

INTEGRATION OF THE ENERGY EFFICIENCY INTO THE LOCAL DEVELOPMENT STRATEGIES

by

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Original scientific paper

<https://doi.org/10.2298/TSCI170529129D>

Balanced Scorecards represent powerful management tool for describing, explaining, representing and implementing different business strategies. Being in use for more than two decades, this tool proved its applicability in public, private and non-profit enterprises, which makes it suitable for applying in local development plans. The municipality of Savski Venac applied balanced scorecards as decision-making tools to structure its objectives and articulate them into the strategy. However, the energy efficiency, although perceived as a national priority, was not included in the developed municipality strategy map. This paper investigates the possibilities to integrate the energy efficiency objectives and the municipality strategic objectives, in order to identify and apply proper key performance indicators, targets and measures to improve energy efficiency in different sectors. The ultimate goal is to propose proper GHG mitigation measures to enhance energy efficiency that will fit within the local development strategy of the municipality of Savski Venac, to align the energy efficiency measures with its energy policy, to improve the selection process of the energy efficiency measures and to adjust it to the municipality needs.

Key words: development strategy, energy efficiency, business model, municipality of Savski Venac

Introduction

Urban and energy planning at regional and local level should provide and enhance implementation of measures that contribute to the state government objectives. Usually state level of governance makes decisions about the development and planning at the local level without involvement of and consultation with local and regional development authorities and actors [1]. This is the case in Serbia, where there is absence of alignment between national strategies and objectives, and local level strategic documents and action plans. The best way to achieve this alignment could be combining bottom-up and top-down screening, analysing and planning activities in the framework of state policies. This approach is used by central governments of many advanced economies in EU. Namely, in order to enhance a link and alignment between planning and other relevant policies in different sectors, they transfer decision making power from the central government, through all hierarchical levels to the local

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communities [2-4]. Local governments, therefore, become active participants in development of different policies and implementation of the objectives and action plans set by higher authorities. One of the approaches used to achieve the governmental strategic objectives, whose important segment is always to increase the energy efficiency, is project oriented implementation of the selected measures, ranging from the energy performance improvements of existing facilities and plants to the new building stocks and plants, including public and private ownership. Most of the governments of EU member states provide guidelines and means to different stakeholders that can contribute to country's energy efficiency targets. Special effort is made to effectively communicate the strategic objectives with all their stakeholders.

Inspired by the effectiveness and applied models and financing schemes in advanced economies in Europe, the purpose of this paper is to analyse how the energy efficiency measures in the Municipality of Savski Venac in the City of Belgrade can fit within the already set objectives, including the indirect objective to increase the energy efficiency as well as what should be done to set a driving force to responsible behaviour toward energy, including raising awareness of environmental protection issues in the municipality.

Based on the existing strategic documents, the modified strategy map provided presentation of the existing municipal objectives and the proposal of the new energy efficiency objectives that should enhance municipality energy planning. The balanced scorecards (BSC) was also developed to illustrate how performance measures and initiatives to increase energy efficiency can be identified using the existing and available municipal documents. The paper also shows the possibilities of applying multi-criteria decision making, *i. e.* analytic hierarchy process (AHP) to support the selection process of the energy efficiency measures and initiatives and to adjust it to the municipality needs.

Strategic framework of the Municipality of Savski Venac

Municipality of Savski Venac represents an integral part of the Serbian public sector, as one of the 17 municipalities in the City of Belgrade. Therefore, it is non-profit local government body that should fit within the City of Belgrade strategies and more widely into the governmental objectives and policies.

The City of Belgrade Development Strategy from March 2011 [5] is an umbrella strategy containing short term objectives addressing the period from 2011 to 2016. Its major objectives are to use the City of Belgrade resources and potentials to improve competences and prosperity, to provide the appropriate sources of finance, as well as new employments. The City of Belgrade Development Strategy dealing with the period from 2016 to 2021 is under preparation. It is interesting that the strategy dealing with single sector – Energy Development Strategy of the City of Belgrade has the projections and priorities until 2030 [6], although it was mentioned that this strategy should be aligned with the City of Belgrade Development Strategy, as well as Energy Sector Development Strategy of the Republic of Serbia [7]. This is one of the reasons why special attention should be paid on the investigation of alignment between the strategies at different levels of governance and in various sectors, since their articulation and synchronization is obviously complex due to various time intervals they refer to.

However, it is clear that the energy efficiency is perceived as a national priority, which is documented in both National Sustainable Development Strategy for the period from 2008 to 2017 [8] and Energy Sector Development Strategy for the period by 2025.

