

Energy management in public buildings in Municipality of Maribor



REGIONAL ACTION PLAN

Energy Agency of Podravje – Institution for Sustainable Energy Use
August 2019

Contents:

1. Summary.....	3
2. Introduction.....	4
2.1 Operational programme (OP) for Structural funds 2014 – 2020.....	5
2.2 Municipality of Maribor Local Energy Policy	5
2.3 Municipality of Maribor Local Energy Policy – weak points.....	6
2.4 EMPOWER project in Maribor.....	7
3. General information.....	8
4. Policy context	8
4.1 Regional development policy instrument	8
5. Regional action plan	9
6. Details of the actions envisaged.....	10
Peer Review	11
7. Costs and funding sources.....	16
8. Sustainability and viability of RAP	16
9. Regional and national impact of RAP implementation	16
10. Approval of Regional Action Plan	17

1. Summary

Local communities play a key role in tackling climate changes mainly caused by the inefficient energy use and the use of fossil fuels. EU has a leading role in sustainable energy developments. It has prepared and adopted many climate and energy programmes, strategies, action plans and regulations.

Despite the intensive investment in renovation of buildings in recent years, the building stock still represents the sector with the highest potential for achieving energy savings. There are many new technologies and system that can assure low energy or even zero and plus energy buildings. Nevertheless, there are still too many cases where planned energy and CO₂ emission savings are not met. The reasons are mainly in bad or no energy management including people (users) behaviour. One of the most important issue is energy management. Gathering data and evaluation of energy and environmental performance are at the heart of decarbonisation strategies to enhance energy efficiency and to reduce energy use in buildings.

Slovenia regulates the obligation of yearly energy monitoring and reporting for public buildings. It does not offer a complete management system since the whole management cycle is not required. Well implemented energy management in building contributes up to 10 % of energy and financial savings.

The Municipality of Maribor, the second biggest in Slovenia has more than 10 years of experience with monthly energy and financial monitoring but it is not upgraded to the management. Municipality has more than 250 public buildings without social housing. Only some users are involved in the management. City administration is big and there is also lack of horizontal and vertical communication for efficient energy management. The theory is well known: good energy management is a part of good governance as a whole also from financial aspects. With the optimal energy management system optimal solutions and planned saving could be achieved and year after year optimisation and commissioning of the buildings could be done. For transferring the theory into the practice Maribor has joint EMPOWER project to share real experiences and get more knowledge.

As a result of exchange of experience between project partners and work of local stakeholders within the EMPOWER project ENERGAP has prepared Regional action plan to improve the governance of municipal energy policy and to implement pilot project for social houses to tackle the energy poverty. The actions will be implemented in 2020 and 2021 and will result in more than 10 % of CO₂ emission savings. Its actions, results and knowledge gained within the implementation will be incorporated into the Sustainable energy and climate action plan for Municipality of Maribor (SECAP) that will be adopted by City Council in 2021.

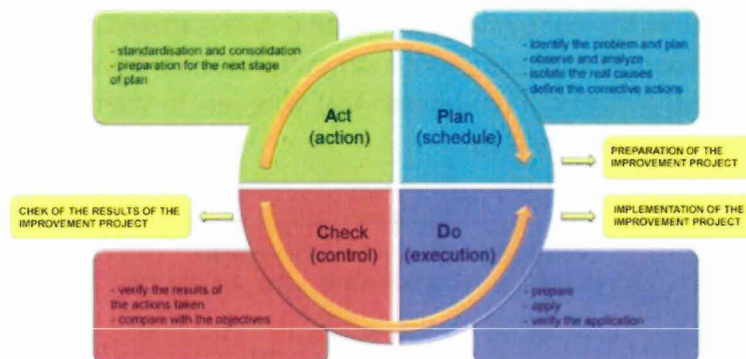
2. Introduction

Local communities play a key role in tackling climate changes mainly caused by the inefficient energy use and the use of fossil fuels. EU has a leading role in sustainable energy developments. It has prepared and adopted many climate and energy programmes, strategies, action plans and regulations.

