Trend Assessment and Comparison of Primary Renewable Energy Consumption in the European Union and India: Possibilities after Covid-19 and War

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Abstract: This paper is an attempt to bring attention to the ways in which global renewable energy consumption has been transforming, by the recent shocks in the energy markets caused by the covid-19 pandemic and the war in Ukraine. Evaluating global trends would require a much more extensive study, yet this article attempts to make empirical conclusions, by observing the trend in percentage changes in unconventional energy consumption time series data, collected over the span of 10 years from the European Union and India. A trend analysis of these characteristics can be useful in making informed predictions for formulating renewable energy policies, to reduce interdependency on other countries, supply chains and political instabilities. The comparison between the European Union and India is justified on the grounds of size and their similar dependency on neighboring superpowers for fulfilling domestic energy needs. In conclusion, this study proposes to focus on the untapped potential of the EU-India relationship and to mutually strengthen their position in Europe and Asia. India has an abundance of non-renewables and the potential for generating renewable energy, which the EU can tap into, via new energy trade agreements. In exchange, the EU has the expertise and technical resources to provide backing to the energy initiatives of India.

Keywords: Renewable and non-renewable energy; primary energy consumption; geo-politics; trend analysis

1 Introduction

The aftermath of the past 3 years of a constant chaos, in global energy markets, has left a lot of economies with high inflation, higher cost of living and above all, steep rises in energy prices and supply crisis. The turmoil was largely cause due to the onset of the global Covid-19 pandemic followed by the political unrest in the Russia-Ukraine region leading up to a still on-going war that continues to put pressure on major economies to reform and redirect their energy acquisition strategies to other regions or to more sustainable, domestically available and renewable sources of generating energy to fulfill their population's needs without causing a total collapse of their currency and economy. A number of economies were attempting to recuperate from the effect of Covid-19 all through 2020-21, and now and again managing the post-pandemic rises in prices of energy like oil, gas, and petroleum, the annexation of Ukraine by Russia and the accompanying conflict escalated the energy emergency in the European Union.

The actual barriers put on supply pipelines by Russia and the resulting sanctions placed on Russia for trading have disturbed the energy exchange and brought about skyrocketing energy costs. Based on the insights from World Bank, energy costs are expected to exhibit about 50% increment in price by the end of 2022, which along with different effects of the war might direct the worldwide economies to a recession of a magnitude that has never been experienced in the past. As the EU has critical energy requirements fulfilled from Russian supplies which account for approximately 40% of gas, 25% of fuel, and about half of coal needed in normal conditions. The international unrest pushed the energy emergency in EU, bringing about severe disagreements among the constituting EU states on successfully formulating strategies for sustainable energy consumption and acquisition that could ensure energy security for the member states harmoniously and fairly.

India's stand on the Russian intrusion into Ukraine has been different from the majority of other governments and among U.S. vital accomplices. Regardless of its disagreement with the Ukrainian conflict, the government of India has embraced a neutral stance in the situation. It has avoided giving support to sanctioning Russia in the United Nations Security Council and Human Rights Council. India didn't cast a vote even in the United Nations general assembly on a proceeding that censured Russian animosity in Ukraine and up to this point has declined to openly acknowledge Russia as the agitator of the emergency. India's neutrality has been disheartening on the grounds that it instigated a sharp disparity in US-India relations on a matter of global scale which is utilizing power to annex a democratic country's regions through a glaring conflict beyond any reason. No matter what their perspectives were at the beginning and during the onset of the war, most prominent Indian leaders concede their country's discretionary nonpartisanship. It is in other

words, “soft-support” of the Russian intentions. This appears to be especially hypocritical since India stands side by side with the US in restricting Chinese forces in the Indo-Pacific while simultaneously seeming lenient toward the boundlessly more terrible Russian actions in Europe.

