

Potential avenues of linking the energy efficiency and the sustainable economic development in the Balkan region

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2021.

Published by ARDA.

Abstract

The energy efficiency represents a global and multi-faceted issue. It is especially important in the former socialist countries belonging to the Balkan's region being geographically located in the Southeastern Europe (SE). The research problem addressed in this paper focuses on the unexplored potential links between the energy efficiency and the economic development. Energy efficiency is deemed to be highly job intensive phenomenon. It delivers multiple long-range benefits by the means of increasing competitiveness, energy affordability, and decreasing energy bills. Furthermore, it seeks to tackle the important issues of reduced reliance on energy importing, reduction in harmful greenhouse gas emissions and freeing up of funds to be critically invested in other economic areas. Energy efficiency, efficient and effective policies have been found to be directly linked to job creation and deliverance of the economic stimulus. These types of jobs are related to the activities with the paramount aim in reduction of the energy consumption. Investments in energy efficiency in the buildings and construction sector have been found to have brought about the greatest macroeconomic impact. This impact is due to the increasing need for the construction of new buildings and renovation of existing ones, in addition to its considerable potential in activation of the above listed industries' value chains. The introduction of energy management system (EMS) being exemplified through the set of processes which utilize data to maintain and enhance energy efficiency and operational efficiency could be one of the important avenues to pursue. On the other hand, the EMS reduces the energy intensity and detrimental environmental polluting impact.

Keywords: Energy efficiency, Sustainable economic development, Energy management system (EMS), Balkan region

1.1. Introduction

The energy efficiency represents one of the critical resources for the social and the economic development. This is especially true for the former socialist countries belonging to the Balkan's region of the south-eastern Europe. The energy efficiency captures the primary place as a major energy resource in the context of national and international activities to achieve sustainability metrics. As such, it represents a paradigm shift representing, both, the supply and demand side in achievement of the economic growth. Governments and related institutions are facing an increased pressure in order to enhance their energy consumption, which has been largely regarded as a fundamental component in the sustainable economic development. Energy efficiency has been singled out as the most cost-effective method addressing the challenges of achieving the

sustainable economic growth. These actions are being supported by the means of enhancement of the energy security, competitiveness and the environmental sustainability. Four strategic considerations have been crystallized to aid policymakers in bringing about the most efficient and most effective economic stimulus. First of all, the energy efficiency endeavors can be linked to supporting of the economic stimulus programs through support of existing labor force and creation of the new jobs. Second aspect involves government facilitation of better economic results by utilization of large-scale investment programs. Third aspect involves the importance of the market considerations focusing on high energy efficiency and setting of incentives. Finally, the fourth aspect addresses the need for government to deliver the economic stimulus packages by utilizing scale and speed. This includes the standardization of designs, eligibility criteria in contract, innovation in retrofitting and technology upgrades all the way to the philosophy, as to how the energy efficiency can be included into all-encompassing government stimulus packages. The policy makers in developed economies have grasped the sense for cities (urban areas) to focus significant part of its economic development efforts on energy management in the public residential buildings. By doing so, they tend to attract and keep valued businesses with their jobs and tax revenues. The linkage between the energy efficiency and energy management efforts, in order to enhance the economic development has shown the growth strategy with two elements. First element is being exemplified through the so-called carrot of energy competition, while the second element focuses on benchmarking and disclosure requirements [1], [2], [3], [4].

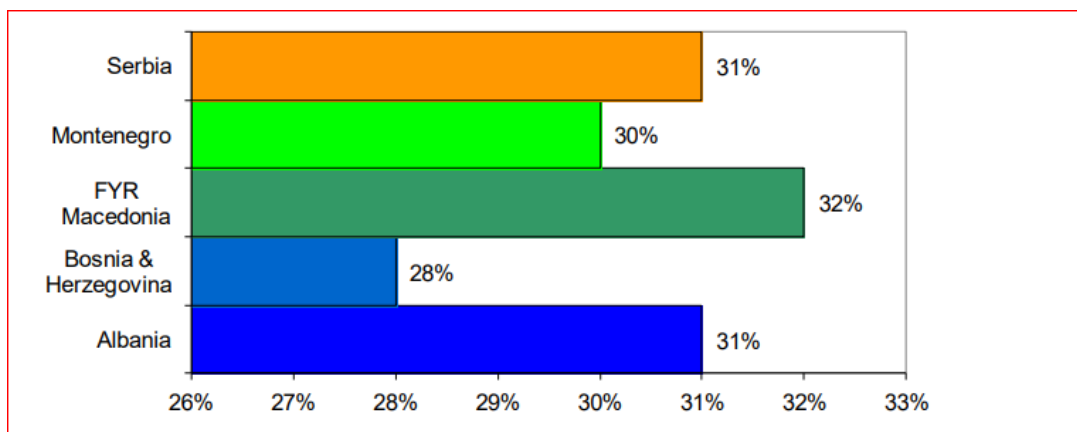


Figure 1. The energy consumption in Western Balkan’s (WB’s) region Residential Sector [5]

As Fig. 1 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.

