

## Energy efficiency financing strategies and obstacles for residential public buildings in the Balkan region

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### ABSTRACT

The energy efficiency represents an international and multi-faceted phenomenon. It is especially important in the countries belonging to the Balkan's region of the Southeastern Europe (SE). The research problem addressed in this paper focuses on the improvements in the inherent energy inefficiency by the means of quality financing of investment arrangements. This paper utilizes detailed literature review of multi-faceted sources, journal articles, private and government publications. Furthermore, the obstacles to attracting viable sources of private financing shall also be researched and addressed. Semi-developed and still developing Balkan countries have been experiencing severe lack of diversified financial instruments. The financial risks, energy poverty and low incomes, lack of appropriate understanding of the market and the absence of the appropriate regulatory framework have been identified as the major obstacles to attracting viable private financing. There are several issues impacting the attraction of private financing arrangements. These barriers could be summed up as the lack of appropriate regulatory framework, deficiencies in the proper market understanding, inherent presence of energy poverty and low incomes, multitude of financial risks, lack of skilled human resources, the presence of the so-called split incentives and fragmentation issues in common decision-making process. The so-called multiple benefits approach (MBA) to energy efficiency investments tend to widen the energy efficiency perspectives beyond the traditional measures of reducing energy demand and lowering greenhouse gas emissions. This approach looks into multiple spheres by assessing multitude of different benefits to stakeholders. In conclusion, the big disparity in size and variety of financial supporting instruments between the EU members and non-member states must be addressed and reduced.

**Keywords:** Environment, Energy efficiency, Financing, Financial mechanisms, Financing support instruments, Multiple-benefits-approach (MBA), Balkans, EU member states, Non-EU member states

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### 1. Introduction

Energy efficiency implies the rational utilization of various kinds of energy including the multitude of activities aimed at enabling the optimal production and the management of the efficient consumption. It is important to note that the energy efficiency represents an international and multifaceted phenomenon. There are numerous examples of entry strategies in financing environmentally friendly projects. The importance or the energy efficiency can be exemplified in multitude of ways. Job creation and retention, homeowners' savings, business, and industrial savings, environmental and public health benefits are just some of the examples. Energy efficiency opens significant opportunities in the public and private sector in the form of reduced bills to pay and addressing of the new infrastructure issues in the long term. Common denominators for all of them is that they create financial goals, sources, and guidelines for the global investments in the future. All of this is being undertaken in order to gain the levels of sustainable development. By closely following the international issues, such as depletion of non-renewable energy sources, abnormal changes in energy prices, excessive environmental pollution and global warning can significantly contribute to the building blocks of the looming economic crisis. Western Balkan's (WB's) countries including Bosnia and Herzegovina can still be classified

as semi-developed and even developing countries in some socio-economic areas, which need financing and provisional arrangements in order to improve their energy efficiency. One solution approach to the above listed issues could be more robust application of the cost-benefit analysis (CB). Unfortunately, the private and commercial investors tend to be wary of these projects having the presumption of high uncertainty, regulatory and legal obstacles, and ultimately high risk. One way of improving this precarious situation would be the introduction of public-private partnership mechanisms. These mechanisms would inherently include government subsidies, which would cover the portion of the inevitable project developmental costs. There is a big potential that this kind of partnership would be beneficial for the government, the private or commercial investors and the consumers' population [8].

The application of these partnerships has crystallized for unique aspect and associated advantages in the financing of environmentally friendly energy efficiency projects:

- 1.) Decreased risks to the environment on the part of newly formed businesses;
- 2.) Improved positioning of newly created companies in the areas of innovation and market development and
- 3.) Newly formed recognition of the new enterprise both as an investor and as the partner.

The member countries of the European Union (EU) display the multitude of utilized fiscal sources in order to invest in the improvement of quality environmental protection. One of the major types of financial assistance are being exemplified in the reduction of taxes, fees, and duties. Additionally, there is the aspect of strong involvement from the funds acquired from the privatization processes.

