

Review

Development of Sustainable Energy Use with Attention to Fruitful Policy

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Abstract: There are different energy approaches around the world to the development of sustainable energy systems. In this regard, the role of governments, local governments, and people in the development and use of sustainable energy is remarkable. This research, concerning the present epistemic and normative differences, aims to investigate the societal debate on citizen inclusion, local and national attempts to develop clear procedures and guidelines in the transition to sustainable energy use in different countries. Existing theories, subjectivities, and policy implications for different countries are first carefully analyzed. Based on theories, evidence, and policy implications, the behavioural insights for sustainable energy use are then examined. The results show that national governments should never ignore the psychology and behaviour of people, especially in terms of economic behaviour, performance applicable and knowledge of local governments and people in sustainable energy development. Channels of communication between local, people, and national governments, can make a robust shared network and implement simple policies such as increasing their authority. They can also encourage and build capacity through the training, support, trust and knowledge capacity of local governments and people to move toward sustainable energy development. Therefore, focusing on government and maintaining national authority should be departed from any approaches that local government and the public should be constrained as minor actors in sustainable energy governance networks. This work demonstrates that local governments can develop sustainable energy. Moreover, national governments can overcome issues and further control sustainable energy public policy goals under difficult national political conditions.

Keywords: sustainable energy use; behavioral insights; energy policy implications; governments



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1. Introduction

Increasing energy consumption, global warming and population growth have emerged over the past decades as significant global challenges in the future [1]. In this regard, sustainable energy use has been considered one of the most effective policies to meet these challenges [2]. Moreover, abundant sources of renewable energies worldwide hold promise for most countries, so governments are making efforts to develop them as safe fuels [3]. Fortunately, in recent years, researchers, policymakers and energy experts for renewable energy development around the world and especially in their countries have taken significant tangible actions [4].

For instance, Caferra et al. (2021) examined the critical role of political and social trust on energy-saving behaviour in Europe. Their results show that social and political

trust positively impacts the reduction of domestic energy consumption, which has allowed people to save energy [5]. Neij et al. (2021), focusing on energy efficiency in buildings, investigated the transition of the energy system through evaluation of research, policy instruments and programmers in Sweden. Although the weakness of current evaluation practice is the limited scope and the fragmented approach does not support transformative change, they demonstrated using better vision documents for the envisioned transition. In addition, they strengthened coordination between evaluations can modify the current evaluation approach [6].

Frederiks et al. (2015) investigated conservation behaviour and the complexity of household energy consumption using psychology and behavioural economics principles. They proved that consumers, because of the wide gap between material interests, peoples' values and their actual behaviour, like to use more mental shortcuts to reduce this complexity and prefer lower-value certainties instead of higher-value risks. Furthermore, to ensure maximum return on investment and cost-effectiveness, they suggested more use of sustainable energy as an efficient strategy [7]. Finally, Sam Hampton et al. examined the role of the social sciences in environmental policy and influencing energy in the United Kingdom. Through interviews with government social researchers and auto-ethnographic insights working on climate change and the energy field, they discussed policy engagement for all energy researchers.

In this regard, they proved that government social researchers to incorporate practice theory into mainstream policy discourse need an evidence base for practice-inspired policy instruments that should take the help of the government social researchers scale (GSRS) [8]. Using cross-sectional data comprising answers, they investigated the willingness of the Netherlands people to expense money for sustainable energy development. Researchers demonstrated that hopeful people are willing to pay more for green energy expenses if their hope is not based on denial of the severity of the issue. The findings of this work, about the importance of climate change, could frame sustainability based on appropriate policies and measures for investing more green energy to tackle climate change [9]. Audley Genus et al. examined the implications of energy research and the transformation of energy systems as alternative energy concepts to meet energy challenges and climate change using a policy integration. They found that a techno-economic energy imagination still dominates European energy systems. The release needs a proper approach such as interdisciplinarity, attention to social practices relevant to energy use, and related knowledge with diverse actors. Also, the authors showed that the adoption of such an imaginary for enhancing policy integration of contribution of social sciences and humanities and ameliorating energy and climate change challenges is crucial [10].

