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Interreg Balkan-Mediterranean PRO-ENERGY

PROJECT

PRO-ENERGY – PROMOTING ENERGY EFFICIENCY IN PUBLIC BUILDINGS OF THE BALKAN MEDITERRANEAN TERRITORY

Work Package:	3. Joint Regional Analysis, Strategy and Framework
Activity:	3.3 3. Joint Regional Analysis, Strategy and Framework - Joint strategy and action plan for increasing energy efficiency through behavioural change
Activity Leader:	Cyprus Energy Agency- CEA
Deliverable:	3.3.3 Joint strategy and action plan for increasing energy efficiency through behavioural change

Version:	Final 1.0	**Date:**	**31/04/21**
Type:	Synthesis Report		
Availability:	Confidential		
Responsible Partner:	Cyprus Energy Agency		
Editor:	Cyprus Energy Agency		


Interreg
EUROPEAN UNION
Balkan-Mediterranean
PRO-ENERGY


Cyprus
Energy
Agency
Department of
Electrical and
Mechanical Services


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Table of contents

Table of Figures

Table of tables

IDENTIFICATION SHEET

Project Ref. No.	BMP1/2.2/2052/2019
Project Acronym	PRO-ENERGY
Project Full Title	'Promoting Energy Efficiency in Public Buildings of the Balkan Mediterranean territory'

Security (distribution level)	Confidential
Date of delivery	31/04/21
Deliverable number	3.3 3. joint strategy and action plan for increasing energy efficiency through behavioural change
Type	*[Type of deliverable]*
Status & version	Draft 1.0
Number of pages	*166*
ACTIVITY contributing to the deliverable	*3.3 Joint Regional Analysis, Strategy and Framework - Joint Strategy and Action Plan for the promotion of Circular Economy*
Responsible partner	Cyprus Energy Agency
Editor	Cyprus Energy Agency

INTRODUCTION

PRO-ENERGY is a transnational cooperation project, co-financed by the Cooperation Programme "Interreg V-B Balkan Mediterranean 2014-2020", under Priority Axis 2, Specific Objective 2.2 Sustainable Territories. The project aims at promoting Energy Efficiency in public buildings in the Balkan Mediterranean territory and to create a practical framework of modelling and implementing energy investments interventions, through specific ICT monitoring and control systems, as well as through energy performance contracting (EPC). The specific objective of PRO-ENERGY is to reduce by more than 20% the energy spending in public buildings of the participating entities in one year after the implementation of pilot actions.

Based on the above, Work Package 3 (WP 3) "Joint Regional Analysis, Strategy and Framework" aims at formulating a Joint Strategy and Action Plan for the whole Balkan Med area regarding energy efficiency through behavioural change based on the analysis of the existing situation regarding energy efficiency in participating territories incorporating mapping of policies, initiatives and interventions, and the selection of good practices and benchmarking of participating authorities.

More specifically, Activity 3.3."Joint strategy and action plan for increasing energy efficiency through behavioural change" aims to formulating:

- a Joint Strategy and Action Plan regarding energy efficiency through behavioural change based on the analysis of the existing situation regarding energy efficiency in participating territories incorporating mapping of policies, initiatives and interventions and the selection of good practices and benchmarking of participating authorities at building know-how.

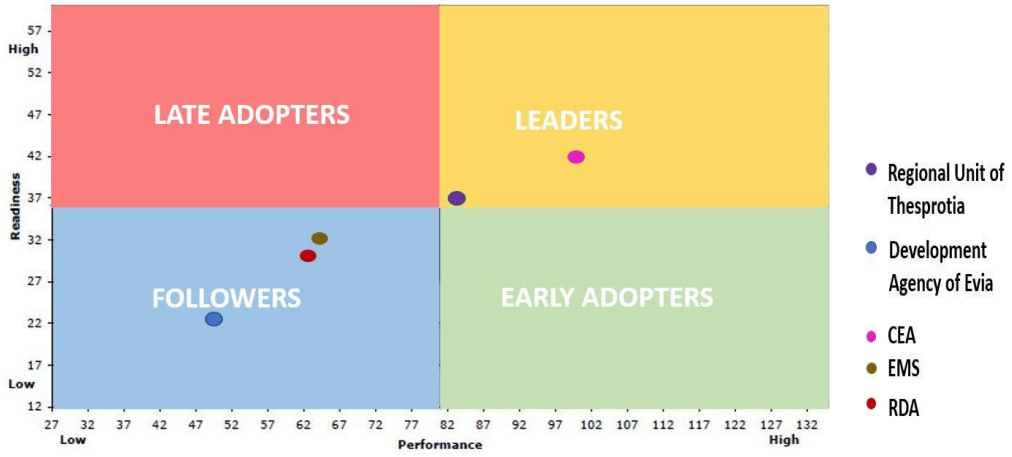
Section 1

Executive Summary

Stimulating public authorities to reduce their energy consumption through behavioural change is a challenge. All aspects need to be considered for the energy transition, such as improving awareness of the benefits of energy efficiency and renewable energies. It is very important to highlight to making sure, that technologies are easy to use, and that financial decisions can be made in a well-informed manner. The challenge is to consider how real people react to everyday decisions and situations, how they plan in the long-term, and how they therefore make investment decisions.

Based on the benchmarking analysis that was developed on the Deliverable D3.2 Good practices and Benchmarking Tool, it was identified that range of technical and behavioural measures with the potential to improve energy efficiency through behavioural measures. The benchamarking tool it was developed with the identification of the parameters that need to be taken into consideration in order to evaluate each administration positioning in the Energy Efficiency through behavioural change (namely "readiness" and "performance") and presentation of the matrix, that classify partners among the potential combinations of features regarding "readiness" and "performance", as both have already been defined. It is once again noted that the matrix per self is useless if its only purpose is to provide a typology; the main rationale behind this matrix is to identify ways to improving current conditions by moving towards the upper right position ("leaders").

The scaling of the axis of the Matrix are analysed and explained in the chapter that follows. What is of interest at this point is to identify what the positioning of an organization in each one of these quadrants means. The matrix is presented below:



Matrix of Benchmarking Analysis

More specifically, the resulting scores in each dimension produce 4 potential profiles of the organisations: Leaders, Late Adopters, Early Adopters and Followers. Based on the results the organisations have been identified as follow:

- ***Regional Unit of Thesprotia – Early Adopters – Leaders***

The Regional Unit of Thesprotia, they are positioned in quadrant 4, but with a slightly different from the quadrant 3. The organisation are equipped with the necessary strategy, action plan and resources, but still lag behind in terms of implementing their strategy for the Energy Efficiency through behavioural change. Therefore, they positioned also in quadrant 4, because they have opportunities to become more active and implement their strategy.

- ***Development Agency of Evia – Followers***

The organisation is positioned at the 1st quadrant, where indicates that they are neither ready to introduce relevant initiatives (due to their significant lack of necessary strategy, action plan and infrastructure/resources) nor ever tried to explore the opportunities for the Energy Efficiency through behavioural change. There is a need to develop a strategy, action plan and resources that will give the potential and opportunities for adaptation of actions.

- ***Cyprus Energy Agency – Leaders***

CEA has been identified as Leader as they are positioned in quadrant 4. The organization contributes actively to the conservation of resources, the protection of the environment, and the support of local authorities for mitigated climate change and improve their energy efficiency. Therefore, their actions shown that they are active to several projects and methods for reducing energy consumptions through behavioural change.

- ***Electromechanical Services –Followers***

The organisation is positioned at the end of the 1st quadrant, where indicates that they are ready to introduce relevant initiatives and tried to explore the opportunities for the Energy Efficiency through behavioural change. Therefore, the EMS could be positioned with more actions at the Late adopters, with the implementation of activities at a small scale for promoting energy efficiency through behavioural change.

- ***RDA with Business Support Centre of SMEs – Followers***

The organisation is positioned at the end of the 1st quadrant, where indicates that they are ready to introduce relevant initiatives and tried to explore the opportunities for the Energy Efficiency through behavioural change. Therefore, the RDA could be positioned with more steps at the Late adopters, with the implementation of activities at a small scale for promoting energy efficiency through behavioural change.

All partners have identified their needs in order to develop measures with focusing on energy behaviour and implementing strategies and action plans, increasing competences of public buildings owners and operators, developing and applying technologies& tools for reducing energy consumption in public buildings and promoting good practices and results generated by the project to other local/regional/national entities in the area.

Section 2 – Regional Unit of Thesprotia

1. Summary of Existing Situation Analysis

The current section provides a summary of the Existing situation analysis that took place in previous stage in order to have a clear picture of the current status in terms of energy efficiency and the potential of the area in this regard.

In terms of background information, Epirus is one of the thirteen administrative regions of Greece. The region is a traditional geographic and modern administrative region in northwestern Greece. To the south it borders the region of West Greece, to the west the Ionian Islands, to the east the regions of Western Macedonia and Thessaly and to the north, Albania. The Region covers a total area of 9,203.22 km2 and it is divided into four regional units, namely those of Thesprotia, Ioannina, Arta and Preveza. Its capital and largest city is Ioannina, where nearly one third of the population lives. Additional main urban centers include the cities of Arta, Preveza and Igoumenitsa. According to the census conducted in 2011 by the Hellenic Statistic Authority, the total population amounts to approx. 336,856 people.

With regard to the climatic conditions, and on the basis of the information provided by the Energy Efficiency Regulation of Buildings - KENAK, the Greek territory is divided into four climatic zones, based on the degree of heating days, with zone A being the warmest and D the coldest. The Region of Epirus belongs to climatic zones B and C. The Regional Units of Thesprotia, Arta and Preveza belong to climatic zone B while the Regional Unit of Ioannina belongs to C. As long as the Regional Unit of Thesprotia is concerned, on the coast and in the lowland zone the climate is Mediterranean, with mild winters and warm summers, while in the semi-mountainous and mountainous hinterland the climate renders to continental.

With regard to the performance of the region in terms of the energy efficiency in public buildings, the data presented at previous stage reveal poor performance. More specifically, with regard to the Region's performance more than half of them belongs to Categories D and E, while none has achieved an A/A+ Grade. The Regional Unit's performance concerning buildings' energy efficiency is poor, as the majority (14 buildings) belongs to Class D and E, while no public buildings have achieved an A/A+ Grade.

According to National Energy and Climate Plan (NECP), published in December 2019, Greece has set a core objective for achieving a RES share of at least 35% in in gross final energy consumption by 2030. Moreover, there are additional targets for the RES share in gross final electricity consumption to reach at least 60%, the RES share in covering heating and cooling needs to exceed 40% and the RES share in the transport sector to exceed 14% in line with the relevant EU calculation methodology. Furthermore, a specific objective has been set for promoting RES systems in buildings and dispersed generation systems, through auto production and net metering schemes. More specifically, a forecast has been made for having such RES power generation systems in operation with an installed capacity of 1 GW, capable of covering the average electricity consumption of at least 330,000 Greek households, by 2030.

As long as the Region of Epirus is concerned, the total installed RES capacity, as per September 2020, is presented to the following table.

Table 1: RES Installed Capacity – Region of Epirus

RES Type	Installed Capacity (MW)
Wind Farms	619
Small Hydro Power Plants	47
Biomass/Biogas	4
PVs	180
Total	**849**

Source: DAPEEP/RES info note Sep-20

When it comes to public sector, energy performance certificate is mandatory for all public sector buildings of more than 250 m2 total floor surface, in which regular interaction with the general public takes place. It is mandatory for the Energy Performance Certificates of public buildings to be posted in public view. For the year 2019, 780 energy performance certificates were issued for public sector buildings in Greece (0.25% of the total amount of certificates issued), that cover a total surface of 665,988 m2. Most of them (47.82%) are classified in energy category C-D, 43.21% in energy category E-G and only a percentage of 8.97% in A-B.

According to the sum of energy performance certificates that have been issued between the years 2011-2019, almost half of the public sector buildings (49.51%) are classified in energy categories C-D, while the largest part of total annual energy consumption is related to heating (131 kWh/m2) and lighting (113 kWh/m2) purposes. In addition, the most energy-intensive public service buildings are the penitentiaries (average annual primary energy consumption

equal to 652 kWh/m2) and the buildings used for temporary accomodation purposes 781 kWh/m2).

Identification and participation of stakeholders is of vital importance for the successful implementation of a long-term strategy for the energy renovation of buildings. For the selection of the key stakeholders of the area the LFA's (Logical Framework Approach) methodological tool of stakeholders' matrix was applied and a number of stakeholders were selected as follows: seven (7) Central Government Bodies, five (5) Regional and Municipal Authorities, three (3) Public companies, four (4) institutions, two (2) associations, four (4) environmental NGOs and two (2) private entities. Such stakeholders can develop policies, manage existing programmes, own public buildings and can thus promote actions relevant to energy efficiency in the area linked to increased information (conferences), mobilization of other representatives as well as citizens and organizing bilateral meetings and discussions.

With regard to Energy Efficiency Investments in the area, mapping of policies, interventions and initiatives, the Region of Epirus has conducted its Operational Program for the period 2014-2020, with a total budget of approx. € 337.1 mn. The latter foresees both as a Strategic Target and as a Priority Axis (PA 2) the "Environmental Protection and Sustainable Development" and as a Thematic Objective (TO 4) "To support the shift towards a low carbon economy in all sectors". The total budget of PA2 amounts to € 132.2 mn. Moreover, the Program sets as an Investment Priority (IP 4c) the "Support for energy efficiency, smart energy management and the use of renewable energy sources in public infrastructure, including public buildings, and in the housing sector".

The most important directives at EU level are: Energy Efficiency Directive (2012/27/EU) and Energy Performance of Buildings Directive (2010/31/EU). At national level, Law 4122/2013 (transposition of EU Directive 2010/31/EU) includes, among others:

- The conduction of a Long-term Strategy for Energy Refurbishment of all public and private buildings.
- The framework for setting out the energy efficiency minimum requirements through KENAK.
- The mandate, starting from 01.01.2019, for all the new public sector buildings to be near zero energy consumption.
- The issuance of Energy Performance Certificates for all public sector buildings of more than 250 m2 total floor surface, in which regular interaction with the general public takes place.

- The mandate for the Energy Performance Certificates of public buildings to be posted in public view.
- The initiation of measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings. Incentives shall take into account the cost-effectiveness of energy efficiency investments for society as a whole.

The main policy at national level that provides for strategic priorities is the National Energy and Climate Plan (NECP) which establishes a central quantitative objective for the renovation and replacement of residential buildings with new nearly zero-energy buildings, which could in aggregate amount to 12-15% of all residential buildings by 2030. On a national level, the annual objective is to have an average of 60,000 buildings or building units upgraded in terms of energy and/or replaced with new more energy-efficient ones. policy measures for energy efficiency improvement in the period 2021-2030 aim to cover twelve different policy priorities (PP3.1-PP3.12):

- PP3.1: Improvement in energy efficiency of public buildings and exemplary role of public sector - Improvement of urban public space microclimate
- PP3.2: Strategy for renovation of the building stock in the residential and tertiary sector
- PP3.3: Promoting energy efficiency contracts by energy service companies
- PP3.4: Promoting market mechanisms
- PP3.5: Promoting innovative financial instruments to ensure private capital leverage and financial sector involvement
- PP3.6: Improvement in energy efficiency and competitiveness of the industrial sector
- PP3.7: Framework for the replacement of polluting passenger vehicles and goods vehicles
- PP3.8: Developing infrastructure and plans for a shift in transport operations
- PP3.9: Energy efficiency improvement of electricity and gas infrastructures
- PP3.10: Promoting measures for modernising water supply / sewage and irrigation infrastructures
- PP3.11: Promoting efficient heating and cooling
- PP3.12: Training/informing professionals and consumers on energy-efficient equipment and rational use of energy

at a Regional level, a major intervention consists of the EIB funded Project “Efficient Eco-Friendly Transportation, Public Lighting and Buildings in the Region of Epirus, Greece”. The latter is implemented through the ELENA Mechanism of European Investment Bank and aims at improving the energy efficiency of public buildings and public lighting systems located in the Region of Epirus and deploy sustainable transport. The programme has a substantial scale for

the Region as well as a high level of ambition in terms of energy efficiency performance objectives set.

It is the first project of that kind in Greece, while the ELENA assistance contributes substantially to the implementation of the investment program by bringing in missing resources and expertise.

The very investment program consists of four (4) pillars, namely:

- Design and implementation of a sustainable lake transportation system in the city of Ioannina
- Design and construction of a new rural regional road lighting network, including smart grid technology, for the entire Region of Epirus
- Design and deployment of a new LED lighting technology including dedicated control systems in the Municipalities of Arta, Preveza and Igoumenítsa
- Design and implementation of Renewable Energy Systems and Energy Efficiency Retrofits in Public Buildings in the Region of Epirus

All investment schemes shall be realized through either PPP or EPC initiatives, aiming at mobilizing a total amount of investments of approx. € 63 mn. The project's expected results include:

- Energy Efficiency - annual energy saved 13.6 GWhel and 7.1 GWhth
- Renewable Energy - annual total energy generation 1.2 GWh
- CO2 emissions reductions – annual total reductions of CO2 emissions 25,400 t CO2 eq.

Furthermore, when it comes to the Regional Unit of Thesprotia, Igoumenitsa consists the only Municipality that has successfully developed a Sustainable Energy and Climate Action Plan (SECAP) within the framework of the Covenant of Mayors Initiative.

Within its SECAP framework, the Municipality of Igoumenitsa has already carried out final studies and subsequently energy saving interventions and inspections, in three public buildings (1st Nursery School of Igoumenitsa, Nursery School of Graikochori, Closed Gym of Igoumenitsa), by taking advantage of the within the framework of the "Exoikonomo" program.

Additionally, Igoumenitsa has already started to implement measures for improving its energy efficiency such as the installation of photovoltaics on the rooftop of a public school and upgrading the energy efficiency of two public school buildings and one public sports complex.

Moreover, the Municipality has carried out an extended improvement of the walking and cycling infrastructure in the city centre, while it is also aiming to the completion of the research for the city lighting, as part of European funding programs.

2. Summary of Good Practices

A Good Practice aims at following a standard way of doing things as well as at maintaining quality as an alternative to mandatory legislated standards and can be based on self-assessment and benchmarking. Regarding the identification of good practices, their aim is to highlight several local / regional / national / European / International good practices related to the energy efficiency interventions in public buildings. The collection of such practices has been achieved via a desk research and the main ones that were identified are being presented below. All of them refer to public buildings and behavioural change with regard to interventions on energy efficiency.

Good Practice - #1

Title of the good practice and name of the building

- Posters and official letters to school principle and local officials in Primary School of Boroi

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Rebus Project

Short Summary of the practice

- The Primary School of Boroi has done a remarkable job in promoting the issue of energy saving both in the very school environment as well as in buildings other than school facilities. In particular, the students who participated in the program created a best practice poster for energy saving, along with information leaflets and various thematic posts that have been uploaded on the school blog. In addition, a series of official letters have been sent to both the school management and the mayor of Phaistos Municipality, proposing a full toolkit of behavioural actions to enhance energy saving and therefore minimize relevant costs.

Evidence of success

The following table depicts the energy savings achieved during the years 2014 and 2015, when the EURONET 50/50 MAX program was actively implemented in the Primary School of Boroi:

	Energy savings achieved			
Year of program implementation	*in kW*	*in %*	*in EUR*	*in t CO2*
2014	2,215	41.82	243.65	1.02
2015	1,436	27.11	157.96	0.66

Challenges encountered

The participating students were really enthusiastic about the project and - guided by the supervising teachers - managed to significantly alter their own behaviour and mindset regarding energy saving. It was reported by many of the pupils, that they tried to convince their families and friends to adjust their energy spending habits and make them more in tune with the EURONET 50/50 MAX guidelines.

Potential for learning or transfer

As it is apparent, the very action is considered a best practice as there were significant energy savings achieved by this school, as depicted in the table above. However, the school is worth of being promoted as "best practice" not only for this.

Another reason is that its students took seriously the core principle of the program (i.e. making students conscious regarding the issue of energy saving in school and how to achieve it) and tried to promote the energy-saving message to the wider audience.
This was done by using all means at their disposal (e.g. the Internet) and appropriately prepared materials (e.g. the best practices energy saving poster and the official letters regarding energy saving practices) to reach out to the school's officials and the local community/authorities.
Essentially, the fact that they convinced locals to take notice on the issue of energy saving, question their energy consumption ways and be open to suggestions, is the greatest achievement of the participants.
Hence, the case of Primary School of Boroi has been included as a best practice in the EURONET 50/50 MAX methodology guidebook, thus enhancing transferability of projects results.
Given the poor energy-efficiency current state of play characterizing the vast majority of school facilities in Greece, as well as the need for setting up a holistic approach on the level of local communities, there is severe potential for replicating such kind of actions in various regions, aiming at both increasing energy efficiency in school buildings but also streamlining awareness on energy savings over local communities stakeholders.
In addition, the 50/50 methodology can be implemented in any public building, provided that its energy bills are covered from municipal budget (therefore achieved savings mean savings both for the Local Authorities and the building itself).
The methodology for calculating energy and financial savings is very simple (yet includes all important aspects, like weather conditions in a given year) and can be applied to any kind of buildings. The calculations can be based on the data gathered from invoices or energy meters, so no sophisticated energy monitoring systems are necessary.
Large part of the methodology is focusing on capacitating building users to optimise energy use. A lot of useful methodological and educational material is gathered on the project website. The model contract on the 50/50 implementation (signed between the local authority and the building manager) is available on-line and can be adapted to different local conditions.

Further information

http://www.euronet50-50max.eu/en/
https://blogs.sch.gr/dimvoron/

Good Practice - #2

Title of the good practice and name of the building

- Energy Saving Projects in Municipal Buildings in the City of Edessa

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Support Project

Short Summary of the practice

A series of refurbishment interventions have been implemented in two (2) public buildings in the Municipality of Edessa, namely the City Hall and the Municipal Cultural Centre, aiming at enhancing energy efficiency and increasing awareness of employees and citizens on sustainability issues.

Evidence of success

Annual energy savings recorded after the interventions:

- Replacement of luminaries in the City Hall: 38,458 kWh/year
- Installation of green roof in City Hall: 5,302 l oil or 53,075 kWh. The coefficient of thermal permeability of the un-insulated roof before planting is estimated at 3.2 W/m^2K and after planting at 1.2 W/m^2K
- Replacement of old glazing and window frames of the City Hall: 3,791 l oil or 37,950 kWh

- Replacement of old glazing and window frames of the Cultural Centre: 2,405 l oil or 24,076 kWh

Challenges encountered

The main challenge encountered was the installation of the Green Roof in the City Hall building. The fact, however that the Head of the pertinent municipal department was an Agricultural engineer, specialized in such activities helped to bring the project to a successful conclusion.

Potential for learning or transfer

- Improved energy-efficiency education and awareness raising on sustainability issues, as the building of the City Hall is open to visitors and to interested schools. In fact the visitors' record includes an educational visit by a school from Spain.
- Increase in the percentage of greenery of the City of Edessa
- Improvement of knowledge about the behavior of endemic plants on roofs and properties of the climatic conditions of Edessa
- Increased sense of pride of employees and executives since they work in a refurbished building with attractive and sophisticated outlook - not many public buildings in Greece have planted roof terraces.

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/1813/energy-saving-projects-in-municipal-buildings/

Good Practice - #3

Title of the good practice and name of the building

- Green Roof installation on the Town Hall of Gournes

Does this practice come from a European funding program?

Interreg Europe / Rebus Project

Short Summary of the practice

A pilot application of a green roof to demonstrate the building insulation and landscape enhancement.

Evidence of success

There has been a severe increase in energy efficiency status of the Town Hall through the improvement of comfort conditions inside the building regarding heating and cooling. As a result, an approx. 20% reduction in electricity consumption has been recorded.
Moreover, the project has significant impact in terms of raising awareness as the Town Hall constitutes a demonstration site that supports dissemination and public awareness on energy efficiency measures.
Furthermore, the project has innovation characteristics, as it combines a series of

materials and measures resulting in a low budget, self-maintained, energy efficiency improving application.

Challenges encountered

The project was easily implemented without any difficulties.

Potential for learning or transfer

- Successful implementation of energy efficiency application that does not require additional works or the building (construction enhancement, watering and drainage system)
- The applied technique creates an environment with minimum to none management requirements

- Easy to replicate to Mediterranean countries
- Demonstration site to disseminate the idea of energy efficiency to the public

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/1228/green-roof-of-the-municipality-s-town-hall-in-gournes/
https://www.interregeurope.eu/rebus/
https://www.hersonisos.gr/

Good Practice - #4

Title of the good practice and name of the building

- EPC Project for National Theatre of Prague

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Finerpol Project

Short Summary of the practice

Czech monumental building of the National Theatre successfully used financial instrument in form of energy performance contracting (EPC).

Evidence of success

Since 2011, savings have been more than 50% of the original energy costs, while the Energy Services Company (ESCO) ENESA guarantees savings of at least 400,000 Euros per year.
The practice was so successful that, after the initiation of the first round energy efficiency measures that resulted to 800,000 Euros of energy savings within 3 years' time (approximately 260,000 Euros per year), the project was further enhanced with additional energy efficiency measures which raised total savings to 400,000 Euros per year.

Challenges encountered

Energy refurbishment Interventions had to be applied only in a way that shall not negatively affect the monumental outlook of the building, as it is located in Prague's historical city center.

Potential for learning or transfer

The National Theater is a historical building in the center of Prague and its energy intensity was perceived as a necessary tax for the protection of monument protection.
Through this very project, it is clear that even historic buildings without major interventions can provide a set of appropriate measures to reduce energy consumption using appropriate financial instruments – in this case the EPC tool.
Furthermore, an additional benefit of the project is that the life of the installed measures is at least twice the time required to repay the input costs. After the installments are terminated, the customer will remain in the budget for the entire savings achieved. Environmental benefits are an accompanying effect for EPC projects - Economics and ecology are not in a contradictory position here.
Moreover, the monumental nature of the building and the permanent interaction with several groups of stakeholders belonging to general public (visitors, citizens, audience) may lead to raising awareness on energy efficiency and sustainability issues.

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/385/epc-project-for-national-theatre-in-prague-czech-republic/

Good Practice - #5

Title of the good practice and name of the building

- "Refurbishment of an abandoned radio station to serve as a Sustainable Development Centre and the creation of a Nature park"

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Support Project. However, the refurbishment project was not funded by EU funds.

Short Summary of the practice

The practice involved the refurbishment and the restoration of a former – and currently abandoned - German radio station building to serve as a Sustainable Development Centre, along with the creation of a Nature park of more than 15,500 trees. Within this framework, and besides the energy upgrade interventions, open spaces for general public and educational facilities have been created aiming at raising public awareness for sustainability issues.

Evidence of success

Annual energy savings recorded after the interventions:

- PV system installed: Energy savings: 23,500 kWh/year; Reduction of CO_2: 20.5 tns/year.
- Wind System installed: Energy savings: 16,000 kWh/year; Reduction of CO_2: 14 tns/year.
- SWH system installed: Energy savings: 20,075 kWh/year; Reduction of CO_2: 17.5 tns/year.

Challenges encountered

No challenges were encountered during project's implementation.

Potential for learning or transfer

The project results have shown many benefits and potentials for future projects, namely:

-better economy for stakeholders

-practical use of Renewable Energy Sources and use of treated wastewater

-development of ecotourism in the area

-showcase of the Nature Park and Sustainable Development Centre

-environmental education facilities

-possible future funding for other conservation projects

-education for Sustainable Development (ESD) through outdoor learning.

-holistic education across the curriculum for all ages

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/2708/xrobb-l-ghagin-sustainable-development-centre/
https://www.xrobblghagin.org.mt/

3. Analysis of the project areas and stakeholders

3.1 Definition of SWOT Analysis

SWOT analysis, (Strengths, Weaknesses, Opportunities, Threats) presents the strengths and weaknesses of the Region of Epirus - Regional Unit of Thesprotia with regard to the area of Energy and Efficiency overall and in particular with regard to the building sector as well as the opportunities and threats arising also from the external environment of the country. The following table presents the SWOT analysis for the needs of approaching the current situation in Thesprotia. The table below shows the SWOT analysis in order to approach the current state of play in Thesprotia.

3.2 SWOT Analysis of each project Area and Stakeholders

Strengths	Weaknesses
• Adequate number of public authorities and stakeholders involved in the energy upgrade of the buildings • Participation of Igoumenitsa in the Covenant of Mayors initiative • Installed photovoltaics in one school building and 2 upgraded schools in terms of energy efficiency • Extended and improved walking and cycling infrastructure in the city centre of Igoumenitsa	• 3rd Lowest GDP per capita • Categorised as having one of the warmest climates at National level (Category 2) • Poor performance in building energy efficiency • Almost half of the public sector buildings are classified in categories C and D at national level • Low number of investments in the energy sector
Opportunities	**Threats**
• Existence of NECP promoting a number of interventions, renovation of buildings and RES • Green Deal and other related to energy directives and policies • Regional Operational Programme • ELEKTRA program • Sustainable Energy and Climate Action Plan (SECAP) at Municipal level	• Low number of Energy Performance Certificates for category A at national level • COVID-19 pandemic • Energy poverty issue at national level due to the long-term crisis

3.3 Definition of PESTLE Analysis

The PESTLE analysis is an analysis of all the external environment parameters of the Sterea Ellada region that affect the actions of PRO-ENERGY project. These parameters are broken down into political, economic, social, technological, legal and environmental aspects and are they are being analysed in the following section.