This research has identified nine major types of financial institutions and their associated financial arrangements, which have shown to have had particular importance in the financing of the environmentally friendly projects in the Western Balkans:

- 1.) The European Bank for Reconstruction and Development (EBRD);
- 2.) The Financial Instrument for the Environment (LIFE+);
- 3.) Green for Growth Fund for South-eastern Europe (GGF);
- 4.) The United Nations Development Program (UNDP);
- 5.) The Carbon Fund Europe (CFE);
- 6.) The Instrument for Pre-EU-Accession Assistance Aid Program (IPA Fund);
- 7.) The Social Development European Bank (CEB Bank);
- 8.) The European Investment Bank (The EU Bank); and
- 9.) The International Bank for Reconstruction and Development (IBRD).

The above listed financial and aid institutions provide the variety of, both, financial, investment and aid arrangements. For example, one of the underlying features determining European IPA funds is being represented in the provision of grants, which are by nature defined as the financial stimulants, which do not require the repayments in the future. The grants can be explained in the forms of varying types of assets augmenting the resources, which are being previously allocated to enhance reforms from the budget on the part of developing countries. Another important feature is that these assets could be utilized for various forms, of, both environmentally friendly and environment enhancing investment projects [2], [3].

Another avenue worth considering could be the establishment of the energy efficiency revolving fund (EERF). This innovative type of fund shall be tailored to serve the needs of the public agencies. The ways in which EERF could assist the public agencies with creditworthiness issues could be exemplified through the following financial and legislative arrangements: debt financing, energy services financing, grants provision, budget capturing, etc. As Figure 1, below, displays the funding sources relating to EERF and its interaction with funding sources, public agencies, energy efficiency projects and energy service providers.

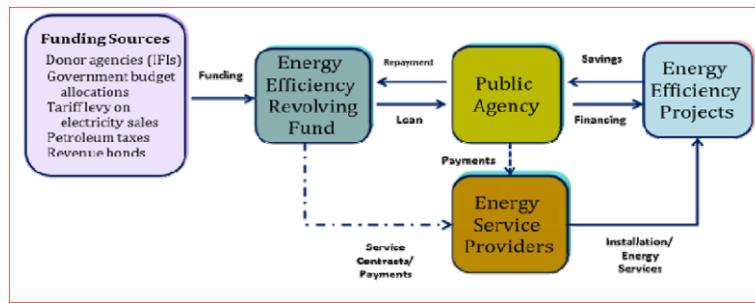


Figure 1. Typical structure of the EERF (Source: Kalkum, May 2014).

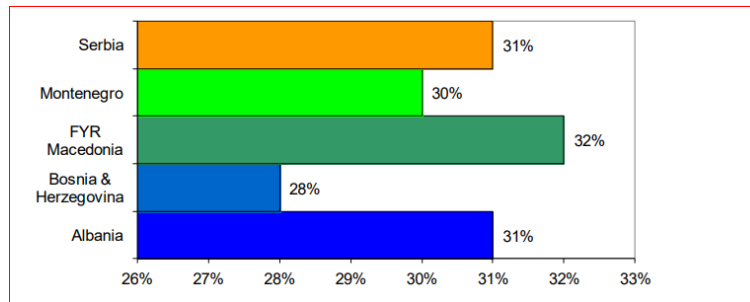


Figure 2. The energy consumption in Western Balkan’s (WB’s) region Residential Sector [9]

As Figure 2, above shows, the energy consumption in WB’s residential sector was the largest in North Macedonia with 32 percent and the lowest in Bosnia and Herzegovina (BiH) with 28 percent.

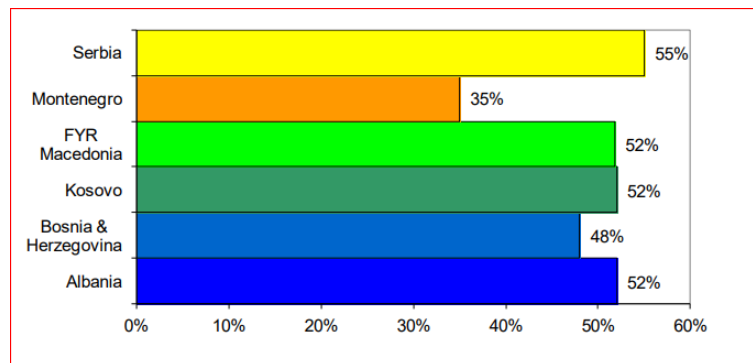


Figure 3. The share of electrical energy consumption in Western Balkan’s region [9]

Per Figure 3, displayed, above, the largest share of electrical consumption energy in WB’s region was in Serbia with 55 percent and the lowest in BiH with 48 percent.