Despite the intensive investment in renovation of buildings in recent years, the building stock still represents the sector with the highest potential for achieving energy savings. There are many new technologies and system that can assure low energy or even zero and plus energy buildings. Nevertheless, there are still too many cases where planned energy and CO₂ emission savings are not met. The reasons are mainly in bad or no energy management including people (users) behaviour. One of the most important issue is energy management with energy and financial monitoring. Gathering data and evaluation of energy and environmental performances are at the heart of decarbonisation strategies to enhance energy efficiency and to reduce energy use in buildings. The European Energy Performance of Buildings Directive (EPBD) and Directive on Energy Efficiency also require EU members to encourage intelligent metering and active control and management systems in new or renovated buildings. Not having proper data could lead to wrong policy decisions and actions, and, as a consequence, to lost opportunities for savings and even get higher costs. In past years, there was not a lot of energy data related to different users especially in public sector. Without good data planning of energy efficient activities is difficult. Without good monitoring the results are also difficult to check. Therefore public sector has to start following some private sector models and standards related to energy monitoring and energy planning (like ISO 16001, 50001).

EU member states more or less follow the EU strategies and programmes in the field. Slovenia is not very active in the field of energy transition. Responsible ministry has prepared different energy related action plans and legislative requirements. Many of them are not implemented well. Relation to the energy management are not well defined therefore only basic yearly energy and financial monitoring is requested for public sector.

Slovenia regulates the obligation of yearly energy monitoring and reporting for public buildings bigger than 250 m². The reporting is organized within national central monitoring platform. It does not offer a complete management system since the whole management cycle as presented on Picture 1 is not required. Good energy management system includes collecting and analysing an energy data. On its basis planning is done. After the implementation of planned activities, the results are controlled and re-planning is performed. Well implemented energy management in building contributes up to 10 % of energy and financial savings.



Picture 1: Good energy management cycle

(Picture source: <https://www.linkedin.com/pulse/pdca-plan-do-check-act-hassan-el-meligy-msc-mdx-uk>)

2.1 Operational programme (OP) for Structural funds 2014 – 2020

Slovenia has quite ambitious OP in the field of energy efficiency in buildings. The energy management in public sector is one of its measures in the field of energy efficiency in buildings. No specific projects have been developed in the relation to good energy monitoring and management.

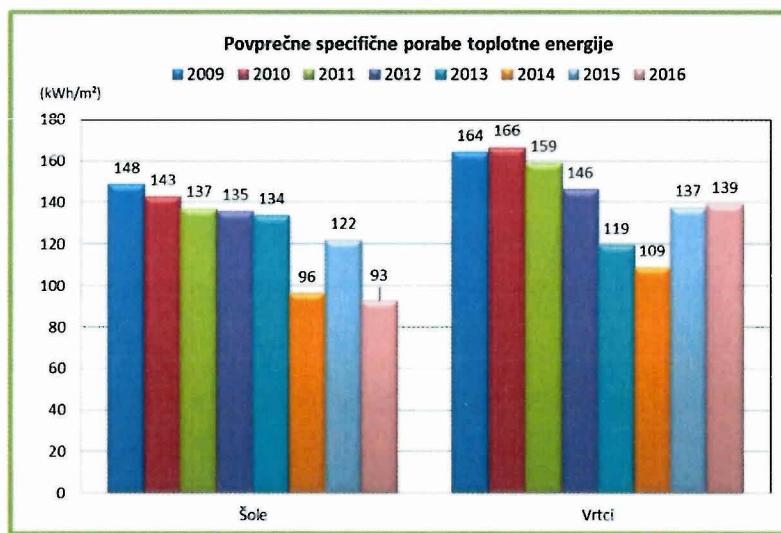
2.2 Municipality of Maribor Local Energy Policy

Municipality of Maribor is the second biggest municipality of Slovenia. It has started sustainable energy activities already in 2006. In past years many successful projects were implemented. Nevertheless, some results and data show that as a municipality it is still energy inefficient but it is finally recognized that climate changes affect people's everyday lives. Adaptation of the society and the City of Maribor to climate changes and reducing energy consumption in the coming years are the challenges and opportunities for future development. It has been recognized also at the City Council.