To achieve Belgrade's vision, as stated in the City of Belgrade Development Strategy, it was recognized that all stakeholders should contribute to the common effort to increase the significance of energy efficiency and local energy sources, both in households and indus-

try. To improve the quality of living in Belgrade, strategy prescribes to enhance activities to improve building thermal envelopes during reconstruction of the existing households. The City of Belgrade is committed to increase energy efficiency and usage of RES by different stimulation programs. In Strategy, the increase of energy efficiency is often related to the district heating systems. However, although strategy does not identify energy efficiency as a separate objective, it foresees three priority projects related to this issue:

- increase energy efficiency through introduction of measures set that could contribute to the rational production and consumption of energy,
- education about energy efficiency to permanently develop the conscience about the importance of energy and possibilities of energy efficiency, and
- establishment of City's funds for energy efficiency.

For the further consideration in this paper, these projects can be considered as a framework for development of lower level municipality strategies, since it is the most precise consideration of the energy efficiency under the City of Belgrade Development Strategy.

Based on this Strategy, Municipality of Savski Venac prepared Strategic Development Plan (SDP) for the period from 2011 to 2016 [9]. Screening analysis during the SDP preparation showed that, although many activities have been realized in municipality of Savski Venac every year, there was lack of their alignment with planning and strategic documentation and the character of those activities were mostly *ad hoc*. The activities should be oriented toward results, while proper monitoring systems should be established. Clearer division of responsibilities is also necessary. These conclusions led to the development of the strategy map and set of balanced municipality performance measures using BSC methodology, which was also presented in SDP.

It could be observed that these conclusions, although made by authors for municipality as a whole, could be applied also to the research field of this paper – energy efficiency. The energy efficiency was mentioned in SDP at some segments and extends together with some potential projects. This field was also indirectly mentioned in the municipality strategy map. However, this paper investigates how objectives and measures related to the energy efficiency fit within existing strategic objectives of the Municipality of Savski Venac and what should be added to make energy efficiency more present in the municipality strategic planning.

Strategy consideration and integration of the energy efficiency into the Strategy map

Originally BSC methodology was introduced by Norton and Kaplan [10] as a performance measurement framework, aimed to aid non-financial performance to traditional financial matrices in profit organization [11, 12]. During years, BSC evolved into strategic management concept and had been subject of many modifications and is being used in business, industry, government, and non-profit organizations. One of the existing variations of BSC is sustainability BSC, which provides non-conventional approach to the environmental and social management system, showing the casual relation between environmental, economic and social performance of organization [13, 14]. However, in this paper the intention was not to consider all aspects of sustainability, but to focus on ways to improve energy efficiency in households and public and commercial sector, proposing its wider presence in the development strategy of the Municipality of Savski Venac, without going into details to consider the role of energy efficiency in the sustainable development.

The SDP of the Municipality of Savski Venac contains developed strategy map and BSC. Therefore, it was used as a base line for our consideration. Strategy map presented in this

paper shows the modifications comparing to the original concept of four BSC perspectives and contains five perspectives [15, 16]: the citizen perspective, the economy perspective, the financial perspective, the internal processes perspective, and the learning and growth perspective. The citizen perspective answers the question what are the expectations of citizens in terms of municipality's services. The economy perspective suggests how to stimulate local economic development and what its drivers are. The financial perspective emphasizes the importance of achieving operational efficiency of the local governance bodies. The internal processes perspective provides answers how to improve internal processes and finally learning and growth perspective provides non-material support to the objectives in all other perspectives.

In this map, energy efficiency was not recognized and defined as a separate objective, although the Municipality of Savski Venac already undertakes the activities that contribute to the improvement of the energy efficiency. However, due to the absence of systematic approach in energy planning, it was not perceived as an objective. It can be concluded that the energy efficiency is not present in the planning of the municipality development, which is a precondition for its effects measurement and monitoring.

There are different directions of applying energy efficiency measures, and its changes influence all levels of decision-making process. Energy efficiency can be integrated into the BSC on three different ways [17, 18]:

- integration into some or all BSC perspectives, when energy efficiency objective have to be defined and linked to other objectives by cause-effect relationship,
- adding additional sixth perspective as energy efficiency perspective, if energy efficiency is considered as important success indicator for particular business model of a municipality, and
- specific energy efficiency BSC can be formulated.

In this paper, the first option was selected and we investigated the possibilities to integrate energy efficiency into the existing Strategy map.

For non-profit organization, the starting point in developing strategy map is the mission. This is a critical issue, since municipality's performance in achieving its mission is the ultimate definition of its success [11]. Short mission of the Municipality of Savski Venac expresses that municipality provides comfort of living, working and investing. Based on the considered strategic themes and mission as defined in SDP, five objectives were defined, to which separate objectives from each perspective are related. The sixth objective was added to bring the energy efficiency into the strategy map. The objective to increase the energy efficiency contributes directly to the mission segment to provide the quality of life, but via other objectives to all other dimensions of the mission. Also, this objective the most significantly contributes to the environmental protection and the local economic development, as is shown in fig. 1.

