THE ROLE OF THE PUBLIC SECTOR IN PROMOTING SUSTAINABLE BUSINESS AND ACHIEVING COMPANIES´ ENERGY EFFICIENCY GOALS

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Abstract

The role of the public sector in achieving the energy efficiency goals of companies has proven to be a key link that can have a significant impact on the speed and efficiency of the energy transition in companies. Given the different mechanisms at its disposal, the public sector should encourage, support and implement measures and activities that lead to a sustainable and more energy-efficient economy. Through subsidies and tax incentives, research and development funding, educational campaigns and infrastructure development in the field of energy efficiency and renewable energy sources, the public sector can motivate businesses to invest in sustainable technologies and practices. However, sustainable operations cannot be viewed separately from the company's main goal, i.e. achieving positive financial results. Increasing energy efficiency can significantly reduce company costs because energy efficiency is seen as a resource in modern times. The research was conducted on a sample of companies from the energy sector of the Republic of Srpska, analysing the impact of energy efficiency goals on financial results, the level of achieved energy efficiency goals, satisfaction with the level of public sector support, preferred public sector measures, and examining the connection between public sector support and the achievement of these goals. The results of the research suggest that public sector measures to encourage sustainable business are of key importance for achieving the energy efficiency goals of companies in the energy sector, which confirms our research hypothesis.

Keywords: Energy efficiency, sustainable business, corporate governance, company behaviour, business goals, public sector, public-sector measures

JEL: G38, H32, L21

INTRODUCTION

The public sector is crucial in promoting energy efficiency, acting both as a regulator and as a significant user of energy resources. The public sector performs multiple functions, with a particular emphasis on executing EU energy efficiency mandates. In the EU, a new Directive on energy efficiency (Directive (EU) 2023/1791) was adopted on 13/09/2023, which stipulates the reduction of final energy consumption at the EU level. According to the European Commission, energy efficiency is a key area for the full decarbonization of the EU economy, and the public sector will play a critical role in strengthening energy efficiency.

Due to its specific organization, Bosnia and Herzegovina does not have a uniform legal and legislative framework in the energy sector, which complicates the implementation of energy policy (Serdar Raković, 2023). The energy sector is very strictly regulated, so energy policy or energy efficiency cannot be considered without reviewing the legal framework in the energy sector. By ratifying the agreement on the establishment of the Energy Community, BiH

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committed itself to adopting the EU *Acquis Communautaire*, i.e. to adopting and implementing a large number of EU directives and regulations. The complex regulatory framework in BiH includes internationally adopted obligations and ratified agreements, as well as laws at the state level, which are divided into laws and regulations in the Republic of Srpska (RS), the Federation of Bosnia and Herzegovina and the Brčko District. Considering the importance of the energy sector, the public sector is the important link in strengthening this sector and increasing energy efficiency.

The study examines a selection of companies operating in the energy sector of the Republic of Srpska to investigate the influence of energy efficiency objectives on financial performance, the extent of attainment of energy efficiency targets, preferred strategies of the public sector, and the relationship between public sector assistance and the realization of these goals. The research findings offer insights into the interplay between energy efficiency initiatives and financial outcomes in the energy sector of the RS. Support from the public sector is crucial in shifting both mindset and business practices. This can be achieved through new funding sources, tax incentives, and other measures to encourage energy transformation awareness.

LITERATURE REVIEW

The primary focus of contemporary countries is the shift towards an economy that effectively maximizes resource utilization and safeguards people from the adverse effects of environmental change. The importance of energy efficiency is underscored by the uneven distribution of fossil fuels and the unpredictable prices in the energy market. These issues encompass both economic and geopolitical concerns, as nations relying on energy imports are at heightened risk during times of geopolitical turmoil or economic sanctions. It is essential to shift energy production towards renewable sources and improve energy efficiency to decrease the negative impacts.