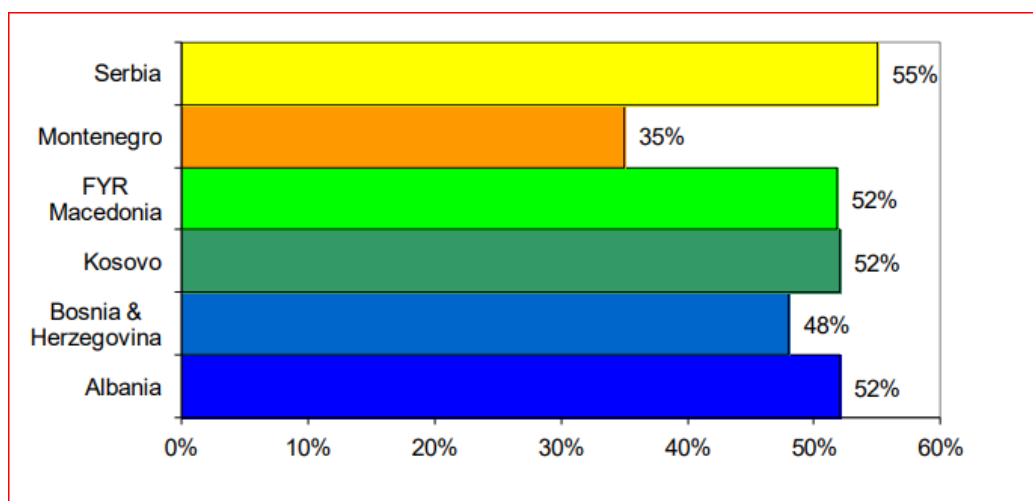


Figure 2. The share of electrical energy consumption in Western Balkan’s region [5]

Per Fig. 2, 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, respectively.

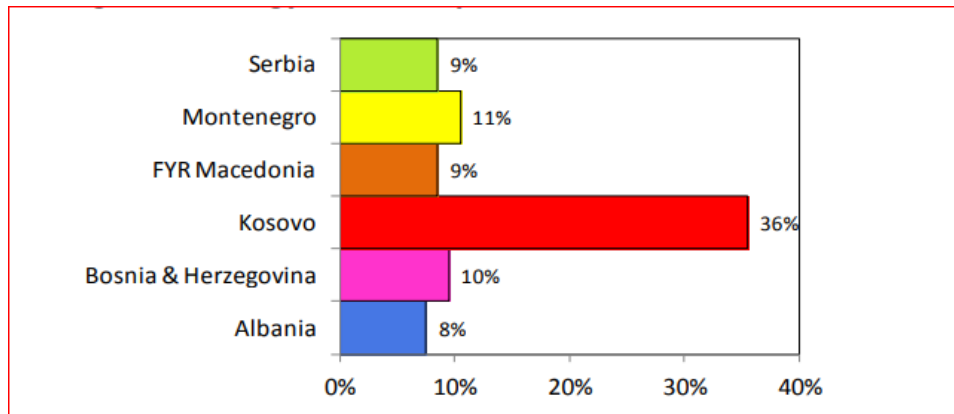


Figure 3. The share of energy subsidies as percentage of the Gross Domestic Product (GDP) for the Western Balkan's region [5]

As depicted in the Fig. 3, 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.

