Research Article
DOI: 10.29064/ijma.1622748

A Comparative Analysis of Renewable Energy Policies in Local Governments

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Abstract: This study evaluates the importance and impacts of renewable energy sources in local government policies. The risk of depletion of fossil fuels, climate change and the need for environmental sustainability have accelerated the orientation of local governments towards renewable energy in the world. Local governments have various responsibilities such as increasing energy efficiency, reducing carbon footprint and raising public awareness on green and renewable energy sources by taking a leading role in energy transformation processes. In this article, local policies for renewable energy are analysed in terms of various legal regulations, financial incentives, community participation and technological developments. In addition, the integration of renewable energy at the local level is discussed with different examples from around the world and the contributions of these policies on sustainable development are discussed. The purpose of this study, explores the critical role that local governments play in promoting and implementing renewable energy initiatives. It highlights how local policies can significantly influence the adoption of renewable energy technologies, improve energy efficiency and contribute to sustainable development goals. The paper discusses various strategies used by local governments, such as incentives for renewable energy projects, zoning regulations that favour clean energy infrastructure, and community engagement efforts to raise awareness about the benefits of renewable energy. In addition, it addresses the challenges faced by local governments, including funding limitations, regulatory barriers, and the need for intergovernmental co-operation. In the study, qualitative method was used, document analysis and literature review were conducted. Overall, the paper emphasises that effective local government policies are necessary to promote the transition to renewable energy sources and achieve long-term environmental and economic benefits for communities. Furthermore, this study reveals that local governments have a strategic position in the energy transition.

Keywords: Local governments, Renewable energy, Environment, Sustainable development, Energy efficiency

JEL Classification: H76, K32, Q20
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INTRODUCTION

After the 1973 oil crisis, governments and local administrations of many countries started to discuss the importance of energy and the need for energy. Since then, developed and developing countries have sought policies to diversify their energy sources, to create environmentally friendly and renewable energy sources and to use energy efficiently. As the world grapples with the urgent challenges of climate change and environmental degradation, the transition to renewable energy sources has emerged as a critical component of sustainable development. Local governments play a pivotal role in this transition, bringing about policies that not only promote the adoption of renewable energy, but also boost economic development.

Factors such as urbanisation, diversification of information technology, changes in production and consumption habits lead to an increase in energy demand and needs. In order to realise a sustainable growth, many countries have made it their main objective to meet their energy demands and needs at the most appropriate scale. If countries cannot meet these needs within their own borders, they become dependent on foreign energy. Empirical studies conducted in recent years also attribute one of the most important obstacles to industrialisation and growth to the high dependence on foreign energy (Kavas and Acet, 2019: 238).

Energy is a scarce resource. Energy dependence is increasing in all areas of life. People in the world more and more energy every day. Therefore, energy has meanings beyond being an economic factor and gains importance in a

number of areas such as social and political platforms. Ensuring the sustainability of energy, which is inadequate in the world and constitutes a cause of many conflicts between societies, is a fundamental requirement for all societies (Gündüzöz and Can, 2015:29). Renewable energy is an extremely important factor in meeting the needs of a country with domestic resources in sustainable energy supply by diversifying resources and minimising the damage to the environment as a result of energy consumption. Despite the high dependence on fossil fuels in the current situation, the use of renewable energy is increasing year by year (Karagöl and Kavaz, 2017:7). Since about a quarter of the energy consumed worldwide today is provided from renewable energy sources, the local government bodies of many countries have started to take measures locally, at least trying to produce the energy consumed by their own institutions from renewable energy sources such as wind and sun.

Local governments play a crucial role in promoting and implementing renewable energy solutions and contribute significantly to the global shift towards sustainable and low-carbon energy systems. According to the US Climate and Energy programme, local governments have the authority to enact policies and regulations in line with national and regional energy strategies. They can establish mandates, incentives and regulatory frameworks that encourage the adoption of renewable energy technologies within their jurisdiction. These policies usually take the form of feed-in tariffs, tax incentives, energy cost reductions and streamlined permitting processes (State Climate and Energy Programme, 2024).

This paper emphasises the importance of local governments in policy making in achieving global climate goals. Local governments are well suited to promote renewable energy growth due to their proximity to communities and their understanding of local dynamics and local needs. The results of this study emphasised the importance of "renewable energy production and use" in local governments as part of a broader sustainability agenda.

2. METHODS

In this study, literature review and document analysis, which are qualitative research methods, were used, current and old studies were reviewed, and the place of renewable energy in local government policies was analysed. As a result of the literature review, it has been determined that renewable energy resources have found more and more place in local government policies and the reasons and results of this are mentioned in the article. The study group consists of books and articles written on the field. Data were obtained through document review of works published in the field of space. For this, libraries, Google Academic, YOK Thesis Center and periodicals of various journals were used. Document analysis method was used in the analysis of the works used in the research. In this study, all the rules specified in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed.