2 Literature Review

The Covid-19 pandemic has had a significant impact on global renewable energy consumption. Renewable energy consumption has been affected due to the decrease in economic activity, disruption of supply chains, and reduced investments in clean energy. The war in Ukraine has also had an impact on renewable energy consumption as the conflict has disrupted energy supply networks and prevented new investments in renewable energy projects. About the reaction of the war on the European Union, Umar et al. quote that EU was the first clean and conventional energy market that suffered an immediate set-back from the day 1 since the escalation of the war in Ukraine [1]. Additionally, the decrease in oil prices has reduced the incentive to invest in renewable energy, leading to a decrease in renewable energy consumption. While supporting Ukraine may also help the European Union to tap into the abundance of critical resources available within the regions of Ukraine when the market prices are as low as in 2022 [2].

The European Union (EU) and India have both experienced a decline in renewable energy consumption due to the impacts of Covid-19 and war. In the EU, the decline in renewable energy consumption has been primarily due to the decrease in demand for electricity caused by the pandemic. As in the case of Hungary, a member of EU since 2004 but not a part of the Euro-zone suffered due to the energy price shocks and it had an effect on the currency exchange rates too[3]. The inflation in the Euro-zone as well as in the members of the EU will evidently keep increasing in the foreseen future if the Ukraine-Russia conflict continues [4].The EU can also exchange its experience and technology to support a post-war Ukraine to rebuild itself using the technology to produce and store unconventional energy resources such as solar and wind energy [5]. Ukraine itself is currently is still heavily dependent on conventional energy as many post-Soviet Union countries with high carbon-footprint [6].

In the context of India, the ties between India and Russia are far to complex and go deeper than just trade and geopolitical cooperation and the inter-dependency creates a sense of neutral stance of India in the conflict [7]. In India, the decline has been due to a combination of factors, including reduced economic activity, the impacts of conflict in Kashmir, and the lack of access to funds for renewable energy projects [8]. In the EU, renewable energy consumption decreased by 5.3% in 2020 compared to 2019, while in India it decreased by 4.3%. This decline was especially pronounced in the EU due to the significant drop in electricity demand in the wake of the pandemic. In comparison, India's decline was due to a combination of factors,

including a significant decrease in economic activity, the conflict in Kashmir, and the lack of access to funds for renewable energy projects. The outlook for renewable energy consumption in both the EU and India is uncertain. In the EU, renewable energy consumption is expected to rebound in 2021, although the growth rate is likely to be lower than pre-pandemic levels. In India, the outlook is less certain, as the impacts of the pandemic.

The COVID-19 pandemic had a significant impact on electricity prices in the European Union (EU). In the early stages of the pandemic, electricity demand decreased significantly as a result of lockdowns and other measures to curb the spread of the virus. This led to a drop in electricity prices, as excess supply outstripped demand. In the latter stages of the pandemic, as economies began to recover and demand for electricity increased, prices began to rise again. Based on the evidences from Italy shared by Pizarro-Irizar in a recent article, the effect on the electricity cost in the country due to the pandemic was rapid, significant but not long-lasting [9].

Overall, the impact of COVID-19 on electricity prices in the EU was complex and varied, depending on the specific circumstances in each country. Some countries saw prices decline, while others saw prices rise. The specific impact on electricity prices also varied depending on the type of electricity generation and the mix of sources used in each country.

2.1 Impact on Accessibility to Energy

The accessiblity to renewable energy is different in developed and developing countries around the world. A typical assumption is that India would have lesser access to renewable energy resources but statistically it has been the biggest consumer of renewable energy besides super powers like the United states and China [10]. The Covid-19 pandemic has had a significant impact on renewable energy consumption in the world. The pandemic has caused a decline in the number of people who are able to access clean energy, and this decline has had a knock-on effect on the renewable energy sector. In particular, the Covid-19 pandemic has led to a decline in the number of people who are able to access solar energy, as this technology is particularly reliant on sunlight. This has had a knock-on effect on the global market for solar panels, and this has led to a decline in the price of these panels. In addition, the Covid-19 pandemic has led to a decline in the number of people who are able to access wind power, as this technology is particularly reliant on wind. This has had a knock-on effect on the global market for wind turbines, and this has led to a decline in the price of these turbines.A 2017 study by Acemoglu, suggests that a sudden focus on renewable energy, over non-renewable energy sources, can cause a price instability in the energy market and hence have an effect on the welfare of society or purchasing power of the countrys' population [11].

