Hindawi
Journal of Nanomaterials
Volume 2023, Article ID 9850967, 1 page
https://doi.org/10.1155/2023/9850967

Retraction

Retracted: Relationship between Urban Landscape Design and Ecological Environment Protection in the Application of Environmental Protection and Renewable New Energy Materials

Journal of Nanomaterials

Received 18 July 2023; Accepted 18 July 2023; Published 19 July 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] S. Wu, X. Yu, Y. Cao, and G. Wang, "Relationship between Urban Landscape Design and Ecological Environment Protection in the Application of Environmental Protection and Renewable New Energy Materials," *Journal of Nanomaterials*, vol. 2022, Article ID 6360300, 13 pages, 2022.

Hindawi
Journal of Nanomaterials
Volume 2022, Article ID 6360300, 13 pages
https://doi.org/10.1155/2022/6360300

Research Article

Relationship between Urban Landscape Design and Ecological Environment Protection in the Application of Environmental Protection and Renewable New Energy Materials

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Received 4 March 2022; Revised 22 June 2022; Accepted 2 July 2022; Published 27 August 2022

Academic Editor: Awais Ahmed

With the economic growth in recent years, urban construction has also developed rapidly. In developing countries, the pursuit of rapid development has also brought about huge energy consumption, energy shortage, and environmental pollution. It is urgent to find and develop renewable energy. In order to understand the role of renewable energy materials in urban landscape design and ecological environment protection, replace nonrenewable materials with renewable energy materials, and reduce urban pollution, we analyze the available energy for buildings in urban areas and optimize the allocation of various available resources. Energy, improve energy efficiency, so as to save energy, protect the environment, and coordinate the development of energy, economy, and environment. Renewable energy is also known as alternative energy, sustainable energy, or nontraditional energy. It is energy that can be obtained from nature and can be replenished naturally. Experimental results prove that the energy required for traditional material consumption is much higher than the consumption of renewable energy, and its range is more than 50%. Renewable energy can replace the role of nonrenewable energy. This article hopes to stimulate more relevant architects to think about this subject through the research and analysis of renewable energy.

1. Introduction

The rational use of renewable resources such as solar energy, geothermal energy, and bioenergy in urban buildings will contribute to the sustainable development of urban energy, economy, and environment. Through the analysis of the available energy in urban buildings, rationally optimizing the distribution of various available energies and improving energy efficiency, the goals of energy conservation, environmental protection, and coordinated development of energy, economy, and environment can be achieved. With the development of the new era, the concept of sustainability has gradually penetrated into the hearts of the people, and the design of gardens must also develop with the trend of the times. Starting with the functionality of the garden, to a certain extent, make the garden a purification system for the urban environment and play a role in buffering air pollution. Therefore, on this basis, the design of urban gardens must be highly coordinated with the planning of related cities, and the different functions of gardens should be brought into play according to the content of urban planning. Therefore, it is necessary to study the design of urban building energy system and coordinate the available energy distribution of various buildings from the urban planning level. In this way, the sustainable use of energy can be ensured, the utilization of energy can be maximized, and the urban ecologicalization can be realized.

Renewable energy collection embedded system is a technology that uses renewable energy to have the characteristics of wide distribution, sustainable collection, and low cost, and to efficiently collect and store renewable energy while replacing a single battery as the energy supply unit of the embedded system. However, in terms of energy harvesting and storage, the technology is still affected by environmental changes and the limitations of traditional energy storage technologies, resulting in irregular and unpredictable input energy in the energy harvesting process, energy conversion, and high energy consumption of the energy storage system. The development and utilization of new energy and renewable energy are the basic requirement for implementing the scientific development concept and building a resource-saving and environment-friendly society. It is an urgent need to adjust the energy structure, save energy and reduce emissions, and reasonably control the total energy consumption. At the same time, it is also an important way to protect the ecological environment, deal with climate change, develop the rural economy, and cultivate strategic emerging industries. This paper aims to explore the relationship between urban landscape design and ecological environmental protection in the application of environmental protection and renewable new energy materials, in order to make a certain contribution in this regard, so as to inspire more relevant architects to think about this topic.

For sustainable development, experts at home and abroad have conducted many studies. Samadi P is concerned about the load dispatching and power trading issues in systems with high penetration of renewable energy (RER). The game theory method is used to simulate the interaction and excess generation between users. The simulation results show that the proposed algorithm reduces the user's energy expenditure. The proposed algorithm also promotes the use of RER by encouraging users to consume excess power locally instead of reinjecting it into the grid [1]. Yang P formulated the cost minimization problem of storage and power generation planning, while considering the initial investment cost and operation/maintenance cost, and proposed a distributed optimization framework to overcome the difficulties caused by the large-scale optimization problem. The results will help to make decisions about energy storage and power generation capacity planning in future decentralized grids with high renewable penetration rates [2]. Rezaei R's model focuses on the unified theory of technology acceptance and use (UTAUT), which is extended to study the factors that influence the intention to use renewable energy. Using the structural equation model's multiple techniques and adding attitude variables as mediating variables in the model, it was found that the predictive ability of the model increased by 19%, providing evidence for five mediation paths in the cognitive process of renewable energy use intentions [3]. Wu Y considered cost-effective energy dispatch for residential smart grids equipped with centralized renewable energy. Quantify the best use of renewable energy to achieve a trade-off between the system-wide benefits of using renewable energy and the related costs due to its fluctuation; evaluate how the fluctuation of renewable energy affects its optimal development. A distributed algorithm with high computational efficiency is proposed to determine the best use of renewable energy and related energy scheduling decisions [4]. Rahim S conducted a comparative evaluation of the performance of home energy management controllers designed based on heuristic algorithms, introduced general demand-side management (DSM) architecture, and used a combination model of time-of-use electricity prices and inclined block rates for energy pricing. The simulation results show that all the designed energy management models have significantly achieved our goals and proved to be a cost-effective solution to improve the sustainability of the smart grid [5]. The purpose of the Athari M H study is to use an optimized fuzzy logic controller (FLC) to examine the impact of time-varying power prices on the performance of the energy storage components of the grid-connected hybrid renewable energy system (HRES). Considering that the grid electricity price has a considerable impact on the performance of the energy storage components running on the grid-connected HRES, because the weekly and daily optimized FLC results in less working hours of fuel cells and electrolyzers, and less SOC fluctuations [6]. The Dogan E empirical study analyzed the impact of actual income, renewable energy consumption, nonrenewable energy consumption, trade opening, and financial development on CO2 emissions in the first few countries listed in the EKC model. It is found that by using CADF and CIPS unit root tests, the analyzed variables become stable at the first-order difference, and the analyzed variables are cointegrated by using the LM bootstrap cointegration test. The increase in renewable energy consumption, trade opening, and financial development reduced carbon emissions, while the increase in nonrenewable energy consumption contributed to the level of emissions [7]. These studies provide a lot of reference for this article, but due to insufficient relevant research data and old research methods, the conclusions of the research cannot convince most people.