3. AN OVERVIEW OF RENEWABLE ENERGY SOURCES

Renewable energy is an energy source that can constantly renew itself within the balance of the ecosystem itself and can exist exactly the same in the days after its use. Energies that are formed spontaneously or can be converted into different types without external intervention are called natural energy. While separating energy according to its types; its storability, usability, economy and whether it destroys the environment are considered (Özdemir, 2012: 20-24). Renewable energy is a type of energy that can be accessed continuously and repetitively from nature and there is no reduction in its source. They are more environmentally friendly than other energy sources. However, since especially

undeveloped and developing countries do not have the technology to provide renewable energy, they had to import the relevant equipment and machinery from the producing countries and this situation increased the costs even more.

Unlike fossil resources, renewable energy resources, once used, can be reused by naturally transforming back to its original state. Renewable energy sources are not limited like fossil resources such as oil, coal, natural gas or nuclear energy. This feature offers the opportunity to utilise renewable energy almost unlimitedly. Renewable energy sources protect the environment. There is almost no energy source that does not cause environmental problems. Even the most trouble-free source destroys the environment in the system installation. Although renewable energy sources, which are called clean energy sources, cause environmental damage at reasonable levels during the manufacturing and installation stages, they exhibit a structure that is generally environmentally sensitive and does not cause pollution during the energy production phase (Ağaçbiçer, 2010: 48).

The most basic definition of renewable energy is defined as the ability to renew itself at a rate equal to the energy received from the energy source or faster than the rate of depletion of the source. The fact that this type of energy is called "renewable" is due to the fact that the resources are never depleted and can renew themselves continuously. It is important that they are sustainable by diversifying resources and clean in terms of minimising the damage to the environment. In addition, it is also very important in terms of not being dependent on foreign resources, in other words, in terms of reducing foreign dependence by meeting the energy need with domestic resources, and in terms of revitalising the local economy due to its production in its location (Dikmen, 2019: 65). Figure 1 below shows renewable and non-renewable energies:

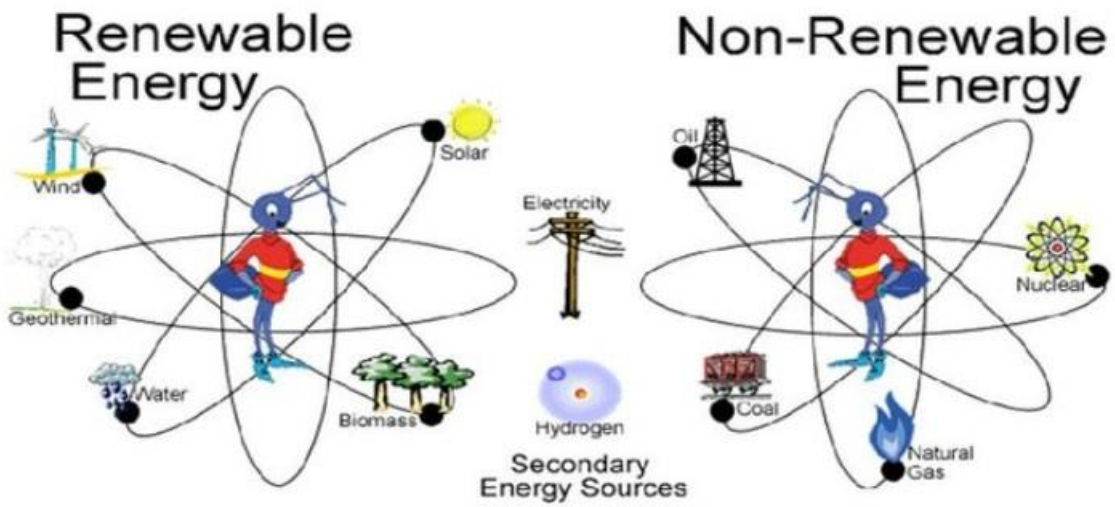

Figure 1. Diagram of Renewable and Non-Renewable Energy (Kalyani, 2015)

As seen in Figure 1, renewable energy sources accepted in the literature are solar, wind, geothermal, geothermal, water, bioenergy, while non-renewable, also known as fossil energy sources are oil, nuclear energy, natural gas and coal. There are also secondary energy sources such as electricity and hydrogen energy, which are converted from primary energy sources such as coal, oil, natural gas and wind. Today, intense efforts are made by countries and

multinational companies in order to have energy. In fact, "energy wars" have emerged from the past to the present. Because energy is an input that must be used in production and is also a necessary input for the social and cultural development of societies and is one of the most basic building blocks of economic development and growth, it constitutes an important place in determining the level of development of countries and the international policies of countries (İsmiç, 2015: 260). The priorities in developed countries are not to increase energy consumption, but rather to increase energy efficiency and reduce fossil fuel consumption. In this context, policies are implemented to increase the share of renewable resources in energy consumption and these targets are measured

Community ownership of renewable energy projects allows individuals to develop skills in renewable energy technologies, project management and energy efficiency, as well as training and capacity building opportunities. This feature, highlighted by Pillan et al. (2023), allows for an increased level of local expertise and self-efficacy. This sharing of expertise and skills helps communities to manage their energy needs more efficiently, empower themselves and increase their independence.