2.2 Determinant Factors of Renewable Energy Utilization which were Affected by COVID-19 and War

There are several factors that can affect the development of renewable energy sources. The determinants factors within the European Union were studied by Tu et al. in 2022 and concluded that highly developed economies with high employment in the advanced technology industry, sustainability driven policies and high economic freedom per capita were the biggest driving forces for improvement in renewable energy and its consumption [12]. The common determinents for alternative energy consumption between European Union and India are:

- Government policies and incentives: Both the EU and Indian governments play a significant role in promoting the development of renewable energy through policies such as subsidies, feed-in tariffs, and renewable portfolio standards through various programs implemented over the years.
- Technological advancements: As renewable energy technologies improve and become more cost-effective, it becomes easier to develop and deploy them. In India there is a necessity to rapidly develop technologies which can manage to sustain the demands of the large population.
- Natural resources: Some regions may have an abundance of natural resources such as sunlight or wind, which can make it easier to develop renewable energy projects. Both the EU and India have huge potential for producing energy from windmill and solar panel installations.
- Public attitudes: Public attitudes towards renewable energy can also play a role in its development. If the public is supportive of renewable energy, it may be easier to gain political and financial support for projects. There is a sudden change in the perception of the masses all over the world after the pandemic and the energy crisis due to the war. People have come to the realization that every single individual is directly or indirectly afftected by the disruption caused by these unprecedented events.
- Financial considerations: The cost of renewable energy technologies is an important factor in their development. As the cost of renewable energy continues to decline, it becomes more competitive with traditional energy sources. Due to technoligical advancements, the cost of producing and distributing renewable energies has come to a very competive level with usual energy supplies and not at a premium anymore.
- Energy demand: The demand for energy can also influence the development of renewable energy. As demand increases, the need for new energy sources may drive the development of renewable energy technologies. It is common knowledge that non-renewables are on consistant depleting curve and are not replenishable but the demand for energy is ever increasing in contrast to the availability.

In a 2022 study, Olabi et al. suggest that a governmnt driven stimulus package can help recover from the disruption that the energy market is facing due to the war and continued affects from 2019 due to the pandemic [13]. The European Union (EU) has implemented a number of policies and incentives to promote the development of renewable energy. Below is a table comparing the various initiatives, programs and incentives implemented and encouraged by the European Union and the Indian government:

Table 1

Comparision of Government initiatives for Renewable energy development

Initiatives	India	European Union
Renewable energy directive		The EU's Renewable Energy Directive sets targets for member states to achieve a certain share of their energy mix from renewable sources by a certain date [14].
Feed-in tariffs	The Indian government provides feed-in tariffs to support the development of renewable energy projects, with higher tariffs for certain technologies such as solar and wind [15].	These are financial incentives that support the development of renewable energy by providing a fixed payment for every unit of electricity produced from renewable sources [16-17].
Renewable energy support schemes/funding	The government provides financial support to help cover the costs of developing renewable energy projects, such as through grants and low-interest loans [18].	These schemes provide financial support to help cover the costs of developing renewable energy projects, such as through grants or low-interest loans [19].
Renewable energy quota systems/obligations	Under these obligations, power distribution companies are required to source a certain percentage of their power from renewable energy sources [20].	Under these systems, energy companies are required to source a certain percentage of their energy from renewable sources or purchase credits from renewable energy producers [21].
Tax incentives	The Indian government offers tax incentives for the development of renewable energy projects, including income tax exemptions and customs duties exemptions on certain equipment [22].	

