LUPINE PUBLISHERS

Lupine Online Journal of Nursing & Health care

DOI: 10.32474/LOJNHC.2023.03.000170

ISSN: 2637-6695

Research Article

Government Feedback on The Benefits of Green Energies

Maia Melikidze[1]*, Nana Gendzekhadze[2] and Garik Teymurazyan[3]

[1]*Maia Melikidze, Associate professor at BTU, Founder of RES LAB (Renewable Energy Sources Laboratory), Georgia*

[2]*Nana Gendzekhadze, Researcher, RES LAB, Business and Technology University, Georgia*

[3]*Garik Teymurazyan, Researcher, Deputy Director at RES LAB, Business and Technology University, Georgia*

***Corresponding author:** Maia Melikidze Associate professor at BTU, Founder of RES LAB (Renewable Energy Sources Laboratory), Georgia

Received: September 06, 2023 **Published:** September 28, 2023

Abstract

In the modern world, the need for energy use is increasing day by day, which is directly proportional to the rate of electricity consumption. Most of the countries of the world are facing the biggest challenges, which involves the use and generation of such energy resources that will not have harmful effects on the environment and will also bring them energy independence. The aim of this paper is to identify the recommendations for the Government of Georgia [1] based on the advantages of green and renewable resources, the specifics of consumption and the practices of international countries, the implementation of which will be a step forward in the country's energy independence. The research questions of the paper are what type of renewable energies have a perspective in Georgia. Also, to analyze what legal and economic incentives Georgia can use for the development of renewable energy. The research is focused on identifying specific results, which in turn will help us in the detailed analysis of the situation and making recommendations. The task of the research is also to study the best practices of different countries and to identify the opportunities of their integration process with Georgia.

Keywords: Renewable Energies; Green Energy; Energy Efficiency; Energy Independence; International Practice

Introduction

Global warming is a problem that the world has chosen to solve by replacing traditional energy sources with green and renewable energy sources. World leaders at the summit, COP26, held in Great Britain in 2020, decided to take a course according to which, by 2050 [2]. the emission of carbon dioxide into the atmosphere from energy facilities will be reduced to zero. At a time when 20% of Georgia is occupied by Russia, and in recent years we have been importing most of our energy from it, this increases the risk in terms of energy security. In addition, the instability of the currency often makes the price of imported electricity significantly higher. Georgia's energy landscape is characterized by a limited presence of hydrocarbon reserves, and the stable operation of the integrated energy grid requires the presence of basic power plants, which mainly use nuclear or hydrocarbon combustion energy. In addition, in the near future, it is expected that the main part of road transport will be converted to electricity, which in itself will lead to an increase in current energy consumption by almost ¼, and to obtain the necessary energy, it is desirable to put into operation green and renewable energy facilities. That is why it is vital for Georgia to be energy independent and to create an environment where energy consumption will be globally and locally effective. For the given result, Georgia should also join the above-mentioned world agenda.

The aim of this paper is to find the ways to minimize the risks expected for the transition period and to find the best experiences necessary for the transition to renewable energy on the example of successful countries. Their activities, the effects caused by these actions and its relevance in the conditions of our country should be investigated.

Results and Analysis

Energy independence stands as a fundamental pillar of a nation's security. It denotes a country's or region's capacity to fulfill its energy requirements without reliance on external primary or final energy imports. In the case of the latter, it necessitates a diversified and self-sustaining supply. Recently, politicians around the world have been actively talking about increasing domestic energy generation and reducing oil imports, which often come from places full of political tensions. The Russia-Ukraine conflict has had a profound impact on European nations, particularly concerning energy security, given that the EU relies on imports for approximately 90% of its natural gas consumption. To eliminate this situation, the European Commission has developed the plan RE Power EU, which means that Europe will become independent from Russian fossil fuels by 2030 [3]. The action plan places special emphasis on green energy and energy efficiency. Equally important is the energy efficiency, which is a measure of the useful work done by converting a unit of energy. To the extent that the conversion of energy from one form to another is associated with thermodynamic losses, efficiency is the ratio of the energy required for the process to the total energy expended in the system. The closer this ratio is to one, the more efficient the system is.

Situational Analysis: Norway

Norway's energy sector is strictly regulated by the state, especially when it comes to the use of hydro resources, petroleum products and other fossil energy resources. Foreign investors enjoy significant liberty to invest in Norway's energy sector without facing substantial constraints. This openness extends to investments in various domains such as wind energy, the establishment of small-scale hydropower plants, grid expansion, and district heating projects. However, an exception refers to large hydroelectric power stations possessing a capacity of 40 GW or more. In such cases, the involvement of non-state entities is limited to no more than one-third of the total ownership. Norwegian Government have changed the hydropower tax system, allowing energy companies to reinvest funds from the tax base, thereby helping to accelerate the modernization of existing capacity, which is more effective than creating new capacity with the same amount of funds [4].