Using the Westerlund and Edgerton technique, Muhammad Wasif Zafara et al. examined the positive role of technology, education in biomass energy consumption, and remarkable effects on environmental quality. In this research that belongs to Asia-Pacific Economic Cooperation countries, they proved that utilisation of biomass energy and technological innovation reduces the environmental quality, and growing economic increases carbon emissions in the environment. On the other hand, financial development and education contribute to reducing carbon emissions [11]. Mohammed Al-Breiki et al. evaluated the life cycle assessment of sustainable energy of various energy carriers including methanol, liquid hydrogen, liquefied natural gas, dimethyl ether, and liquid ammonia. They showed that Liquid hydrogen is produced from solar electrolysis with 42.50g CO₂ eq among these energy sources. MJ⁻¹ fuel) is the cleanest energy carrier. Also, the liquid ammonia produced through photovoltaic-based electrolysis with 60.76g CO₂ eq. MJ⁻¹ fuel), is cleaner than liquified natural gas [12]. Tomas Baležentis et al. explored the limits for increasing energy efficiency in the residential sector of the European Union. They investigated the rebound effect in the household sector based on the ODEX index and then proposed an econometric approach for estimation.

The results from 2000–2015 showed that the proposed approach as a reference and the other available approaches to ensure the robustness of the analysis can be applied. In this

study and after using this method, countries such as Estonia, Italy, Slovenia, Spain, Bulgaria, Hungary, the Czech Republic, and Romania faced the most severe rebound effects, which led to backfire [13]. Yong Liu et al. examined unpacking stereotypes about sustainable energy. This study was conducted in China and was based on policy, knowledge, and public misperceptions regarding solar energy and coal. The results showed that negative stereotypes regarding these energy sources could lead to prejudice and misunderstandings and easily prevent sustainable energy development. From participants' point of view, solar energy was abundant, clean, and sustainable, but unreliable, costly, difficult to store, and regionally restricted. Also, participants believed that coal is unsustainable and a major source of pollution significant low prices and mature technology.

The survey results indicated that the participants' knowledge sources could easily influence stereotypes, thereby requiring some policies such as providing appropriate information, comparative thinking, and governmental promotion [14]. Bahareh Oryani et al. investigated the asymmetric impact of energy consumption on reshaping future energy policy in Iran. This work used the extended Cobb–Douglas production function, the one-way causality running from EC and CO₂ emissions to GDP, and the symmetric impact of energy consumption on GDP was confirmed. To overcome the issues like economic growth, the authors recommended market-based and nonmarket-based interventions [15]. Based on evidence from common correlations, Festus Fatai Adedoyin et al. investigated alternative energy utilisation and its effects on low-carbon energy and trade on the environment from different perspectives.

Based on regional trade and the outlook of EU-27 alternative energy, this work demonstrated that alternative energy utilisation in the regional bloc aids, but regional trade policy could posit environmental issues in the EU [16]. Cody Yu-Ling Hsiao et al. examined the contagious effect of energy policy on stock markets for the solar photovoltaic industry in China by examining the fluctuations in the daily stock prices. Through both mean and volatility contagion channels, they showed that China's significant solar energy policies, including solar subsidies, feed-in tariffs, and market-based instruments, have remarkable effects on most sectors in China [17]. José Goldemberg et al. investigated the global demand for biofuels via sustainable land use in 2021. Due to the 2013 renewable energy policy mandates, Ethanol produced from sugarcane and corn in 2021 will need to increase from 80 to approximately 200 billion. Expansion of land into dedicated biofuels and increasing the productivity of raw material per hectare, or a combination of both, can reach this goal.

Therefore, a scientific basis and appropriate land expansion policies with environmental programs are essential for sustainable biofuel expansion [18]. This research highlights the existing subjectivities regarding governance actors perceiving and approaching citizens in different countries regarding the sustainable energy use transition. By drawing attention to the present epistemic and normative differences in different countries, we investigate the societal debate, citizen inclusion, local and national attempts to develop clear procedures and guidelines. The present study is based on energy policy insights for sustainable energy use, and in this regard, the theories, evidence, and policy implications are investigated for different countries.

