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# **Synthesis report on Regional RES H/C plans Rhodope Region, Bulgaria**

**Name of partners:** Association of Rhodope Municipalities  
Black Sea Energy Research Centre

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## 1. Recipients

The RES heating plan covers 21 Rhodope municipalities located in four administrative districts of Bulgaria:

- Smolyan, Banite, Borino, Chepelare, Devin, Dospat, Madan, Nedelino, Rudozem, Zlatograd (**Smolyan district**);
- Kardzhali, Kirkovo, Momchilgrad (**Kardzhali district**),
- Bratsigovo, Batak, Rakitovo, Septemvri and Velingrad (**Pazardzhik district**)
- Asenovgrad, Laki and Rodopi (**Plovdiv district**)

The Bulgarian Law requires the local authorities to adopt and report on the implementation of short-term and long-term energy efficiency plans as well as programmes for promotion of energy from renewable sources. The municipalities of Asenovgrad and Smolyan are signatories of the Covenant of Mayors and they have their SEAPs in action. Six other Rhodope municipalities (*Banite, Bratsigovo, Zlatograd, Rudozem, Chepelare and Nedelino*) are in a process of elaboration of their SEAPs.

Additionally, District authorities develop development plans and coordinate the policy in the municipalities in the respective district.

The Plan contains useful data, analyses of the RES potential and heat consumption, cost-benefit analyses, sets priorities for action and measures to achieve them. It will contribute to the better implementation and monitoring of the existing local and regional strategic documents, as well as to the development of future ones.

The methodology used in the Plan, such as data sources, data collection procedures, mapping approach, cost-benefit analysis (CBA) tool in Excel, etc. could be easily applied in other Bulgarian regions. Additionally, many outcomes of the analyses, such as CBA results, objectives and measures to achieve them, are efficiently replicable in other Bulgarian regions with similar environmental conditions.

## 2. Challenges, objectives and strategies

### Challenges of the region

The Rhodope region possesses very high potential of wood biomass. This heating resource is used by 63,1% of the households in the region. In several municipalities this share even exceeds 90%. The most common use of biomass energy is in primitive stoves and this requires substantial time and efforts for operation. In spite of this burden, the low price of this resource, combined with the low income of the local population, made it a widely distributed solution for heating.

Besides the biomass there are many conventional heating sources, such as electricity, diesel, coal, etc., used for heating, which cause air pollution during the winter season. Many private buildings and the majority of the public buildings are heated by such energy resources.

The local population is generally not aware of the benefits of the more efficient or less polluting heating systems.

### Challenges of the Plan development

The statistical data regarding heating consumption is insufficient for in-depth analysis of the region. There is no data either for the industrial or for the services (private/public) sectors. There is only data about the installed energy equipment in the residential sector, but there is no data about the energy consumption of that equipment.

Additionally, the available population grid has resolution of 1 km<sup>2</sup> and this does not allow identifying on the maps the promising district heating solutions.

Another problem to be mentioned is that there is no central body that govern the whole region and could be able to take the sole responsibility of implementing the RES heating plan, which hinders the setting of ambitious targets.

The investments in efficient heating systems in municipal/region buildings are hampered by insufficient or lack of financial resources in the budgets of respective authorities. There are only limited resources available through the structural funds, low interest loans or national programmes.

Similarly, in the residential sector, the shift towards more efficient heating solutions is hindered by both lack of own financial sources to cover the initial investment and very limited availability of opportunities for external financing.

### Objectives

The plan aims to promote the transition to more sustainable heating and hot water supply in the Rhodope region.

Two scenarios (Business-as-usual and Optimal) for the heating in the residential sector have been elaborated for the timeframe of the Plan until 2030. The following table presents the comparison of the energy consumption, total costs (including financial, environmental, and social), share of RES, and CO<sub>2</sub> emissions, based on the cost – benefit analyses.