In developing countries like Serbia, increasing the energy efficiency needs to provide a good financial prospective in order to find its way to the final consumers. Energy efficiency unambiguously save money, but it costs money in advance and will be paid back in the form of reduced energy cost. From one side there is financial challenge since the cost of energy efficiency measures needs to be low. From the other side there are non-financial measures that are hard to evaluate, such as raising awareness. Consideration of these issues is very complex. Also, the assessment of the effects of energy efficiency measures can be observed over the long run, while municipal authorities are focused mainly on the short term benefits. This could be the reason why the energy efficiency was not addressed directly by SDP, although it is clear national and regional priority.

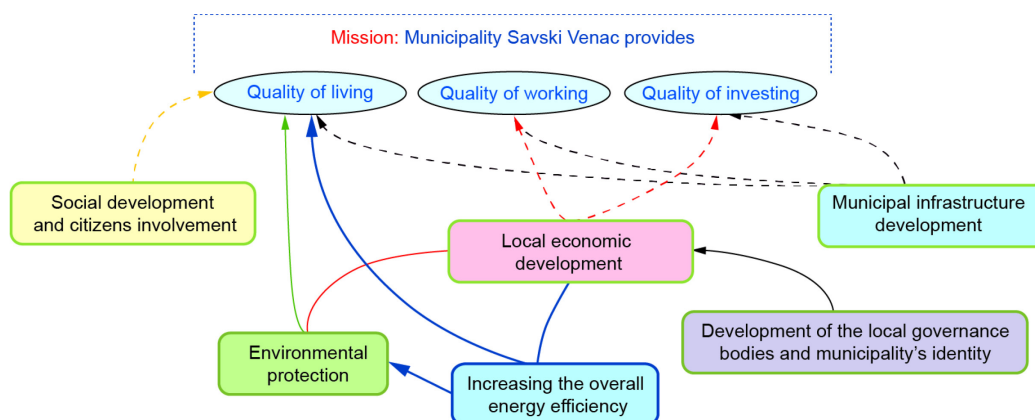


Figure 1. Missions and strategic objectives of Municipality of Savski Venac

Energy efficiency lead to the reduction of GHG emissions, especially since most of the energy used in Municipality of Savski Venac is coming from the fossil fuels. Improved energy performance of the buildings would be the first step toward this objective, while green buildings and provision of ecosystem services [10, 19, 20] would be future of municipal responsible behaviour toward the nature. In the screening part of the SDP it was mentioned that municipality Savski Venac is committed to the improvement of energy efficiency. Three projects were planned, in cooperation with European Commission, Swedish embassy, Philips Company:

- the analysis of opportunities for geothermal energy application,
- the organized construction of green surfaces network, in order to have positive impact to microclimate and reduce energy consumption, and
- the instalment of the energy saving bulbs in public lightening.

Increasing the energy efficiency can certainly contribute to the quality of living, since the less money spent on energy by households, commercial and public services means that this money can instead be spent on costumer goods, education, different services and products. Therefore, at every step of the economic value chain produced by energy efficiency investments, there are opportunities to target the economic and social benefits to those households and businesses for which they will make the biggest difference [21]. The benefit from reduced utility bills is especially significant for low-income households and small business, when they can use these savings for their unmet needs. Investing money saved by increasing the energy efficiency elsewhere in economy contributes to the local economic development and creation of new jobs in efficiency services. Local economic development implies focus of the Municipality's leaders to create attractive environment to set up and grow business. Here the priority is the development of commercial sector, which is, in accordance with definition in Cambridge English Dictionary the part of an economy that includes all businesses except those involved in manufacturing and transport. Most of the energy efficiency businesses can be developed for the territory of municipality, since they involve installation and maintenance of equipment locally and they can employ citizens of the Municipality of Savski Venac. The municipality should create and establish programs and incentives to ensure that more of the economic benefits from energy efficiency remain in the local communities.

As it was previously mentioned, the strategy map of Municipality of Savski Venac contains five perspectives, with its individual objectives. For the purpose of this paper those