In 2021, the Norwegian Government developed the so-called Energy Resources White Paper. The book focuses on four near-term goals:

1. Economic growth and creation of new jobs in the sector.
2. Further electrification of the country.
3. Introducing new profitable products and technologies.
4. Modernizing the oil and gas sector to reduce climate change impacts. (Jorn A. Uggerud 2021)

Situational Analysis: Denmark

Denmark has a strong tradition of extensive political energy agreements [5]. In 2012, a large majority of the Parliament reached an energy agreement, which defines the initiatives and important areas of the energy policy for 2012-2020 [6]. The Government reached agreement on a new Climate Act on December 6, 2019, which includes a legally binding target of reducing greenhouse gas emissions by 70% by 2030 (compared to 1990 levels), reaching net zero emissions by 2050 at the latest, and setting milestones based on a five-year cycle. The EU's climate and energy policy is the central framework for Denmark's national efforts. As a small country participating in the integrated Nordic electricity market, cross-border aspects of the energy system are becoming more and more relevant for Denmark. Especially in light of the growing amount of variable energy in the energy system, Denmark sees the increasing importance of a well-functioning and integrated energy market across borders. Therefore, it is increasingly important for Denmark to know the energy mix and policy, as well as cooperation with their neighboring countries [7]. A climate agreement was signed in 2020 with the aim of developing, expanding and integrating green technologies in the energy sector and industry. The strategy relies on a high level of electrification in energy sectors. One of the goals is to promote renewable energies in the heating sector by reducing electricity taxes and increasing taxes on fossil fuels used for heating.

Situational Analysis: Turkey

Liberalization of the energy market, as well as a predictable and transparent pricing process, became the main basis of the energy policy of modern Turkey. After the liberalization and privatization of the energy market in 2001, it became possible for private organizations to participate in the generation of electricity along with state enterprises. Under the Renewable Energy Support Program (YEKDEM), Turkey offers generators preferential tariffs for power plants that operate on the bases of wind; solar Hydro; Geothermal and biomass. Additional support is provided if the batteries of the facility are produced in Turkey [8]. In 2016 Turkey adopted the program (YEKA) - Renewable Energy Zones. Tender process for large-scale projects in these areas. For today, the mentioned schemes have attracted quite large private investments in renewable energy. The Turkish state recognizes that the basis of energy security lies in increasing energy efficiency, therefore, the National Energy Efficiency Program for 2017-2023 (NEEAP) was adopted, which envisages a 14% reduction in primary energy consumption in several sectors, such as: residential and administrative buildings, services, heat supply, transport, industry and agriculture [9]. (IEA 2021)

The rapid growth of Turkey's economy and population over the past two decades has led not only to a rapid increase in energy consumption, but also to the country's greater dependence on imported energy sources. 99% of consumed gas and 93% of oil is

covered by imported resources. The encouraging policies of the Turkish government in the field of renewable energy over the past decade have already produced some results. The introduction of the Feed-in-Tariff incentive tool has had an impact on the development of wind energy. For instance, if it was 1.5 terawatt hours (TWh) in 2009, it increased to 21.8 TWh in 2019 [10]. Overall, in 2021, the share of renewable energy in the total energy was 48%. This includes mainly hydro and distributed solar power.

Situational Analysis: Georgia

Georgia is facing a significant challenge - electricity consumption is increasing every year, while its generation is not able to meet the demand independently. This situation requires finding alternative ways of obtaining energy, so that the state can independently provide its own country with energy. The main source of energy resources production in Georgia are hydro power plants, which are characterized by seasonality. That is why it is necessary to find alternative ways to balance the energy balance according to the months. This situation requires finding alternative ways of obtaining energy, so that the state can independently provide its own country with energy. The main source of energy resources production in Georgia are hydro power plants, which are characterized by seasonality. That is why it is necessary to find alternative ways to balance the energy balance according to the months. The primary objectives of Georgia's energy policy revolve around ensuring energy security, safeguarding national interests, and guaranteeing a consistent supply of diverse, high-quality energy sources at affordable prices for its citizens. These goals are pursued through the following key directions in the energy policy:

a. Energy market diversification

b. Utilization of renewable resources

c. Synthesis of the country's legislation with the European Union

d. Improvement and development of energy market and trade mechanisms

e. Increasing the country's transit role in the region

f. Increasing the production and trade of clean energy

In 2019, Georgia enacted the "Energy Law," aligning itself with the legal standards of the European Union. The primary objectives of this legislation are to ensure a reliable, safe, and efficient supply of electricity while fostering a competitive, transparent, and non-discriminatory energy sector. Additionally, the law seeks to establish uniform regulations that facilitate Georgia's integration into energy unions and promote the creation of a flexible investment environment. In the same year, Georgia also passed legislation to promote the generation and utilization of renewable energy sources, with a foundation built on the requirement to align with European Union Directive 2009/28/EC. In accordance with this law, Georgia aims to achieve a 35% share of its energy supply sourced from green and renewable energy by the year 2030 [11]. Based on the 2020 energy concept project formulated by the Georgian government, renewable energies, particularly solar and wind energy, assume a crucial role. During the same year, through Resolution N403, a support framework was established to aid private investors in developing and running power plants with a capacity exceeding 5 megawatts. Under this scheme, a support duration of 10 years (8 months per year) was specified, along with a premium tariff, which supplements the equilibrium price at a specific point in time. In accordance with the adopted concept, Georgia's objectives were set while considering the fundamental principles governing the operation, organization, and functioning of the wholesale electricity market. This concept outlines four primary goals, chief among them being the establishment of an investor-friendly marketplace founded upon a competitive and transparent market model, thereby creating a conducive and appealing environment for potential investors.