<b>Performance indicators</b>	<b>Baseline Scenario</b>	<b>Optimal Scenario</b>
Total Energy Consumption [GWh]	1213	1213
Total costs [k€]	64,9	54,6
Share of RES [%]	63,1	100
CO <sub>2</sub> emissions [kt]	213,3	65

In the residential sector, the target is 100% share of renewable energy for heating, and (regarded to this) a reduction of greenhouse gas emissions by 70%. This is justified by the results of the cost – benefit analyses showing the optimal structure of heating energy share - wood stoves in buildings with relatively low (below 17 MWh/ year) consumption of energy for heating and efficient heating systems as ones using wood chips in buildings with higher than 17 MWh/ year energy consumption.

There are good conditions for solar energy utilization for water heating in several municipalities. Those municipalities are the ones located in the lowlands of the territory. There the target is to replace the existing electric boilers.

In public buildings, the target is reaching a 58% share of renewable energy for heating and reduction of greenhouse gas emissions by 35%. The target is based on the recommended switching from oil and electricity to wood chips.

In the town of Velingrad 8 municipal buildings are heated and hot water supplied by geothermal energy source. This trend of expansion of geothermal energy utilisation should be kept and more public and private buildings should use this source instead of conventional energy sources.

Municipality of Zlatograd has geothermal energy source on its territory. Based on the cost – benefit analysis results, it should develop geothermal district heating network, provided that sufficient heat load is secured.

Similarly to the residential sector, the solar energy should replace the electricity used for water heating in public buildings with high and stable consumption, located in the municipalities with higher solar radiation.

The realization of these objectives requires the implementation of a set of measures. The objectives and measures contained in this Plan are consistent with local action plans and integrate municipal policy in regional planning. Municipalities will be the main driver for the sector of renewable heating.

The projects implemented in public buildings will not only have a direct contribution to economic, social and environmental indicators, but their demonstration effect will support the replication of these results in other sectors.

### **Measures to achieve the Plan objectives**

The measures could be summarized in the following areas:

- Implementation of projects to improve energy efficiency and RES in public buildings;
- Provision of support (financial, organizational, expert, etc.) to the local population in order to implement energy efficiency & RES projects in residential buildings;
- Support for the establishment and operation of logistics centres for biomass;
- Support for the creation of Civil energy cooperatives;
- Organisation of information campaigns to increase the capacity of all stakeholders, and dissemination of information among the population.

Below the specific measures are described:

<b>Measure/Project</b>	<b>Period of implementation</b>	<b>Responsible person</b>	<b>Expected achievements</b>	<b>Reduction of tCO<sub>2</sub>/year</b>	<b>Expenditures, EUR</b>
<b>Organization of annual events for promotion of RES heating solutions</b>	Annually until 2030	Mayors, energy efficiency experts at municipal administrations	Increase share of wood chips heating systems in the residential sector	980	300 000 (1 000 EUR/year/municipality)
<b>Establishment of Local programme/fund for stimulating multi-family buildings owners to use wood chips heating systems</b>	From 2017 to 2030	Mayors, energy efficiency experts at municipal administrations	Increase share of heating by wood chips in the residential sector	145 150	9 300 000
<b>Tax deduction if certain level of energy efficiency (i.e. RES) in a residential building is reached</b>	Until 2018	Mayors, energy efficiency experts at municipal administrations	Motivation of building owners to invest in heating system replacement and building renovation		
<b>Installation of highly efficient wood biomass installations in municipal buildings, where applicable</b>	Until 2030	Mayors, energy efficiency experts at municipal administrations	Heating costs reduction, reduced GHG emissions, increased comfort in the buildings	480	1 070 000
<b>Installation of highly efficient wood biomass installations in District/State buildings, where applicable</b>	Until 2030	District governors, energy efficiency experts at District administrations	Heating costs reduction, reduced GHG emissions, increased comfort in the buildings	180	460 000