The energy balance of a country encompasses all economic activities associated with energy, excluding natural biological processes, and is established through meticulous planning and analysis. According to Marković (2010), analyzing the energy balance allows for the assessment of the current status and future projections of a country's energy sector. Energy efficiency encompasses a variety of strategies and actions aimed at reducing energy usage to a minimum level, while concurrently enhancing or maintaining the overall quality of life across various domains. In the shift towards a decarbonized economy, governmental bodies utilize a variety of fiscal mechanisms to facilitate and accelerate the transition process (Thygesen et al., 2022). Achieving carbon neutrality requires the integration of trading and investment systems. The aforementioned changes will undoubtedly have significant implications in terms of macroeconomics, structural adjustments, and budgetary considerations.

Energy efficiency can be conceptualized as a valuable energy resource due to its ability to facilitate energy conservation, thereby reducing the need for generating electricity and other forms of energy from primary sources. This results in significant environmental and economic benefits. Investing in energy efficiency is crucial for resource conservation, as it allows for more strategic investment decisions in new resources and enhances the effectiveness of current systems. The incorporation of energy efficiency as a resource in the decision-making process is essential due to the significant cost-saving advantages associated with it.

According to the European Court of Auditors (2022), EU member states are committed to achieving substantial reductions in carbon emissions in line with the Paris Agreement and the European Green Deal. The ultimate goal is to transition the EU into a climate-neutral economy by the year 2050. Sparkes and Cowton (2004) emphasize that the integration of social and environmental objectives into investment considerations constitutes the foundation of socially

responsible investing. In 2018, the European Commission (EC) introduced a definition for sustainable financing, characterizing it as the practice of incorporating environmental and social factors into investment evaluations to promote the allocation of resources towards sustainable assets with long-term benefits. The European Green Plan, as outlined by the EU (2019), emphasized the necessity of better-directing capital and financial flows towards green investments.

Patterson (1996) highlights that the concept of energy efficiency involves achieving comparable levels of productivity and utility while minimizing energy consumption. According to Galvin (2014), energy efficiency can be assessed using both monetary and physical indicators. This study sheds light on the various ways in which energy efficiency can be measured and evaluated. Galvin (2014) discussed the concept of using the relationship between input and output energy represented in monetary terms as a monetary indicator, specifically in terms of invested energy per gross domestic product (GDP). As Ganda and Ngwakwe (2014) study, energy efficiency encompasses a combination of policies, technologies, and strategies aimed at mitigating the challenges associated with energy consumption in residential, commercial, and national settings. The main objectives of energy efficiency initiatives are to lower financial costs and decrease the release of gases that contribute to global warming.

According to Atalla, Mills, and McQueen (2022), governments have the option to select from a variety of policy interventions and economic-financial tools to facilitate the transition of energy and industrial frameworks, enhance energy efficiency, combat environmental degradation, and safeguard and rehabilitate natural resources. Serdar Raković and Topić-Pavković (2023) argue that the implementation of green taxes, environmental standards, and incentives is crucial for promoting environmentally sustainable practices. Green taxes are imposed on activities that harm the environment, while new standards and certifications focus on energy efficiency and reducing emissions. In addition, incentives such as tax breaks, grants, loans, and subsidies are provided to encourage compliance with these regulations and promote investments in green and sustainable technologies.

The idea of sustainability, particularly concerning energy, has become a key guiding principle in tackling the increasing global issues of environmental degradation and dwindling resources. Indicators for sustainability that concentrate on energy are crucial tools for evaluating and tracking advancements towards a more sustainable energy system. In the study conducted by Muniz et al. (2023), the focus is on the assessment of potential opportunities for enhancing energy efficiency and the evaluation of relevant indicators for assessing the attainment of desired sustainability objectives. The aforementioned indicators yield significant knowledge regarding the environmental, social, and economic aspects of energy activities and their enduring consequences. Through careful analysis and comprehension of these indicators, stakeholders such as policymakers, businesses, and communities can make well-informed decisions, develop impactful policies, and channel their resources towards achieving a more sustainable energy landscape.