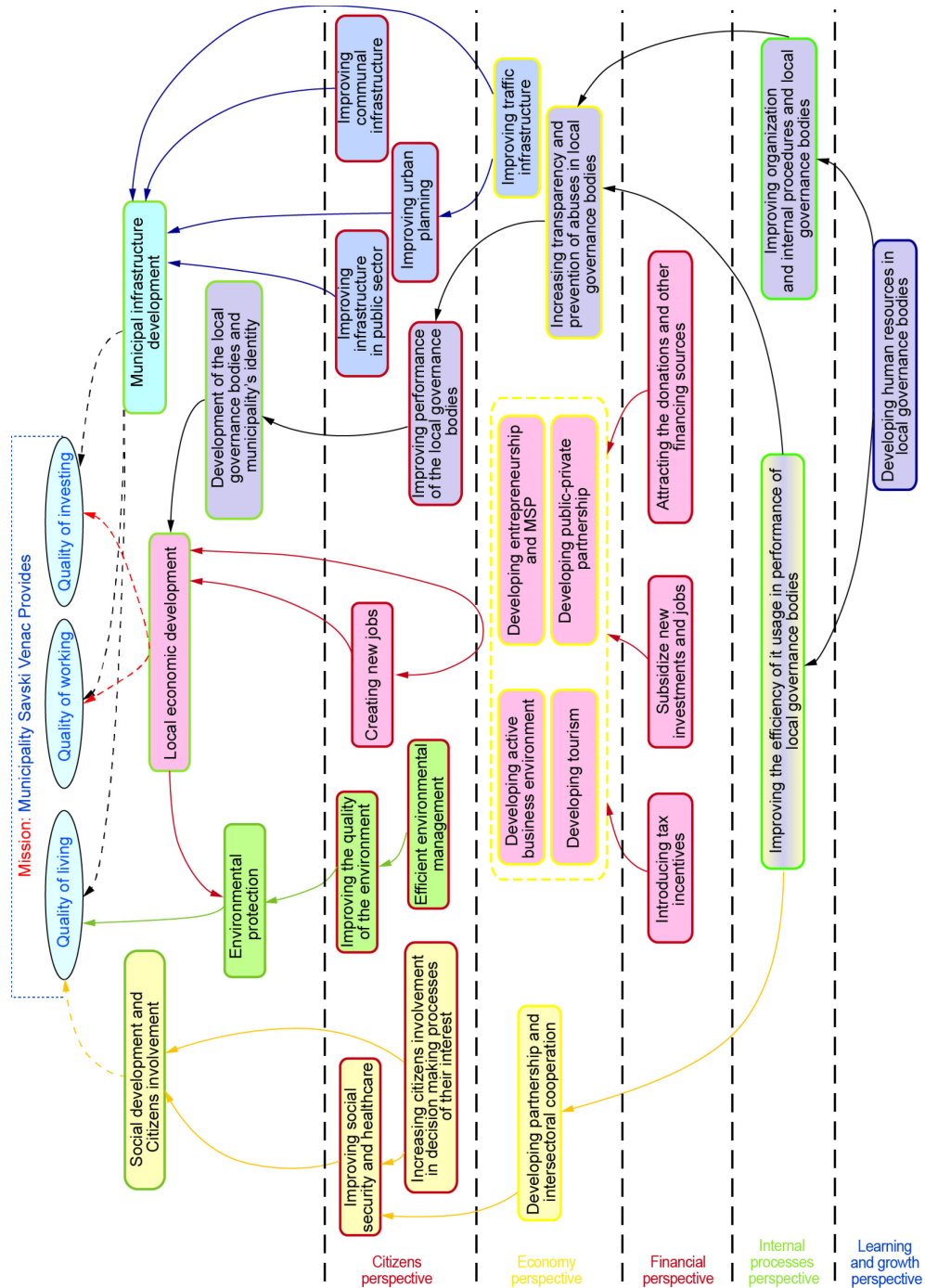


Figure 2. Modified Strategy map of the Municipality of Savski Venac

objectives were redefined and sometimes merged in order to provide descriptive overview, suitable for integration with the energy efficiency objectives. The selected individual objec-

tives classified in BSC perspectives where they belong, as well as its cause-and-effect relationships, are shown in fig. 2. The cause-and-effect relationships in this paper were also added to the strategy map developed by the municipality. The objectives in different perspectives, which contribute to the specific strategic objective, are presented by the same colour for better visualization.

It could be observed that the energy efficiency does not exist as a separate objective in this strategy map. Also, the organizational unit in charge for energy efficiency or even energy policy does not exist in the Municipality of Savski Venac and there is no institutional framework for the energy efficiency improvements. This revealed lack of the appropriate energy efficiency measures and its transparency, which is the reason why this paper proposed possible way to incorporate energy efficiency into the Municipality of Savski Venac objectives. This will enable municipality to achieve multiple benefits from increasing the overall energy efficiency by identifying and applying proper key performance indicators, targets and measures to improve its energy efficiency.

The first step was to add the objective to increase the overall energy efficiency into the upper part of the strategy map which represents strategic objectives, as it was presented previously in fig. 1. This paper deals only with the energy efficiency objectives and measures in households, public and commercial sector. We considered the energy efficiency increasing in different sectors as separate objectives. The increase of the energy efficiency in households belonged to the citizens perspective, while the increase of the energy efficiency in commercial and public sectors belonged to the economy perspective. Figure 3 represents modified municipality strategy map containing additional objectives related to the increasing of the energy efficiency in households, public and commercial sector, classified in proper BSC perspectives.

