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Article

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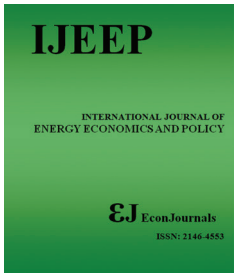

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Impact of the Adopted Financial Processes for Carrying Out Green Energy Projects in Georgia

Aizada Zhakupova[1]*, Lambekova Aigerim[2], Syzdykova Elmira[3], Syzdykova Dinara[4], Zhanseitov Azamat[5]

[1]Department of Finance and Data Analytics, Narxoz University, Almaty, Kazakhstan, [2]Department of Accounting and Audit, Academician Y.A. Buketov Karaganda University, Karaganda, Kazakhstan, [3]Department of Accounting and Audit, Academician Y.A. Buketov Karaganda University, Karaganda, Kazakhstan, [4]Department of Accounting and Audit, Academician Y.A. Buketov Karaganda University, Karaganda, Kazakhstan, [5]Academy of Public Administration under the President of the Republic of Kazakhstan. *Email: aizada.zhakupova@narxoz.kz

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ABSTRACT

Green energy is considered the backbone for all the environmental strategies as it impacts the organizations in three key areas, such as the economy, society, and environment. Green energy projects have emerged as the sustainable drivers of economic elevation for a country, replacing the conventional energy sources that damage the ecology to a great extent. In this paper, the primary purpose is to overview the financial processes to pursue green energy. Moreover, this paper has analyzed all the financial mechanisms required in Georgia to carry out green energy projects. This paper has also compared Georgia's economic mechanisms with those of another developing country, Kazakhstan. For this purpose, this paper has gathered the secondary sources of data to identify the financial processes and the associated risks of Georgia's financial operations for pursuing the green energy processes. For understanding Georgia's financial mechanisms, this paper has incorporated descriptive analysis tools and regression analysis.

Keywords: Financial Development, Economic Progress, Energy Consumption, Financial Strategy, Financial Stability Budget, Renewable Energy
JEL Classifications: Q16, 016, 044

1. INTRODUCTION

The modern world faces an increased demand for all the energy and its associated services to meet economic and social development while improving human health and welfare. With the advent of industrialization, the global usage of various fossil fuels, including gas, coal, and oil, has given rise to the elevated supply of dominant energy leading towards drastic growth in the emissions of carbon-di-oxide (Kaltsa et al., 2020). However, this dire condition has facilitated the demand for a better and more sustainable alternative to reduce greenhouse emissions in developing countries. Financing can be one of the most considerable barriers to create sustainability in energy for developing countries (Gibson et al., 2017). This paper has analyzed the impact of effective financing procedures to carry out sustainable energy projects in one of the developing countries, Georgia. The utilization of data and various statistical tools have simplified the analysis to provide the readers with a comprehensive viewpoint (Stucki, 2019).

This particular research has upstanding aims to analyze the impact of the constructive financing procedures required to carry out the green energy or sustainability in the energy projects in the developing countries. For this purpose, this study has critically aimed to focus on Georgia's financial processes while comparing it to that of Kazakhstan. The objectives, extracted from the aims, are as follows:

- To identify the financial processes of implementing green energy in Georgia.

- To understand the impact of the strategic financial policies to address green energy projects in Georgia.
- To compare the financial processes of Georgia with that of Kazakhstan.
- To identify the challenges of financial processes regarding green energy projects.

2. LITERATURE REVIEW

2.1. Financial Processes of Implementing Green Energy in Georgia

According to Doyle and Aggidis (2019), most developing countries strive to access cleaner and more stable energy to address sustainable goals. For this purpose, the dependency and depletion of fossil fuels have impacted the developing countries to an extreme level leading the states to opt for sustainable energy projects. However, availability and access to the financial processes are the most concerning challenges for developing countries like Georgia. Bhowmik et al. (2017) has viewed that Georgia's strategic policies have documented green energy projects, including the NEEAP, NDC, and LEDs, making it apparent that this country requires further scaling up of the financial processes to implement better sustainability. The detailed and approximate calculations are considerable under NEEAP, LEDs, and the third National Communication for the green-energy projects.

Moreover, according to NDC, the financial investment will require nearly 2 billion in 2030. The NDC of Georgia has the inclusion of the mitigation targets along with international support. Lees et al. (2020) have pointed out that the further improvement in estimating the priority domains' investment requirements can lead to the Georgian government prioritizing specific projects highlighting the country's targets on green growth. Aslanishvili and Omadze (2019) stated that the publicly available data has revealed that the potential and existing financial sources for green energy projects in Georgia are the municipal and national governments, financial institutes, and state-owned enterprises. Moreover, the domestic public authorities have covered nearly 40% of the financial sources for Georgian green energy projects. On the other hand, Lambekova et al. (2017) have stated that the internal audits have provided Kazakhstan with the conceptual tools to address the green energy projects that have distinguished this country's financial processes from that of Georgia.