3.4 PESTLE Analysis of each project Area and Stakeholders

P **P**olitical factors	**E** **E**conomic factors	**S** **S**ocial factors	**T** **T**echnological factors	**L** **L**egal factors	**E** **E**nvironmental factors
- Volatile political situation that is hindered by the pandemic - Promotion of energy transition high on the EU agenda (Green Deal)	- Stable economic situation at national level that is hindered by the current pandemic - High unemployment rate at national level - Obstacles in the implementation of new initiatives and economies of scale - High number of investments in the energy sector - Financial and tax support for investment in energy savings technologies	- Aging population - Stagnating population - Issue of Energy poverty at national level - Low consciousness with regard to the Behavioural change in terms of energy efficiency - Negative effects caused by the pandemic	- Application of high value technologies in a number of interventions planned with regard to the renovation of old buildings - Support for investments in energy savings technologies - Promotion of innovative smart city models through the use of state-of-the-art technologies.	- Sufficient legislative framework both at European and national level - Establishment of an Energy Management System based on the international and European standards (EN 16001)	- Low number of Energy Performance Certificates for category A at national level -Climate related issues causing high temperatures

4. Objectives of the strategy and KSFs

4.1 Definition of Objectives of the Strategy

The strategy of the Regional Unit of Thesprotia for increasing the energy efficiency in public buildings through behavioural change is based on the results of the analysis of the current situation alongside the best practices, taking also into consideration the national policies and particularly NECP.

More specifically, the Strategic Objectives of the Regional Unit of Thesprotia for the increase of the energy efficiency in public buildings through the behavioural change are the following:

❖ Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
❖ Promotion of the renovation and upgrade of the existing building stock
❖ Increase the behavioural change in energy efficiency especially for officers working in public sector
❖ Raise awareness of the local community on issues related to energy efficiency
❖ Monitor the evolution in terms of energy savings via data collection
❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

The abovementioned objectives can be categorised on the basis of the overall strategic approach for the promotion of the energy efficiency that may also include the actual renovation of the buildings as this is already highlighted and raised in the current national strategies.

Moreover, the objectives highlight the importance of the human factor in this process of transitioning to more energy efficiency practices, that may apply at community level and more specifically with the focus on the public sector and thus the officer that are employed.

Finally, objectives are developed on the basis of the importance that tools and other technical means have in such transition since numbers and measures are key in order to have a clear picture of the current status in terms of energy saving and predict and develop future practices and actions in this regard. Such actions and interventions will then enable the enhancement of a number of investments and interventions that will make the sector more attractive and thus more competitive in this regard.

4.2 Definition of Keys Success Factors

The success of the strategy and relevant actions will depend on a number of factors in relation to skills, communication, planning, teamwork and process. Such factors are being summarised as follows:

❖ Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
❖ Involvement of the officers working in the public sector in order to acquire necessary skills for the promotion of such change.
❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives.
❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings and application of changes when deemed necessary
❖ Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
❖ Available funding tools to implement strategy's policies and planned interventions and actions

5. Strategic priorities

5.1 Definition of Strategic Priorities

On the basis of the analysis that took place regarding the existing situation and best practices as well as the definition of the objectives and main key factors mentioned before the Regional Unit of Thesprotia has identified a number of key strategic priorities as well key criteria on the basis of which the goals will be achieved.

These priorities are summarised on the following priority axes that are being analysis further in the following section:

❖ **Priority Axis 1:** Enhanced energy efficiency and use of RES in public sector buildings
❖ **Priority Axis 2:** Promote awareness raising and behavioural change for public sector officers and local communities
❖ **Priority Axis 3:** Enhanced tools and technologies that will enable the transition to low carbon economy and increase energy savings

5.2 Strategic Priorities

The current section provides for an analysis of the main strategic priorities – axes that have been mentioned previously as well as the key criteria that will enable the achievement of the relevant goals. More specifically:

Priority Axis 1: Enhanced energy efficiency and use of RES in public sector buildings

This Priority Axis is also in line with the investment priority that is being highlighted in the Regional operational program of Sterea Ellada. The main aim of such axis is to place the energy efficiency and promotion of RES overall as a strategic priority for the area and more specifically targeting the buildings that belong to the public sector.

The enhancement of energy efficiency and RES requires, first and foremost, the engagement of the public sector authorities as well as other key stakeholders coming also from private sector in order to promote the existing policies at EU and national level and ensure the most efficient and successful implementation of the planned interventions and activities in line also with the set targets.

In line also with the objectives that were mentioned previously, the strategic aim of this axis is also to promote the exemplary role of the public sector in promoting such interventions and take the lead in this regard especially with the assistance of the relevant authorities.

Priority Axis 2: Promote awareness raising and behavioural change for public sector officers and local communities

This Priority Axis highlights the societal aspect of the strategy. More specifically, it focuses on the strategic importance of the change in the behaviour of the users and, thus, it places the human factor at its core.

One of the main prerequisites for the transition to low carbon economy as well as more energy savings is the behavourial change that entails the change of people's mentality in terms of energy efficiency by the change on a number of habits and daily routine.

Behavioural Energy Efficiency, consists of a set of tools that may trigger, sensitise, advise & finally drive individual users towards practical & measurable actions for their personal & everyday use of energy resources. Studies reveal that a 3-4,5% reduction in energy consumption may be achieved through simple rules ("switch off the lights when leaving the room", "maintain a steady temperature on the thermostat") that may reach 15% when rules are driven/supported by a consistent information system at the hands of the energy user.

Against the above background, it is more than evident that more information is required on the benefits of energy efficiency at personal and social level. That is why the strategy should also focus on the information and awareness raising at local and national level of the citizens and communities that will enable the shift of the current mentality in order to apply such practices not only at home but also at the working place. Considering that the target is mainly public sector buildings, the target group may also be the public sector officers. However, dissemination activities will need also to targets a broader public at community level.

Priority Axis 3: Enhanced tools and existing technologies that will enable the transition to low carbon economy and increase energy savings

This Priority Axis highlights the importance of tools and technical means in the transition to an economy that is characterized by a high level of energy savings.

First of all, monitoring is of high importance in order to have a clear picture of the current status in terms of saving, as well as be in the position to predict via a given number of algorithms future consumption. Thus, it is more than obvious how this priority is linked to the strategies and policies since such algorithms are in the position to confirm the efficiency of the current ones and, at the same time, foresee the future ones or changes in the interventions that will need to be applied depending on the results.

Based upon the universal fact “You may not improve unless you measure first”, actual & precise energy readings from different energy sources that may come available near real-time through the application of technical means and tools. Such tools and means may include also online platforms that can concentrate useful data on consumption as well as tools related to cost-benefit analysis that may be used for future investments for the benefit of the public sector via a number of specific interventions (renovations, retrofits etc).

6. Action Plan, including activities for the promotion of Energy Efficiency at interregional level, relevant budget and monitoring and evaluation tools for the implementation of such activities

The current section presents in more detail the action plan that has been designed by the Regional Unit of Thesprotia in order to promote the increase of the energy efficiency in public buildings and also the behavioural change.

The following sections provide for an in-depth analysis of such plan on the basis of the strategic priority axes that have been mentioned before as well as the specific targets and actions per axis, the groups to be involved, the necessary financial resources for this purpose and the respective time plan that is foreseen for such proposed actions and interventions.

6.1 Action Plan

This section provides an overview of the main aspects of the Action plan that was developed by the Regional Unit of Thesprotia, as mentioned, on the basis of the priorities, objectives and key factors identified following the analysis of the current status while taking also into consideration the best practices highlighted in previous chapters.

More specifically, for each of the Priorities mentioned above there are certain **objectives and goals** also highlighted that correspond to certain types of actions and target groups analysed on the basis of the stakeholder's matrix that was developed in previous cases. The aim of this categorization is to define in details the priorities and actions that correspond to each group and in this way to have a clear planning process to be put in force by the relevant authorities as soon as the plan will be finalised.

Priority Axis 1: Enhanced energy efficiency and use of RES in public sector buildings
❖ Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
❖ Promotion of the renovation and upgrade of the existing building stock

❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

As already mentioned above, this Priority Axis has a more strategic and horizontal dimension that is also linked to the political aspect of the Plan and the role of institutions.

Against this background, the main aim under this priority is the promotion of the exemplary role of the sector via interventions in energy efficiency that may also target explicitly the renovation and general upgrade of the existing building stock in line also with the current legislative framework.

The political will for the promotion and boost of investments is vital in order to increase the level of competition of the sector in the area of energy. A key factor in this regard is also the financial support that is an important prerequisite for the implementation of any type of action in any case.

The **key factors** that need to be ensured for a successful outcome in this regard are as follows:

❖ Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
❖ Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
❖ Available funding tools to implement strategy's policies and planned interventions and actions

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

❖ *Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector*

Proposed **types of actions** in line also with the national legislation:

- Engage on a long-term strategy for the refurbishment and renovation of the public sector buildings via the organisation of bilateral meetings and discussions in order to achieve better results and further engagement in this regard
- Increase the number of issuances of Energy Performance Certificates to be extended to all the public sector buildings especially the ones that the current surface occupied exceeds 250 m2 in total.
- Initiate measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings

With regard to the **second Strategic Objective**:

- *Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level*

Similarly, to the previous objectives, relevant types of actions relate to the enhanced role of the key stakeholders in the area of energy and public sector authorities in order to ensure the alignment of the national policies with the ones set at EU level and thus ensure alignment with the set targets in both levels. More specifically:

- Engage on the implementation of the relevant policies as well as the promotion of respective intervention via the organisation of bilateral meetings and discussions in order to achieve better results and efficiency in meeting the set targets at both levels.
- Initiate the organisation of informative sessions that will be open to all interested parties in order to promote the benefits of the energy efficiency at individual, community and national level.

With regard to the **third strategic objective**:

- Available funding tools to implement strategy's policies and planned interventions and actions

This objective refers mainly to the actions that the public authorities and key stakeholders will have to undertake in order to ensure that there are adequate funding tools and programmes in order to implement the planned policies and interventions.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being

summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Political influence	Decision-making power	Financial resources
Central Government Bodies	*	*	*
Regional and Municipal Authorities	*	*	*
Public Companies	-	*	-
Institutions	-	*	-
Associations	-	*	-
Private Entities	-	-	*

Priority Axis 2: Promote awareness raising and behavioural change for public sector officers and local communities
❖ Increase the behavioural change in energy efficiency especially for officers working in public sector
❖ Raise awareness of the local community on issues related to energy efficiency

As already mentioned above, this Priority Axis has a more social dimension and more specifically to the role of the human factor in the process of transitioning to a low carbon economy and in particular an economy with high energy savings on the basis of the behavioural change tool.

Against this background, the main aim under this priority is the mobilisation of the public sector officers as well as citizens at local level n order to incentivize them to apply practices that target energy savings via the behavioural change in terms of energy efficiency. One key parameter in this regard is the raising of awareness and the dissemination activities that will make officers and public overall about the benefits of energy saving at individual and community level and for the benefit of the sector that will bring also benefits in economic terms and increased also its competitiveness.

The target to the local community shows that the issue of energy saving is not strictly related to the workplace. On the contrary, it will need to be linked to everyday lives of people as citizens as well considering that such an area is still not well known to the public and the swift to the behaviour in terms of energy consumption depends also on the swift from a certain mentality that has been established the last decades. Additionally, and considering the bigger picture, the transition to a low carbon economy requires the participation and motivation of the local communities that due to the linkages that they can create can form the driver for such progress.

The **key factors** that need to be ensured for a successful outcome in this regard are as follows:

❖ Involvement of the officers working in the public sector in order to acquire necessary skills for the promotion of such change
❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

❖ Increase the behavioural change in energy efficiency especially for officers working in public sector

Proposed types of actions in line also with the national legislation:

- ❖ Organisation of info days in order to update the officers in relation the latest news in the area of energy efficiency and motivate them to participate in other relevant events organised either online by other institutions (also at EU or international level) or by way of physical means
- ❖ Enhance the skills of the officers by organizing short training sessions on the basis of identified training needs providing also recommendations that result from best practices at local, European and international level

With regard to the **second Strategic Objective**:

- ❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives

Similarly, to the above-mentioned actions, it is important to inform the local communities in relation to the energy related news and other opportunities offered to participate. More specifically:

- ❖ Organisation of info days and other dissemination activities that will be open to the local community for all citizens to participate and to be updated with regard to the latest news in the area of energy efficiency. Such activities will aim at motivating them to be more incentivized in order to apply practices related to energy efficiency and energy savings in their everyday lives and thus also in the workplace either this belongs to public sector or the private one.

The aim is to spread the awareness of the whole society with regard to the importance of reducing energy consumption not only at individual level, in each house, but also with the extension of such practice and mentality along the day and also at the workplace.

- ❖ Organisation of training seminars for those interested in learning more regarding energy efficiency. Such seminars can be either theoretical or practical providing the participants guidelines or other types of hints and advice on how to integrate such practices better and in a more efficient way in their lives.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Decision-making power	Technical Guidance/assistance
Central Government Bodies	*	-
Regional and Municipal Authorities	*	-

Public Companies	*	-
Institutions	*	*
Associations	*	*
Environmental NGOs	-	*

Priority Axis 3: Enhanced tools and existing technologies that will enable the transition to low carbon economy and increase energy savings
❖ Monitor the evolution in terms of energy savings via data collection
❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

As mentioned before, monitoring is of high importance in order to have a clear picture of the current status in terms of saving, as well as be in the position to predict via a given number of algorithms future consumption. Thus, it is more than obvious how this priority is linked to the strategies and policies since such algorithms are in the position to confirm the efficiency of the current ones and, at the same time, foresee the future ones or changes in the interventions that will need to be applied depending on the results.

Based upon the universal fact "You may not improve unless you measure first", actual & precise energy readings from different energy sources that may come available near real-time through the application of technical means and tools. Such tools and means may include also online platforms that can concentrate useful data on consumption as well as tools related to cost-benefit analysis that may be used for future investments for the benefit of the public sector via a number of specific interventions (renovations, retrofits etc).

The **key factor** that needs to be ensured for a successful outcome in this regard are as follows:

❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings and application of changes when deemed necessary

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

- ❖ Monitor the evolution in terms of energy savings via data collection

Proposed types of actions are as follows:

- ❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings
- ❖ Enhance the skills of the officers by organizing short training sessions in order to be informed in relation to such means and use of these tools

With regard to the **second Strategic Objective**:

- ❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

Proposed types of actions are as follows:

- ❖ Actions in order to identify opportunities in terms of investments and financial support that will increase the competition. Such actions include also the involvement of key actors and bilateral meetings and agreements necessary in this regard.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Decision-making power	Technical Guidance/assistance
Central Government Bodies	*	-

Regional and Municipal Authorities	*	-
Public Companies	*	-
Institutions	*	*
Associations	*	*
Environmental NGOs	-	*

6.2 Activities for the promotions of EE at interregional level

Conclusions

Problems highlighted

- 3rd Lowest GDP per capita
- Categorised as having one of the warmest climates at National level (Category 2)
- Poor performance in building energy efficiency
- Almost half of the public sector buildings are classified in categories C and D at national level
- Low number of investments in the energy sector

Objectives to be achieved

- Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
- Promotion of the renovation and upgrade of the existing building stock
- Increase the behavioural change in energy efficiency especially for officers working in public sector
- Raise awareness of the local community on issues related to energy efficiency
- Monitor the evolution in terms of energy savings via data collection
- Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

Existing initiatives (opportunities)

- Existence of NECP promoting a number of interventions, renovation of buildings and RES
- Green Deal and other related to energy directives and policies
- Regional Operational Programme
- Sustainable Energy and Climate Action Plan (SECAP) at Municipal level

Initiatives to be taken on the basis of the Strategic Objectives

- Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
- Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
- Available funding tools to implement strategy' s policies and planned interventions and actions

6.3 Budget of Activities

The proposed actions of the Strategy as being mentioned above for the promotion of energy efficiency and behavioural change can be financed in a number of ways as follows:

- National Strategic Reference Framework (NSRF): it includes both the Regional Operational Programme of Epirus and the sectoral operational programmes especially the ones that relate to the infrastructure, the environment and sustainable development of the new programming period, 2021-2027.
- Transnational Programmes such as Interreg Programmes of the new programming period, 2021-2027 and more specifically, Interreg MED, Interreg Balkan-Med, Interreg Adrion, Interreg V-A Greece-Italy, and Interreg IPA Greece-Albania.
- European research funding programs such as HORIZON 2020 which enable through specific programs to conduct research in the behavioural change in terms of energy efficiency and to pilot the results of research.
- Taking advantage of other financing opportunities such as the opportunities provided by the European Investment Bank that provide opportunities to finance maturing large energy saving projects through programs such as ELENA

With regard to the respective timeframes, the strategy to promote energy efficiency and behavioural change is proposed to be implemented over a five-year period.
The complexity of financing the actions and their possible integration into different funding programs requires long-term planning.

The different phases of the strategy are as follows:
-1st year: Action specification and funding targeting (Phase 1)
-2nd year: Inclusion in the selected financing program (Phase 2)
-3rd to 5th year: Implementation and evaluation (Phase 3)

In addition to the above schedule, an annual review and redesign is planned based on the strategy implementation needs and funding opportunities presented.

6.4 Monitoring and Evaluation tools of the implementation of activities

Monitoring and evaluation will take place at all stages of the implementation. As mentioned above, the implementation will take place during the 3rd and 5th year (Phase 3). A mid-term evaluation will take place on the 4th year of implementation for all activities in order to evaluate the level to which the initial targets were achieved. The final evaluation will take place following the 5th year of implementation, in a period of up to 6 months following the implementation process.

With regard to the evaluation a number of indicators will be developed for each of the set actions and relevant targets will be set for each. More specifically:

- *Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector (PA1)*

Types of actions

- Engage on a long-term strategy for the refurbishment and renovation of the public sector buildings via the organisation of bilateral meetings and discussions in order to achieve better results and further engagement in this regard

- **Indicator:** number of buildings that were refurbished and renovated (around 8-10 each year)

- **Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

❖ Increase the number of issuances of Energy Performance Certificates to be extended to all the public sector buildings especially the ones that the current surface occupied exceeds 250 m2 in total.
- **Indicator:** number of issuances of Energy Performance Certificates (around 8-10 each year)

❖ Initiate measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings
- **Indicator:** number of actions/means to improve the status of buildings in terms of energy efficiency

❖ *Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level* (PA1)

Types of actions

❖ Engage on the implementation of the relevant policies as well as the promotion of respective intervention via the organisation of bilateral meetings and discussions in order to achieve better results and efficiency in meeting the set targets at both levels.
-**Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

❖ Initiate the organisation of informative sessions that will be open to all interested parties in order to promote the benefits of the energy efficiency at individual, community and national level.
-**Indicator:** number of information sessions that took place in this regard (2 each year of at least 15 participants)

❖ Available funding tools to implement strategy's policies and planned interventions and actions (PA1)

This type of actions refers mainly to the ones that took place in previous phase whereby funding tools were identified. During this stage of implementation there will be an

evaluation of whether such tools were sufficient or new ones may be used in future interventions.

- Increase the behavioural change in energy efficiency especially for officers working in public sector (PA2)

Types of actions

- Organisation of info days in order to update the officers in relation the latest news in the area of energy efficiency and motivate them to participate in other relevant events organised either online by other institutions (also at EU or international level) or by way of physical means
  -**Indicator:** number of info days and events that took place in this regard (2 each year of 20 participants)

- Enhance the skills of the officers by organizing short training sessions on the basis of identified training needs providing also recommendations that result from best practices at local, European and international level
  -**Indicator:** number of training sessions and participants that took place in this regard (2 each year of 20 participants)

- Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives (PA2)

Types of actions

- Organisation of info days and other dissemination activities that will be open to the local community for all citizens to participate and to be updated with regard to the latest news in the area of energy efficiency. Such activities will aim at motivating them to be more incentivized in order to apply practices related to energy efficiency and energy savings in their everyday lives and thus also in the workplace either this belongs to public sector or the private one.
  -**Indicator:** number of info days and activities that took place in this regard (2 each year of at least 15 participants)

- Organisation of training seminars for those interested in learning more regarding energy efficiency. Such seminars can be either theoretical or practical providing the participants guidelines or other types of hints and advice on how to integrate such practices better and in a more efficient way in their lives.

  -**Indicator:** number of training seminars and participants that took place in this regard (2 each year of at least 15 participants)

- Monitor the evolution in terms of energy savings via data collection (PA3)

Proposed types of actions are as follows:

- Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings
  -**Indicator:** number of tools that will be developed in this regard (around 1-2)

- Enhance the skills of the officers by organizing short training sessions in order to be informed in relation to such means and use of these tools
  -**Indicator:** number of training seminars and participants that took place in this regard (2 each year of at least 15 participants)

- Enhance investments and financial support to increase competition of the sector in the area of energy efficiency (PA3)

Proposed types of actions are as follows:

- Actions in order to identify opportunities in terms of investments and financial support that will increase the competition. Such actions include also the involvement of key actors and bilateral meetings and agreements necessary in this regard.

  -**Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

Section 3 - Development Agency of Evia S.A

1. Summary of Existing Situation Analysis

The current section provides a summary of the Existing situation analysis that took place in previous stage in order to have a clear picture of the current status in terms of energy efficiency and the potential of the area in this regard.

In terms of background information, Sterea Ellada is one of the thirteen administrative regions of Greece that occupies the eastern half of the geographical prefecture of Continental Greece, including the island of Evia. To the south, it borders the regions of Attica and Peloponnese, to the west the region of West Greece and to the north the regions of Thessaly and Epirus. The Region covers a total area of 15,549 km2 and it is divided into five regional units, namely those of Boeotia, Evia, Evrytania, Phocis and Pthiotis. Its capital city is Lamia, while Chalkida (which is the capital city of the Regional Unit of Evia) is the Region's most populated city (102,000 citizens). According to the census conducted in 2011 by the Hellenic Statistic Authority, the total population amounts to approx. 547,000 people.

With regard to the climatic conditions, and on the basis of the information provided by the Energy Efficiency Regulation of Buildings - KENAK, the Greek territory is divided into four climatic zones, based on the degree of heating days, with zone A being the warmest and D the coldest. The Region of Sterea Ellada belongs to zone B thus being characterized by relatively warm days when compared to other regions belonging to zones C and D. This also indicates the high needs of the area in cooling especially in summer months.

With regard to the performance of the region in terms of the energy efficiency in public buildings, the data presented at previous stage reveal poor performance. More specifically, this refers to the low level of issuance of Energy Efficiency certificates at regional level since almost half of the buildings belong to Categories D and E, while only two buildings have achieved an A/A+ Grade. Additionally, poor performance is also noted at regional unit level, as the majority (36 buildings) belongs to Class D and E, while no buildings have achieved an A/A+ Grade.

With regard to the renewable energy resources, Greece has set a core objective for achieving a RES share of at least 35% in gross final energy consumption by 2030. Moreover, there are additional targets for the RES share in gross final electricity consumption to reach at least 60%, the RES share in covering heating and cooling needs to exceed 40% and the RES share in the transport sector to exceed 14% in line with the relevant EU calculation methodology. Furthermore, a specific objective has been set for promoting RES systems in buildings and dispersed generation systems, through auto production and net metering schemes. More specifically, a forecast has been made for having such RES power generation systems in operation with an installed capacity of 1 GW, capable of covering the average electricity consumption of at least 330,000 Greek households, by 2030. The total installed RES capacity of the region, as per September 2020, is presented to the following table.

Table 1: RES Installed Capacity – Region of Sterea Ellada

RES Type	Installed Capacity (MW)
Wind Farms	1.125
Small Hydro Power Plants	33
Biomass/Biogas	1
PVs	361
Total	**1.520**

Source: DAPEEP/RES info note Sep-20

When it comes to public sector, energy performance certificate is mandatory for all public sector buildings of more than 250 m2 total floor surface, in which regular interaction with the general public takes place. It is mandatory for the Energy Performance Certificates of public buildings to be posted in public view. For the year 2019, 780 energy performance certificates were issued for public sector buildings in Greece (0.25% of the total amount of certificates issued), that cover a total surface of 665,988 m2. Most of them (47.82%) are classified in energy category C-D, 43.21% in energy category E-G and only a percentage of 8.97% in A-B.

According to the sum of energy performance certificates that have been issued between the years 2011-2019, almost half of the public sector buildings (49.51%) are classified in energy categories C-D, while the largest part of total annual energy consumption is related to heating (131 kWh/m2) and lighting (113 kWh/m2) purposes. In addition, the most energy-intensive public service buildings are the penitentiaries (average annual primary energy consumption equal to 652 kWh/m2) and the buildings used for temporary accomodation purposes 781 kWh/m2).

Identification and participation of stakeholders is of vital importance for the successful implementation of a long-term strategy for the energy renovation of buildings. For the selection of the key stakeholders of the area the LFA's (Logical Framework Approach) methodological tool of stakeholders' matrix was applied and a number of stakeholders were selected as follows: seven (7) Central Government Bodies, five (5) Regional and Municipal Authorities, three (3) Public companies, four (4) institutions, two (2) associations, four (4) environmental NGOs and two (2) private entities. Such stakeholders can develop policies, manage existing programmes, own public buildings and can thus promote actions relevant to energy efficiency in the area linked to increased information (conferences), mobilization of other representatives as well as citizens and organizing bilateral meetings and discussions.

With regard to Energy Efficiency Investments in the area, mapping of policies, interventions and initiatives, the Region of Sterea Ellada has conducted its Operational Programme for the period 2014-2020, with a total budget of € 190 mn. The latter foresees as a Priority Action (PA 4) the "Support towards the transition to a low carbon economy in all sectors", which counts for the 7.68% of the total

budget. Moreover, the Programme sets as an Investment Priority (IP 4c) the “Support for energy efficiency, smart energy management and the use of renewable energy sources in public infrastructure, including public buildings, and in the housing sector”.

The most important directives at EU level are: Energy Efficiency Directive (2012/27/EU) and Energy Performance of Buildings Directive (2010/31/EU). At national level, Law 4122/2013 (transposition of EU Directive 2010/31/EU) includes, among others:

- The conduction of a Long-term Strategy for Energy Refurbishment of all public and private buildings.
- The framework for setting out the energy efficiency minimum requirements through KENAK.
- The mandate, starting from 01.01.2019, for all the new public sector buildings to be near zero energy consumption.
- The issuance of Energy Performance Certificates for all public sector buildings of more than 250 m2 total floor surface, in which regular interaction with the general public takes place.
- The mandate for the Energy Performance Certificates of public buildings to be posted in public view.
- The initiation of measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings. Incentives shall take into account the cost-effectiveness of energy efficiency investments for society as a whole.

The main policy at national level that provides for strategic priorities is the National Energy and Climate Plan (NECP) which establishes a central quantitative objective for the renovation and replacement of residential buildings with new nearly zero-energy buildings, which could in aggregate amount to 12-15% of all residential buildings by 2030. On a national level, the annual objective is to have an average of 60,000 buildings or building units upgraded in terms of energy and/or replaced with new more energy-efficient ones. policy measures for energy efficiency improvement in the period 2021-2030 aim to cover twelve different policy priorities (PP3.1-PP3.12):

- PP3.1: Improvement in energy efficiency of public buildings and exemplary role of public sector - Improvement of urban public space microclimate
- PP3.2: Strategy for renovation of the building stock in the residential and tertiary sector
- PP3.3: Promoting energy efficiency contracts by energy service companies
- PP3.4: Promoting market mechanisms

- PP3.5: Promoting innovative financial instruments to ensure private capital leverage and financial sector involvement
- PP3.6: Improvement in energy efficiency and competitiveness of the industrial sector
- PP3.7: Framework for the replacement of polluting passenger vehicles and goods vehicles
- PP3.8: Developing infrastructure and plans for a shift in transport operations
- PP3.9: Energy efficiency improvement of electricity and gas infrastructures
- PP3.10: Promoting measures for modernising water supply / sewage and irrigation infrastructures
- PP3.11: Promoting efficient heating and cooling
- PP3.12: Training/informing professionals and consumers on energy-efficient equipment and rational use of energy

When it comes to the Regional Level, in the Region of Sterea Ellada, through its Operational Programme for the period 2014-2020, and more specifically, under the Investment Priority 4c "Support for energy efficiency, smart energy management and the use of renewable energy sources in public infrastructure, including public buildings, and in the housing sector", a series of actions are meant to take place in order to improve energy efficiency through:

- Public buildings' energy refurbishment actions
- Bioclimatic design criteria application and redesign to existing buildings
- Shell interventions and functional features redesign of existing public buildings (eg schools, health buildings, social - welfare facilities etc.)

Through the implementation of the Operational Programme's relevant thematic target, the Region aims at:

- Reducing conventional energy consumption in order to deteriorate greenhouse gas emissions
- Reducing energy costs and, thus, increasing available income for citizens and SMEs
- Reducing public sector cost, regarding energy consumption related to public buildings and infrastructure. As a result, a reduction of reciprocal fees may become possible.
- Taking advantage of the area's RES potential
- Mobilizing investments in RES sector

2. Summary of Good Practices

A Good Practice aims at following a standard way of doing things as well as at maintaining quality as an alternative to mandatory legislated standards and can be based on self-assessment and benchmarking. Regarding the identification of good practices, their aim is to highlight several local / regional / national / European / International good practices related to the energy efficiency interventions in public buildings. The collection of such practices has been achieved via a desk research and the main ones that were identified are being presented below.

All of them refer to public buildings and behavioural change with regard to interventions on energy efficiency.

Good Practice - #1

Title of the good practice and name of the building
• Green University Strategy for TUC • Technical University of Crete (TUC), Greece
Does this practice come from a European funding program?
The practice came from Interreg Europe/ Rebus Project
Short Summary of the practice
Creation of a Green University which shall act as an "open lab" for research and technology according to sustainable development. In addition, a series of energy refurbishment interventions have taken place in order to increase energy efficiency scores of the institution and deteriorate relevant costs. Energy reduction measures focused on two directions, namely: - Analyze energy data in order to assess potential savings and - Implement actions towards energy saving direction.
Evidence of success
• Minimized heating oil expense from 133,389 € in 2012 to 44,135 € in 2014. • Reduced electricity consumption from 4,350 MWh in 2012 to 3,702 MWh in 2014. • Total energy expenditure decreased by 17.6% from €762,668 in 2012 to €628,352 in 2014.
Challenges encountered
The successful implementation of the Green strategy was based on the cooperation among the involved stakeholders (Administration, Technical Service, staff and students). To this purpose, a series of means have been used in order to increase the users' awareness and to provide them with proper guidelines for energy saving. The relevant toolkit included Web campaigns, banners, student contests etc.

