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SOME VIEWS ON RENEWABLE ENERGY MARKETING DUE TO CLIMATE CHANGE IMPACTS*

Mustafa Seçkin ŞALVARLI**

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Abstract

Currently, two-thirds of greenhouse gas emissions come from the energy sector, and many energy plans still lag behind the required emission reductions. The increasing impact of global warming makes it important to take urgent measures. Renewable are predicted to account for at least two-thirds of the total final energy supply by 2050. Key strategies concern energy savings for those who demand, efficiency improvements in power generation, and the substitution of a variety of new and renewable energy sources for fossil fuels. Climate change, which is a global problem, requires a global solution. The most important effects of climate change are heavy downpours, strong storms, heat waves, melting ice-field, droughts, reduced food security, pests and diseases. Climate changes can significantly affect the availability, reliability and affordability of energy supply systems. An effective strategy will require the commitment and action of all developing and developed countries. It is known that some climate-related policies need additional revisions in order to achieve the desired levels in the energy sector. The fundamentals of marketing can be applied to renewable energy marketing, as has been extensively stated in the literature. Climate protection aspects partially convert renewable energy into the public good.

Keywords: Renewable energy, climate change, environment, sustainable development, marketing

İKLİM DEĞİŞİKLİĞİ ETKİLERİ NEDENİYLE YENİLENEBİLİR ENERJİ PAZARLAMASINA İLİŞKİN BAZI GÖRÜŞLER

Özet

Şu anda, sera gazı emisyonlarının üçte ikisi enerji sektöründen gelmekte ve birçok enerji planı hala gerekli emisyon azaltımlarının gerisinde kalmaktadır. Küresel ısınmanın artan etkisi acil önlemler almayı önemli kılmaktadır.

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∗∗ Öğr. Gör. Dr., Dokuz Eylül Üniversitesi İzmir Meslek Yüksek Okulu, (e-posta: mustafa.salvarlı@deu.edu.tr, **ORCID ID:** 0000-0002-5306-5655).

Yenilenebilir kaynakların 2050 yılına kadar toplam nihai enerji arzının en az üçte ikisini oluşturacağı tahmin edilmektedir. Kilit stratejiler, talep edenler için enerji tasarrufu, elektrik üretiminde verimlilik iyileştirmeleri ve fosil yakıtlar yerine çeşitli yeni ve yenilenebilir enerji kaynaklarının kullanılması ile ilgilidir. İklim değişikliği küresel bir sorundur ve küresel bir çözüm gerektirir. İklim değişikliğinin en önemli etkileri şiddetli sağanaklar, kuvvetli fırtınalar, sıcak hava dalgaları, eriyen buz kütlesi, kuraklıklar, gıda güvenliğinin azalması, zararlılar ve hastalıklardır. İklim değişiklikleri, enerji tedarik sistemlerinin mevcudiyetini, güvenilirliğini ve satın alınabilirliğini önemli ölçüde etkileyebilir. Etkili bir strateji, tüm gelişmekte olan ve gelişmiş ülkelerin taahhütlerini ve eylemlerini gerektirecektir. Enerji sektöründe istenilen seviyelere ulaşılabilmesi için iklimle ilgili bazı politikaların ek revizyonlara ihtiyaç duyduğu bilinmektedir. Pazarlamanın temelleri, literatürde kapsamlı bir şekilde belirtildiği gibi yenilenebilir enerji pazarlamasına uygulanabilir. İklim koruma unsurları, yenilenebilir enerjiyi kısmen kamu yararına dönüştürür.

Anahtar Kelimeler: Yenilenebilir enerji, iklim değişikliği, çevre, sürdürülebilir kalkınma, pazarlama

Introduction

Procuring energy at affordable prices and meeting national energy needs are key challenges in strategy plans for many countries. Government policies should provide energy subsidies while reducing consumer expenses and regulating production costs. Therefore, the burden of the state will increase (Tampubolon and Setyoko, 2019).