3 Methodology

The method that can be used to compare time series data on renewable energy consumption between EU and India are statistical test such as a Mann-Whitney U test or a Wilcoxon rank-sum test to compare the two time-series. These tests are similar to the two-sample t-test, but they are more robust to violations of the assumptions of normality that are required for the t-test. The Mann-Whitney U test was developed by Henry Mann and Donald Whitney in the 1930s. It is also known as the Mann-Whitney-Wilcoxon test, the Wilcoxon rank-sum test, or the U test [23].

The Mann-Whitney U test is a nonparametric statistical test that is used to compare the median of two independent samples. It is often used in social science research because it does not assume that the data is normally distributed, which is a common assumption for many parametric statistical tests. The test can be used to determine whether there is a statistically significant difference between the two samples in terms of the median value of the variable being measured. The test is often preferred in social science research because it is less sensitive to deviations from normality than parametric tests, and it can be used with small sample sizes. To interpret the result of a Mann-Whitney U test, we look at the test statistic (U) and the p-value. The test statistic is calculated based on the ranks of the values in the two samples, and it reflects the difference between the two samples. The p-value is the probability of obtaining a test statistic at least as extreme as the one observed, given that the null hypothesis is true.

If the p-value is less than the alpha level (the level of statistical significance that has been chosen), then it can be concluded that there is a statistically significant difference between the two samples. In other words, the difference between the two samples is not likely to have occurred by chance alone.If the p-value is greater than the alpha level, then the null hypothesis cannot be rejected, and the conclusion is that there is not a statistically significant difference between the two samples.In this study we have utilised the Mann-Whitney U test which is a statistical test that is used to determine whether there is a significant difference between the means of two independent samples.

To perform a Mann-Whitney U test, we first needed to organize the data obtained from source into two separate samples, one for each country. We acquired our data from a highly acclaimed and trusted secondary data source for energy related statistics called the ourworldindata.org. The data was prepared for the calculation by adding up the renewable energy consumption from solar, wind, hydro and other renewable energy resources as total to be used for the nominal variable used for the analysis. We then calculated the means and standard deviations of each sample, and used these values to compute the Mann-Whitney U value. This resulting value is a measure of the difference between the means of the two samples, standardized by the standard deviations of the samples.

If this value is significantly different from 0, it suggests that there is a significant difference between the means of the two samples, and that this difference is unlikely to have occurred by chance. In this case, with a value of 8, we can conclude that there is a significant difference in energy consumption between the two countries.

The details of the method are elaborated as below:

To reach conclusive evidence for the topic understudy we came up with the below null and alternative hypothesis. Then based on the descriptive statistics produced by inputting the data sets, a Mann-Whitney U test was performed to test the hypothesises.

Null hypothesis	**Alternative hypothesis**
There is no difference between the European Union and India groups with respect to the dependent variable total renewable energy consumption (TWh)	There is a difference between the European Union and India groups with respect to the dependent variable total renewable energy consumption (TWh)

Table 2

Descriptive statistics

		N	**Mean**	**Median**	**Standard deviation**
Total renewable energy consumption (TWh)	European Union	10	28.39	20.46	22.63
	India	10	81.52	77.83	42.55

The results of the descriptive statistics show that the European Union group had lower values for the dependent variable Total renewable energy consumption (TWh) (Mdn = 20.46) than the India group (Mdn = 77.83).

Table 3

Mann-Whitney U

	Values
Mann-Whitney U	8
Z	-3.17
Asymptotic Significance (2-tailed)	0.001
Exact Significance (2-tailed)	0.001

The result of the Mann-Whitney U-Test showed that the difference between European Union and India with respect to the dependent variable Total renewable energy consumption (TWh) was statistically significant, U=8, p=.001, r= 0.71. Thus, the null hypothesis is rejected.