<b>Measure/Project</b>	<b>Period of implementation</b>	<b>Responsible person</b>	<b>Expected achievements</b>	<b>Reduction of tCO<sub>2</sub>/year</b>	<b>Expenditures, EUR</b>
<b>Participation in the creation of logistics centres for biomass (LCBs) through PPP</b>	Until 2020	Mayors, energy efficiency experts at municipal administrations	Easier access of consumers and distributors to the biomass resources, improved market conditions, active role of local authorities in the development of business environment		
<b>Participation in the creation of logistics centres for biomass (LCBs) through technical support</b>	Until 2020	Mayors, energy efficiency experts at municipal administrations	Facilitating the registration of LCBs and support for the issuance of necessary documents		
<b>Consulting and informing the associations of owners on the opportunities for co-financing of projects</b>	Until 2020	Mayors, energy efficiency experts at municipal administrations	Increased awareness through regular association meetings and development of the investment environment	760	
<b>Cooperation between municipal and regional administrations in the region</b>	Until 2030	Mayors, District governors	Coordinated district/ regional and municipal plans Exchange of best practices and expertise		

## Interrelation to other plans and strategies

The Rhodope region Plan covers 21 municipalities, each of which has a state obligation for developing local energy strategies and plans. Besides the state obligations eight municipalities have developed or are developing SEAPs as signatories of Covenant of Mayors initiative.

The Rhodope Plan is in line with these policy documents. Additionally, it supports both their reporting and development through:

- Collection and analysis of the heating data for both sectors - municipal and residential;
- Maps of residential and public heating demand, biomass energy potential, solar energy potential;
- Cost-benefit analyses of numerous heating solutions;
- Proposed policies (where possible, with quantification of their costs and benefits) for the promotion of the best heating solutions.

## Accompanying measures for implementation on action/strategy proposed

During the elaboration of the Plan a fruitful cooperation with a Horizon 2020 project, aiming to support the biomass utilisation in the region – BioRES (<http://bioresproject.eu/>) has been established.

## 3. Responsibilities and funding

### Responsible parties for Plan's implementation

The plan covers a territory that has no centralised administration body. Its implementation will involve all representatives of local governments, which are members of the Association of Rhodope Municipalities. The commitments will be under the responsibility of mayors and local experts in energy efficiency. Their duties include:

- Coordination of the implementation of the Plan;
- Coordination of the particular tasks;
- Development of a system for collection of data on energy consumption;
- Collecting data on heating energy consumption in municipal buildings;
- Organization of information campaigns to raise awareness among all stakeholders;
- Collection of data on energy consumption in the residential sector over two years to develop monitoring reports;
- Development of monitoring reports every two years from 2018 to 2030;
- Updating the planned measures to the needs of the region;
- Report on the activities carried out at the end of the period of the Plan.

The municipalities are responsible for development of local energy strategies and plans and for their reporting, while the regional authorities ensure the implementation of the state policy at

local level. Therefore both bodies are responsible for the development of heating and cooling market in the region. The municipalities have their own budget to invest in RES projects or to support initiatives for more efficient heating in the region. Usually they have financial capital only for co-funding the measures set in the Plan. The Structural funds and other financial mechanisms have the main role in investing in improvement of the heating energy consumption. The regional authorities do not possess their own budget to invest in RES measures. They could support the aims of the Plan through technical support and information campaigns.

It is very important for the Plan's successful implementation to include all stakeholders in this process. The residential sector has the greatest resource consumption for heating the dwellings and therefore the inclusion of citizens in the achievement of the objectives is essential for positive results and sustainable utilisation of the local resources. The best tools for this purpose are information campaigns and the creation of conditions for demonstrating best practices to convince people of the benefits of a particular technology.