Green energy innovation and societal marketing needs must be addressed and countered by strong government guidance and funding (Ruan et al., 2020). As will be known, green energy innovations promote the use of renewable and sustainable energy sources, such as solar, wind, hydro, and geothermal power. They refer to the development and implementation of new technologies and practices. Thus, the dependence on fossil fuels is reduced and the impacts of climate change are mitigated. On the other hand, In the context of green energy innovation, societal marketing can help to promote the adoption of renewable energy sources to create incentives for the transition to a more sustainable energy system. While raising awareness of their benefits, highlighting the consequences of relying on fossil sources, and working with governments and communities, both of green energy innovation and societal marketing need to work together to drive the shift towards a more sustainable energy future.

The demand for responsible consumption, production and prevention of waste generation is becoming more and more important due to issues such as the consumption of global resources, environmental effects, social and economic concepts (Lakatos et al., 2018).

Traditional fossil resources largely meet the current energy supply and use. Technologies that improve human, economic, social and environmental conditions will need to be developed to meet current and future demands. Global politics and economic situation, technology and energy policy

and market development can be counted among the very important factors that shape the future of energy (Salvarli and Salvarli, 2020; UN, 2015).

Cost, market share and policy issues are the main obstacles to the development of renewable energy. Many countries have developed energy policies to support the sustainable development of parameters such as economic, social and industrial. Rapid industrialization and human labor are the main reasons for the increase in environmental pollution. Energy-related factors such as use, security, pricing, policy, practice and technology will cover the foundations of sustainable development.

Countries implementing the low carbon policy planned to stimulate new markets for technological innovation. Standardized equipment and materials should also be used to support power generation, transmission, distribution and trading (Salvarli and Salvarli, 2020; Levidow and Raman, 2020).

Renewable energy is called clean energy and is generally obtained from continuously renewed natural resources. One of the important environmental and social impacts identified regarding renewable power plants may be climate change (Bilagi et al., 2021).

Thanks to energy innovations that increase regional energy values such as stability, reliability, democracy and independence, national modernization and security imaginations are being developed. Other studies on energy values focus on energy transitions, low-carbon futures and smart grids (Levendaa et al., 2018)

As defined in (Stephenson et al., 2021), energy culture of a country relates to its national decision-making structure and can be chosen as the interaction between regular, stable, traditional and policy-relevant characteristics. It is argued that increasing national low-carbon achievements is strongly associated with cultural actions such as elections, policies and investments. The current and future roles of energy in each country provide varied prospects and implications for low carbon levels.

On the other hand, it is argued that many of the production units are inefficient, uneconomical and not satisfied with ecological standards, so they should be removed from use in the near future. The great significant pillars of a country's energy policy are energy security, competitiveness, improving the energy efficiency of the economy and impact factors on the environment (Gawlik and Mokrzycki, 2019).

Renewable will have the fastest growth in the world electricity sector, producing 28% of total generation in 2020 and providing 88% of total generation to achieve net zero CO_2 emissions and to limit the global temperature rise to 1.5 °C by 2050. As also pointed out in the literature, solar PV and

wind energies continue to grow in the electricity sector, and are expected to meet about 55% of global electricity production by 2050.

Renewable energy sources such as solar energy, wind energy, hydropower, biogas energy and geothermal energy are continuously renewable resources that are used to meet the energy needs of people. According to the data given in the literature, usage rates of these renewable energy resources are shown as Table 1-4 (IEA-c, 2019; IEA-b, 2018).