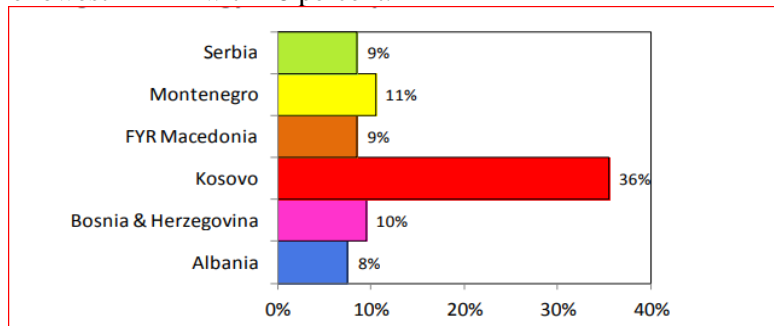


Figure 4. The share of energy subsidies as percentage of the Gross Domestic Product (GDP) for the Western Balkan’s region [9]

As depicted in the Figure 4, above, the largest share of energy subsidies as the percentage of GDP in the WB’s region was by far in Kosovo with 36 percent, the lowest in Albania with 8 percent, while BiH averaged 10 percent.

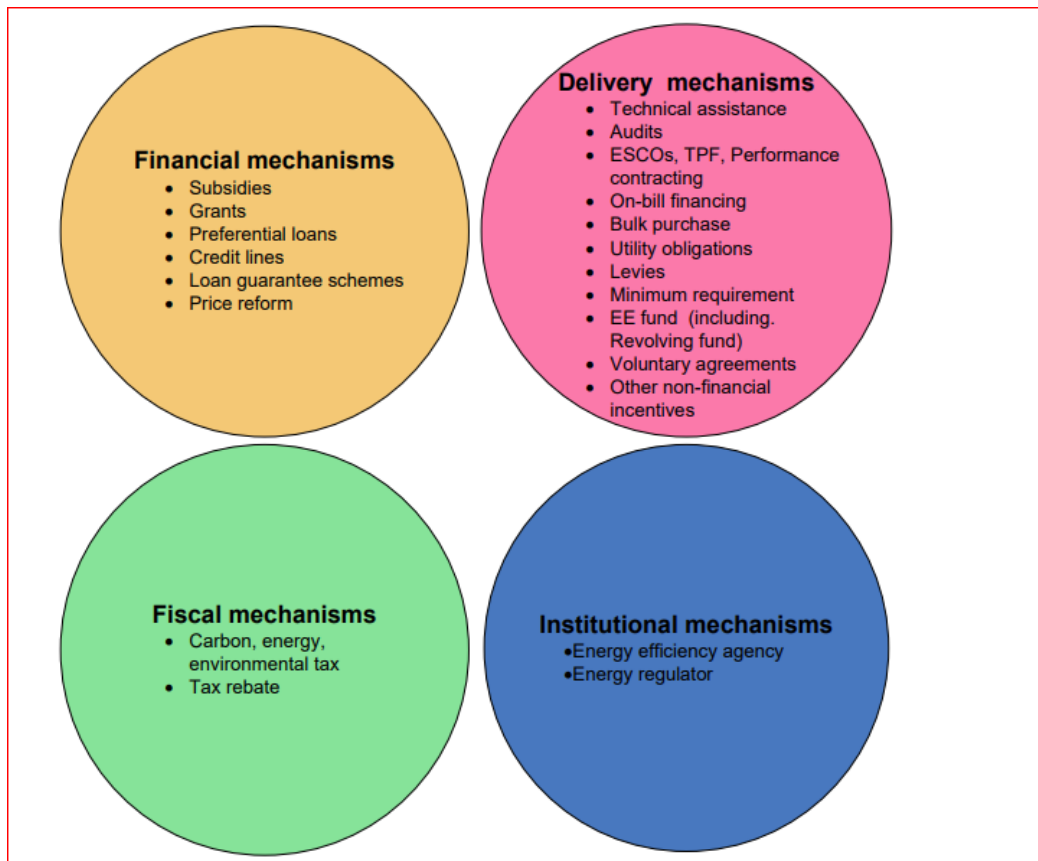


Figure 5. The types of Energy Efficiency Improving Mechanisms [9]

Figure 5, above, depicts four (4x) major types of energy efficiency improving mechanisms, with financial and fiscal ones being the most pertinent to the subject matter of this article.