Potential for learning or transfer

- Energy saving targets: Aiming at reducing the total energy consumption by 20%, all parties involved made a bid to minimize oil consumption and reduce electricity consumption.
- Simple and feasible actions: Public awareness, Upgraded lighting equipment, Reconstruction of student residence, new water heaters, heat pump for DHW supply and solar thermal utilization, new air-conditioning units, thermally interrupted aluminium windows with low thermal transmission glass, new heat pumps, automatic control system of central air-conditioning units.
- Transferability: The TUC strategy can be easily replicated. The engagement of everyone involved is of major importance. Building a database is also crucial. All actions related to monitoring the action plan are applicable to every public building.

Creating databases-Innovation in monitoring: Electricity consumption is being recorded, using a software that produces an energy map depicting energy consumption of all its main units.

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/1235/green-university-strategy-for-tuc/

https://www.interregeurope.eu/rebus/

Good Practice - #2

Title of the good practice and name of the building

- Energy upgrade of the Centre of Architecture and the Central Municipal Library Buildings
- Centre of Architecture and Municipal Library, City of Thessaloniki, Greece

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Support Project, while project implementation was funded through EU structural funds.

Short Summary of the practice

The good practice consists of implementing a series of energy refurbishment actions in the Centre of Architecture as well as the Municipal Library in Thessaloniki.

Evidence of success

According to the energy study and the relevant energy audits, the energy savings are estimated at approximately 366 MWh per year and the CO_2 reduction at approximately 258 tns per year.

Challenges encountered

Such projects depend on funding sources, which are directly relevant to regional policies and state programs. The Operational Programs (OP) provide opportunities to use these funds in line with the pertinent OP policies.

Potential for learning or transfer

The project is integrated to the implementation of the Sustainable Energy Action Plan of the Municipality. The overall intervention constitutes a good practice for similar intervention at other public buildings, since the municipal building accumulates important public activities.

Furthermore, the constant interaction with citizens may lead to spreading energy efficiency awareness to general public.

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/1812/energy-upgrade-of-the-centre-of-architecture-and-the-central-municipal-library-buildings/

Good Practice - #3

Title of the good practice and name of the building

- Use of Internet in the 3rd Primary School of Rethymno
- 3rd Primary School of Rethymno, Greece

Does this practice come from a European funding program?

Intelligent Energy Europe Programme of the European Union / EURONET 50/50 MAX

Short Summary of the practice

The students implemented a wide range of activities, from homework during the lessons, such as creating subjects' paintings and posters promoting energy saving, up to extracurricular activities, such as educational trips to waste treatment facilities and participation in thematic energy saving events.

The school showed excellent performance in raising the awareness of the students and teachers, as well as that of the wider society, on the importance and methodology of energy saving, by intelligently using popular social networking tools such as Blogging, YouTube and Pinterest in order to convey the message of efficient energy saving to the general public.

Evidence of success

The following table depicts energy savings achieved during the year 2015, when the EURONET 50/50 MAX program was actively implemented in the 3rd Primary School of Rethymno:

	Energy savings achieved			
Year of program implementation	*in kW*	*in %*	*in EUR*	*in t CO2*
2015	1,424	13.92	156.64	0.66

Challenges encountered

One of the challenges encountered was the fact that a great variety and combination of information sessions (either in the form of indoor sessions or external educational visits) and creative activities were necessary to keep the interest and motivation of the students and their focus on program's objectives.

Once the students, however, realized the importance of the project, they tackled it passionately, thinking of creative ways to achieve energy saving in the school building, as well as to promote the message of energy saving outside their school.

In addition, a further challenge was the development of promotional tools concerning the raise of environmental awareness using a limited budget.

The participants involved, however, showed great ingenuity and flexibility in finding clever and cost – effective ways to streamline their environmental campaign by making use of social media platforms, thus spreading their message beyond their institution's environment.

Potential for learning or transfer

As presented above, there were significant energy savings achieved by this school during the project's implementation. However, the best practice so far was the way that involved energy teams spread the message of energy saving using a variety of on-line tools and media, expertly exerting their enthusiasm and creativity along the way.

Various actions of the energy teams, who are using appropriate internet tools, constitute a good communication model that other schools could replicate to promote the concept of energy saving to the wider audience. Hence, the case of the 3rd Primary School of Rethymno has been included as a best practice in the EURONET 50/50 MAX methodology guidebook, thus enhancing transferability of project's results.

In addition, the 50/50 methodology can be implemented in any public building, provided that its energy bills are covered from municipal budget (therefore achieved savings mean savings both for the Local Authorities and the building itself).

The methodology for calculating energy and financial savings is very simple (yet includes all important aspects, like weather conditions in a given year) and can be applied to any kind of buildings. The calculations can be based on the data gathered from invoices or energy meters, so no sophisticated energy monitoring systems are necessary.

Large part of the methodology is focusing on capacitating building users to optimise energy use. A lot of useful methodological and educational material is gathered on the project website. The model contract

on the 50/50 implementation (signed between the local authority and the building manager) is available on-line and can be adapted to different local conditions.
Further information *http://www.euronet50-50max.eu/en/ http://3dim-rethymn.reth.sch.gr/*

Good Practice - #4

Title of the good practice and name of the building • Thermo-modernization of public buildings in the Poviat of Opatow - Nursing Home in Zochcinek • Nursing Home in Zochcinek, Poland
Does this practice come from a European funding program? The practice came from Interreg Europe/ Enerselves Project
Short Summary of the practice Thermo-modernization of public buildings in the Poviat of Opatow: House of Social Assistance in Zochcinek, building A, B and 5.
Evidence of success Construction works are being carried out as part of this task. Performed, among others insulating ceilings, external walls, window carpentry has been replaced. Works related to the installation of photovoltaic panels, heat pumps and the installation of a gas installation are in progress. Additional effects: significant reduction of carbon dioxide emissions (66%) and an increase in the share of renewable energy sources in the overall balance of energy demand, reaching 10.2%.
Challenges encountered In the course of the contract, there were doubts of contractors whether for installation of gas heat pumps and other construction works outside the outline of the building should apply 23% VAT rate and whether for works within the building should apply an 8% VAT rate.
Potential for learning or transfer The described investment, which will be implemented under the project called "Thermo-modernization of public buildings in the Poviat of Opatów", shows that thermomodernization should be approached comprehensively, interfering with both in the central heating installation, installation for preparing hot tap water, window and door woodwork, insulation of walls or ceiling, but taking into account social factors.

The Social Welfare Home in Zochcinek supports people in need, supports families, strives for a dignified standard of living, and acts as a center of cultural activity.

The area organizes events and events covering the residents of not only the inhabitants of the village of Zochcinek or the Opatów Commune, but also the whole of the Opatów district.

The thermo-modernization carried out will contribute to achieving the desired ecological and economic effects and will significantly improve the standard of living of the charges of the center and the staff.

Further information

https://www.interregeurope.eu/policylearning/good-practices/item/877/thermo-modernization-of-public-buildings-in-the-poviat-of-opatow-nursing-home-in-zochcinek/

Good Practice - #5

Title of the good practice and name of the building

- Energy refurbishment of public building according to environmental minimum criteria
- Municipal Public Building in Tivoli Municipality, Italy

Does this practice come from a European funding program?

The practice came from Interreg Europe/ Support Project. In addition, the refurbishment project was funded by structural EU funds.

Short Summary of the practice

Energy efficiency interventions on public building. Pilot project to define invitation to tender “Product specification” to Environmental Minimum Criteria.

Evidence of success

The monitoring results confirmed the estimated energy saving:

- Upgrade of the building from category F to B.
- Global energy performance ratio KWh (mq x year) reduced from 204,00 to 85,03.
- Heating consumption m^3/year reduced from 35.04 to 20.33.
- Illumination and electric consumption KWh/year reduced from 39.359 to 10. 949
- Energy production KWh/year 8.010
- Primary Energy equivalent consumption KWh (conversion factor =2,17) from 85.409 to 23.759, reduction of 72%.

Challenges encountered The intervention has fostered a positive relation between different public administration: Regione Lazio supported the local municipality's lack of Knowledge
Potential for learning or transfer The main success factors of the practice (which can be transferred to other contexts) can be thus synthesized to (a) good use of EU funding, as the two steps call helped the small municipality to programme first feasibility studies (Energy audit included) and then (b) the realization of works adequate to new environmental law.
Further information *https://www.interregeurope.eu/policylearning/good-practices/item/2367/energy-refurbishment-of-public-building-in-according-to-environmental-minimum-criteria/*

3. Analysis of the project areas and stakeholders

3.1 Definition of SWOT Analysis

SWOT analysis, (Strengths, Weaknesses, Opportunities, Threats) presents the strengths and weaknesses of the region of Sterea Ellada with regard to the area of Energy and Efficiency overall and in particular with regard to the building sector as well as the opportunities and threats arising also from the external environment of the country. The following table presents the SWOT analysis for the needs of approaching the current situation in Evia. The table below shows the SWOT analysis in order to approach the current state of play in Evia.

3.2 SWOT Analysis of each project Area and Stakeholders

Strengths	Weaknesses
• 4th highest GDP per capita at national level • Considerable capacity in RES installed at regional level • Adequate number of public authorities and stakeholders involved in the energy upgrade of the buildings • Participation of Evia in the Covenant of Mayors initiative • Existence of energy communities and promotion of smart cities	• Categorised as having one of the warmest climates at National level (Category 2) • Poor performance in building energy efficiency • Almost half of the public sector buildings are classified in categories C and D at national level • Low number of investments in the energy sector

Opportunities	Threats
• Existence of NECP promoting a number of interventions, renovation of buildings and RES • Green Deal and other related to energy directives and policies • Regional Operational Programme • Sustainable Energy and Climate Action Plan of Evia	• Low number of Energy Performance Certificates for category A at national level • COVID-19 pandemic • Energy poverty issue at national level due to the long-term crisis

3.3 Definition of PESTLE Analysis

The PESTLE analysis is an analysis of all the external environment parameters of the Sterea Ellada region that affect the actions of PRO-ENERGY project. These parameters are broken down into political, economic, social, technological, legal and environmental aspects and are they are being analysed in the following section.

3.4 PESTLE Analysis of each project Area and Stakeholders

P **P**olitical factors	**E** **E**conomic factors	**S** **S**ocial factors	**T** **T**echnological factors	**L** **L**egal factors	**E** **E**nvironmental factors
- Volatile political situation that is hindered by the pandemic - Promotion of energy	- Stable economic situation at national level that is hindered by the current pandemic - High unemployment rate at national level - Obstacles in the implementation of	- Aging population - Stagnating population - Issue of Energy poverty at national level	- Application of high value technologies in a number of interventions planned with regard to the renovation of old buildings	- Sufficient legislative framework both at European and national level	- Low number of Energy Performance Certificates for category A

transition high on the EU agenda (Green Deal)	new initiatives and economies of scale - High number of investments in the energy sector - Financial and tax support for investment in energy savings technologies	- Low consciousness with regard to the Behavioural change in terms of energy efficiency - Negative effects caused by the pandemic	- Support for investments in energy savings technologies - Promotion of innovative smart city models through the use of state-of-the-art technologies.	- Establishment of an Energy Management System based on the international and European standards (EN 16001)	at national level -Climate related issues causing high temperatures

4. Objectives of the strategy and KSFs

4.1 Definition of Objectives of the Strategy

The strategy of the Development Agency of Evia for increasing the energy efficiency in public buildings through behavioural change is based on the results of the analysis of the current situation alongside the best practices, taking also into consideration the national policies and particularly NECP.

More specifically, the Strategic Objectives of the Development Agency of Evia for the increase of the energy efficiency in public buildings through the behavioural change are the following:

❖ Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
❖ Promotion of the renovation and upgrade of the existing building stock
❖ Increase the behavioural change in energy efficiency especially for officers working in public sector
❖ Raise awareness of the local community on issues related to energy efficiency
❖ Monitor the evolution in terms of energy savings via data collection
❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

The abovementioned objectives can be categorised on the basis of the overall strategic approach for the promotion of the energy efficiency that may also include the actual renovation of the buildings as this is already highlighted and raised in the current national strategies.

Moreover, the objectives highlight the importance of the human factor in this process of transitioning to more energy efficiency practices, that may apply at community level and more specifically with the focus on the public sector and thus the officer that are employed.

Finally, objectives are developed on the basis of the importance that tools and other technical means have in such transition since numbers and measures are key in order to have a clear picture of the current status in terms of energy saving and predict and develop future practices and actions in this regard. Such actions and interventions will then enable the enhancement of a number of investments and interventions that will make the sector more attractive and thus more competitive in this regard.

4.2 Definition of Keys Success Factors

The success of the strategy and relevant actions will depend on a number of factors in relation to skills, communication, planning, teamwork and process. Such factors are being summarised as follows:

❖ Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
❖ Involvement of the officers working in the public sector in order to acquire necessary skills for the promotion of such change.
❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives.
❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings and application of changes when deemed necessary
❖ Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
❖ Available funding tools to implement strategy's policies and planned interventions and actions

5. Strategic priorities

5.1 Definition of Strategic Priorities

On the basis of the analysis that took place regarding the existing situation and best practices as well as the definition of the objectives and main key factors mentioned before the Development Agency of Evia has identified a number of key strategic priorities as well key criteria on the basis of which the goals will be achieved.

These priorities are summarised on the following priority axes that are being analysis further in the following section:

❖ **Priority Axis 1:** Enhanced energy efficiency and use of RES in public sector buildings
❖ **Priority Axis 2:** Promote awareness raising and behavioural change for public sector officers and local communities
❖ **Priority Axis 3:** Enhanced tools and technologies that will enable the transition to low carbon economy and increase energy savings

5.2 Strategic Priorities

The current section provides for an analysis of the main strategic priorities – axes that have been mentioned previously as well as the key criteria that will enable the achievement of the relevant goals. More specifically:

Priority Axis 1: Enhanced energy efficiency and use of RES in public sector buildings

This Priority Axis is also in line with the investment priority that is being highlighted in the Regional operational program of Sterea Ellada. The main aim of such axis is to place the energy efficiency and promotion of RES overall as a strategic priority for the area and more specifically targeting the buildings that belong to the public sector.

The enhancement of energy efficiency and RES requires, first and foremost, the engagement of the public sector authorities as well as other key stakeholders coming also from private sector in order to

promote the existing policies at EU and national level and ensure the most efficient and successful implementation of the planned interventions and activities in line also with the set targets.

In line also with the objectives that were mentioned previously, the strategic aim of this axis is also to promote the exemplary role of the public sector in promoting such interventions and take the lead in this regard especially with the assistance of the relevant authorities.

Priority Axis 2: Promote awareness raising and behavioural change for public sector officers and local communities

This Priority Axis highlights the societal aspect of the strategy. More specifically, it focuses on the strategic importance of the change in the behaviour of the users and, thus, it places the human factor at its core.

One of the main prerequisites for the transition to low carbon economy as well as more energy savings is the behavourial change that entails the change of people's mentality in terms of energy efficiency by the change on a number of habits and daily routine.

Behavioural Energy Efficiency, consists of a set of tools that may trigger, sensitise, advise & finally drive individual users towards practical & measurable actions for their personal & everyday use of energy resources. Studies reveal that a 3-4,5% reduction in energy consumption may be achieved through simple rules ("switch off the lights when leaving the room", "maintain a steady temperature on the thermostat") that may reach 15% when rules are driven/supported by a consistent information system at the hands of the energy user.

Against the above background, it is more than evident that more information is required on the benefits of energy efficiency at personal and social level. That is why the strategy should also focus on the information and awareness raising at local and national level of the citizens and communities that will enable the shift of the current mentality in order to apply such practices not only at home but also at the working place. Considering that the target is mainly public sector buildings, the target group may also be the public sector officers. However, dissemination activities will need also to targets a broader public at community level.

Priority Axis 3: Enhanced tools and existing technologies that will enable the transition to low carbon economy and increase energy savings

This Priority Axis highlights the importance of tools and technical means in the transition to an economy that is characterized by a high level of energy savings.

First of all, monitoring is of high importance in order to have a clear picture of the current status in terms of saving, as well as be in the position to predict via a given number of algorithms future consumption. Thus, it is more than obvious how this priority is linked to the strategies and policies since such

algorithms are in the position to confirm the efficiency of the current ones and, at the same time, foresee the future ones or changes in the interventions that will need to be applied depending on the results.

Based upon the universal fact "You may not improve unless you measure first", actual & precise energy readings from different energy sources that may come available near real-time through the application of technical means and tools. Such tools and means may include also online platforms that can concentrate useful data on consumption as well as tools related to cost-benefit analysis that may be used for future investments for the benefit of the public sector via a number of specific interventions (renovations, retrofits etc).

6. Action Plan, including activities for the promotion of Energy Efficiency at interregional level, relevant budget and monitoring and evaluation tools for the implementation of such activities

The current section presents in more detail the action plan that has been designed by the Development Agency of Evia in order to promote the increase of the energy efficiency in public buildings and also the behavioural change.

The following sections provide for an in-depth analysis of such plan on the basis of the strategic priority axes that have been mentioned before as well as the specific targets and actions per axis, the groups to be involved, the necessary financial resources for this purpose and the respective time plan that is foreseen for such proposed actions and interventions.

6.1 Action Plan

This section provides an overview of the main aspects of the Action plan that was developed by the Development Agency of Evia, as mentioned, on the basis of the priorities, objectives and key factors identified following the analysis of the current status while taking also into consideration the best practices highlighted in previous chapters.

More specifically, for each of the Priorities mentioned above there are certain **objectives and goals** also highlighted that correspond to certain types of actions and target groups analysed on the basis of the stakeholder's matrix that was developed in previous cases. The aim of this categorization is to define in details the priorities and actions that correspond to each group and in this way to have a clear planning process to be put in force by the relevant authorities as soon as the plan will be finalised.

Priority Axis 1: Enhanced energy efficiency and use of RES in public sector buildings

❖ Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
❖ Promotion of the renovation and upgrade of the existing building stock
❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

As already mentioned above, this Priority Axis has a more strategic and horizontal dimension that is also linked to the political aspect of the Plan and the role of institutions.

Against this background, the main aim under this priority is the promotion of the exemplary role of the sector via interventions in energy efficiency that may also target explicitly the renovation and general upgrade of the existing building stock in line also with the current legislative framework.

The political will for the promotion and boost of investments is vital in order to increase the level of competition of the sector in the area of energy. A key factor in this regard is also the financial support that is an important prerequisite for the implementation of any type of action in any case.

The **key factors** that need to be ensured for a successful outcome in this regard are as follows:

❖ Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
❖ Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
❖ Available funding tools to implement strategy's policies and planned interventions and actions

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

- *Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector*

Proposed **types of actions** in line also with the national legislation:

- Engage on a long-term strategy for the refurbishment and renovation of the public sector buildings via the organisation of bilateral meetings and discussions in order to achieve better results and further engagement in this regard
- Increase the number of issuances of Energy Performance Certificates to be extended to all the public sector buildings especially the ones that the current surface occupied exceeds 250 m2 in total.
- Initiate measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings

With regard to the **second Strategic Objective**:

- *Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level*

Similarly, to the previous objectives, relevant types of actions relate to the enhanced role of the key stakeholders in the area of energy and public sector authorities in order to ensure the alignment of the national policies with the ones set at EU level and thus ensure alignment with the set targets in both levels. More specifically:

- Engage on the implementation of the relevant policies as well as the promotion of respective intervention via the organisation of bilateral meetings and discussions in order to achieve better results and efficiency in meeting the set targets at both levels.
- Initiate the organisation of informative sessions that will be open to all interested parties in order to promote the benefits of the energy efficiency at individual, community and national level.

With regard to the **third strategic objective**:

❖ Available funding tools to implement strategy's policies and planned interventions and actions

This objective refers mainly to the actions that the public authorities and key stakeholders will have to undertake in order to ensure that there are adequate funding tools and programmes in order to implement the planned policies and interventions.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Political influence	Decision-making power	Financial resources
Central Government Bodies	*	*	*
Regional and Municipal Authorities	*	*	*
Public Companies	-	*	-
Institutions	-	*	-
Associations	-	*	-
Private Entities	-	-	*

Priority Axis 2: Promote awareness raising and behavioural change for public sector officers and local communities
❖ Increase the behavioural change in energy efficiency especially for officers working in public sector

❖ Raise awareness of the local community on issues related to energy efficiency

As already mentioned above, this Priority Axis has a more social dimension and more specifically to the role of the human factor in the process of transitioning to a low carbon economy and in particular an economy with high energy savings on the basis of the behavioural change tool.

Against this background, the main aim under this priority is the mobilisation of the public sector officers as well as citizens at local level n order to incentivize them to apply practices that target energy savings via the behavioural change in terms of energy efficiency. One key parameter in this regard is the raising of awareness and the dissemination activities that will make officers and public overall about the benefits of energy saving at individual and community level and for the benefit of the sector that will bring also benefits in economic terms and increased also its competitiveness.

The target to the local community shows that the issue of energy saving is not strictly related to the workplace. On the contrary, it will need to be linked to everyday lives of people as citizens as well considering that such an area is still not well known to the public and the swift to the behaviour in terms of energy consumption depends also on the swift from a certain mentality that has been established the last decades. Additionally, and considering the bigger picture, the transition to a low carbon economy requires the participation and motivation of the local communities that due to the linkages that they can create can form the driver for such progress.

The **key factors** that need to be ensured for a successful outcome in this regard are as follows:

❖ Involvement of the officers working in the public sector in order to acquire necessary skills for the promotion of such change
❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

- ❖ Increase the behavioural change in energy efficiency especially for officers working in public sector

Proposed types of actions in line also with the national legislation:

- ❖ Organisation of info days in order to update the officers in relation the latest news in the area of energy efficiency and motivate them to participate in other relevant events organised either online by other institutions (also at EU or international level) or by way of physical means
- ❖ Enhance the skills of the officers by organizing short training sessions on the basis of identified training needs providing also recommendations that result from best practices at local, European and international level

With regard to the **second Strategic Objective**:

- ❖ Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives

Similarly, to the above-mentioned actions, it is important to inform the local communities in relation to the energy related news and other opportunities offered to participate. More specifically:

- ❖ Organisation of info days and other dissemination activities that will be open to the local community for all citizens to participate and to be updated with regard to the latest news in the area of energy efficiency. Such activities will aim at motivating them to be more incentivized in order to apply practices related to energy efficiency and energy savings in their everyday lives and thus also in the workplace either this belongs to public sector or the private one.

The aim is to spread the awareness of the whole society with regard to the importance of reducing energy consumption not only at individual level, in each house, but also with the extension of such practice and mentality along the day and also at the workplace.

- ❖ Organisation of training seminars for those interested in learning more regarding energy efficiency. Such seminars can be either theoretical or practical providing the participants guidelines or other types of hints and advice on how to integrate such practices better and in a more efficient way in their lives.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Decision-making power	Technical Guidance/assistance
Central Government Bodies	*	-
Regional and Municipal Authorities	*	-
Public Companies	*	-
Institutions	*	*
Associations	*	*
Environmental NGOs	-	*

Priority Axis 3: Enhanced tools and existing technologies that will enable the transition to low carbon economy and increase energy savings
❖ Monitor the evolution in terms of energy savings via data collection
❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

As mentioned before, monitoring is of high importance in order to have a clear picture of the current status in terms of saving, as well as be in the position to predict via a given number of algorithms future consumption. Thus, it is more than obvious how this priority is linked to the strategies and policies since such algorithms are in the position to confirm the efficiency of the current ones and, at the same time, foresee the future ones or changes in the interventions that will need to be applied depending on the results.

Based upon the universal fact "You may not improve unless you measure first", actual & precise energy readings from different energy sources that may come available near real-time through the application of technical means and tools. Such tools and means may include also online platforms that can concentrate useful data on consumption as well as tools related to cost-benefit analysis that may be used for future investments for the benefit of the public sector via a number of specific interventions (renovations, retrofits etc).

The **key factor** that needs to be ensured for a successful outcome in this regard are as follows:

- ❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings and application of changes when deemed necessary

Against this background a number of indicative actions are put forward for each objective/goal as well as proposed target groups that may participate in this process. These are being summarised and further analysed as follows:

With regard to the **first Strategic Objective**:

- ❖ Monitor the evolution in terms of energy savings via data collection

Proposed types of actions are as follows:

- ❖ Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings

- ❖ Enhance the skills of the officers by organizing short training sessions in order to be informed in relation to such means and use of these tools

With regard to the **second Strategic Objective**:

- ❖ Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

Proposed types of actions are as follows:

- ❖ Actions in order to identify opportunities in terms of investments and financial support that will increase the competition. Such actions include also the involvement of key actors and bilateral meetings and agreements necessary in this regard.

With regard to the main target group that will need to address such action, and on the basis of the stakeholder's analysis that has been developed in previous stage such actors are being summarised in the following table along with their contribution in relation to each of the opportunities and incentives they can offer under this Priority axis indicated by a "*":

Stakeholder Category	Decision-making power	Technical Guidance/assistance
Central Government Bodies	*	-
Regional and Municipal Authorities	*	-
Public Companies	*	-
Institutions	*	*
Associations	*	*
Environmental NGOs	-	*

6.2 Activities for the promotions of EE at interregional level

Conclusions

Problems highlighted

- Categorised as having one of the warmest climates at National level (Category 2)
- Poor performance in building energy efficiency
- Almost half of the public sector buildings are classified in categories C and D at national level
- Low number of investments in the energy sector

Objectives to be achieved

- Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector
- Promotion of the renovation and upgrade of the existing building stock
- Increase the behavioural change in energy efficiency especially for officers working in public sector
- Raise awareness of the local community on issues related to energy efficiency
- Monitor the evolution in terms of energy savings via data collection
- Enhance investments and financial support to increase competition of the sector in the area of energy efficiency

Existing initiatives (opportunities)

- Existence of NECP promoting a number of interventions, renovation of buildings and RES
- Green Deal and other related to energy directives and policies
- Regional Operational Programme
- Sustainable Energy and Climate Action Plan of Evia

Initiatives to be taken on the basis of the Strategic Objectives

- Engagement of public sector authorities as well as other identified key stakeholders in the promotion of the energy efficiency and the swift of the behaviour in terms of energy saving in public buildings
- Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level.
- Available funding tools to implement strategy' s policies and planned interventions and actions

6.3 Budget of Activities

The proposed actions of the Strategy as being mentioned above for the promotion of energy efficiency and behavioural change can be financed in a number of ways as follows:

- National Strategic Reference Framework (NSRF): it includes both the Regional Operational Programme of Sterea Ellada and the sectoral operational programmes especially the ones that relate to the infrastructure, the environment and sustainable development of the new programming period, 2021-2027.
- Transnational Programmes such as Interreg Programmes of the new programming period, 2021-2027 and more specifically, Interreg MED, Interreg Balkan-Med, Interreg Adrion, Interreg V-A Greece-Italy, and Interreg IPA Greece-Albania.
- European research funding programs such as HORIZON 2020 which enable through specific programs to conduct research in the behavioural change in terms of energy efficiency and to pilot the results of research.
- Taking advantage of other financing opportunities such as the opportunities provided by the European Investment Bank that provide opportunities to finance maturing large energy saving projects through programs such as ELENA

With regard to the respective timeframes, the strategy to promote energy efficiency and behavioural change is proposed to be implemented over a five-year period.

The complexity of financing the actions and their possible integration into different funding programs requires long-term planning.

The different phases of the strategy are as follows:

-1st year: Action specification and funding targeting (Phase 1)

-2nd year: Inclusion in the selected financing program (Phase 2)

-3rd to 5th year: Implementation and evaluation (Phase 3)

In addition to the above schedule, an annual review and redesign is planned based on the strategy implementation needs and funding opportunities presented.

6.4 Monitoring and Evaluation tools of the implementation of activities

Monitoring and evaluation will take place at all stages of the implementation. As mentioned above, the implementation will take place during the 3rd and 5th year (Phase 3). A mid-term evaluation will take place on the 4th year of implementation for all activities in order to evaluate the level to which the initial targets were achieved. The final evaluation will take place following the 5th year of implementation, in a period of up to 6 months following the implementation process.

With regard to the evaluation a number of indicators will be developed for each of the set actions and relevant targets will be set for each. More specifically:

- *Enhancement of energy efficiency in public buildings and promotion of the exemplary role of the public sector (PA1)*

Types of actions

- Engage on a long-term strategy for the refurbishment and renovation of the public sector buildings via the organisation of bilateral meetings and discussions in order to achieve better results and further engagement in this regard

- **Indicator:** number of buildings that were refurbished and renovated (around 8-10 each year)
- **Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

- Increase the number of issuances of Energy Performance Certificates to be extended to all the public sector buildings especially the ones that the current surface occupied exceeds 250 m2 in total.

  - **Indicator:** number of issuances of Energy Performance Certificates (around 8-10 each year)

- Initiate measures, funding Programmes and other means to improve the energy efficiency of new and existing buildings

  - **Indicator:** number of actions/means to improve the status of buildings in terms of energy efficiency

- *Alignment of the national policies to the European ones especially also to the targets set and also to the targets set at regional level* (PA1)

Types of actions

- Engage on the implementation of the relevant policies as well as the promotion of respective intervention via the organisation of bilateral meetings and discussions in order to achieve better results and efficiency in meeting the set targets at both levels.

  -**Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

- Initiate the organisation of informative sessions that will be open to all interested parties in order to promote the benefits of the energy efficiency at individual, community and national level.

  -**Indicator:** number of information sessions that took place in this regard (2 each year of at least 15 participants)

- Available funding tools to implement strategy's policies and planned interventions and actions (PA1)

This type of actions refers mainly to the ones that took place in previous phase whereby funding tools were identified. During this stage of implementation there will be an evaluation of whether such tools were sufficient or new ones may be used in future interventions.