Energy efficiency is directly related to the sustainability of economic development goals, but it is also very important due to the key role it plays in reducing greenhouse gas emissions in cities. While decision makers produce policies for energy production in line with the principle of sustainable development, protecting the environment from the negative effects of energy production should be one of the main objectives. Greenhouse gases released into the atmosphere in all processes of energy production and consumption play a major role in the deterioration of the ecosystem, and significant emissions are the most important cause of climate change. The most economical and effective way to optimise energy demand, emissions and thus climate change is energy efficiency (Altan and Sağbaş, 2020: 19). In Figure 2, we can see the amount of renewable energy production in certain continents and regions of the world and the changes between 2020-2022:

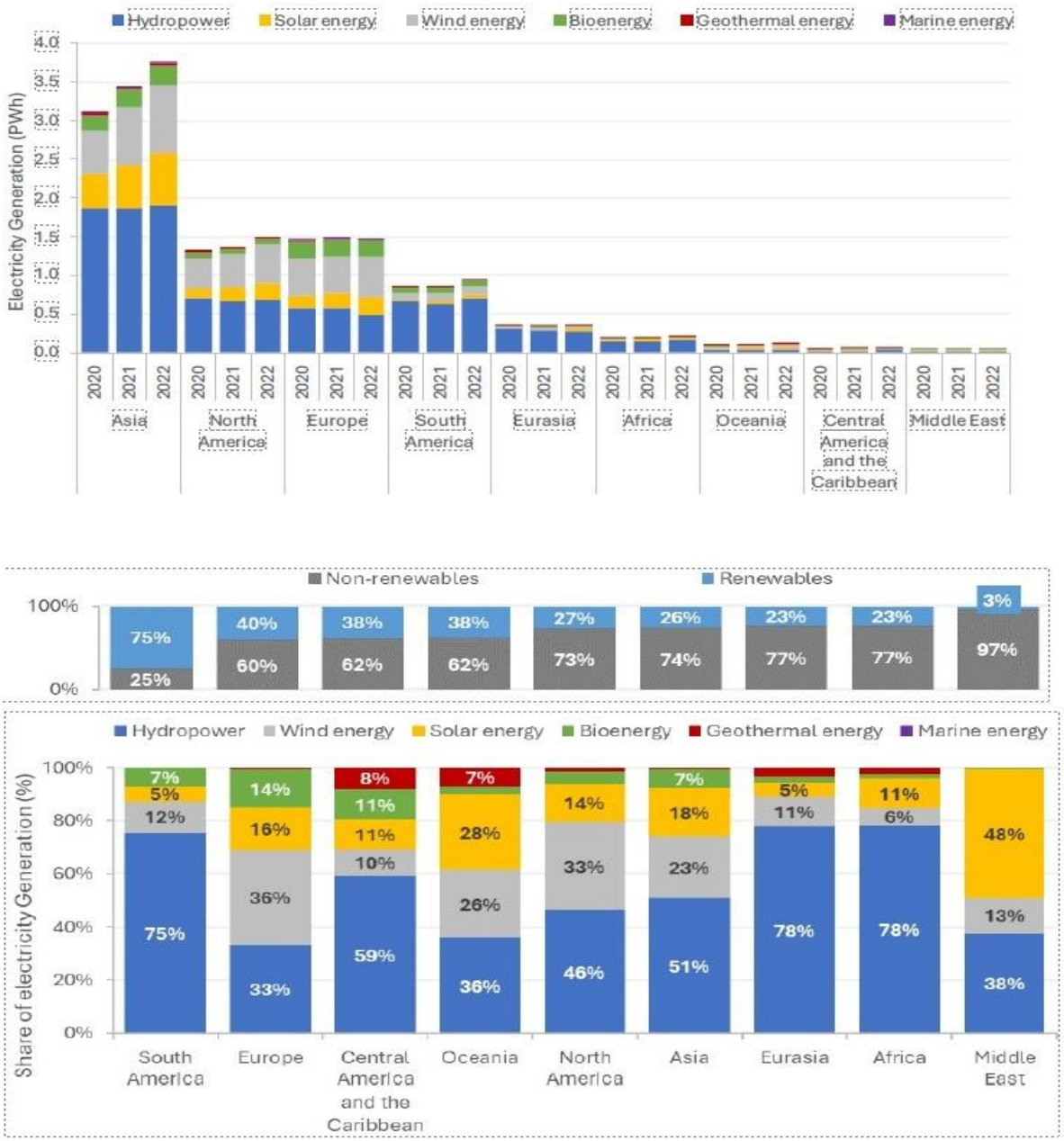

Figure 2. Renewable Energy Production In The World (Irena, 2024)