Strategically planned investments in the energy efficiency have shown to be one of the most cost-effective ways in aiding the transition to the economy with environmentally friendly, low-carbon emitting economy. In this context it is important to note that the European Union places energy efficiency to be the composing element of its Energy Union Framework Strategy (EUFS). This strategy is supposed to bring multitude of important benefits to the EU citizens, some of which could be exemplified in the forms of job growth, decreased energy costs, supply security improvement of public health, and sustainable future growth [1], [4]. The European commission's EUFS states that the public or government funding will not be sufficient to realize its strategically planned goals, but that the private financing sources will have to be tapped. To achieve this, the EU's energy policy ought to create better investing conditions by encouraging demand for energy efficiency. The utilization of innovative and flexible financing instruments in the public building sector would be one way worth considering [1], [5], [10], [11].

It is important to note the number of severe challenges affecting the attraction of private financing in the Balkan's regions of southeastern Europe. The poorer financial capacity of households in discussed region augments the problem. Wide range and severity of barriers have proven to detrimentally affect the energy efficiency building and improving capacity. The inadequacy and poor application of the regulatory legal framework is the first example. It is being followed by the inability to understand the market and to conduct a focused and quality analysis of the market gap, in addition to being plagued by the chronic energy poverty. Furthermore, it is important to highlight that the financial investment risks tend to be connected with the return on investment (ROI) levels associated with the particular energy efficiency improvement project. In continuation, deficiency of skilled human assets could be improved through the implementation of the good practices recommended by the European Commission (EC). Finally, the inherent issues relating to the so-called split incentives and joint decision making between owners or landlords and renters/tenants must also be researched, improved, and addressed, further [6], [7], [14], [15].

## 2. Material and methods

This research paper utilizes detailed review of multi-faceted resources ((peer-reviewed journal articles, government, European Union (EU), European Commission (EC), International Energy Agency (IAE) and private publications)) in order to discern the answers to the research problem, research aims and objectives.

## 3. Discussion and Results

The introduction of more cost-effective ways in order to improve financing arrangements are paramount. In addition, the introduction of new and improved partnership approaches are also recommended. A big potential has been identified in improvements in the residential public sector/stock. This may include the aggregate environmental enhancements and the fight against energy poverty. The sum of these actions tend to significantly improve public health care outcomes and reduce exorbitant health care costs. Even in the EU members belonging to the Balkan's region, such as the Republic of Bulgaria, there are deficiencies in the level of financial support addressing energy efficiency improving endeavors in the residential public buildings. The overall consensus is that the creation of the long-term strategic vision is very important. Furthermore, the sharing of common experiences between European regions is also strongly recommended [1].

In this context it is important to note the far-reaching financial support initiatives of the European Union in order to support and strengthen the transition from the old, environmentally polluting sources of energy creation to the new environmentally friendlier sources. The amount of aggregate investment is being estimated to be 177 million euros, annually, from 2015 till 2030. The European Commission (EC) is expected to play the crucial role in this investment. In that light, the creation of financial instruments to include the public or governmental sector is being researched. One of its initiatives called smart finance for smart buildings is aimed to bridge the critical obstacles in energy efficiency investment in the public buildings [12]. The energy efficiency should not be in opposition and an obstacle to the economic development and in that sense the quality investments and financing arrangements are of the critical importance [1], [16].