- Increase the behavioural change in energy efficiency especially for officers working in public sector (PA2)

Types of actions

- Organisation of info days in order to update the officers in relation the latest news in the area of energy efficiency and motivate them to participate in other relevant events organised either online by other institutions (also at EU or international level) or by way of physical means
  -**Indicator:** number of info days and events that took place in this regard (2 each year of 20 participants)

- Enhance the skills of the officers by organizing short training sessions on the basis of identified training needs providing also recommendations that result from best practices at local, European and international level
  -**Indicator:** number of training sessions and participants that took place in this regard (2 each year of 20 participants)

- Support of the local communities and involvement also of citizens in order to raise awareness on the importance of energy savings in their lives (PA2)

Types of actions

- Organisation of info days and other dissemination activities that will be open to the local community for all citizens to participate and to be updated with regard to the latest news in the area of energy efficiency. Such activities will aim at motivating them to be more incentivized in order to apply practices related to energy efficiency and energy savings in their everyday lives and thus also in the workplace either this belongs to public sector or the private one.
  -**Indicator:** number of info days and activities that took place in this regard (2 each year of at least 15 participants)

- Organisation of training seminars for those interested in learning more regarding energy efficiency. Such seminars can be either theoretical or practical providing the participants guidelines or other types of hints and advice on how to integrate such practices better and in a more efficient way in their lives.

  -**Indicator:** number of training seminars and participants that took place in this regard (2 each year of at least 15 participants)

- Monitor the evolution in terms of energy savings via data collection (PA3)

Proposed types of actions are as follows:

- Acquisition of necessary tools and technical means that will ensure the successful monitoring of the status on energy savings

  -**Indicator:** number of tools that will be developed in this regard (around 1-2)

- Enhance the skills of the officers by organizing short training sessions in order to be informed in relation to such means and use of these tools

  -**Indicator:** number of training seminars and participants that took place in this regard (2 each year of at least 15 participants)

- Enhance investments and financial support to increase competition of the sector in the area of energy efficiency (PA3)

Proposed types of actions are as follows:

- Actions in order to identify opportunities in terms of investments and financial support that will increase the competition. Such actions include also the involvement of key actors and bilateral meetings and agreements necessary in this regard.

  -**Indicator:** number of bilateral meetings and other form of discussion that took place in this regard (at least 2-3 each year)

Section 4 - CYPRUS

1. Summary of Existing Situation Analysis

In Cyprus, public buildings are used by central government authorities (Ministries, police, the Attorney General's Office); local authorities; public schools, public universities, and other public educational institutions; and the army. The total number of public buildings, except schools and educational institutions, is approximately 1.000. The large majority of the public buildings were developed before 2000 and were constructed without any requirements for thermal insulation or any other energy efficiency measures, similar to the majority of the buildings in the tertiary sector in Cyprus. Consequently, the energy efficiency of the vast majority of public buildings can be characterized as very poor. It's worth mentioning that the majority of public buildings are rented by the government and as a result, the owners did not proceed to the implementation of any energy efficiency measures. As regards their Energy Performance Certificates (EPC), the energy class of the majority of public buildings ranges from C to E. Therefore, the potential for improving energy efficiency in public buildings is significant.

2. Summary of Good Practices and Benchmarking

A good practice is considered to be an action that has been proven to work well and produce good results and is therefore recommended as a model. The essence of identifying and sharing good practices is to learn from others and to re-use knowledge. An analysis of the available good practices implemented in public buildings promoting energy efficiency through behavioral change was carried out among the countries participating in the project "PRO-ENERGY". In this section, a summary of these good practices will be presented.

As regards Cyprus, the good practice that had the greatest influence on behavior change of the employees in the public sector was the energy competitions between the energy teams of municipalities that were implemented as part of the European project Compete4SECAP (C4S).

Specifically, the Municipalities of Aradippou, Agios Athanasios, Lakatamia, and Strovolos take part in the competition, with three buildings each. Each building created its own Energy Team, which was responsible for completing the day-to-day challenges of recognizing significant energy consumption in their buildings, saving energy through behavioral measures, and reducing the carbon footprint of building users. The Energy Competitions reached their objectives by targeting every day, often routine behaviour such as turning lights on and off, setting the temperature for the heating and cooling system, using office equipment, maintaining the different systems (heating, lighting, etc.) and equipment, organizing events, eating and drinking, traveling, etc.

As part of the energy competitions, a guidebook was created that contains best practice examples of office buildings, case studies, and tips for the Energy Teams in the participating buildings on how to help, organize and motivate people for a more energy-efficient behaviour in the workplace. Moreover, employees are encouraged to continue in their homes what they have already done during the Energy Competitions.

The example of the Energy Competitions is considered as a good practice because it can be easily adopted by other local authorities and public services which are housed mainly in office buildings.

3. Analysis of the project areas and stakeholders

SWOT analysis is a strategic planning technique mainly used to help organizations to identify strengths, weaknesses, opportunities, and threats related to business competition or project planning.

SWOT assumes that strengths and weaknesses are frequently internal, while opportunities and threats are more commonly external. The name is an acronym for the four parameters the technique examines:

Strengths: characteristics of the business or project that give it an advantage over others.

Weaknesses: characteristics that place the business or project at a disadvantage relative to others.

Opportunities: elements in the environment that the business or project could exploit to its advantage.

Threats: elements in the environment that could cause trouble for the business or project.

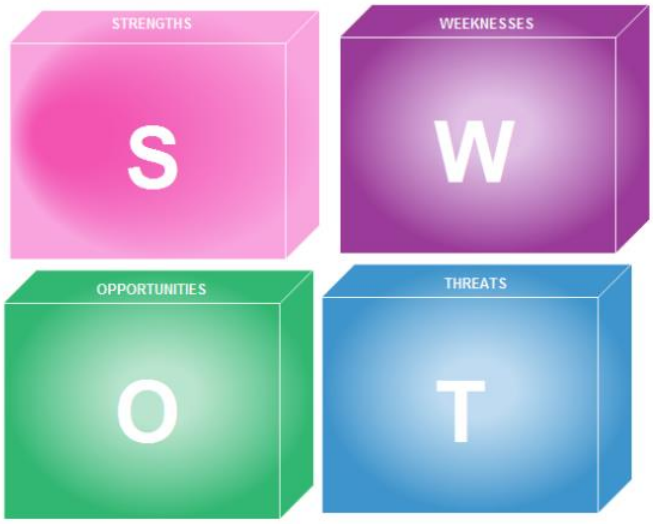


Figure 1: SWOT analysis diagram

3.1 SWOT Analysis of each project Area and Stakeholders [Diagram]

SWOT analysis is a tool most commonly used for strategic planning and risk assessment, but it is also a useful Stakeholder Analysis tool. In this scenario each stakeholder is assessed as follows:

Strengths: What are the Stakeholder' strengths? Could these strengths help the project? Could these strengths hinder the project?

Weaknesses: What are the stakeholder's weaknesses? What are the stakeholder liabilities? Could these weaknesses help or hinder the project?

Opportunities: What positive expertise, connections, influence does this stakeholder have? Could these be useful?

Threats: What threats could the stakeholder bring to the project? Could the stakeholder put the project at risk? How can these threats be reduced?[1]

The first step in SWOT analysis is to make a list of the key organizations and powerful individuals that are affected by or have an influence on the development of the joint strategy and action plan for increasing energy efficiency through behavioral change. Most of the stakeholders have already presented in the previous deliverable *"3.3.1 Existing situation analysis-energy efficiency, paragraph 2: Stakeholders in Cyprus, Relevant to Energy Efficiency of Public Buildings"*. These stakeholders are listed below:

- Ministry of Energy, Commerce & Industry (MECI)
- Ministry of Agriculture, Rural Development & the Environment (MARDE)
- Directorate General of European Programmes, Cooperation, and Development (DG EPCD)
- Ministry of Finance (MoF)
- Cyprus Scientific and Technical Chamber (ETEK)
- Union of Cyprus Municipalities
- Union of Cyprus Communities
- Department of Electrical and Mechanical Services
- NGOs (Cyprus Energy Agency)
- Energy Saving Officers of public buildings
- Energy auditors
- Universities (the University of Cyprus, Cyprus University of Technology)
- Other research institutes (Cyprus Institute)
- Public sector employees

The second step is to list the relevant Strengths, Weaknesses, Opportunities, and Threats of each stakeholder. The table below shows the analysis of Stakeholders based on these 4 criteria.

[1] Source: Stakeholder SWOT, https://www.stakeholdermap.com/stakeholder-SWOT.html

Table 1: Stakeholders SWOT Analysis

	Internal		External	
Stakeholder/ stakeholder group	**Strengths**	**Weaknesses**	**Opportunities**	**Threats**
Ministry of Energy, Commerce & Industry (MECI)	They can change the legal framework related to energy saving	The control of the implementation of the legislation depends on the diligence/consistency of the officers of the ministry	Putting pressure on the legislative authority	The indifference of officials focuses on other areas.
Ministry of Agriculture, Rural Development & the Environment (MARDE)	They can change the legal framework related to energy saving	The control of the implementation of the legislation depends on the diligence/consistency of the officers of the ministry	Putting pressure on the legislative authority	The indifference of officials focuses on other areas.
Directorate General of European Programmes, Cooperation, and Development (DG EPCD)	Proper utilization of money from European funds	Not proper control - waste of money	New funds from European bodies that are not widely known	
Ministry of Finance (MoF)	Inclusion of energy saving actions in the government budget	Non-inclusion of energy saving actions in the government budget	Energy saving funding schemes	Cutting funds for energy savings
Cyprus Scientific and Technical Chamber (ETEK)	Inform engineers and energy managers. Technical advisor to the state		They can positively influence the change in legislation regarding energy saving	They can have a negative effect on the change in legislation regarding energy savings
Union of Cyprus Municipalities	All local authorities are under the same body	Lack of staff and available budget. Other priorities.	Agreement of local authorities for the development of a joint action plan for energy saving	Non-expert staff
Union of Cyprus Communities	All local authorities are under the same body	Lack of staff and available budget. Other priorities.	Agreement of local authorities for the development of a joint action plan for energy saving	Non-expert staff
Department of Electrical and Mechanical Services	Responsible for the energy upgrade of the buildings belonging to the central government	Lack of technical expertise and lack of funding	Replacement of electromechanical equipment with lower energy consumption	Non-replacement of electromechanical equipment with lower energy consumption equipment
NGOs (Cyprus Energy Agency)	Training of energy managers and energy auditors		Providing consulting services in the creation of energy teams	
Energy Saving Officers of public buildings	Monitoring of the implementation of energy saving actions in public buildings	Non-control of the implementation of actions for energy saving in public buildings	Expand their knowledge on energy efficiency measures through capacity building workshops	
Energy auditors	Systems evaluation and in-depth study on energy saving	Misdiagnosis of systems and wrong in-depth study of energy savings		
Universities (the University of Cyprus, Cyprus University of Technology)	Energy saving training programs	Lack of corporation with the public sector	External expertise to the government for the creation of an action plan for energy saving in the public sector	
Public sector employees	The proper implementation and operation of the action plan depends on their own hands	Refusal to implement energy saving measures by some will have negative effects on the implementation of the plan	They can be an example for other sectors besides the public sector	They can be an example to be avoided

3.2 Definition of PESTLE Analysis

PEST analysis (Political, Economic, Socio-Cultural and Technological) describes a framework of macro-environmental factors used in the environmental scanning component of strategic management. Usually, it is part of an external analysis when conducting a strategic analysis or doing market research, and gives an overview of the different macro-environmental factors to be taken into consideration.

The basic PEST analysis includes four factors:

Political factors relate to how the government intervenes in the economy. Specifically, political factors have areas including tax policy, labor law, environmental law, trade restrictions, tariffs, and political stability. Furthermore, governments have a high impact on the health, education, and infrastructure of a nation.

Economic factors include economic growth, exchange rates, inflation rate, and interest rates. These factors can drastically affect how a business operates. For example, interest rates affect a firm's cost of capital and therefore to what extent a business grows and expands.

Social factors include the cultural aspects and health consciousness, population growth rate, age distribution, career attitudes, and emphasis on safety. High trends in social factors affect the demand for a company's products and how that company operates. For example, the aging population may imply a smaller and less-willing workforce (thus increasing the cost of labor).

Technological factors include technological aspects like R&D activity, automation, technology incentives and the rate of technological change. These can determine barriers to entry, minimum efficient production level and influence the outsourcing decisions. Furthermore, technological shifts would affect costs, quality, and lead to innovation.

Expanding the analysis to *PESTLE* adds:

Legal factors include discrimination law, consumer law, antitrust law, employment law, and health and safety law. These factors can affect how a company operates, its costs, and the demand for its products.

Environmental factors include ecological and environmental aspects such as weather, climate, and climate change, which may especially affect industries such as tourism, farming, and insurance. Furthermore, growing awareness of the potential impacts of climate change is affecting how companies operate and the products they offer, both creating new markets and diminishing or destroying existing ones.

None of the above factors should be considered more important than the other, as everything plays a decisive role in the operation of a business.

3.3 PESTLE Analysis of each project Area and Stakeholders [Diagram]

In the previous section, the SWOT analysis for the stakeholders was developed. However, the SWOT analysis alone is not a complete study but a useful tool for the preliminary examination and the first drawing of conclusions is needed.

The complementary tool of SWOT analysis is PESTEL analysis which is a strategic tool used to analyze the external environment of a project. Therefore, below will be an analysis of the project area of Cyprus with the help of the PESTEL tool.

Figure 2: PESTEL Analysis

4. Objectives of the strategy and KSFs

4.1 Definition of Objectives of the Strategy

The general objective of PRO-ENERGY is to reduce by more than 20% the energy spending in public buildings of the participating entities in one year after the implementation of specific actions.

Another objective that is directly related to the goal of the reduction of energy consumption is the reduction of CO2 emissions. Consequently, the goal of the project in Cyprus, apart from the reduction of energy consumption, is also the reduction of CO2 emissions by 20% in one year.

The above two objectives will be achieved through the implementation of an analytic strategy and an action plan for the reduction of energy consumption in public buildings that is focused on the awareness of the employees.

In addition to the main objectives, some sub-objectives are also mentioned in the project proposal, such as:

- The conduction of 2 training sessions for the employees in the public sector (most likely online, due to the measures against the covid-19). The training will aim to inform and train employees on issues related to energy efficiency, reduction of energy consumption and CO2 emissions.
- The issuance of Energy Performance Certificates - EPCs for the public buildings
- The implementation of energy audit in the public buildings mentioned above. The energy audits will be used to be able to record the current situation and to have a comparison measure for the reduction of energy consumption.

4.2 Definition of Key Success Factors [Analysis]

***KSFs: Skills/Communication/Planning/Teamwork/ Process*

Key Success Factors state the important elements required for a company to compete in its target markets. In effect, it articulates what the company must do, and do well, to achieve the goals outlined in its strategic plan.

In our case, KSFs are the elements that will help to achieve the objectives of the strategy and action plan for the reduction of energy consumption in public buildings through awareness-raising.

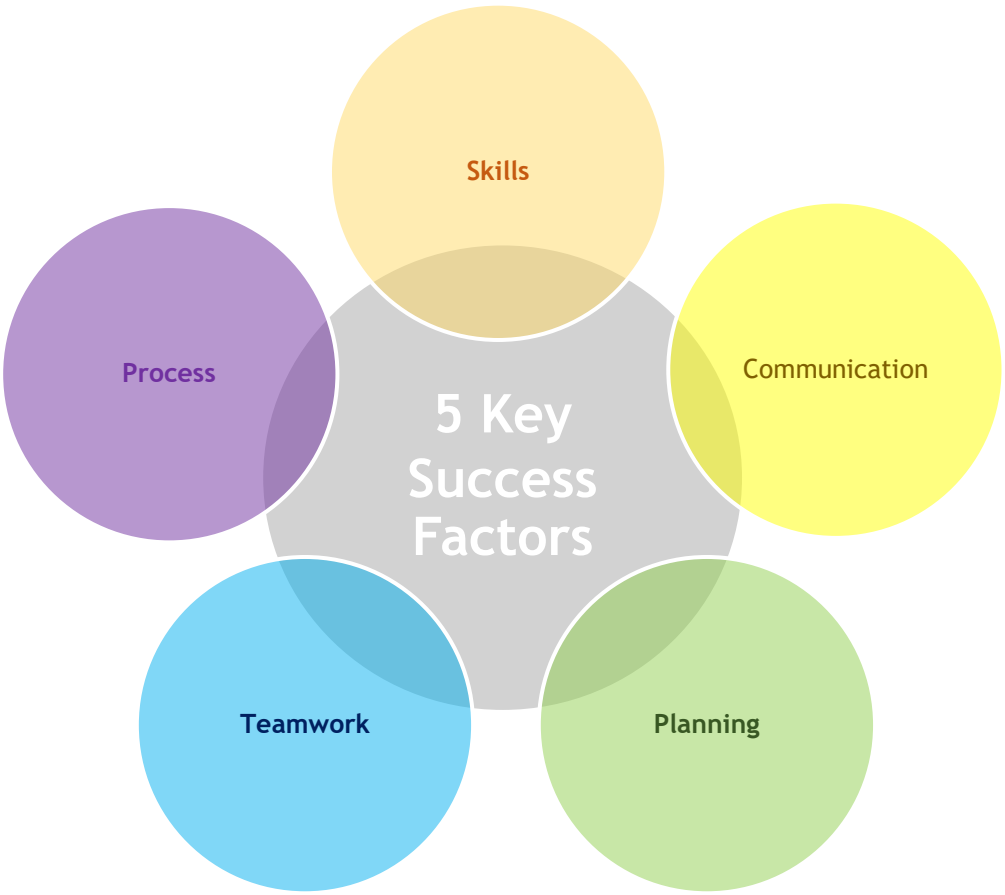


Figure 3: Key Success Factors

Skills

The Energy Saving Officers of each building should be appointed. He or she will be responsible for all issues related to energy consumption in the building. If the Energy Saving Officer does not have the required qualifications then he/she should be trained to acquire knowledge in matters of energy efficiency, energy saving, etc.

Some of the skills that can also be learned are financial management, communication, project management and planning, problem-solving and leadership.

Communication

Every public building should gather all the staff, thus allowing hearing all the opinions on what could be best for achieving the goal to reduce the energy consumption. The public sector must pay attention to two parts of the communication process: The Initial Communications, which will determine the plan to be achieved and the Ongoing Communications, which will be the way to inform the staff about the progress of the action plan.

Planning

For the action plan to work properly, everything needs to be planned and explained thoroughly to the employees. Tools can be used to make planning work faster and easier. A strategy for each department can be planned separately.

Team Work

Good teamwork is the key to success when all the staff collaborates more ideas and opinions can be discussed to find the best way to achieve success. However, in addition to the Energy Saving Officer, an Energy Team should be appointed to assist the Energy Saving Officer and monitor the proper implementation of the action plan.

Process

A process or method can often be modeled as a flowchart of a sequence of activities with decision points or as a process table of a sequence of activities with data-based relativity rules in the process.

The benefits of using procedures are to prevent the wrong implementation of actions and also, to monitor the actions faster and easier.[2]

5. Strategic priorities

5.1 Definition of Strategic Priorities (+Criteria to achieve goals)

Priorities are objectives that have been determined to be essential to carry out the organization's strategic direction, which in our case is the increase of energy efficiency in public buildings through behaviour change. Before an action plan is in place, the executive leadership team of each public building (or sector) needs to meet and discuss what are the priorities. These agreed-upon priorities shape the daily actions of the energy teams, who work consistently to achieve the results. While the daily actions may change, the priorities do not.

The organization's strategic priorities are statements of what we are trying to achieve. They make up the key components of the strategy at the highest level and are vital in the strategic planning process.

In summary, strategic priorities are the values that need to be focused on and given the necessary attention to achieve the goals. In addition, the following four "perspectives" should be considered when setting strategic priorities:

Financial perspective: What are the key financial goals?

Customer perspective: What should the customers say about the organization?

*** Note** In this case, customers can be considered the employees of other public buildings, public service executives, and the general public.*

Internal processes: What processes are most critical for the success of the action plan?

Learning & Development perspective: Where should the organization focus to make its employees more efficient?[3]

[2] Source: Key Success Factors (KSFs) , https://en.wikipedia.org/wiki/Critical_success_factor#Key_Success_Factors_(KSFs)

[3] Source: How To Create & Write Out Your Strategic Objectives, https://www.clearpointstrategy.com/how-to-write-strategic-objectives/

5.2 Strategic Priorities [Analysis]

In this section, the strategic priorities for creating an action plan to reduce energy consumption in public buildings by changing employee's behavior will be analyzed.

Initially, a good way to do this is by using the rule of three. Under each category (Financial, Customer, Internal Processes and Learning & Development) we come up with at least three objectives.

Then, value is added by creating relationships between them. Then, they are placed in the right category and then are linked together working from the bottom to the top as shown in the diagram below. Lower levels will drive change or impact the outcome of upper levels.[4]

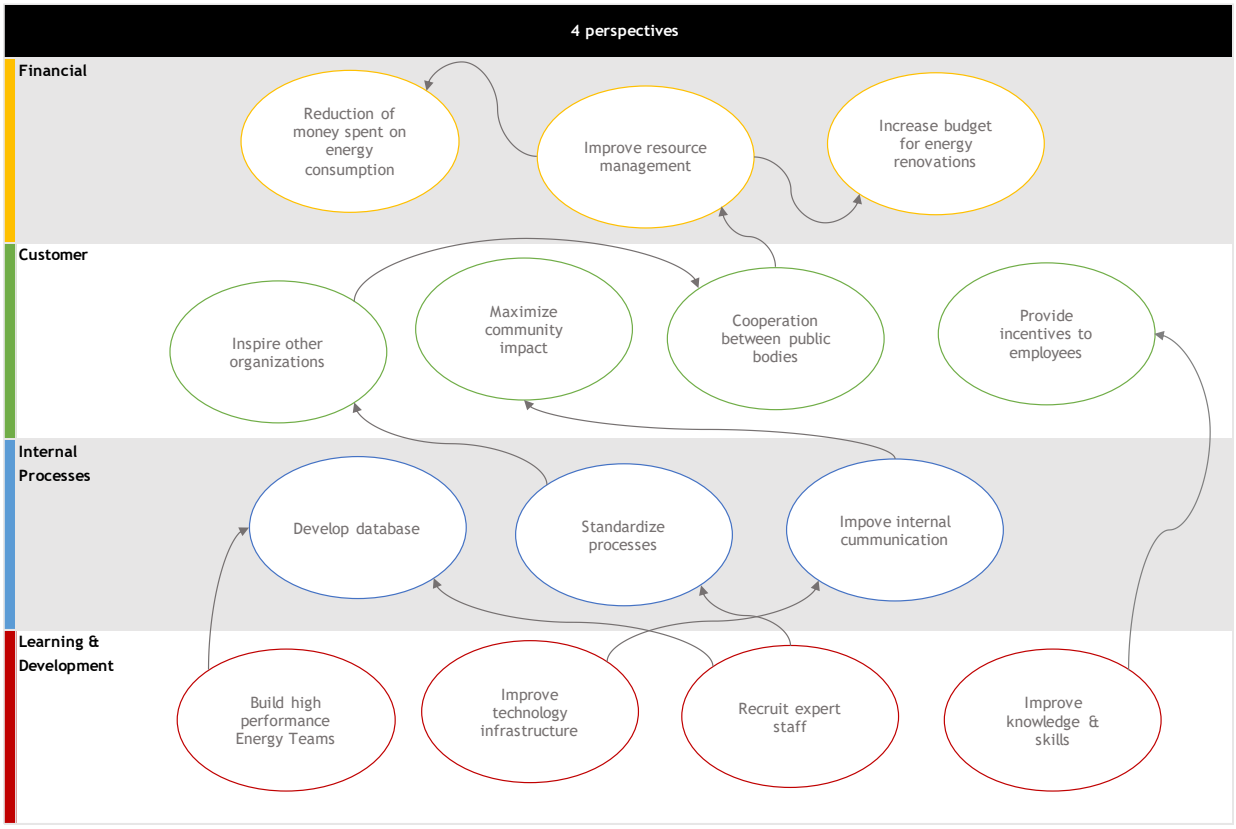


Figure 4: Analysis of the four perspectives

Financial perspective:

- *Reduction of money spent on energy consumption* – one of the main objectives of the action plan is to reduce energy consumption and CO2 emissions which has a direct effect on the reduction of costs of each building

[4] Source: Strategic Planning Process, https://www.intrafocus.com/strategic-planning-objectives/

- *Increase budget for energy renovations* – by reducing energy costs we have a reserve of money that can be used for energy renovation projects
- *Improve resource management* – proper resource management e.g. putting people in the right place improving profitability

Customer perspective:

- *Inspire other organizations* – the correct implementation of the action plan can be an example for other public and private sectors
- *Maximize community impact* – the change in employees' behaviour towards energy saving can be transferred outside the working environment, for example to the family and society in general
- *Cooperation between public bodies* – cooperation with other public bodies can bring greater results in energy saving
- *Provide incentives to employees* – motivating and rewarding employees ensures proper implementation of the action plan

Internal processes:

- *Develop database* – developing a database with energy consumption will help to create a comparison measure but also identify the areas with the highest consumption
- *Standardize processes* – proper organization of work will help control the implementation of the action plan
- *Improve internal communication* – It is very important to keep staff informed about the progress of the action plan. The opinion of all employees is significant.

Learning & Development:

- *Build high-performance energy teams* - the energy team of a building is the one that will control the implementation of the actions and at the same time will inform the rest of the staff about the progress of the project
- *Improve technology infrastructure* – installation of smart systems for monitoring energy consumption and training of staff in new energy saving systems
- *Recruit expert staff* – hiring staff with knowledge of the field of energy saving (e.g. energy experts, EUREM)
- *Improve knowledge & skills* – Continuous training of staff on energy issues through educational lectures, seminars and by sending information material

Through the analysis of these four perspectives and the definition of the objectives of the strategy for energy saving through behaviour change, three strategic priorities emerge which are:

- **Reducing energy consumption and CO2 emissions**
- **Continuous training of staff on energy issues**
- **Continuous communication (internal and external) on energy issues but also on the progress of the action plan**

6. Action Plan

6.1 Action Plan

[Plan (clear definition of the project chart, goals, roles, and impacts, access to financial resources) Processes (Formal work methodology), People (Collaborations, commitment), Power (Experienced managers) and Contingency Strategy (Risk and vulnerability assessments)]

The Action Plan is prepared for increasing the energy efficiency of the public buildings through behavioural change of the employees. The action plan includes measures/actions to attain the target of PRO-ENERGY to reduce by more than 20% the energy spending in public buildings of the participating entities in one year.

The Action Plan consists mainly of “soft measures”, i.e. actions which have as their main goal the change of behavior of the employees regarding energy efficiency in public buildings.

The estimated reduction for one year by applying the measures described in sections 6.2 and 6.3 amounts to 541 MWh. The impact of the reduction to the energy consumption will result in the reduction of 302 tonnes of CO_2 emissions.

The development of the Action Plan consists mainly of two parts. The parts are divided as follows:

- In the first and most important part, a detailed analysis of the measures/actions to achieve the objective of reducing energy consumption and CO2 emissions was made.
- In the second part, a risk and vulnerability assessment was performed to assess potential risks that could lead to the unsuccessful implementation of the action plan.

Explanation of Measures

Measure 1: Establishment of an Energy Team

It is proposed to set up an Energy Team in each public building, which will consist of the Energy Saving Officer and representatives from all administrative levels. The group will meet at least once a month to discuss issues related to energy saving and the evaluation of actions.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Establishment of an Energy Team	Each public building	2020	2021	-	-	-

Measure 2: Training of Energy Saving Officers

The Energy Saving Officer appointed in each public building is responsible to record energy consumption and promote energy efficiency mainly through soft measures. He plays a central role in changing the habits of the employees towards the more rational use of energy. They are also responsible for the energy efficiency of each public building and report on the measures and savings achieved annually. Therefore, the training of energy-saving officers in the public sector is very important to improve their knowledge on energy efficiency measures, the available energy efficiency technologies, energy performance certificates, energy audits and energy efficiency contracts.

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[5]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Training of Energy Saving Officers	Training bodies (CEA)	200	1	50%	3	500	1,500	150	106	2020-2021

[5] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

Measure 3: Staff training program

Measure 3 concerns the training of employees in the public buildings with open lectures / seminars by energy experts, on issues related to energy saving, energy upgrading and Renewable Energy Sources (RES).

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[6]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Staff training program	Training bodies (CEA)	1000	1	30%	2	100	1,500	60	42	2020-2021

Measure 4: Adoption of a measure for the implementation of Green Public Procurements

The fourth measure adopts the provisions for the Green Public Procurements so that office equipment, vehicles, electromechanical systems, etc. that will be selected, meet energy efficiency criteria. With this measure, it is expected that the new equipment of the public buildings, which will replace the old one, will achieve significant energy savings.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Adoption of a measure for the implementation of Green Public Procurement	Central government	2020	2021	-	-	-

[6] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

Measure 5: Creation of a Green Fund

This measure provides for the establishment of a green fund in every public building, the revenues of which will be used to finance actions for the energy upgrade of public buildings. The revenue of the fund will come from the savings that will result from the action plan. The revenues and expenditures of the green fund should be determined by regulations from the central government.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Creation of a Green Fund	Central government	2020	2021	-	-	-

Measure 6: Rewarding employees in public buildings with energy awards

This measure provides for the reward of the employees who have proven to have applied a best practice or have been distinguished by their behavior or participation in energy and environmental events. Appropriate publicity should be given at the award ceremony, aiming to raise the awareness of other employees. In addition, a competition between employees can be organized for the best energy/environmental idea that can be implemented in their organization.

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[7]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Rewarding employees in public buildings with energy awards	Each public building	2000	1	20%	2	50	500	40	28	2020-2021

[7] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

Measure 7: Implementation of energy and environmental policy

Each public building should proceed with the implementation of energy and environmental policy which will include and meet the clear targets of the organization. This measure aims to raise environmental awareness and inform the employees of the public buildings about energy saving tips in offices, resource management, sustainable mobility, recycling etc.