It then presents effective strategies and policies to develop them. We analyze different sections to obtain appropriate results for the following researchers for better understanding and progress in their research works. This work can also be effective research researchers looking for relevant studies regarding sustainable energy use and development research. This research highlights the existing subjectivities regarding governance actors perceiving and approaching citizens in different countries regarding sustainable energy use transition. By drawing attention to the present epistemic and normative differences in different countries, we investigate the societal debate, citizen inclusion, local and national attempts to develop clear procedures and guidelines.

1.1. The Key Role of Social Context Citizens and Government in Social and Political Progresses

Publics in societies are social representations of all citizens managed by actors in governance networks [19]. Therefore, it can be said that their participation and decisions significantly affect society, especially energy [20]. Now, if the public is active, uses knowledge, and has participated in different decisions, growth speed in society is accelerating by governance actors, and they achieve to welfare degree that expects [21]. Thereby, the previous public attitudes and behaviours essentially lead to the current and future formation of decisions by governments in society but are not absolute [22].

On the other hand, increasing the knowledge level of the public, and sudden public participation in has not happened in any society unless a vital issue or significant event has forced people to, increasing their knowledge level, participate and make public decisions [23]. So, expecting sudden growth in terms of intellectual and participatory from the general public is futile. However, it is possible to progress and sustain society by adopting strategies and approaches [24]. On the other hand, the role of governance and its power helps shape public expectations based on decision-making, and progress will evolve [25].

If the government, especially local governments, is kind, with plans, honesty, and compassion to people, this process will be faster, and vice versa [26]. In this regard, governments can encourage the public to change previous attitudes and behaviours around policy, technological requirements proposed, or new projects and help them make proper decisions on strategies, appropriate actions, and engagement formats [27].

Elitist Approach by Governments and Key Role of Them in Society Progress

From the logical point of view, the elite can be influential in different areas [28] and can present efficient suggestions in different times [29]. Thereby, elite rule and participation in making decisions are favourable for every society provided they are not abused [30]. Therefore, a remedial approach for governments and local governments to accelerate progress in different areas, especially in societies' transnational policy networks, is the use of elites to take responsibility and present practical solutions to overcome existing issues [31]. However, on the other hand, the elite knowledge about different fields of energy such as energy policy, energy efficiency, energy technology, sustainable energy, etc., especially for proposing appropriate solutions for overcoming challenges of global energy transformations on a more significant scale, can play a beneficial role [32]. In addition, about climate change issues [33], and energy (sustainable development) [34], renewable energy development [35], the elite using their thinking power can pave the way for policymakers and energy experts.

1.2. Energy Technology: Introducing New Energy Systems for the Future

Countries are under considerable pressure from the Paris agreement and are forced to reduce greenhouse gas emissions [36]. Therefore, they are intensely looking for new technology environmentally friendly solutions [37]. For this purpose, researchers and scientists in different fields but with the same goals such as energy efficiency [38], affordable energy [39], clean energy development [40], Blockchain technology and the sustainable supply chain [41], etc., that are for the welfare of humanity are working on the various systems and materials for introducing innovations applicable to energy systems [42].

In this regard, new technologies such as New Breed of Betavoltaics [43], Flexible Generators [44], Recycling Radio Waves [45], Pickin' Up Good Vibrations [46], Optical Rectenna [47], Fuel from the Sky [48], Graphene Supercaps [49], Monolithic Microscale Heat Pumps [50], and Next-gen Power Plants [51], are moving toward providing energy with CO₂ emissions targets reduction [52], will be efficient and replacing with previous technologies in the future.