The Plan has been endorsed by 3 regional bodies:

1. The General Assembly of the Association of Rhodope Municipalities. The GA, consisting of the Mayors and representatives of the Municipal Councils of all member municipalities, held its regular meeting on 26<sup>th</sup> May 2016. At this meeting, the Plan has been presented, discussed, and endorsed. A standing Working group responsible for the plan implementation and monitoring has been established at ARM.
2. Smolyan district council on Sustainable Energy. The Council consists of energy experts from the District, municipal specialists as well as other organizations. The Plan endorsement took place at the Council meeting on 25<sup>th</sup> May 2016, following presentation of and discussions on the Plan.
3. Kardzhali district council on energy efficiency. The Council consists of energy experts from the District, municipal specialists as well as other organizations. The Plan was endorsed at the Council meeting on 31<sup>st</sup> May 2016, which was entirely dedicated to Plan.

## **Funding sources**

### Operational Programme "Regions in Growth" 2014 – 2020

Activities in investment priority 4c "Providing support for energy efficiency, intelligent energy management and renewable energy use in public infrastructure, including public buildings and in the housing sector".

### Operational Programme "Innovation and Competitiveness" 2014 – 2020

Energy efficiency project are financed under Investment priority 3.1: Energy technology and energy efficiency".

To support the projects is planned allocation of grants and the creation of a loan instrument for energy efficiency measures in enterprises. For this investment priority are planned 21.58% of the Programme budget - 119 million EUR from ERDF, representing an 85% co-financing and the rest will be provided by the national budget.

### International Programmes and Initiatives



## Horizon 2020 Framework Programme for Research and Innovation (2014 – 2020)

It aims to tackle the major societal challenges identified in the strategy “Europe 2020”.

### Jaspers Programme

"Jaspers" is a partnership between the European Commission (DG "Regional Policy"), the European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD) and the German Fund for Reconstruction and Development (KfW). It is a mechanism for technical assistance for the twelve EU countries which joined the EU in 2004 and 2007. It provides those Member States the necessary help to prepare quality projects co-financed with EU funds.

### National Programmes and Initiatives

#### Project "Energy renovation of the Bulgarian homes"

The program provides associations of owners of condominium 100% grant for the refurbishment of buildings.

### Credit lines

#### Energy Efficiency and Renewable Energy Fund

The fund aims to finance energy efficiency measures with low interest loans. Its beneficiaries are municipalities, companies, associations of energy consumers, small businesses and individuals, financial credit institutions (banks) through their financial products.

### International Fund Kozloduy

The IFK was established by the Framework Agreement between the EBRD and Bulgaria in 2000. The financial capital is provided by the European Commission, EU member states and Switzerland. IFK financially support the decommissioning of units 1 - 4 of NPP "Kozloduy" and the increasing energy efficiency in Bulgaria.

### National Trust Eco Fund

The NTEF (NTEF) is an independent institution that operates with the support of the Bulgarian government. It finances projects in four priority areas:

- Clean up pollution that occurred in the past;
- Reducing air pollution;
- Clean water protection;
- Biodiversity Conservation.

## **4. Monitoring strategy**

The monitoring will be performed by the standing Working group on Economic development, Energy Efficiency and Renewable energy sources consisted of municipal experts from the municipalities, members of Association of Rhodope Municipalities. The time horizon of the Plan is 2030. All activities are planned for this period and their implementation will be verified by monitoring reports. Two types of such verification is planned – on the second year – Short

Monitoring Report and every four years after it (2019, 2023, 2027) and on the fourth year – Detailed Monitoring Report every four years until the end period of the Plan (2021, 2025, 2029). The short report will monitor the overall performance, i.e. share of RES, measures implemented and their impact, etc. The Detailed report will collect much more detailed data, specified comprehensively as annex to the Plan. After each report there will be analysed the need for improvement of the measures in order to achieve the targets. At the end will be elaborated final report with all achievements up until then. The responsible party for reporting will be the Association of Rhodope Municipalities, which will have the opportunity to collect all data needed from all 21 municipalities, involved in the RES heating plan.