

## **Sustainable development strategy in Iraq in 2030 and the role of renewable energy sources**

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**Abstract :** The scientist faces a challenge in establishing a balance between sustainable development and preserving the environment. At a time when he continues to rely on traditional energies that occupy a large part of the use of energy, this has major impacts on non-renewable resources of the environment, as well as on the depletion of the environment. Therefore, the world turns to renewable energy sources for sustainable development. Renewable energy has long been described as the last resort to the world's energy and environmental problems. This enables inexpensive and virtually unlimited energy potential without pollution. The initial interest in renewable energy, stimulated by the oil crises of the 1970s and by fears of resource depletion and political insecurity, resulted in developmental and research activity, clear technological advances, and rapid technological advances. However, as the 1980s and 1990s progressed, fears of energy crises of the past faded, while renewable energy technologies remained expensive despite the progress made. It was evident that renewable energy is the energy of the future. Iraq, like the rest of the world, faces environmental and economic challenges. However, Iraq has opportunities to invest in renewable energy. Like solar energy and wind energy. And if used properly, it will eliminate the environmental impacts of conventional energy and make up for the lack of electricity. As well as other social and environmental improvements in order to reach sustainable development. The 2030 Sustainable Development Goals demonstrate the 17 goals and 169 targets , The breadth of this global plan and the extent of its ambition, which are integrated and indivisible goals and objectives that achieve a balance between the three dimensions of sustainable development: the economic dimension, the social dimension, and the environmental dimension. Under the available capabilities, the most important conclusion was the consistency of the research hypothesis, as through the analysis it became clear that the production of renewable energy had not achieved any effects on sustainable development in Iraq.

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### **The first topic**

#### **technical and financial mechanisms to promote renewable energy**

With the new licensing rounds, Iraq is taking a free market approach by allowing investors to bid for different prices while awarding the least amount of projects on build, own and operate (BOO) and (IPP) on an independent energy product basis. The winning companies will be dealt with under the Federal Investment Law of 2006 (and approved reviews). Hence, as "investors," renewable energy developers will have free access to government-owned land, reduced customs fees, and the ability to repatriate profits without tax. The permits are valid for 20-50 years, depending on the type of investment project. The Ministry of Finance has shown a tendency in the past to provide sovereign credit guarantees to former private companies in the IPP program. Today, there is an installed capacity of 3,000 megawatts of independent power plants in Iraq. Iraq is also prepared to provide security (at no charge) to energy producers at the utility level to reduce security risks.

#### **The first requirement: investment in renewable energy, reality and ambition**

Since the beginning of 2019, the federal government, through the Ministry of Electricity, the Ministry of Finance and the Energy Council, has built the necessary technical and financial mechanism for direct access for citizens to small loans to purchase and install solar energy units on the roof. Preliminary technical specifications have been prepared for solar energy systems, to be installed on the roofs of homes, and work is underway now to discuss the issuance of soft loans to citizens, with some banks, and work to formulate the legal environment and prepare special instructions for granting energy sustainability loans and in view of the issuance of instructions for loans by some banks and to come up with a formula Unified that serves all parties, especially the citizen, so that it leads to the desired goal , Of these loans, it is the installation of solar energy systems in homes, which leads to reducing the loads on the national grid and covers some of the citizens' needs and thus rationalizing the consumption of electric energy. In addition, technical surveys were conducted for a number of government buildings to assess their suitability for generating solar energy. The Ministry of Finance and the Central Bank of Iraq have put in place a loan mechanism for soft loans (with a maximum of 4% interest rate) through public and private banks to finance capital investment and installation costs for families with solar units on the roof (3 kW, 5 kW, 10 kW and more) from the manufacturers And suppliers approved by the Ministry of Electricity. The ministry will also provide smart meter solutions for consumers to become net energy producers through this initiative. For utility projects (above 10MW), Iraq abandoned the pre-set Feed-in Tariff (FiT) of \$ 3.5 / kWh as a precondition for building solar power plants. This fiscal tariff was seen as repressive

and unattractive to investors <sup>(1)</sup>. Given the government's directives to install solar energy systems for the purpose of preserving the environment and encouraging the use of energy produced from solar energy, so that a citizen's electricity consumer can install solar cell systems, instructions have been issued for installing solar energy systems for citizens through the method of soft loans and a mechanism for qualifying companies implementing this project, solar home systems Until the renewable energy law is approved, and then it is considered part of the law.

### **The second requirement: the difficulties facing the development of the renewable energy sector in Iraq after 2003**

**Institutional difficulties and structural:** The use of advanced technological power, such as production (wind energy and bio-fuel and hydro-power and solar energy) requires dedicated efforts of a large number of partners, including legislative authorities and the executive that are relevant, including the Ministry of Electricity, Environment and Higher Education And scientific research, transportation, and the Ministry of Finance. Therefore, roles must be defined and implementation plans drawn up with a fully coordinated management system in order to reach the production of energy from renewable sources , However, the absence of this coordination between these ministries led to the failure to reach the required level for the development of this important type of energy, as this coordination collided with the individual interests of the parties and the ruling blocs that are measured.

