

AN OVERVIEW OF THE BUSINESS ENVIRONMENT AROUND THE GLOBE THROUGH THE MEANS OF THE PESTEL ANALYSIS FRAMEWORK – THE EXAMPLE OF THE RENEWABLE ENERGY

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Abstract

The international environment is changing at an ever-accelerating pace and there are new challenges facing the global economy on a daily basis. In this paper we will provide a brief overview of the major changes in the international business environment using the PESTEL analysis framework with the help of analysis and synthesis of several previous publications. Additionally, examples are provided in order to show how these changes are affecting the development of renewable energy. As a result of this overview, forecasts are also given for the future impact of renewable energy on the global economy.

Keywords: global business environment, renewable energy, PESTEL analysis

JEL: F62, Q43, Q42, O11, J11, P48

Introduction

Since the beginning of this decade, we have witnessed many changes in the global economic environment. The effect of these changes will have an impact on the future of the world economy and will determine the development of the society as a whole. That is why there are growing fears among some people and many business owners that a new recession and economic difficulties are on the horizon. This is due to a number of factors, such as high inflation and the corresponding rise in interest rates by the central banks in countries around the world, efforts to tackle climate change and therefore to deploy an increasing number of renewable energy systems, the rise of artificial intelligence and others. A PESTEL analysis of the main changes in the current economic environment will be presented to gain a more complete picture of the current market trends, with examples of how they are affecting the development of the renewable energy globally.

Why exactly PESTEL analysis will be used for the purposes of this study? The chosen research framework is suitable for indicating the trends in the international business environment because it takes into account a wide range of factors on

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macroeconomic level. Consequently, it serves as a holistic approach for the researcher in order to obtain information, categorize and analyze the current trends around the globe and to show how they are connected with the renewable energy.

This article will comply to the following structure:

1. Introduction – explanation of the chosen topic and its relevance;
2. Methodology – description of the methods, limitations, main aim and purpose of the research;
3. Discussion – in this part of the paper will be evaluated the major factors, which are included in the PESTEL analysis alongside with few examples of their manifestation in terms of their influence on the renewable energy sector;
4. Statistics – this section will have the goal to confirm the author's statements with available statistical data from reputable sources;
5. Global challenges to the renewable energy – it will consists of the current issues, which the sector is facing, based on the findings from this study;
6. Conclusion – it includes the summary of the topic and predictions for the near future of renewable energy;
7. References – list of all used sources.

Methodology

This paper presents a brief overview of the changes in the international business environment using the PESTEL analysis framework but also, the renewable energy sector will serve as an example in order to trace the impact from those transformations of the market conditions. The study focuses on the analysis of data from various reputable sources that are primarily related to renewable energy such as the International Energy Agency, the International Monetary Fund, the United Nations, the European Council, the Energy Institute and others. Also the sources include some high-profile journals like Bloomberg, Forbes, BBC, CNBC, Washington Post, Independent and others. The time period is focused from 2020 to 2023 in order to keep the most recent factors into consideration and to follow the latest trends across the world. By using the most recent data, there will be more value from the analysis of the study for all readers. At the end of the paper, a simple prognosis is given on the projected development of the green energy sector.

For the purpose of this study the terms “green energy” and “renewable energy” will be used as synonyms in the text, same applies to “renewable energy” and “renewable energy sources (or renewables)”. Regarding the use of the PESTEL analysis framework, another limitation has to be introduced, namely that not all factors are fully examined, but only the ones of the macroenvironment that the author considers to be the most relevant and the most important at the moment are considered. The grouping of the research components through the PESTEL

framework is only for the convenience of the reader and for easier categorization of the different influencing factors. Therefore, it is important to clarify that the author does not claim the completeness of the study or its comprehensiveness. The aim of the whole research is to present a snapshot of the current state of the global business environment and how the renewable energy sources are currently performing.