The innovations of this paper are as follows: (1) The concept, technical principles, and characteristics of regional building energy planning are analyzed. On this basis, the method of urban regional building energy planning is studied, and the basis of urban regional building energy planning is proposed. (2) Through analysis and evaluation, the available amount of conventional energy and renewable resources in urban areas can be obtained, which can provide strong data support for the comprehensive planning of urban building energy, thereby promoting energy, economic, and sustainable development. (3) Use the urban building energy planning method proposed in this paper to carry out energy planning for new urban buildings, combining theoretical research with practical engineering cases.

2. Research and Use Methods of Renewable New Energy Materials

2.1. Renewable New Energy. Renewable energy is also called alternative energy, sustainable energy, or nontraditional energy. It is energy that can be obtained from nature and can be supplemented naturally, such as wind energy, solar energy, hydro energy, geothermal energy, biological energy, and ocean energy. [8]. The main reasons why humans use renewable energy are as follows. The advancement of science and technology has made such energy more "easy to use." Fossil energy is limited, not only will its price increase day by day, but it will eventually run out. Certain renewable energy sources (e.g., wind, hydro, and solar) do not emit greenhouse gases (e.g., carbon dioxide) and therefore do not increase the risk of the greenhouse effect. To improve energy supply security, reduce reliance on imported fossil fuels, and meet the demand for sustainable energy. As a clean energy source, renewable energy is environmentally friendly and sustainable. However, along with its advantages, the use of renewable energy is still limited due to some disadvantages.

(a) Renewable resources (b) Non-renewable resources

Figure 1: Renewable and nonrenewable resources.

First of all, one of the main disadvantages is climate dependence, because these energies continue to exist in different geographical spaces, so the available energy changes in the order of magnitude all the time [9]. The solution at this stage is to apply multiple forms of renewable energy hybrid collection technology to enable the energy collection system to continuously collect energy from the natural world. The second disadvantage is that the energy collection efficiency is low, and the energy collection cost is high. In addition to geothermal energy collection, compared with traditional energy collection technology, the cost of renewable energy collection is much higher than that of traditional energy collection systems. Therefore, reducing the cost of renewable energy collection and improving energy utilization efficiency are key issues. The third is technology development and commercialization. Nowadays, some high-efficiency, stable, and sustainable collection technologies for renewable energy are still under development [10]. Practice has proved that renewable energy can not only provide clean alternative energy, but more importantly, it can also stimulate the development of related industries such as equipment manufacturing. It is an effective way to speed up the transformation of economic development mode and the adjustment of economic structure in the post-international financial crisis period.

Renewable energy harvesting application technology mainly includes five parts: energy harvesting, electric energy conversion, electric energy transmission, electric energy storage, and electric energy use. Due to the frequent and unpredictable changes of renewable energy, the collected energy cannot be directly supplied to the load. Therefore, the collected energy needs to be rectified or stored to supply power to the load [11]. The main function of the regenerative energy storage system (ESS) and energy management system (EMS) is that in addition to efficient storage of the collected energy, it can also play a role in “shaving peaks and filling valleys” to reduce energy fluctuations and slow down the load caused by fluctuations. The energy management system includes data acquisition and monitoring system, automatic power generation control and economic dispatch control, power system state estimation, safety analysis, and dispatcher simulation training system. Renewable resources and nonrenewable resources are generally shown in Figure 1:

In the analysis of the energy storage process, the part of the object or space that is delineated in order to determine the research object is called the energy storage system. It includes energy and matter input and output, energy conversion, and storage equipment. Energy storage system (ESS) can be divided into physical energy storage, chemical energy storage, and electromagnetic energy storage in terms of characteristics and methods. Among them, flywheel technology, pumped water energy storage, and compressed air energy storage technology belong to physical energy storage; superconducting and supercapacitors are electromagnetic energy storage technologies; lead-acid, lithium ion, sodium sulfur, and liquid batteries are electrochemical energy storage technologies [12, 13]. Small-scale low-power storage technologies are mainly lithium-ion batteries, lead-acid batteries, and super capacitors. Traditional ESS is mainly based on lead-acid batteries and lithium-ion batteries. Energy storage systems often involve multiple energies, multiple devices, multiple substances, and multiple processes. They are complex energy systems that change over time and require multiple indicators to describe their performance. Commonly used evaluation indicators include energy storage density, energy storage power, energy storage efficiency, energy storage price, and impact on the environment. With the development of ESS technology, people are paying more and more attention to supercapacitor technology. Table 1 shows the comparison of the characteristics of three energy storage devices.

The role of the EMS is to protect, detect, and control the ESS to ensure the safe and efficient operation of the ESS and to extend the service life of the ESS. The main functions of EMS include protection functions, state and parameter estimation, and energy balance and redistribution functions between single cells [14].

With the development of China and the further improvement of people’s living standards, people have higher and higher requirements for the comfort of the indoor thermal environment of residential buildings, which will lead to a further increase in the energy consumption of residential buildings [15]. Currently, urban energy, economic, and environmental issues have become issues of concern to the world. How to use energy reasonably, improve the overall energy efficiency of urban buildings, optimize the energy distribution of urban buildings, and protect the urban environment on which mankind depends for survival is a long-term interest issue in the world today.

2.2. Renewable Energy Collection. We conduct research on traditional wind energy collection, solar energy collection, and storage technologies. The structure, parameters, and their mathematical models and equivalent circuits of energy conversion devices will be analyzed separately [16]. At the same time, the I-V curve and P-V curve of solar energy collection

Table 1: Comparison of characteristics of three energy storage devices.

	Lead-acid batteries	Lithium ion battery	Super capacitor
Energy density (Wh/kg)	25-55	85-300	5-55
Power density (W/kg)	25-55	160-500	$699 - 10^5$
Cycle life (times)	<499	499-3000	$>10^6$
Cell voltage (V)	1-2	2-3	3-5
Equivalent internal resistance (Ω)	<1	<1	<0.01
Self-discharge	High	Low	Generally
Safety	Generally	Lower	High
Environmentally destructive	Higher	Generally	Lower
Market	Saturation	Develop	Great potential

and the Cp-λ, Cp-ω characteristic curves of wind energy collection are listed for the model.