Municipality of Maribor adopted Local Energy Concept (SEAP) in 2009 (renewed in 2017) where many different actions are proposed to achieve sustainable energy goals.

One of the most important goal is the implementation of energy monitoring and management in public buildings and street lighting system. In the past years energy and financial bookkeeping system was introduced in some public buildings in Maribor (schools, kindergartens, administrative buildings). It includes monthly monitoring of energy use and costs for heating, electricity and water. The system was explained also as a good practice in Empower Good practice register.

In Picture 2 collected data for Maribor's primary schools and kindergartens is presented. The energy use is presented as an indicator of energy use in kWh per square meter. The results were achieved by implementation of different activities. It can be seen that from year to year the buildings are more efficient but still far from low energy buildings.



Picture 2: Energy use in kWh per square meter per year for primary schools (left) and kindergartens (right) in Maribor since 2009 (Source: Local energy concept report to the City Council)

2.3 Municipality of Maribor Local Energy Policy – weak points

The municipality has more than 10 years of experience with monthly energy and financial monitoring. Not all public buildings are included and monitoring is not upgraded to the management. Municipality has more than 250 public buildings without social housing. Only some users are involved in the management. City administration is big and there is also lack of horizontal and vertical communication for efficient energy management. The theory is well known: good energy management is a part of good governance as a whole also from financial aspects. With the optimal energy management system including ICT monitoring tools and the methodological process guidelines for energy and CO₂ monitoring system, optimal solutions and planned saving could be achieved and year after year optimisation and commissioning of the buildings could be done. For transferring the theory into the practice Maribor has joint EMPOWER project to share the experiences and get more knowledge.

The second weak point is that SEAP for Municipality of Maribor does not include the activities linked to energy management in social housing and energy poverty. It includes only the provisions about

educational and informational activities for the marginal groups. Up to now there has been no project planned or implemented about energy and CO₂ monitoring and savings in social houses in the region.

2.4 EMPOWER project in Maribor

Energy agency of Podravje (Energap) is the energy manager of Municipality of Maribor and it takes care about the implementation of good energy management. It has been recognized that implementation of the energy management in public sector in Slovenia is very difficult. Energap was happy to introduce the energy and financial monitoring to some public buildings in Maribor. It took a lot of time and human resources to convince public sector. As an energy manager it has recognized that only monitoring is not enough and that Maribor has to work towards the energy management in all public buildings to achieve planned results.

In 2017 the big energy refurbishment project (24 public buildings) has started as a part for Empower project (activities related to data collection). All data about energy and financial monitoring were used to demonstrate that good energy data can help to prepare the investment documentation. The project where implemented together with private investor as a public private partnership project.

Through interregional cooperation, sharing the good practices and learning process Energap and stakeholders wanted to learn how to improve energy and financial monitoring in all public buildings in Maribor and how to upgrade the monitoring into the energy management.

Within the EMPOWER action plan, foreseen activities are:

- improving the governance of public buildings in energy field by establishing inter-sectoral working group and
- implementing the energy management project in social housing sector as one of the most important measure to protect the most vulnerable people against the fuel poverty.