Energy, a crucial factor required for all facets of existence, significantly contributes to the advancement of nations. According to Türkoğlu and Pinar (2018), efficient utilization of energy resources is essential for countries to gain a competitive edge in the global arena and promote sustainable development. Enhancing energy efficiency has the potential to markedly decrease energy expenditures for enterprises. The ability of firms to enhance their competitiveness in the marketplace has the potential to yield positive economic implications at a macroeconomic level. Companies that implement energy efficiency practices showcase their dedication to broader societal goals, thus enhancing their social reputation and improving public relations.

The enhancement of energy efficiency measures has the possibility of decreasing the country's dependence on energy imports, consequently boosting its energy autonomy and resilience. Public institutions play a vital role in advancing sustainable business practices as they possess various mechanisms to shape the behaviour of both companies and individuals towards sustainability. This study highlights the significance of the topic and identifies a clear gap in the current literature and research conducted within the country. The discrepancy may be due to the implementation of new regulatory directives within the EU that have not been thoroughly investigated in academic research.

RESEARCH METHODOLOGY

The energy industry holds significant importance in the country, offering substantial potential and a wide range of investment opportunities. The energetic system in the Republic of Srpska encompasses a sophisticated network involving the generation and dissemination of both electrical and thermal energy. This energy is primarily derived from industrial power plants, thermal and hydroelectric power plants, mines associated with thermal power production, as well as the oil and natural gas sector. By the decree of the Government of the Republic of Srpska (2012, 2018), energy was identified as the most crucial sector for the development of the RS. RS is planning to accelerate the development of wind and solar power plants alongside its current hydroelectric, thermal, and mini power plants. The RS's energy potential is currently being utilized at only 30%, but the establishment of renewable energy sources like solar power plants and wind farms will greatly boost its utilization.

This study aims to analyze attitudes and derive insights regarding the significance and extent of incorporation of energy efficiency objectives, as well as to investigate the relationship between public sector initiatives and the attainment of these objectives by firms within the RS energy sector.

The research hypothesis reads: Public sector initiatives aimed to promote sustainability business practices are crucial for energy sector companies reaching their energy efficiency goals.

The research was carried out to verify the proposed hypothesis. Data was gathered through surveys administered to a sample of 25 company managers within the energy sector of RS, during February and March 2024. The energy sector was selected as the focus of the study due to its significant contribution to the national economy. The sample comprised a diverse group of participants including general managers and company managers from various industries within the energy sector such as thermal power, hydropower, mines, oil, and natural gas:

- Electricity production: MH Elektroprivreda Republike Srpske and five subsidiaries: ZP Hidroelektrane na Trebišnjici a.d. Trebinje, ZP Hidroelektrane na Drini a.d. Višegrad, ZP Hidroelektrane na Vrbasu a.d. Mrkonjić Grad, ZP Rudnik i termoelektrana Gacko a.d. Gacko i ZP Rudnik i termoelektrana Ugljevik a.d. Ugljevik; then Hidroelektrana Dabar d.o.o. Trebinje, Hidroelektrane Bistrica d.o.o. Foča, HES Gornja Drina d.o.o Foča, EFT Rudnik i Termoelektrana Stanari d.o.o. Stanari.
- Electricity distribution: subsidiaries of MH Elektroprivreda RS: ZP Elektrokrajina a. d. Banja Luka, ZP Elektro Doboj a. d. Doboj, ZP Elektro-Bijeljina a. d. Bijeljina, ZP Elektrodistribucija a. d. Pale i ZP Elektro-Hercegovina a. d. Trebinje.
- Petroleum industry - procurement of crude oil, oil refining and production of petroleum derivatives, production of base oils, paraffin, motor oils and lubricants and wholesale of petroleum products, oils and lubricants, and placement: OPTIMA Grupa d.o.o. Banja Luka and related legal entities Refinery of Oil a.d. Modriča, Refinery of oil a.d. Brod and Nestro Petrol a.d. Banja Luka.