As it can be observed, two already existing objectives related to the financial perspective can contribute to the energy efficiency: subsidizing new investments and jobs and attracting donations and other financing sources. We also added a new objective which in related to the introduction of new credit lines, aimed to facilitate financing of the energy efficiency measures. Measures in financial perspective imply that municipality should take an active role in providing proper financing of the energy efficiency measures such as improving the building thermal envelope in households and public buildings. Municipality can even conclude different kind of agreements with the commercial banks to provide its citizens better loan conditions for the energy efficiency increasing.

Municipality can introduce different programs to promote energy efficiency in their jurisdiction and to enhance citizens' interest to invest their money into the energy efficiency. Implementation of various pilot projects, which can show good practices in energy efficiency improvements in public buildings, could be an effective way to encourage energy efficiency measures. The municipality should work to increase the visibility of its energy efficiency programs and to effectively plan new energy efficiency programs and its financing schemes.

Finally, citizens need to be aware and educated about the benefits of energy efficiency, whether they want to develop their own business or to take a loan to finance replacement of the windows on their building. With respect to the learning and growth perspective, the municipality should establish the innovative and interactive training program that can contribute to the development of energy efficiency services and understanding the market needs. In terms of rising awareness, Municipality should also establish a number of public education programs aimed to provide ideas and directions for energy efficiency improvements.

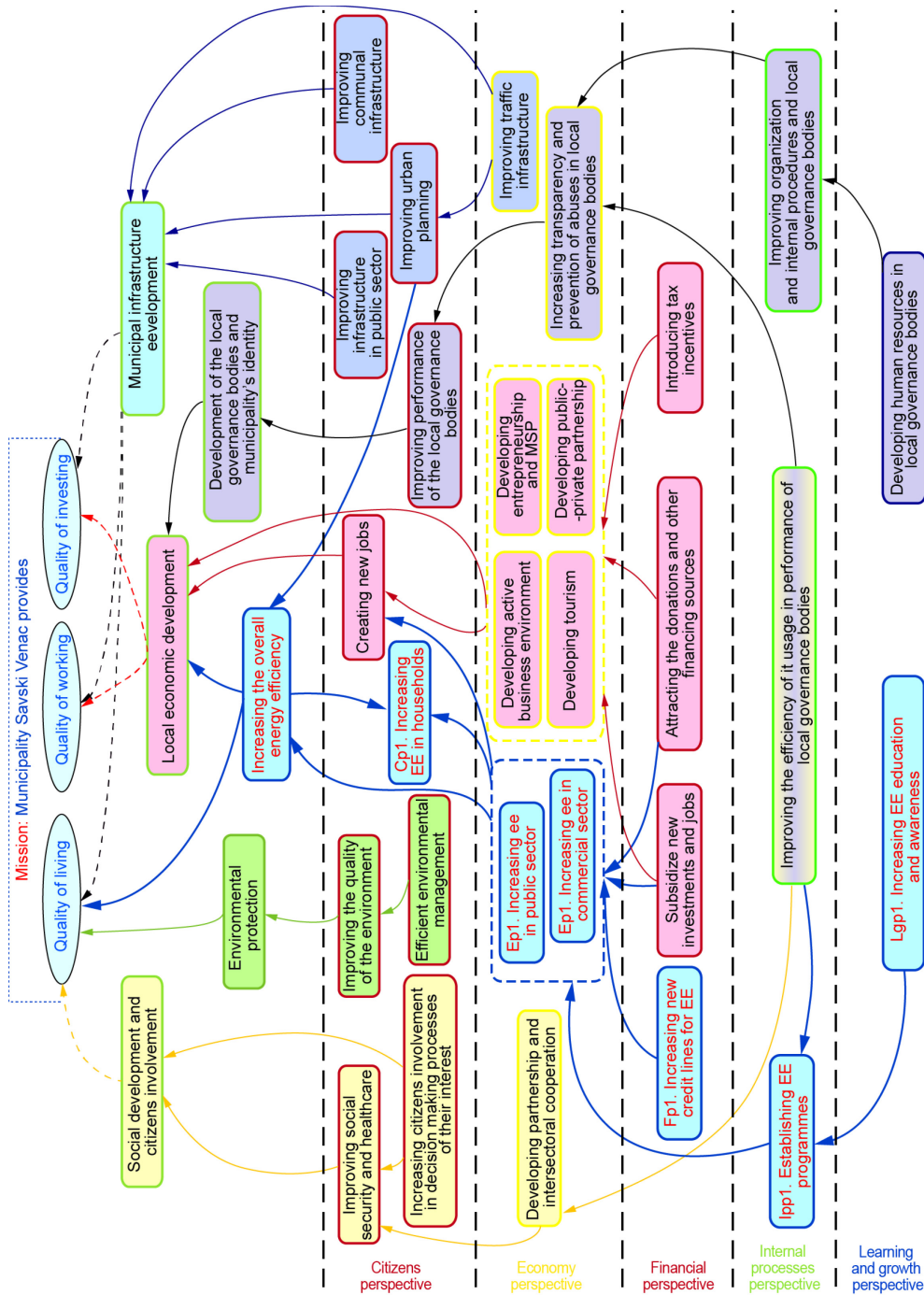


Figure 3. Integration of energy efficiency objectives into the Municipality of Savski Venac Strategy map

