future potential raised the interest of investors in RES in 2010 – applications amounted to more than 10,000 MW, a figure far beyond the gross demand for electricity (for comparison, Bulgaria’s total installed generating capacity in 2006 was 12,015 MW²⁶).

²³ Renewable and Alternative Energy Sources and Biofuels Act (2007).

²⁴ National Renewable Energy Action Plan (June 2010),

http://ec.europa.eu/energy/renewables/transparency_platform/doc/national_renewable_energy_action_plan_bulgaria_en.pdf

²⁵ Interview with a representative of the Ministry of Regional Development and Public Works, 09.05.2011.

²⁶ Bulgaria 2020: A Challenging Decade Ahead, Center for the Study of Democracy, 2011.

Table A – Synthesis of measures to support renewables in electricity generation in Bulgaria

Electricity prices (per kWh 000)		Measures						
Domestic	Industry	Biomass	Biowaste	Photovoltaic	Solar thermal	Small hydro	Wind onshore	Wind offshore
68.5	63.7	FIT: 84.88– 110.95	FI: keep 15–20% of the loan	FIT: 386.03– 420.8	FI: keep 15– 20% of the loan	FIT 53.69 (guaranteed 15 years, max 10 MW)	FIT 94.11– 96.63	FI: keep 15– 20% of the loan

Source: Provided by Applica

During public discussions on national support mechanisms, the focus has been on general support instruments, without in-depth focus on the separate types of RES. Table A provides synthesised information on measures aimed at supporting specific renewable energy technologies for electricity generation.

Table B – Results for bottom-up estimation of net support costs to RES-electricity

	Estimated net support expenditures in 2007 [EUR million]	Estimated net support expenditures in 2008 [EUR million]	Estimated net support expenditures in 2009 [EUR million]
Bulgaria	3	4	18
EU 27	9.001	11.408	16.867

(i.e. premium on top of the revenues from the conventional power market). Source: Financing Renewable Energy in the European Energy Market, Ecofys, Fraunhofer ISI, TU Vienna EEG, Ernst &Young, 2 January 2011²⁷

Net support expenditure (FIT or the sum of reference electricity price and green certificate prices) is the total support payments reduced by the product of the reference electricity price and the total amount of RES-E generation. According to the estimates in Table B the net support costs in Bulgaria have increased sharply from EUR 3 billion in 2007 to roughly EUR 18 billion in 2009. However, it should be noted that the estimates are indicative and may diverge from the actual net support expenditure. Nevertheless, these figures highlight the strong expansion in RES support during the past few years.

As regards energy efficiency in residential housing, the Energy Efficiency Agency²⁸ so far has mainly supported energy audits through grants, aimed at enterprises.

According to an interview with a real estate agency, in Bulgaria energy efficiency measures still do not affect property prices greatly – the increase in price is less than 2–4% – customers tending to choose housing on other criteria. The same is the case for rents where

²⁷ http://ec.europa.eu/energy/renewables/studies/doc/renewables/2011_financing_renewable.pdf

²⁸ Energy Efficiency Agency, <http://www.seea.government.bg/>

EE measures have hardly any effect at all. People, however, are more prone to invest in EE once a house or apartment becomes their property, especially in recent years.

7. CONCLUSIONS

ERDF support aimed at encouraging the use of RES and increasing energy efficiency of residential housing is still in its initial stages. The majority of measures have only indicative budgets and no actual allocation of funding has occurred since very few contracts have so far been signed. A probable reason for this is the low level of knowledge about the OPs of SMEs and the general public.

Bulgaria is caught between the ambitious and demanding goals of the EU and its own challenges of economic development: RES and EE support schemes are in their initial stages, while the country relies on fossil fuels and production remains dependent on coal, much like a developing country.²⁹ In this context, a major challenge for Bulgaria in relation to RES and EE is to engage consumers in energy saving behaviour and to promote the concept of energy efficiency and its benefits through public awareness campaigns. Currently, the price of electricity in Bulgaria does not encourage the adoption of energy efficiency measures and leads to excessive and wasteful use of energy. In addition, the costs of increasing energy efficiency (e.g., through housing insulation) are too large to be borne by the average household, which calls for greater government involvement.