Discussion

Theoretically, the PESTEL analysis framework is an economic tool that serves to evaluate the business environment in which a company conducts its activities. There are previous studies that have theoretically explained the usage of the PESTEL analysis (Buye, 2021) and its elements (Alanzi, 2018). The relevant factors that affect the business are divided into different categories that define the acronym PESTEL or political, economic, social, technological, environmental and legal factors respectively (Washington State University, 2023). As mentioned earlier, in this study we will use the same framework, but in relation to the renewable energy.

We will begin the analysis by following the accepted sequence of factors from the default PESTEL analysis structure, while also providing examples of their manifestation and their correlation with the renewable energy sources. By doing so, we will be able to relate the theoretical setting to the practical dynamics of the international business environment.

The political factors during the previous three years had the most significant effect on the development of the renewable energy sector and the international business in general. We can divide them into the following main categories:

- Force majeure – the lockdowns and the supply chain issues from 2020 and 2021 have caused a major shift in the economy in all sectors (Siripurapu, 2021);
- Political tensions between countries and military conflicts – initially there was the problem with the increased tariffs between the USA and the EU, but also between the USA and China (Credendo, 2023). After that the military conflict between Russia and Ukraine, recently the military actions in Gaza, which are due to the Israeli–Palestinian conflict, have caused other issues to the economy like the rise in the price of crude oil.
- Trade restrictions between countries and actions by specific governments – for example Russia, Iran and North Korea are facing difficulties in their budgets and economies due to their isolation from most of world and they are left with only few trading partners.
- Measures to combat the Global warming and efforts to increase the share of renewable energy globally – many countries are investing in renewable energy and we can point out China, the United States of America and the European Union as the leaders in the energy transition (Turrentine, 2022).

- But how are those political factors affecting the renewable energy sector exactly? Since the transition towards green energy is ongoing, the current economic shocks are further increasing the speed of adopting renewables. The bottlenecks and the supply chain issues have led to changes in the procurement of raw materials closer to the home country of the plants. The conflicts and the trade restrictions have caused the increase in the prices of everything, but this also includes the conventional fuels. Therefore, the strong will of the governments to fight with the Global warming are still present and it could be supported by the example of the plans of the German government to ban the use of fossil fuel-run heating systems completely from 2045 (Amelang, 2023). It is no surprise that they are planning such an action because Germany is among the leading countries in the EU itself, which are already taking huge steps into completing the green energy transition before 2030. Their plans have faced resistance from some, but it is certain that the renewables will be the primary source of energy in the country from the next decade, given the fact that they have already shut down their nuclear power plants (Clifford, 2023).

The economic factors, together with political factors, are those that have the greatest impact on the current international environment and the international business. Their influence on green energy development is therefore crucial. The most important trends in the economy at the moment are as follows:

- High levels of inflation and consequent rise of interest rates – even after the measures, which were taken by the central banks, a lot of countries around the globe are still experiencing high levels of inflation in their economies (Neufeld, 2022);
- More cash and cash equivalents in circulation – in the United States after the quantitative easing from 2020, in 2022 started an unprecedented quantitative tightening (Miller and McCormick, 2022). Their example was followed by the central banks in other counties, but it is clear that still there is excessive cash in circulation;
- Income inequality – widening gap between rich and poor, which has caused many protests in different countries (Carothers, and Feldman, 2022).
- The levels of unemployment – so far we have witnessed only reduction in the numbers in certain sectors like the IT (Kaur, 2023), but it is expected that soon the unemployment levels will rise in other sectors of the global economy.

All economic factors are connected, but the high interest rates can limit sources of funding for new projects, including those for green energy. Also, another example is the energy insecurity and the higher prices of energy, which have caused many issues around the globe during the previous year (Keefe, 2022). The high levels of inflation and the more money in circulation are causing the prices of renewables also to rise and this is a big issue, but the eventual rise of the

unemployment could lead to more people working in the renewable energy sector and consequently to be of a benefit for their future development.