The results show that there is a significant difference between the consumption between EU and India and also that, India consumes much more renewable energy compared to the European Union. Thereby, the effect of Covid-19 and the war would be much more adverse on the economy of the European Union which is much more dependent on the traditional forms of energy generation compared to India which has been tapping into the renewable resources since before the pandemic and the war.

4 Discussion

The COVID-19 pandemic has caused a global economic recession, and the EU has been hit particularly hard due to its reliance on international trade and tourism. Many countries in the EU have implemented lockdowns and other measures to slow the spread of the virus, which has disrupted supply chains and led to a decline in consumer spending. The economic downturn has also led to job losses and an increase in government debt as countries have implemented fiscal stimulus measures to support their economies.

The conflict in Ukraine has also had negative economic consequences for the EU. The conflict has resulted in economic sanctions being imposed on Russia, which is a major trading partner for many EU countries. The sanctions have disrupted trade and led to economic losses for both the EU and Russia. In addition, the conflict has led to an increase in energy prices, as the EU relies on Russia for a significant portion of its energy needs. The increase in energy prices has had a negative impact on the EU's economic growth. The European Union (EU) has made a significant contribution to the development of renewable energy in its member countries. The EU has set ambitious targets for the use of renewable energy, including a goal of achieving at least 32% of the EU's energy consumption from renewable sources by 2030. To achieve this goal, the EU has implemented a number of policies and programs to support the development of renewable energy. The Renewable Energy Directive, which sets binding targets for the use of renewable energy in the EU and provides a framework for promoting renewable energy at the national and EU level.The European Investment Bank, which provides funding for renewable energy projects in the EU through loans, guarantees, and other financial instruments.

The European Fund for Strategic Investments, which helps to finance renewable energy projects and other investments that support the transition to a low-carbon economy.The Horizon 2020 research and innovation program, which provides funding for research and development projects related to renewable energy, including projects focused on developing new technologies and improving the efficiency of existing technologies.Overall, the EU has played a key role in supporting the development of renewable energy in its member countries and promoting the transition to a low-carbon economy.

On the other hand, India has a rapidly growing economy and a large population, and as a result, energy demand in the country has been increasing over the past several decades. Between 2010 and 2019, India's primary energy consumption increased by an average of 5% per year. The main sources of energy in India are coal, oil, and natural gas, and the country is also increasing its reliance on renewable energy sources such as solar and wind power. In recent years, India has implemented various policies and initiatives to increase energy efficiency and reduce the country's reliance on fossil fuels. These efforts have included the implementation of energy efficiency standards for buildings and appliances, the expansion of renewable energy generation capacity, and the promotion of electric vehicles.

India has a diverse mix of renewable energy resources, including solar, wind, hydropower, bioenergy, and geothermal energy. Solar energy is a particularly important renewable resource in India. The country has a large solar potential due to its abundance of sunshine, and it has made significant investments in solar power generation in recent years. As of 2021, India had an installed solar power capacity of over 40 GW, making it one of the largest solar markets in the world. The government has set a target of achieving a total installed solar power capacity of 100 GW by 2022.

Wind energy is also an important renewable resource in India. The country has a large wind energy potential, particularly in the coastal areas and in the western and southern states. As of 2021, India had an installed wind power capacity of over 48 GW, making it the fourth largest wind market in the world. Hydropower is another important renewable resource in India. The country has a large hydropower potential, with a total installed capacity of over 45 GW as of 2021. The government has set a target of achieving a total installed hydropower capacity of 145 GW by 2024.Bioenergy, including biomass and biofuels, is another important renewable resource in India. The country has a large potential for bioenergy production, particularly from agricultural residues and forestry waste. As of 2021, India had an installed bioenergy capacity of over 10 GW. Geothermal energy is a lesser-known renewable resource in India, but the country has a small potential for geothermal power generation. As of 2021, India had an installed geothermal power capacity of just over 0.5 GW.