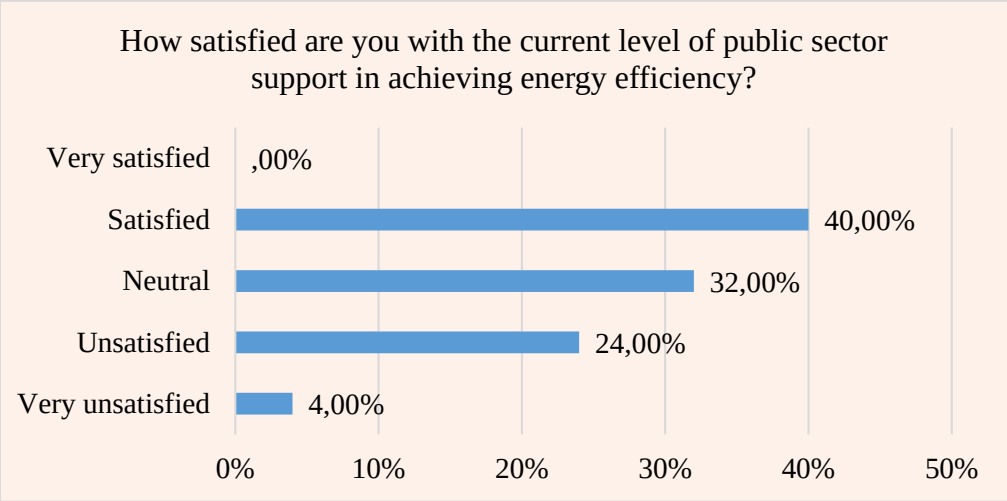
– Mines and aluminium production: Rudnik Stanari (lignite mine), Rudnik Gacko (lignite mine) Rudnik Ugljevik (brown coal mine), and Alumina d.o.o. Zvornik (production of alumina, hydrates, zeolite and water glass).

The majority of questions are closed-ended, such as multiple-choice questions, opinion scales, multiple-choice drop-down lists, binary questions, and multi-factor matrices. Moreover, the survey includes sections for comments, allowing participants to share their views on the research subject. The study is focused solely on investigating the energy industry in RS. While the sample size may be small and limited to a specific sector with a few companies, the research focused only on general managers and top managers. Therefore, we can deem the sample to be appropriate for making conclusions.

RESULTS

The results of the research showed that the respondent's opinions were divided on the issue of satisfaction with public sector measures. Namely, 40% of respondents are satisfied and 28% are unsatisfied with the support they receive from the public sector in the field of energy efficiency. 32% of respondents did not have a clear position on this issue. Interestingly, not a single respondent stated that they are very satisfied with the measures and policies of the public sector in the segment of sustainable business.

Chart 1: Level of satisfaction with the current level of public sector support for achieving energy efficiency goals



Source: Research of the authors

Table 1: Basic Statistic and Chi Chi-Squared Test for Chart 1

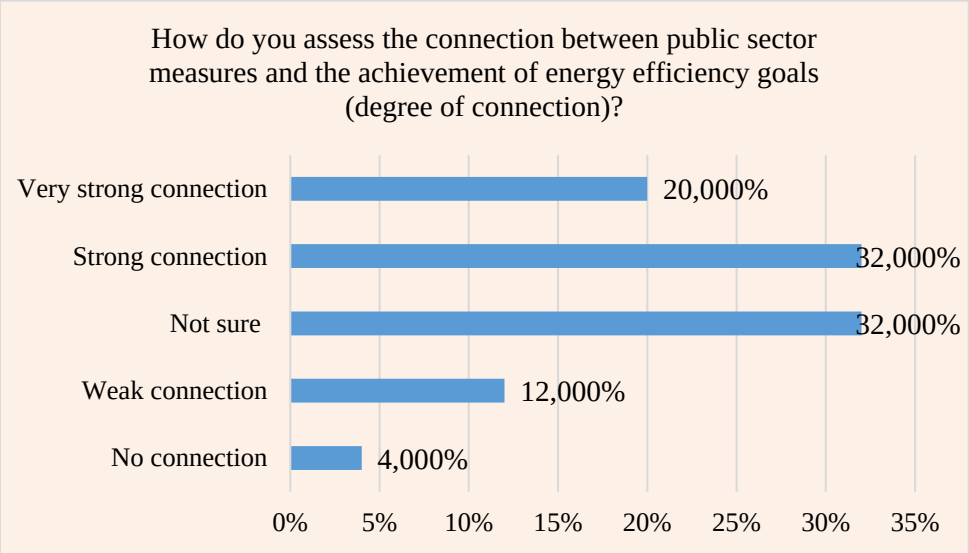
Basic Statistics				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	5.00	3.00	2.92	0.89
Chi-Squared Test		$\chi 2$ value	df	Significance (p)
		15.20	4	0.0043