The social factors are the next category, which has to be evaluated. They include the following:

- Brain drain (from the East to the West) – it is due to the difference in the quality of life and the wages;
- Unwillingness of many youngsters to work a regular job – the so called ‘influencer syndrome’ is spreading like a wildfire across the world and the youngsters are searching for new ways to receive money without working a regular type of job, but also to get more attention from the people and to be more famous;
- Social inequality – asymmetric distribution of resources, opportunities and privileges among the society, which is based on differences in education, access to healthcare, social status, job opportunities, and living conditions;
- Aging population problem – fewer working-age people in the economy is a problem, which is more obvious in the developed countries, where the older people are surpassing in number the ones in working age or the children (Runde et al., 2021);
- Immigration – due to the previous groups (political and economic) of factors, the immigration process is a bigger issue than before. The countries in the EU have recently been affected by this.

The social factors are a major pillar for the growth of the usage of renewables. For example, the green energy faces difficulties in social terms due to the lack of sufficiently qualified personnel for the sector (Joselow, 2023). This is expected to change in the near future since there are efforts in order to satisfy the need for more workers in this sector with the introduction of new curricula in universities to teach about renewable energy, but also with the retraining of many workers from working with conventional fuels to dealing with green energy.

The technological factors are the specific category, which experienced the most rapid changes in the previous month. We can summarize them as follows:

- Rise of Artificial intelligence (AI) – the rise of AI has been a popular topic recently. It has been through a lot of improvements and has a great potential to change not only the labor market, but also the whole international business environment (McLaren, 2023);
- Incentives to invest in new technological solutions – with so much money and the rising levels of debt across the globe, the investors are keen to fund new projects that provide new technological solutions to existing problems;
- Automation and technological change – they are a part of an ongoing process, which ease the work in different areas of the business and at the same time requires less human supervision on daily basis.

The impact on the green energy from this group of factors is significant – the rise of AI could mean that in the future there could be systems, which implement

improvements in the working processes of renewable power generating stations and with the help of the artificial intelligence less energy is lost during transportation and more is put into the electric grid for further usage.

Another example is that new innovations in technology help photovoltaic cells (Perovskite) better harness solar energy (Cuthbertson, 2023). And new types of batteries help make it easier to store and transfer energy from renewables (Innovationorigins, 2023). This is a major breakthrough on the road to complete energy transition towards green energy.

The environmental factors introduce the renewable energy as the ‘hot topic’ of debate at the moment. The oil crisis from the 1970s has shown the importance of an alternative energy sources as the renewables. Nowadays the problems are the same as in the past:

- Global warming – it is not solved, but there are efforts in order to slow it down;
- Greenhouse gas (GHG) emissions – the trade with quotas for carbon dioxide are something normal at present, but there are also a lot of restrictions for the industries in order to lower the volume of GHG emissions, which are released on daily basis in the air;
- Climate change – sudden climatic swings throughout the seasons, which are out of the normally accepted measurements. The example with the climate change – July set to be world’s warmest month on record (McGrath and Poynting, 2023);
- Measures against the pollution – more precisely against the excessive use of plastic materials.

The environmental problems are the main reason why the renewable energy sources are being developed and upgraded with each day. All of the factors in this category support the rise of the green energy. For example, most of the people are not aware that methane is a far more dangerous greenhouse gas than carbon dioxide (Buchanan, 2020). This fact supports the use of renewables.

The legal factors are the last part of the PESTEL analysis framework. Currently the most important for the green energy transition are those:

Laws against air and water pollution – every country has implemented such laws in their legislation systems;