## 4. Conclusion

The research for new ways in finding and creating the financial instruments is of paramount importance in the Balkan's region. Small- and large-scale energy efficiency improvements and renovation projects are critically dependent on the financing stemming from the various private sources. The addressing of challenges staying in the way of attracting private financing in the improvement of energy efficiency must take into account the improvement of the legal and regulatory framework, investment in the better understanding of the market, the reduction of energy poverty, and an increase in incomes. Furthermore, the reduction of financial risks related to long time investment spans in lieu to return on investment (ROI) and insufficient knowledge on energy efficiency in public buildings must also be addressed. Investments by the means of the economic recovery programs can tap into the vast potential of energy efficiency to support the existing jobs, create new jobs and augment the economic activity in the critical labor-intensive economic sectors. The issues of insufficiently developed and small market size related to the high energy efficient technologies, in addition to the development of high-quality and focused educational system to address still present lack of skilled workforce connected to the issues of competing interests, also called split incentives, must be addressed to ensure win-win decision making between the residential public buildings' owners and tenants.

## References

- [1] The European Commission, "Financing Energy Efficiency in Central and South-Eastern Europe," *Executive Agency for Small and Medium-sized Enterprises (EASME)*, 28 June 2018, pp. 3-6, 2018.
- [2] M. Počuča, R. Tepavac, J. Cvijić and A. Mitrović, "Potential Sources for Financing Environment Protection Projects: Focusing on Energy Efficiency," *Management*, vol. 2016, no. 75, pp. 57–63, 2016.
- [3] J. N. Ferrer, "Leveraging funding for energy efficiency in buildings in South Eastern Europe. in *CEPS Policy Insights – Thinking Ahead for Europe*, no. 2019-05/28, March 2019.
- [4] E. Acuner and S. Onaygil, "Comparative analysis on building energy efficiency for the Balkan world: is it really developing", *Energy use in buildings, projects, technologies, ECEEE Summers Study Proceedings 2015*, 1083-1092.

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- [5] OECD/IEA, “Capturing the Multiple Benefits of Energy Efficiency: Executive Summary. pp. 18-25, 2014.
- [6] B. Kalkum, “Scaling Up Energy Efficiency in Buildings in Western Balkans”: Financing Energy Efficiency Measures for Residential Building Stock”, Guidance Note 89324, World Bank Group, pp. 4-28, May 2014.
- [7] D. Limaye, J. Singh and K. Hofer, “Scaling Up Energy Efficiency in Buildings in Western Balkans”: Establishing and Operationalizing an Energy Efficiency Revolving Fund”, Guidance Note 89319, World Bank Group, pp. 4-34, May 2014.
- [8] M.M. Mihić, D.Č., Petrović, A.M., Vučković, V. Lj., Obradović and D.M. Djurović, “Application and Importance of Cost-Benefit Analysis to Energy Efficiency Projects in Public Buildings”: The Case of Serbia”, THERMAL SCIENCE, vol. 16, no. 3, pp. 915-929, 2012.
- [9] M. Mihić, A. Vučković, M. Vučković. “Benefits Management in Energy Efficiency Projects in Serbian Public Buildings”, Management Journal for Theory and Practice Management, vol. 62, pp. 65-74, 2012.
- [10] International Energy Agency (IEA), “Energy Efficiency and economic stimulus”. IAE strategic considerations for policy makers. pp. 1-7, 8 April, 2020.
- [11] K. Hogan, “Energy Efficiency and Economic Development. *Energy Efficiency & Renewable Energy*. pp. 1-10, 2020.
- [12] K. Ganda and C.C. Ngwakwe, “Role of energy efficiency on sustainable development. *Environmental Economics*., vol. 5., no. 1 pp. 86-98, 2014.
- [13] J. Spencer, “The Growing Link Between Energy Efficiency and Economic Development”. 1 pp. 1-2, September 4, 2015.
- [14] Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, “Fourth Annual Report under the Energy Efficiency Directive”, pp.1-28., August, 2020.
- [15] M. Alam, P. X. W, Zou, J. Sanjayan, R. Stewart, O. Sahin, E. Bertone and J. Wilson, “Guidelines for Building Energy Efficiency Retrofitting”. Sustainability in Public Works Conference, pp.1-10., 24-26 August, 2016.
- [16] B. Duraković, B. Yıldız and G. Yahia, “Comparative performance evaluation of conventional and renewable thermal insulation materials used in building envelopes,” *Tehnički Vjesnik – Technical Gazette*, vol. 27, no. 1, pp. 283–289, Feb. 2020.