Resources	Share (%)
Oil	31.8
Coal	27.1
Natural gas	22.2
Biofuels and waste	9.2
Nuclear	4.9
Hydro	2.5
Solar, wind, geothermal and tidal	1.8
Other	0.3

Table 1. Fuel Shares in World Total Primary Energy Supply, 2017 (IEA-c, 2019)

Sector	Share (%)
Residential, commercial and public	41.7
Electricity plants	35.1
Industry	10.5
Transport	4.4
Combined heat and power plants	3.0
Heat plants	0.5
Other	4.8

Table 2. World Sectoral Consumption of Renewables, 2017 (IEA-c, 2019)

Resources	Share (%)
Coal	38.5
Natural gas	23.0
Hydro	16.0
Nuclear	10.3
Solar, wind, geothermal and tidal	6.5
Oil	3.3
Biofuels and waste	2.0
Other	0.4

Table 3. Fuel Shares in World Electricity

Production, 2017 (IEA-c, 2019)

	Year	
	2017	2023
	Share (%)	
Renewable electricity	23.9	29.4
Renewable heat	10.3	11.8
Biofuels in road transport	3.4	3.8

Table 4. Shares of Renewables, 2017 and 2023 (IEA-b, 2018)

As will be seen in Tables 1 to 4:

- The share of the fossil fuels include around 81 % of total primary energy supply. It is aimed that the renewable energy will be used to displace fossil fuels as both environmentally safe and economically sustainable (Tables 1),
- The majority of renewable are consumed in the residential, commercial and public services sectors (Tables 2),
- The second largest contributor to global electricity production is the renewables which account for 24.5% of total electricity production (Tables 3),
- Trends for the future show that renewable will have the fastest growth in the electricity sector (Tables 4).

2. Sustainable Development and Environment

All countries plan to activate optimal energy systems for sustainable development goals and, more importantly, to improve human, economic, social and environmental conditions. Currently, challenges related to demographic, social, economic and technological trends are of paramount importance for the long-term sustainability of global energy systems. For any country to achieve its sustainable development goals, it needs to provide renewable energy sources because the problems associated with depletion of fossil fuel levels, rising fossil fuel prices worldwide and reducing environmental impacts will largely disappear. Since the objectives of the countries are to protect the climate system, improve their policies and implement the relevant measures, it should be ensured that the standards on local air pollution are strengthened and implemented effectively and efficiently (Salvarli and Salvarli, 2020).

Although the tendency to depend on fossil fuels is still high and dominant, measures should be taken, especially regarding global warming, in order to develop renewable energy sectors on a global scale. This is why switching from conventional fuels to environmentally friendly options is of paramount importance around the world (Pujari and Shrestha, 2020; Jing Wu et al., 2018).

It is clear that the electricity produced by fossil fuels has negative effects on the ecosystem. However, it can be concluded that the expectation that greenhouse gas emissions will decrease when more advanced technologies are used in the consumption of fossil fuels (Tampubolon and Setyoko, 2019; Özgül et al., 2020).

Ecosystems are under threat due to some factors such as population growth, energy demand, intensive use of fossil fuels in energy production and other human activities (Anup, 2015).

Renewable energy sources offer opportunities for sustainable and green clean energy production. Therefore, clean, affordable energy will be a viable option to achieve sustainable development goals. However, it has shown that renewable energy systems have the potential to change the local and regional climate, which can affect both humans and wildlife in the long run (Mabvuto, 2019).

As detailed in resources (WEC, 2016; Renewables Energies Innovation for the Future., 2019), market-based climate change interventions, efficient use of resources, low energy consumption, low risks, social equity, regional integration of energy systems, sustainable energy supply and public acceptance should be provided.

Large financial resources are important in energy investments where environmental protection is planned. On the other hand, the success of a new technology will be determined by the cost-effectiveness parameter that improves the environment.

As noted in the references (Hoppe and de Vrie, 2019; Zaharia et al., 2019), the transition to low-carbon energy systems cannot rely solely on technological innovation. It also requires social innovation. The most important features that encourage green investments are in relation with the length of the firm-bank relationship and size, age, profitability and innovativeness of business. Many of these seem to encourage businesses to invest in environmentally friendly equipment.

For sustainable development, the benefits and development costs of applicable technologies should be considered in the planning of electricity generation systems. During the planning and construction of all industrial facilities; by taking into account the possible effects on the environment, it is ensured that the economy is improved, ecology is supported and energy is saved (Arbucklea et al., 2021).