**Technical and technical difficulties:** Iraq lacks knowledge in manufacturing equipment and renewable energy technologies, it requires a broad technical skills, experience and management advanced, the absence of side informational and knowledge that is associated with the manufacture of renewable energy systems components of the technical obstacles that are an obstacle to the deployment of Applications of renewable energy, as what characterizes Iraq after 2003 is its dependence on the import of technology products and not technology, and for many reasons, including administrative and financial corruption.

**Economic difficulties:** The initial cost of the high one of the largest economic barriers for systems of renewable energy costs are large established relatively, with the absence of mechanisms, especially funding if we know that budgets successive year after 2003 was in favor of government expenditures and operational rather than investment, and that any investment it is the interests of the spoilers or to serve electoral interests For the big parties, likewise, the prevailing misconception among decision makers in Iraq is that investing in renewable energy projects represents a great risk. On the one hand, on the other hand, the policy of subsidizing energy prices has made it easier for the majority of the population to benefit from services as a result of the lowering of their prices than the real prices. Consumption as a result of subsidized prices, and loading the state budget for additional expenditures.

**Political difficulties and secur:** The political difficulties through the lack of understandable policies pursued by successive benefit governments of **ity** renewable energy to achieve sustainable development, as the strategies developed by these governments plans were not well thought out and had developed well thought out, the application deviated from what he aspired them (For example, agricultural plans or strategies or explosive plans that were developed before 2014), This is taking the achievement of renewable energy and sustainable development spread in some kind of lack of clarity and organization of the steps that increase the growth and spread and support the sector and its investments, as well as the lack of cooperation between the executive authorities and the legislature has its reasons back to the feuding blocs or corrupt deals related to those strategies, as well as the The decision-making political class does not take risks and seeks to exploit energy alternatives and seek to develop development projects to develop sectors that are balanced with the energy sector, As for the security difficulties, which are the most important strategies that are taken into account, as well as the threats that are in friction with neighboring countries and the great fear of repeating terrorist events, as in 2006 and 2014, as security is preserved in the year 2006 and 2014. And it is no secret to all that after the events of 2006, many of the country's strategic facilities were destroyed and looted. And after 2014, terrorist groups took control of five Iraqi governorates, which led to the destruction and looting of many of these facilities (for example, the sulfur and phosphate plants and the glass plant in the largest factory in Mwasfa Salah al-Din Governorate).

**Legal difficulties:** that characterizes Iraq, is his lack of clear energy management law this which makes the quality of the process and improve the efficiency of their use and encourage the use of renewable energies is a voluntary subject to market forces, and as the energy markets in Iraq are still not fully competitive and is controlled by the governments in the sense that it A complete monopoly market in favor of the Iraqi government , The participation of the private sector to produce electricity, but electricity production is a marginal to fill the daily shortfall did not live up yet because a private sector creates a competitive electric power plants and then the private sector to invest concern the production of renewable energy and going into Bhecma is governed by the case of market total monopoly, so it is difficult to encourage And persuading consumers to improve their efficiency in the use of energy , This led to the absence or weakness of the standard specifications, as there are no standard specifications for energy-consuming

equipment, so the quality standards applied are not taken into account when importing the equipment, and this causes the spread of equipment and devices.

### **The third requirement: ways to enhance the use of renewable energy in the 2030 Agenda for Sustainable Development.**

The search and finding energy alternatives is a complementary measure for the sake of the sustainability and continuity of Iraq as an energy-exporting country and the preservation of the country's economic level. However, in order to keep pace with the global development in the field of renewable energy, a number of methods should be guided, including: <sup>(2)</sup>

(1) Government support for prices: Providing government support through its various institutions for all joints that contribute to the creation of renewable energies, starting from the project and ending with the individual consumer, will undoubtedly play an active role in making renewable energies increase their contribution to the total energy more to secure basic needs The Iraqi Energy Society.

(2) Financial and moral support and stimulating research and development in the fields of renewable energy.

(3) Establishing a bank for detailed information on renewable energy sources in Iraq.

(4) Approval of the planned projects and training of national cadres on them to benefit from all their applications and the participation of major international companies such as Siemens in the implementation and investment in establishing major projects for renewable energy sources, especially solar energy, wind and vital materials.

(5) Increasing the effectiveness of scientific exchange and consultations between Iraq and the leading countries in the field of renewable energies and holding periodic conferences and meetings.

(6) Implementing all necessary means to rationalize and preserve renewable energy sources and provide financial support to citizens who use renewable energy sources in their homes, especially solar panels.

(7) Using the tax incentives and pricing method for the purpose of encouraging investment and spreading renewable energies, including those tax measures.