The European Union (EU) and India are both large, diverse regions with a range of technological capabilities. the EU and India have a strong trade relationship and have signed a number of agreements to promote cooperation in various sectors, including energy. For example, the EU-India Energy Dialogue is a forum for discussing energy issues and promoting cooperation in areas such as renewable energy, energy efficiency, and clean coal technology. In addition, the EU and India have signed a Memorandum of Understanding on Energy Cooperation, which aims to strengthen their partnership in the energy sector through exchanges of information, technical assistance, and research and development.When comparing the level of each regions capability in tackling with the disruption caused by Covid-

19 and the war, we also have to consider the comparison of advanced technology the production and implementation of these resources in these two regions:

Research and development: The EU is known for its strong research and development sector, with many world-class universities and research institutions. It is a leader in fields such as biotechnology, renewable energy, and information and communication technologies (ICT). India also has a growing research and development sector, with a particular focus on software engineering and IT services.

Infrastructure: The EU has a highly developed infrastructure, with advanced transportation systems, reliable electricity and water supplies, and widespread internet access. India's infrastructure is not as well-developed, with some significant disparities between urban and rural areas.

Industrial base: The EU has a diverse industrial base, with strong manufacturing sectors in fields such as automotive, aerospace, and pharmaceuticals. India's industrial base is also diverse, with a particular focus on textiles, chemicals, and engineering.

Overall, it is difficult to make a direct comparison between the level of advanced technology in the EU and India, as both regions have their own strengths and areas of focus. However, the EU is generally considered to be more technologically advanced in due to its strong research and development sector and well-developed infrastructure.

The discussion below follows the interpretations made by observing the changes in percentage consumption of energy from eight different energy sources namely, coal, gas, oil, solar, wind, nuclear, hydro-power and some other resources of renewable energy. It is important to highlight that for better representation, the graphs are divided between the no-renewable and renewable energy consumption categories. The differentiation also assists in comparing the dependency on each type of resources. The first figure is the representation of the percentage change in utilization of non-renewable energy within all the member countries of the European Union.

As represented in Figure 1, in the span of 9 years between 2012 to 2020, the EU had gradually decreased its dependency overall on all the non-renewable energy sources but after the set-back from Covid-19 pandemic, there seems to be a drastic increase in the consumption of these resources in 2021. The least amount of deviation, thereby stable demand in EU is for gas. The change in consumption of coal increased only in 2021 out of all 10 years in comparison. This is evidence of the effect of the pandemic on the energy consumption volumes in the region.

Figure 2 depicts the percentage change in the consumption of renewable energy resources in the European Union between 2012 to 2021. As per observation, it can be interpreted that the after the onset of pandemic, regions in the European Union started to increase the consumption of nuclear and other unconventional energy

resources, while the usage of hydro and wind generated energy reduced from 2019 to 2021.

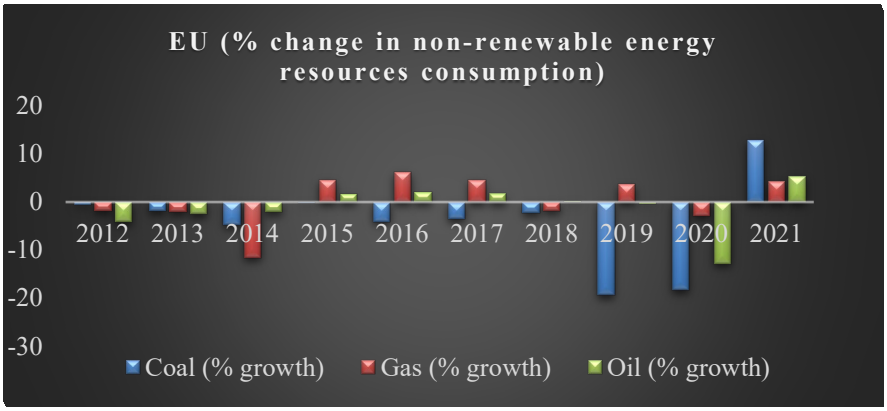

Figure 1
OurWorldInData.org [24]