Bulgarian households are already considered to be energy poor (i.e. spending more than 10% of their income on energy), while the economy has very high energy intensity. Thus any future increases in the price of energy (including in relation to the use of RES and the pledged 16% target) will need to be combined with support for vulnerable consumers. Moreover, not all buildings can be covered by the existing EE support schemes, and condominium associations, which require 100% agreement among homeowners and are a prerequisite for participation in an EE scheme, are not easily formed. The Energy Charter Secretariat (2008) notes that "Bulgaria has made good use of the EU accession process to improve the energy efficiency policy framework. The challenge for energy efficiency policy makers will be to ensure efficient implementation of the policy measures and coherence among the various sectoral instruments in the coming years."³⁰

Bulgaria succeeded in fulfilling its interim goal of an 11% share of electricity from RES in electricity consumption by 2010, yet failed to address the 5.75% target for biofuels in transport. In addition, Bulgaria received the lowest additional increase (i.e. of 6.6% from 2008 levels) compared to other Member States for achieving its target of 16% final energy

²⁹ Green Energy Governance in Bulgaria: at a Crossroads, Center for the Study of Democracy, 2011 (upcoming).

³⁰ The Bulgaria 2008 In-Depth Review of Energy Efficiency Policies and Programmes, Energy Charter Secretariat, http://www.encharter.org/fileadmin/user_upload/Publications/Bulgaria_EE_2008_ENG.pdf

consumption from RES by 2020. The fact that current achievements are due to the use of traditional hydro power plants and not to new energy sources, such as wind power or solar, is commonly overlooked.³¹ At the same time, recently adopted legislation restricts the use of several types of hydro-power plants due to environmental concerns.³²

³¹ Green Energy Governance in Bulgaria: at a Crossroads, Center for the Study of Democracy, 2011 (upcoming).

³² Interview with a representative of the Bulgarian Ministry of Environment and Water, 28.04.2011.

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Ms Desislava Yordanova, State expert on the implementation of program priorities, Regional Development Programming Directorate, Ministry of Regional Development and Public Works, 09.05.2011.

TABLES AND FIGURES

Annex Table A – Electricity generated from renewable sources

% of gross electricity consumption	1990	1995	2000	2005	2006	2007	2008
Bulgaria	4.1	4.2	7.4	11.8	11.2	7.5	7.4
EU27	11.9	13.0	13.8	14.0	14.6	15.5	16.7

Source: Provided by Applica

Annex Table B – Overview on economic & technical-specifications for new plants

	Investment	O&M	Lifetime	Typical
	costs	costs	(average)	plant size
	[EUE/kWeI]	[EUR/(kWeI*year)]	years	[MWeI]
Technology				
Biomass plant	2225 – 2995	84 – 146	30	1 – 25
Hydro small scale	1275 – 5025	40	50	2
Photovoltaics	2950 – 4750	30 – 42	25	0.005-0.05
Solar thermal power	3600 – 5025	150 – 200	30	Feb-50
Wind onshore	1125 – 1525	35 – 45	25	2
Wind offshore, 30-50 km	3100-3350	110	25	5