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[8]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Implementation of energy and environmental policy	Each public building	2000	1	20%	2	50	-	40	28	2020-2021

Measure 8: Energy Audits and issue of EPC in Public Buildings

By conducting energy audits in public buildings, a more thorough, techno-economic study will be performed by external experts. The energy consumption of each building will be recorded and specific energy upgrade measures will be proposed. In addition, the issuance of the Energy Efficiency Certificate (EPC) and its posting in each building, directly helps to raise awareness of employees and the people who visit the buildings, on energy efficiency issues.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost[9]	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Energy Audits and issue of EPC to Public Buildings	Energy Experts / Energy Auditors	2020	2021	108,000	-	-

[8] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

[9] Calculations: (1000 buildings*1%*800€/EPC) + (1000 buildings*1%*10,000€/energy audit) = 108,000€

Measure 9: Establishment of energy and environmental standards (ISO 50001, ISO14001, EMAS)

Implementation of international standards such as ISO 5001, ISO14001 and EMAS for the environmental and energy management of public buildings will aim to improve their energy and environmental performance by committing them to evaluate and reduce their negative environmental impacts.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Establishment of energy and environmental standards (ISO 50001, ISO14001, EMAS)	Central government	2020	2021	50,000	-	-

Measure 10: Promotion of Energy Performance Contracts

Preparation of standard public tender documents for the selection of Energy Service Companies (ESCOs) to conclude Energy Performance Contracts by the public and wider public sector. The aim is to create standard documents, together with a short, step-by-step process that will then be communicated to the public sector, in order to facilitate the implementation of such projects. The documents are expected to help increase the utilization of ESCOs for the implementation of energy efficiency projects in the public sector.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Promotion of Energy Performance Contracts	Central government	2020	2021	-	-	-

Measure 11: Mandatory provision for the creation of bicycle parking spaces and locker rooms in existing public buildings

As a measure to encourage and facilitate the use of bicycles as a means of transportation from homes to workplaces, the mandatory provision in the terms of the building permit is proposed for the creation of parking and locker rooms in public buildings. It is a measure that will also increase the awareness of the employees about sustainable mobility.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Mandatory provision for the creation of bicycle parking spaces and locker rooms	Central government	2020	2021	-	-	-

Measure 12: Mandatory provision for the installation of charging point for electric vehicles in existing public buildings

As a measure to encourage and facilitate the use of electric vehicles, it is proposed the mandatory provision in the terms of the building permit for the installation of parking space with charging points in public buildings. It is another measure that will increase the awareness of the employees about sustainable mobility.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Mandatory provision for the installation of charging point for electric vehicles in existing public buildings	Central government	2020	2021	-	-	-

Measure 13: Use of energy efficient buildings

The central government should buy or rent high energy efficiency buildings complying with the minimum energy efficiency requirements. It is expected that this measure will change the situation where the central government used to rent or buy buildings without considering their energy performance. It is noted that this measure is in line with article 6 of Directive 2012/27/EU.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Use of energy efficient buildings	Central government	2020	2021	-	-	-

Measure 14: Participation of employees in voluntary events

This measure aims to raise the awareness of employees on environmental issues by encouraging them to participate in voluntary activities such as tree planting, beach cleaning, "Let's do it Cyprus" etc.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Participation of employees in voluntary events	Central government	2020	2021	-	-	-

Measure 15: Placement of signs relating to energy-saving behaviours

Measure 15 aims to reduce energy consumption by placing signs (posters, stickers) that display messages-small tips to save energy in the office. Some smart messages might be:

- "Turn off the light before leaving the office"
- "Let the sun in, open the curtains during daytime"
- "Close the door when the a/c is on"
- "Set the right temperature in A/C during summer and winter season"

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[10]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Placement of signs relating to energy-saving behaviours	Energy Teams	2500	1	40%	3	50	500	150	106	2020-2021

Measure 16: Development of energy savings tool for the employees of public buildings

The energy saving tool can work as a database where the Energy Saving Officers or the members of the Energy Team can enter energy data of their buildings. The tool can give useful tips for saving energy or can be used as a tool to monitor actions.

Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
		Start	End	(€)	MWh/year	tCO_2/year
Development of energy savings tool for the employees of public buildings	Energy Teams	2020	2021	2,000	-	-

[10] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

Summary of Measures

Table 2: Summary of the measures included in the Action Plan

A/A	Key action	Responsible body	Implementation timeframe		Estimated implementation cost	Energy savings	CO_2 reductions
			Start	End	(€)	MWh/year	tCO_2/year
1	Establishment of an Energy Team	Each public building	2020	2021	-	-	-
2	Training of Energy Saving Officers	Training bodies (CEA)	2020	2021	1,500	150	106
3	Staff training program	Training bodies (CEA)	2020	2021	1,500	60	42
4	Adoption of a measure for the implementation of Green Public Procurement	Central government	2020	2021	-	-	-
5	Creation of a Green Fund	Central government	2020	2021	-	-	-
6	Rewarding employees in public buildings with energy awards	Each public building	2020	2021	500	40	28
7	Implementation of energy and environmental policy	Each public building	2020	2021	-	40	28

8	Energy Audits and issue of EPC in Public Buildings	Energy Experts / Energy Auditors	2020	2021	108,000	-	-
9	Establishment of energy and environmental standards (ISO5001, ISO14001, EMAS)	Central government	2020	2021	50,000	-	-
10	Promotion of Energy Performance Contracts	Central government	2020	2021	-	-	-
11	Mandatory provision for the creation of bicycle parking spaces and locker rooms in existing public building	Central government	2020	2021	-	-	-
12	Mandatory provision for the installation of charging point for electric vehicles in existing public buildings	Central government	2020	2021	-	-	-
13	Use of energy efficient buildings	Central government	2020	2021	-	-	-
14	Participation of employees in voluntary events	Central government/ Energy Teams	2020	2021	-	-	-
15	Placement of signs relating to energy saving behaviour	Energy Teams	2020	2021	500	150	106
16	Development of energy savings tool for the employees of public buildings	Energy Teams	2020	2021	2,000	-	-
	Total				**164,000 €**	**440 MWh/year**	**310 tCO_2/year**

Risk and vulnerability assessment

Above is an analysis of the measures included in the Action Plan to increase the energy efficiency of public buildings through changing employee behavior. The next step is to record and evaluate the risks that may exist and that may have a negative effects on the proper implementation of the Action Plan.

Table 3: Risk assesment of the Action Plan

A/A	Risks	Likelihood	Consequence	Corrective actions	Likelihood	Consequence	Risk Level	Risk Priority
1	Interruption or even reduced funding of the measures	Unlikely	Major	Search for other sources of funding (e.g. European projects)	Unlikely	Moderate	Low	4
2	Employees distrust in changing their daily habits	Possible	Major	Change the way of approaching each employee	Unlikely	Major	Medium	2
3	Increase bureaucracy for assessing energy efficiency investments	Likely	Moderate	Adaptation of regulations to facilitate procedures	Possible	Moderate	Medium	3
4	Incorrect procedures standardization	Possible	Moderate	Introduction of standards (e.g. ISO 50001)	Unlikely	Moderate	Low	6
5	Refusal of public building owners to make energy upgrades	Possible	Moderate	Gradual transfer of public services to privately owned buildings	Unlikely	Moderate	Low	7
6	Non-implementation of measures due to teleworking (covid-19 pandemic)	Likely	Major	Inform and train employees through teleconferences	Unlikely	Major	Medium	1
7	Reduced employee participation in training seminars	Possible	Moderate	Provide incentives to employees to participate in seminars	Unlikely	Moderate	Low	5

Table 4: Risk Severity Matrix

Consequence

Likelihood	Minor	Moderate	Major
Likely	M	M	H
Possible	L	M	H
Unlikely	L	L	M

6.2 Activities for the promotions of EE at interregional level

Communication and dissemination activities are considered crucial for the success of the Action Plan that contribute to the behavioural change of the employees.

Measure 18: Providing information through the website of each public organization

The Measure 18 aims to raise awareness and inform not only the employees, but also the general public about energy saving, renewable energy technologies, sustainable mobility, recycling, etc. This can be achieved by uploading articles in specific section on the website of each public organization, where the interested party will be able to find easily tips and solutions for their homes/offices.

Key action	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[11]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
Providing information through the website of each public organization	Energy Teams	5,000	1	10%	3	40	-	60	42	2020-2021

[11] Calculated based on the carbon dioxide emission factor for electricity (0.704 CO_2/MWh)

Measure 19: Flyers and information messages

These measure aims also to raise awareness and inform the employees and the general public about energy saving, renewable energy technologies, sustainable mobility, recycling, etc. This can be achieved through printed material, radio or television messages prepared by the central government. Moreover, social media (Facebook, Twitter, YouTube etc.) can be used to promote, among other things, Energy Efficiency, reduction of CO2 emissions, etc.

Key actions	Responsible body	No. Of participants	Years of application	Awareness rate	Diffuse influence	Energy savings per person	Estimated implementation cost	Energy savings	CO2 reductions[12]	Implementation timeframe
						kWh/year	(€)	MWh/year	tCO2/year	
		(v)	(ε)	(n)	(vδ)	(ESPP)		ES=v*ε*n*vδ*ESSP		
EE & RES flyers	Central government	5,000	1	5%	1	50	2,000	12.5	9	2020-2021
Sustainable mobility brochures	Central government	5,000	1	5%	1	50	2,000	12.5	9	2020-2021
TV spots	Central government	2,000	1	5%	1	50	5,000	5	3.5	2020-2021
Radio spots	Central government	1,500	1	5%	1	50	3,000	3.75	3	2020-2021
Social media	Central government	3,000	1	5%	1	50	500	7.5	6	2020-2021
Total							**12,500**	**41.25**	**30.5**	

[12] Calculated based on the carbon dioxide emission factors

6.3 Budget of Activities

The budget needed for the implementation of the activities included in the Action Plan, for one-year period, amounts to **€176,500.** Funding for the implementation of the Action Plan is expected to be taken from the following resources:

- Savings that will result from energy reduction measures in buildings
- Funding from the Grant Scheme of the Ministry of Energy, Commerce, Industry and Tourism for the promotion of Energy Efficiency
- Potential funding from the structural funds.
- Utilization of the Funding tool "Fund of Funds" that provides low-interest loans for energy efficiency.
- Potential funding from other European programs.
- Projects implementation with the contribution of Energy Performance Contracts (EPCs)

The proposed share of each funding source to the Action Plan is:

Funding source	Percentage
National Funds	36%
European Funds	64%
Private	0 %

6.4 Monitoring and Evaluation tools of the implementation of activities

If something is not measured, it cannot be managed and thereafter reduced. Moreover, the more data collected, and the more detailed they are, the better. After implementing energy saving actions, it is important to monitor and evaluate their effectiveness and see how they perform in relation to the targets and goals. Analyzing the energy data regularly, for example, once a week or once per month, is the only way to ensure that the Action Plan is on track.

Energy-data collection can be done manually from the energy bills or by reading the respective meters every day, week or month. However, the usefulness of this information is quite limited since it lacks the necessary detail and is prone to a human recording error. Measuring energy consumption even daily will not easily reveal sudden increases in the power demand, which occur randomly throughout the day, but at least it will provide a base figure against which energy efficiency improvements can be measured.

The best approach to energy-data collection and evaluation is to fit automatic metering systems that measure and monitoring energy consumption in specif periods. Such detailed energy consumption data allows seeing patterns of energy wastage that would be impossible to detect otherwise.

The problem of data collection and evaluation can be solved through one of the three pilot actions of the PRO ENERGY project. The pilot action foresees the design & development of an open-source Joint ICT Platform. 1 public building per area involved will be equipped with smart sensor systems. An integrated cloud-based platform will measure & analyse energy consumed at any given period of the day from different sources. Then all data & measurements will be integrated & evaluated, using specially designed ICT tools, algorithms, data analytics & statistical methods, thus producing the energy consumption profile of each building.

As a result, the Energy Saving Officers and the Energy Teams will have at their disposal a tool that will help them record the energy data they need but at the same time will facilitate them to control and evaluate the actions.

Generally, energy savings actions that are based on behavioural changes need constant reminders and continuous encouragement of the employees, to ensure they remain effective and achieve their maximum potential. It is quite common for unsupervised employees to become less efficient with time.

A great way to solve this problem is by creating private messaging groups for each building. The employees can demonstrate their energy-saving actions by sending photos to their energy groups or simply describing the actions they have taken. Additionally, a points rating system can be set up and employees will earn points per action they take. This solution has been implemented with great success in the energy competitions held in the framework of the European project COMPETE4SECAP.

Section 5 - Bulgaria

1. Summary of Existing Situation Analysis

Plovdiv Region is located in the central part of Southern Bulgaria on an area of 5972.9 km2 and has a population of 666 801 people (according to NSI data by 31.12.2019).
There are 18 municipalities on the territory of Plovdiv district - Asenovgrad, Brezovo, Kaloyanovo, Karlovo, Krichim Kuklen, Lucky, Perushtitsa, Parvomay, Rakovski, Sadovo, Sopot, Stamboliyski, Saedinenie, Hissarya, Maritsa, Rodopi and Plovdiv.

The climate in Plovdiv is transitional-continental, typical for quite central southern parts of Europe. The average annual temperature is 12.3 ° C. The average maximum temperature in July was 30.3 ° C, and the absolute maximum was measured on July 5, 2000: 45 ° C. The average annual minimum temperature is 6.5 ° C, and the absolute minimum is minus 31.5 ° C, measured in the morning of January 24, 1942 in a state of temperature inversion.
The average annual relative humidity is 73%, with the highest in December (86%) and the lowest in August (62%).

The state energy efficiency policy is conducted by:

- the Minister of Energy - in the field of energy efficiency in energy production, transmission and distribution, as well as in final energy consumption;
- the Minister of Economy - in the field of increasing energy efficiency in small and medium enterprises, as well as in the consumption of energy by industrial systems;
- the Minister of Regional Development and Public Works - in the field of development and introduction of technical rules and norms in the field of energy performance of buildings, implementation of projects related to renovation of the housing stock and improvement of energy efficiency in residential buildings in Bulgaria;
- the Minister of Transport, Information Technology and Communications - in the field of energy efficiency in the transport sector.

The activities for conducting the state policy for increasing the energy efficiency are performed by the executive director of the Agency for Sustainable Energy Development, a legal entity on budget support. The activity, the structure and the organization of work of the agency are determined by structural regulations, adopted by the Council of Ministers. The Agency confirms the amount of energy savings as a result of the performed energy efficient services and other measures to increase energy efficiency by issuing certificates

for energy savings.

The state policy in the field of energy efficiency is implemented by all state and local bodies.

The Energy Efficiency Act regulates public relations related to the implementation of the state policy for increasing energy efficiency. The law aims to increase energy efficiency as part of the country's sustainable development policy through:

- use of a system of activities and measures to increase energy efficiency in the production, transmission and distribution, as well as in final energy consumption;
- introduction of schemes for energy savings obligations;
- development of the market for energy efficient services and promotion of the provision of energy efficient services;
- introduction of financial mechanisms and schemes supporting the implementation of the national energy efficiency target.

To support the implementation of the national energy efficiency target in all heated and/or refrigerated state-owned buildings used by the state administration, measures are taken annually to improve the energy performance of at least 5% of the total built-up area. The target is calculated on the basis of the total built-up area of buildings with total built-up area over 500 m2, and from July 9, 2015 - over 250 m2, which as of January 1 of the respective year do not meet the minimum energy performance requirements set by regulation.

The public service buildings in operation with a total built-up area over 250 m2 and the buildings in operation are subject to mandatory inspection and certification. The amendments to the Energy Efficiency Act explicitly set the requirement for energy efficiency certification of all buildings over 1000 m2, regardless of their type of ownership. The requirements for energy efficiency are also provided in the Spatial Planning Act.

Energy performance certificates for buildings

The issuance of a certificate is carried out on the basis of the results obtained from an inspection for energy efficiency, which must be performed by a licensed company under Art. 16 of the Act and must cover the entire building, not just individual parts of it.

The certificate for design energy characteristics is issued after the completion of the construction of a new building before its commissioning or after the elaboration of the investment project before the issuance of a construction permit for the building (by order of the assignor/owner).

The second certificate is issued after an inspection, which takes into account how much energy the building consumes, what are the opportunities to reduce energy costs and what

are the recommended measures to optimize energy efficiency. The procedure ends with an assessment of energy savings - the result of the implementation of one or a group of measures aimed at increasing energy efficiency.
The energy efficiency inspection procedure is mandatory for public buildings that meet three conditions - to be state or municipal property, to be in operation and with a total built-up area of over 500 square meters. From July 9, 2015 the last requirement changes - the building must have a total built-up area of over 250 square meters.

The energy efficiency audit of buildings includes the identification of building enclosures and elements and systems to ensure the microclimate, measurement and calculation of energy performance, as well as analysis and determination of the potential for reducing energy consumption.
The next stage is the development of measures to increase energy efficiency, their feasibility study and assessment of saved carbon dioxide (CO2) emissions as a result of the implementation of the recommended measures.
The subject of the survey audit is also the analysis of the possibilities for the use of energy from renewable energy sources - part of the assessment of the annual energy consumption in the cooperative

Implemented ESM in 2019 by municipal and district administrations - Plovdiv Region

Implementation of 36 ESM in 11 municipal buildings with a total area of 29 606 m2:

- Thermal insulation of external walls - 8 pcs. in the municipalities: Asenovgrad, Karlovo, Parvomay, Plovdiv and Rakovski;
- Thermal insulation of the roof - 6 pcs. in the municipalities: Karlovo, Plovdiv and Rakovski;
- Thermal insulation of the floor - 4 pcs. in the municipalities: Karlovo and Plovdiv;
- Replacement of windows and doors - 8 pcs. in the municipalities: Asenovgrad, Karlovo, Parvomay, Plovdiv and Rakovski;
- ESM of pipe network - 8 pcs. in the municipalities: Karlovo, Plovdiv and Sopot;
- ESM under the DHW system - 3 pcs. in the municipality of Plovdiv;
- ESM for lighting systems - 2 pcs. in the municipalities: Parvomay and Sopot;
- ESM by MA systems - 2 pcs. in the municipalities: Karlovo, Perushtitsa.

Summarized assessment of the effect of the measures implemented in 2019 to increase energy efficiency in the South Central Region. South Central RP covers five districts with a

total of 58 municipalities. In 2019, the ESM on buildings and external SL were performed in 22 municipal administrations.

Type	Number ESM	Investments thousand BGN	Saved fuels and energies MWH/y	Savings saved Thousand BGN	Saved CO2 emissions tons/year
Implemented ESM in buildings	244	19433	6230	288	2327
SL systems with completed ESM	5	2154	305	324	250
Use of RES	5	100	28	N/A	28
Total SCR	**254**	**21687**	**6563**	**612**	**2605**

* ESM on enclosing elements, heating and ventilation, air conditioning, measuring systems and automation, heating and lighting installations (without gasification and use of RES)

To achieve the set national energy efficiency target of 27% by 2030:

- Encouraging public buildings to serve as an example

  In this regard, the Republic of Bulgaria has set a more ambitious goal for the renovation of the buildings owned and used by the central administration as the legal requirement set in Art. 23 (1) of the Energy Act, is in all heated and/or cooled buildings - state property, used by the state administration to take annual measures to improve the energy performance of at least 5% of the total area
- Energy efficient public procurement

  According to Art. 30a of the Energy Act, when conducting public procurement, public contracting authorities will purchase only products, services and buildings with high-energy efficiency indicators
- Energy audits and management systems

  The examination/audit is performed at least once every 4 years

  The application of an energy or environmental management system and evidence that the management system they apply meets the minimum requirements for energy audits shall be provided to the SEDA within one month of the acquisition ofthe certificate.

The owners of public service buildings - state and municipal administrations, are obliged to perform EE management. The management is carried out through the implementation of programs, activities and measures to increase EE and annual analysis of energy consumption. For the management of EE, similar to business owners, building owners also prepare annual reports according to a template prepared by SEDA, and the reports are submitted to the Agency no later than 1 of March of the year following the reporting year.

Policy makers and public authorities plan, promote and implement initiatives to improve energy efficiency in the South Central Region.

2. Summary of Good Practices and Benchmarking

According to the Knowledge Forum of FAO - UN "Good Practice is simply a process or a methodology that represents the most effective way of achieving a specific objective" or another way of defining a good practice is "one that has been proven to work well and produce good results, and is therefore recommended as a model".

Five good practices in Plovdiv municipality were identified: a secondary school, **Plovdiv Language High School, University of Food Technologies, Medical University and** Vocational **High School of Food Technologies and Equipment - Plovdiv.**

The municipal energy efficiency projects are implemented in accordance with regulations, development of investment projects, public announcement in the Public Procurement Agency and conducting a procedure for selection of contractor and conclusion of a contract and in accordance with the funding program / institution.

- **"Lyuben Karavelov" Secondary School, Plovdiv -** project of the Municipality of Plovdiv "Implementation of construction and installation works related to major repairs, reconstruction, improvement and implementation of energy efficiency measures in two buildings

Procedure BG16RFOP001-1.001-039 "Implementation of Integrated Urban Reconstruction and Development Plans 2014-2020", Priority Axis 1 "Sustainable and Integrated Urban Development" under OP "Regions in Growth" 2014-2020

The good practice includes the design of major repairs and reconstruction, implementation of energy efficiency measures, as well as reconstruction and improvement of the adjacent yard of "Lyuben Karavelov" Secondary School.

The construction is carried out in accordance with the approved investment project, including all energy saving measures prescribed in the energy efficiency survey, including measures for utilization of renewable energy sources, which lead to compliance of the building with the regulatory requirements for energy efficiency andhave a direct environmental effect.

The evidence for success is:

- An energy audit was carried out - prescribed measures: thermal insulation of walls, thermal insulation of the roof

- Measures have been taken to increase energy efficiency: thermal insulation walls, thermal insulation roof, and replacement of windows
- Ownership: Public-municipal
- Sources of funding are: OP "Regions in Growth" and the Municipality of Plovdiv
- Investments: BGN 271.52 thousand
- Energy saved per year: El. energy 12.98 MWh/year; Thermal energy/TPP/ 30.23 MWh/year Total: 43.21 MWh/year. CO2 emissions saved 16.40 tons/year. Specific for the solar installation.

❖ **Construction and installation work for increasing the energy efficiency of Plovdiv Language High School under a project funded by the National Trust Ecofund / NTEF - a project of the Municipality of Plovdiv.**

The National Trust Ecofund (NTEF) with its Investment Programme for Climate - Energy Efficiency finances energy efficiency measures in many municipalities of Plovdiv region and South Central region – Municipalities of Rakovski, Sadovo, Maritsa, Parvomay, Devin, Momchilgrad, Haskovo.

The increase of energy efficiency includes the following types of construction and installation works in the educational building, a dormitory for boys and a dormitory for girls:

- Construction of thermal insulation system and facade plaster on external walls: southern, eastern facade and staircase of the educational building;
- All facades of dormitories for boys and girls, with already about 1/3 of the thermal insulation on the walls of the dormitory for girls;
- Thermal insulation of floors to unheated rooms: gym, warm connection and part of the corridor first floor of School educational building;
- Thermal insulation of bay windows/jetties; Thermal insulation of ceilings - laying of mineral wool on cold roofs;
- Replacement of non-replaced windows;
- Replacement of internal heating installation;
- Construction of a solar installation for domestic hot water;
- Built-up area by subprojects: Educational building - 1770 sq.m. Dormitory for boys - 552 sq.m, Dormitory for girls - 552 sq.m.

❖ **Energy efficiency, improving access for disadvantaged people at the University of Food Technology - Plovdiv and modernization of information services**

Under Procedure BG16RFOP001-1.001-039 "Implementation of Integrated Plans for Urban Reconstruction and Development 2014-2020", Priority Axis 1 "Sustainable and Integrated Urban Development" under Operational Programme Regional Development 2014-2020.
The project is implemented with the financial support of the Operational Programme "Regional Development" 2007-2013, co-financed by the European Union through the European Regional Development Fund. ", Grant scheme BG161PO001/1.1-07/2009, "Support for providing adequate and cost-effective infrastructure of higher education institutions in urban agglomerations".
It includes:

- The introduction of energy efficiency measures in educational buildings № 4, № 3 and № 1 Ensuring equal access of disadvantaged groups to the educational service in theeducational building № 1;
- Modernization of the information service in the university library in the academic building № 1;

It was found that after the introduction of Energy Saving Measures the average heat savings for the year was achieved in the amount of 84.01% of the base energy consumption, and the energy saved for the three heating seasons after the project is 1514,079 MWh. The achieved environmental effect is 305,844 t of saved CO2 emissions. It has been proven that as a result of the saved heat for the studied period (2012-2015) after the introduction of the ESM UFT 130,165 white certificates were available.
The implementation of the project increased the competence and skills of the specialists and associates at the university.

- **Providing accessible and cost-effective infrastructure of the Medical University - Plovdiv by improving the energy efficiency of buildings and modernization of the library and information centre**

It was funded by Operational Programme "Regional Development" 2007 - 2013 through the European Regional Development Fund, the state budget of the Republic of Bulgaria and through the university's own funds.
The project is funded under the Grant Scheme BG161PO001/1.1-07/2009 "Support for providing appropriate and cost-effective infrastructure of higher education institutions/universities in urban agglomerations" under Operational Programme "Regional Development".
The performed activities under the project are as follows:

- Construction and installation work for providing accessible and cost-effective infrastructure of the Medical University of Plovdiv by improving the energy efficiency of buildings and modernization of the Library and Information Centre - separate position No 5 "construction and installation work / subproject: energy saving measures of medical college;
- Implementation of energy efficiency measures in the Medical College;
- Carrying out construction and installation activities in the LIC;
- Delivery and installation of equipment for protection and preservation of the library fund;
- Delivery and installation of specialized library equipment and furniture
  In the middle of October 2014, the Medical University of Plovdiv was awarded in the category "Best University Library" for 2014 in the international competition "Science and Education", organized in Oxford.

The good practice is the successful implementation of the project "Providing accessible and cost-effective infrastructure of the Medical University - Plovdiv by improving the energy efficiency of buildings and modernization of the Library and Information Centre" worth BGN 2,701,358.57.

- **Modernization of the infrastructure and improvement of the quality of the educational environment in the Vocational High School of Food Technologies and Equipment - Plovdiv**

A project of the Municipality of Plovdiv "Educational Infrastructure" - construction and renovation of schools, kindergartens and nurseries in the city under axis 1 "Sustainable and integrated urban development" of the Operational Programme "Regions in Growth" 2014-2020.
The physical educational environment of VSFTE has improved.
- The building stock Modernized, including - introduction of energy efficient measures in accordance with European standards;
- The material and technical base of the school has been updated;
- The attractiveness of vocational education and training for young people was increased;
- The number and employment of young professionals with specific skills and qualifications corresponding to the needs of the regional sector increased.

Evidence of success is as follows:
The school has been renovated; there is a new waterproofing of the roof and new PVC windows.
Delivered and installed specific equipment for classrooms: Contractor: "Gaia-99-Test" Ltd.

They are supplemented to an existing solar installation; Delivery and installation of solar panels for domestic hot water: Contractor: "Filkab Solar" Ltd.
Delivery and installation of solar panels for domestic hot water.
The implementation of the project led to the creation of a favorable, timely educational environment, which through the complex activities envisaged in the project contributed to improving the quality and conditions of training of young people in Plovdiv wishing to receive specialized vocational training and specific expertise to help their future realization on the labor market.

3. Analysis of the project areas and stakeholders

The new energy saving technologies promoted by PRO-ENERGY refer to Behaviour-based Energy Efficiency. Behavioural efficiency programmes and strategies introduce a cost-effective way to reduce energy consumption. Clean Energy initiatives are twofold processes which produce energy by means of renewable energy sources (RES) or by finding ways to make efficient use of existing energy at hand.

A modern and proven approach is the concept of "Behavioural Energy Efficiency", a set of tools that trigger, sensitise, advise and finally drive individual users towards practical and measurable actions for their personal and everyday use of energy resources.

Policies relating to aspects of behaviour derive from a spectrum of motivations, from:

- A need to raise citizens' awareness and understanding of the need for concern about energy in society – important in gaining acceptance of other major policy measures, which may be unpopular or controversial
- A desire to win individuals' commitment to the idea that they have a role to play in reducing energy demand
- A recognition that individuals' habitual and/or investment behaviour is itself an essential component in reducing consumption patterns.

The effectiveness (and cost-effectiveness) of behavioural change programmes will be greatly increased if adequate time and consideration is given to identifying the approaches, instruments and programmes most likely to yield the desired outcomes, at the time of writing policy and of proposing new programmes. The following should be considered:

a. Taking time to prepare action (programme design, resourcing and implementation): Jumping into immediate and visible action may account for the bulk of the mistakes made in developing a behavioural change programme. Careful consideration of what changes are expected and how they may be brought about always pays off.

b. Seeking synergies through collaboration between departments: Before embarking on an entirely new programme focusing on behavioural aspects of energy conservation, policymakers and implementers alike should identify what other parallel programmes exist or are being developed in related areas. The most obvious here are behavioural programmes concerned

with aspects of environmental management, including those that aim to increase awareness and induce behavioural change in relation to climate change. More cost-effective approaches may be found through integrating programmes which are complementary to one another or that may be perceived to be complementary or overlapping by the public.

c. Seeking synergies with private and civil sector activities: Programmes are often more effective when these are supported by a wide range of parties, from governments to the Political pressures often lead to the need for taking quick, visible actions.

d. Identifying what has been done previously that has been effective, in comparable fields (not energy alone): All too often, behavioural change programmes are developed as though it is the first time they have been conceived. In reality, there is by now a great deal of accumulated experience in such programmes, as the case studies examined in the BEHAVE project illustrate. Furthermore, there is a vast body of experience in other fields, such as public health, drug control, citizenship and the environment.

e. Involving appropriate expertise across a range of disciplines: It has been mentioned above that many so-called behavioural change programmes are handed over to public relations and advertising consultants. Yet much of what can be incorporated into such programmes derives from research and experiences in areas such as social psychology, sociology, economics, and in public and commercial marketing. A basic tenet of what is now called social marketing is that multi-disciplinary approaches to behaviour change are more effective than those that derive from one discipline only. Those who are involved in moving from policy to the specification of programmes for action should consult as widely as possible across disciplines.

f. Highlighting the importance of specific behavioural goals, target market(s) and timeframes: It is important to establish clear behavioural goals and target markets, as a part of programme design. Detailed goals, however, cannot adequately be set in high-level policy. Therefore, policy makers should insist on the development of specific goals to be realized by behavioural changes, and on adequate market segmentation, as part of the programme development and implementation process.