Application of multi-criteria decision making for BSC development

After objectives' identification and structuring in the strategy map, the performance measures with appropriate initiatives should be listed in BSC, in order to determine whether the organization is moving toward the successful implementation of its strategy. This is actually the step when the strategy is translated into measures and initiatives, giving the opportunity to the employees at all organizational levels to define their contribution to the organizational success. The measures selection process must be consistent with organizational values and guiding principles of employees' operation [22]. Dozens of potential measures can be result of different meetings and focused discussions within the organization therefore the appropriate selection mechanism should be applied to accurately capture the essence of the municipality strategy. Also, the number of performance measures should be limited, and they should be selected in accordance to their significance.

Keeping in mind these constraints and due to the problem complexity, multi-criteria decision making seems to be reasonable solution for facing various objectives and performance measures, with different significance criteria and applicability. This paper investigates the application of AHP as a multi-criteria decision making method for the performance measures rating in BSC, according to the criteria supplied. The performance measures are rated only with the respect to the energy efficiency objectives, with the notation that this process can be extended to all objectives that contribute to the municipality's mission. The increasing the overall energy efficiency was identified as a main goal related to the energy efficiency.

The performance measures used for the evaluation are proposed by the municipality, to keep consistency with the municipality intentions and planned activities, and to show how the existing energy efficiency measures relate to the newly introduced energy efficiency objectives in the strategy map. However, these performance measures were structured to be appropriate for AHP. For this research, as shown in tab. 1, six criteria were selected together with nine performance measures, whose relative importance was examined.

Table 1. List of BSC objectives, measures and initiatives related to the energy efficiency

Perspective	Objectives/criteria	Performance measures	Initiatives
1. Citizens perspective 2. Economy perspective 3. Learning and growth perspective	1. Increasing the energy efficiency in households 2. Increasing the energy efficiency in public sector 3. Increasing energy efficiency education and awareness	The energy efficiency office established	<ul style="list-style-type: none"> – Starting the administrative procedure to establish the Energy Efficiency Office – Cooperation with the Faculty of Mechanical Engineering related to the office establishment – Provision of the funds from the municipality budget
1. Citizens perspective 2. Economy perspective 3. Economy perspective	1. Increasing the energy efficiency in households 2. Increasing the energy efficiency in public sector 3. Increasing the energy efficiency in commercial sector	The energy efficiency strategy prepared	<ul style="list-style-type: none"> – Cooperation with the Faculty of Mechanical Engineering and other relevant institutions related to the strategy preparation – Provision of the funds from municipality budget – Formation of the teams that will participate the strategy preparation



Table 1. Continuation

Perspective	Objectives/criteria	Performance measures	Initiatives
Internal processes perspective	Establishing energy efficiency programs	Municipality capacity for the management of energy efficiency projects built	<ul style="list-style-type: none"> – Strengthening the capacity of the local self-government for energy efficiency projects preparation and implementation in accordance with EU standards through continuous employees education
Economy perspective	Increasing the energy efficiency in commercial sector	The availability of information and networking of the entrepreneurs and small and medium enterprises related to the energy efficiency improved	<ul style="list-style-type: none"> – Gathering the useful information for the entrepreneurs and small and medium enterprises. Information are related to the business in the field of energy efficiency such as availability of locations suitable for investing in energy efficiency increasing, availability of various additional sources of financing for energy efficiency improvement, <i>etc.</i>
Learning and growth perspective	Increasing the energy efficiency in commercial sector	The continuous cooperation between Municipality and the scientific and expert community in the energy efficiency field established	<ul style="list-style-type: none"> – Promoting the cooperation between municipality and scientific and expert community via joint professional and expert forums and brainstorming meetings – Developing of the common projects in the energy efficiency field
Financial perspective	Launching the different financing schemes in order to improve energy efficiency (credit lines, grants, subsidies, <i>etc.</i>)*	The number and amount of grants aimed to support the energy efficiency measures	<ul style="list-style-type: none"> – Providing the grants from various sources for the feasibility studies preparation that can contribute to the energy efficiency improvement – Providing the grants from various sources for pilot projects financing in order to prove the effects of energy efficiency measures – Using the energy efficient public lightening in the green surfaces
Financial perspective	Launching the different financing schemes in order to improve energy efficiency (credit lines, grants, subsidies, <i>etc.</i>)*	The number of new energy efficiency projects supported by subsidies	<ul style="list-style-type: none"> – Establishing of green funds for subsidizing the energy efficiency programs in households – Initiating the new employments and other kinds of support for the energy efficiency improvements at different local self-government levels
Learning and growth perspective	Increasing energy efficiency education and awareness	Efficient application of IT in the Municipality activities aimed to increase energy efficiency	<ul style="list-style-type: none"> – Analysing the possibilities and action plans for integrating the energy efficiency services IT platforms based (creation of energy efficiency databases, online application for the energy efficiency grants and subsidies, <i>etc.</i>)
Learning and growth perspective	Increasing energy efficiency education and awareness	The conscience of the significance of energy efficiency increasing raised	<ul style="list-style-type: none"> – Initiating the raising awareness campaigns on the energy efficiency for the citizens – Organizing the public debates of the issues related to the significance of energy efficiency