Source: Calculation of the authors

The Chi2 test shows that there is a statistically significant difference between the categories of respondents who are satisfied, not satisfied or have no expressed opinion on this issue.

The following graph is particularly significant in terms of the obtained results because it shows that managers are aware of the importance of energy efficiency goals, not only due to the fulfilment of requirements for sustainable business and international obligations but also due to the large impact on the company's financial results.

Chart 2: The degree of connection between public sector measures and the achievement of energy efficiency goals



Source: Research of the authors

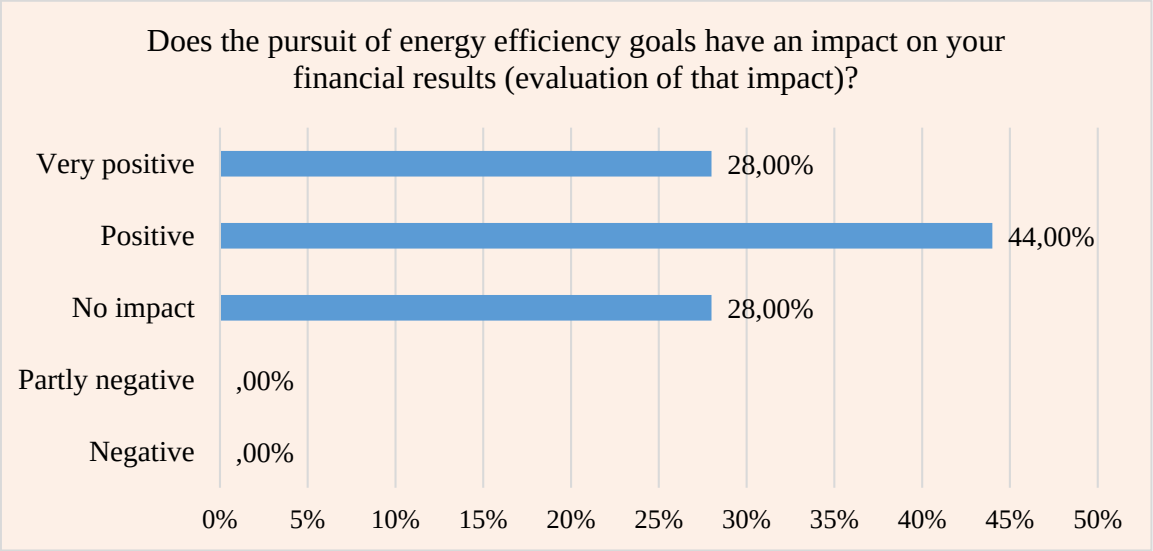
Table 2: Basic Statistic and Chi-Squared Test for Chart 2

Basic Statistics				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.48	1.06
Chi-Squared Test		$\chi 2$ value	df	Significance (p)
		7.60	4	0.1074

Source: Calculation of the authors

The role of the public sector in achieving the Sustainable Development Goals (SDGs) is essential as it includes a wide range of activities aimed at promoting sustainable development at the global, national and local levels. Thus, the public sector plays a central role in achieving these goals through various mechanisms and strategies. In the domain of the connection between public sector support and the achievement of energy efficiency goals, the results are interesting, because the mentioned connection was perceived as very strong by 20%, and as strong by 32% of respondents. On the other hand, 32% of respondents were not sure and did not express their opinion. Only 16% of managers believe that the relationship is not pronounced (weak connection - 12% and no connection - 4%). Although the majority of respondents (52%) consider the connection between public sector measures and success in achieving energy efficiency goals to be pronounced and strong, due to the large number of those who did not express an opinion, the difference between the degree of connection by categories of respondents is not statistically significant.