3. General information

Project: **EMPOWER – More carbon reduction by dynamically monitoring energy efficiency**
Partner organisation(s) concerned: **Energy Agency of Podravje – Institution for Sustainable Energy Use**
Country: **Slovenia**
NUTS2 region: **Vzhodna Slovenija**
Contact person: **Dr. Vlasta KRME LJ, director**
Email address: **vlasta.krmelj@energap.si**
Phone number: **+386 2 234 23 60**
+386 31 334376

4. Policy context

The Action Plan aims to impact:

- ☐ Investment for Growth and Jobs programme
- ☐ European Territorial Cooperation programme
- ☐ **Other regional development policy instrument**

Name of the policy instrument(s) addressed:

Local energy concept of Municipality of Maribor (Sustainable energy action plan), Thematic objective: Energy management in public buildings

4.1 Regional development policy instrument

Municipality of Maribor adopted Local energy concept in 2009 and updated it in 2017 to Sustainable energy action plan (linked to the Covenant of Mayors initiative). It has 7 thematic objectives:

1. Sustainable city
2. Planning of city energy infrastructure
3. Energy efficiency and use of renewable energy in buildings
4. Green economy in the city
5. Sustainable solutions in transport
6. Modern public lighting
7. Well informed and active citizens

Thematic objective 3: Energy efficiency and use of renewable energy in buildings

Energy use in buildings contributes to more than a quarter of CO₂ emissions in Maribor. A large part of these emissions can be avoided by renovating old buildings and installing efficient energy systems. One of the most important activity within this thematic objective is energy monitoring and energy management in public buildings owned by municipality. The activity is dealing only with monitoring

and it is not upgraded to the real energy management. At the same time there are no special provisions or projects foreseen for social housing to tackle the energy poverty issues.

Energy management plays a crucial role in achieving long term energy, CO₂ and financial savings. It is a set of systematic actions (as described in standard ISO EN 50001). It is more than just monitoring. It means that energy and financial data are analysed and used for planning the measures. After implementing proposed measures, the achievements in savings have to be monitored. If planned saving targets are not met, new planning has to be done based on data analysis. It is permanent and continuous cycle of activities. Also the stakeholders has to be involved in all parts of the management. Continuous information and educational campaign has to be implemented.

5. Regional action plan

The purpose of the RAP is to support the ongoing activities in the field of energy and financial monitoring and to improve the energy management of public buildings in Municipality of Maribor to achieve at least 10 % of energy and CO₂ savings and through improved governance achieve long term savings. Part of the plan is dedicated to social housing and its monitoring to combat fuel poverty as very important part of sustainable energy development in the City of Maribor.

The aim of the action plan is to improve the policy instrument – Local energy concept – Thematic objective 3 - Energy efficiency and use of renewable energy in buildings through:

- improved governance in energy management for public buildings by **establishing municipal inter-sectoral working group** and
- implementing a new project – **implementing the energy monitoring and management in some social houses** as a pilot project

Energy management should be implemented as proposed by different standards (for example SIST EN 50 001). It has to include not only monitoring but also analysis of the results of monitoring, use the results for checking the implemented actions and for adjusting plans. Very important part of energy management is also informing and educating of stakeholders and including them in the management process. Especially it is important for marginal groups as in social housing to tackle the energy poverty.

The ambition of Municipality of Maribor is that the results of the activities and projects described below will be important input and knowledge to take into account in the forthcoming policy Municipal Sustainable Climate and Energy Action Plan 2030.

6. Details of the actions envisaged

The actions aim to:

- improve the overall governance in energy management in public sector by establishing a municipal inter-sectoral working group (Action 1) and
- implement the project of energy monitoring and management system in social houses (Action 2).

The actions will be executed in 2020 and 2021 and results monitored.

ACTION 1:

Establishing municipal inter-sectoral working group to improve energy management in public buildings:

NATURE OF THE ACTION 1 (activities):

Setting the municipal working group consisting of city administration staff (that work in different departments dealing with public buildings like education, sport, culture and building users (usually headmasters delegates or building managers). If needed subgroups will be established. Energy agency of Podravje will lead the work of the group. Working group will:

1. define the procedure for all steps of energy management (planning, acting, checking, reporting and re-planning);
2. prepare yearly energy refurbishment plan on the basis of the results of energy, financial and CO₂ monitoring with planned savings;
3. meet at least 6 times a year;
4. be responsible for preparing yearly reports on energy, CO₂ and financial savings that will be included in yearly energy report plan that is presented to City Council. Special report on the savings will be prepared for already refurbished or new buildings to prove the low energy standards;
5. perform continuously information and educational activities for public sector and decision makers about energy efficiency in public buildings. Following events will be organized:
 - a. At least once a year workshop for headmasters will be organized.
 - b. At least once in 2 years each building users have to attend workshop on energy efficiency in buildings.
 - c. At least once a year energy agency will organize study visit to local good practice in energy efficiency for municipal staff.
 - d. Once in 2 years the seminar about sustainable energy and projects will be organized for decision makers (politicians, City Council members).
 - e. Different educational and promotional materials will be prepared for different target groups (children, teachers, kitchen staff, visitors of cultural buildings).

RELEVANCE TO THE PROJECT

Peer Review

At Peer Review all partners presented their policy instruments to work. During discussion and exchange of experiences it was recognized that all partners phases similar circumstances when implementing energy and CO₂ monitoring and management systems in public buildings.

Following outputs as learning needs were directly linked to Maribor policy instrument and field of Action 1 in Regional action plan (RAP) for improving the governance of energy management in public buildings:

1. Communication activities are very important on different levels, with different stakeholders, using different methods to motivate a whole society.
2. Training and educational activities are still needed for all stakeholders in different forms and levels including decision makers and politicians.
3. Financial monitoring is a basis for good financial and energy management of buildings and the need for implementing different financial mechanisms for energy efficient investments.

Study Visits

According to identified learning needs Maribor's stakeholders made different study visits and learn about different projects. The most important good practices that have influenced the development of Action 1 were:

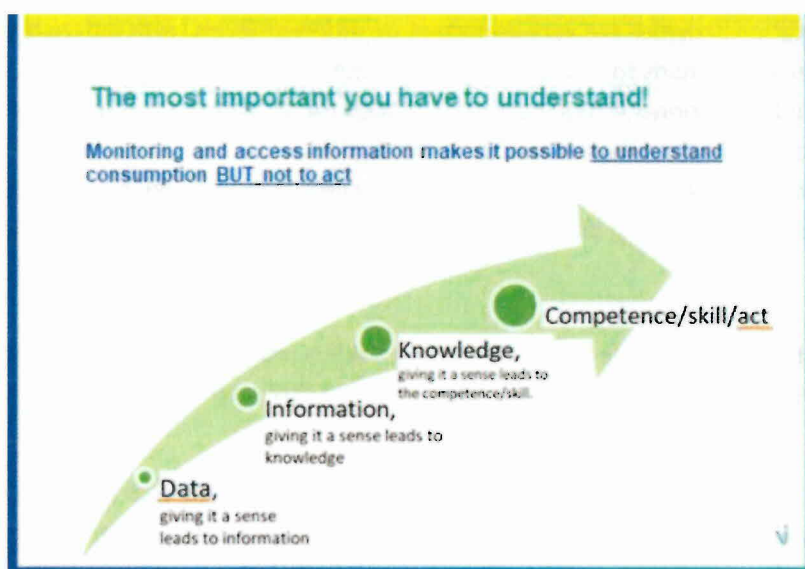
- Use of sensors to work on, use different environmental data and planning of monitoring (where to have big data and where to collect only monthly data, how to analyse it and use it for future planning, organizing the management), Cork, Ireland;
- Planning and monitoring of implemented energy efficient measures, case of Ice-hockey arena, (horizontal and vertical cooperation of different sectors and users), Vaxyo, Sweden;
- Using of energy and financial monitoring for controlling energy contracting long term contracts (to finance energy efficient measures, to control the implementation, to organize the planning and implementation activities), Santander, Spain.