### **The second topic**

#### **indicators of sustainable development in Iraq**

Given the difficulty of taking note of all sustainable development indicators, we will address the most important of these indicators, which are the following (3):

#### **The first requirement: indicators of momentum**

##### **1- Economic indicators:**

##### **A- Per capita gross domestic product**

The per capita gross domestic product increased significantly during the period (2004-2013), increasing from 1.75 million dinars in 2004 to 4.96 million in 2011 . And it achieved its highest increase in 2013, reaching 7.05 million dinars. As for the period (2014-2019), the trend of Iraqi per capita output was downward, as it decreased from 6.83 million dinars in 2014 to 4.88 million dinars in 2017, and the largest decrease was at the end of the period, reaching 4,96 million dinars in 2019 As shown in Table (1), this decline is due to the drop in global oil prices after the second half of 2014, and Iraq is among the countries with average per capita income according to the classification of the Human Development Report for the year 2019.

##### **B- The ratio of investments to the gross domestic product**

The role of the private sector is still marginal in the Iraqi economy, as government investment is still the dominant share of the total investment, which depends entirely on the revenue of oil rent, which constitutes more than 95% of the government's general budget revenues, so it is subject to fluctuations in oil prices and developments in the market Oil. Despite the foregoing, the ratio of investments to output amounted to 17.9 as an average for the period 2004-2019, which is weak compared to Arab countries, which reached nearly 30% in the UAE and Jordan, and reached more than 25% at the level of Arab countries <sup>(4)</sup>. Despite the urgent need for the Iraqi economy to increase what is allocated for investment for reconstruction and construction.

**Table (1) Economic indicators for sustainable development in Iraq for the period 2004-2019**

The ratio of exports to imports	The ratio of investments to GDP	GDP per capita	the year	The ratio of exports to imports	The ratio of investments to GDP	GDP per capita	the year
1,69	17,8	6,31	2012	0,87	7,6	1,7	2004
1,98	26,9	7,05	2013	0,89	19,2	1,8	2005
0,71	12,5	6,83	2014	1,34	20,99	1,9	2006
1,3	14,1	5,93	2015	1,7	37,1	2,43	2007
1,5	17,6	5,62	2016	1,7	11,2	3,54	2008
1,57	16,9	4,88	2017	1,06	13,3	4,16	2009

1,61	17,98	5,0	2018	1,19	19,8	4,58	2010
1,59	17,65	4,96	2019	1,66	16,4	4,96	2011

Source:

- Central Statistical Organization, Priority Environment and Sustainable Development Indicators in Iraq, Baghdad, 2011, p. 76

- The Central Bureau of Statistics, the Millennium Development Goals in Iraq and a look beyond 2015, multiple pages  
The data in Table (1) indicate that the coverage rate of exports, of which oil constitutes more than 98% of them, to imports is high, reflecting Iraq's ability to continue importing throughout the period 2004-2019. This indicator also reflects the high degree of openness of the economy to the outside world.

## 2- Social indicators:

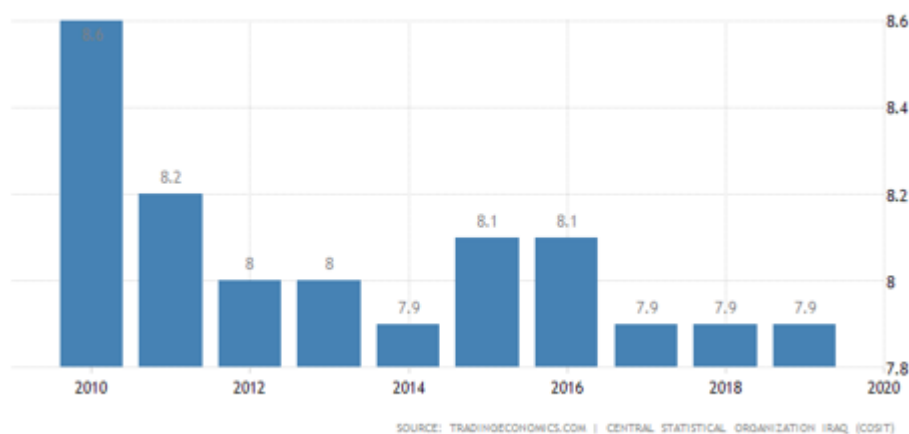
### A- Unemployment rate:

It is evident from Figure (1) that the unemployment rate decreased relatively in 2012, when it reached 8%, after it was 8.6 in 2010 and then decreased to 7.9% in 2014, but the level of unemployment is still high compared to the countries neighboring Iraq, as the unemployment rate increased Youth for ages 15-24 males from 17% in 2014 to 20.1% in 2018, while for females it decreased from 64.8% to 38% for the same year <sup>(5)</sup>.