Sustainable development also requires biodiversity for the sustainability of the natural environment for the survival of humans and the world. Taxes, allowances, emissions subsidies and technology obligations, as well as research and development subsidies, which are considered various environmental policy instruments, meet the main evaluation criteria. On the other hand,

environmental policy tools are also related to areas such as agriculture, forestry, fisheries, transportation, substance abuse and health (Mabvuto, 2019; Goulder and Parry, 2008).

The relationships between the environment and economic and political systems should be examined with a strong analytical framework provided by the economy. Many countries may face higher costs and loss of market share if strict environmental regulations are enforced (Pimonenko et al., 2021; Tietenberg and Lewis, 2018).

3. Strategies of Renewable Energy Developments

In order for each country to maintain its sustainable development and use, it is necessary to ensure the transition to renewable energy sources as soon as possible. Since domestic sources form the basis of renewable energy sources, they can be converted into electricity or liquid fuels. It is estimated that renewable energy will make up about 30% of the world's energy mix by 2050 (IEA, 2018). As also detailed in the reference (Renewables Energies Innovation for the Future., 2019), various requirements such as environmentally safe and economically sustainable are important in sustainable energy supply.

Renewable energy is obtained from constantly renewed natural resources. The main characteristics of the most common types of renewable energy are as follows (Bilagi et al., 2021; Salvarli and Salvarli, 2020):

• The use of hydraulic energy can provide many benefits for water supply and irrigation in agriculture, but it has impacts on aquatic ecosystems.

• The environmental impact of wind energy is relatively small compared to the environmental impact of fossil fuels. The location and operation of wind turbines can have adverse health effects on humans and other creatures living near wind turbines, depending on certain conditions. One of the important environmental and social impacts of wind farms is climate change. Wind turbines are located on land or offshore.

• While the use of solar energy systems such as solar, photovoltaic and concentrated solar energy is increasing rapidly all over the world, many system arrangements are also being developed.

• Geothermal power plants are also sustainable and low-emission compared to traditional fossil fuel plants. However, if some pollutants are released from the power plant, it can harm the environment. For this reason, cooled geothermal fluids are injected back into the soil in order to reduce the risk to the environment. Geothermal energy is also used for heating and cooling purposes other than electricity generation.

• Biomass is a clean energy source and bioenergy is produced according to the type of biomass used and the technology of process changing.

As the market is expected to grow by 2050, the European Union predicts that offshore wind power will play an important role in making the European Union the first continent in terms of climate neutrality (Fernandez et al., 2021).

Many government strategies are often based on volatile renewable energy, energy business models and government roles in the energy sector (Bryant et al., 2019). The characters such as renewable energy development, energy security, direct tax and financial incentives are provided. Therefore, it is necessary to attract investors while helping to remove economic and political barriers to renewable energy generation (Luo et al., 2020).

In order to realize available, economic, reliable and sustainable electricity systems in the future, policy-makers should take all the needed measures to increase the contribution of renewable energy to the energy mix (Ntanos et al., 2018; Kuo, 2015).

Through the transition to a low-carbon economy, renewable energy generation will create new jobs in the public transport and building sectors, in the development and production of energy-efficient technologies. Undoubtedly, many of these newly created jobs in developing countries will be both more reliable and better paid than before (Markkanen and Anger-Kraavi, 2019).

Flexible capacity transmission networks, energy storage innovations and new standards are the requirements of renewable energy. Thus, any subsidy policy suitable for a renewable energy development program is evaluated by supporting the integration of large-scale and connected networks (Tampubolon and Setyoko, 2019).

4. Impacts of Climate Change

Reducing carbon dioxide levels in the atmosphere can help slow climate change and ensure a better world for future generations. However, the effectiveness of carbon taxes in reducing carbon emissions is not as expected Appropriate future policies for clean power generation also relate to energy emission targets, carbon taxes, and transmission and distribution loss improvements (Jung et al.,2021; McLaughlin et al., 2019; Awopone and Zobaa, 2017).