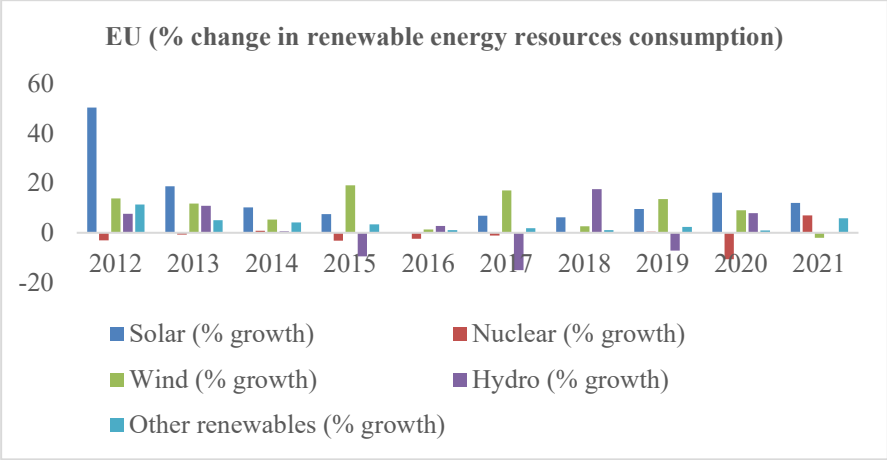

Figure 2
OurWorldInData.org [24]

Figure 3 represents the same statistics as in Figure 1 but in the case of India in the span of 10 years. In 2021, we see the largest spike in the utilization of coal as a source for conventional energy while in 2020 both coal and oil consumption were much lower due to long and strict lockdowns put into action by the government of India to curb the spread of coronavirus. Therefore, once the lockdowns were lifted, we can see an increase in demand for all kinds of fuels and energy.

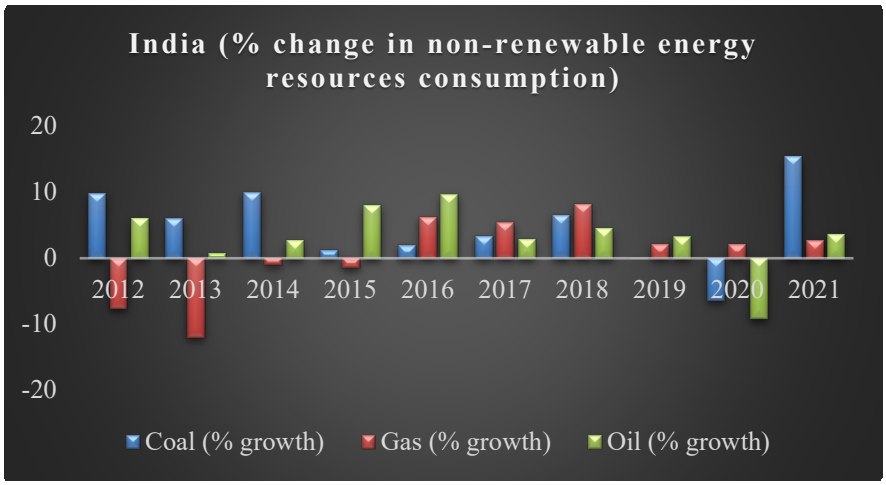

Figure 3
OurWorldInData.org [24]