Wind energy is a kind of available energy provided to human beings due to the work done by air flow and belongs to renewable energy. The kinetic energy of air flow is called wind energy. Wind energy harvesting includes energy conversion devices (WT) and control systems. In wind energy collection technology, accurate modeling of wind energy conversion devices is particularly important. Because in order to efficiently collect and transform wind energy, MPPT is required. The MPPT technology is inseparable from an accurate wind energy conversion device model. The WT mechanical energy collection model is as follows:

$$P_m = \frac{1}{2} p\pi r^3 v^3 C_p, \tag{1}$$

where P_m is the mechanical power (W), r is the radius of the WT blade, v is the wind speed, and C_p is the power coefficient. Expressed by the tip speed ratio function C_p, the relationship between the power factor and the tip speed ratio is shown in the following formula:

$$C_p(\lambda, \beta) = c_1 [c_2 \partial - c_3 \beta] e^{-c6\partial} + c7\lambda, \tag{2}$$

$$\partial = \left(\frac{1}{\lambda + 0.05\beta}\right) - \left(\frac{0.025}{1 + \beta^3}\right), \tag{3}$$

where λ is the tip speed ratio and β is the blade pitch angle because the constant parameters are different for different WTs. For the convenience of research, suppose the blade pitch angle β of WT is 0. Therefore, the maximum mechanical power at a given wind speed P max is:

$$P \max = \frac{1}{2} p\pi r^3 v^3 C_p(\lambda_{\text{opt}}), \tag{4}$$

$$\lambda_{\text{opt}} = \frac{rw}{v} \longrightarrow w_{\text{opt}} = \frac{\lambda_{\text{opt}} v}{r}. \tag{5}$$

The above formula can be rewritten as:

$$P_{\max} = \frac{1}{2} p\pi r^5 \frac{C_{pma}x}{\lambda_{\text{opt}}^3} * \frac{\lambda_{\text{opt}}^3 v^3}{r^3}, \tag{6}$$

$$K_{\text{opt}} = \frac{0.5 p\pi r^5 C_{p\ \max}}{\lambda_{\text{opt}}^3}. \tag{7}$$

From the above reasoning, the relationship between the power coefficient and the tip speed, as well as the relationship between the power and the angular speed of the rotor, can be obtained.

Figure 2 is a schematic block diagram of the wind energy collection system. The control system can sample the motor speed ω and output voltage, current, and power. Then, the system will calculate the maximum power point. If the output power of the WT needs to be adjusted, the control system can adjust the WT gearbox or control the DC-DC circuit to achieve MPPT.

Solar energy is produced by the fusion of hydrogen and helium atoms inside the sun to release huge nuclear energy, which is the radiation energy from the sun. The vast majority of human energy needs come directly or indirectly from the sun. Solar energy collection technology is similar to wind energy collection technology and also requires mathematical modeling of energy harvesting devices, and at the same time depicting output characteristic curves and MPPT strategy design based on mathematical models [17]. Different from wind energy harvesting, the solar energy output energy waveform changes more slowly. Therefore, the output voltage of the device can be regarded as direct current and does not require AC-DC rectification.

After the PV device is made, it needs to be packaged. The package structure mainly includes the front plate, solar cell, sealing layer, back plate, protective frame, and junction box [18]. The front panel can increase the mechanical strength and rigidity of the PV. It should be noted that the front panel must have good penetration and low reflectivity for light with wavelengths from 350 nm to 1200 nm; the back panel provides physical protection for the PV and can pass through the back panel. Surface reflection improves the efficiency of PV. We use the single diode model to describe the characteristics of the

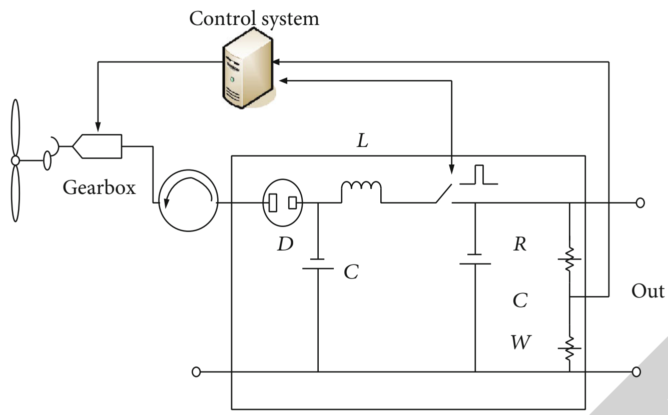


Figure 2: Wind energy collection system.

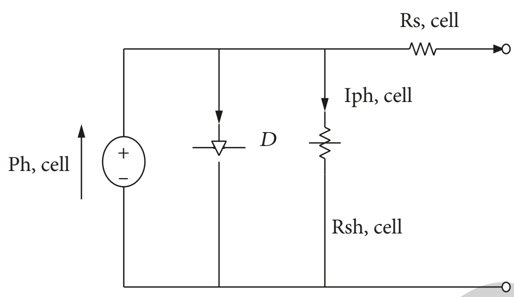


Figure 3: PV equivalent circuit diagram.

photovoltaic cell, and the PV equivalent circuit is shown in Figure 3:

According to Kirchhoff's first law definition [19], the battery output current satisfies the formula:

$$I = I_{\text{ph,cell}} - I_{d,\text{cell}} - I_{R_{\text{sh,cell}}}. \tag{8}$$

In order to determine the volt-ampere relationship of the PV cell, it is necessary to determine the parameters such as the sum of the cell. The function relationship between the induced current of the PV cell equivalent circuit and the irradiance and temperature is shown in the formula.

In order to determine the volt-ampere relationship of the PV cell, it is necessary to determine the parameters such as the sum of the cell. The function relationship between the induced current of the PV cell equivalent circuit $I_{\text{ph,cell}}$ and the irradiance and temperature is shown in the formula:

$$I_{\text{ph,cell}} = \frac{G}{G_{\text{ref}}}\left(I_{\text{sc,ref}} + K_i \Delta T\right), \tag{9}$$

where V is the output voltage of the PV cell and T_{ref} is the output current of the PV cell. The current absorbed by the internal resistance of the PV cell equivalent circuit G_{ref} is as follows:

$$I_{d,\text{cell}} = I_{s,\text{cell}} \exp\left[\left(\frac{V + I_{R_{s,\text{cell}}}}{nV_{\text{th,cell}}}\right) - 1\right], \tag{10}$$

where V is the output voltage of the PV cell and I is the output current of the PV cell. The current absorbed by the internal resistance of the PV cell equivalent circuit is as follows:

$$I_{R_{\text{sh,cell}}} = \frac{\left(V + I_{R_{s,\text{cell}}}\right)}{R_{\text{sh,cell}}}, \tag{11}$$

where $I_{\text{sh,cell}}$ is the shunt resistor of the PV cell. Saturation current of PV battery diode:

$$I_{s,\text{cell}} = I_{\text{sref,cell}}\left[\frac{T}{T_{\text{ref}}}\right]^3 \exp\left(\frac{qR_q}{nK}\right). \tag{12}$$