Technical workshops on energy and finances

Stakeholders from Maribor participated in 2 technical workshops dedicated to energy and financial monitoring. Following ideas and knowledge will be transposed into Action 1:

- When and how to use smart meters with very detailed energy data (every minutes or even few seconds) – they are needed when diagnosing the problems not at early stage of energy bookkeeping – all users and managers have to have monthly or weekly data first to be able to use more specialized data. They are very important in new or renovated buildings when results show that planned savings are not realized;

- Energy managers have to cooperate already when planning new building or renovation of old one to show the results of past monitoring and to propose different indicators;
- When implementing energy performance contracting for building refurbishment it is necessary to have very good energy data to be able to negotiate good savings and good price in contract. Without the monitoring of savings through the agreement period (usually 10 – 15 years) public sector break the public budget roles;
- Energy demand management is very important including users behaviour changes. As shown in Picture 4 collecting the data is only the first step to develop new knowledge and competences that are crucial for successful long term energy management in public sector.



Picture 4: Data and monitoring are only the first step in achieving the long term savings
(Source: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1543571430.pdf)

STAKEHOLDERS INVOLVED IN THE IMPLEMENTATION

In the implementation of Action 1 of RAP following stakeholders will be involved:

- Energy agency of Podravje to organize and lead the work,
- Mayor and its team to agree on activities,
- Members of City Council of Municipality of Maribor to adopt the measures for improvement and cooperate in communicational activities,
- City administration (directors and the staff) and
- Headmasters and directors of public buildings, employees and users of public buildings.

ACTION 1 EXECUTION TIMEFRAME AND INDICATORS OF THE PROGRESS

ACTIVITIES	DATE OF DELIVERY	INDICATORS OF THE PROGRESS
Setting the municipal working group consisting of city administration staff (that work in different departments dealing with public buildings like education, sport, culture and building users (usually headmasters delegates or building managers)).	January 2020	Working group set Minutes of the meetings
Working group:		
define the procedure for all steps of energy management (planning, acting, checking, reporting and re-planning).	February 2020	Adopted procedure in line with ISO standard 50.001
prepare yearly energy refurbishment plan on the basis of the results of energy, financial and CO ₂ monitoring with planned savings	February 2020 February 2021	Plan for 2020 Plan for 2021
meet at least 6 times a year	Meeting every 2 months	6 meeting minutes per year
be responsible for preparing yearly reports on energy, CO ₂ and financial savings that will be included in yearly energy report plan that is presented at City Council. Special report on the savings will be prepared for already refurbished or new buildings to prove the low energy standards.	Yearly report for 2019 Yearly report for 2020 Yearly report for 2021	Each report presented at city council Reported savings of 5% per year (10 % according to 2019) for energy in kWh and CO ₂ in tonnes
Perform continuously information and educational activities for public sector and decision makers about energy efficiency in public buildings.		
Events		
At least once a year workshop for headmasters will be organized	Workshop in 2020 Workshop in 2021	Workshop reports
At least once in 2 years each building users have to attend workshop on energy efficiency in buildings	Continuously	Attendance list
At least once a year energy agency will organize study visit to local good practice in energy efficiency for municipal staff.	Continuously	Best practice register and public presentation in media
Once in 2 years the seminar about sustainable energy and projects will be organized for decision makers (politicians, City Council members).	Seminar in 2020	Seminar report
Different educational and promotional materials will be prepared for different target groups (children, teachers, kitchen staff, visitors of cultural buildings)	2020 and 2021	Different materials in paper, on the web page,

ACTION 2

Implementing energy monitoring in social houses

In Maribor Municipal Housing Authority manages the social houses that are used by low income households. They take care about the infrastructure and they manage the public calls to give the non-profit (social) apartments to the users. National social security authority takes care about the income of the users and ability to pay a rent. If users have the difficulties with covering the energy related costs they usually ask the Regional Red Cross Authority for help. They give them the money or advice. With the energy monitoring and management the municipality in the cooperation with stakeholders would like to assure the right measures (organisational or investment) to prevent energy poverty in the city.