Source: Ecofys

Annex Table C – RES prices in Bulgaria

	Feed-in tariff rates	Feed-in tariff rates
RES type	(EUR, without VAT)	(EUR, without VAT)
	2010	2011
WPPs with up to 2 250 work hours and of 800 kW or more installed capacity	97.5	96.3
WPPs with over 2 250 work hours and of 800 kW or more installed capacity	89.2	88.4
WPPs of less than 800 kW installed capacity and asynchronous cage rotor generator	76.1	76.0
PVPPs of up to 5 kWp installed capacity	405.4	388.8
PVPPs of over 5 kWp installed capacity	372.4	357.5
PPs of up to 5 MW installed capacity using forestry waste, etc.	111.1	129.2
PPs of up to 5 MW installed capacity using residues from agriculture	86.3	85.7
PPs of up to 5 MW installed capacity using energy crops	96.5	95.4
PPs of up to 150 kW installed capacity indirectly using biomass from vegetable and animal substances	101.8	217.3
PPs of 150 kW to 500 kW installed capacity indirectly using biomass from vegetable and animal substances	93.9	203.5
PPs of 500 kW to 5 MW installed capacity indirectly using biomass from vegetable and animal substances	85.9	154.8
PPs of up to 150 kW installed capacity indirectly using energy from municipal waste	139.2	136.0
PPs of 150 kW to 500 kW installed capacity indirectly using energy from municipal waste	133.9	130.9
PPs of 500 kW to 5 MW installed capacity indirectly using energy from municipal waste	128.5	125.8
PPs of up to 150 kW installed capacity indirectly using energy from municipal sewage sludge	77.1	76.9
PPs of 150 kW to 500 kW installed capacity indirectly using energy from municipal sewage sludge	69.8	70.0
PPs of 500 kW to 5 MW installed capacity indirectly using energy from municipal sewage sludge	61.0	61.7
HPPs of less than 10 MW installed capacity	56.7	57.5
HPPs of up to 5 MW installed capacity – low head, run-of-river type	102.3	109.0
HPPs of up to 5 MW installed capacity – low head, axial-flow type	78.0	----

Source: Bulgarian Renewable Energy Plan + Feed-in tariffs for 2011,

http://www.dker.bg/NPDOCS/Reshenie_preferencialni_tceni_ot_VEL_31032011.pdf

Annex Table D – Specific measures to fulfil the requirements under Articles 13, 14, 16 and Articles 17 to 21 of Directive 2009/28/EC.

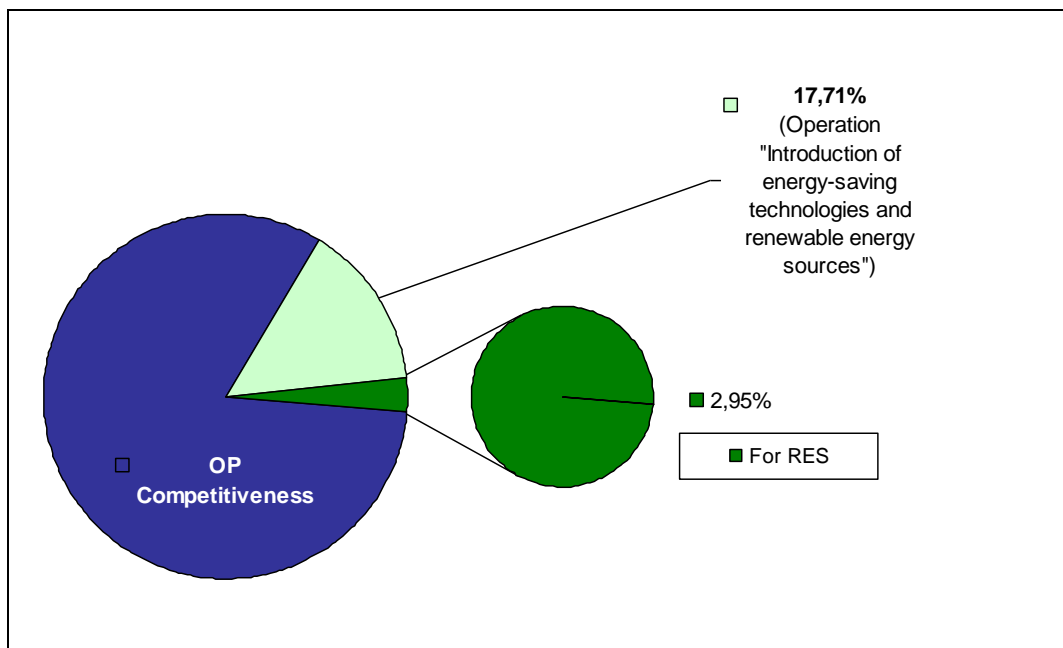
Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Start and end dates of the measure
1. Feed-in tariffs for electricity produced from renewable sources (FiT)	Financial	Energy generated (ktoe)	Investors	With respect to new projects, the measure will end in 2015. Duration of the agreement: 25 years in respect of solar and geothermal energy and 15 years in respect of energy from other renewable sources
2. Obligatory and priority connection of producers of electricity from renewable sources to the grid	Regulatory	Energy generated (ktoe)	Investors	No specific time limit
3. Payment only of the direct costs of connection to the grid	Regulatory	Installed capacity (MW/year)	Investors	No specific time limit
4. Long-term power purchase agreements with regard to electricity produced from renewable sources	Regulatory	Energy generated (ktoe)	Investors	15/25 years
5. Obligatory purchase of electricity produced from renewable sources, except for HPPs of over 10 MW installed capacity	Regulatory	Energy generated (ktoe)	Investors	15/25 years
6. Penalty payments in the event of curtailment of production due to the network operator's fault ¹	Financial	Energy generated (ktoe)	Investors	15/25 years
7. Compensation mechanism for the costs of the Public Supplier and Public Retailers of purchasing electricity from renewable sources at preferential prices	Regulatory	Energy generated (ktoe)	Networks, investors, users	15/25 years
8. Licensing procedures for producers of electricity from renewable sources of over 5 MW installed capacity	Regulatory	Energy generated (ktoe)	Producers	15/25 years
9. Guarantees of origin	Regulatory	Energy generated (ktoe)	Investors	No specific time limit