For any given $x \in X$, there is a uniquely determined$\mu A(\mathrm{x}) \in [0, 1]$ membership function value corresponding to it, and the fuzzy set can be expressed as:

$$\mu\tilde{A}(x) \colon X \longrightarrow [0, 1]. \tag{13}$$

Generally, the expression of fuzzy sets is as follows:

$$\tilde{A} = \frac{\mu_{\tilde{A}}(x_1)}{x_1} + \frac{\mu_{\tilde{A}}(x_2)}{x_2} + \cdots + \frac{\mu_{\tilde{A}}(x_n)}{x_n}. \tag{14}$$

This method of representation is also called Zadeh notation. It can also be expressed in ordinal notation:

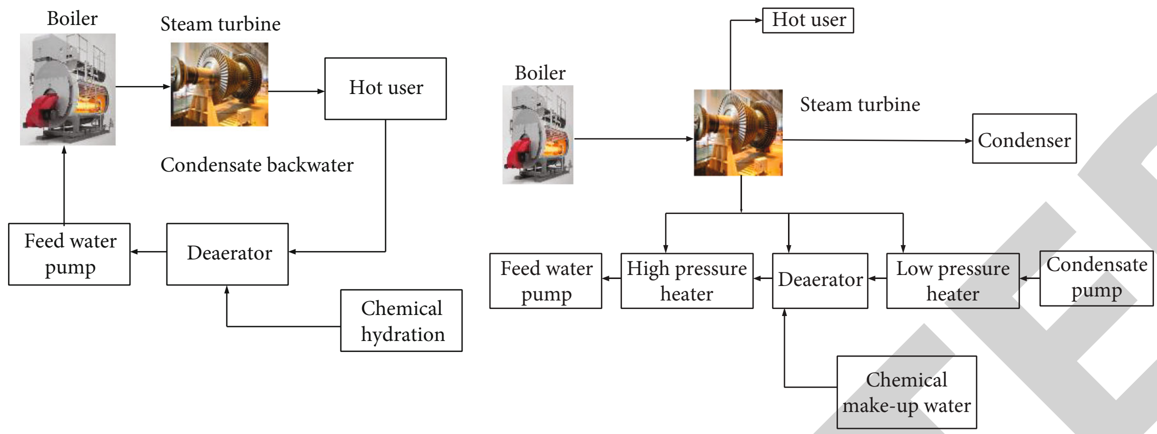
$$\tilde{A} = \{(x_1, \mu_{\tilde{A}}(x_1)), (x_2, \mu_{\tilde{A}}(x_2)), \cdots, (x_n, \mu_{\tilde{A}}(x_n))\}, \tag{15}$$

Or, use vector notation:

$$\tilde{A} = \{\mu_{\tilde{A}}(x_1), \mu_{\tilde{A}}, \cdots, \mu_{\tilde{A}}(x_n)\}. \tag{16}$$

The definition of the distance function is as follows: For all $\vec{x}_1 \in \Gamma$

$$d\left(\vec{x}\right) = \min\left(\left|\vec{x} + \vec{x}_1\right|\right). \tag{17}$$



(a) Back pressure steam turbine unit process (b) Pumping condensing unit

Figure 4: Typical process of two groups of units.

From the definition, when the unknown point is on the boundary, the function value is 0. Find the nearest point on the boundary and mark the nearest point, the value of the distance function is

$$d\left(\vec{x}\right) = \left|\vec{x} - \vec{x}c\right|. \quad (18)$$

From the definition of the distance function, the specific definition of the signed distance function is:

$$\begin{aligned} \phi\left(\vec{x}\right) &= d\left(-\vec{x}\right) = 0, \quad \vec{x} \in \Gamma \\ \phi\left(\vec{x}\right) &= -d\left(\vec{x}\right) \qquad \vec{x} \in \psi \end{aligned}. \quad (19)$$

The signed distance function is a subset of the implicit function and has all the properties of the implicit function discussed in the previous section. Using the signed distance function can simplify many level set methods for dealing with implicit functions.

$$Z_i = T^T \left(x_{nm} - f \notin R^n\right). \quad (20)$$

When solar and wind energy are sufficient, that is, the collected energy is greater than the energy consumed by the equipment, in order to avoid energy loss and maximize the use of the collected energy, it is necessary to store the excess energy [20]. Due to the irregular, unpredictable, and serious environmental impacts of the output power of solar and wind energy collection systems, the ESS of the collection system is mostly multicell cascade. This increases the difficulty of monitoring the battery module [21].

2.3. Regional Planning of Urban Landscape Design. Urban landscape is a broad, comprehensive, and difficult to define profession in architecture. A city is a complex organism, and housing and architecture should be the main body of it, complemented by a space environment other than architecture. The two together are called urban landscape.

Table 2: Changes under different voltages and currents.

Experimental parameters	Parameter value
Charge switching frequency	1 khz
Circuit PWM modulation pulse frequency	400 khz
Buck mode input voltage range	5 V-25 V
Buck mode input current range	0-1.5 A
Buck mode output voltage	5 V
Boost mode input voltage	3 V-12 V
Boost mode input current range	0-5 A
Boost mode output voltage	15 V

Landscape planning refers to the activities of comprehensively determining and arranging the nature, scale, development direction, main content, infrastructure, comprehensive spatial layout, construction staging, and investment estimation of landscape construction projects. Urban garden planning is a complex and important project. Certain principles must be followed to achieve good results. The construction of gardens on the basis of following the corresponding principles can achieve a multiplier effect with half the effort. Urban landscape refers to the natural landscape beauty inherent and created by the landscape function in the human settlement environment. It can make the city have natural landscape art and make people feel comfortable and happy in urban life. Generally speaking, urban landscape design needs to follow the following principles:

(1) The principle of function. The main function of urban gardens is to maintain the physical and mental health of residents and protect the local natural ecology. Humans and nature are the two key points of garden construction and cannot be ignored

(2) The principle of economy and efficiency. There is no doubt that economy is the foundation of garden construction, and efficiency is the driving force of

Table 3: Different energy harvesting classifications.