Chart 3: The impact of achieving energy efficiency goals on the financial results of the company



Source: Research of the authors

Table 3: Basic Statistic and Chi-Squared Test for Chart 3

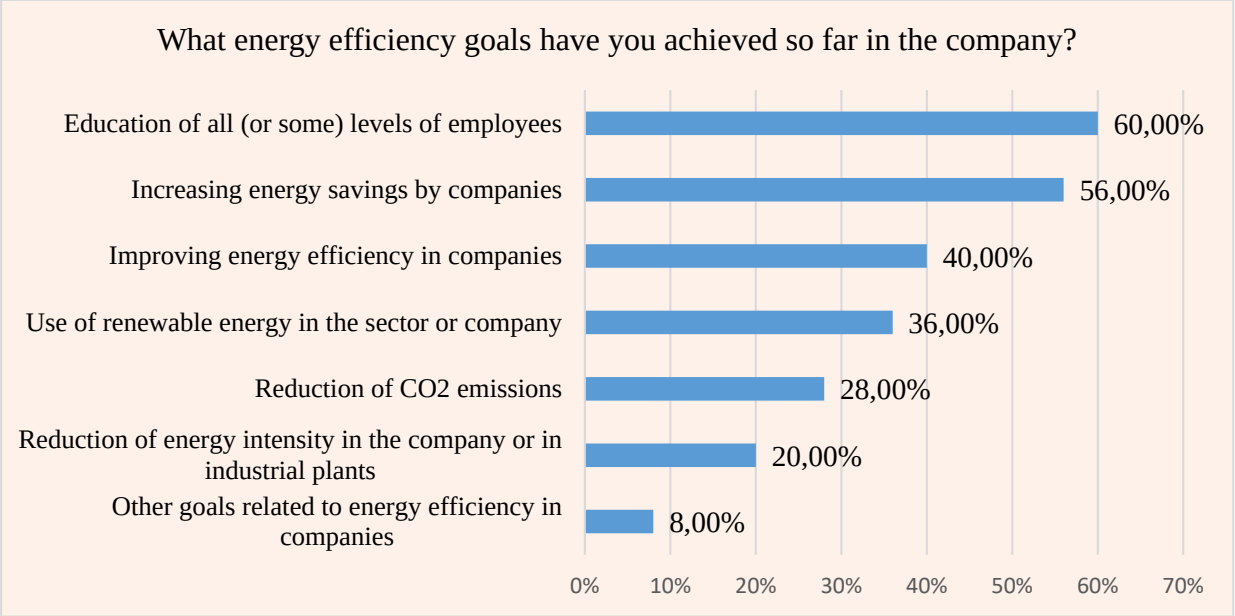
Basic Statistics				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	2.00	0.75
Chi-Squared Test		$\chi 2$ value	df	Significance (p)
		18.80	4	0.0009

Source: Calculation of the authors

It is observed that 72% of the respondents agree that the achievement of energy efficiency goals has a positive impact on financial results (28% mark this impact as very positive, and 44% as positive). 28% of respondents did not express themselves, that is, they were neutral on this issue. However, it is very significant that no manager marked this impact as partly negative or as negative. Also, as many as 80% of respondents indicated that it is important for them to accomplish energy efficiency goals in addition to achieving financial results (very important - 60% and important - 20%).

According to conventional criteria (p=0.0009), the difference between categories of respondents who consider the impact of energy efficiency on financial results to be positive, negative or have no opinion is considered extremely statistically significant. Managers in the energy sector are very aware of the connection between achieved energy efficiency goals and financial results in their companies and the sector in general.