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Start and end dates of the measure
10. Obligations for persons placing on the market petroleum-derived liquid fuels for transport purposes to offer fuels for diesel and petrol engines blended with biofuels in the percentage terms laid down in the ZVAEIB	Financial	Biofuel production and use (ktoe)	Investors, traders and public administration	In force from 2007; last amended by the ZVAEIB: 1 March 20102
11. Zero rate of excise duty for pure biodiesel and reduced rate of excise duty for biofuel blends of a specified percentage	Financial	Biofuel production and use (ktoe)	Investors, traders and public administration	November 2009 to November 20113
12. The authority responsible for supervising the quality of pure biofuels and biofuel blends has been designated	Administrative	Use of biofuels for transport	Distributors and end users	2007
13. Testing equipment for pure biofuels provided to the State Agency for Metrology and Technical Surveillance	Administrative	Use of biofuels for transport	Distributors, end users and public administration	End of 2009
14. Energy Efficiency and Renewable Energy Credit Line ('EERECL')	Financial	Energy generated (ktoe)	Investors and (industrial) end users	The facility expires in 2011. It may be extended.
15. Energy Efficiency Facility of the European Investment Bank and the KIDS Fund	Financial	Energy generated from RES	Investors	No specific time limit
16. Enterprise for the Management of Environmental Protection Activities	Financial	Electricity generated from small HPPs	Investors	No specific time limit
17. Operational Programme "Development of the Competitiveness of the Bulgarian economy" 2007–2013	Financial	Electricity generated from RES	Investors	Start date: 2010
18. Rural Development Programme 2007– 2013	Financial	Energy generated from RES	Investors	Start date: 2010
19. Application of the measures provided for in the Investment Promotion Act ('ZNI') and its implementing regulation,	Administrative, Financial	Improving the business environment	Investors	Start date: 2008

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Start and end dates of the measure
where appropriate				