* This objective represents the combination of three objectives from the financial perspective, in order to simplify the considerations

To incorporate judgments about the various segments in this hierarchy, the segments were compared two by two to examine how important each objective (criteria) is to the municipality, with respect to increasing the overall energy efficiency, as major goal contributing to the municipality's mission. The comparison in this paper was done in accordance with authors' experience and knowledge about the City of Belgrade and its municipality strategic documents, as well as the governmental energy efficiency policies, strategies and action plans. The scale adopted for this comparison was from 1 to 100%.

First, the judgements about all the comparison criteria were made, keeping their relationships shown at the fig. 3, as a basis for the conclusions. The criteria weights were calculated, resulting in relative impact of each of the individual criteria to the overall goal, and presented in fig. 4. Inconsistency rate is 0.01 which is acceptable.

It could be observed that launching various financing schemes in order to improve energy efficiency have the highest impact to the overall increase of the energy efficiency, while the increase of energy efficiency in households is second by its importance, followed by the establishment of energy efficiency programs. The criterion of the lowest importance for the energy efficiency increasing is energy efficiency increasing in the commercial sector.

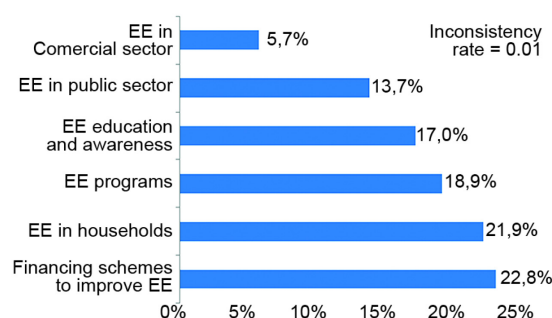


Figure 4. The contribution of the energy efficiency (EE) criteria to the overall goal

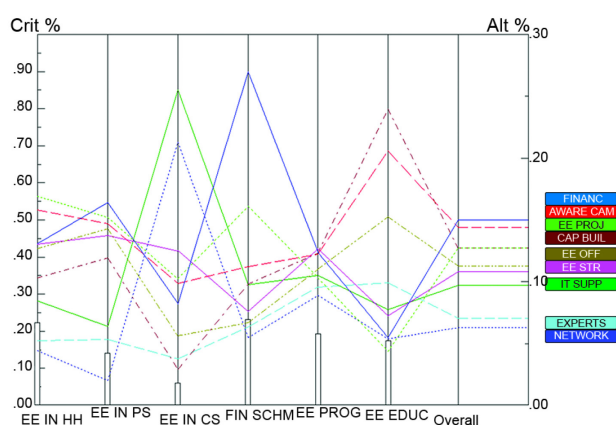
The next step is to determine the performance measures that contribute up to the certain extend to the particular strategic objectives, *i. e.* to prioritize the performance measures with the respect to the previously structured objectives/criteria. The pair-wise assessment of the relative contributions of each performance measure to these criteria was done in accordance with the information available from the municipality energy policy and its priorities. After the calculation in the AHP score matrix the results are presented in tab. 2 showing the relative significance of nine performance measures, with respect to each energy efficiency objective (criteria) from the Strategy map, using the short notations of the criteria shown in fig. 3.

The inconsistency ratio range from 0.004 to 0.08 that is lower than the recommended 0.1 meaning that the adequate consistency in pair-wise comparison was achieved. Previously, it was shown that launching the different financing schemes in order to improve energy efficiency was objective with the highest contribution to the main goal to increase the overall energy efficiency. This objective was, among others, used also as criteria for performance measures selection. Further on, in the tab. 2 it could be observed that for the criteria *Increasing new credit lines for energy efficiency* (FP1), the performance measure of highest significance was *The number and amount of grants aimed to support the energy efficiency measures*, with the share of 27%, followed by the performance measure *The conscience of the significance of energy efficiency increasing raised* with the share of 11.2%. The lowest significance share with the respect to this objective was the measure named *The availability of information and networking of the entrepreneurs and small and medium enterprises related to the energy efficiency improved*, which was not relevant for the energy efficiency increasing in households, with the significance share of 5.5%. The similar approach can be used to analyse all other significance shares with respect to each energy efficiency objective.