2.2. Impact of the Financial Processes for Undertaking Green Energy Projects

Egli et al. (2018) have depicted that the latest financing facilities for promoting investment in the green energy projects in the developing countries, including Georgia, have assisted several small-scale energy significant projects, saving money while reducing emissions at the same time. The establishment of credit lines with the regional banks and financial, technical, and legal expertise in Georgia has facilitated the financial processes. The constrained access to finance earlier had led the green energy projects in Georgia to confront various challenges. According to Simcock (2016), the stakeholders implementing projects with energy efficiency receive more than 15% of the entire loan amount as cash backs in terms of investment incentive payments for reducing the investment cost. The financial processes in Georgia benefit the environment and enhance the business prospect, employment, and technology transfer. In Yessengeldin's (2018) words, Kazakhstan has differentiated itself from Georgia in financial processes established by the EBRD financing facility. The banks provide the country with additional mechanisms for extending finance for the green energy projects in Kazakhstan.

2.3. Comparison between the Financial Processes of Georgia with Kazakhstan

According to Alieva et al. (2020), Along with the other financial sources, UNDP provides financial support to both Georgia and Kazakhstan with various innovative economic mechanisms. Revolving funds have been allocated to Georgia, whereas interest rate subsidy, loan guarantee, and blended finance, including soft and grants loans, are earmarked for Kazakhstan for carrying out green energy projects. Yıldırım et al. (2020) stated that Kazakhstan has been undertaking NAMA projects in its urban sectors to improve urban services. According to Kulakhmetova et al. (2018), these projects have adopted financial support, along with interest rate subsidies and loan guarantee. The UNDP has also provided Georgia with technical assistance in green energy efficiency.

2.4. Challenges of Financial Processes Regarding Green Energy Projects

Elmustapha and Hoppe (2020) have pointed out several challenges in the financial processes while carrying out green energy projects in Georgia and Kazakhstan. The green energy projects are more likely to have higher up-front costs and lower operational costs leading to long-term funding. The investment decisions can be discriminated against if excluded from long-term financing. According to Park (2018), for developing countries like Kazakhstan and Georgia, long-term funding is also tricky. Also, the limited investment aspects prove to be drawbacks for the developing countries where the long-term assets are not available smoothly. Additionally, Baxter (2018) stated that lack of project financing, uncertain and higher project development costs, and lack of equity financing could also prove to be significant challenges for the financial processes for carrying out green energy projects in these developing countries.

3. RESEARCH METHODS

For understanding the financial processes of carrying out sustainable green energy projects in Georgia, this paper has used the secondary sources of data considering the recently published articles, newspaper reports, and governmental reports. This paper has used regression analysis to represent statistical analysis. Descriptive statistics have also provided a better understanding of the savings of primary and energy emission abatement. The qualitative method has helped to gather data from secondary sources. After collecting data, various statistical tools have simplified the analysis. The utilization of secondary data has consumed less money and time, avoiding little duplication of the study. The paper has maintained all ethical aspects thoroughly. The scholar has cited the reference of the authors while interpreting the standpoints of them with authority. Moreover, the use of graphs, pie charts, and tables has simplified the entire visualization of Georgia's financial processes in terms of green energy projects.

4. RESULTS

For improving the sustainability of the environment, the financial resource is one of the significant resources for Georgia to increase awareness of addressing energy issues. It promotes the actions at the local and global levels of this country. This section of the paper has analyzed the gathered data with graphs, pie charts, and several statistical tools.

Based on the Figure 1, this country has observed an increment in electrical consumption during the last decade. The rate of consumption increases by more than 7% in 2017. The overall electricity consumption has risen by an average of more than 4% from 2007 to 2017. The electricity generation structure increases the electricity generation shares with the help of thermal and hydropower plants. The electricity generates by thermal plants is more than 18.8% in 2017. The percentage of electricity in the total generation which is shared is more than 80%.

According to the Figure 2, the target amount of Georgia is relatively high in terms of energy efficiency. Based on the figure, it is clear that the amount of energy efficiency in 2017 is 75,587, and it increases by more than 287,000 in 2020, which is one of the high amounts. The above graph shows an upward direction from its based year to its current year. This country chooses to implement an alternative policy that combines both investment and technology in all the sectors to fulfill this energy efficiency target. According to Article seven, the members need to implement EEO's scheme to achieve an equal amount of energy savings with the help of alternative policies.