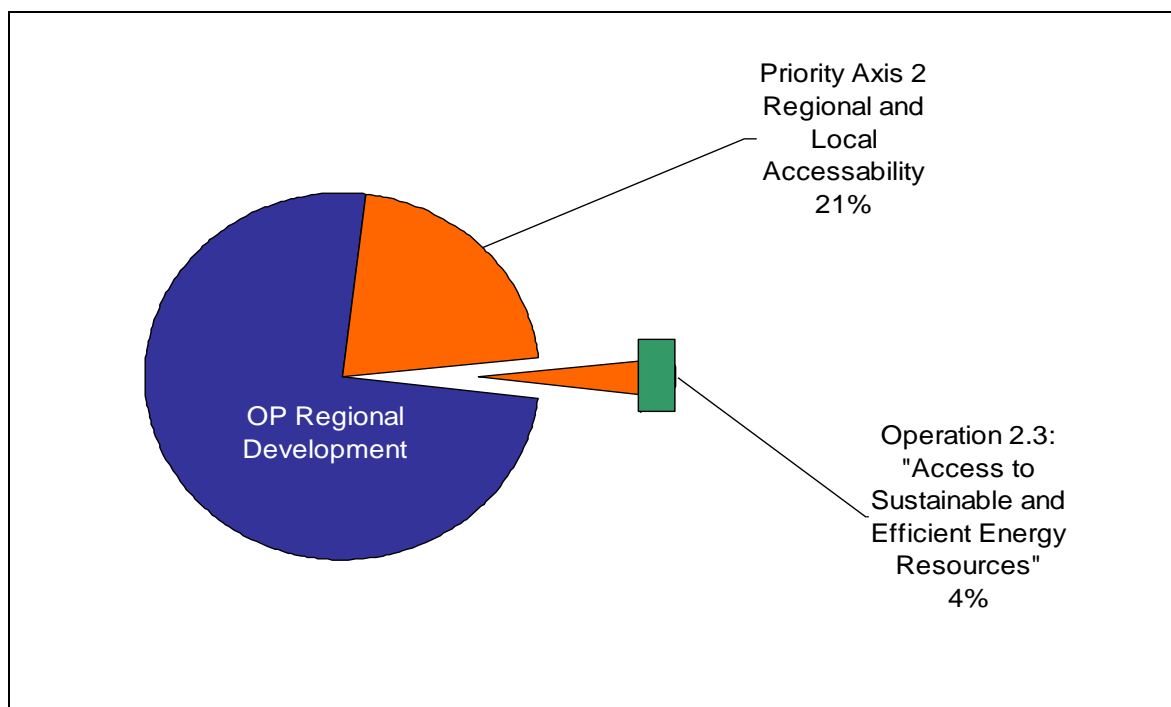
Source: National Renewable Energy Action Plan, 30 June 2010

Annex Figure 1. Share of indicative funding for Renewable Energy Sources, as compared to Total OP Competitiveness