As can be seen in Figure 2, Asia ranked first in the world in terms of renewable electricity generation, generating approximately 3750 TWh of electricity in 2022. The 9.3 per cent increase in solar and hydroelectric power generation somewhat compensated for the declines in wind energy and bioenergy. Despite the decline in bioenergy, North America ranked second for the first time with an 8.6 per cent increase in energy resources as the United States increased its investments in renewable energy. There was a slight decline in Continental Europe. In terms of electricity comparison by region, South America leads the way with 75.0 per cent of its electricity coming from renewable sources, mostly hydropower, accounting for three quarters of its renewable energy. Europe follows with 40.5% of its electricity from renewable sources and is characterised by a more diverse mix: 35.7% wind power, 33.3% hydropower, 16.1% solar, 14.0% bioenergy and 0.8% geothermal (Irena, 2024: 2). As can be seen from the figure above, renewable energy production tends to increase in most parts of the world with a few exceptions. Although hydroelectric power plants are considered as renewable energy, they are not considered as green energy due

to the damages they cause to the environment and the giant power plants built especially in South America cause debates and protests even today. Europe, on the other hand, obtains most of its electricity generation from wind power plants, thus providing a more environmentally friendly energy production, although its renewable energy production is less compared to South America.

4. EVALUATING LOCAL GOVERNMENTS THROUGH RENEWABLE ENERGY POLICIES

The increase in energy demand, growing environmental problems and sustainable development goals have rapidly increased the interest in renewable energy. In this context, the increasing energy consumption in cities and the effective use of limited energy resources make the role of local governments in energy transformation even more important.

Local governments are autonomous governance structures that are established independently from the central government for the common needs of local communities and whose decision-making bodies are directly elected by the people. This form of administration is defined as a local organisation model (Çiçek, 2014: 54). These structures operate to meet the needs of the people of the region, to provide services at the local level, to use public funds efficiently and to improve the quality of life of the people of the region (Urhan, 2008: 85). According to another definition, local governments are constitutional institutions established to meet the common and local needs of people and other living beings living in settlements of various sizes such as villages, towns and cities within the borders of the country. These institutions operate within a certain legal order (Varcan, 2013: 3). As can be seen, the concept of local government has been defined from different angles in the literature, but the common point of these definitions is shaped on common needs. At this point, renewable energy production and consumption of local governments have become common expectations of people.

4. 1. The Management Of Renewable Energy By Local Authorities

Energy policies of local governments play a decisive role in the implementation of national strategies on the ground. Cities are home to a large proportion of the world's population, while most of the energy consumption takes place in these regions. This puts the onus on local governments to adopt more sustainable approaches to energy management. Renewable energy production and consumption by local governments is important because of the following:

- The use of renewable energy sources is one of the most effective ways to reduce greenhouse gas emissions caused by fossil fuel consumption. Local governments can take the lead in reducing the regional carbon footprint through environmentally friendly policies. Thus, local governments can act as a saviour for the cities where we see the negative effects of global warming day by day.

- Ensuring the continuity of renewable energy supply with local production in cities is critical for the energy security of local regions. So much so that the current Russian-Ukrainian war has left the whole of Europe without natural gas and once again demonstrated the importance of energy security.

- Renewable resources such as solar, wind, geothermal and biomass can be utilised in accordance with local characteristics. These projects not only reduce energy dependency but also increase local employment opportunities. In this way, both income inequality will be reduced in the city and local governments will provide positive externalities to the environment and sustainable development principles.

- Finally, the transition to clean energy sources can improve air quality and reduce pollution-related health risks. This leads to healthier communities and can reduce health costs in the long run. Today, air pollution is still a major

problem and presents many negative externalities, such as the proliferation of people suffering from air pollution-related cancers.

In his speech at the "C40 World Mayors Summit" held on 11 October 2019, United Nations Secretary-General António Guterres emphasised that the first response to the climate crisis will be given by mayors, stating that "Whether the war on climate will be won or lost will largely be determined in cities". These determinations are important in terms of showing the international understanding of climate management that is dominant today. The climate problem is now defined not only as a global problem, but also as a local problem, and cities and local governments are pointed to in addition to nation states and central governments at the point of solution (Balaman et al. , 2021: 23). It is clear that one of the most effective ways to combat the climate crisis is that cities should focus on renewable energy production and consumption.

Energy consumption and resource utilisation of cities have the characteristics of causing environmental problems. In this context, local governments have the power to reduce negative environmental impacts through measures such as increasing energy efficiency, switching to renewable energy sources and managing natural resources effectively. Promoting energy-efficient buildings, developing public transport systems with low emission rates, green infrastructure projects and similar steps are strategies that strengthen the role of local governments in energy and resource management. In addition, it is among the responsibilities of local government formulate local policies on energy and resource management issues, to guide the implementation and supervision processes, and to raise awareness and encourage the participation of communities in these issues (Arvas, 2024: 79). In this sense, local governments have very important duties and obligations in the context of renewable energy production and consumption.

Among the policies regulating renewable energy production in terms of local governments, fixed price guarantee is one of the most intensively used incentive mechanisms in the world. This type of support, which can also be referred to as feed-in tariff or purchase guarantee, is applied in the form of fixed cash payments per kilowatt-hour to energy producers that are determined by a local government body and generally meet the necessary conditions. With a fixed price guarantee, producers are assured of a certain level of security by offering a fixed price valid for all their products (Acar et al. 2014: 14). In order for the fixed price to constitute a real incentive, it should be at a level that is considered profitable for the producer. Although the fixed price guarantee is given for a certain period of time and varies from country to country, it generally covers the first twenty-year period from the moment the renewable generation facility starts operation.