### B- Child mortality rate under five years old

The statistics of this indicator indicate that the rate reached 44 deaths per 1000 births for the year 2008, and despite the improvement in the index, it is still below the required level and in the years 2011, 2014, 2018, it was 37, 18, 21, respectively, and may reflect some efforts to improve The level of primary health care.

**Figure (1) The unemployment rate in Iraq for the period 2010-2019**



Source: Republic of Iraq, Central Bureau of Statistics, annual reports for various years

### C- The rate of adults who can read and write

Reflects the percentage of adults who are literate as a percentage of the total population, in 2004 it reached 71.5%, it rose to 77.8% in 2007 and decreased to 74.9% in 2012, it increased in 2018 to reach 76%, which is a low percentage compared to For some Arab countries, it is less than the average for countries with medium human development, which is 82% <sup>(6)</sup>.

## The second requirement. Status indicators:

### 1- Economic indicators:

#### A - Debt / GDP

It is noted from the table (2) that the debt / product ratio exceeded the permissible percentage, which is 60% according to the Maastricht Treaty during the years 2004-2007, as the ratio was very high, specifically during 2004, reaching 251.2%, due to the accumulation of the bureau from previous years and the country's inability to pay its debts This is due to the lack of flexibility of the Iraqi economy, and after 2008, this percentage was taken to drop below the specified standard percentage, and this is a positive indicator for the financial surpluses achieved, which contributed to reducing debt (7) .

**Table (2) Public debt / GDP, Iraq for the period (2004-2019)**

%

2018	2016	2014	2012	2010	2008	2006	2004	the year
55	60	30	29	47	42	100	251	The ratio

Source: From the researcher's work based on the Ministry of Planning, National Accounts for the years 2004-2018 and the Central Bank of Iraq, General Directorate of Statistics and Research, annual reports.

## 2- Social Indicators:

### A- The population living below the poverty line

The percentage of the population living below the national poverty line was 22.9% in 2007, which is a high percentage in a country characterized by its richness and abundance of natural and human resources. This percentage varies from one governorate to another. Muthanna governorate recorded the highest rate of 45%, while the lowest percentage was in Erbil and Sulaymaniyah governorates, at 3% and 3.4%, respectively. This percentage decreased in 2012 by 4.9%, at a rate of 18%, of which the rural share was 31%. As for the governorate level, the situation has not changed, so Muthanna still occupies first place with a rate of 53%, followed by Qadisiyah Governorate 44%. As for the northern governorates, it achieved the lowest rate of 2% and 3.6% for each of the governorates of Sulaymaniyah and Erbil, respectively (7), and Table (2) Explain it.

**Table (2) The percentage of the population living below the poverty line in Iraq**

%Total	%countryside	% Attended	the year
%23	40,1	16,2	2007
%18	31	13,8	2012
%23	-	-	2014
%20	28,1	11,7	2018

Source: Central Statistical Organization, Priority environmental indicators and sustainable development in Iraq 2011 and the Millennium Development Goals in Iraq for 2019.

## **The third requirement: environmental indicators:**

### A- The percentage of arable land

One of the basic pillars of sustainable development is agriculture, because it provides food for the population. The percentage of actually cultivated land compared to arable land has fluctuated during the period (2004-2018), and the highest percentage was in 2007, reaching 48%, then it decreased to 38% in 2012 and 28% in the year In 2014, the percentage improved slightly during 2018, achieving 31%. The reason for this is largely due to the phenomenon of high land salinity in addition to the ongoing phenomenon of desertification of the lands, and the lands affected by this phenomenon reached 40% in 2011.

### B - Proportion of protected areas (biodiversity)

Protected areas are land or waters of competitive, scientific or tourist value that are placed under legal protection to protect their environmental wealth and to sustain their development. The total areas proposed as natural reserves in Iraq were about 283923 hectares, or about 2847 km<sup>2</sup>, equivalent to 0.67% of the total area of Iraq <sup>(8)</sup>. This measure is considered one of the important measures to identify the extent of the state's commitment to its natural heritage.

## **The third topic:**

### **the path of the sustainable development strategy 2030**

The 17 Sustainable Development Goals 2030 and their 169 goals demonstrate the breadth of this global plan and the extent of its ambition, which are integrated and indivisible goals and objectives that strike a balance between the three dimensions of sustainable development: the economic dimension, the social dimension and the environmental dimension (11).

### **The first requirement: the goals of the 2030 Sustainable Development Strategy**

Iraq as a country and people has an urgent desire for change aimed at achieving the required development and the continuous aspiration for a better life, and that any solutions to get out of the current crisis in all its dimensions need a party that adopts the responsibility of supervision, implementation and follow-up, and that the starting point for a development plan that focuses on the element of sustainability is to define visions and goals And the main axes calling for change. Therefore, an integrated strategy must be drawn up with the participation of civil society, the private sector, experts, academics and representatives from the relevant ministries. With the need to educate and educate society through seminars, conferences and all media, and for the success of any plan, the means and goals must be serious, and there are a number of basic principles of the sustainable development strategy in 2030 (12):

A- That the Iraqi economy be diversified and has a competitive and balanced economy based on innovation, knowledge, justice, social inclusion and participation, a balanced and diversified ecosystem that invests all its human energies and resources to achieve its sustainable goals.