As stated (Markkanen and Anger-Kraavi, 2019), climate change mitigation policies should be well designed and carefully implemented. In this way, social and economic common benefits will be created to reduce poverty. Opportunities to review issues such as gender, health and economic inequalities will be provided.

Behavioral challenges caused by climate change are fundamentally social impact issues. However, representations of social norms can advance climate change (Gregg et al.,2020).

It is known that an increasing number of studies are carried out on the effects of climate change on renewable energy in order to ensure the security of the sector, data availability and sustainable development of methods (Martínez, 2019; Solaun and Cerda, 2019).

Not surprisingly, the commitment of all countries to rapidly reduce their dependence on fossil fuels could meet the expectations of global climate change negotiations (Stephenson et al., 2021).

A few strategies (Peker and Ataöv, 2020) identified to improve quality of life and climate change are as follows:

- Dissemination of solar and wind power plant applications,
- Expanding public transportation systems in urban transportation,
- Development of rail system alternatives,
- Promoting non-motorized modes of transportation,
- Creation of pedestrian zones,
- Creation of the bicycle path master plan,
- Reproduction of national gardens and green spaces.
- Dissemination of buildings that produce their own energy.

As outlined in the 2015 Paris Climate Talks, the carbon tax can address the challenges of climate change in a comprehensive manner and reduce greenhouse gas emissions. Therefore, governments should provide economic incentives to both producers and consumers so that they can maintain electricity generation in a way that reduces greenhouse gas emissions (Luo et al., 2020).

Decision makers of developed countries generally aim to improve and evaluate social welfare. Therefore, they plan to implement more energy efficient green technologies that mitigate the effects of climate change and save energy in the long run. Developing countries, on the other hand, intend to improve the total value of goods produced and services provided by approving social and environmentally friendly applications (Zharia et al., 2019; de Vries, 2019).

Ultimately, climate-smart power systems will need to be based on supporting environmentally and financially sustainable energy development (Almeida et al., 2021).

As stated in the literature, climate change can cause changes such as:

- Average precipitation value,
- Geographic distribution of rain,
- Seasonal precipitation patterns,
- Increase in average temperatures,
- Increased frequency of forest fires,
- Shrinking ice sheets,
- Sea-level rise,
- Increase in ocean acidification,
- Timing and distribution of plant and animal species,
- Shifting patterns of disease transmission,
- Carbon sequestration.

On a global scale, international protocols, agreements and similar issues that have been implemented in the past create wide participation and awareness in taking measures against climate change. Priorities in climate action may change according to the geography, population and socio-economic structure of cities. The greatest potential for emissions reductions in cities relates to actions in buildings, transport, energy supply and landfills. As it is known, if wastes are stored or incinerated in the wild way, they will pollute the air, soil and groundwater (Peker and Ataöv, 2020).

Climate change and carbon emission policies seem to provide selective opportunities to forge new alliances among local government, business, green urban development and civil society to attract green jobs **(**Jonas et al., 2017).

Climate change and energy policies raise complex issues of intergenerational justice. As it is known, an internationally coordinated response plan will be needed to tackle climate change. In addition, climate change is expected to intensify the frequency and duration of droughts, increasing water demand and reducing water supply. With the right reforms, governments can take adequate action against severe water-related shocks and adverse precipitation trends to help people and ecosystems (Tietenberg and Lewis, 2018; Wolfson et al., 2020).

5. Renewable Energy Marketing

Market failures are associated with environmental problems. The main environmental problems can be summarized as follows:

Local health costs,

- Damages to ecosystems and the services they provide,

- Costs for land and sea creatures,
- Damages caused by climate change.

However, market failures during the promotion of clean technology developments, even when linked to environmental problems, can provide a rationale for efficiency.