Energy harvesting technology	Equivalent internal resistance	Output voltage (V)	Output power	Conversion efficiency
Electromagnetic induction technology	25-450	0-13	0.1-0.5 W	35%-50%
Gear transmission technology	50-200	0-8	0.1-1.3 W	20%-35%
Piezoelectric ceramic technology	50-280	0-30	10 mW-30 mW	80%-85%
RF receiving technology	5 k-45 k	0-0.5	0.002 mW-0.1 mW	5%-15%

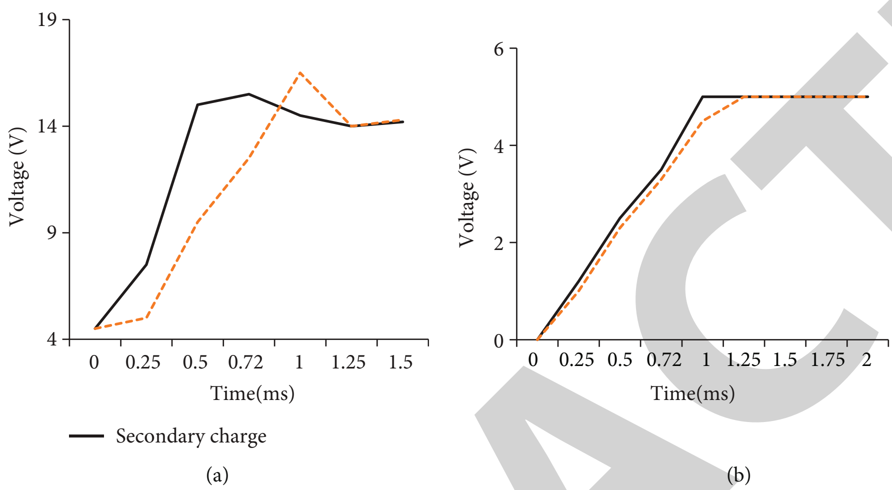


Figure 5: Changes in step-up and step-down.

garden construction. How to achieve economy and efficiency is a key issue that relevant departments and units should think about

(3) The principle of recycling and regeneration. As the concept of sustainable development gains roots in the hearts of the people, recycling and regeneration have become the focus of urban development. We must not only make good use of the recycling and regeneration functions of nature, but also must protect these functions. Nature's gifts to us are never infinite, and if we abuse them uncontrollably, the consequences will be disastrous

How to comprehensively utilize the energy resources available in the region is the key to the energy planning of urban buildings. It is particularly necessary to consider advanced and reasonable comprehensive utilization technologies of energy resources in the regional building energy planning and to rationally configure various resource supply systems. The back pressure steam turbine unit refers to the steam turbine unit that directly supplies the steam of the steam turbine to heat users for heating, and this unit corresponds to the condensing unit [22]. The exhaust steam condensing unit has holes in the appropriate position, and the steam turbine condensing unit that releases part of the steam for heating is called the exhaust steam condensing unit. The steam extraction method of this unit is divided into two types: adjustable exhaust and nonadjustable exhaust. Provide thermal users with adjustable output, and the system uses nonadjustable output. The typical flow of the unit is shown in Figure 4.

The heat, power, and cold cogeneration system is based on the basic idea of cascade utilization of energy, uses natural gas as fuel, and uses natural gas-burning equipment such as micro internal combustion engines, gas internal combustion engines, and small gas turbines. The waste heat generated after the high-temperature exhaust gas is used for heating in winter, cooling in summer, or supplying domestic hot water [23]. The system makes full use of high-temperature exhaust gas and increases system efficiency to 80%, thereby saving a lot of time. Compared with the central power generation-long-distance power transmission, the natural gas heat-electricity-cooling three-electric system significantly improves the overall energy efficiency. For example, the current output efficiency of large power plants is about 30%-40%. If the cogeneration system is used for waterfall energy utilization, the efficiency of the power supply system can be increased by about 40% compared with the conventional power generation system. At about 80%, there is no transmission loss problem.

District cooling technology can also use rivers and lakes, sea water, urban sewage, or steam produced by thermal power plants as cold and heat sources. Combining the actual situation of the urban area, the Dalong Lake and the hot water pipeline of the thermal power plant can be used. Therefore, the regional cooling in the urban area is suitable for heating pipelines and the surrounding areas of rivers and lakes. The application object is the density of buildings and the larger plot ratio. At the same time, with the application of a large temperature difference and a small flow energy supply system, the pipe diameter of the entire system can be reduced, and the

Table 4: Energy conservation in the region.

Type	New increment				Cumulative amount			
	Installed capacity (ten thousand KW)	Average annual power generation (100 million kWh)	Annual average emission reduction (ten thousand tCO_2)	Annual average standard coal quantity (ten thousand tce)	Installed capacity (ten thousand KW)	Average annual power generation (100 million kWh)	Annual average emission reduction (ten thousand tCO_2)	Annual average standard coal quantity (ten thousand tce)
Hydropower	195	64	407	195	799	253	1555	839
Wind power	1049	216	1521	647	1699	615	2301	863
Solar energy	487	74	578	227	499	76	280	228
Biomass energy	29	4	30	15	30	4	30	15

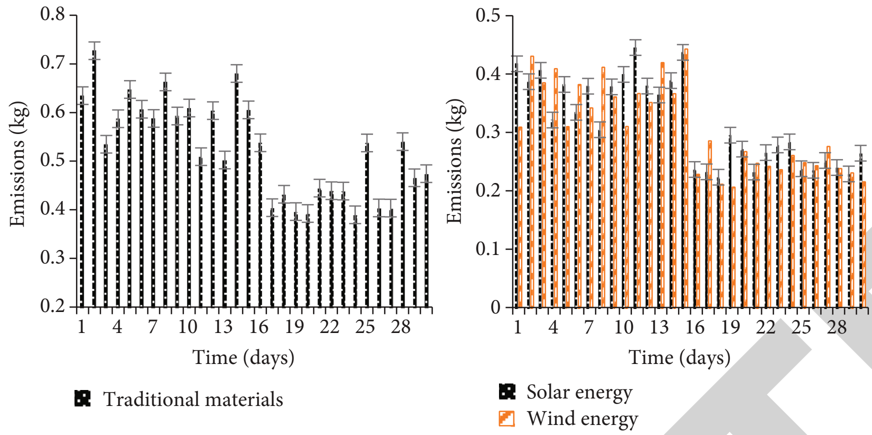


Figure 6: Comparison chart of carbon emissions statistics.