1.2.1. Renewable Energy Development as Sustainable Energy

The primary objective for deploying renewable energy in different countries is to advance economic development, improve access to energy, improve energy security, and

mitigate climate change [53]. Therefore, the exploitation and development of renewable energy resources and technologies are critical for sustainable development [54]. At present, energy providers, based on price considerations, lack of consumers, sense of environmental and social responsibility, are trying to develop renewable energy that is encouraging [55]. Without a doubt, renewable energy has less negative environmental impact than other existing energy sources that we use [56].

Thereby, the reality that the utilisation of renewable energy in sustainable energy use is a logical and efficient way for policymakers and energy experts to achieve their targets, thus, they try to develop these kinds of energies as much as possible that so far have succeeded [57]. There are many countries where a considerable part of their energy is provided through renewable energy, expanding this plan [58]. The countries such as Germany [59], China [60], the US [61], Denmark [62], the UK [63] and European Union countries [64] are pioneer countries in this field. With an accurate glance at these countries' policies during these years, we will understand that all sections have developed renewable energy and widespread popular support for using renewable energy [65].

1.2.2. The Government Policies in an Open Market for Supporting Clean Energy

The positive effects of the government's policies in an open market for supporting clean energy have shown their trust in this kind of fuel [66]. Fortunately, in recent years the critical role of governments in the open market and appropriate policies to support particular generations such as renewables through allocating direct subsidies, feed-in tariffs, quota obligations were outstanding, tax relief. In addition, renewable portfolio standards and encouraging [67], especially in the US [68], China [69], and the EU [70], as the biggest energy producers in the world, were significant. Also, for giving more detail related to the EU, the European countries had remarkable plans for the energy subsidies during these years.

According to a report by the European parliament published 2020, energy subsidies can be in various forms, such as government revenue foregone (e.g., tax incentives and credits), the direct transfer of funds (e.g., grants, loans), the provision of goods and services, price support, payments to funding mechanisms, or income. In this regard, it reported that total energy subsidies in the European countries in 2018 were estimated at EUR159 billion. As above mentioned, the forms of subsidies in EU countries are different. For instance, two-thirds of Germany's total volume of subsidies supported renewables, while primarily in Latvia supported energy efficiency measures. In addition, In Greece, France, Finland, Belgium, Poland, and Ireland, the highest shares were spent on fossil fuels. This report also showed that most of the subsidies, respectively, belonged to the energy sector (EUR92 billion), industry (EUR20 billion), households (EUR17 billion), transport (EUR13 billion), and in the end in agriculture (EUR5 billion) in 2018, that renewable energy in the energy sector, received almost three-quarters of the subsidies.

Thus, this report demonstrated the importance of renewable subsidies in the energy sector in supporting their deployment [71]. Moreover, the government's policies to allocate direct subsidies and tariffs on renewable energy for developing the markets in countries show that the governments of these countries have unique plans for more rely on renewable energy as the main fuel in the future, such as Italy [72], Iran [73], Australia [74], Netherland [75], Saudi Arabia [76], Sweden [77], Brazil [78], Chile [79], and Canada [80].

2. Materials and Methods

Interventional studies involving animals or humans, and other studies that require ethical approval, must list the authority that provided approval and the corresponding ethical approval code. Investigating behavioural insights for sustainable energy use requires comprehensive research in the different fields of energy. As such, the role of government, policymakers, energy experts, local governments, and people is significant. In this research and in order to collect the information required, we used the words such as sustainable energy use, energy policy, governments and planning for sustainable energy use, policies

3. Results

In this section, we investigate that for understanding governance to more sustainable energy use, the essential actor groups, their relationship to governance, and their interests. On the other hand, we investigate the politics of the governing about sustainable energy use, their arguments, and relevant them mediated by political institutions.

3.1. Initiatives Governments for Sustainable Energy Use and Green Deal in Different Countries

Undoubtedly, there need to be profound practice changes for establishing sustainable energy, especially in energy policy and prospects for different countries. However, this is not easy but should be done [81]. The changes such as regulation in energy consumption [82], how energy is produced and used energy technology [83], and energy price should be done by policymakers as the most important initiatives of the governments in the line of sustainable energy [84]. Government initiatives and their responsabilisation have caused those numerous projects in the sphere of green energy.