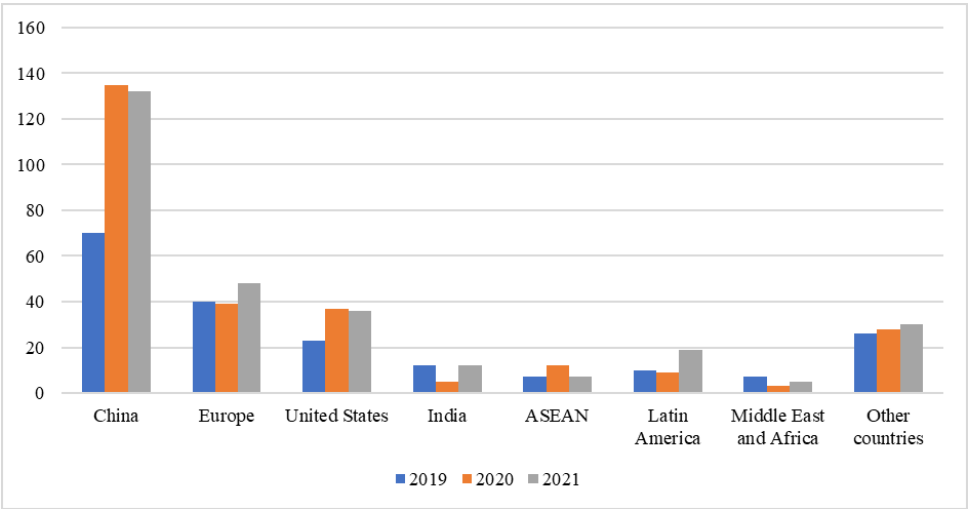
- The Paris Agreement from the 12th of December 2015 – international treaty about the climate change, which has a great impact on the decisions from the governments;
- Legislation for sustainable development – the seventeen sustainable development goals by the United Nations are the keystone for such laws. There is also an Agenda for Sustainable Development for 2030, adopted by all United Nations Member States in 2015, which provides “a shared

blueprint for peace and prosperity for people and the planet, now and into the future” (UN, 2015).

For example, the European Green Deal and Fit for 55 package (a climate goal of reducing EU emissions by at least 55% by 2030 a legal obligation). It is the current legislation framework, which has been recently introduced in the EU (The European Council, 2021). The main goal is to make the EU climate-neutral by 2050, which could only happen with the usage of renewables.

Statistics

After analyzing the elements of each of the categories of factors, we cannot help but conclude that each of them influences renewable energy to varying degrees. However, the commitment of governments around the world to address the phenomenon of Global Warming remains unchanged, so we can safely predict that the rate of growth of renewable energy use will maintain its upward trend in the years to come. In order to be able to confirm this statement we will examine some statistical data. We will start with the information about the new added capacity of renewable energy sources for the period between 2019 and 2021.



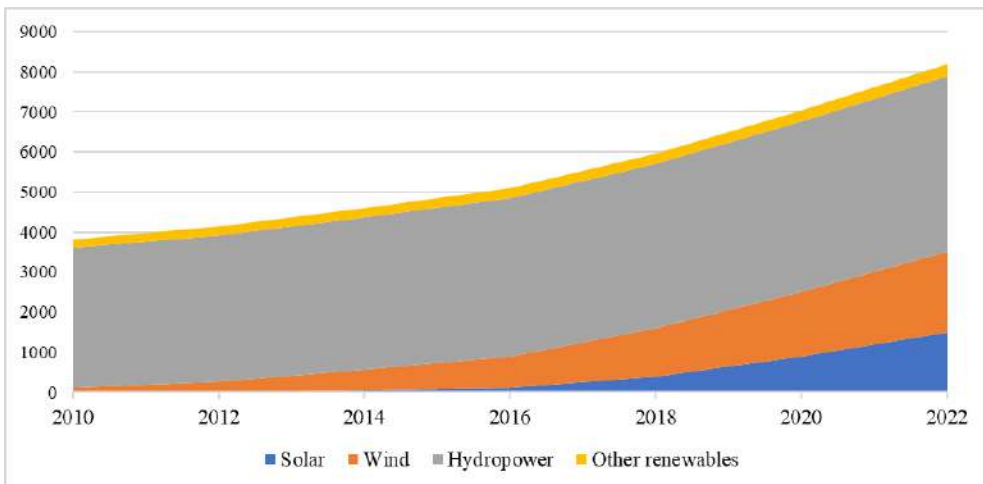
Source: IEA (2022).