Along with feed-in tariffs, quota requirements are one of the most common policy instruments used by local governments to support renewable energy all over the world. Compared to feed-in tariffs, which are price-based in terms of renewable energy support, quotas are quantity-based support policies (Abolhosseini and Heshmati, 2014: 10). In addition, renewable energy certificates issued by local sources for renewable energy production and consumption are examples for these quotas. They are important in terms of incentivising both renewable energy producers and consumers.

4. 2. Local Sustainable Energy Policymaking

The renewable energy sector is also supported through local incentives and public investments, both in terms of promoting the use of renewable energy sources and in terms of competing with conventional sources and

discouraging fossil fuel production. These fiscal incentives can be applied in each of the production, investment and consumption processes and can be used as a complement to regulatory support policies. All instruments that can be used to make the renewable energy sector attractive to investors, linked to the manner and level of taxation, are referred to as fiscal incentives. Along with various energy and environmental taxes such as carbon tax, subsidies for renewable energy investments, low-interest loans, tax exemptions and reductions, customs exemptions, some tax advantages specific to the investment period, tax credits and investment incentives are considered as fiscal incentives (Eser and Polat, 2015: 207). In this sense, local governments have a great role in the context of land allocation to investors, various supports and raising awareness of people about renewable energy.

The main purpose of local policy-making in sustainable energy is thought to be related to a wide range of factors influencing policy debates, the choices policy-makers can make, their capacity to act autonomously and to steer or otherwise enable changes of a sustainable nature. In Figure 4 we can see the factors influencing local sustainable energy policy making.

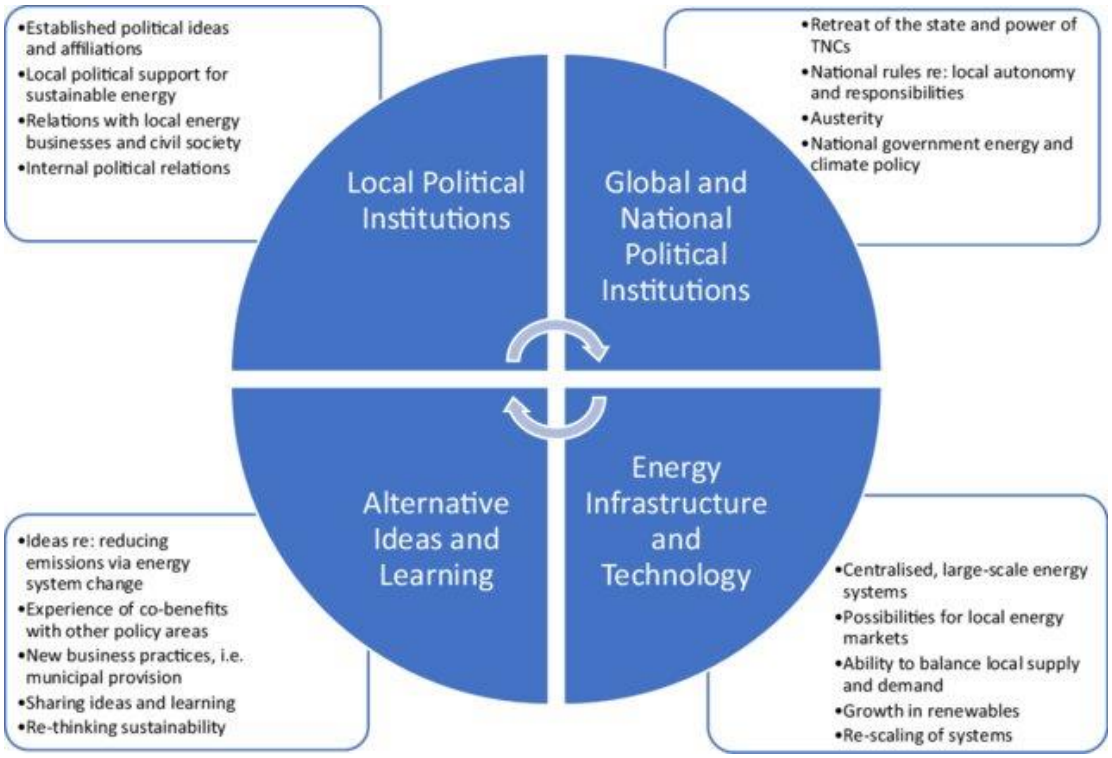

Figure 3: Factors that Influence Local Sustainable Energy Policymaking (Kuzemko, 2019: 95).

In Figure 4, Kuzemko (2019) summarised the factors affecting local sustainable energy policy making under 4 main headings and emphasised that in order to ensure that these factors are sustainable, local government institutions should be in constant communication with non-governmental organisations and energy business executives. He also emphasised the importance of cooperation with national and international institutions and said that TNCs, i.e. supranational companies, should be aware of their importance. He said that complying with national rules and responsibilities will prevent the emergence of other problems while producing renewable energy on the one hand. Another important issue is that alternative ideas and suggestions should also be evaluated. Local government organisations that can redefine sustainability and shape it according to current demands will be successful in this

regard. He stated that the preparation of energy infrastructure and the development of technology will create a local energy market and this will balance local demand and supply.