Behavioural interventions in this area are aimed at reducing energy consumption (e.g. providing feedback to consumers), increasing investment in energy efficiency (e.g. framing in a clear and salient way information related to energy efficiency), and encouraging the use of energy from renewable sources (e.g. leveraging green defaults).

PRO-ENERGY project will help the national/regional stakeholders groups to acquire behavioural changes in implementing the various national and regional plans, programmes and strategies as:

- **Energy strategy of the Republic of Bulgaria until 2030**
- **Integrated plan in the field of energy and climate of the Republic of Bulgaria 2021-2030**
- **Energy Efficiency Act**
- **Trends and policies for energy efficiency in Bulgaria**
- **The Implementation of municipal short-term and long-term programmes to promote the use of energy from renewable sources**

- **National plan for improvement of the energy characteristics of the heated and / or cooled buildings - state property, used by the state administration**

In addition to the direct benefits, the implementation of the present Plan would contribute to:

- promoting the exemplary role of buildings occupied by public authorities;
- enhancing the administrative capacity of the central government's administration and accordingly better
- energy efficiency regulation;
- providing better thermal comfort and working environments to civil servants;
- strengthening the institutional interoperability of functions and responsibilities;
- improving the provision of administrative services for citizens owing to the occupancy of a better and healthy environment

- **National long-term program for investment promotion for implementation of measures for improvement of the energy performance of the buildings from the public and private national residential and commercial building fund**

The implementation of the National Long-Term Investment Promotion Programme for the implementation of measures to improve the energy performance of buildings by the public and private national residential and commercial building stock contributes to:

- raising the social status of the population and the quality of life;
- increasing public confidence in institutions;
- improving the regulatory framework;

- improving the investment climate;
- the development of technologies and the free market of goods and services;
- creation of new jobs;
- increasing the administrative capacity of the administration and strengthening the institutional compatibility of functions and responsibilities between the departments;
- Improving Bulgaria's image in the EU as a reliable partner in the implementation of the Union's sustainable development policies

➢ **National plan for buildings with close to zero energy consumption 2015-2020**

In order to implement the national plan for buildings with close to zero energy consumption, along with the significant necessary investments, the current need for professional knowledge, skills and creative approach to the search for solutions should not be forgotten. Achieving the requirements of the national definition cannot be unambiguously and in all possible cases achieved simply by combining single energy saving measures. Without a creative integrated approach of teams of architects, engineers, builders, consultants to combine modern energy efficient forms of buildings with modern building materials, products and technologies, it will be difficult to provide the necessary basis for meeting the requirements for buildings with close to zero energy consumption.

➢ **Long-term national strategy to support the renovation of the national building stock of residential and non-residential buildings until 2050.**

The long-term national strategy has been developed in the long run with the flexibility to respond to the development of technologies and the requirements for energy efficiency measures

The dynamically developing European energy efficiency policy requires decisions for the further development of the renovation of the national building stock.

In this regard, the Ministry of Energy together with the Ministry of Regional Development and Public Works and the Agency for Sustainable Energy Development will monitor and evaluate the progress of the implementation of the Long-Term National Strategy by preparing biennial reports within the Integrated National Progress Reports. in the field of energy and climate, including an analysis of the implementation of the set objectives and priorities and, if necessary, proposals for adaptation and updating of the Long-Term National Strategy.

- **Recovery and Sustainability Plan of the REPUBLIC OF BULGARIA**

The main objective of the Recovery and Sustainability Plan is to facilitate economic and social recovery from the crisis caused by the COVID-19 pandemic. In pursuit of this goal, the government has grouped a set of measures and reforms that will not only restore the potential for economic growth, but also develop it by ensuring resilience to negative externalities. This will allow in the long run achieving the strategic goal of the government for convergence of the economy and incomes to the Central European ones. At the same time, the Plan lays the foundations for a green and digital transformation of the economy, in the context of the ambitious goals of the Green Deal.
The plan is structured in four pillars:

- **Innovative Bulgaria** - aiming at increasing the competitiveness of the economy and transforming it into an economy based on knowledge and smart growth - 20% 1 of the resources under the Plan;
- **Green Bulgaria** - with a focus on sustainable management of natural resources, allowing to meet the current needs of the economy and society, while maintaining environmental sustainability, so that these needs can continue to be met in the long run - 37% of the resources of The plan;
- **Connected Bulgaria** - focusing on providing prerequisites for increasing the competitiveness and sustainable development of the country's regions, such as improving transport and digital connectivity, as well as promoting local development, based on the specific local potential - 22% of the resources under the Plan;
- **Fair Bulgaria** - with a special focus on disadvantaged groups and individuals to achieve more inclusive and sustainable growth and shared prosperity for all, as well as with an emphasis on building effective and responsible public institutions sensitive to the needs of business and the needs of the citizens - 21% of the resources under the Plan.

In pillar Green Bulgaria is included:

- **Energy efficiency programme**

The programme envisages the implementation of four components to increase energy efficiency. **The first component envisages financing measures to increase energy efficiency in the country's housing stock.** The renovation of residential buildings will be implemented in accordance with the objectives of the Long-Term National Strategy to support the

renovation of the national building stock of residential and non-residential buildings (with a horizon of 2050), and will finance the energy efficiency measures in residential buildings, aimed at achieving a minimum class B of energy consumption. Priority will be given to sites / buildings that have been approved but not funded due to exhaustion of financial resources under the National Programme for Energy Efficiency of Multifamily Residential Buildings and the Operational Programme "Growing Regions" 2014-2020. In addition, single-family residential buildings are included in the scope of the component. Indicative resource for Component 1: BGN 1,728 million. **The second component envisages financing of measures for energy renovation of state and municipal buildings, incl. administrative** (70%), cultural (15%) and sports (15%) infrastructure. Indicative resource for Component 2: BGN 417.5 million. **The third component envisages financing of measures for energy renovation of industrial buildings** with an indicative resource of BGN 282.2 million. **The fourth component envisages financing of measures for energy efficiency of outdoor artificial lighting systems** with an indicative resource of BGN 452.3 million.

Under the Programme, costs for organization and management of the program, as well as for organization and management of projects by the beneficiaries will be eligible.

Energy efficiency is considered a priority, given its importance for improving the country's energy security by reducing dependence on energy imports, reducing energy costs for businesses, households and administration, creating more jobs, improving the quality of energy. air and reducing greenhouse gas emissions and improving the quality of life of citizens. Improving the energy efficiency of the building stock will have a positive impact in terms of economic growth and job creation, and saving energy will also save financial resources. Saving energy is one of the fastest and most cost-effective ways to achieve the strategic goals of combating climate change, ensuring energy security and achieving sustainable economic and social development. The total planned resource is BGN 3 billion with an implementation period of 2021-2026.

During the implementation of the national, regional and municipal plans, programmes and strategies the stakeholders participating in meetings of council of the regional development, stakeholders meetings and workshops will change their behavior attitude and change to the problems of energy efficiency, Green Bulgaria, and different measures improving energy efficiency of public buildings by behaviour change:

- promoting the exemplary role of buildings occupied by public authorities;

- enhancing the administrative capacity of the central government's administration and accordingly better
- energy efficiency regulation;
- providing better thermal comfort and working environments to civil servants;
- strengthening the institutional interoperability of functions and responsibilities;
- improving the provision of administrative services for citizens owing to the occupancy of a better and healthy environment
- raising the social status of the population and the quality of life;
- increasing public confidence in institutions;
- improving the regulatory framework;
- improving the investment climate;
- the development of technologies and the free market of goods and services;
- creation of new jobs;
- increasing the administrative capacity of the administration and strengthening the institutional compatibility of functions and responsibilities between the departments;
- Improving Bulgaria's image in the EU as a reliable partner in the implementation of the Union's sustainable development policies

➢ **Strategy for sustainable energy development of the Republic of Bulgaria until 2030 with horizon 2050**

The strategy for sustainable energy development of the Republic of Bulgaria until 2030, with a horizon until 2050, has been developed on the basis of Art. 4, para. 2, item 1 of the Energy Act and reflects the vision of the state for development of the energy sector until 2030, with a horizon until 2050, in accordance with the current European framework of energy policy and global trends in the development of new energy technologies.

The Strategy for Sustainable Energy Development of the Republic of Bulgaria until 2030, with a horizon until 2050 sets out the common European policies and objectives for energy development and climate change mitigation, reflecting the national specifics in the field of energy resources, production, transmission and distribution of energy. The main strategic decisions aimed at achieving national goals and guaranteeing Bulgarian interests are defined.

The strategy clearly reflects trends, measures and policies in the field of energy security, energy efficiency, the liberalization of the electricity and gas markets and their integration into the common European energy market, the development and implementation of new

energy technologies. These policies are also reflected in the Integrated Plan in the field of energy and climate of the Republic of Bulgaria 2021 - 2030, with a horizon until 2050, which was prepared in implementation of Regulation (EU) 2018/1999 on the governance of the Energy Union and the climate action.

The Strategy includes:
1. Ensuring energy security and sustainable energy development;
2. Development of an integrated and competitive energy market and consumer protection by ensuring transparent, competitive and non-discriminatory conditions for the use of energy services;
3. Increasing energy efficiency in the processes from production to final energy consumption;
4. Sustainable energy development for clean energy and decarbonisation of the economy;
5. Implementation of innovative technologies for sustainable energy development.

In connection with the implementation of these national energy priorities by 2030, with a horizon of 2050, and to ensure Bulgaria's contribution to the implementation of the common European energy policy, the following goals are set by 2030:

- Reduction of primary energy consumption compared to the baseline forecast PRIMES 2007 - 27.89%;
- Reduction of final energy consumption compared to the baseline forecast PRIMES 2007 - 31.67%;
- 27.09% share of renewable energy in gross final energy consumption;
- at least 15% interconnection of electricity.

In 2012, Bulgaria achieved the mandatory national target of 16% share of renewable energy in the gross final energy consumption in the country for 2020.

In the following years, the achieved share of renewable energy in gross final energy consumption continued to exceed the national target set for 2020, with the main contribution to this being increasing the use of renewable energy in the heat and cooling sector. In the electricity sector, a higher share of renewable energy in the gross final consumption of electricity has been achieved than defined in the National Renewable Energy Action Plan. The use of energy from renewable sources in the transport sector increased rapidly, as in the period 2013-2015 the achieved values for the share of energy from renewable energy exceeded those set in the National Action Plan for Energy from Renewable Sources. After 2015, the

changes in the European legislation related to the introduction of restrictions on the reporting of conventional biofuels for this purpose in the transport sector led to a slowdown in the increase in energy consumption from renewable sources.

Putting energy efficiency first is a key goal of the Clean Energy for All Europeans legislative initiative, as saving energy leads to improved air quality and public health, reducing greenhouse gas emissions, improving energy security by reducing dependence on energy imports, reducing energy costs of households and businesses, increasing the competitiveness of the economy, creating more jobs, thus improving the quality of life of citizens.

In line with the EU's energy efficiency priorities, Bulgaria puts energy efficiency first and plans to achieve a reduction in primary energy consumption by 27.89% and a reduction in final energy consumption by 31.67%, compared to the PRIMES 2007 reference scenario.

In order to achieve a highly energy efficient and decarbonized building stock, measures will be taken for: (1) construction of new buildings and transformation of existing ones into buildings with close to zero energy consumption; (2) improving the energy performance of residential and non-residential buildings; (3) promoting the introduction of intelligent technologies in the building sector.
It is crucial to raise the awareness of all consumers about the benefits of energy efficiency by: providing accurate information on how energy savings can be achieved; providing education and training in the field of energy efficiency, with an emphasis on the application of energy efficient technologies or techniques and their benefits.

Energy efficiency measures will be supported by well-designed and efficient financial instruments, and cooperation between public and private stakeholders will be encouraged to develop large-scale investment programs and financing schemes.

Renewable energy policy is an essential element of national and European energy and climate change policy.

In recent years, the consumption of energy from renewable sources has significantly increased, reaching in 2018 a share of 20.53% 2 in the gross final energy consumption in the country, which exceeds the mandatory national target for renewable energy in the National Action Plan, 16% by 2020.

In the period 2021-2030 the development of the electricity sector will be taken into account: (1) the possibility for maximum integration of the electricity produced by renewable energy in the electricity market, (2) the possibilities for decentralized electricity generation, (3) electricity from renewable energy sources at an affordable and lowest possible price for all consumers, (4) encouraging and facilitating the development of consumption of own electricity from renewable energy sources and the creation of communities for renewable energy.

3.1 Definition of SWOT Analysis

SWOT Analysis means analysis of Strengths, Weaknesses, Opportunities and Threats of a company. SWOT analysis helps to determine the current state of the organization and future prospects.

SWOT analysis is a general technique for assessing any public or private organization and itsenvironment. It belongs to the “Analysis” part of a strategic planning process and helps decisionmakers to focus on key issues. Performing a SWOT analysis involves the generation andrecording of the strengths, weaknesses, opportunities and threats concerning the organization.
Once key issues have been identified, they feed into operational objectives.

SWOT stands for strengths, weaknesses, opportunities, and threats. SWOT analysis can be simplyunderstood as the examination of an organization's internal strengths and weaknesses, and itsenvironment, opportunities and threats. It is a general tool designed to be used in the preliminarystages of decision-making as a precursor to strategic planning: it belongs to the “Analysis” part ofthe strategic planning process.

SWOT analysis is an effective method of identifying the Strengths and Weaknesses of the organization, andto examine the Opportunities and Threats it faces. Often carrying out a SWOT analysis will be enough to reveal changes, which can be usefully made in putting problems into perspective. Themethod provides a framework for identifying critical issues. Analyses are then limited to thesignificant items that can really be addressed.

The SWOT should cover all of the following areas, each of which may be a source of strengths, weaknesses, opportunities or threats: political and economic environment of the institution, stakeholders and stakeholder’s policy, operating budget, statistical production, relationships with internationalorganizations.

A SWOT analysis can be an excellent, fast tool for initiating a strategic planning exercise. It looks at future possibilities for the institution through a systematic approach of introspection into both positive and negative concerns.

3.2 SWOT Analysis of each project Area and Stakeholders[Diagram]

South Central Planning Region NUTS2

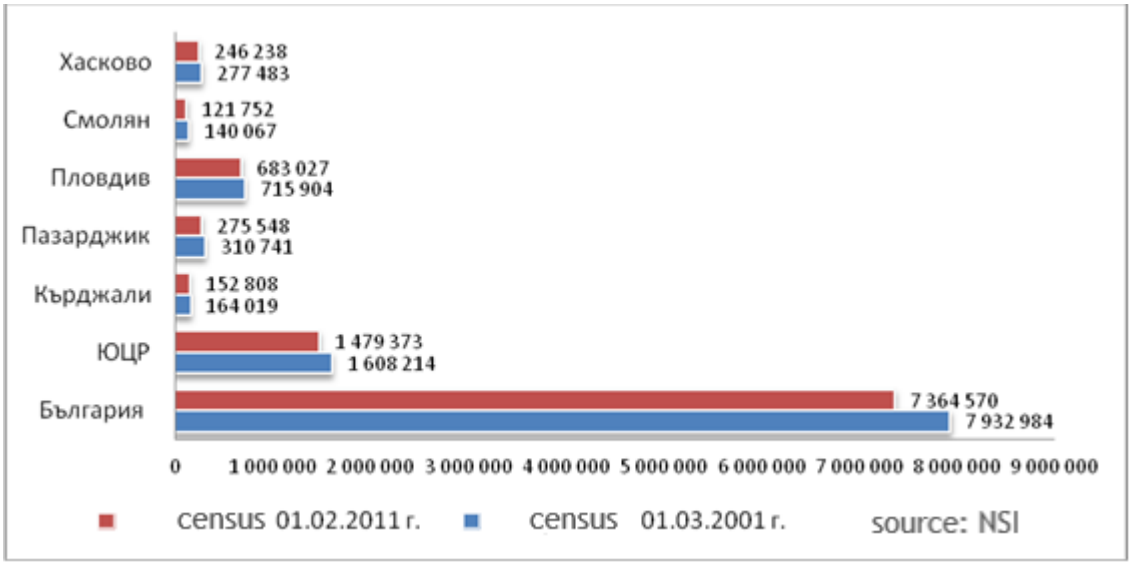
South Central region is part of the region at level 1 / NUTS 1 / "Southwestern and South Central Bulgaria", including Southwestern and South Central region, corresponding to NUTS 2. The region covers the territories of Kardzhali, Pazardzhik, Plovdiv, Smolyan and Haskovo / NUTS level 3 /, with a total of 57 municipalities. The area of the South Central Region / South Central Region / is 22,365.1 km2, constituting 20.1% of the country's territory.

The number of the population in the South Central Region as of 31.12.2011 is 1,471,107 people, corresponding to 20.07% of the country's population. The population density of the region is 65.7 people per km², equal to the national average - 66 people per km². The highest population density is Plovdiv district - 114 d. / Km², which is much above the national average, and the lowest is Smolyan district - 37.7 km².

Regions	Population - number	Population density- people/км²
Bulgaria	**7 327 224**	**66,01**
South Central	**1 471 107**	**65,77**
Kardzhali	152 009	47,36
Pazarszhik	273 808	61,43
Plovdiv	680 884	113,99
Smolyan	120 456	37,72
Haskovo	243 955	44,08

Source: National Statistical Institute

Between the 2001 censuses. and 2011 there is a decrease in its number both in the SRC and in all areas



In terms of contribution to the total gross domestic product / GDP / of the country, the South Central Region ranks second among the other regions of level 2, after the Southwestern region, which also includes the city of Sofia.
Plovdiv Region NUTS3 is located in the central part of Southern Bulgaria on an area of 5972.9 km2 and has a population of 675,586 people (according to NSI data for 2014).

There are 18 municipalities on the territory of Plovdiv region - Asenovgrad municipality, Brezovo municipality, Kaloyanovo municipality, Karlovo municipality, Krichim municipality, Kuklen municipality, Lucky municipality, Perushtitsa municipality, Parvomay municipality, Rakovski municipality, Sadovo municipality, Sopot municipality, Stamboliyski municipality, Saedinenie, Hissarya municipality, Maritsa municipality, Rodopi municipality and Plovdiv municipality.

Priority industries in Plovdiv region are agriculture, food industry, tourism, clothing and textile industry, wood processing and furniture industry. The growth of the IT sector, outsourcing, processing industry, business services and communication services is also great. These are the sectors with the most significant contribution to the employment of graduates and qualified staff.

Plovdiv Municipality

The Energy Efficiency Programme of the Municipality of Plovdiv for the period 2020 - 2025 has been developed in order to concentrate the efforts for sustainable energy planning and management, working consistently and systematically in the following directions:

- Increasing the energy efficiency of the building stock of the Municipality of Plovdiv and the systems for street and park lighting and achieving a high level of energy savings, through large-scale implementation of measures to improve their energy performance, through the application of cost-effective methods of rehabilitation;
- Realization of direct financial benefits from the introduction of measures for increasing the energy efficiency of the building stock and the street and park lighting systems;
- Achieving a high level of savings in final and primary energy consumption while increasing the comfort of living;
- Significant reduction of carbon emissions in the atmosphere, directly leading to the improvement of the ecological condition of the urban environment;
- Realization of effective monitoring of the energy and ecological characteristics of the buildings in the Municipality of Plovdiv and the systems for street and park lighting, by applying successful European and world practices in the field of energy efficiency;
- Development of mechanisms for creating and imposing sustainable behavioral models of end users, for efficient use of energy through training, as well as development and approval of written instructions for the use of heating, cooling, lighting systems, etc. from end users in municipal buildings (administrative, kindergartens and nurseries, schools, healthcare buildings, sports, etc.);
- Creating conditions for sustainable planning and development of the Municipality of Plovdiv in the field of efficient management of energy resources.

The implementation of the Programme will lead to the successful realization of the regional and national goals in the field of energy efficiency, set in accordance with the short-term, medium-term and long-term national plans and programs, which are based on the common EU policies for achieving the global goals of the Union. within the period from 2020 to 2050, set in the so-called "Green Deal".

The city of Plovdiv is located in the Thracian plain, occupies a central position for Southern Bulgaria, for the South Central Region, for the Region of Plovdiv and for the Municipality of Plovdiv. The city is also a municipality established by a decree of the Council of State in October 1987,

Policy in the field of energy efficiency of the Municipality of Plovdiv for the period 2008 - 2020 - municipal building stock

The policy pursued by the Municipality of Plovdiv during the period of operation of the EU budgets under operational programs from 2007 to 2020 was in line with the national priorities in the field of energy efficiency, as it was based on the National Long-Term Energy Efficiency Program. During the period, a number of projects aimed at achieving the local and national indicative targets for energy savings have been implemented.

Policy directions for energy efficiency in Plovdiv Municipality for the period 2020 – 2025.

The energy efficiency policy in the Municipality of Plovdiv will be aimed at achieving measurable goals by prioritizing the implementation of a systematic approach based on national legislation and the current EU Directives in the field of energy efficiency.
The program aims, through a system of activities and measures at the municipal level to contribute to:

- Creation of project readiness of the Municipality of Plovdiv for successful absorption of funds under programs for increasing the energy efficiency of the building stock and systems for street and park lighting in the next programming period of the EU 2021 - 2027;
- Creation of project readiness of the Municipality of Plovdiv for successful absorption of funds under national programs for increasing the energy efficiency of the building stock in the period 2021 - 2030;
- Improving the energy performance of the building stock of the municipality (priority sites) through the implementation of projects for the introduction of energy saving measures (ESM) in combination with the implementation of measures for the introduction of RES;
- Protecting the environment by reducing the generated greenhouse gas emissions;
- Systematic reduction of budget expenditures for energy and fuels and creation of an opportunity for reinvestment of savings in subsequent energy efficiency improvement projects.

The municipality is able to exercise control and implement policies in a number of activities leading to increasing energy efficiency; to make strategic decisions related to this and within its competence to impose on investors the implementation of measures of a similar nature. The main tools for this should be:

- approval of development plans;

- use of environmentally friendly technologies;
- promoting private initiative related to the implementation of energy efficient projects

Here, actions can be directed towards influencing the end users of energy - industrial enterprises, retail outlets, households, by conducting information campaigns and providing incentives to reduce energy consumption, as well as implementing joint activities with the obligated persons - energy traders.

An integral part of the policy of the Municipality of Plovdiv in the field of energy efficiency is the compliance of the investment intentions of the Municipality with the National Plan for buildings with close to zero energy consumption.

Given the size of the national energy saving target by 2030 and based on EU policy within the so-called "Green Deal", Plovdiv municipality should focus its efforts in the following areas:

- When implementing projects for new construction buildings, the latter to meet the national definition of buildings with close to zero energy consumption. This objective is realistic and achievable, through the sources of funding set out in this Programme, in the next EU programming period from 2021 to 2027, as well as based on other possible financial instruments set out in the Programme.

- When implementing projects for increasing the EE of buildings, where there are partially implemented measures and the goal is to "upgrade" them, it is completely realistic to reach energy consumption levels that meet the national definition of Buildings with almost zero energy consumption. This type of project is applicable to both rehabilitated kindergartens, kindergartens and schools in the first decade of the 21st century, and to administrative buildings built at a later stage, such as the administrative buildings of the Plovdiv districts – Easterm, South and Trakia.

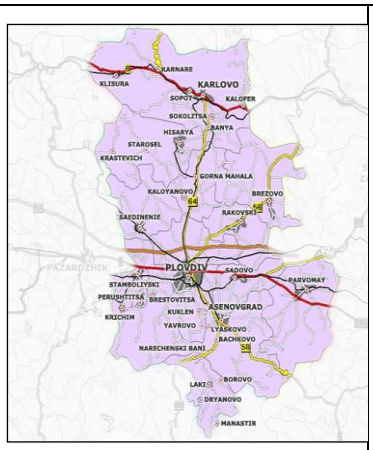
Strengths	**Strengths** Existence of: • Energy Strategy of the Republic of Bulgaria until 2020 • Integrated plan in the field of energy and climate of the Republic of Bulgaria 2021-2030 • Energy Efficiency Act • The implementation of municipal short-term and long-term programs to promote the use of energy from renewable sources • National plan for improvement of the energy characteristics of the heated and / or cooled buildings - state property, used by the state administration • Long-term national strategy to support the renovation of the national building stock of residential and non-residential buildings until 2050. • Recovery and Sustainability Plan of the REPUBLIC OF BULGARIA, including an Energy Efficiency Programme • Strategy for sustainable energy development of the Republic of Bulgaria until 2030 with a horizon of 2050 • Trends and policies for energy efficiency in Bulgaria • The Integrated Territorial Strategy for Development of the South Central Region 2021-2027 • Municipal energy efficiency programs • District Council for Sustainable Energy Development of Plovdiv District • Regional Development Council Plovdiv • Municipal and regional energy efficiency programs • Sustainable Energy Development Agency • The Regional Development Council of the South Central Planning Region	**Weaknesses** • No regional programs for energy efficiency have been developed in the districts of Plovdiv, Smolyan, Kardzhali and Haskovo • At the end of the programming period 2014-2020 and the Covid 19 pandemic lack of financial resources for the implementation of energy efficiency measures • Insufficient competence of the staff dealing with energy efficiency • Insufficient information campaigns in the community about the need to take EE measures and the possibilities for their financing • Lack of coordinated action between institutions • Difficult access to investments in energy efficiency projects and limited opportunities for municipalities at their own expense; • lack of targeted financial resources; • Lack of practice for monitoring and analyzing the efficiency of energy systems; • lack of incentives to limit energy consumption; • Lack of public-private partnership in the sector.	**Weaknesses**

Opportunities	**Opportunities**	**Threats**	Threats
	• Implementation of integrated territorial strategies in the next programming period 2021-2027 • Optimization of energy consumption by implementing energy efficiency measures. • Development of Regional Action Plans to achieve the objectives of the program; • Development of energy efficiency projects; • Unification and coordination of energy saving actions in the public sector; • Creating preconditions for investment and financing of measures related to efficient energy consumption and the use of renewable energy sources; • Implementation of public - private partnerships; • Carrying out events for promotion of energy efficiency measures and change in energy behavior of different consumer groups • Energy efficient new construction and building installations • Rehabilitation of buildings - state or municipal property • Informing stakeholders. • Increasing energy efficiency at district, municipal and national level • Transfer of good practices from partners and / or involved in the policy training platform of INTERREG EUROPE and other programmes • Creation of regional internet based platforms for energy efficiency	• At the end of the programming period 2014-2020 and the Covid 19 pandemic lack of financial resources for the implementation of energy efficiency measures • Existence of force majeure (force majeure), incl. pandemic situations • Political and legislative uncertainty • Lack of funding as well as lack of awareness • Insufficient capacity and competencies • Untimely development and approval of the operational programs for the next programming period 2021 - 2027	

STAKEHOLDERS at different level, who form the stakeholders' group and are engaged in the project:

Level	Map	- Stakeholders	Programmes, Strategies
National Level	 	- Sustainable Energy Development Agency (SEDA is a legal entity at state budget support with headquarters in Sofia and has the status of an executive agency within the Ministry of Energy) - Association of Bulgarian Energy Agencies - Ministry of Regional Development and Public Works	- Regional programmes under Energy Efficiency Act (ZEE) - 1 pc. - Municipalities that do not have a ZEE programme - 17 - Municipal programmes under ZEE with expired term - 7 pcs. - Municipal programs under ZEE with validity until 2019 - 2 pcs. - Municipal programs under ZEE with a validity period after 2019 - 32 pcs.
NUTS 2 South Central Planning Region	 	- Ministry of Regional Development and Public Works – General Directorate "Strategic Planning and Programmes for Regional Development Department "South Central Region" - Sustainable Energy Development Agency (SEDA is a legal entity at state budget support with headquarters in Sofia and has the status of an executive agency within the Ministry of Energy) - Council of Regional Development of South Central Region	- Regional programmes under Energy Efficiency Act (ZEE) - 1 pc. - Municipalities that do not have a ZEE programme - 17 - Municipal programmes under ZEE with expired term - 7 pcs. - Municipal programs under ZEE with validity until 2019 - 2 pcs. Municipal programs under ZEE with a validity period after 2019 - 32 pcs.