Table 2. The relative percentage significance of nine performance measures with respect to the six energy efficiency objectives

Performance measures	CP1	EP1	EP2	FP1	IPP1	LGP1
	[%]					
The energy efficiency office established	12.7	14.3	5.6	6.7	11.0	15.2
The energy efficiency strategy prepared	13.1	13.7	12.5	7.6	12.7	7.2
Municipality capacity for the management of energy efficiency projects built	10.3	11.9	2.9	9.8	12.3	24.0
The availability of information and networking of the entrepreneurs and small and medium enterprises related to the energy efficiency improved	4.4	2.0	21.3	5.5	8.9	5.4
The continuous cooperation between municipality and the scientific and expert community in the energy efficiency field established	5.3	5.3	3.8	6.3	9.6	9.9
The number and amount of grants aimed to support the energy efficiency measures	13.1	16.4	8.2	27.0	12.4	5.5
The number of new energy efficiency projects supported by subsidies	16.9	15.2	10.2	16.1	10.3	4.4
Efficient application of IT in the municipality activities aimed to increase energy efficiency	8.4	6.4	25.5	9.7	10.5	7.7
The conscience of the significance of energy efficiency increasing raised	15.8	14.7	9.9	11.2	12.2	20.6

After AHP calculations, the sensitivity analysis provided useful tool to assess the effects of the changes in the criteria significance to the performance measures. These changes can be monitored through the sensitivity analysis interactive graphical representation, fig. 5, which allows changing the performance measures significance share by changing the relative importance of the individual objectives with respect to the main goal. The abscissas indicate the criteria used to determine the importance of the proposed performance measures, while those performance measures were shown at ordinate.

**Figure 5. The sensitivity analysis – interactive diagram**
(for color image see journal web site)

measure *The number of new energy efficiency projects supported by subsidies* will lose its significance and its relative share will be lower than 16.9%. This example illustrates how the

This is the moment when the BSC is ready to be applied by municipality authorities, proving them the possibilities to explore different perspectives and direction of their energy policies, *i. e.* to monitor the changes in the performance measures priorities with respect to the main goal and individual objectives mutual impact. For example, if the increase of the energy efficiency in households is not anymore priority of the local authorities, and its share to the overall municipal goal to increase the energy efficiency is not 21.9% but lower, the performance

interactive diagram from fig. 5 provides easy and responsive tool to monitor how changes in the importance of the criteria set by the municipality lead to the different performance measures prioritizing.

Conclusions

The usage of BSC can reveal the relationships that exist among the energy efficiency performance measures to be applied, their expenses and municipality development objectives (energy policy objectives of the local communities). It provides a framework for integrating non-financial measures into the municipality operations and activities, streaming toward the fulfilment of its energy policy objectives.

It is important to say that developed strategy map and BSC should be subject of discussion and consideration of local authorities' representatives and that without their involvement it is not possible to develop the final version of these documents. This paper contains a proposal how local government should approach the energy efficiency issues and integrate the objectives related to the energy efficiency into its strategy. During the integration of energy efficiency into municipality strategy, attention should be focused on its alignment with the energy policy and other objectives. Monitoring of the implementation of individual energy efficiency objectives and measures can be also useful from the aspect of state authorities that supervise and report the implementation of energy efficiency measures.

The proposed strategy map can be upgraded adding the objectives that are related to the energy efficiency in production sector, as well as transportation. The approach presented in this paper can be easily generalized and applied by any other municipality in our country. It provides guidelines that should be adjusted to each specific case.

The BSC was proposed in this paper, while the set of performance measures and related initiatives was modified and adjusted to the strategy map proposed in this paper with integrated energy efficiency objectives, in accordance with the information available from the municipality energy policy and its priorities. Only the measures identified by the Municipality of Savski Venac in their overall BSC were used. It is evident that these measures should be amended in order to better include the benefits from the existing energy sector development strategy in the City of Belgrade, as well as other strategic documents and recommendation at the national level. The attempt of this paper was only to clearly present the approach of BSC methodology and involvement of energy efficiency as a separate objective(s), due to its strategic importance and the benefits of BSC methodology application.

Acknowledgment

This paper was done in the scope of the projects: TR33027 *The development of the energy efficient solid biomass gasification and cogeneration plant*, funded by the Ministry of Education, Science and Technological Development, Republic of Serbia and project TR44006 *Development of new information and communication technologies, based on advanced mathematical methods, with applications in medicine, telecommunications, power systems, protection of national heritage and education*.

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