Because of this, and in recent years, the countries such as Argentina, Brazil, Canada, Mexico, and the United States for green energy proliferation and with economic benefits, and CO₂ emission reduction targets, have spent much money through its policy. However, government initiatives are always inefficient for countries because most projects will fail without planning and energy policy. Therefore, the correct understanding of the governments of current situations and how a national project can succeed is critical by using policymakers and energy experts plans well done [85]. Therefore, it can be concluded that policymakers and energy experts have a critical and active role in shaping energy policy at the high level of governments energy governance. They can use effective strategies and policies to shape the energy systems (sustainable energy) in the line of stakeholders [86].

For example, in the US, and the UK, measures such as the Energy Company Obligation and Green Deal, for encouraging energy efficiency innovations while were slow to start, now represent ambitious efforts of these countries to drive domestic retrofit markets. It shows that new sustainable energy policies can make regulations and rules that increase sustainable practices however are under governance processes [87]. Also, Luciana Maria Miu et al. explored large-scale retrofit of UK housing based on domestic energy efficiency and emissions reduction targets. The authors used a straightforward assessment framework, assessed Green Mortgage, the Variable Stamp Duty Land Tax, and the Variable Council Tax known for the Energy Company Obligation (ECO) to replace the UK's current major domestic retrofit proposed. They showed that the green Mortgage and the Variable Council Tax for overcoming the main barriers to retrofit policies have a high potential for the high-level UK targets, especially energy consumption [88]. About this reality that still there is a significant financing gap like an investment for the large-scale deployment of low-carbon technologies in different countries. Through 52 interviews in three countries (Germany, Australia, and the UK), investment banks' performance is to leverage additional private finance and close this finance gap in these countries.

The results showed that the Kreditanstalt für Wiederaufbau (KfW) in Germany, the Clean Energy Finance Corporation (CEFC) in Australia, and the Green Investment Bank (GIB) in the UK are proper for these targets. Because these banks can create trust for projects, help projects gain an excellent track record and enable financial sector learning in catalyzing private investments into low-carbon investments [89]. The European green Deal examined the emission performance standards and the perspectives. This Commission approved that car manufacture between 2021 and 2030 must reduce 37.5% of the average carbon emissions of their fleets. This action was crucial for mobility research to reduce lobbying power in the EU and led to more moving to electric vehicles [90]. In order to minimise the domestic energy use in cities in achieving sustainability goals, Gary Goggins et al., with an analysis of a database of 249 recent sustainable energy initiatives across urban areas in Europe, evaluated two major themes, namely stratification and integration that emerged from reviewing the data.

They recognised for stratification five key areas: governance, general approach, evaluation frameworks, problem framing, and engagement mechanisms. Moreover, for the corresponding typology of initiatives, four categories: experimental, enhancing, responsive, and directional have been recognised. Then they argued that integration of these initiatives could increase the success of initiatives in household energy use to achieve long-term sustainable transformation across critical areas [91]. Finally, four municipalities of Norway and Sweden investigated central government ambitions and local commitment to climate mitigation initiatives. In this study, they showed that the national approaches for developing such initiatives depend not only on the central government efforts but also on the targeted municipalities. In this regard, local coalitions of committed individuals for helping the government programs and implement these initiatives are significant [92].

3.2. The Effect of Policy and Regulatory Framework Initiatives

Without a doubt, the effect of policy and regulatory framework initiatives is impressive on society. Therefore, this regard needs accurate energy planning, practical strategies, policies calculated by policy-makers and energy experts, recognising issues and solutions for these. [93]. The actions such as Tariff policy amendments [94], encouraging investors to come to energy markets [95], full support of the equipment failure [96], forecasting natural disasters to prevent damages, and tackle potential hazards in relation with energy [97], issued the standardisation of renewable energy projects policy (testing, standardisation, and certification) [98], action plans for standards (testing and certification of performance) for renewable energy [99], improvement of manufactured components of the energy systems [100], improvement and co-optimisation of the infrastructure of energy systems [101], developing markets of renewable energy [102], finding main barriers of energy systems [103], review mechanism of energy efficiency policies especially for buildings [104], critical revisions energy efficiency policies [105], reduce the subsidies and invest in Research & Development Funding (R&D) lagging [106], increasing manufacturing storage system affordable to reduce the cost of renewables [107], and renewable energy technologies development [108], can be efficient as proper policy and regulatory framework initiatives by governments in sustainable energy use development.