B- The goals of the strategy should be realistic and appropriate for the Iraqi economy and the building of the Iraqi people>

C- The starting point of the strategy is based on the sustainability component and defining the main axes calling for change to achieve sustainable development in the near future in Iraq. This strategy includes 10 axes that include the economic, social and environmental dimensions, which are as follows:

The economic dimension includes 4 axes: the economic development axis, the energy axis, the knowledge, innovation and scientific research axis, the efficiency and transparency of government institutions.

The social dimension includes 4 axes: social justice, health, education and training, and culture.

The environmental dimension includes two axes: the environment and urban development.

These comprehensive goals are a roadmap towards achieving the goals of sustainable development 2030, and they need serious and realistic implementation in light of political will, transparency and effective community participation.

### **The second requirement: accelerate Iraq's implementation of the path of the 2030 sustainable development strategy and the role of renewable energy sources**

In order to promote sustainable energy in Iraq, the United Nations Development Program (UNDP) provides technical support and is building government capacity with the aim of integrating photovoltaic energy as a renewable energy source to meet the country's electricity demand. Finding clean and sustainable energy sources has become an urgent matter for Iraq to accelerate the implementation of the sustainable development goals that were adopted in 2016. The support of the development program comes through the project "stimulating the use of photovoltaic energy" in partnership with the Regional Center for Renewable Energy and Energy Efficiency and the Global Environment Facility.

On October 2, 2017, forty representatives from the Ministries of Electricity, Health and Environment, Industry, Science and Technology, along with the private sector participated in a technical workshop in Baghdad on policy options and incentives for renewable energy. Participants studied the potential of renewable energy in Iraq, and learned about best practices in policy, legal and regulatory framework in the region.

The Government of Iraq greatly appreciates the support and contributions of the United Nations Development Program and the Regional Center for Renewable Energy and Energy Efficiency. Together, we look forward to harnessing the potential of photovoltaic energy to meet the demand for electricity in Iraq while maintaining our commitment to the issue of climate change."

And "renewable energy acts as a powerful and multiplier for the sustainable development goals. The key to progress in renewable energy generation and energy efficiency measures in Iraq is to encourage private sector investment in national public policies and plans. This creates the conditions for renewable energy to contribute to achieving the sustainable development goals."

In partnership with the Regional Center for Renewable Energy and Energy Efficiency, UNDP is launching targeted policy initiatives, such as developing the tariff system and the electricity grid law in the coming months. The proposed policy inputs and support are expected to create an enabling environment to encourage and increase investment in renewable energy and to assist Iraq in fulfilling its obligations in this regard.

The UNEP Regional Office for Western Asia and the United Nations Development Program in Iraq are joining to accelerate Iraq's implementation of the 2030 Agenda for Sustainable Development. UNEP and the United Nations Development Program will work on environmental policy, biodiversity, ecosystems, pollution and climate change to advance environmental sustainability in Iraq. . A four-year Memorandum of Understanding (Memorandum of Understanding) was signed aiming to accelerate the implementation of the 2030 Sustainable Development Agenda, in particular the Environmental Sustainable Development Goals (SDGs) (12). The Memorandum of Understanding identifies several priority areas that the United Nations Environment Program and the United Nations Development Program will jointly address including; Environmental policy, biodiversity and ecosystems, pollution and waste management, climate change, and support for the Government of Iraq in its post-COVID-19 response in areas related to environmental sustainability. The United Nations Environment Program and the United Nations Development Program share a successful history of collaborating on projects and initiatives at the global, regional and country levels. In late 2019, the two organizations signed a global strategic partnership that promotes engagement and collaboration at the institutional level. The United Nations Environment Program and the United Nations Development Program share unique and complementary features.

While UNDP has a strong country presence and access to a wide range of stakeholders and sectoral politics, UNEP is the leading global environmental authority setting the global environmental agenda, has a deep-rooted scientific foundation, and a strong normative mandate that promotes the coherent implementation of the dimension. Environmental sustainable development.