Based on the Figure 3, it is evident that 78% of the households use incandescence blubs. This country's government needs to provide efficient blub to the home to save electricity that can be more than 500 MW. This savings is equal to build the new power plant of the capacity of 500 MW, which can cost $600–$700 million in total.

According to the Table 1, regression table of renewable energy and cost, it is transparent that the value of p is 0.8021. The amount of p is more than 0.05. Thus, it rejects the alternative hypothesis. It accepts the null hypothesis. The alternative view is the use of renewable energy is not related to the cost. Hence it is comprehensive that the use of this type of life is closely related to the price.

According to the Table 2, the primary energy savings' mean value is 906, whereas the final energy savings amount is 428.166. The mean of the emission abated is 355440.5. Based on the above table, the median result is 417.5 of the savings of primary energy. However, the median value of the final is 127. Thus, the amount of direct energy savings is higher compared to the importance of final energy savings.

Figure 1: Electricity Generation and Consumption of Georgia

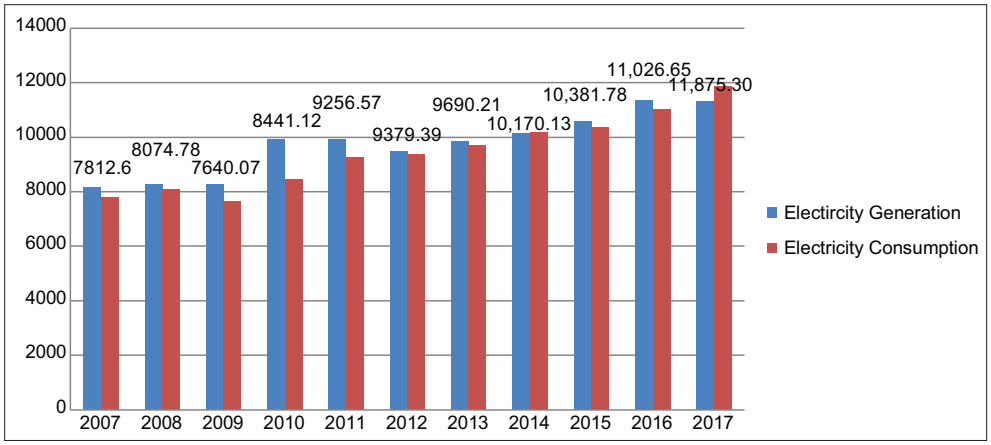


Table 1: Regression of Use of Renewable Energy and Cost of Georgia

Regression Statistics								
Multiple R	0.99887725							
R Square	0.99775576							
Adjusted R Square	0.9971947							
Standard Error	10.7742023							
Observations	6							
ANOVA								
	df	**SS**	**MS**	**F**	**Significance F**			
Regression	1	206436.1	206436.1	1778.3423	1.89E-06			
Residual	4	464.3337	116.0834					
Total	5	206900.4						
	Coefficients	**andard Err**	**t Stat**	**P-value**	**Lower 95%**	**Upper 95%**	**Lower 95.0%**	**Upper 95.0%**
Intercept	−1.3542477	5.059117	−0.26768	0.8021783	−15.40061	12.6921121	−15.4006075	12.69211207
X Variable 1	5.2398E-07	1.24E-08	42.1704	1.89E-06	4.895E-07	5.5848E-07	4.8948E-07	5.58477E-07

Table 2: Descriptive statistics of savings of primary and energy and emission abated

Primary Energy Savings		Final Energy Savings		Emission Abated	
Mean	906	Mean	428.1666667	Mean	355440.5
Standard Error	458.3456483	Standard Error	259.848086	Standard Error	236763.0207
Median	417.5	Median	127	Median	139018
Mode	#N/A	Mode	#N/A	Mode	#N/A
Standard Deviation	1122.712964	Standard Deviation	636.4952212	Standard Deviation	579948.5907
Sample Variance	1260484.4	Sample Variance	405126.1667	Sample Variance	3.3634E+11
Kurtosis	0.658383671	Kurtosis	3.415156374	Kurtosis	5.072050783
Skewness	1.294277344	Skewness	1.881782476	Skewness	2.217131934
Range	2810	Range	1621	Range	1504343
Minimum	34	Minimum	24	Minimum	8464
Maximum	2844	Maximum	1645	Maximum	1512807
Sum	5436	Sum	2569	Sum	2132643
Count	6	Count	6	Count	6
Largest(1)	2844	Largest(1)	1645	Largest(1)	1512807
Smallest(1)	34	Smallest(1)	24	Smallest(1)	8464
Confidence Level (95.0%)	1178.214998	Confidence Level (95.0%)	667.9607696	Confidence Level (95.0%)	608618.7201