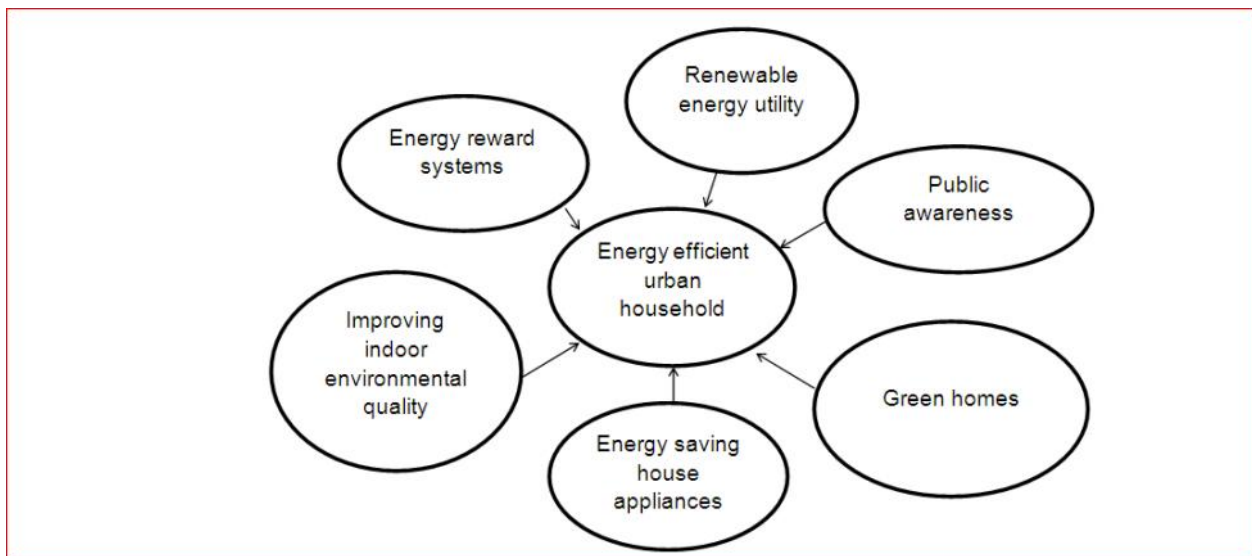


Figure 4. Energy efficiency strategies for urban residential stock [4]

Furthermore, Ganda & Ngwakve [4] expanded the carrot and stick approach to the improvement of the energy efficiency in the light of its contribution to the sustainable economic development by including six contributory elements to the energy efficient open household. Per Fig. 4, above, these elements are being exemplified in the green homes, energy saving house appliances, improving indoor environmental quality, energy reward systems, renewable energy utility and an increased public awareness.

Nunez-Ferrer [6] depicted the Revolving Fund model, in the Fig. 5, above. It shows the centrally placed revolving fund, which receives private equity financing in addition to the state guarantees in the forms of loans, promotional banks, and other types of funds. In continuation, the revolving fund is being fed by favorable types of funding provided by the banking financial institutions.

2. Materials and methods

This research paper utilizes detailed review of multi-faceted resources (peer-reviewed journal articles related to the environmental economics, various governments', European Union (EU)), European Commission (EC), International Energy Agency (IAE) and private publications)) in order to discern the answers to the outlined research problem.