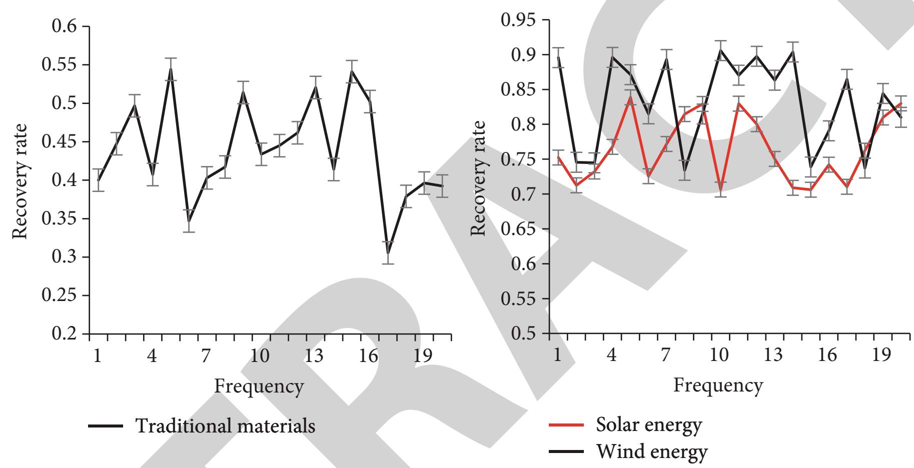


Figure 7: Recycling ratio of different materials.

flow rate of the water pump can be reduced, thereby saving operating costs and initial equipment investment. Therefore, through the combination with district cooling technology, initial investment and operating costs can be saved [24].

3. Experiments and Results of Renewable New Energy Materials

3.1. Energy Changes. In the experiment, we first display the collected energy conversion efficiency and make statistics on the changes under different voltages and currents. The results are shown in Table 2:

It can be seen that in this experiment, the input voltage range of the step-down mode is 5 V-25 V, the output voltage is 5 V, and the output current range is 0A-1.5A; the input voltage range of the step-up mode is 3 V-12 V; and the output voltage range is 5 V-25 V.

The capability classification of different energy harvesting technologies is shown in Table 3:

We compare the two-stage charge pump with the single-stage boost. Under the same experimental conditions, when the two-stage charge pump and the single-stage boost/buck circuit rise from 4.5 V to 15 V and from 24 V to 5 V, apply the voltage simulated by OrCAD—the time results are shown in Figure 5, where Figure 5(a) is boost and Figure 5(b) is buck:

It can be seen that when the buck/boost topology circuit is used alone for voltage regulation, as the horizontal axis voltage rises, the conversion efficiency decreases almost linearly. The secondary voltage regulating circuit added with the charge pump will slow down the decline of the conversion efficiency of the circuit at the mode switch by changing the mode of the charge pump voltage regulation [25].

3.2. Comparison before and after Transformation. The ultimate goal of developing new energy is to realize the sustainable development path of low energy consumption, high energy efficiency, less pollution, and diversified energy supply for economic and social development. We calculate the carbon emission reduction and energy saving of new energy and renewable energy in the region, and the results are shown in Table 4:

We compare new energy materials using wind and solar energy with traditional materials. By comparing their carbon dioxide emissions, recycling capacity, time cost, and energy consumption, we first make statistics on carbon emissions, and the results are shown in Figure 6:

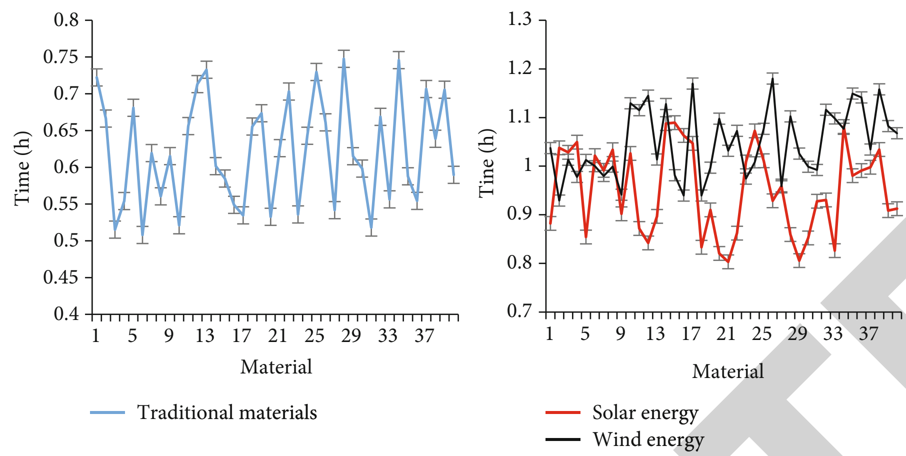


FIGURE 8: Time required to produce materials.

FIGURE 9: Virtual city image.

It can be seen from the comparison of the figure that in the comparison of the carbon emissions of different materials within one month, the carbon emissions of traditional materials are much greater than that of solar and wind energy, with an average daily emissions of about 0.4, which is twice as high as that of solar and wind energy. Many, great damage to the environment, needs to be changed.

We have carried out statistics on the recycling capacity of different materials, conducted multiple simulations, and took the average value for comparison. The results are shown in Figure 7:

It can be seen that the current recycling rate of materials is not ideal, especially in traditional materials, the recycling rate is about 35%, while for renewable energy, the recycling rate can reach about 85%, which greatly improve the protection of the environment.

We have made statistics on the time required after each piece of material is produced. Of course, due to the lack of relevant technology, our statistical time is only fuzzy time and not very accurate. The statistical results are shown in Figure 8:

As can be seen from the figure, in the time shown for the production of materials, the average time required for materials produced by traditional methods is about 0.6 h, while the average value of wind energy and solar energy is about 1 h. This is due to the requirements of solar and wind energy for climate. Higher, the display is not stable, which also causes the traditional method to produce materials faster than renewable energy. We use environmentally friendly materials to plan the city, and the virtual image is shown in Figure 9:

At present, the environment in which we live has become worse due to energy consumption, and people have gradually realized the importance of protecting the environment. Therefore, we have compared the energy consumed by different materials, and the results are shown in Figure 10.

It can be clearly seen that the energy required for the consumption of traditional materials is much higher than that of renewable energy, which is more than 50% higher. This is also due to the different production methods of the materials. Regarding the role that different materials can play in urban landscape design, we have compared the existing data and obtained relevant results. The results are shown in Figure 11.

It can be seen that in the eyes of most people, traditional materials have been more and more questioned due to their serious damage to the environment. People's pursuit of environmentally friendly materials and renewable energy has become more and more urgent. Advantages, it has become more and more people's first choice [26].

4. Discussion

Carbon dioxide and other greenhouse gas emissions are causing global climate change, posing a serious threat to human survival and sustainable economic and social development. Therefore, climate change is not only an environmental issue, but also a development issue.