3.3. Strategies and New Approaches for Behaviour Change of People

Human activities affect atmospheric composition and energy consumption [109] directly. Moreover, these adverse effects cause issues such as global warming and energy crisis [110]. In addition, lack of energy, especially electricity, will cancel most activities in the different countries; therefore, developing energy with a low-carbon policy is essential for every country [111]. On the other hand, as energy is an auxiliary good for increasing life, it requires accurate consumption monitoring, especially for domestic appliances, electronics, etc. [112]. Energy consumption at home and work, rather than on deliberate choices, is based on automatic and routine behaviour [113]. Then, to have electricity permanently as the essential kind of energy and its conserve, we should not be wasting so much electricity quickly when we do not need it [114]. Thereby, behaviour change programs to use less energy can be effective, especially in their homes [115]. Behaviour changes of people in energy use at home and at work on evidence from behavioural psychology and economics shows that the new approaches can convince people to reduce energy consumption and prevent loss of energy easily [116].

Based on routine reporting of comparative energy consumption information in-home, and work adopting strategies like behaviour change programmes advice can have remarkable effects in reductions in energy use and lead to energy savings [117]. In this regard, having essential strategies, governments, and policymakers' strategies such as energy technologies (Smart meters) for improving energy efficiency and reducing energy consumption should be considered [118]. On the other hand, paying attention to enhancing people's sufficiency can be investigated as an efficient strategy [119]. Because when the people know how energy is produced and what issues before producing it, they will know the

energy's value [120]. However, sometimes, due to financial incentives, the people don't like to follow up the policies of the governments in the energy consumption field. Thereby, they refusal the regulations [121]. The intervening of governments to change behaviour and save energy is effective such as, more training [122], presenting cost-effective, mass-scalable behavioural solutions to encourage renewable and sustainable energy use among consumers [123], greater control to employees and organisations [124], implanting the smart meter systems in offices and homes [125], considering a penalty [126], and implanting price tags and energy efficiency labels on the high consumer's electrical devices [127], for the people that have not attended to their consumption.

3.4. Applying Psychology and Behavioural Economics to Explain, Predict and Change Consumer Behavior

One of the most critical issues about energy is consumer behaviour [128]. Consumer behaviour analysis such as behavioural psychology, behavioural economics, and marketing science is essential to finding hidden issues related to energy [129]. For example, Foxall, G. R. during the years 2004, 2010, 2011, 2015, and 2016, investigated consumer psychology from a behavioural perspective and showed people's behavior in different times depending on the situation, is related to the norms of economic theory [130–134]. However, Kahneman and Tversky have demonstrated that people's behavior often deviates substantially from the norms of economic theory [135]. Moreover, Nils Magne Larsen believes that another technique for consumer research is in-store observation of the consumers in stores Behavior based on their choices [136]. Michael G. Pollitt et al., proved that behavioural economics could provide new positive perspectives, lead to appropriate policy design for change behaviour, evaluate options, and make correct decisions to tackle climate change while considering energy efficiency and conservation [137]. N'Famory Camara et al., using behavioural economics, examined the understanding of household energy use and decision making and in Guinea-Conakry.

They showed that concerning an increase in power generation, behavioural economics could predict consumer behaviour before the projects' full completion and prevent the public policy interventions of the household and community [138]. Elizabeth V. Hobman et al. investigated uptake and usage of cost-reflective electricity pricing in Australia. This work presents the psychology and behavioural economics insights to design cost-reflective prices for customers for their attracts and optimal usage for most of the population. These works showed that having proper strategies about behavioural economics has a significant role in energy consumption management while providing shared benefits for customers, networks, retailers, and regulators alike [139].