5. CASE STUDIES: SUCCESSFUL INTEGRATION OF RENEWABLE ENERGY INTO LOCAL GOVERNMENT POLICIES

There are many examples of successful integration of renewable energy into local government policies around the world. This can also show us that each local government body can be successful in its own way. From a small village to a metropolis, renewable energy can be produced and utilised in every local area. If the energy needed in every region, from a village to a large metropolis with millions of people, can be produced with renewable resources, the costs of both local government and citizens will be reduced, and a more sustainable and livable world heritage can be left for the environment and future societies. In this section of the paper, the successful integration of renewable energy in four local areas will be analysed.

5. 1. Case Studies

The project Local Energy Oxfordshire (LEO) is a smart grid trial in the UK and is a collaboration between energy innovators, local government, community groups and universities. The aim of the project is to test new market platforms for local energy trading and services by combining heat, electricity and transport projects. Data and learning are focussed on informing local energy strategy and contributing to national knowledge-sharing networks. The project is funded by a combination of private investment and government innovation funds and is a case study in experimentation, learning and co-operation at different scales (Project LEO, 2023).

We can also understand how local governments are pioneers in the renewable energy transition with the example of Philadelphia. Philadelphia was highly praised by environmental groups in 2017 when Mayor Jim Kenney signed a pledge to reduce the city's greenhouse gas emissions by 80% by 2050 and released a municipal energy master plan that includes maintaining or reducing the cost of energy, switching to 100% renewable electricity, halving greenhouse gas emissions and reducing municipal energy use by 20% by 2030. In September 2019, Philadelphia City Council passed three resolutions to achieve 100% clean energy by 2050. These are 100% renewable electricity for municipal operations by 2030, 100% renewable electricity citywide by 2035, and renewable energy for all other uses by 2050. According to the 2022 progress update published by the City's Office of Sustainability in February 2023, Philadelphia is on track to meet the 2030 targets, as can be seen in Figure 4, with the exception of the renewable energy component.

	Baseline	2019 Comparison	2021 Progress	2030 Goal	Status
GREENHOUSE GAS EMISSIONS	219,306 MT of CO_2e (2006)	133,527	122,750	109,653	On Track
ELECTRICITY CONSUMPTION	281,324 Weather Normalized MWh (2016)	274,481	268,397	225,059	On Track
PRIMARY HEATING CONSUMPTION	828,532 Weather Normalized MMBTU (2016)	760,556	743,356	662,825	On Track
RENEWABLE ELECTRICITY	6% (FY16)	8%	8%	100%	Needs Improvement
TOTAL COST OF ENERGY	$42.4 Million	$33.4 Million	$33 Million	<$42.4 Million	On Track

Figure 4. City of Philadelphia renewable energy production and 2030 goals (2023).

As we can see in Figure 4, since there is no development between 2019 and 2021 for the current situation in Philadelphia, renewable electricity sources need to be developed and continue to take firm steps towards achieving other targets. In other states of the United States, there has been an increase in renewable energy production over the years.

Another interesting and intriguing example is the island of Samsø in Denmark. This island stands out as a community that has fully embraced renewable energy sources and meets its own energy needs and exports the surplus to the mainland. This is the result of the island's transformation journey, which began in 1997 and lasted nearly ten years. Throughout this process, Samsø has set a global example in sustainable energy production. The first step in Samsø's transition to renewable energy was taken when the island won a competition in line with the Danish government's goal to transition to renewable energy sources. The islanders became the main actors in this transformation, installing wind turbines, solar panels and biomass plants. In 1997, Samsø Island won a national competition for 100% self-sufficient islands with renewable energies, which they achieved through a 10-year master plan. Its long-term goal is to be free of fossil fuels by 2030. In 2007, a review was published to assess the results of the 10-year master plan. Samsø Island has managed to become 100% self-sufficient with local renewable energy sources for electricity (Renewables Networking Platform, 2021).

As another local government area, Feldheim attracts attention both nationally and internationally as a village in the German state of Brandenburg, approximately 80 kilometres southwest of Berlin, powered entirely by renewable energy sources. The renewable energy community of Feldheim came to life in 2010 as a result of a co-operation between the local energy company Energiequelle and the residents of the village. Feldheim's energy community has created a strong sense of community and awareness of participation in energy production processes. Energy independence and sustainable lifestyles have improved the quality of life of village residents and strengthened environmental awareness. As a community that has achieved energy independence and significantly reduced its energy costs, Feldheim vividly proves that sustainable energy use is possible and inspires other communities, setting a reference point for the transition to renewable energy. The electricity generated by the village of 130 inhabitants is enough to meet the needs of 50,000 households. The village of Feldheim transfers surplus electricity to the local public electricity system (Frohwitter, 2020). In this sense, it has written its name in gold letters in the world in terms of renewable energy production.