As a result, no tool can effectively correct market failures resulting from both emissions and information availability problems (Goulder and Parry, 2008).

Current policies are planned to reduce air pollution and ensure universal energy access. Thus, efforts are made to achieve the long-term climate targets under the Paris Agreement. As expected, renewable energy technologies are the first choice in energy markets due to falling costs and the possibilities provided by supportive government policies. By 2040, the global power mix is expected to share more than 40% of renewable energy. Despite everything, coal and gas will continue to take its place as the largest energy sources (Salvarli and Salvarli, 2020).

Considering the variability in energy sources and power systems, it is obvious that future electricity markets will have adaptability and flexibility. In the sharing of renewable resources; some factors such as market reforms, network investments and efficient technologies need to be active (IEA-a, 2018).

As stated in the document (SUSCHEM, 2018), advanced materials, advanced production systems and industrial biotechnology are needed to overcome the societal challenges and to accelerate the development of the economy and the energy transition, which are at the forefront of important fundamental issues.

According to the comments, while taking into account issues such as energy mix, efficiency, market and environmental standards, various rehabilitations for unlicensed electricity generation and renewable energy sources in meeting energy policy targets are as follows (Arbucklea et al., 2021).:

- Providing free market prices better than the tariff guarantee,
- To give additional incentive sales tariffs for the domestically produced or produced parts of renewable energy power plants,
- Prioritizing renewable energy when connecting to the grid.

While the share of renewable energy sources is gradually increasing, it is seen that much more flexibility is needed for energy markets. Major customers who directly purchase renewable energy are large electricity end users such as retailers, manufacturers and technology companies. There is a varying interaction between many users, such as independent energy producers, public and

commercial and industrial institutions. The role of public services appears to vary by transaction as new models are developed. Sustainable business models are becoming increasingly popular across different sectors and offer stakeholders a profitable market model. Thus, these models can be applied in many groups such as energy, innovation, entrepreneurship, marketing, engineering, construction, transportation and so on (ACORE, 2016).

The renewable energy market is supported by the most widely used feed-in tariff. As a result, there is a fixed price guarantee for electricity sold during the contract period. For renewable energy, the feed-in tariff will provide rapid cost reductions, but long-term government subsidies will pose a risk. On the other hand, there has been a shift from government-managed tariff guarantees to auction systems in the last few years. In order to achieve the goals of achieving significant cost reductions in renewable energy, it is decided to set prices in renewable energy contracts.

It is known that one of the most important factors in the dissemination, research and development of renewable energy technologies is financing. Among the major financial resources, public finance institutions, private investors and institutional investors can be mentioned. When it comes to industrial marketing, business-to-business marketing comes to mind, and products are based on price and quality considerations, which are functional consumption values. As is known, business-to-business companies are companies that sell, lease and supply goods to other companies. In global market conditions, local customers do not only buy their products from local suppliers. Therefore, under conditions of increasing global competition, business-to-business companies must find the best ways to stay relevant in the market. Selling products or services directly to consumers is the goal of business-to-consumer marketing. On the other hand, business-to-business companies involved in sustainable solutions will have market advantages.

As it can be understood, the marketing of renewable energy has a complex structure. Therefore, purchasing a renewable energy product can be considered an investment. Clients help finance the investment by relying on support programs that are often not fixed and can vary in different countries. Meanwhile, companies investing in renewable energy expect to use their environmental identities for marketing purposes by promoting the use of renewable energy. It is expected that companies investing in renewable energy will be able to use their environmental identities for marketing purposes by supporting their use of renewable energy. On the other hand, since it is important to secure different support programs such as tax credits and subsidies, it is natural for governments interested in renewable energy and its benefits to meet these considerations. Of course, in this process, subsidies to fossil fuels are reduced, making renewable energy even more attractive. Some energy markets require power systems with a higher share of variable renewable energy and thus respond to issues such as digitalisation, centralization and electrification.