		- 5 Regional governors of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali (NUTS 3) - BG421 Plovdiv Region; BG422 Haskovo Region; BG423 Pazardzhik Region; BG424 Smplyan Region; BG425 Kardzhali Region - 5 Regional Administrations of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali - 5 Regional centres – municipalities of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali - Regional Council for sustainable energy development of Plobdiv region - Council of energy efficiency and RES at Regional administration – Pazardzhik	
NUTS 3 Plovdiv Region (NUTS 3) - BG421		- Regional Council for sustainable energy development of Plovdiv region - All 18 municipaities: Asenivgrad, Brezovo, Kaloyanovoo, Karlovo, Lucky, Martista, Plovdiv, Parvomai, Rakovski, Dodopi, Sadovo, Saedinenie, Hissar, Kritchim, Perustista, Stamboliyski, Kuklen, Sopot - Plovdiv Region Admin. Plovdiv Region Governor - At municipal level :	-

		- Plovdiv municipality - Mayor of Plovdiv - Municipal Council - Energy Agency Plovdiv https://www.eap-save.eu/ - Regional Council for sustainable energy development of Plovdiv region https://pd.government.bg/?page_id=1440 - SEDA Regional representative Plovdiv Universities: - University of Food Technologies – Plovdiv - Technical University Sofia – branch Plovdiv - University of Agribusiness and Regional Development - Plovdiv Companies: - EVN Trading South East Europe JSCo - EVN Bulgaria District Heating JSCo - Energy Policy and Environment Department - CityGas Bulgaria JSCo - EVN Trading South East Europe - EVN Bulgaria EAD - Energy Policy and Environment Department - Regional Construction Chamber Plovdiv	

No	Stakeholder Category & Basic Characteristics	Interests and how Affected by PRO-ENERGY	Capacity and Motivation to Bring About Change	Possible Actions to Address Stakeholders Interests
• *1*	• *At national level in Bulgaria:* • *Sustainable Energy Development Agency (SEDA is a legal entity at state budget support with headquarters in Sofia and has the status of an executive agency within the Ministry of Energy)* • *Ministry of Regional Development and Public Works* • *Association of Bulgarian Energy Agencies*	• *Formulate policies and interventions on Energy Efficiency, Renewable Energy Sources, Governance etc.* • *Manage / Implement Horizontal Operational Programmes (co-funded by the Structural Funds under NSRF) that include interventions on the aforementioned fields*	• *Political Influence* • *Decision-making power* • *Financial resources* • *Limited motivation to change due to NSRF inflexibilities (difficulties in changing the content of already approved plans)*	• *Raise their awareness through conferences, public consultations, articles and publications, bilateral meetings etc.* • *Mobilize citizens and business representatives to influence them*

No	Stakeholder Category & Basic Characteristics	Interests and how Affected by PRO-ENERGY	Capacity and Motivation to Bring About Change	Possible Actions to Address Stakeholders Interests
• 2	***At NUTS 2 level*** • *Ministry of Regional Development and Public Works – General Directorate "Strategic Planning and Programmes for Regional Development Department "South Central Region"* • *Council of Regional Development of South Central Region* • *5 Regional governors of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali (NUTS 3)* • *BG421 Plovdiv Region; BG422 Haskovo Region; BG423 Pazardzhik Region; BG424 Smplyan Region; BG425 Kardzhali Region* • *5 Regional Administrations of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali* • *5 Regional centres – municipalities of Plovdiv, Pazardzhik, Smplyan, Haskovo, Kardzhali*	• *The Regional Development Council coordinates the implementation of the state policy for regional development in NUTS 2 planning region.* • *Discusses and approves the draft of the integrated territorial strategy for development of NUTS 2 planning region;* • *Performs functions for management, coordination, monitoring and control of the implementation* • *Participates in the process of selection of projects co-financed by the European Structural and Investment Funds, other European funds and financial sources..*	• *Political Influence* • *Decision-making power* • *Financial resources*	• *Raise their awareness through conferences, public consultations, articles and publications, bilateral meetings etc.* • *Mobilize citizens and business representatives to influence them*

No	Stakeholder Category & Basic Characteristics	Interests and how Affected by PRO-ENERGY	Capacity and Motivation to Bring About Change	Possible Actions to Address Stakeholders Interests
3	***At regional level - Plovdiv Region (NUTS 3) - BG421*** • *Regional Council for sustainable energy development of Plobdiv region* • *All 18 municipaities: Asenivgrad, Brezovo, Kaloyanovoo, Karlovo, Lucky, Martista, Plovdiv, Parvomai, Rakovski, Dodopi, Sadovo, Saedinenie, Hissar, Kritchim, Perustista, Stamboliyski, Kuklen, Sopot*	• *Regional Governor* • *Regional Development Councils* - *Assist municipal administrations of municipalities in the region in developing and implementing plans for integrated community development by providing advice and recommendations* - *Coordinates the implementation of sectoral strategic documents* - *assists in the preparation of projects* - *Assists in providing information and publicity on the territory*	• *Political Influence* • *Decision-making power* • *Financial resources*	• *Raise their awareness through conferences, public consultations, articles and publications, bilateral meetings etc.* • *Mobilize citizens and business representatives to influence them*

No	Stakeholder Category & Basic Characteristics	Interests and how Affected by PRO-ENERGY	Capacity and Motivation to Bring About Change	Possible Actions to Address Stakeholders Interests
4	***At municipal level*** • *Plovdiv municipality* • *Mayor of Plovdiv* • *Municipal Council* • *Energy Agency Plovdiv https://www.eap-save.eu/* • *Regional Council for sustainable energy development of Plovdiv region* • *SEDA Regional representative Plovdiv* • *Universities* • *Companies*	• *The Mayor* • *The municipal council* *-Organize the elaboration of the plan* *-Manage, organize and control the activity*	• *Political Influence* • *Decision-making power* • *Financial resources*	• *Raise their awareness through conferences, public consultations, articles and publications, bilateral meetings etc.* • *Mobilize citizens and business representatives to influence them*

From the Stakeholder Needs Assessments for the Implementation of Article 7 EED - ENSMOV October 2019

Foreseen changes for the implementation of Article 7 EED and need for special training in regard of the amendment of Article 7 EED:

Bulgaria complies with the requirements of Article 7 EED by means of alternative measures and an EEO scheme. Additional alternative measures (mostly grant financing schemes) are planned to be developed.

Knowledge exchange on the policy implementation of Article 7 EED:

Among the most important topics for Bulgarian stakeholders from group I were:

- ensuring equity, tackling distributive effects (e.g. reducing energy poverty)
- keeping the administrative burden deriving from the EEO scheme low for the obligated parties
- raising awareness about the opportunities for and the benefits of energy efficiency
- ensuring the sustainability of the EEO scheme/alternative measure(s) in terms of re-financing
- budget commitment for the EEO scheme/alternative measure(s)
- ensuring additionality of the energy efficiency savings

Among the most important topics for Bulgarian stakeholders from group II were:

- involve the relevant stakeholders in the policy (re)design process for the EEO scheme/alternative measure(s)
- provide the obligated parties with sufficient information in order to fulfil their obligations
- designing the policies in order to minimize the costs for all parties involved
- ensuring the sustainability of the EEO scheme/alternative measure(s) in terms of re-financing (e.g., through cost recovery for obligated parties)

Knowledge exchange on the monitoring, reporting and verification for Article 7 EED:

- lack of political support for the implementation and (re)design of the MRV scheme
- lack of penalties for obligated parties not complying with the legal national regulations
- cost-efficient provision of MRV
- defining the sample size and the parameters for representative MRV
- providing tools for MRV schemes (e.g. web applications, calculation guidelines/tools, etc.)

Among the most important topics for Bulgarian stakeholders from group I were:

The positions of stakeholder group I (Ministries as well as implementing bodies) and national obligated parties (market players, etc.) appeared quite opposite. Policymakers see the tendency of obligated parties not to be willing to fulfil obligations deriving from the national obligation scheme, whereas obligated parties see the solution in having more cost-effective approaches available for their branch and in being included in feedback loops for the redesign of the obligation scheme.

Particular policies or sectors ENSMOV should focus on:

- coordination among different policies;
- energy poverty
- transport sector
- cost-effective approaches to reach the national energy efficiency targets

Preferred knowledge exchange

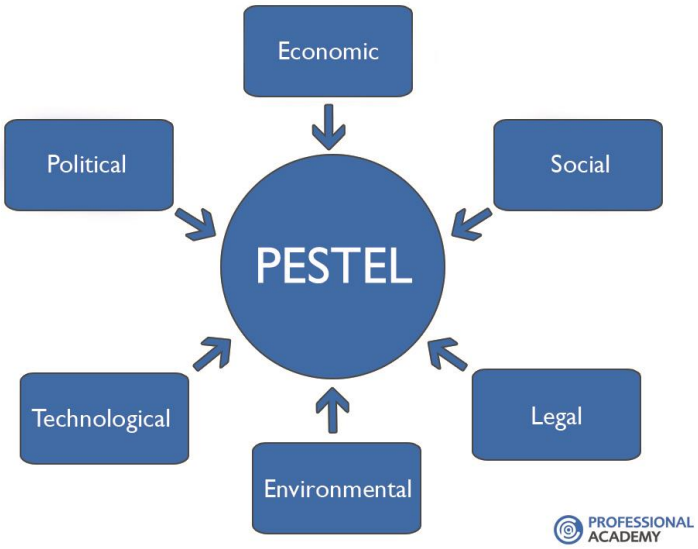
- sharing knowledge considering the requirements of the national obligations (trainings and involvement of stakeholders in working groups)
- sharing experience (best practice, expert meetings, guidelines) regarding the implementation of Article 7 requirements with other Member States

3.3 Definition of PESTLE Analysis

PESTLE analysis is a strategic management tool that businesses use to identify macro-economic factors that it needs to consider. The word 'PESTLE' stands for the six factors – Political, Economic, Social, Technological, Legal, and Environmental. Together, they form the basis for identifying key issues that may affect the strategic direction of the company.

The PESTLE analysis is a useful tool to help management decide between two strategic options. For example, management may consider developing a new product, or, expanding into a new country. The PESTLE analysis helps with this decision by looking at the four key factors and identifying advantages and disadvantages for each.

3.4 PESTLE Analysis of each project Area and Stakeholders [Diagram]



A PESTEL analysis is an acronym for a tool used to identify the macro (external) forces facing an organisation. The letters stand for Political, Economic, Social, Technological, Environmental and Legal. Depending on the organisation, it can be reduced to PEST or some areas can be added (e.g. Ethical)

In marketing, before any kind of strategy or tactical plan can be implemented, it is fundamental to conduct a situational analysis. In addition, the PESTEL forms part of that and should be repeated at regular stages (6 monthly minimum) to identify changes in the macro-environment. Organisations that successfully monitor and respond to changes in the macro-environment are able to differentiate from the competition and create a competitive advantage.

Political Factors:

POLITICAL factors determine the extent to which a government may influence the economy or a certain industry. These include e.g. tariffs, legal frameworks, competition regulation, regulation and deregulation, tax policy (tax rates and incentives), government stability and related changes,government involvement in trade unions and agreements, import restrictions on quality and quantity of product, intellectual property law (copyright, patents), consumer

protection and e-commerce, laws that regulate environment pollution. From an energy perspective, the factors may include: 2020 targets, grant aid, REFITs, tax regime etc.

Economic Factors:

ECONOMIC factors are determinants of an economy's performance that directly affect a company/industry and have resonating long-term effects. They may include inflation rate interest rates, foreign exchange rates, economic growth patterns etc. From an energy perspective, the factors may include cost of renewables, access to finance, and access to funding.

Social Factors:

SOCIAL factors analyse the social environment of the industry, and assess determinants such as cultural trends, demographics, and population analytics. From an energy perspective, the factors may include community structures, level of engagement with communities, acceptance of the technologies, tourist impact, NIMBYism, and stakeholder impact.

Technological Factors:

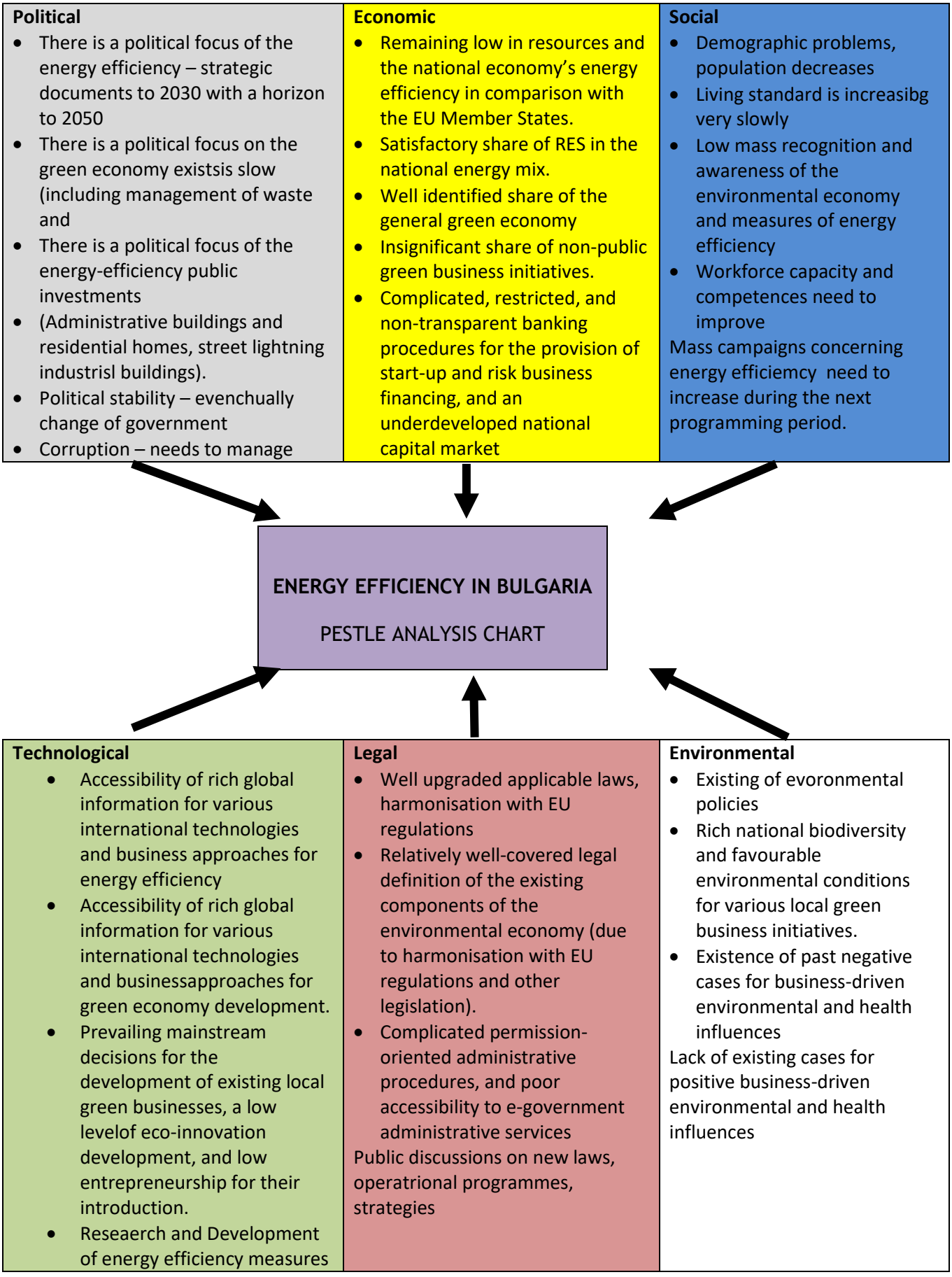
TECHNOLOGICAL factors refer to innovations in technology that may affect the operations of the industry and include the levels of automation, research and development and the level of technological awareness. From an energy perspective, the factors may include renewable technologies, grid access, and planning process.

Legal Factors:

LEGISLATIVE factors include the laws that affect that industry within a certain country and may include consumer law and safety standards. From an energy perspective, the factors may include planning, access to resources, grid access, ownership models and local benefit frameworks.

Environmental Factors:

ENVIRONMENTAL factors include all those that influence or are determined by the surrounding environment and may include climate, weather, climate change, and environmental offsets. From an energy perspective, the factors may include: Climate change, planning issues near protected areas, challenges associated with living in rural areas


Political
There is a political focus of the energy efficiency – strategic documents to 2030 with a horizon to 2050
There is a political focus on the green economy existsis slow (including management of waste and
There is a political focus of the energy-efficiency public investments
(Administrative buildings and residential homes, street lightning industrisl buildings).
Political stability – evenchually change of government
Corruption – needs to manage
Economic
Remaining low in resources and the national economy's energy efficiency in comparison with the EU Member States.
Satisfactory share of RES in the national energy mix.
Well identified share of the general green economy
Insignificant share of non-public green business initiatives.
Complicated, restricted, and non-transparent banking procedures for the provision of start-up and risk business financing, and an underdeveloped national capital market
Social
Demographic problems, population decreases
Living standard is increasibg very slowly
Low mass recognition and awareness of the environmental economy and measures of energy efficiency
Workforce capacity and competences need to improve
Mass campaigns concerning energy efficiemcy need to increase during the next programming period.
ENERGY EFFICIENCY IN BULGARIA
PESTLE ANALYSIS CHART
Technological
Accessibility of rich global information for various international technologies and business approaches for energy efficiency
Accessibility of rich global information for various international technologies and businessapproaches for green economy development.
Prevailing mainstream decisions for the development of existing local green businesses, a low levelof eco-innovation development, and low entrepreneurship for their introduction.
Reseaerch and Development of energy efficiency measures
Legal
Well upgraded applicable laws, harmonisation with EU regulations
Relatively well-covered legal definition of the existing components of the environmental economy (due to harmonisation with EU regulations and other legislation).
Complicated permission-oriented administrative procedures, and poor accessibility to e-government administrative services
Public discussions on new laws, operatrional programmes, strategies
Environmental
Existing of evoronmental policies
Rich national biodiversity and favourable environmental conditions for various local green business initiatives.
Existence of past negative cases for business-driven environmental and health influences
Lack of existing cases for positive business-driven environmental and health influences

4. Objectives of the strategy and KSFs

Energy efficiency programme

The programme envisages the implementation of four components to increase energy efficiency:

- **The first component envisages financing measures to increase energy efficiency in the country's housing stock**. The renovation of residential buildings will be implemented in accordance with the objectives of the Long-Term National Strategy to support the renovation of the national building stock of residential and non-residential buildings (with a horizon of 2050), and will finance the energy efficiency measures in residential buildings, aimed at achieving a minimum class B of energy consumption. Priority will be given to sites / buildings that have been approved but not funded due to exhaustion of financial resources under the National Programme for Energy Efficiency of Multifamily Residential Buildings and the Operational Programme "Growing Regions" 2014-2020. In addition, single-family residential buildings are included in the scope of the component. Indicative resource for Component 1: BGN 1,728 million.
- **The second component envisages financing of measures for energy renovation of state and municipal buildings, incl. administrative** (70%), cultural (15%) and sports (15%) infrastructure. Indicative resource for Component 2: BGN 417.5 million.
- **The third component envisages financing of measures for energy renovation of industrial buildings** with an indicative resource of BGN 282.2 million.
- **The fourth component envisages financing of measures for energy efficiency of outdoor artificial lighting systems** with an indicative resource of BGN 452.3 million.

The Energy Efficiency Program under the Recovery and Sustainability Plan
Budget: BGN 3 billion with deadlines for its negotiation 2021-2022 and deadline for its implementation 2026

- Preliminary budget allocation:
    - for residential buildings -58% of the total budget,
    - for public buildings -14% of the total budget,
    - for industrial buildings - 9% of the total budget,
    - for street lighting - 15% of the total budget,
    - for technical assistance -4%. from the total budget
- Beneficiaries: municipalities, district administrations, ministries and public-private partnerships for industrial buildings and street lighting.

- Responsible departments: Ministry of Regional Development and Public Works, Ministry of Finance, Ministry of Economy, Ministry of Energy, Council of Ministers - CCC.
- Leading department for implementation: Ministry of Regional Development and Public Works
- In connection with the implementation of these national energy priorities by 2030, with a horizon of 2050, and to ensure Bulgaria's contribution to the implementation of the common European energy policy, the following goals are set by 2030:

1. Increasing EE in the housing stock of the country (single-family and multi-family residential buildings), by applying EE measures:
    - Author's and Construction supervision; Construction and installation activities; Solar DHW systems and heat pumps in residential buildings that are not connected to heat and gas networks
    - Energy saving measures: "C", "B", "A"
    - Indicative financial resource: 1 728 million BGN
    - Criteria for prioritization of residential buildings proposed by the Ministry of Regional Development and Public Works
        • Existence of constructive inspection / need for constructive strengthening;
        • Existence of EE inspection, certificate;
        • The most efficient investment - saved energy / necessary resource for implementation;
        • Year of construction of the building;
        • Total area of the site and number of households.
    - Single-family residential buildings
        • 6% of the financial resource for residential buildings (BGN 103 million);
        • Municipalities announce a call for applications according to criteria set by the Ministry of Regional Development and Public Works;
        • Analysis of site information (SES) and summarization for prioritization purposes;
        • The municipalities prepare a prioritized list of sites - single-family residential buildings based on criteria and method
        logy prepared by the Ministry of Regional Development and Public Works.

2. **Energy renovation of state and municipal public service buildings (administrative, cultural and sports infrastructure)**
    - Eligible activities:Energy audits; Technical passport of the building; Investment project; Construction supervision and author's supervision; Construction and

installation activities for EE and RES (including energy saving measures to achieve energy class A with the use of energy from renewable sources, introduction of energy monitoring systems, etc.)

- Beneficiaries:- Municipalities - Partners (district administrations and ministries, building owners)
- Indicative financial resource:BGN 417.5 million
- Method of financing:Grant financing with a mechanism for recovery from future revenues from saved energy to the Decarbonisation Fund for a period of 5-15 years - Combined financing (grant + financial instruments)
- Financial allocation of resources for public buildings
  - for public and administrative buildings - 70% of the total resource;
  - for cultural infrastructure -15% of the total resource;
  - for sports infrastructure 15% of the total resource.

3. Intelligent lighting systems in public spaces

- Eligible activities:Intelligent street lighting systems, new luminaires, wires and cables; facility / s for production and storage of electricity from renewable sources for own consumption in a system for external artificial lighting; Construction and installation work related to the outdoor artificial lighting system (s); new means of management, measurement and control; Preparation of an investment project; Construction supervision; Author's supervision
- Beneficiaries: Municipalities - Partners (Economic operators, etc
- Indicative financial resource:BGN 452.2 million
- Method of financing: -Grants and Financial Instruments (after financial analysis), ESCO financing

4. Industrial buildings

- Eligible activities:Energy audits and energy conservation measures; Design; Replacement of existing windows; Improving the thermal insulation of external enclosing elements; Replacement of existing heating appliances with more energy efficient ones or the use of waste heat from technological processes; Use of RES in industrial buildings; Replacement of lighting systems with more energy efficient ones; Increasing the efficiency of ventilation, air conditioning and DHW systems
- Beneficiaries:Small, medium-sized and large enterprises throughout the country
- Indicative financial resource: BGN 282.2 million
- Method of financing: Grants and Financial Instruments (after financial analysis)

4.1 Definition of Objectives of the Strategy

National goals and policies

In line with the EU's energy efficiency priorities, Bulgaria puts energy efficiency first and plans to achieve a reduction in primary energy consumption by 27.89% and a reduction in final energy consumption by 31.67%, compared to the PRIMES 2007 reference scenario.

In order to create the necessary conditions for achieving the national goals for increasing energy efficiency by 2030, the necessary changes in the regulatory and regulatory framework will be made.
Improving energy efficiency in the processes from production to final energy consumption is key to meeting the national energy efficiency target.

To support the implementation of the national energy efficiency target, a cumulative energy savings target for final consumption for the period 2021-2030 will be introduced, equivalent to new annual savings of at least 0.8% of final energy consumption. To achieve the goal of cumulative energy savings, cost-effective mechanisms will be sought, using a combination of different approaches provided for in Directive (EU) 2018/2002 on energy efficiency and energy saving transfer possibilities, incl. and for consideration.
The development of the market for energy efficient services will continue, encouraging the implementation of contracts with a guaranteed result (ESCO contracts).

To achieve a highly energy efficient and decarbonized building stock, measures will be taken to: (1) construction of new buildings and transformation of existing ones into buildings with close to zero energy consumption;
(2) improving the energy performance of residential and non-residential buildings;
(3) promoting the introduction of intelligent technologies in the building sector.
In the period up to 2030 and beyond, efforts will be focused on promoting the introduction of new technologies for the construction of efficient district heating and cooling systems and efficient heating and cooling infrastructure.
Consumption optimization is an important tool for improving energy efficiency and in this regard the provision of ancillary services by transmission and distribution system operators for energy management will be encouraged.

It is crucial to raise the awareness of all consumers about the benefits of energy efficiency by: providing accurate information on how energy savings can be achieved; providing education and training in the field of energy efficiency, with an emphasis on the application of energy efficient technologies or techniques and their benefits.
Energy efficiency measures will be supported by well-designed and efficient financial instruments, and cooperation between public and private stakeholders will be encouraged to develop large-scale investment programs and financing schemes.

4.2 Definition of Keys Success Factors [Analysis]

Key success factors are those key elements which are required for an organisation to accomplish or exceed their desired goals. It is imperative that these factors be given proper attention and are adhered to attain the desired objective. Any lax in these factors may lead the organisation other way i.e. the organisation will not attain their desired goals. The definition of key success factors does not only restrict to organisations but may encompass personal attainment of goals as well i.e. they can be viewed from an individual perspective as well.

The Top 10 Communication Skills include:
1. Emotional Intelligence
Emotional intelligence is the ability to understand and manage your emotions so as to communicate effectively, avoid stress, overcome challenges and empathise with others.

There are four main strands to emotional intelligence:

Self-awareness

Self-management

Social awareness

Relationship management

2. Cohesion and Clarity
Good communication is much more than saying the right thing; it is about communicating messages clearly and concisely.
3. Friendliness
In any type of communication, make sure that you set the right tone. A friendly tone will encourage others to communicate with you.
Always try to personalise messages, particularly when working with partners or fellow colleagues.

4. Confidence

In all interactions, confidence (but not over-confidence) is crucial.

Demonstrating confidence will give customers faith in your abilities to deliver what they need, and that you will follow through with what you have promised.

Conveying confidence can be something as simple as maintaining eye contact during a conversation or using a firm but friendly tone when speaking with people over the phone.

5. Empathy

Within a busy work environment, everyone will have their own ideas about how things should be done. Even if you have disagreements with your colleagues or partners, their point of view should be considered and respected.

Empathy is also beneficial when speaking with customers in certain types of customer-facing role.

6. Respect

Empathy leads into the next communication skill, respect.

If you respect the ideas and opinions of others, they will be more likely to communicate with you.

7. Listening

Good communication is all about listening effectively.

Take the time to listen to what the other person is saying and practice active listening.

8. Open-Mindedness

Try to enter into communications without having an agenda.

Strong communications require an open mind and a commitment to understanding other people’s points of view.

9. Tone of Voice

The tone of your voice can set the whole mood of the conversation. If you start the discussion in an aggressive or unhelpful manner, the recipient will be more inclined to respond in a similar way.

The tone of your voice will include the level of emotion that you use, the volume you use and the level of communication you choose

10. Asking Good Questions

Good questions can help conversations flow and improve the outcome.

During a conversation, always aim to ask open-ended questions. These are questions with prompts which encourage the recipient to speak about certain points and they require more detailed responses.

5. Strategic priorities

In the **Strategy for Sustainable Energy Development of the Republic of Bulgaria until 2030 with a horizon of 205**0. the implementation of the commitments of the Republic of Bulgaria to achieve the goals of the European energy policy for the establishment of the Energy Union, in the Strategy for Sustainable Energy Development by 2050, the following main priorities are set:

1. Ensuring energy security and sustainable energy development;
2. Development of an integrated and competitive energy market and consumer protection by ensuring transparent, competitive and non-discriminatory conditions for the use of energy services;
3. Increasing energy efficiency in the processes from production to final energy consumption;
4. Sustainable energy development for clean energy and decarbonisation of the economy;
5. Implementation of innovative technologies for sustainable energy development.

In the field of **energy security and sustainable energy development**, the European Framework, in accordance with the provisions of the Agreement on the United Nations Framework Convention on Climate Change in Paris (Paris Agreement 2015), undertakes to take measures to keep global average temperatures well below 20C above the levels of the pre-industrial period.

A key EU priority in the energy sector is the diversification of Europe's energy sources and ensuring energy security through solidarity and cooperation between Member States, strengthening the diversification of EU energy supplies and the development and use of local energy resources.

In connection with the implementation of these national energy priorities by 2030, with a horizon of 2050, and to ensure Bulgaria's contribution to the implementation of the common European energy policy, the following goals are set by 2030:

- Reduction of primary energy consumption compared to the baseline forecast PRIMES 2007 - 27.89%;
- Reduction of final energy consumption compared to the base forecast PRIMES 2007 - 31.67%;
- 27.09% share of renewable energy in gross final energy consumption;
- at least 15% interconnection of electricity.

In setting national priorities and goals for energy development until 2030, the following key factors have been taken into account:
1. Implementation of European policies and objectives in the field of energy and climate;
2. Forecast for the macroeconomic indicators of the country;
3. Taking into account the specifics of the national energy mix, the available local energy resources, ensuring energy security, the competitiveness of the economy, as well as the social impact of the transition to decarbonisation;
4. The forecasts for energy production and consumption in the country and the region.

National goals and policies

In accordance with the priorities of the European energy policy, the goals set by the Bulgarian state for ensuring energy security and sustainable development of energy for the period until 2030, with a horizon of 2050, are aimed at:
(1) Use of local energy resources, in strict compliance with environmental legislation,
(2) Development of the network energy infrastructure and increase of the interconnection energy connectivity,
(3) Ensuring the adequacy and sustainability of the national power system,
(4) Diversification of sources and routes for natural gas supply,
(5) Increasing the network and information security of the energy system.

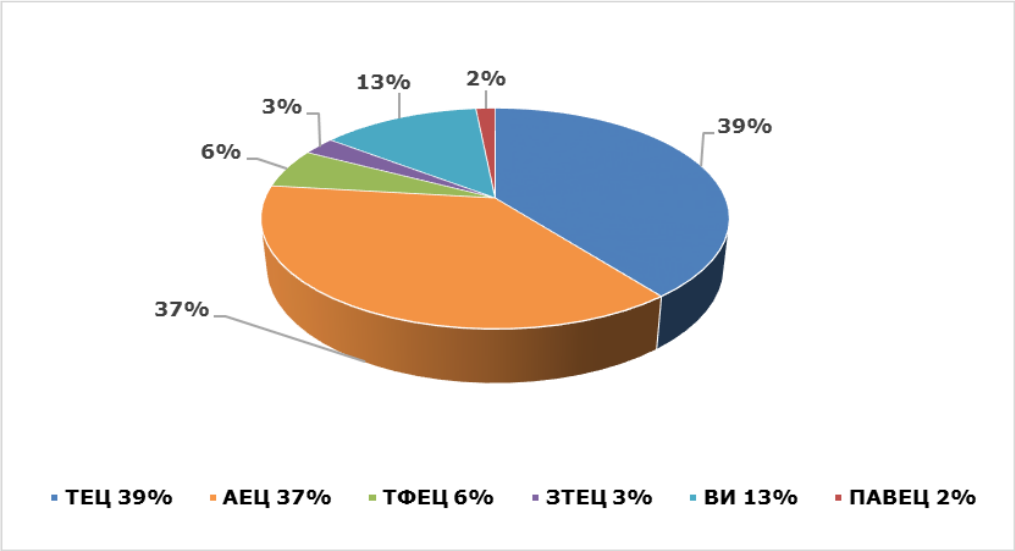
Regarding the State of Energy Security of the Republic of Bulgaria has:
1. Energy resources:
   - Use of local coal
   - Extraction and delivery of oil and natural gas
   - Nuclear energetics
   - Renewable energy sources

The share of renewable energy in primary energy production in 2018 is 21.52% (according to NSI data).