Since 2009, the United Nations Environment Program in West Asia and the United Nations Development Program in Iraq have worked on a wide range of projects, including supporting Iraq in its reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, and developing a strategy A national environmental and action plan that defined the extent of environmental degradation in Iraq, its causes and root effects, and the necessary next steps. As a signatory to the Paris Agreement in 2016, , Iraq continues to prioritize climate change adaptation and mitigation measures in its environmental planning and is committed to adopting a green vision and implementing green programs. Today's agreement puts the United Nations Environment Program and the United Nations Development Program (UNDP) firmly on the path to supporting Iraq's progress towards achieving the 2030 Agenda for Sustainable Development. "UNEP is committed to establishing strong cooperation with the United Nations Development Program in Iraq to support the country in meeting environmental challenges while supporting Government and people: rebuilding Iraq better after the COVID-19 pandemic. The United Nations Development Program has a proven track record of success in Iraq, and all efforts are being united to achieve a sustainable environment for all. Iraq faces a number of environmental challenges - from water scarcity, to rising temperatures, to pollution, to environmental degradation due to years of conflict and neglect. Facing these challenges in a complex environment like Iraq cannot be done through the United Nations Development Program in Iraq only, but in cooperation with the United Nations Environment Program and supporting the government of Iraq in securing a healthy and sustainable environment, now and for future generations. "Without increasing efforts to slow down the crisis the climate , The Iraqi population will not be able to live prosperously in the future. The SDG goal of not leaving anyone left behind, especially SDG 6 on clean water and sanitation, SDG 7 on clean and affordable energy, and SDG 13 for climate action has a special significance for Iraq.

The localization of the SDGs in Iraq is a critical process in order to accelerate the implementation of the SDGs, while ensuring that "no one is left behind". By bringing the SDGs closer - across their economic, social, governance and environmental dimensions - to people on the ground and ensuring their voices are heard in the decision-making process, we are ensuring ownership and sustainable change. The localization of the SDGs means that the actors and institutions (governmental and non-governmental at the sub-national level) have a fundamental role in formulating, implementing and monitoring the SDGs. This bottom-up approach increases local government ownership of control over the SDGs, while leveraging existing networks, civil societies, the private sector, and academia. The United Nations Development Program in Iraq established a community-led approach for three governorates (Basra, Anbar, and Karbala) to localize the goals and indicators of the SDGs, with a focus on community consultations, and the active participation of local academics and the private sector. And non-governmental organizations, including youth and women. Vulnerable groups such as farmers. These governorates have faced various development challenges, and the local sustainable development committees - created with the support of the United Nations Development Program - are keen to develop a local vision and roadmap for sustainable development. The necessity of "leaving no one behind" was at the heart of all planning processes, ensuring the integration of the local sustainable development vision with all stakeholders, including academia, civil society organizations, government authorities, the private sector, members of parliament, and vulnerable groups including youth , Women and farmers to enrich discussions of the sustainable context with the practical needs of local communities.

### **The third requirement: the use of renewable energy and its developmental implications in Iraq**

Use of renewable energies can raise the level of development a large proportion in Iraq, Fastglalha linked with a significantly improved access to services and energy materials affordable, socially acceptable and environmentally sound manner, taking into account the specificities and national and local Iraq circumstances, through various means such as increasing the supply of electricity to Rural areas and the adoption of decentralized systems of energy, in addition to developing national policies.

**First: In the economic sphere:** An economically sustainable system achieves the continuous production of goods and services and maintains a certain level of economic balance between economic output and debt, and as a result of the occurrence of imbalances in economic policies. Among the most important areas of influence and change are the following:

Economic structure: Indicators related to economic growth usually reflect economic activity, per capita income and purchasing power within market balances, and these indicators can give a clear idea of the economic dynamics.

(1) The impact of economic policies on natural resources, which is one of the priorities for measuring sustainable development. For there is fairness for generations that have not yet been born, and those whose interests are not taken into account when developing economic analyzes, and the brutal market forces do not take into account these interests. Equity for those who live today and who do not find equal opportunities to obtain natural resources or social and economic goods.

(2) Production and consumption patterns: It is considered one of the main economic issues in sustainable development, as it is expected to bring about a radical change in production and consumption policies to preserve resources and make them available to all of the world's population.

(3) The share of per capita consumption of natural resources: It is represented in making opportunities to obtain resources, products, and services, among individuals within the society, closer to equality, for example, the discrepancy between access to education, freedom of education, and services. And other than that, political rights constitute an important barrier to development.

(4) Equality in the distribution of resources: The successful way to alleviate the burden of poverty and improve livelihoods has become the responsibility of both rich and poor countries alike. While the individuals within the society are closer to equality, this equality helps to stimulate the economic development and growth necessary to improve the standard of living.

(5) Reducing costs: Renewable energies contribute to reducing costs in comparison with traditional energies, especially in remote areas. The use of water pumps in irrigation of agricultural lands, in addition to the use of public lighting, can not be used in rural areas.

(6) Reducing income inequality: sustainable development means limiting the growing inequality in income and access to work, and making available large and productive land holdings for the poor, who do not own land, and for that to have a wealth of landowners. Provided that they are equal or not mutually exclusive with other sectors in terms of income, the government side should make a deduction from the profits in order to bridge the gap between the rich and the poor. What allows for a lack of inequality between incomes, and it is worth noting here that it is among these policies that stimulated the rapid growth witnessed by the Asian tiger economies such as Malaysia, South Korea and Taiwan.