It is possible to gradually improve energy market pricing by incorporating factors such as the real value of electricity over time, new transportation rules, flexibility, economical energy sources, self-consumption and market connectivity into a package. The energy transition can be accelerated by adapting electricity market designs to changing power system models. Currently, electricity users have many suppliers that offer them services and innovative opportunities. These users can easily change their tariffs and suppliers when necessary. Despite everything, not all users in the retail market achieve the results they desire (Leutgöb et al., 2019; Herbes and Friege(editors), 2017; Nosratabadi et al., 2019; ACORE, 2016; Facchinetti et al., 2016); Nielsen(thesis), 2018; IRENA, 2019).

The renewable energy market is classified by type, end use and region. By type, the market includes hydropower, wind power, bio-energy, solar power and geothermal energy. It is pointed out that more than three-sevenths of the total share in the global market is hydroelectric. The market relates to residential, commercial, industrial and others in terms of end use. More than three-eighths of the total share in the global market is dominated by the residential segment. As expected, the global renewable energy market exhibits high growth potential due to its use in residential, commercial, industrial and other fields. The main energy systems in which renewable energy technologies are applied in buildings are as follows:

- Solar or photovoltaic systems,
- Solar hot water and air preheated ventilation,
- Geothermal heat pump,
- Wind turbines systems,
- Biomass systems.

The increasing use of geothermal heat pump in residential heating application is important for the growth of the market. As a result, the increase in electricity demand will lead to a significant increase in the need for geothermal energy. Such a situation will inevitably lead to the growth of the market (Bilagi et al., 2021).

As expected, the performance of national energy policy may be constrained by some factors such as market instruments, efficiency of smart grid and perception of innovations in energy sectors, institutional development. Development strategies, energy regulation standards, measuring energy efficiency and energy savings should be well coordinated with the construction of a sustainable energy system (Kolosok et al., 2020).

As detailed in (Liu et al., 2021), policies related to climate change are significantly less efficient and can distort energy markets. Thus, prices and the financial sustainability of investing in or maintaining production capacity are affected. However, thanks to market-based policies, climate

change can be addressed more efficiently and decarbonisation targets can be achieved in the most efficient way. These policies also foresee the least problematic price formation in wholesale electricity markets. For this reason, policy choices harm the financial sustainability of capacity investments. Price formation and market design issues may arise due to high penetration of renewable energy. Prices provide incentives, but market incentives are not always consistent with promoting sustainable results. Prices provide incentives, but while aiming for sustainable results, market incentives are not always consistent. According to the scientists, the relationship between methane emissions and climate change is a positive feedback loop. Increases in emissions of the greenhouse gas methane contribute to climate change (Tietenberg and Lewis, 2018).

A sustainable electricity generation and electricity market is absolutely necessary to maintain the minimum standard of living and economic growth for every country in the world. The effects of climate change define electricity generation capacity, electricity demand and electricity market.

In order to reach a balance with the optimal capacity mix, a result can only be achieved with a perfect energy market mechanism. Naturally, when there are distorted price signals in the electricity market, the optimum feature is deviated. Currently, renewable electricity generation depends on subsidies and is not internalized in electricity markets. This is seen as a serious problem. Adjusting the required fossil resource capacity according to the increasing share of renewable energy will be regulated through the market-based mechanism.

As price distinctions in capacity payments develop internally, this causes money to be redistributed from emissions-intensive ones to cleaner power plants. As suggested, renewable energy sources may be a suitable mechanism for subsidized liberalized electricity markets for the transition to electricity generation based on renewable energy sources. It has also been discussed that the internally driven capacity market has advantages over general capacity bidding (Pimonenko et al., 2021).

In many countries, investment subsidies are already used as follows (Luo et al., 2020):

- Promoting general renewable energy development,
- Supporting institutional research and development,
- Promoting renewable energy grid connection infrastructure,
- Encouraging public support for the renewable energy market.
- Conducting marketing and public welfare activities.