Research Methodology and Interpretation

Within the framework of the research, a qualitative research was carried out, in particular, an in-depth interview with experts in the field, which in turn gave us the opportunity to get an answer to the main question of the research, what specific feedback(s) should the Government of Georgia implement in order to receive green and renewable energy benefits to become energy independent. The research findings unveiled Georgia's significant potential in harnessing green and renewable energy sources. In the short term, hydro, as well as wind and solar energies, emerged as prominent options. For the long-term perspective, hydrogen was identified as a promising avenue. It's worth noting that there were skeptical sentiments among respondents concerning the utilization of marine resources. Experts note that it is valid for the country to integrate the economic incentives tested in Europe, to suit the situations and energy circumstances (FIT; FIP; PPA CED). Also, the liberalization of the energy market is critically important. Before the state takes drastic steps in terms of green energy development, it is necessary to actively communicate with the public and raise awareness by showing the advantages of renewable energies. It was clearly mentioned that it is necessary to develop the legal framework in the direction of renewable energies and to promote scientific activities.

Conclusion

Thanks to its strategic geographical location and favorable natural conditions, Georgia possesses significant untapped potential for the active generation of energy through green and renewable resources. The paper extensively examines the primary categories of renewable energy sources, delving into their respective strengths and weaknesses. Additionally, it explores the factors that either hinder or encourage the production of green energy in the region. It is fundamentally important to create a unified strategy for the development of the sector, which in turn will be in close correlation with renewable energies, which will increase the country's energy efficiency. A strategic development plan, with strengths and weaknesses, threats and opportunities, will create a unified picture that will help the country to study and analyze the current situation in detail.

Effective steps should be taken by the government of Georgia in terms of legislation. It is necessary to modify the laws related to renewable energies together with international organizations and partners. The optimal situation for this is the analysis of the legislation of the relevant countries that correspond to Georgia, be it the Baltic countries, Denmark, Norway or others [12,13]. We can consider strengthening and modifying the legislative direction as a part of the main strategy that the country will develop in terms of renewable energies. The state should make special emphasis on preserving the green environment and climate, that is why it is important to tighten the environmental regulations from the legislative point of view. Strengthening and amending the legislative framework should be integral to the country's overarching strategy for renewable energy development. An explicit focus should be placed on preserving the green environment and mitigating climate impact. Therefore, it is imperative to enhance environmental regulations from a legislative standpoint. Elevating the quality of technical education stands as a pivotal challenge for our nation. Consequently, the government's focus on attracting investments should extend to the educational sector, as investing in education today promises to yield some of the most enduring benefits for the state. Such investments do not just yield a skilled workforce; they also foster the development of the educational sector itself, particularly in areas related to renewable energies. By strategically integrating Research and Development (R&D), innovation, and other stimulating avenues, Georgia has the potential to emerge as a regional hub in the realm of renewable energies. This transformation can catalyze not only advancements but also a continuous influx of fresh ideas and breakthroughs.

References

1. The Government of Georgia (2022) Security of Supply Report in the Electricity Sector.
2. Legislative Herald of Georgia (2016).
3. The Government of Georgia (2022).
4. Electricity Market Operator ESCO (2021).
5. Danish Energy Agency (2021) National Energy and Climate Plan.
6. Danish Ministry of Climate, Energy and Utilities, (2019) - Climate Act.
7. Daniel M, Martinez, Ben W, Ebenhack, Travis P, et al. (2018) Energy Efficiency Concepts and calculations. Chapter 1-4.
8. European Commission, Strasbourg (2022) Article Communication From The Commission To The European Parliament, The European Council, The Council, The European Economic And Social Committee and The Committee Of The Regions.
9. European commission, (2021) Article Zero Pollution and How To Achieve It.
10. IEA World Energy Investment, (2021) - World Energy Investment 2021, International energy agency.
11. IEA, (2020) - Turkey 2021 Energy Policy.
12. Jonathan N. Rogers,Bryce Stokes,Jennifer Dunn,Hao Cai,May (2016) ArticleAn assessment of the potential products and economic and environmental impacts resulting from a billion ton bioeconomy.
13. Mari Reitzel, Joran Sndvik, Aksel Tannum, Pauline Helle (2021) Alternative Energy & Power 2021.
14. Statista, Brauna Alves (2021) Distribution of electricity generation in Denmark in 2021.

DOI: 10.32474/LOJNHC.2023.03.000170