(7) Reducing the dependency of the developing countries: launching a development strategy based on self-reliance and securing self-sufficiency, and thus expanding regional cooperation and trade with the expansion of technology between the developing countries and the large-scale realization of wealth in the capital. It ensures avoiding economic dependency.

From the observation of Table (3), it is evident that Iraq does not enjoy any sustainable development indicators, as the average per capita consumption of crude oil increased from 5.9 barrels per year per capita / capita in 2000 to 6.2 per capita oil equivalent per year / year 2018 Average per capita consumption of natural gas from 1.8 barrels of oil equivalent per year / person to 1.5 barrels of oil equivalent per year / person for two consecutive years without achieving any sustainable development effects that have been produced. As the average per capita per capita consumption of renewable energy in Iraq decreased from 0.8 per capita per year per capita to 0,0 barrels of oil equivalent per year / per capita for the following two consecutive years, as a result of a decrease in the energy production. As well as the increase in the population.

**Table (3) Average per capita consumption of renewable energy for the period 2000-2018**  
**Barrel equivalent annually / capita**

Years		Statement	power source
2018	2000		
632	388	Quantity	Crude Oil
6.2	5.9	Wicket	
150	119	Quantity	Natural gas
1.5	1.8	Wicket	
0	20.8	Quantity	Renewed
0	0.8	Wicket	
782	557	Quantity	Total
7.7	8.5	Wicket	

Source :

- OAPEC, Annual Statistical Report, 2005, Kuwait, 2006, p. 44

- OAPEC, Annual Statistical Report, 2018, Kuwait, 2019, pp. 64-65

**Second: The social aspect:** The system will be socially sustainable if it is able to achieve fairness in distribution, and the principles of social services such as health and education reach those who need them and establish equality in society. The difference between sustainable systems indicates that the view of sustainable development varies according to the methodology and background of the analysis, and economists focus on economic goals more than others, just as they emphasize the environmental protection of the importance of the environment. First, social equality: The social equality one of the major social issues in sustainable development, as reflected to a great extent the quality of life and public participation are linked to equality with the degree of justice and inclusiveness in the



distribution of resources and opportunities and decision-making and include access to employment and public services, The most important of these are health, education, and justice. Among the important issues linked to achieving social equality, issues stand out as combating poverty, employment, income distribution, and access to financial resources. And the second aspect is public health: A close association between health and sustainable development, Access to clean drinking water and healthy food accurate health care is one of the most important principles of sustainable development, because health conditions as a result of contamination of the surrounding population, poverty, and the cost of living environment, population growth has led to the failure to achieve sustainable development, especially in Developing countries , As health and environmental services did not develop in a way that parallels the development of the economic market. As for the most important variable is education: education is a major prerequisite for achieving sustainable development, because education is one of the most important gains that a person can gain in order to achieve success in life, just as there is a slow progression in education. As for housing, it is one of the most important needs of sustainable development, and the conditions of life in large cities are always affected by the economic situation, the rate of population growth, poverty, unemployment, and the quality of urban and urban planning , The concern here comes for those who live in difficult circumstances. And finally, security: justice, democracy and social peace all depend on the existence of a developed and fair system of security administration that protects citizens from crime and not violating the rights of people .

From the observation of Table (4), we find that the Iraqi people suffer from the most important basic services that the government must provide for its people, namely the services of electric energy, and due to the severe shortage of electricity generation, which is the production of electricity. 7 kWatts, as the deficit reached about 6.4 kW in 2018, in addition to the great disparity in its supply between large cities, the countryside and remote areas, as the distribution and electricity supply in remote areas and in the rural areas between the cities has been unequal.

**Table (4) Evolution of the amount of electrical energy from its main sources in Iraq (megawatts)**

2018		2000		1990		1980		Statement	
%	Quantity	%	Quantity	%	Quantity	%	Quantity		
43	3981	14	960	7	256	21	259	Invasive	Traditional Thermal
32.5	3002	48	3330	66	2477	66	801	Steam	
6	568	0	0	0	0	0	0	Diesel	
82	7549	62	4290	73	2733	87	1060	Total	
3	291	38	2620	19	632	13	151	Hydroponic	Renewable
0	0	0	0	0	0	0	0	Investment lines	
15	1398	0	0	0	0	0	0	Imported fonts	
100	9238	100	100	100	3364	100	1210	Total installed capacity	
15703		6500		5162		2225		Maximum total load	
6465		410		1798-		1015-		Demand gap	
59		%106		%65		%54		Capacity to load ratio	

Sources:

- OAPEC annual statistical report for multiple years - Kuwait.
- Ministry of Electricity, the annual statistical report for multiple years - Baghdad.