Considering the share of renewable energy in total final energy net consumption and total greenhouse gas emissions, the growth of the economy, excluding other factors, can generate a net

gain. In addition, the net determinants of the share of renewable energy include both the credit market and the stock market (Zharia et al., 2019).

As expected, the global renewable energy market will grow as prices fall and legal and financial initiatives increase. As the fall in prices increases demand, the global renewable energy market will gradually accelerate its growth (Bilagi et al., 2021).

There are thousands of job opportunities under the investments in environmental factors, energy efficiency and renewable energy all over the world. In order to evaluate this situation in the most effective way, it is necessary to develop renewable energy alternatives, to support energy efficiency and thus to reduce the impact of energy consumption on climate change. Increasing supply security with these contributes significantly to the economy, while its positive effects on employment have recently started to take place in the literature (Erdal, 2012).

The more advantageous the countries with fossil fuels are, the more disadvantaged the countries that import these fuels are due to alternative costs. For this reason, it is very important to create an alternative to fossil fuels. One of these alternatives is renewable energy sources. It is economically very important to produce the tools and equipment to be used in the electricity production to be obtained with renewable energy sources in the country with domestic opportunities. A significant amount of employment is provided during the production of turbines in wind and hydroelectric energy or panels in the solar energy sector. Employment is high, especially during the production of materials and the installation of power plants. 90% of the total employment is employed during the manufacturing phase and installation process, and 10% during the operation and maintenance and repair phases. Increasing rates will be achieved by supporting investments in renewable energy resources and having a large market share (Karaca and Eşgünoğlu, 2016).

Conclusions

The largest part of energy consumption all over the world is met by fossil fuels, which are still increasing and continue to increase. For this reason, environmental pollution becomes inevitable and the direct contribution of renewable energy plants cannot be provided. When the plan that the main energy sources will be new and renewable energies is implemented, renewable will have an impact in many areas such as continuous cost reduction, job creation, developing future industries, and achieving energy and environmental targets.

Thanks to the use of less and cleaner energy, many technologies that provide energy efficiency can be foreseen in power plants, buildings, industrial facilities, transportation systems. These technologies can bring solutions to issues such as reducing costs by up to eighty percent, saving up

to thirty percent of energy, and gradually slowing down global warming. Thus, it becomes easier for countries to achieve sustainable progress. In another definition, the act of understanding consumers and their needs is addressed in the marketing of renewable energy (Salvarli and Salvarli, 2020).

While there is a direct positive relationship between energy consumption and factors such as greenhouse gas emissions, gross domestic product, population and labor force growth, there is, however, a negative relationship between reducing energy consumption and factors such as health expenditures or energy taxes. Recent research reveals that climate change management will be an important factor in restructuring political authority through carbon control. Policies and measures applied to countries are varied but tend to focus on mitigation and eco-modern responses. Further research will enable a better understanding of the various climate policy initiatives and their geopolitical economies (Bulkeley, 2010).

Overarching national concepts of modernization and security are addressed and reflected by local and regional socio-technical concepts as energy innovations are managed. It is known that the impact of countries' energy cultures on climate change and energy plays an important role in shaping future decarbonisation pathways.

The participation and support of policy makers has a very important place in successful practices that reduce mitigation of the climate change impacts and can help to minimize the energy expenditure and improve the energy behavior. Policies and regulations enable local authorities and stakeholders to follow energy transition strategies. In the long run, both environmental taxation and eco-innovation are expected to increase the budget revenues of countries.

The share of renewable in meeting the global total energy supply is expected to reach approximately 46% by 2050. To make sustainable progress and stay cost-effective in the relevant sector, the countries in concert with international partners should provide appropriate policy for public health and the environment, private sector inventiveness and investment.

Many energy efficient enabling technologies and processes related to green chemistry are applied. Thus, in the longer term, the aims of green chemistry will be met by slashing costs, ensuring energy savings, making significant contributions to energy needs, reducing pollution at its source and helping to slow global warming.

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