Chart 4: Achieved energy efficiency goals in the energy sector



Source: Research of the authors

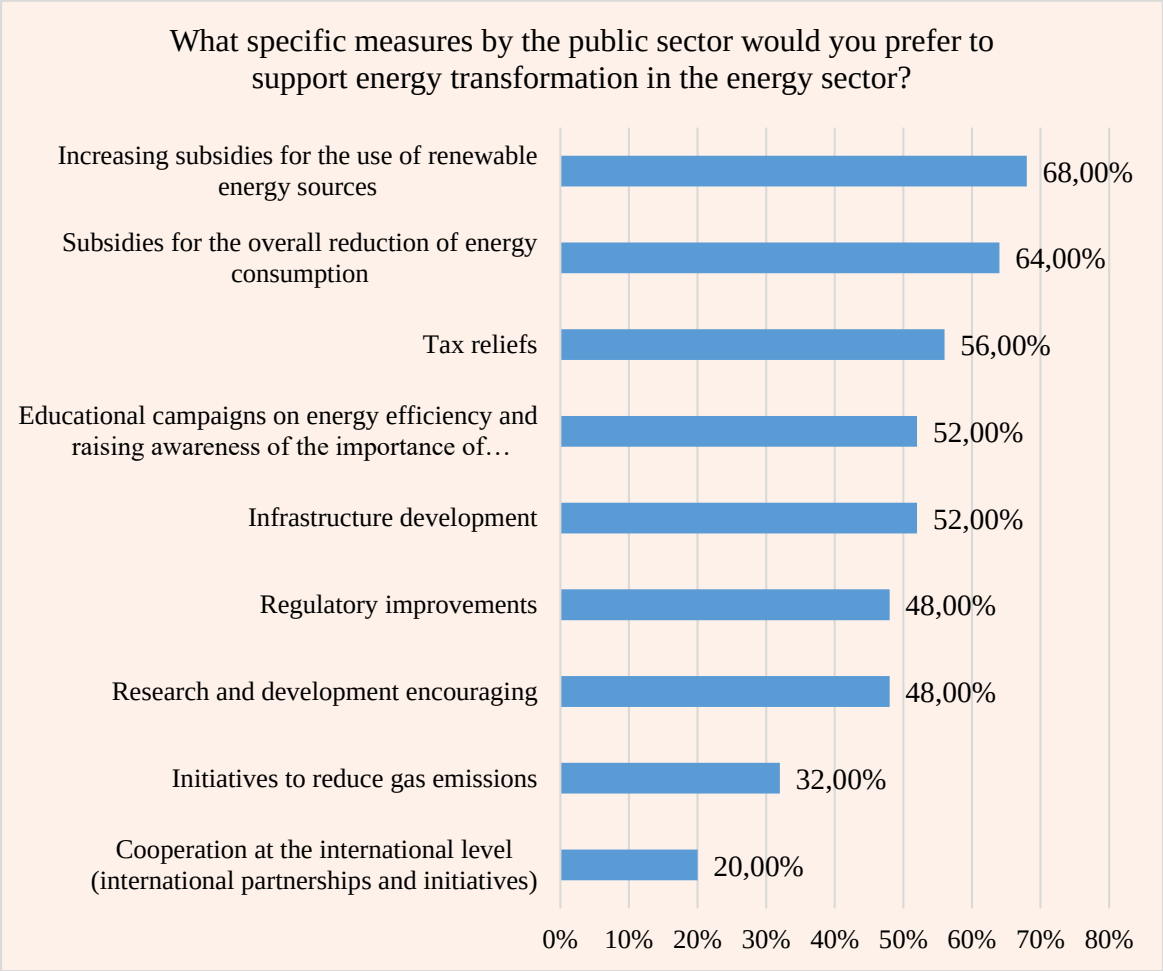
Table 4: Basic Statistic and Chi-Squared Test for Chart 4

Basic Statistics				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	7.00	3.00	3.69	1.88
Chi-Squared Test		$\chi 2$ value	df	Significance (p)
		14.75	6	0.0223

Source: Calculation of the authors

The analysis of energy efficiency goals achieved so far in energy sector companies showed that the most was achieved in employee education - 60% and increased energy savings - 56%. The improvement of energy efficiency in the companies themselves is also significant - 40%, as well as the use of renewable energy - 36%. At the bottom of the scale of accomplished goals are the reduction of CO2 emissions - 28% and the reduction of energy intensity in the company or industrial plants - 20%. Regarding the other achieved goals, the respondents mentioned participation in programs for energy efficiency and setting goals for raising awareness of energy efficiency measures and their importance for the environment and the company (8%). We can state that the accomplished goals are by the difficulty of application and the level of effort that needs to be invested in achieving energy efficiency. Also, statistically analyzed, there is a statistically significant difference between goals whose level of achievement is high and those whose level of fulfilment is at a lower level.