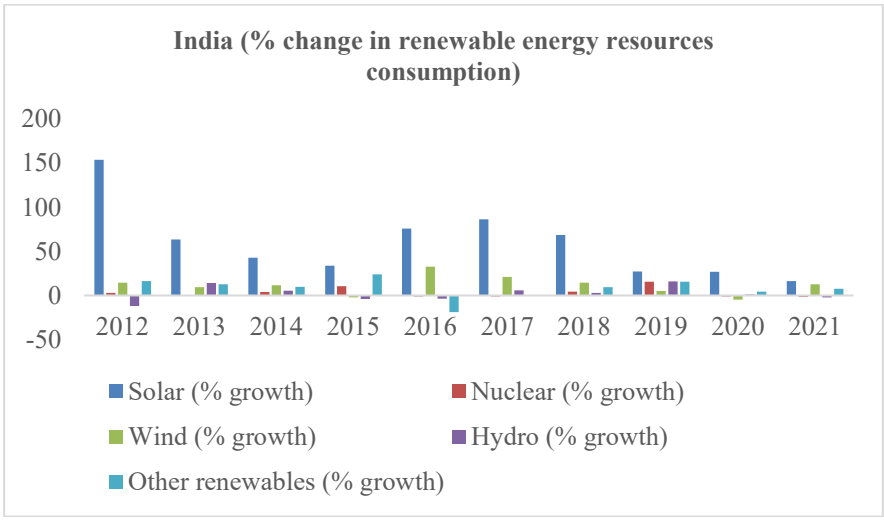

Figure 4
OurWorldInData.org [24]

The above Figure 4, is also the same statistic as Figure 2, for India and it portrays the inferences from the literature that we found that India has already been at the forefront of development, acceptance, implementation and consumption of renewable and unconventional energy resources compared to the European Union and therefore, no drastic or unusual trend is observed. Nonetheless, it can be still noted that the overall it was more volatile until 2019 before the onset of the Covid-19 pandemic.

Conclusions

This paper discusses the impact of the COVID-19 pandemic and the war in Ukraine on global primary energy consumption. It uses data from the European Union and India to evaluate trends in primary energy consumption over the past 10 years and make predictions about the future. The authors suggest that a focus on the relationship between the EU and India could help both regions strengthen their positions in Europe and Asia, with the EU providing expertise and technical resources to support India's energy efforts and India offering non-renewable and renewable energy resources to the EU through new trade agreements. The paper concludes by proposing that such a partnership could help reduce dependence on other countries and political instability.

The COVID-19 pandemic has had a significant impact on the non-renewable energy sector. The sharp drop in global demand for energy due to lockdowns and economic downturns has led to a decrease in the price of oil, natural gas, and other fossil fuels. This has had a negative impact on the profitability of many non-renewable energy companies, and some have had to reduce production or shut down operations temporarily. In addition, the pandemic has disrupted supply chains and transportation systems, which has affected the production and distribution of non-renewable energy sources. Finally, the focus on renewable energy and the push to reduce carbon emissions in response to the climate crisis has gained renewed momentum during the pandemic, leading to increased competition for non-renewable energy sources.

Wars can have a significant impact on the global energy market, as they can disrupt the production, transportation, and distribution of energy resources. Though we can use different economic models based on historical experiences to predict the implications of the Russia-Ukraine conflict, the outcomes of war in the modern world can be drastically different and long-lasting as seen in not so old geo-political crisises. The situation of resource rich Russia can be identical to the oil-producing regions, such as the Middle East and North.

Africa, where crisis lead to shortages and price spikes, as happened during the Gulf Wars in the 1990s. Wars can also lead to the destruction of infrastructure, such as oil rigs and pipelines, which can disrupt production and transportation. Additionally, the uncertainty and instability caused by wars can discourage investment in energy projects, leading to a decline in production and supply. Overall, wars can have significant and long-lasting impacts on the global energy market and can lead to significant economic consequences for both the affected region and the global economy.

The way forward from here, can be to await the more comprehensive data and statistics published for 2022 in 2023 and perform extensive studies further with different combination of countries and entities like European Union, to predict the effect of such crisis and conflicts in the future.

The limitations we faced in the formulation of this article were as fundamental as not having access to the latest and factual developments in the conflict in real time and therefore, the situations discussed here may change rapidly within a matter of days. Another limitation was the lack of availability of data for the year of 2022, which will only be published by the source in 2023.

Conflict of Interest

The authors declare no conflict of interest.

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