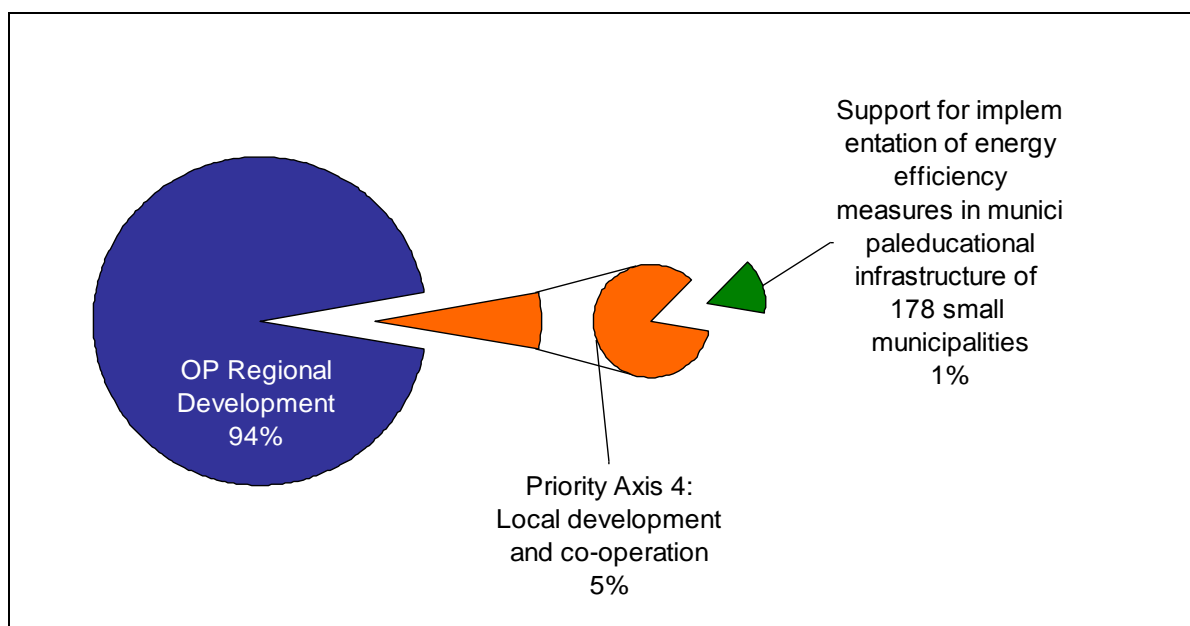
(i.e. premium on top of the revenues from the conventional power market) Source: Ministry of Finance: Information system for Structural Funds in Bulgaria

Annex Figure 2. Share of indicative budget for Operation 2.3 "Access to Sustainable and Efficient Energy Resources", as compared to Total OPRD



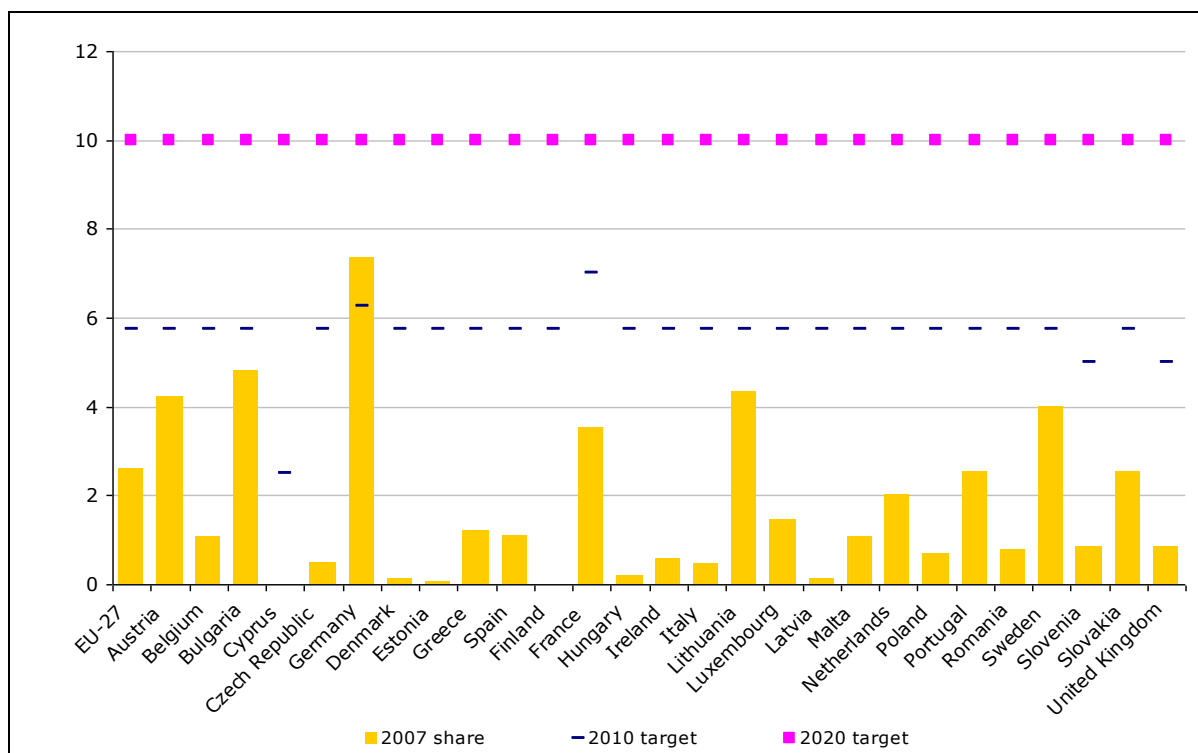
Source: Ministry of Finance: Information system for Structural Funds in Bulgaria