By analyzing and researching the energy planning concepts, technical principles and characteristics of building regional energy planning, it is concluded that the building regional energy planning mainly includes the setting of

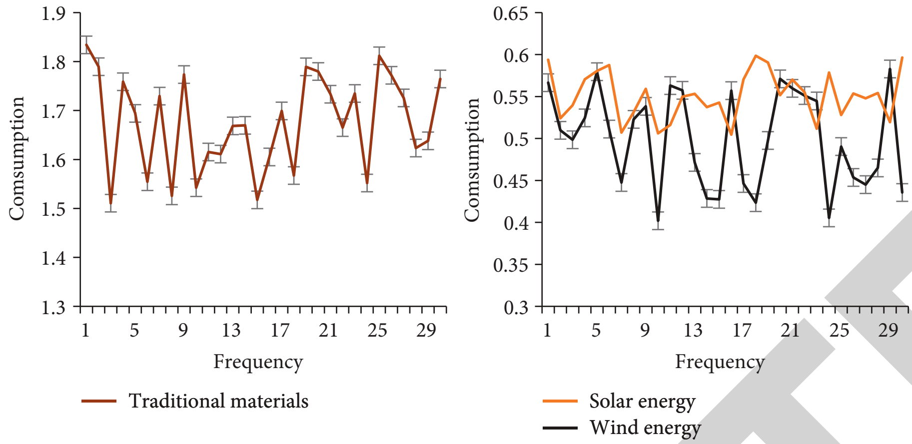


Figure 10: Different materials consume energy.

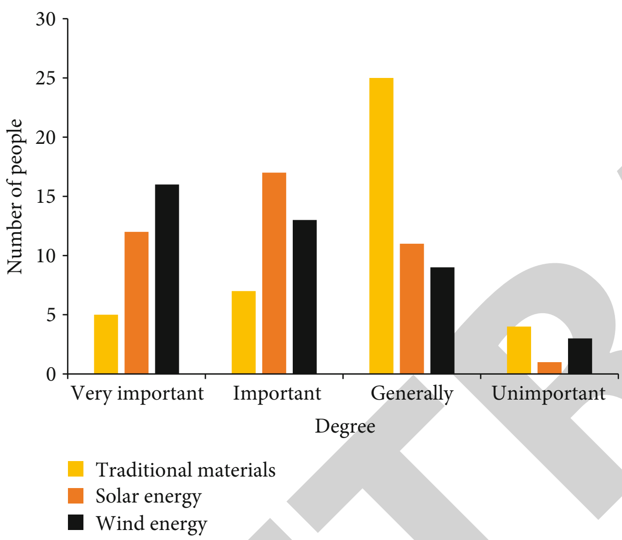


Figure 11: The importance of different energy sources.

regional energy-saving strategic goals. Determine the available energy resources and the development of energy construction in the region. And forecasting the energy load of the region, select the appropriate energy system and technical route, and evaluate the energy utilization rate of the regional energy system and the possible impact on the environment.

In the field of architectural planning, how to rationally arrange the location of buildings and plants to achieve natural ventilation and natural lighting, and in a single building, how to integrate solar energy, solar cells, solar water heaters, range hoods, biogas, and geothermal heat to make rational use of ground-floor dwellings are all issues that need to be considered. In this regard, this paper proposes some technical solutions by adopting the method of software-assisted analysis. Among them, the key to passive design is to handle the relationship between the building and the environment and nature, plan and overall design in the plot, and choose the appropriate building layout and courtyard shape, and the environmental elements such as plants and ponds must be reasonably matched with the building.

For natural ventilation, the key is to organize the ventilation channels and vents; for natural lighting, the building's shading system and day lighting system must follow the angle and track of the sun. These are all used in traditional residences, especially in the planning of new residential districts, and they should be planned and laid out in detail. For the use of energy, priority is given to selecting renewable energy sources, such as solar energy, biogas energy, and geothermal energy. Solar energy is abundant, and solar power generation is now mainly used in areas where there is no grid, and it needs to be popularized due to its high cost. Solar water heaters have a big trend and can be used in engineering and construction applications, but they still face many challenges.

Generally speaking, the use of renewable energy in daily life has been very extensive, and various energy sources have their own application ranges and limitations. In order to make the effective use of renewable energy, various energy sources should complement each other in the application. This article analyzes the device and packaging structure of the PV cell and then in-depth study of the equivalent circuit model of the PV cell. According to the PV cell equivalent circuit model, the mathematical model and power-voltage output characteristic curve of the PV cell are derived. In this way, based on the output characteristic curve and mathematical model of the PV cell, the PV cell can be controlled by MPPT to obtain the maximum output power.

5. Conclusion

At present, most countries in the world have realized the importance of a good and environmentally friendly living environment to people, and have begun the ecological construction and design of modern human settlements, and have achieved some results, solving the problem of satisfying people's living conditions. Quality requirements, so in the contemporary human settlement environment, we should see the ecological philosophy and spiritual connotation of traditional residential buildings, which in many aspects show its advanced and modern concept of ecological environmental protection. Fully use and use it for reference to the modern living environment, and build a modern residential area suitable for modern people with a good ecological environment, energy saving, and intelligent. This is also our long-term pursuit of the modern living environment. Of course, the research in this article also has its shortcomings. The article only considers the comparison of solar energy and wind energy to renewable energy, and does not give more introduction to other environmentally friendly energy sources. The design of energy harvesting does not meet the design requirements. Therefore, in future research, this paper will design a self-starting system for the energy harvesting system to further improve the efficiency of energy harvesting. According to the characteristics of wind and solar hybrid energy harvesting, a dedicated energy harvesting controller chip is designed to reduce the energy consumption of the energy harvesting circuit, reduce the circuit volume, and improve the efficiency of energy harvesting. However, due to the limitation of time and technology, we did not further discuss the design of urban garden landscape. We will also conduct in-depth discussions in the follow-up, in order to make certain contributions in this regard.

Data Availability

No data were used to support this study.

Conflicts of Interest

There is no potential conflict of interest in this study.

Acknowledgments

This study has been supported by the Anhui University Humanities and Social Science Research Key Project "Study on the Influence of Taoist Philosophy on the Architectural Form Design of Huizhou Ancient Dwelling Houses," Project Number: SK2019A0602; the Anhui Province University Outstanding Young Talents Support Program Project, "Research Project on the Hierarchical and Classified Protection Mode and Comprehensive Utilization Technology of Ancient Houses in Huizhou under the Background of New Urbanization," Project ID: gxyq2018053; and the Anhui University Humanities and Social Science Research Project "Research on the Morphological Design of Ancient Villages in Huizhou from the Perspective of Intangible Cultural Heritage," Project Number: SK2019A0602.

References

[1] P. Samadi, V. Wong, and R. Schober, "Load scheduling and power trading in systems with high penetration of renewable energy resources," *IEEE Transactions on Smart Grid*, vol. 7, no. 4, pp. 1–1, 2017.

[2] P. Yang and A. Nehorai, "Joint optimization of hybrid energy storage and generation capacity with renewable energy," *IEEE Transactions on Smart Grid*, vol. 5, no. 4, pp. 1566–1574, 2014.

[3] R. Rezaei and M. Ghofranfarid, "Rural households' renewable energy usage intention in Iran: extending the unified theory of acceptance and use of technology," *Renewable Energy*, vol. 122, pp. 382–391, 2018.

[4] Y. Wu, V. K. N. Lau, D. H. K. Tsang, L. P. Qian, and L. Meng, "Optimal energy scheduling for residential smart grid with centralized renewable energy source," *IEEE Systems Journal*, vol. 8, no. 2, pp. 562–576, 2014.

[5] S. Rahim, N. Javaid, A. Ahmad et al., "Exploiting heuristic algorithms to efficiently utilize energy management controllers with renewable energy sources," *Energy & Buildings*, vol. 129, pp. 452–470, 2016.

[6] M. H. Athari and M. M. Ardehali, "Operational performance of energy storage as function of electricity prices for on-grid hybrid renewable energy system by optimized fuzzy logic controller," *Renewable Energy*, vol. 85, pp. 890–902, 2016.

[7] E. Dogan and F. Seker, "The influence of real output, renewable and non-renewable energy, trade and financial development on carbon emissions in the top renewable energy countries," *Renewable & Sustainable Energy Reviews*, vol. 60, pp. 1074–1085, 2016.

[8] U. Al-Mulali, I. Ozturk, and S. A. Solarin, "Investigating the environmental Kuznets curve hypothesis in seven regions: the role of renewable energy," *Ecological Indicators*, vol. 67, pp. 267–282, 2016.

[9] J. B. Geng and Q. Ji, "Technological innovation and renewable energy development: evidence based on patent counts," *International Journal of Global Environmental Issues*, vol. 15, no. 3, pp. 217–219, 2016.

[10] A. Ghafoor, T. U. Rehman, A. Munir, M. Ahmad, and M. Iqbal, "Current status and overview of renewable energy potential in Pakistan for continuous energy sustainability," *Renewable & Sustainable Energy Reviews*, vol. 60, pp. 1332–1342, 2016.

[11] R. M. Ferdous, A. W. Reza, and M. F. Siddiqui, "Renewable energy harvesting for wireless sensors using passive RFID tag technology: a review," *Renewable & Sustainable Energy Reviews*, vol. 58, pp. 1114–1128, 2016.

[12] G. Ferruzzi, G. Cervone, L. D. Monache, G. Graditi, and F. Jacobone, "Optimal bidding in a day-ahead energy market for micro grid under uncertainty in renewable energy production," *Energy*, vol. 106, pp. 194–202, 2016.

[13] A. Kamjoo, A. Maheri, A. M. Dizqah, and G. A. Putrus, "Multi-objective design under uncertainties of hybrid renewable energy system using NSGA-II and chance constrained programming," *International Journal of Electrical Power & Energy Systems*, vol. 74, no. 1, pp. 187–194, 2016.

[14] W. Chen, X. Wu, L. Yao, W. Jiang, and R. Hu, "A step-up resonant converter for grid-connected renewable energy sources," *Transactions of China Electrotechnical Society*, vol. 30, no. 6, pp. 3017–3029, 2016.

[15] R. Hosseinalizadeh, H. G. Shakouri, M. S. Amalnick, and P. Taghipour, "Economic sizing of a hybrid (PV–WT–FC) renewable energy system (HRES) for stand-alone usages by an optimization-simulation model: case study of Iran," *Renewable & Sustainable Energy Reviews*, vol. 54, pp. 139–150, 2016.

[16] V. Bertsch, M. Hall, C. Weinhardt, and W. Fichtner, "Public acceptance and preferences related to renewable energy and grid expansion policy: empirical insights for Germany," *Energy*, vol. 114, pp. 465–477, 2016.

[17] Y. Shu, Z. Zhang, and J. Guo, "Study on key factors and solution of renewable energy accommodation," *Zhongguo Dianji Gongcheng Xuebao/Proceedings of the Chinese Society of Electrical Engineering*, vol. 37, no. 1, pp. 1–8, 2017.

[18] A. Gasparatos, C. Doll, M. Esteban, A. Ahmed, and T. A. Olang, "Renewable energy and biodiversity: implications for

transitioning to a green economy," *Renewable and Sustainable Energy Reviews*, vol. 70, pp. 161–184, 2017.

[19] G. Faranak, P. Pinson, and H. B. Gooi, "Very short-term nonparametric probabilistic forecasting of renewable energy generation— with application to solar energy," *IEEE Transactions on Power Systems*, vol. 31, no. 5, pp. 3850–3863, 2016.

[20] L. Ju, Z. Tan, H. Li, Q. Tan, X. Yu, and X. Song, "Multi-objective operation optimization and evaluation model for CCHP and renewable energy based hybrid energy system driven by distributed energy resources in China," *Energy*, vol. 111, pp. 322–340, 2016.

[21] B. J. Williamson, P. Blondel, E. Armstrong et al., "A self-contained subsea platform for acoustic monitoring of the environment around marine renewable energy devices–field deployments at wave and tidal energy sites in Orkney, Scotland," *IEEE Journal of Oceanic Engineering*, vol. 41, no. 1, pp. 67–81, 2016.

[22] J. Huenteler, C. Niebuhr, and T. S. Schmidt, "The effect of local and global learning on the cost of renewable energy in developing countries," *Journal of Cleaner Production*, vol. 128, no. 1, pp. 6–21, 2016.

[23] S. Sanajaoba and E. Fernandez, "Maiden application of cuckoo search algorithm for optimal sizing of a remote hybrid renewable energy System," *Renewable Energy*, vol. 96, pp. 1–10, 2016.

[24] X. Xiang, Q. Li, S. Khan, and O. I. Khalaf, "Urban water resource management for sustainable environment planning using artificial intelligence techniques," *Environmental Impact Assessment Review*, vol. 86, article 106515, 2021.

[25] R. Atassi and K. Yang, "An integrated neutrosophic AHP and TOPSIS methods for assessment renewable energy barriers for sustainable development," *International Journal of Neutrosophic Science*, vol. 18, no. 2, pp. 157–173, 2022.

[26] L. Zeng, X. P. Guo, G. A. Zhang, and H. X. Chen, "Semiconductivities of passive films formed on stainless steel bend under erosion-corrosion conditions," *Corrosion Science*, vol. 144, no. 1, pp. 258–265, 2018.