Feldheim's transition to renewable energy began in 1993 when a young entrepreneur visited the village. The entrepreneur was looking for a place to install four wind turbines and was impressed by Feldheim's geographical conditions. Successfully convincing the inhabitants of Feldheim to lease the land to him, the entrepreneur installed the first four wind turbines in 1995 and later founded the energy company Energiequelle. The village now has 55 wind turbines with an electrical capacity of over 123 MW. Figure 5 shows the timeline of Feldheim's transition to renewable energy (Xu, et al., 2022: 1407). As can be seen, this village started to produce renewable energy with wind turbines at a time when many people did not even know the name of renewable and green energy, and now, with the current population number and capacity, it has managed to produce unimaginable levels of energy and sell it to the public.

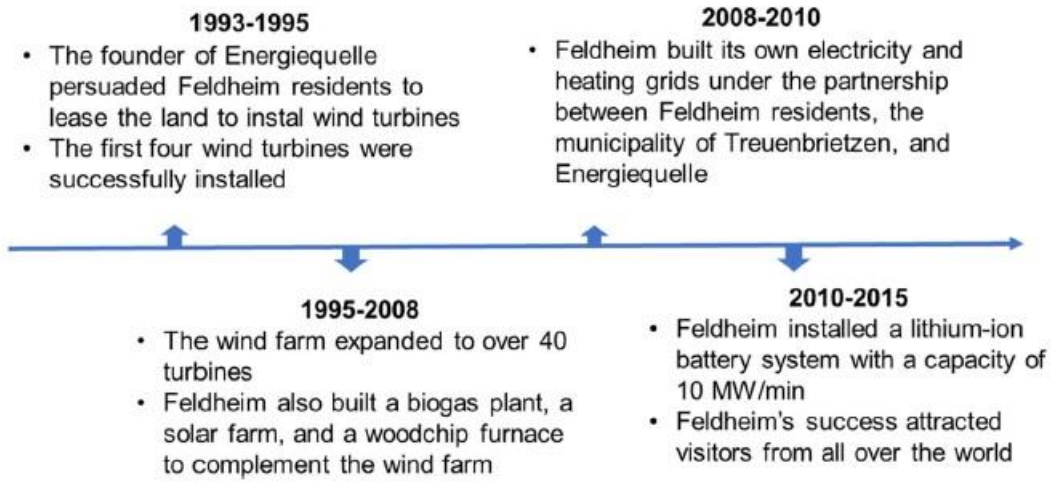

Figure 5. Timeline of Feldheim's transition to renewable energy (Xu, et al., 2022).

6. CHALLENGES FACED BY LOCAL AUTHORITIES IN IMPLEMENTING RENEWABLE ENERGY INITIATIVES

Local governments face numerous challenges when implementing renewable energy initiatives, which are crucial for sustainable development and reducing carbon emissions. These challenges span financial, political, social and technological domains and differ across different regions and contexts. Understanding these barriers is crucial to develop effective strategies to overcome them and successfully transition to renewable energy sources. This chapter explores the various challenges local governments face when adopting renewable energy initiatives, covering financial limitations, regulatory barriers, public acceptance, technological constraints and the need for intergovernmental co-operation. Furthermore, this chapter illuminates the dominant issues faced by local authorities in the implementation of renewable energy projects and provides recommendations to overcome these challenges.

As the imperative to address climate change grows, municipal authorities are taking on a crucial role in the transition to sustainable energy alternatives. Their initiatives have the potential to significantly impact greenhouse gas emissions, energy security and community resilience. However, the execution of such initiatives is fraught with complexities that differ depending on the geographical context, the prevailing political environment and the resources at their disposal.

A significant barrier to the realisation of renewable energy initiatives is the financial challenge facing local governments. Many municipalities operate under tight budgets and struggle with competing priorities, making the allocation of funds for renewable energy projects particularly challenging. The initial capital required for infrastructure development, including solar panels, wind turbines or energy efficiency improvements, can be significant. In addition, local governments often face barriers in accessing low-interest loans or grants that can reduce financial pressures. Under-utilisation of innovative financing mechanisms, such as public-private partnerships or community investment programmes, can increase reliance on traditional financing models and thus hinder the transition to renewable energy.

As an example of financial constraints, local governments often struggle with limited budgets that limit their ability to invest in renewable energy projects. In Poland, for example, municipalities tend to engage in eco-energy projects when non-repayable funds are available and emphasise the critical role of financial support in facilitating these

initiatives (Kata and Pitera, 2023: 8). In Italy, the profitability of renewable energy communities is highly dependent on energy costs, sales fees and incentives, with payback periods ranging from 8 to 14 years (Moretti and Stamponi, 2023: 5). The introduction of public-private partnership models, increasing the capacity to access national and international financing sources, setting a certain percentage of local tax revenues for renewable energy initiatives can be considered as possible solutions.