Chart 5: Preferred measures of the public sector in encouraging energy efficiency in the energy sector



Source: Research of the authors

Table 5: Basic Statistic and Chi-Squared Test for Chart 5

Basic Statistics				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	9.00	4.50	4.53	2.49
Chi-Squared Test		$\chi 2$ value	df	Significance (p)
		9.12	8	0.3326

Source: Calculation of the authors

When it comes to the expected measures and support of the public sector, the high-ranking measures are the increase of subsidies for the use of renewable energy sources - 68% and subsidies for the overall reduction of energy consumption - 64%. Also, tax relief of 56% is a very popular measure, according to the managers. Educational campaigns and infrastructure development were marked as important by 52%, and regulation improvements and research and development were encouraged by 48% of respondents. At the bottom of the scale of preferred measures are initiatives to reduce gas emissions - 32% and cooperation at the international level - 20%. The results are expected, since managers value measures that will enable them to achieve better financial results in the short term (the first three measures), and then in the medium term

(the next four ranked measures). However, there is no statistically significant difference between the preferred public sector support measures ($p>0.05$).

For financial and investment purposes, the public sector can mobilize funds for sustainable development projects and programs through public investments, grants and incentives. Private investment in sustainable technologies and practices can also be encouraged through tax incentives and other financial instruments. Various forms of tax reliefs and exemptions can play a significant role in the improvement and successful implementation of energy transformation from the aspect of public finances. They are the basic mechanisms for encouraging sustainable development. Partial or complete deduction of investment costs for energy efficiency from the tax base for citizens and businesses can be a very significant stimulus for new investments in the country. The public sector can, through educational institutions, encourage the inclusion of sustainability programs in educational and educational plans. This includes encouraging innovation through research and development. All the results suggest that public sector measures in encouraging sustainable business are of key importance for achieving the energy efficiency goals of energy sector companies, which confirms our research hypothesis.

CONCLUSION

Companies´ energy efficiency is important to society and the public interest for many reasons, including economic, environmental and social benefits. By supporting the goals of energy efficiency, the public sector not only influences the fulfilment of international obligations and encourages sustainable development, but through the reduction of company costs, indirectly promotes economic growth and competitiveness in the global market. Currently, there are no tax breaks in BiH, nor an efficient and effective system of subsidizing green business models and projects. Therefore, it is necessary to use different methods in the financing of sustainable development, so that all relevant actors, with the help of the state, fully use their financial potential.

The research results show that the respondents´ opinions were divided regarding their satisfaction with the public sector measures so far. However, respondents are very aware of the importance of energy efficiency goals, not only due to the fulfilment of regulatory requirements for sustainable business but also due to the significant impact on the company's financial results. As many as 72% of managers are convinced that achieving energy efficiency goals has a positive impact on the financial results of their companies. The majority of managers (52%) believe that the connection between the support measures of the public sector and success in accomplishing energy efficiency goals is pronounced and strong. The achieved energy goals are by the difficulty of application and the level of effort that needs to be invested in achieving energy efficiency. It has been shown that managers value public sector measures that will enable them to achieve better financial results in the short term, and then in the medium term. We can conclude that in the energy sector awareness of the importance of meeting new and raising the level of achieved energy efficiency goals, will have a positive impact on financial results, where the public sector support plays a key role. For companies, it is extremely important to shift the focus from traditional to new ways of doing business and develop new business models and innovative practices, which are in line with global requirements for sustainable business.

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