2. Electricity generation and heat supply

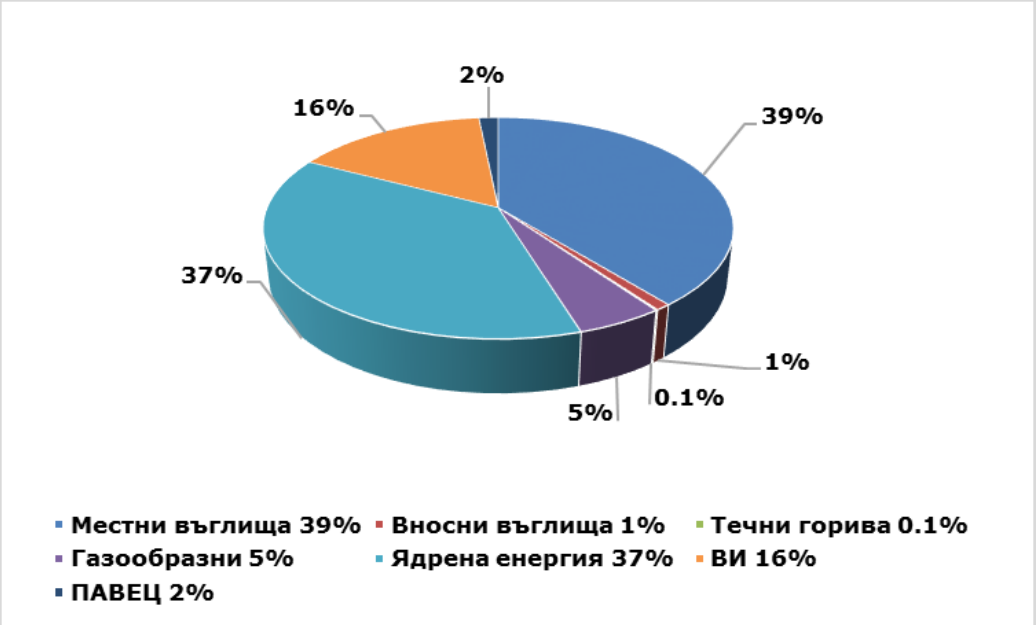
The Republic of Bulgaria has a diverse electricity generation mix. The structure of electricity production is dominated by thermal power plants using coal, followed by the nuclear power plant Kozloduy NPP EAD. The percentage distribution by types of power plants is shown in the following figure.

Structure of gross electricity production by types of power plants (2019)%



Heat Power Plant 39%, Nuclear power plant 37%, RES 13%

Structure of produced electricity by types of energy carriers (2019),%



Local coal	39%	Imported coal	1%	liquid fuels	0.1%
Gaseous	5%	Nuclear energy	37%	RES	16%
Pumping and accumulating hydroelectric power plant	2%				

3. Heat supply

District heating is one of the most efficient ways to supply heat and is a significant factor in saving primary energy.

Households, administration and business in the largest cities - Sofia, Plovdiv, Varna, Burgas, Ruse, Pleven, Pernik, Vratsa, Sliven, etc., use their services. For the needs of the industry, thermal energy produced from factory thermal power plants (ZTEC) is used. The potential for new high-efficiency cogeneration capacities has been assessed on the basis of the unheated population and the climatic indicators of the areas where it is concentrated. The following criteria are applied:

• Population over 42,000 inhabitants, and

• Heat consumption over 10 GWh / year.

The potential for heat production in new cogeneration plants can be realized mainly through:

• Transition from separate heat production to highly efficient cogeneration;

• Switching from the Rankine steam cycle to the combined gas-steam cycle;

• Potential for waste use.

• Ensuring the development of highly efficient combined heat and power generation with consideration of possibilities for production of cooling energy;

• Stimulating the construction of local district heating and cooling systems in settlements, as well as the use of micro-units for cogeneration, installed in residential buildings

• Connection of new consumers of heat and / or cooling energy to the existing heat transmission networks

• Ensuring the connection of producers of heat and cooling energy from renewable sources to the existing heat transmission networks and purchase from the heat transmission enterprise of the energy produced by another producer, when this is technically possible and economically feasible.

4. Energy connectivity

The Bulgarian power system works in parallel with the power system of the countries of continental Europe. The connection of our EES with the united European EES.

ENERGY EFFICIENCY

Putting energy efficiency first is a key goal of the Clean Energy for All Europeans legislative initiative, as saving energy leads to improved air quality and public health, reducing greenhouse gas emissions, improving energy security by reducing dependence on energy imports, reducing energy costs of households and businesses, increasing the competitiveness of the economy, creating more jobs, thus improving the quality of life of citizens.

Part of the "Clean Energy for All Europeans" energy package is Directive (EU) 2018/2002 on energy efficiency, which sets out a common framework of energy efficiency measures to ensure that the EU's 32.5% energy efficiency target is met. efficiency by 2030 and Directive (EU) 2018/844 on the energy performance of buildings, which sets the framework for achieving decarbonisation of the building stock.
In line with the EU's energy efficiency priorities, Bulgaria puts energy efficiency first and plans to achieve a reduction in primary energy consumption by 27.89% and a reduction in final energy consumption by 31.67%, compared to the PRIMES 2007 reference scenario.
In order to create the necessary conditions for achieving the national goals for increasing energy efficiency by 2030, the necessary changes in the regulatory and regulatory framework will be made.
To support the implementation of the national energy efficiency target, a cumulative energy savings target for final consumption for the period 2021-2030 will be introduced, equivalent to new annual savings of at least 0.8% of final energy consumption. To achieve the goal of cumulative energy savings, cost-effective mechanisms will be sought, using a combination of different approaches provided for in Directive (EU) 2018/2002 on energy efficiency and energy saving transfer possibilities, incl. and for consideration.

To achieve a highly energy efficient and decarbonized building stock, measures will be taken to:
(1) Construction of new buildings and transformation of existing ones into buildings with close to zero energy consumption;
(2) Improving the energy performance of residential and non-residential buildings;
(3) Promoting the introduction of intelligent technologies in the building sector.

5.1 Definition of Strategic Priorities (+Criteria to achieve goals)

ENERGY FORECASTS UNTIL 2030 WITH A HORIZON UNTIL 2050
Forecasts for the change of the main energy indicators by 2030 with a horizon by 2050.

The forecasts for the change of the main energy indicators, for the electricity balance and for the installed electricity generation capacities in the country until 2050 are developed based on the following main assumptions and strategic goals:

• Macroeconomic growth and sectoral added value, projecting the corresponding growth of energy supply and demand
• Appropriate energy efficiency measures to achieve a declining energy intensity curve of the economy
• Integrated approach for modeling energy consumption, economic development and the environment, based on historical data and forecasts, aimed at reflecting the most realistic development of the country's economy and society;
• Incorporate applicable EU environmental policies and restrictions into energy production and climate change modeling and planning;
• Development of the energy sector, in particular the electricity sector, with a focus on national and regional energy security, internal market integration and a balanced mix of local and imported energy sources;
• Maintaining a sustainable level of external dependence on energy imports below the EU average;
• Continuing the liberalization of energy markets while providing protection for vulnerable social groups and managing possible social risks and negative impacts;
• Sustainable development of renewable energy on a market basis;
• Setting reasonable energy efficiency targets;
• Introduction of new nuclear power in the national energy mix after 2030

In connection with the implementation of these national energy priorities by 2030, with a horizon of 2050, and to ensure Bulgaria's contribution to the implementation of the common European energy policy, the following goals have been set by 2030.
• Reduction of primary energy consumption compared to the baseline forecast PRIMES 2007 - 27.89%;
• Reduction of final energy consumption compared to the base forecast PRIMES 2007 - 31.67%;
• 27.09% share of renewable energy in gross final energy consumption;

• At least 15% interconnection.

In the period up to 2030 and beyond, efforts will be focused on promoting the introduction of new technologies for the construction of efficient district heating and cooling systems and efficient heating and cooling infrastructure.

It is crucial to raise the awareness of all consumers about the benefits of energy efficiency by: providing accurate information on how energy savings can be achieved; providing education and training in the field of energy efficiency, with an emphasis on the application of energy efficient technologies or techniques and their benefits.
Energy efficiency measures will be supported by well-designed and efficient financial instruments, and cooperation between public and private stakeholders will be encouraged to develop large-scale investment programs and financing schemes.

SUSTAINABLE ENERGY DEVELOPMENT FOR CLEAN ENERGY AND DECARBONIZATION OF THE ECONOMY
Renewable energy policy is an essential element of national and European energy policy and climate change policy.

Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources sets an overall target of 32% for the share of renewable energy in gross final energy consumption in the EU, the value and nature of sectoral targets in the heat sector and cooling energy, as well as targets in the transport sector.

In recent years, the consumption of energy from renewable energy has increased significantly, reaching in 2018 a share of 20.53% 2 in the gross final energy consumption in the country, which exceeds the mandatory national target for renewable energy in the National Action Plan. 16% by 2020.
In quantitative terms, in 2018 the gross final consumption of renewable energy in the country is 2,230.1 ktoe and marks an increase of 52.3% compared to 2011. The increased consumption of renewable energy is due to an increase in the consumption of renewable energy in all sectors: electricity energy, heat and cooling and transport sector.

The final consumption of electricity from renewable energy sources in 2018 increased and reached 738 ktoe, compared to 645.5 ktoe in 2017 and 426.7 in 2011. For the period 2011-2018 there was an increase of 73%. The largest contribution in 2018 is the production of

electricity from hydropower plants (HPPs, 50.6%), followed by biomass power plants (biomass power plants 17.4%), wind power plants (WPPs, 16.4%) and photovoltaic power plants. power plants (FEC, 15.6%) power plants.

The final consumption of heat and cooling energy from renewable energy sources in 2018 is 1 349.2 ktoe and marks an increase compared to 2017 (1 229.7 ktoe) of 9.7% and 30.1% (1 037.4 ktoe) compared to 2011. With the highest solid biomass continues to contribute (88.4% share in final consumption of heat and cooling energy from renewable energy sources).
To ensure the contribution of the Republic of Bulgaria to achieving the overall target of 32% for the share of renewable energy in gross final energy consumption in the EU, the Republic of Bulgaria sets a national target of 27.09% share of renewable energy in gross final energy consumption by 2030 г.
The fulfillment of the national target for 2030 is ensured by achieving the sectoral targets for electricity, heat and cooling and transport energy.

To achieve the national target for the share of energy from renewable sources in the gross final energy consumption by 2030 (27.09%) the following distribution by sectors is forecasted:
• 30.33% share of energy from renewable sources in the electricity sector;
• 42.60% share of renewable energy in the heat and cooling sector;
• 14.2% share of renewable energy in the transport sector

In the period 2021-2030, the development of the electricity sector will be consistent with: (1) the possibility for maximum integration of the electricity produced by renewable energy sources in the electricity market,
(2) the possibilities for decentralized electricity generation,
(3) provision of electricity from renewable energy sources at an affordable and lowest possible price for all consumers,
(4) promoting and facilitating the development of own electricity consumption by renewable energy sources and the establishment of renewable energy communities.

Expansion of electricity production from renewable energy sources will be linked to the possibility for maximum integration of the produced electricity on the electricity market, as well as to take into account the decentralized production of electricity, incl. creating conditions for consumers of own electricity from renewable energy sources and renewable energy communities.

In the period 2020-2030, the net installed capacity for electricity generation from renewable energy sources is expected to increase by 2,645 MW. This growth is accompanied by an increase in the net installed capacity of the HPP by 2,174 MW, at the WPP by 249 MW and the biomass EC by 222 MW.

The emphasis in the use of energy from renewable sources will be placed on its efficient use in the heat and cooling sector, as well as in the search for opportunities for the consumption of new generation biofuels and electricity from renewable energy in the transport sector.

5.2 Strategic Priorities [Analysis]

The policies and goals that Bulgaria sets for the implementation of innovative technologies in a real, working environment are:

Introduction of market-oriented innovative services that meet the changing needs and opportunities of consumers and increase the flexibility of the energy system;
▫encouraging the construction of energy storage systems that will complement the traditional way of energy storage, will allow its optimal use and easier balancing of energy in connection with the increase of production capacities for production of electricity from renewable energy sources;

▫ storage of energy from renewable sources in the gas transmission network through "Power-to-gas" technology;

▫ promoting the development of distribution networks, through the introduction of smart grids, which should be built in a way that promotes decentralized energy production and energy efficiency;

▫ promoting the use of installations prepared for intelligent management and digital solutions in the building stock to reduce energy consumption;

▫ increasing the number of buildings with close to zero energy consumption, through the use of new technologies and materials for renovation of buildings and glazed surfaces;

▫ Introduction of new high-efficiency energy technologies, leading to a significant reduction in energy costs;

▫ use of hydrogen for the production of heat and / or electricity;

▫ development of electromobility and hydrogen technologies in the transport sector.

- **Forecast energy balance, Baseline scenario / without additional measures /**

	2020	2025	2030	2035	2040	2045	2050
Primary energy production (GWh)	140400	142836	130040	128602	131838	133735	101718
Solid fuels	65121	64585	48425	24847	3315	1779	613
Oil	278	266	257	250	243	234	226
Natural gas	1484	1750	3045	3106	3024	3303	4444
Nuclear energy	46731	46731	46731	69197	91662	91662	44932
Hydropower	4707	4707	4707	4707	4709	4713	4714
Biomass and waste	18556	19868	19432	19039	19528	20046	20480
Wind energy	1451	1564	1901	1901	3608	6191	16659
Solar energy	1664	2944	5141	5153	5333	5392	5440
Geothermal energy	407	420	400	402	416	414	4210
Net imports (GWh)	83788	82647	85450	81957	75852	72276	78533
Solid fuels	9531	8848	7493	6525	5445	4833	4533
Petroleum and petroleum products	51801	51160	48704	46127	44683	43095	41243
Natural gas	30389	30433	36417	36243	32557	30792	39555
Electricity	-7992	-8000	-8000	-7997	-8000	-8000	-8000
Biomass and waste	59	206	835	1059	1168	1557	1202
Gross domestic consumption (GWh)	222578	223697	213573	208556	205548	203710	177825
Solid fuels	74652	73433	55917	31372	8759	6613	5145
Petroleum and petroleum products	50482	49667	47083	44440	42876	41124	39154
Natural gas	31860	32157	39425	39283	35489	33998	43888
Electricity	-7992	-8000	-8000	-7997	-8000	-8000	-8000
Nuclear energy	46731	46731	46731	69197	91662	91662	44932
Hydropower	4707	4707	4707	4707	4709	4713	4714
Biomass and waste	18616	20074	20267	20098	20696	21603	21682
Wind energy	1451	1564	1901	1901	3608	6191	16659
Solar energy	1664	2944	5141	5153	5333	5392	5440
Geothermal energy	407	420	400	402	416	414	4210
Final energy consumption (GWh)	116202	120129	120974	119431	118947	118461	118925

Source (B)EST model, E3-Modelling

Projected energy balance, Target scenario /with additional measures/

	2020	2025	2030	2035	2040	2045	2050
Primary energy production (GWh)	140419	144141	132994	129395	133669	135268	101576
Solid fuels	65128	64653	48294	23934	3096	1633	1120
Oil	278	266	257	250	243	234	226
Natural gas	1478	1689	2795	3036	2849	3126	4797
Nuclear energy	46731	46731	46731	69197	91662	91662	44932
Hydropower	4707	4707	4707	4707	4709	4713	4713
Biomass and waste	18576	21293	22751	20817	21154	21305	22488
Wind energy	1451	1564	2049	2049	4394	6883	11719
Solar energy	1665	2813	4998	5001	5148	5300	7374
Geothermal energy	403	424	411	405	416	412	4206
Net imports (GWh)	83855	80784	81000	79592	72503	69324	80002
Solid fuels	9492	8406	6559	5758	4873	4476	4335
Petroleum and petroleum products	52035	50881	48488	45271	43478	41794	39446
Natural gas	30268	29373	33423	35430	30669	29141	42697
Electricity	-7997	-8000	-8000	-7998	-8000	-7994	-8000
Biomass and waste	57	123	529	1132	1483	1906	1524
Gross domestic consumption (GWh)	222663	223139	212078	206984	204030	202290	179152
Solid fuels	74620	73059	54853	29691	7969	6109	5455
Petroleum and petroleum products	50716	49387	46867	43584	41672	39823	37358
Natural gas	31734	31036	36181	38400	33425	32171	47383
Electricity	-7997	-8000	-8000	-7998	-8000	-7994	-8000
Nuclear energy	46731	46731	46731	69197	91662	91662	44932
Hydropower	4707	4707	4707	4707	4709	4713	4713
Biomass and waste	18634	21417	23280	21949	22637	23211	24012
Wind energy	1451	1564	2049	2049	4394	6883	11719
Solar energy	1665	2813	4998	5001	5148	5300	7374
Geothermal energy	403	424	411	405	416	412	4206
Final energy consumption (GWh)	116110	119558	119977	118262	117708	117276	117912

Source (B)EST model, E3-Modelling

The baseline scenario has been developed as a basis for comparison with the Target Scenario and envisages in 2030 with 2.2% less primary energy production compared to the Target Scenario, as this difference in the two scenarios will decrease in perspective by 2050 expects primary energy production in 2030 to decrease by 7.4% compared to 2020 and by 22% in 2050 compared to 2030, while in the Target Scenario the decrease is 5.3% in 2030 compared to 2020 and by 24% in 2050 compared to 2030

The projected increase in primary energy production under the Target Scenario is mainly due to an increase in energy from renewable energy sources (wind, solar and geothermal energy, and biomass) by 2030 and in the future until 2050. The Target Scenario envisages a slower rate of reduction of primary production of solid fuels by 2030. In both scenarios, primary production of hydro and nuclear energy remains unchanged until 2030.

The gross domestic consumption of fuels and energy in the country under both scenarios is close in value in 2030 and in 2050. In order to achieve the national target for the share of energy from renewable sources in 2030 in the Target Scenario is projected at 10.9% greater consumption of energy from renewable sources. In 2030, the Target Scenario in order to comply with European environmental requirements envisages 1.9% lower coal consumption than the Baseline Scenario. In the perspective until 2050 the projected amount of natural gas under the Target Scenario will increase and is by 8% more than in the Baseline Scenario.

In terms of energy efficiency, the Target Scenario in 2030 achieves a lower value of energy intensity of 2 984.6 MWh / M €, while in the Baseline Scenario it reaches 3 005.7 MWh / M €.

The projected development of renewable energy in the Target Scenario allows achieving the national target of 27.09% share of renewable energy in gross final energy consumption by 2030 and meets the recommendation of the EC, Bulgaria to increase the level of ambition for 2030, providing for a share of energy of renewable energy of at least 27%. Under the Baseline Scenario, the possible share of renewable energy in gross final energy consumption is significantly lower and will be 24.72%, as a 14% mandatory share of renewable energy in the transport sector will not be achieved by more than 2 percentage points (11.98 %).

MONITORING AND UPDATING

The strategy for sustainable energy development of the Republic of Bulgaria has been developed in the long run with the flexibility to respond to the development of energy technologies and the challenges in the coming decades.

In accordance with the principles of good governance, the dynamically developing European energy policy, the economic, social and technological environment, it is necessary to make informed management decisions for the further development of the energy sector.

In this regard, the Ministry of Energy monitors and evaluates the progress in the implementation of the Sustainable Energy Development Strategy of the Republic of Bulgaria, and will prepare biennial progress reports including analysis of the implementation of the set goals and priorities and, if necessary, proposals for adaptation and updating of The strategy.

Through monitoring and, if necessary, updating, the risk of possible deviations from the set policies and priorities will be minimized and the maintenance of the long-term vision for the energy sector set in the Sustainable Energy Development Strategy will be ensured.
In implementing the set policies, priorities, goals and forecasts in the Strategy for Sustainable Energy Development of the Republic of Bulgaria until 2030 with a horizon until 2050, the following will be achieved:

- Secure and sustainable energy system;
- High-tech, competitive and financially stable energy;
- More efficient use of energy;
- Well-developed infrastructure and interconnection;
- Production and consumption of more clean energy;
- Lower energy intensity in all sectors of the country's economy;
- Affordable energy at fair prices for Bulgarian citizens and businesses.

6. Action Plan

The PRO ENERGY project focuses on the challenges of promoting energy efficiency in public buildings in the Balkans - Mediterranean in the 5 EU regions.

PRO ENERGY (BMP1/2.2/2052/2019)	
Partner Organization	Regional Development Agency with Business Support Centre for Small and medium-sized Enterprises
Country	Bulgaria
BG422 NUTS3 region BG421 NUTS2 region BG42	Municipality of Plovdiv Plovdiv Region South Central Planning Region
Contact person	Velizatr Petrov
E-mail address	rdaplovdiv@gmail.com
Telephone	+359 878 461438

The PRO ENERGY project partnership has different types of experience and levels of expertise, including working with stakeholders at different levels, national, regional and municipal. The interregional approach explores and examines the challenges to improve energy efficiency in partner countries in the Balkans – Mediterranean region.

Based on the analysis of the current state of Product 3.3.1 and the identified good practices Product 3.3.2 and comparative analysis and on the basis of the performed SWOT and PESTLE analyzes and the defined strategic goals and priorities, the current action plan for promoting energy efficiency in public buildings was developed.

The overall challenge of PRO-ENERGY is to improve the energy efficiency of various public buildings (schools, museums, innovation centers, etc.). The participating areas face common problems of old facilities, obsolete / degraded facades of buildings, materials and equipment (insulation, appliances, cooling / heating systems, etc.), low energy consciousness and awareness, lack of qualified civil servants, which leads to to high energy consumption and CO2 emissions.

With a focus on behavioral energy efficiency, PRO-ENERGY aims to address all issues by developing and implementing joint strategies and action plans, enhancing the competence of owners and operators of public buildings, developing and implementing technologies and tools for reducing energy consumption in public buildings and promoting good practices and results generated by the project for other local / regional / national actors in the area.

The new energy-saving technologies promoted by PRO-ENERGY relate to behavioral energy efficiency. Behavioral efficiency programs and strategies introduce a cost-effective way to reduce energy consumption. Clean energy initiatives are dual processes that produce energy through renewable energy sources (RES) or by finding ways to use existing energy efficiently.

A modern and proven approach is the concept of "behavioral energy efficiency", a set of tools that trigger, inform, advise and finally guide individual consumers to practical and measurable actions for their personal and daily use of energy resources.

Policies related to aspects of behavior derive from a set of motivations, from:

• The need to raise citizens' awareness and understanding of the need to be concerned about energy in society - important for the adoption of other important policy measures that may be unpopular or controversial
• Desire to win people's commitment to the idea that they should play a role in reducing energy demand
• Recognition that the habitual and / or investment behavior of individuals is in itself an essential component of reducing consumption patterns.

During the implementation of national, regional and municipal plans, programs and strategies, stakeholders participating in regional development council meetings, stakeholder meetings and workshops will change their behavior and change towards energy efficiency issues, Green Bulgaria and various measures to improve the energy efficiency of public buildings by changing behavior:

- promoting the exemplary role of buildings occupied by public authorities;
- increasing the administrative capacity of the central government administration and correspondingly better regulation of energy efficiency;
- providing better thermal comfort and working environment for civil servants;засилване на институционалната оперативна съвместимост на функциите и отговорностите;
- Improving the provision of administrative services to citizens due to the creation of a better and healthier environment
- raising the social status of the population and the quality of life;
- increasing public confidence in institutions;
- improving the regulatory framework;
- improving the investment climate;

- development of technologies and the free market of goods and services;
- creation of new jobs;
- increasing the administrative capacity of the administration and strengthening the institutional compatibility of functions and responsibilities between departments;
- Improving Bulgaria's image in the EU as a reliable partner in the implementation of the Union's policies for sustainable development

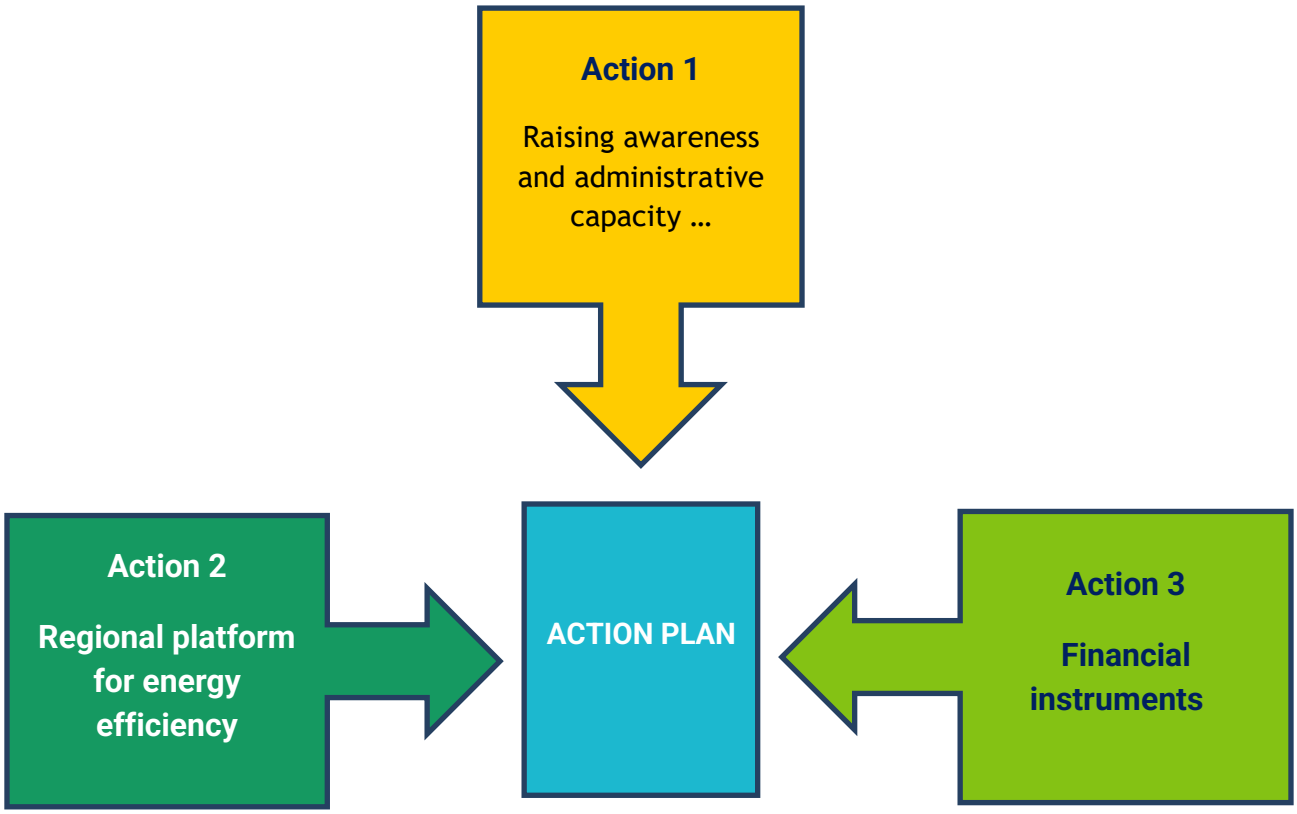
6.1 Activities for the promotions of EE at interregional level

In 2021 - 2022 we will work on the implementation of:

KEY ACTION 1. Raising awareness and administrative capacity of the administration at national, regional, district and municipal level for better regulation of energy efficiency

KEY ACTION 2. Regional platform for energy efficiency

KEY ACTION 3. Financial instruments / Energy efficiency measures under various operational programmes



6.2 Budget of Activities

The budget needed to finance the key activities of the Action Plan is set out in the table:

Key actions	Product / activity name	Necessary funds
KA1 Raising awareness and administrative capacity of the administration at national, regional, district and municipal level for better regulation of energy efficiency	Printed and electronic versions of materials Development and distribution of information materials / brochures / leaflets - 4 pcs Development and distribution of information sheets with information on strategic documents - 4 per year Development of training materials for training of stakeholders - 4 pcs Conducting seminars / trainings with the participation of stakeholders - 4 pcs Participation in meetings of the Regional Development Council of the South Central Planning Region NUTS - 2 per year	10 000 euro 4 500 euro 7 500 euro 1 250 euro
KA 2: Regional platform for energy efficiency	Development and implementation of a Regional Platform for Energy Efficiency Ongoing maintenance of the Regional Platform for Energy Efficiency and current publications	6 450 euro 1 000 euro/year
KA 3: Financial instruments / Energy efficiency measures under various operational programs	Information and promotion of participation in energy efficiency measures for the period 2021 - 2027 Providing consulting services and supporting project development	1 000 euro/year 2 000 euro/year

The key activities can be financed from various sources: PRO ENERGY project “Promoting energy efficiency in public buildings in the Balkans – Mediterranean”, partly by the beneficiaries and from own funds of the Regional Development Agency with business support centre for small and medium-sized enterprises Plovdiv.

6.3 Monitoring and Evaluation tools of the implementation of activities

Subsequent monitoring of the activities under the action plan will be carried out periodically.

Key actions	Inficatiors	Planned values
KA 1 Raising awareness and administrative capacity of the administration at national, regional, district and municipal level for better regulation of energy efficiency	• Number of developed and disseminated information materials • Number of developed and disseminated inf. sheets with information regarding the strategic documents of the Republic of Bulgaria in the field of energy efficiency • Number of developed training materials for training of stakeholders • Number of seminars / trainings conducted • Number of participations in meetings of the Regional Development Council of the South Central Planning Region NUTS 2	• 4 pcs • 4 pcs/year • 4 pcs • 4 pcs • 2 pcs/year
KA 2: Regional platform for energy efficiency	• Number of visits to RPEE to raise general awareness of energy efficiency • Number of published information sheets • Number of publications on the project and energy efficiency	• minimum 100 pcs • 4 pcs/year • 6 pcs/year
KA 3: Financial instruments / Energy efficiency measures under various operational programmes	• Information and promotion of participation in energy efficiency measures for the period 2021 - 2027 • Providing consulting services and supporting project development	• currently • Current measuresrevealed for application .