Figure 1: Net capacity additions for renewables by country and region (in GW), 2019 – 2021

The data from the International Energy Agency (IEA) is reliable, because this institution is autonomous and with almost 50 years of experience. As it can be seen from the figure for the period of 2019 to 2021 China has made the most of

new capacity additions of renewables – especially in 2020 and 2021 they have added more than 125 new GW of energy on year basis. This amount is more than double of the added energy in Europe or in the United States, but also almost equal to the rest of the world, and reveals the plans of the Chinese government to invest in renewable energy and develop this sector of the energy industry. However, it must also be taken into account that the country has huge energy needs and is investing not only in renewables, but also in conventional fuels and is already building nuclear power plants. The role of the US should not be underestimated, which as an independent country has almost as much new added capacity of renewables as the total amount in the countries in Europe.

When taking into account the progress in the development of the examined sector of the economy, the actual amount of energy generated by renewables should also be taken into account. It is measured in TW per hour and shows that in twelve years the electricity generated from renewable energy source has doubled, from 4,000 TWh in 2010 to 8,000 TWh in 2022. We can therefore confidently predict that this trend will continue and will even increase in the upcoming years. Here is how the data looks like.



Source: Based on data from the Energy Institute (2023).

Figure 2: Renewable electricity generation around the globe (in TWh), 2010 – 2022

The information above is based on the data from the Statistical Review of World Energy (2023) by the Energy Institute. This is an organization, which is based in the United Kingdom with more than 70 years of history and has always provided data from energy markets. From the figure it is obvious that the hydropower has the biggest part in the renewable energy mix with almost half of the

produced energy amount, but such hydropower plants are very expensive projects and require a lot of time and money to be constructed. This is why we are observing a significant increase in the use of solar and wind power, since they are less capital intensive and are constructed in a shorter time frame. They can also be made at different scales and in the case of solar panels, even by small businesses or households for private use. The other renewables like biofuels for example, are continuing their steady growth for the whole analyzed period.

Global challenges to the renewable energy

After analyzing the current international business conditions through the usage of PESTEL analysis framework and the statistical about the added capacity and the newly generated electricity from renewable energy sources, we can also point out the problems about the completion of the green energy transition. The renewable energy faces challenges mostly due to political and economic factors and they include the following:

- Supply Issues – rising prices of raw materials due to various factors (inflation, supply chain issues, deglobalization tendencies);
- Cost and Affordability – The initial infrastructure costs for renewable energy projects are still relatively high;
- Land Use and Environmental Impact – many farmers are against the usage of agricultural land for renewable projects;
- Infrastructure and Grid Development – scaling up renewable energy may require significant upgrades to existing energy infrastructure and power grids;
- Global Cooperation and Policies – certain developing countries are opposed to stopping the usage of fossil fuels in their economies because they have existing reserves.

All these problems have their solutions, which can be found through innovations or improvements in the political, economic, social, technological, environmental and legal factors around the globe. The use of the PESTEL analysis framework is therefore suitable in this case and helps to generate a clearer picture of the current situation, challenges and paths for the renewable energy development.

Conclusion

The renewable energy sector is extremely dynamic and rapidly expanding. Therefore, it is an interesting topic for further research, and deserves a more comprehensive analysis using economic tools other than those of the PESTEL analysis framework. We are yet to see its peak of development and how it will

change the international business as a whole. However, first we need to observe whether the targets set by governments around the world for 2030 will be met.

According to the findings in the research we can make the following conclusions and predictions for the near future:

- The renewable energy sector is still facing various challenges around the globe – some of them are political, others are economic or even social;
- The current times are unusual and there will be many changes and problems for the countries in the future, but it is certain that the demand for energy will increase;
- The role of the renewables is still the same – to provide clean energy and also to secure a more sustainable and prosperous future for the next generations;
- Renewable energy adoption in more industries and financial support are the key drivers for the development of renewable energy sources;
- Supporting energy efficiency across countries can further enhance the transition to a sustainable energy future.

In this brief overview we have analyzed the business environment around the globe through the means of the PESTEL analysis framework and with the focus on its impact on the renewable energy. As a conclusion we can support the idea that in order to secure cleaner and safer future for the next generations, there is a need for even stronger global cooperation between the economies across the globe regarding renewable energy and the achievement of the goals.

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