In pursuing renewable energy initiatives, local governments are forced to intervene through a convoluted set of regulations and policies at the federal, state and local levels. Zoning regulations, building codes and permitting procedures can cause significant delays and impede the realisation of renewable energy projects. In some cases, existing regulations may not align with the objectives of renewable energy adoption, resulting in confusion and inconsistency. As for political and governance challenges, political barriers such as lack of authority and means to scale up innovations hinder the progress of energy communities in Europe. Municipalities often rely on other actors due to these constraints. In terms of social and societal breakthrough, engaging citizens and ensuring their participation in renewable energy projects is a challenge. In Europe, despite the potential of energy communities to democratise energy systems, citizen participation remains low (Bonfert, 2024: 4).

Bureaucratic barriers and legal inefficiencies in the implementation of renewable energy initiatives pose significant challenges. The process of obtaining project authorisations can be long and convoluted. Moreover, the lack of effective participation of local authorities in energy policy formulation can hinder project implementation. In order to address these, it can be suggested to involve local government organisations in decision-making frameworks related to energy initiatives, to facilitate the permitting procedure for energy-related projects through local government involvement, and to harmonise legal frameworks with renewable energy-related practices.

Limited access to the latest technologies in undeveloped and developing regions can hinder the implementation of renewable energy initiatives, especially in rural or economically disadvantaged areas. Furthermore, the integration of renewable energy sources into existing energy infrastructures poses technical challenges, including grid reliability and energy storage solutions. Local governments may lack the necessary technical acumen to properly assess and implement these technologies, leading to inefficiencies and increased costs. Frequent revisions to policies on the use of domestic technology in renewable energy projects can slow down investments and create uncertainty (Dindar, 2022: 232). At the same time, local governments struggle with outdated technologies and lack access to advanced renewable energy systems, which affects efficiency and effectiveness. Local governments face budgetary pressures that limit their ability to invest in renewable energy initiatives, often relying on external financing or incentives that may not be sustainable (Kılıç, 2011: 44). Organising training initiatives for staff in local governments and promoting national and international cooperation for the exchange of technical expertise are other proposed solutions. While these challenges are significant, they also present opportunities for innovation and co-operation. Local governments can leverage partnerships with private and community actors, seek financial incentives and adopt sound contract management practices to reduce risks. Overcoming these challenges requires a comprehensive approach that integrates financial, political, social and technological solutions and fosters an enabling environment for renewable energy initiatives to thrive.

7. DISCUSSION AND CONCLUSION

The increasing population in the world has also increased the energy demand of people. The transition from fossil energy sources, which are especially harmful to the environment and whose amount is decreasing, to renewable energy sources has started to be on the agenda not only in the government and local government policies of developed countries, but also in the governments of developing and even undeveloped countries. Major environmental problems will create negative externalities for the poor rather than the rich. Because while people without financial concerns can somehow access clean water and air, this situation will be extremely difficult for people with insufficient financial situation. In this sense, it has become almost mandatory for governments and local administrations to take measures to increase renewable energy production and consumption.

Incorporating renewable energy into local government frameworks is not only an environmental requirement, but also a strategic imperative for sustainable development. As communities tackle the multifaceted challenges posed by climate change, energy security and economic resilience, the role of local authorities is becoming increasingly important. By emphasising renewable energy initiatives, these authorities can foster innovation, create employment opportunities and improve the overall quality of life for their constituents.

Furthermore, local governments have a distinct advantage in customising renewable energy solutions to suit the specific needs and resources of their communities. This localised strategy not only optimises the effectiveness of such initiatives, but also encourages community engagement and support. Through partnerships with various stakeholders, including businesses, non-profit organisations and residents, local governments can formulate comprehensive policies that facilitate the adoption of clean energy technologies.

Decision-making units and managers working in local government institutions should increase the use of renewable energy in local governments and offer incentives such as tax reductions to people living in that region to use renewable energy. Local governments should analyse energy supply, consumption and networks, carry out energy mix planning and feasibility studies, analyse energy efficiency potential and include a comprehensive renewable energy action plan involving all stakeholders.

It is crucial that local governments adopt a proactive approach to renewable energy. This includes investments in infrastructure, providing incentives for clean energy initiatives and disseminating information to the public about the advantages of renewable sources. By undertaking these actions, local governments will not only contribute to global sustainability goals, but also establish their communities as pioneers in the transition to a more sustainable future.

Successful implementation of renewable energy initiatives requires effective resolution of the challenges faced by local governments. A multifaceted and holistic strategy should be used to overcome financial, technical, legal and social barriers. In this effort, local governments can cooperate with central government bodies and international organisations to produce innovative and effective solutions. The successful realisation of renewable energy projects not only advances climate goals, but also stimulates the local economy, increases social welfare and promotes environmental sustainability.

Ultimately, the importance of renewable energy within local government policies serves as a reflection of a commitment to sustainability, innovation and ecological integrity. By positioning renewable energy as the cornerstone of their policy frameworks, local governments can lay the groundwork for a brighter and more sustainable future for future generations. As a result, the imperative of energy transition today has increased the

responsibilities of local governments. In this study, the evaluation of the current situation on renewable energy and the examination of good practice examples and the difficulties experienced by local governments in this regard are addressed with solution suggestions and a road map is put forward.

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