Annex Figure 3. Share of indicative budget for Scheme for "Support for implementation of energy efficiency measures in municipal educational infrastructure of 178 small municipalities", as compared to Total OPRD



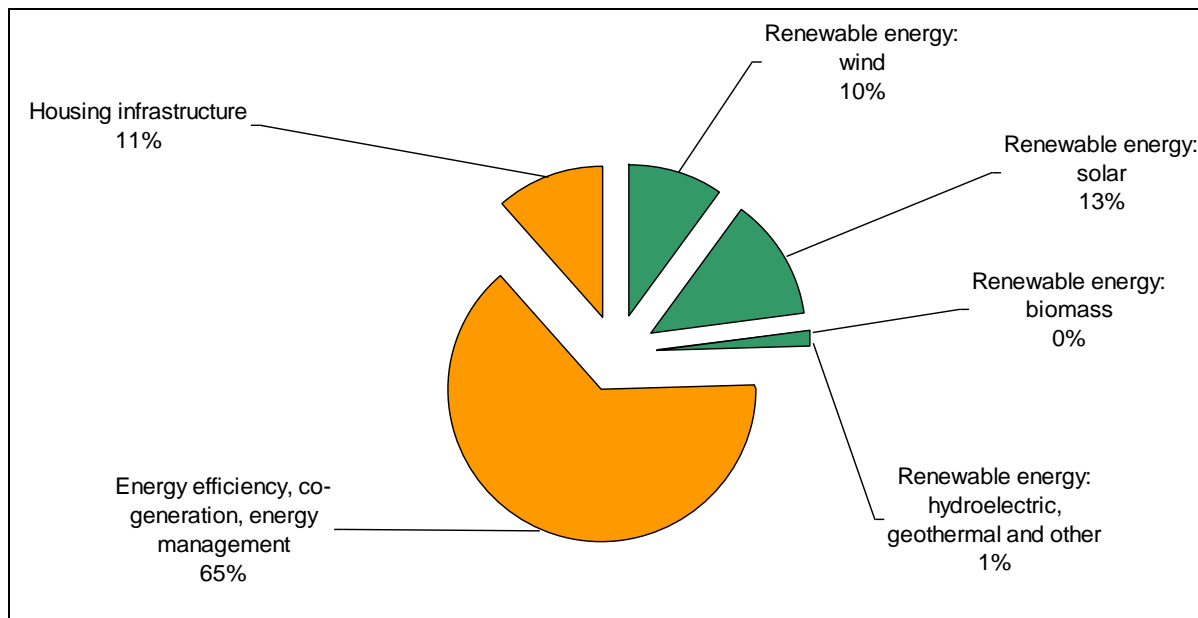
Source: Ministry of Finance: Information system for Structural Funds in Bulgaria

Annex Figure 4. Share of Biofuels in Transport



Source: 2009 RES progress report: Member States 2006 and 2007 reports; EurObserver Biofuels Barometer for some 2007 data

Annex Figure 5. Distribution of the RES and EE indicative support by ERDF for Bulgaria (forming 5.12 % of the total ERDF and Cohesion funding)



Source: Data, provided by DG Regional Policy