Figure 2: Energy Efficiency Scheme of Georgia

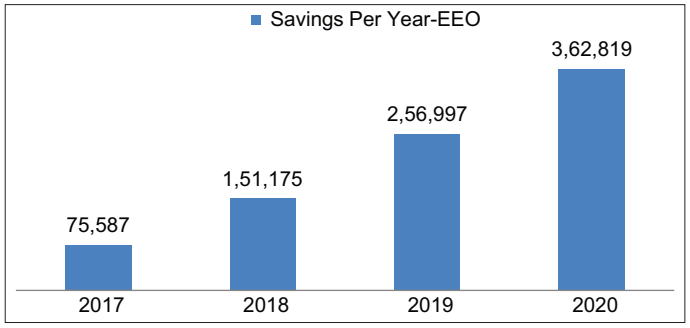
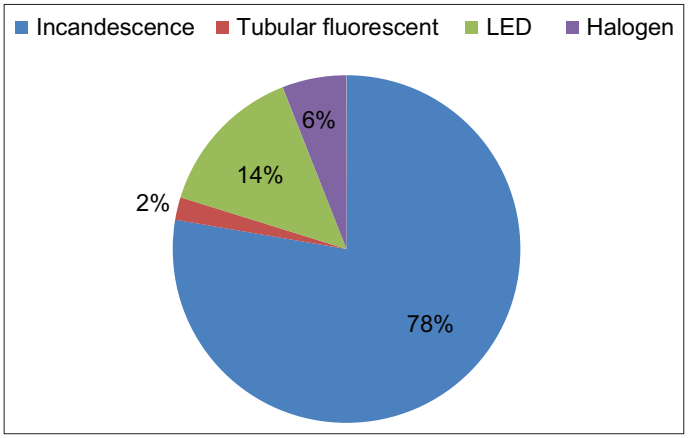


Figure 3: Blub Used in Georgia



5. DISCUSSION

Most developing countries like Georgia are attempting to implement clean and stable energy to fulfill environmental sustainability objectives. Based on the analysis, this country's electric consumption has significantly increased over the years, shown in Figure 1. According to Figure 2, it is seen energy efficiency increases drastically from 2017 to 2020. Thus, it is meaningful that the alternative policies of this country help to achieve the same amount of energy efficiency. Based on the regression, it is evident that energy use and the amount are closely related. Thus, the use of energy can increase the cost of consumption.

According to this study's literature review section, this country needs more than $2 billion required for green energy in 2030. Kazakhstan's internal audit provides the conceptual tool for green energy projects different from the government like Georgia (Bhowmik et al., 2017). The recent financial provisions promote green energy projects in Georgia. The financial process can be beneficial in terms of improving the business prospect and employment of this country. UNDP provides several financial supports to Kazakhstan and Georgia, such as loans and blended finance, to implement green energy projects (Egli et al., 2018). This kind of project in Georgia has a high up-front cost, one of the challenging factors for long-term investment in these projects (Elmustapha and Hoppe, 2020).

Based on the above discussion, it is clear that the cost and energy consumption can effectively relate to each other. Thus, the consumption of energy increases the cost of energy. Georgia has implemented alternative policies that fulfill the target amount of energy efficiency. Georgia and Kazakhstan have different financial processes in terms of Green energy projects. One of the most challenging factors is the higher up-front cost of green energy, which can negatively affect this project's long-term investment.

6. CONCLUSION AND RECOMMENDATIONS

Green energy projects are being utilized by most countries to sustain economic development and ecological enrichment. For supporting the green growth, most of the countries are thriving to develop their green finance. Georgia has a massive prospect in sustaining economic development through the persuasion of these green energy projects. However, green growth requires substantial financial investment. This paper has aimed to identify the various financial processes for pursuing green energy projects in Georgia while considering their impact on society (Gui and MacGill, 2018).

Moreover, this paper has also pointed out the associated challenges of carrying out green energy projects in the developing country, including special mention to Georgia. However, there are various challenges associated with green energy projects, as these are

more likely to have higher up-front costs and lower operational costs. This paper has gathered the secondary data to identify both countries' financial processes facilitating green energy projects.

However, to improve the financial processes, Georgia should formulate a national energy vision where the government should focus on technologies' roles. Developing a legally binding and clear target for green energy projects is integral in this regard. Moreover, the government should enhance the risk-return aspects of green energy projects within the jurisdiction. Improvement of the return expectation can be beneficial. Utilization of global finance with efficacy by leveraging and unlocking the higher private capital can facilitate green energy projects. Providing easy market access also should be undertaken by the Georgian government to ensure more sustainability. However, in the long-term, the domestic political bodies and the national governments should reduce the integrated drivers for the developing countries, including Georgia and Kazakhstan.

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