Finally, Luis Mundaca et al. examined the behavioural economics for Scandinavian perspective energy based on the transition to sustainable energy use and climate change policies. Regarding the critical role of behavioural economics on decarbonisation activities and sustainable energy, they showed that policy evaluation, design, and implementation, need to be given greater attention to behavioural issues. On the other hand, they proved that behavioural interventions for sustainable energy use are not enough; price and non-price interventions also are required, like the technological policymaking approach [140].

3.5. Obstacles in Sustainable Energy Development

For developing sustainable energy use, paying attention to obstacles and finding solutions for them is significant. Thereby, we divided the obstacles into three essential parts observed in Table 1. These include (1) education and training obstacles, (2) environmental obstacles, (3) Social, Economy and policy obstacles.

Table 1. Obstacles and solutions in sustainable energy development.

| Type of the Obstacles | Obstacles | References |
|----------------------------|--|------------|
| Education and training | Lack of skilled human resources especially in the renewable energy sector. Weak follow-up or assistance for the workers (especially during the projects). Weak knowledge in renewables. Lack of awareness programs for the general public, Low per capita income. Lack of trust in the storage system because too costly. Lack clearly understood for the environmental benefits of renewable technologies by the people. | [141–146] |
| Environmental | Great dangers of the thin-film PV cells in increasing the public health threats and environmental threats. The massive volume of wind turbines whatever offshore or onshore, and underwater blade (effect on roads and transmission lines, fishing, sand extraction, gravel extraction, oil extraction, gas extraction, aquaculture, fish, algae, aquatic weeds and other organisms, and navigation of the birds and bats. Adverse effects of Sound and visual impacts of wind turbines. The wind turbines' adverse effects (material production, transportation of materials, on-site construction, assembling, operation, maintenance, dismantlement) and improper disposal of their wastes. | [147–158] |
| Social, economy and policy | Lack of investment or low investment. Lack Tariff of governments for people. Lack of enough training. Lack acceptance quickly by people. Weak in the feedstock market. Weak legislation, policies development, deforestation, inefficient energy-saving systems, inefficient conservative scenarios of governments. Also, obtain an accurate picture of the local current energy situation, measure the state of development and the progress of sustainable energy system, and make energy decisions to implications on sustainable development of selected policies, especially in Africa countries. Access to affordable and accessible electricity concerning UN SDG7 by using clean energy. | [159–170] |

4. Conclusions

Concerning environmental issues and energy crises, sustainable energy use and development is one of the most critical targets of each country. In this research, regarding the present epistemic and normative differences in different countries, we investigated the societal debate regarding citizen inclusion and local and national attempts to develop clear procedures and guidelines in the sustainable energy use transition line. The present study was based on energy policy insights for sustainable energy use. In this regard, the theories, evidence existing subjectivities, and policy implications are explored for different countries. The study presents a comprehensive review of the previous studies concerning previous and current research in sustainable energy use. It then presents effective strategies and policies to develop them. This conceptual work offers a new, interdisciplinary framework for analyzing governing, people, institutions, and organizations for sustainable energy systems by drawing together insights from and offering critiques of socio-technical transitions and new institutionalist concepts of change.

This work can be attended as effective research to researchers looking to relevant studies regarding sustainable energy use and development research. This research highlighted the existing subjectivities regarding governance actors perceiving and approaching citizens in different countries regarding sustainable energy use transition. The results showed that the role of policy is significant in renewable technologies development, attracting private investors, improving energy infrastructures, managing energy consumption, encouraging and punishing the offices and people who lose energy. However, in this regard, there are issues inherent in lack of sustainable energy use; others are the outcome of a skewed regulative structure and marketplace. Hence, the absence of appropriate and comprehensive

policies and regulation frameworks prevents people from adopting sustainable energy use, and sustainable energy development requires explicit policies and proper approaches.

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