**Third, the environmental aspect:** an environmentally sustainable system that maintains a stable base of natural resources. Natural resources must not be over-depleted, and this includes protecting the environment, including all natural environmental systems. And it includes the atmosphere, there are many important issues that fall within the framework of the atmosphere and its changes, including climate change, the ozone hole, and the quality of air, and the effects of these issues are linked to the health of these issues , And the stability and balance of the ecosystem. The use of an integrated approach to the management of ecosystems and land to take into account the protection of land from pollution and degradation, desertification and lack of depletion of Earth's natural resources leads to soil protection is considered biodiversity and sustainable use of natural any organisms living resources of animals, plants and fish, without affecting the negative on the balance of nature, The biological diversity is measured through two main indicators: living organisms threatened with extinction and the proportion of the area of protected areas. And let us not forget that sustainable development means stopping making major changes in the global environment, and reducing the emission of greenhouse gases that cause this phenomenon, And that led to the melting of the icebergs in Greenland, which contain an amount of ice enough to raise the levels of the seas by seven meters, which leads to negative changes. And in this indicator, we must not miss focusing on managing water resources in a sustainable way, because they are the most vulnerable natural resources to depletion and pollution, and they are at the forefront of environmental and economic priorities in the world.

From an observation in Table (5), it is clear that the amount of carbon dioxide emissions in Iraq has increased from 13.7 thousand tons / year in 1980 to 93 thousand tons / year in 2010, then it increased to 119 thousand tons / year, which was reflected in the increase in the share From 1 kg / person in 1980 to 2.9 kg / person, then to 3.6 kg / person in 2018, and compared to the global average, which must stabilize at (1 - 1.5) per year.

**Table (5) the amount of carbon dioxide emission and its per capita share in Iraq**

Per capita share of it (kilo / person)	Carbon dioxide emissions (thousand tons / year)	the year
1	13.7	1980
2.7	49	1990
3.1	75	2000
2.9	93	2010
3.6	119	2018

Source:

- ESCWA, Group of Environmental Statistics in the Economic and Social Commission for Western Asia Region, United Nations, New York, multiple publications

- ESCWA, Group of Environmental Statistics in the Arab Region, United Nations, New York, Multiple Publications

**Fourth, the political aspect:** The adoption of the democratic model in governance and good governance are essential to achieving sustainable development and shaping national policies, strong democratic institutions responsive to the needs of people and achieving freedom and security, internal stability, and respect for human rights, including the right to development. The rule of law, gender equality, social justice, and freedom of opinion are all essential for sustainable human development.

## Conclusions

1. The conclusion that the president reached the premise is to match research with economic reality, which is, renewable energy production in Iraq did not achieve any sustainable development in light of the effects of potential, as the proportion of the contribution of decreased production of hydroelectric power in total electricity from 13% in energy consumption 1980 to 3% in 2018, This raised the average per capita emissions of carbon dioxide from 1 kilogram per person to 3.6 kilograms per capita for the two years in a row; This is to limit the production of renewable energy sources to the production of Iraqi hydroelectric energy only, for which there were not enough water resources to cover the development of its production, especially after the recurrence of the external water relations between Iraq and the main ones.
2. Governments have a major role in adopting renewable energy projects by developing policies and strategies compatible with the state's capabilities. And the shift from the depleted energy economy to the renewable energy.
3. Despite the great potential for renewable energy in Iraq, there are some obstacles and challenges, including economic, technical and environmental.

## Recommendations and outputs

For the development of the production of renewable energy sources all, in order to highlight aspects of sustainable development impacts of the sources of renewable energy in Iraq, it should generally invest in energy sources of renewable local available and that do not support their resources and sources from outside the natural borders of the country through the following:

- 1- Encouraging the use of renewable energy through the enactment of laws and legislative frameworks that are compatible with the capabilities of Iraq in this field and as is the case in the countries with leadership in this field, while providing a suitable environment for investment in the general investment.
- 2- Creating communication channels between official bodies and others, such as the Ministry of Environment, the Ministry of Electricity, the Ministry of Oil, the Ministry of Higher Education and Scientific Research, as well as civil society organizations related to environmental protection, to develop and develop studies and to develop and develop them.
- 3- Carrying out the necessary adjustments to the energy strategy in Iraq, whereby the energy policy is transformed from the energy supply policy to the energy management policy.

## Margins:

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- 4- Jean-Marie Chevalier, *The Great Power Battles*, translated by Mais Azab, First Edition, The Arabic Book, for translation, Riyadh, 2009, p. 230
- 5- United Nations, *Human Development Report 2019*, p. 32
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- 10- Karim Salem Hussein, *Towards a strategic vision for sustainable development for the year 2030 in Iraq*, Al-Bayan Center for Studies and Planning, 2018, pg. 22.
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- 12-** UN Environment Programme ,(2020) *Iraq's environmental sustainability prioritized in new UNEP/UNDP agreement* [EN/AR/KU, UNDP,pp1-3