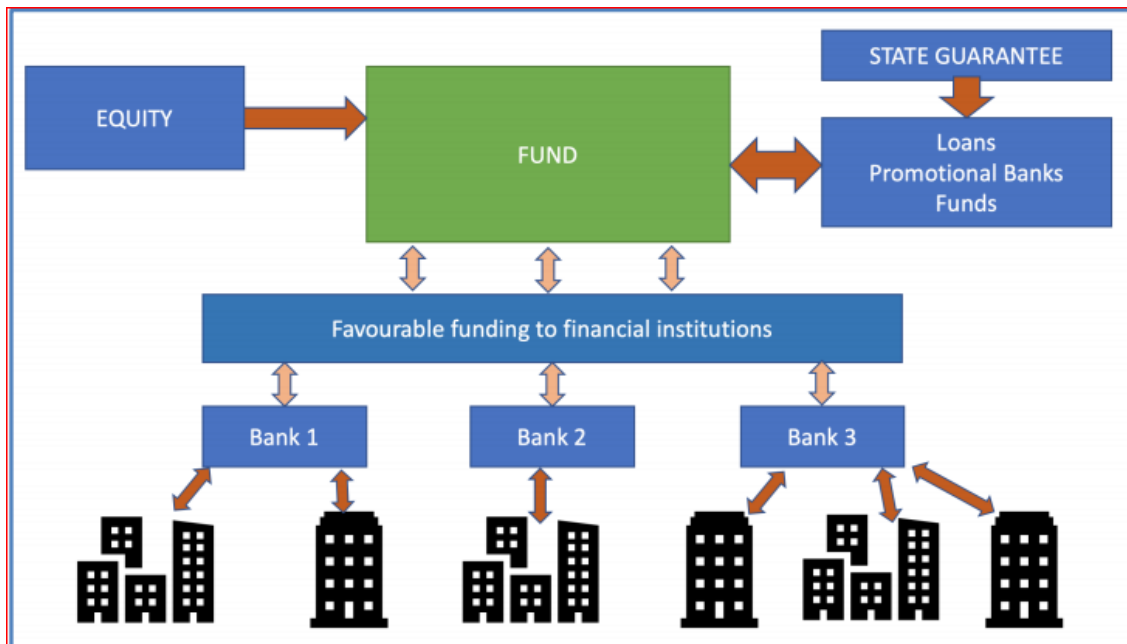


Figure 5. Revolving Fund Model with associated Funding Flows [6]

3. Discussion and results

The significant opportunities of linking energy efficiency efforts and stimulating the economy have been identified in the residential housing sector. For example, they may include programs focused to the new buildings and the upgrade programs for the existing buildings. New building programs revolve around the focus on construction to meet high energy efficiency standards. Reliance on cost effective solutions shall deliver numerous benefits. If they are implemented on a large scale by inclusion of innovations, they can result in significant cost reductions and improved efficiency. On the other hand, improving programs focusing on upgrades look into the provision of incentives to enable the energy efficient upgrades to the residential buildings at scale. Almost two-thirds of the aggregate expenditures on home energy efficiency retrofitting tend to be devoted to labor related costs, which in turn augment the employment growth. Public sector programs aimed at standardized building types, such as hospitals, office buildings, schools, and social housing have proven its effectiveness in creating numerous and considerable economic benefits. The above discussed incentives can be either utilized from the already present programs or can be created from the scratch, in order to advance the economic stimulus and job creation [3], [7], [8].

Governments, at various levels, tend to offer the incentives directly to consumers in order to replace the old and inefficient products, such as household appliances and motor vehicles. Furthermore, the replacement programs can act as the stimulus to the employment, while creating the utilization of more efficient devices. Technology replacement programs can assist the manufacturing sector by bringing to the market newer and more efficient technologies, such as digital building management systems, the electric vehicles, heat pumps and cooling/ventilating/air-conditioning units (HVAC). Other aspects of technology replacement initiatives may include fleet upgrade initiatives related to the motor vehicles, such as trains, buses, transportation vans and taxis. The infrastructures projects can create higher number of jobs by utilizing, both, the public procurement and local value chains. They are focusing on investments, which enable energy efficiency. Some of these examples are smart grids and charging of the electric vehicles, next generation digital connectivity for energy generation systems and the upgrades in public street lightning. In India, second most populous country in the world its "Street lightning national program" manage to upgrade more than 11 million streetlights generating 13,000 jobs and reducing greenhouse gas emissions by 5,000,000.00 tons, annually [3], [7].

As far as the infrastructure projects are concerned the economic stimulus programs, worldwide, will have to involve increased investment levels in the buildings and infrastructure. Furthermore, the construction of high efficiency residential block should decrease the greenhouse gas emissions by 50% over the life of the building. It is important to note that this involves minimal construction related costs in comparison with the construction of energy inefficient buildings. Residing in a high efficiency residential block unit can

significantly reduce the energy related bills. The reduction in these kinds of bills can ultimately free up saved monies to another economic activities, such as investments in the financial instruments or education. When discussing the importance of energy efficiency inclusion in all stimulus investments it is critical to consider, which avenues are the best to target the public funding in addition to the availability of the private capital. It is also important to note that the public residential stock homeowners will be largely unwilling to spend their savings or to take the loans to make home upgrades if there is a lack of affective public financial support programs [3], [7].

Non-sustainable human energy practices have contributed to the destruction of natural environments in addition to an increased pollution. These detrimental practices are linked with harmful climate changes caused by the global warming, droughts, desert expansion and diseases [3], [7], [8].

In conclusion this article will compare and contrast some avenues and policy mechanisms that can be considered to create more effective policies linking energy efficiency efforts and the economic growth and development. The grants and rebates, cash for replacement of old and inefficient vehicles, programs delivered by energy utilities, green procurement, bulk procurement, and direct installation programs. The critical analysis of the effects of energy efficiency on the sustainable economic development can in the aggregate be viewed in the light of carbon reduction, detrimental effects of climate change, and the unemployment and poverty reduction. As far as policy approaches are concerned a critical look into the energy efficiency and the economic stimulus programs conducted by the governments in the past could provide for valuable insights into the improvements of program designs and implementation [3], [7], [8].

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