مجلة جامعة الانبار للعلوم القانونية والسياسية

Journal of Anbar University for Law and Political Sciences
مجلة جامعة الانبار للعلوم القانونية والسياسية
P. ISSN: 2706-5804 E.ISSN: 2075-2024
Volume 14 - Issue 2- December 2024 | كانون الاول ٢٠٢٤ ـ العدد ٢ـ المجلد ١٤

Renewable Energies in the Perspective of International Law

[1] Lecturer. Dr. Raad Hamza Awad [2]Assist. Prof. Dr. Waleed Ahmed Sulaiman Al-Jarjari

[1] Technical Institute/ Hawija, Northern Technical University, Iraq
[2]College of Technical Administration/ Mosul, Northern Technical University

Abstract:

The world has witnessed significant developments on all fronts, especially those related to development, environment, and preserving life on Earth. The negative impacts caused by technological and industrial advancement and the use of traditional energy sources have affected various aspects of human life. These effects have led to many international problems, including deterioration, environmental pollution, climate change, shrinking green spaces, and depletion of natural resources such as water in oceans and rivers, as well as the spread of greenhouse gases that have turned many cities worldwide into foggy cities where living becomes challenging. All of this has drawn the attention of the international community towards establishing international legal regulations for using clean or renewable energies that preserve human life and its development, and safeguarding the Earth and its natural resources. This interest is deeply rooted in the formulation of international agreements to protect the environment and climate and in establishing specialized international bodies to invest in renewable energy resources in various aspects of life.

1: Email:
raadawad_hwj@ntu.edu.iq
2: Email:
waleed_ahmed@ntu.edu.iq

DOI
https://doi.org/10.37651/aujlps.2024.152549.1325

Submitted: 1/8/2024
Accepted: 3/8/2024
Published: 8/8/2024

Keywords:
Renewable Energies
International Community
International Law
Climate Change.

الطاقات المتجددة في منظور القانون الدولي

[١] م. د. رعد حمزة عواد [٢] ا. م. د. وليد احمد سليمان الجرجري
الجامعة التقنية الشمالية- المعهد التقني/ الحويجة [٢]الجامعة التقنية الشمالية- الكلية التقنية الادارية /الموصل

المستخلص

شهد العالم تطورات مهمة على الصعد كافة، لاسيما الجوانب التي تخص التنمية والبيئة والحفاظ على الحياة على كوكب الارض، ولما سببه التقدم التكنولوجي والصناعي واستخدام الطاقة التقليدية من اثار سلبية على مختلف نواحي الحياة البشرية، هذه الاثار التي احدثت الكثير من المشاكل الدولية من بينها التدهور والتلوث البيئي والتغيير المناخي وتقلص المساحات الخضراء والنقص في الموارد الطبيعية كالمياه في المحيطات والانهار وانتشار الغازات الدفيئة التي حولت الكثير من مدن العالم الى مدن ضبابية يصعب العيش فيها؛ كل هذا استرعى اهتمام المجتمع الدولي الى التوجه نحو احداث تنظيم قانوني دولي لاستخدام الطاقات النظيفة او المتجددة التي تحافظ على استمرار الحياة البشرية وتطورها والحفاظ على كوكب الارض وثرواته الطبيعية، هذا الاهتمام الذي ترسخ في وضع الاتفاقيات الدولية لحماية البيئة والمناخ وتاسيس هيئات دولية متخصصة في استثمار موارد الطاقات المتجددة في مختلف جوانب الحياة.

الكلمات المفتاحية: الطاقات المتجددة، المجتمع الدولي، القانون الدولي، تغير المناخ.

Introduction

Since the dawn of human existence and settling on Earth, humans have been seeking resources to meet their daily needs. With the advancement of human societies and the emergence of the state as the main contributor to fulfilling individual needs in various aspects such as health, economy, social, medical, and public lifestyle, technological advancements in traditional energy have evolved and permeated various areas of life. Machines now perform most tasks and functions for both individuals and states. This progress has been accompanied by a significant depletion of Earth's natural resources, resulting in detrimental effects on human environment, including air, water, green spaces, and the spread of diseases and epidemics due to the damages caused by these energy sources. Sometimes these damages can be catastrophic, as demonstrated by the use of nuclear energy to

generate electricity in the Chernobyl disaster in 1986 [11]. Which led to understanding the need to find alternative energy sources that satisfy the needs of life and preserve the environment in which human beings live. Renewable energies generated and exploited from natural sources have often been the solution. It has received international and national attention as one of the 21st century tools that contribute to protecting and preserving the planet.

This research aims to identify the concept of renewable energies and their characteristics, the extent to which the international community has established international legal foundations that regulate the use of these energies at the international level, and the obstacles this regulation faces that limit its effectiveness and make it accessible to countries all over the world. The research will be divided into two axes: the first will address the definition of renewable energies, and the second will explain the international legal regulation of these energies and the obstacles that prevent the effective use of this source of energy.

I. First Axis

Concept of Renewable Energies and Their Characteristics

Energy is the force or activity necessary to move or operate things. Generally, it is defined as the ability to transfer a certain amount of weight from one place to another. It is also defined as the amount of heat that needs to be converted, used, or replaced to complete a manufacturing or distribution process of a specific commodity in the economic system. This definition encompasses various forms of energy used in production processes [2]. Traditional energy, on the other hand, is defined as the well-known sources that have provided energy such as coal, petroleum, and natural gas, which are fundamentally characterized by their depletable nature due to continuous extraction or

(1) Ahmed Abdel-Sayed Ibrahim Al-Alfi, Chernobyl Nuclear Power Plant explosion incident, April 26, 1986, Journal of Humanities and Literary Studies published by the Faculty of Arts, Kafr El-Sheikh University, Egypt, Issue No. 26, 2022, pp. 632 and beyond.

(2) Abdullah Khababah, et al., "Developing Renewable Energies Between Ambitious Goals and Implementation Challenges: A Case Study of Germany's Energy Transition Program", Journal of Economic Sciences, Management, and Commercial Studies, University of M'sila, Algeria, Issue No. 10, 2013, p. 44.

use [1], In this topic, the definition of renewable energy will be discussed and its characteristics will be explained in two paragraphs:

1. Definition of Renewable Energy:

Renewable energy has been defined in several ways to articulate its concept and clarify it. One definition describes it as "a type of energy generated from natural sources, meaning it does not deplete with significant consumption, is constantly renewable, and differs from non-renewable energy sources in being unlimited, environmentally friendly, and not affecting the environment at all, or having a minimal impact compared to fossil fuels for example" [2]. Another definition characterizes it as "electricity generated from the sun, wind, biomass, geothermal heat, and water, as well as biofuels and hydrogen derived from renewable sources" [3]. It has also been defined as "energy obtained from sources at a rate equal to or less than the rate of replenishment of the source" [4]. Furthermore, it has been defined based on its production sources as “electricity generated from wind, solar, geothermal and hydraulic energy, as well as biofuels and hydrogen derived from renewable sources” [5].

On the international level, renewable energy, according to the United Nations Environment Programme (UNEP), is defined as "energy whose source is not a fixed and limited stock in nature, renewed periodically at a faster rate than its consumption rate, and

(1) Hani Obeid, "Man and Environment, Energy, Environment, and Population Systems", 1st Edition, Dar Al-Shorouk for Publishing and Distribution, Amman, 2000, p. 20.

(2) Nagham Hussein Naima, "Management of Investment in Renewable Energies and Its Role in Achieving Sustainable Development", Article published at the following link: https://portal.arid.my/20983/Posts/Details/a9eaa5f3-bc44-488d-af23 Visit date: 22/2/2024.

(3) Mohammed Sahel Talbi, "The Importance of Renewable Energy in Protecting the Environment for Sustainable Development", Al-Bahith Journal, Issue No. 6, University of Ouargla, 2008, p. 203.

(4) John R. Fatch, "Technical Energy and Future Directions", Translated by Abdel Basset Ali Saleh Kerman, Strategic and Advanced Technologies Series, King Abdulaziz City for Science and Technology, Arab Translation Organization, Center for Arab Unity Studies, 1st Edition, Beirut, 2011, p. 297.

(5) Hani Obeid, "Man, Environment, and Population", Dar Al-Shorouk, Amman, 2000, p. 205.

appears in the following five forms: biomass, solar radiation, wind, hydroelectric energy, and geothermal energy" [1]. The International Renewable Energy Agency defines it as "energy that encompasses all forms produced from renewable sources in a sustainable manner, including biomass, thermal, geothermal, hydropower, wind, and solar energy, derived from natural processes and renewed at rates faster than their consumption" [2].

On the national legislative level, legislation in several countries has leaned towards defining renewable energies as one of the clean energy sources that contribute to protecting and improving the environment. The Iraqi legislator defined it as "energy derived from renewable natural resources that cannot be depleted, including energy released from the sun, water, wind, waves, tidal movements, and differs from energy released from fossil fuels because its residues do not contain environmental pollutants" [3]. It was also defined by the Jordanian legislator as "energy derived from natural sources characterized by sustainability and continuity" [4].

From the mentioned definitions, we conclude that most of these definitions focus on highlighting specific aspects of renewable energies. They emphasize the technical and technological side, defining it as clean and sustainable energy, meaning it is a sustainable source of energy, environmentally friendly, and available to the majority of countries for diversifying their energy sources.

2. Characteristics and Advantages of Renewable Energy:

The idea behind using renewable energy aims to achieve sustainable and cleaner development. Renewable energy has several

(1) Yasmine Merzouk, "The Role of Renewable Energies in Achieving Sustainable Development in Algeria", Master's Thesis, Mohamed Boudiaf University, M'sila, Faculty of Law and Political Science, Department of Political Science and International Relations, 2018/2017, p. 14.

(2) The basic system of the International Renewable Energy Agency for the year 2009, Article (3).

(3) Iraqi Environmental Protection and Improvement Law No. (27) of 2009, Article 2/19.

(4) Jordanian Renewable Energy and Energy Efficiency Law No. 13 of 2012, Article (1/A).

advantages that benefit both humans and the environment. Below are explanations of the most important of these advantages:

a) Renewable and Non-depletable: Renewable energy sources remain available as long as humans inhabit the Earth. Water continuously flows, the sun rises every day, and gentle winds never cease. Strong winds are persistent in some locations, providing the world with a significant energy source. This means it is a nearly limitless and sustainable energy source, unlike other energy sources [1].

b) Environmentally Friendly: Unlike fossil fuels that produce carbon emissions, the installation cost of some types of renewable energy is relatively low. They do not produce greenhouse gases like carbon dioxide, which means reducing the phenomenon of global warming and its consequences. Non-natural materials have contributed to what is known as the climate crisis, particularly after the industrial revolution, forest fires, and rapid melting of ice [2].

c) Safe for Humans: Renewable energy sources are non-flammable, and using them helps the world get rid of dangerous materials that are constantly in need of maintenance. They maintain human health since they do not emit harmful gases into the atmosphere, reducing the spread of diseases among people.

d) Low Maintenance and Cost-Effective: The maintenance of renewable energy sources such as wind and solar energy using photovoltaic panels is less expensive than generating gas, saving money. As technology advances and becomes more efficient and widespread among people, the costs will decrease. They also reduce monthly electricity bills and contribute to boosting the country's economy by reducing energy imports or purchases from producing countries. This means the country can rely on self-produced energy, providing new job opportunities for job seekers. Installation and

(1) Robert L. Evans, "Charging Our Future with Energy: An Introduction to Sustainable Energy", Translated by Dr. Faisal Hurdan, Strategic and Advanced Technologies Series, King Abdulaziz City for Science and Technology, Arab Translation Organization, Center for Arab Unity Studies, 1st Edition, Beirut, 2011, p. 297.

(2) Maha Ahmed Eid Abdul Sattar Sayed, "New and Renewable Energy and Its Role in Sustainable Development for Rural Areas", Master's Thesis, Faculty of Engineering, Cairo University, Arab Republic of Egypt, 2013, pp. 7-8.

maintenance require significant effort, reducing unemployment rates worldwide and creating new job opportunities [1].

From the above, we conclude that the characteristics of renewable energies have implications and effects on all political, economic, social, technological, and environmental aspects due to their contribution to preserving and developing these aspects in various countries.

II. Second Axis
International Legal Regulation of Renewable Energy:

The technological and industrial advancements at the end of the 1970s led to significant and rapid developments in all aspects of human life. Despite their importance and substantial positive impacts, they have also caused several negative effects on human life and the planet, resulting in disasters in environmental, economic, and social aspects [2]. This has drawn the attention of the international community to the need for creating effective international mechanisms to address these impacts. Consequently, international efforts began to focus on mitigating and preventing the effects of industrial and technological developments and shifting towards new energy sources that preserve the environment and climate, reduce greenhouse gas emissions, and contribute to protecting the future of humanity [3]. However, these efforts have faced several obstacles that hindered their progress. In this axis, we will discuss the legal regulation of renewable energies and the challenges that limit their adoption in two sections:

(1) Ahmed Saleh Mohammed Taha, Osama Hussein Musa, Islam Abdel Latif Abu Zeid, Ayman Abdel Rahim Abdel Alim, Mahmoud Eid, and Fahti, "Renewable Energy and Its Role in Achieving Sustainable Development in Light of International Experiences (A Case Study of Egypt)", Arab Democratic Center for Strategic, Political, and Economic Studies, Egypt, 2018, p. 62.

(2) Abdul Karim Abbas Karim Kahar and Adnan Karim Kahar Al-Jawazri, "Investment Potential of Solar and Wind Radiation for Renewable Energy Production in Sulaymaniyah and Muthanna Governorates: A Field Study", Journal of Humanities, College of Education for Human Sciences, Wasit University, Iraq, Volume 37, Issue 4, 2020, p. 4.

(3) Lehib Ahmed Mohammed and M.Sc. Khansaa Nasser Aklo, "The Importance of Renewable Energy in Protecting the Environment for Sustainable Development", 2019, p. 2, Scientific article published at the following link: https://ihcoedu.uobaghdad.edu.iq/wp-content/uploads/sites/27/2019/01 Visit date: 2024/1/25.

1. Conventions and International Mechanisms in the Field of Renewable Energy:

The first international attempts to regulate renewable energies appeared in international documents with the Vienna Convention for the Protection of the Ozone Layer in 1985. This convention implicitly referred to renewable energies in Article 1/3, describing them as technologies and equipment resulting from their use that reduce emissions of harmful substances or eliminate them, or those likely to have a harmful effect on the ozone layer [(1)]. Article 4 imposed a general obligation on the parties to cooperate in providing equipment, technology, and training among these states [(2)]. This convention was followed by the Montreal Protocol of 1987, which addressed the technical aspects of substances depleting the ozone layer and its declaration [(3)]. However, it included implicit references to renewable energies in Article 9, which obliged the parties to conduct research and development, public awareness, and information exchange towards finding the best technology to replenish or reduce the levels of controlled substances and provide data on the activities carried out by the parties [(4)].

In 1988, upon an initiative by the United Nations Development Programme (UNDP) in collaboration with the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC) was established. The IPCC provides information related to climate change in its reports and studies presented to the United Nations and member countries of the organization. Most of the international documents issued by the IPCC called for the necessity of

(1) Vienna Convention for the Protection of the Ozone Layer of 1985, Article (1/3).
(2) Article (4/2) of the convention stipulates in its four paragraphs facilitating the acquisition of alternative technology by other parties, providing information about this technology, and providing references and guidance books about it to the parties, as well as providing the necessary equipment and facilities for research and regular observation and appropriate training for practical and technical staff, Vienna Convention for the Protection of the Ozone Layer of 1985, Article (4/2).
(3) Montreal Protocol of 1987, Article (2/A).
(4) Montreal Protocol of 1987, Article (9).

international consensus and action to address the greenhouse gas problem, which leads to global warming on Earth [1].

These efforts continued until the signing of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The convention was characterized by its comprehensiveness and inclusivity in addressing the impacts of climate change, integrating environmental preservation with sustainable economic development. The agreement included important principles to address climate change, such as shared responsibility between States, preventive measures, promotion of sustainable development, improvement of the international economic system and non-discrimination between States [2]. Article 4 of the Convention imposed several obligations on the parties, including the preparation of national programs, cooperation in the field of technology transfer, practices and processes that contribute to reducing greenhouse gas emissions, cooperation and adaptation to climate impacts and the performance of scientific and technological tasks. and technical tasks. and social activities. Economic research and full exchange in these areas [3]. In addition, the agreement included articles and texts related to research activities, regular monitoring of research, data collection and support for international and government efforts to improve national capacities in the areas of scientific and technical research, education, training and awareness raising. public [4]. The Convention also established implementation mechanisms for its implementation, namely the Subsidiary Body for Implementation, the Financial Mechanism and the Conference of the Parties to the Convention [5].

The 1997 Kyoto Protocol explicitly introduced the term “renewable energy” for the first time in Article 3. This article obligated Parties to conduct research into new and renewable forms of energy

(1) For more details, refer to the International Intergovernmental Climate Entity report for 2023: A Report of the Intergovernmental Panel on Climate Change, CLIMATE CHANGE 2023 Synthesis Report, 2023, p. 6.
(2) United Nations Framework Convention on Climate Change of 1992, Article (3).
(3) United Nations Framework Convention on Climate Change of 1992, Article (4).
(4) United Nations Framework Convention on Climate Change of 1992, Article (5) and Article (6).
(5) United Nations Framework Convention on Climate Change of 1992, Article (10) and Article (11).

and technology that contribute to addressing climate change [1]. The Protocol also reaffirmed many countries' obligations, including the shared responsibility of Parties and the need for international cooperation in research. He stressed the establishment of national and regional programs to combat climate change and the use of international organizations to enhance this cooperation.

International legal regulation of renewable energy peaked in 2009 with the establishment of the International Renewable Energy Agency (IRENA). The founding statute of the International Renewable Energy Agency (IRENA) defined the concept of renewable energy, its types, and the organization's objectives to promote the desired and increased introduction of all types of renewable energy and its sustainable use. This should consider national and local priorities, the contribution of this energy to environmental preservation, desertification prevention, poverty alleviation, sustainable development, and the shared responsibility of countries [2]. Article 4 of the foundational system specified IRENA's activities in analyzing renewable energy-related practices, conducting international and local discussions, providing advice, ensuring technology and policy transfer, promoting and encouraging scientific research, monitoring activities, data collection, publication, and implementing projects and work programs in collaboration with countries and international governmental and non-governmental organizations while adhering to the principles and purposes of the United Nations Charter [3]. The foundational system also established executive mechanisms of the organization, including the General Assembly, the Executive Council, and the Secretariat, as its main bodies aiming to achieve the organization's goals and manage its activities internationally [4]. IRENA focuses its efforts on providing technical support and capacity building

(1) Kyoto Protocol of 1997, Article (2/A/4).
(2) The basic system of the International Renewable Energy Agency for the year 2009, Article (2/A-B).
(3) The basic system of the International Renewable Energy Agency for the year 2009, Article (3), (4), and (5).
(4) The basic system of the International Renewable Energy Agency for the year 2009, Article (8).

in developing countries [1], and preparing studies on renewable energy development [2].

In 2016, the Paris Agreement was signed as a complementary agreement to previous international conventions to address the impacts of climate change. Although the Agreement did not explicitly and clearly mention renewable energy as one of the tools and means to address climate change, it implicitly referred to the necessity of resorting to renewable energy in several places. It emphasized the parties' commitments to reduce greenhouse gas emissions, reduce global temperatures, encourage alternative climate adaptation policies, conduct research and scientific studies, exchange experiences, and provide technical and technological cooperation between these countries and financial resources among them. All actions taken to address climate change should be within the framework of achieving sustainable development goals, one of which is the use of renewable energy [3]. The Agreement also stipulated the establishment of subsidiary mechanisms, bodies, and a conference for parties to monitor its implementation.

From the aforementioned, we can observe that the international legal framework for renewable energy has witnessed significant developments at the international level in several aspects, including:

- The international community has recognized the importance of having an international legal framework that assists countries in cooperating and working together to address the impacts of climate change caused by traditional energy sources.
- Most international documents have addressed the topic of renewable energy in the context of combating climate changes that have affected the environment and life on Earth due to the use of traditional energy sources.

(1) Johannes Urpelainen, "International Cooperation on the Seventh Goal of Sustainable Development Regarding Clean and Affordable Energy for All", Emirates Academy for International Studies, United Arab Emirates, 2018, p. 3.
(2) Executive Summary of the (IRENA 2021) report, Future Look at Energy Transformations Around the World: The Path to 1.5 Degrees Celsius, International Renewable Energy Agency, Abu Dhabi, 2021, p. 6 and beyond.
(3) Paris Agreement of 2016, Article (6/2).

- The establishment of international executive mechanisms, subsidiary bodies, and conferences of the parties in international documents is evidence of the international community's seriousness in resorting to renewable energy as an important source of energy and incorporating it into sustainable development goals.
- Establishing the International Renewable Energy Agency as an independent international body is a significant step to enhance international efforts towards accessing clean and safe energy sources that preserve human life and the environment on the planet.

2. Obstacles to the Use of Renewable Energy:

The international legal framework for renewable energy faces several obstacles that limit its potential reach on the international stage. Several factors hinder the adoption of these energies as an alternative to traditional energy sources, and these obstacles include:

- Legal and Political Obstacles: This is a significant barrier due to the weaknesses and shortcomings of the international legal legislative structure. The international community has not yet reached the point of establishing a comprehensive international agreement regulating the mechanisms for using renewable energies and international cooperation in this field. Additionally, the establishment of the International Renewable Energy Agency has not achieved its primary purpose of pushing this development forward due to weak international commitment towards the agency and a lack of integrated relationship between it and other international organizations, especially the United Nations. The weak international political commitment to reducing the use of traditional energy sources and greenhouse gas emissions to combat climate change is also a major obstacle. Many countries either refrain from signing international climate agreements or do not fulfill their commitments to these agreements. In addition to the lack of global partnerships in the field of international agreements

related to this energy. Weak cooperation with international governmental and non-governmental organizations is also a significant hindrance. Moreover, the majority of countries enacting national legislation that addresses renewable energies according to their specific development requirements has contributed to the lack of desire to establish a comprehensive international agreement.

- Economic and Technical Obstacles: These are major reasons for not resorting to renewable energies as an alternative source due to their high economic costs, especially in developing countries that do not have sufficient economic resources for this type of energy transition. Additionally, there is a lack of technical and technological expertise needed for renewable energy, either because advanced countries refrain from providing technical assistance or due to the absence of infrastructure for using this energy. Many countries with abundant traditional energy sources also refrain from resorting to renewable energy.
- Cultural and Social Obstacles: These pose challenges to countries, especially developing ones, in terms of urging them to change their prevailing social, cultural, and consumption policies. There is a lack of public awareness and education on using renewable energy, especially in the face of widespread ignorance, illiteracy, and a lack of cultural awareness of the importance of renewable energy as a means to preserve the environment and climate.

Conclusions and recommendations

At the end of this research, we can note the following conclusions and recommendations:

Firstly: Conclusions:

1. The international legal framework for renewable energy has not reached the required level to align with national legislations, and there is a lack of a comprehensive international agreement addressing this issue.

2. The majority of international documents addressing renewable energy came in the context of combating climate change, greenhouse gas emissions, and integrating these energies within the Sustainable Development Goals.
3. Renewable energies have played a significant role in national legislations in several countries such as Germany, Egypt, Iraq, Jordan, the UAE, among others. The laws of these countries included the use of these energies in electricity generation as an alternative to traditional energy sources.
4. Traditional energy sources still occupy the forefront in their use as an energy source in several countries worldwide, for various economic, social, or legal-political reasons.
5. We observed a weakness in the role of the United Nations and its affiliated agencies regarding renewable energies, both in establishing legal and technical frameworks and in weak international commitment to their use and reducing reliance on traditional energy sources.

Secondly: Recommendations:

1. We recommend that the international community establish a specific international agreement on the use and regulation of renewable energies, outlining its general framework at the international level. The United Nations should play a major role in formulating and legislating this agreement.
2. Enhance the role of the United Nations and its agencies in the field of renewable energy use through cooperation between them, countries, and regional governmental and non-governmental international organizations in developing policies and strategic plans.
3. We suggest integrating the International Renewable Energy Agency within the United Nations system to benefit from the expertise, privileges, and executive mechanisms and the status it holds at the international level.

4. Encourage countries to incorporate renewable energy into their development projects and promote international cooperation in transferring expertise and technology. Facilitate the provision of international financial support by the International Monetary Fund and the World Bank to assist countries in transitioning to the use of renewable energy in various sectors.

References

1- Ahmed Abdel-Sayed Ibrahim Al-Alfi, Chernobyl Nuclear Power Plant explosion incident, April 26, 1986, Journal of Humanities and Literary Studies published by the Faculty of Arts, Kafr El-Sheikh University, Egypt, Issue No. 26, 2022.

2- Abdullah Khababah, et al., "Developing Renewable Energies Between Ambitious Goals and Implementation Challenges: A Case Study of Germany's Energy Transition Program", Journal of Economic Sciences, Management, and Commercial Studies, University of M'sila, Algeria, Issue No. 10, 2013.

3- Hani Obeid, "Man and Environment, Energy, Environment, and Population Systems", 1st Edition, Dar Al-Shorouk for Publishing and Distribution, Amman, 2000.

4- Nagham Hussein Naima, "Management of Investment in Renewable Energies and Its Role in Achieving Sustainable Development", Article published at the following link: https://portal.arid.my/20983/Posts/Details/a9eaa5f3-bc44-488d-af23 Visit date: 22/2/2024.

5- Mohammed Sahel Talbi, "The Importance of Renewable Energy in Protecting the Environment for Sustainable Development", Al-Bahith Journal, Issue No. 6, University of Ouargla, 2008.

6- John R. Fatch, "Technical Energy and Future Directions", Translated by Abdel Basset Ali Saleh Kerman, Strategic and Advanced

Technologies Series, King Abdulaziz City for Science and Technology, Arab Translation Organization, Center for Arab Unity Studies, 1st Edition, Beirut, 2011.

7- Hani Obeid, "Man, Environment, and Population", Dar Al-Shorouk, Amman, 2000.

8- Yasmine Merzouk, "The Role of Renewable Energies in Achieving Sustainable Development in Algeria", Master's Thesis, Mohamed Boudiaf University, M'sila, Faculty of Law and Political Science, Department of Political Science and International Relations, 2018/2017.

9- The basic system of the International Renewable Energy Agency for the year 2009.

10- Iraqi Environmental Protection and Improvement Law No. (27) of 2009.

11- Jordanian Renewable Energy and Energy Efficiency Law No. 13 of 2012.

12- Robert L. Evans, "Charging Our Future with Energy: An Introduction to Sustainable Energy", Translated by Dr. Faisal Hurdan, Strategic and Advanced Technologies Series, King Abdulaziz City for Science and Technology, Arab Translation Organization, Center for Arab Unity Studies, 1st Edition, Beirut, 2011.

13- Maha Ahmed Eid Abdul Sattar Sayed, "New and Renewable Energy and Its Role in Sustainable Development for Rural Areas", Master's Thesis, Faculty of Engineering, Cairo University, Arab Republic of Egypt, 2013.

14- Ahmed Saleh Mohammed Taha, Osama Hussein Musa, Islam Abdel Latif Abu Zeid, Ayman Abdel Rahim Abdel Alim, Mahmoud Eid,

and Fahti, "Renewable Energy and Its Role in Achieving Sustainable Development in Light of International Experiences (A Case Study of Egypt)", Arab Democratic Center for Strategic, Political, and Economic Studies, Egypt, 2018.

15- Abdul Karim Abbas Karim Kahar and Adnan Karim Kahar Al-Jawazri, "Investment Potential of Solar and Wind Radiation for Renewable Energy Production in Sulaymaniyah and Muthanna Governorates: A Field Study", Journal of Humanities, College of Education for Human Sciences, Wasit University, Iraq, Volume 37, Issue 4, 2020.

16- Lehib Ahmed Mohammed and M.Sc. Khansaa Nasser Aklo, "The Importance of Renewable Energy in Protecting the Environment for Sustainable Development", 2019, , Scientific article published at the following link: https://ihcoedu.uobaghdad.edu.iq/wp-content/uploads/sites/27/2019/01 Visit date: 2024/1/25.

17- Vienna Convention for the Protection of the Ozone Layer of 1985.

18- Vienna Convention for the Protection of the Ozone Layer of 1985

19- Montreal Protocol of 1987.

20- Montreal Protocol of 1987.

21- For more details, refer to the International Intergovernmental Climate Entity report for 2023: A Report of the Intergovernmental Panel on Climate Change, CLIMATE CHANGE 2023 Synthesis Report, 2023.

22- United Nations Framework Convention on Climate Change of 1992.

23- United Nations Framework Convention on Climate Change of 1992.

24- United Nations Framework Convention on Climate Change of 1992.

25- United Nations Framework Convention on Climate Change of 1992.

26- Kyoto Protocol of 1997.

27- The basic system of the International Renewable Energy Agency for the year 2009.

28- The basic system of the International Renewable Energy Agency for the year 2009.

29- The basic system of the International Renewable Energy Agency for the year 2009.

30- Johannes Urpelainen, "International Cooperation on the Seventh Goal of Sustainable Development Regarding Clean and Affordable Energy for All", Emirates Academy for International Studies, United Arab Emirates, 2018.

31- Executive Summary of the (IRENA 2021) report, Future Look at Energy Transformations Around the World: The Path to 1.5 Degrees Celsius, International Renewable Energy Agency, Abu Dhabi, 2021.

32- Paris Agreement of 2016.