NATURE OF THE ACTION 1 (activities):

- a. At least 10 apartments will be equipped with energy monitoring system.
- b. The users will get energy advice how to use the equipment and which energy efficient measures to implement to achieve energy and financial savings.
- c. Monitoring reports will be presented at least three time a year to the users to influence behavioural changes and at least twice a year to Municipal Housing Authority and once a year to City Council to support the decision making process on investments.
- d. Regional Red Cross Authority will organize monthly energy advice service to help people in energy related financial difficulties.

RELEVANCE TO THE PROJECT

Study Visits

According to identified learning needs Maribor's stakeholders made different study visits and learn about different projects. The most important good practice that have influenced the development of Action 2 was:

- Monitoring of energy in social housing sector and involvement of users, Almada, Portugal;

Technical workshop on energy

Stakeholders from Maribor participated in technical workshop dedicated to energy monitoring. Following ideas and knowledge will be transposed into Action 2 of RAP:

- When and how to use meters with detailed energy data, how to install them in buildings and connect them to existing energy management systems;

- Dealing with personal data and respects the legislation in the field;
- Energy demand management is very important including users behaviour changes.

STAKEHOLDERS INVOLVED IN THE IMPLEMENTATION

In the implementation of Action 2 of RAP following stakeholders will be involved:

- Energy agency of Podravje to lead and organize the work
- Municipality of Maribor and City Council to be informed about the action and the results
- Municipal Housing Authority to install the meters
- Regional Red Cross Authority to organize advisory service
- Users of the apartments to agree on the cooperation

ACTION 1 EXECUTION TIMEFRAME AND INDICATORS OF PROGRESS

	DATE OF DELIVERY	INDICATOR OF PROGRESS
Introduction of energy monitoring in social houses		
at least 10 apartments will be equipped with energy monitoring system	Spring 2020	10 implemented monitoring systems in social houses
users will get energy advice how to use the equipment and which energy efficient measures to implement to achieve energy and financial savings.	2020 and 2021	10 advices in 2020, repeated in 2021
monitoring reports will be presented at least three time a year to the users and at least twice a year to Municipal Housing Authority and once a year to City Council.	2020 and 2021	60 Monitoring reports 4 minutes of the meetings with Municipal Housing Authority 2 minutes of the City Council meetings
Regional Red Cross Authority monthly energy advice service will be organized to help people with difficulties.	2020 and 2021	Register of the advices 2 yearly reports on the advisory service

7. Costs and funding sources

The cost of the measures will be around 30.000 EUR per year for public buildings and around 30.000 EUR for social houses.

Funding source for Action 1 - activities of working group - will be Municipality of Maribor budget, where a part is dedicated to Sustainable energy concept implementation.

Funding source for implementing Action 2 - measures in social housing - will be the public budget of Municipal Housing Authority and Regional Red Cross Authority.

8. Sustainability and viability of RAP

Regional action plan on energy management in public buildings in Municipality of Maribor will be implemented in 2020 and 2021. Its actions, results and knowledge gained within the implementation will be incorporated into Sustainable energy and climate action plan for Municipality of Maribor (SECAP) that will be adopted by City Council in 2021.

9. Regional and national impact of RAP implementation

Maribor is regional centre and the second biggest city in Slovenia. It has already influenced the energy development in the region and across the country. The action from RAP will be presented to other municipalities and potentially included in their local energy and climate policies.

Ministry for infrastructure of Republic of Slovenia is responsible for energy management in public sector and implementing OP in the field of energy and it is a member of EMPOWER stakeholders groups. It has cooperated in the EMPOWER project and development of RAP. Therefore all information and results of the projects could be spread across the country and could be included in future regulation development. Energy management in public sector and financial mechanisms to implement energy efficient measures in building will play important role also in new OP 2021-2027.

10. Approval of Regional Action Plan

Date:

MARCH 2020

Name of the organisation:

MUNICIPALITY OF MARIBOR

DEPARTMENT FOR DEVELOPMENT PROJECTS AND INVESTMENTS

Name :

TEOBALD PAJNIK

Position :

HEAD OF THE DEPARTMENT

Stamp and signature:



