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The Future Of Competition And Transformation In The Global Energy Market Between Primary And Renewable Energy And Its Repercussions On Iraq

Hossam Salem Abdullah*
Department of Economics
College of Administration and Economics
University of Baghdad ,Iraq
hussamsailmaltea@gmail.com
***Corresponding author**

Jassim Muhammad Musahib
Department of Economics
College of Administration and Economics
University of Baghdad ,Iraq
Jasim.m@coadec.uobaghdad.edu.iq

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Abstract:

Oil is considered important and dominant part in the world of energy, especially industrialized and emerging countries, in terms of solidity and production, and it is difficult to dispense with it, especially in the transportation sector. Oil and gas played an important role in pushing the economic movement forward, throughout history, and despite its importance, it is considered largest part of environmental pollutant, most developed countries have begun to search for renewable energy of various types for security, economic, and environmental reasons, despite its high cost compared to fossil fuels.

The aim of the research was to identify global expectations for renewable and non-renewable energy sources, and also to identify the repercussions of renewable energy sources on traditional ones, including Iraq, which depends entirely on oil. The study proved through the hypothesis that the role of oil will not decrease in the global energy balance for the coming decades despite the pressures. "The economic, environmental and renewable energy competition is directed towards the depleted resource for that the biggest role will be for gas as well."

The research reached several results: “Oil will not be depleted tomorrow,” despite the pressures towards this depleted resource, especially this problem facing the producing countries, and Iraq is part of these countries. Accordingly, Iraq, as a producer of oil and gas, must take practical steps to reduce dependence on oil and move towards alternatives and develop them. By investing in its oil industry and developing it to promote renewable energy that is complementary in the short term and an alternative in the long term, that is, searching for environmentally friendly sources to reduce the phenomenon of pollution, taking into account that the world will abandon fossil fuels in the future, according to Hubbert’s theory, or alternative sources must be replaced Protecting its economy, diversifying its sources, legislating laws, increasing investment, and exploiting its geographical location, which enjoys a comparative advantage, in exploiting renewable energy.

Paper type : Classification/Research Paper

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Keywords:. : Traditional energy- Fossil fuels- Global energy balance- Consumption- Renewable energies- Iraqi oil.

1.Introduction:

Conventional oil represents the main source of energy consumed for the major industrialized countries, so it is The main axis on which it relies in the performance of its various development projects, which is the important part that can not be dispensed with in all fields, whether advanced or simple technology is used . That is why Western oil-consuming countries began coordinating their oil policy in order to obtain this vital commodity in a regular manner, and at appropriate prices, taking advantage of their influence and pressure on oil-producing countries, in addition to their tireless work to find an alternative to this depleted fossil source through research and studies within the framework of what is called Alternative or renewable energy . As for the oil-producing countries, including Iraq, despite the effective participation of this resource in bringing money to their economies, they must unify their foreign policies to protect this depleting resource, and think seriously about finding alternative strategies for it , especially since the Western world is working very seriously to find an alternative to this fossil resource, and its sources can be used to develop other economic sectors, especially since oil prices are unstable and fluctuating in the global market, which exposes the economies of producing countries to shocks that may be violent. Today, the search for renewable energy sources was not a voluntary act, but rather due to energy shortages, prices, and the environment, as a result of the severe depletion of those depletable reserves. It is expected that this transformation represents a transition from traditional energy sources to environmentally friendly renewable ones. In general, non-conventional renewable energy Non-renewable, it is the alternative energy that can be relied upon in the event of the depletion of traditional fossil energy, despite the high production costs.

1.1 **: Literature Review :**

Some previous studies related to the first variable, primary energy (oil and gas) and its agencies, will be presented:

Berkeley (2006) explained that shifting the American economy to rely on renewable energy sources by 20% would lead to reducing costs and providing more job opportunities than if it relied on polluting energies, and that it would provide 75,000 job opportunities annually and would create income-generating projects, including a contribution to providing Tax revenues, and the transition to renewable energies will not happen overnight. Rather, the economy must adapt to the new mechanisms and motivate oil companies and employers to invest in this field.

Research problem: Despite the presence of fossil fuels in huge quantities, especially oil and gas, in Iraq, these sources are depletable and polluting the environment, and from here the problem of the study appears in an attempt to answer the following question: Can renewable energy be reliable energy in the near future and completely abandoned? About fossil fuels, which pollute the environment .

Research objective: The research aims to identify global expectations for renewable and non-renewable energy sources, and also to identify the repercussions of renewable energy sources on traditional ones, including Iraq, which is completely dependent on oil.

Albo Ali (2010) Wanted to began by explaining the importance of the oil sector in the current Iraqi economy by ensuring financial returns, also future indicators confirm Iraq's continued dependence on oil revenues, so it is necessary to know the conditions of this sector, diagnose its problems, anticipate its future, and explain the most important developments in the international oil market and the extent of their impact on the Iraqi oil sector. Also, there must be an integrated oil policy to solve problems and build a successful sector. It works to advance this vital sector. The hypothesis of the study is that Iraq was unable to develop a successful oil policy to develop the oil sector and overcome internal challenges and market developments that ensure effective participation in the international oil market. We conclude from this study that Iraqi oil occupies importance in the global oil market because of the huge reserves it contains, which are

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estimated at 115 billion barrels, in addition to 214 billion confirmed oil, in addition to the low costs of production and discovery with the abundance of oil fields, the multiplicity of export outlets, and the provision of pipelines that can supply the world with oil. Oil, meaning the marketing of oil to all parts of the world and the high rate of depletion at a time when the demand for oil increases and the world's reserves decrease. The study concluded the development of an integrated oil policy with a national vision that works to modernize the oil sector, while investing oil resources mainly in order to increase growth and employment.

Izzat (2012) The started from the fact that the global energy system is beginning the phase of transition from total dependence on fossil energy sources, especially oil, to a new era in which renewable energy sources have a role in meeting the growing needs of global demand, and there are many conditions that contribute to enhancing this transformation. It was based on the premise that the increasing economic and environmental pressures towards our current fossil energy resources, which are described as depleted, require research and use of alternative energy sources to complement them in the short term and replace them in the long term.

Mori (2015), addressed the problem of how oil price fluctuations can affect economic development in Algeria. Either the hypothesis of the study was addressed as follows: The Algerian economy is closely linked to the hydrocarbons sector. We find fluctuations in oil prices have a significant impact on various economic balances, stability or imbalance, because The financial returns generated from the oil sector have a prominent role in achieving economic development, if they are rationalized and their use is rationalized. The objectives of the study are to identify, analyze and diagnose the various developments that oil prices have witnessed in global markets, and to identify the problem of the Algerian economy's connection to oil prices, which makes it hostage to changes. What is happening in the global market, identifying the inability of the Algerian authorities to create a balance between the various economic sectors, which contributed to the hydrocarbons sector becoming the sole leader of the national economy, and the possibility of using the oil financial revenues generated from the oil boom to create added value in the national economy and subjecting them to the principle of effectiveness and efficiency in use. And an attempt to reveal the embodiment of economic development as a qualitative leap in all fields and Algeria's ability to achieve a level of well-being and happiness for its citizens. We conclude that the financial revenues generated from the hydrocarbons sector have an important role in the economy by providing the necessary funding sources to embody economic development. The most important recommendation is the necessity of subjecting the revenues to The finances generated from the hydrocarbons sector adhere to the principles of governance, which enhances transparency in their use in a way that ensures effectiveness in employing them to create added values and avoiding using them in oil consumption projects.

Farhan (2016): The appeared to present renewable and non-renewable energy sources and their importance among the total global energy sources, and based on the hypothesis that renewable energy sources do not have full competitiveness in terms of economic production capabilities as an alternative to depleted energy sources, and hence their inability (Renewable resources) have an impact on the global oil market and the possibility of replacing depleted resources, especially oil.

Hussein Kashiti (2019), The gained its importance because it poses a major problem because it depends on one source for its revenues, which is oil, and the latter is controlled by external forces, which mortgages the general budget programs, which in fact are the embodiment of economic and social development programs, and makes them dependent on price fluctuations in International markets, which adds uncertainty regarding the progress of these programs and plans, and the importance of the study follows from the time frame, as during the past few years the economic and financial crises in particular have accelerated, which in one way or another negatively affected oil prices, similar to the global financial crisis of 2008, As well as the reverse shock to oil prices that began in mid-2014 due to the imbalance of demand and supply, as well as the acceleration of geopolitical events, which negatively and significantly affected the

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components of the Algerian economy, especially in the aspect of public finances on the one hand, and on the other hand, Algerian oil production is a large part of it.

A noticeable decrease in oil reserves is being consumed locally, which threatens to accelerate its depletion, which requires searching for alternative energy, and supporting other growth-driving sectors and renewable sources to ensure economic and financial stability and the sustainability and diversification of sources of income.

Alqura lucy (2022) The started from the hypothesis that the policy of international oil organizations has a role in the instability of the oil market and thus the fluctuation of financial returns and investment plans of producing countries, including Iraq. Its goal is to analyze the global energy balance and the variation in the reality of energy sources and the supply and demand for them, as well as to predict future paths. The study concluded that it is necessary to develop a strategy for the future of the relationship between Iraq and OPEC, especially the plans to be implemented in increasing exports, including renegotiating with OPEC and dividing quotas among members in a way that suits them. With the OPEC+ agreement.

Al-Abadi and Jaaz (2022) The focused on a heated debate among specialists about oil and its future role, as well as competition for oil in light of alternative sources. According to Hubbert's theory, it is an exhaustible substance, and therefore technological development will increase discoveries, and some technologies contribute to reducing waste. The research sheds light on the strategic importance of oil and its future in the list of global energy sources and the role of alternative sources in competing and seizing sources of demand for oil. Other non-fossil sources will also be covered. The research is based on the hypothesis that oil will remain an important source despite the development of alternative energy.

We will review some previous studies related to the second variable of the study, And as follows :

Research problem Despite the presence of fossil fuels in huge quantities, especially oil and gas, in Iraq, these sources are depletable and polluting the environment, and from here the problem of the study appears in an attempt to answer the following question: Can renewable energy be reliable energy in the near future and completely abandoned? About fossil fuels, which pollute the environment .

Research objective The research aims to identify global expectations for renewable and non-renewable energy sources, and also to identify the repercussions of renewable energy sources on traditional ones, including Iraq, which is completely dependent on oil.

2.Material and Methods

. The research is based on the hypothesis that the role of oil in the global energy balance will not decrease in the coming decades, despite the economic and environmental pressures towards our current depleted fossil energy resources, which require searching for alternatives that are complementary to them in the short term and alternatives in the long term.

2.1 Future prospects for demand for renewable and non-renewable energy sources .

2.1.1 Market competition between traditional and renewable energy :

The growth of renewable energy sources in many parts of the world, such as America, China, Germany, Sweden, and others, has an impact on traditional energy, especially oil, in the short and long term, (Al-Qara Lucy and Saleh: 2017) in the field of electric energy production. Some analysts predict an imminent end for coal, and that The renewable energy sector received more support if it witnessed early growth after the recession that struck the world (Daadoush, 2020), due to the spread of the Corona virus pandemic in the world, and the decline in oil prices, in addition to the reasons for the Russian-Ukrainian crisis, which motivated this sector to push towards efficiency. And development and competition with energy alternatives (IRENA, 2020). This can be explained through the following table

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Table 1: Global consumption of traditional and renewable energy for the period from 2015-2020

The volume of energy consumed in thousand terawatt hours (2015-2020)	Percentage of total energy consumption (2015-2020)	power source
509.8	34.4%	Oil
434.3	29.2%	Coal
339.3	22.8%	Gas
99.2	6.7%	Hydropower
68.8	4.6%	Bioenergy
18.7	1.3%	Wind Energy
12.7	0.9%	Geothermal Energy
5.7	0.4%	Solar Energy

Source: Prepared by the researcher, based on: statistics from the Renewable Energy Agency (IRENA) and the Organization of Arab Petroleum Exporting Countries (OAPEC)

Renewable energy can achieve sustainable development, especially after the 2020 Covid pandemic and the collapse that occurred in traditional energy prices, especially oil, and according to the report of the International Renewable Energy Agency in April 2020. The world's transition to a renewable energy system contributed to economic recovery and enhanced growth. From the table it became clear that the consumption of various energy sources, which constituted the highest percentages, was oil, with a consumption of 34.4%, then coal, with a consumption of 29.2%, then gas, 22.8%, and then hydro, bio, wind, and thermal, then Although renewable energy provides a quarter of the global electricity production by 26%, the current need requires bolder decisions in achieving energy sustainability (REN21,2018), and renewable energy can achieve progress in the field of energy, by creating a competitive environment that allows energy Renewable through growth and replacement, replacing the most polluting energy." (Musa , 2010) A table of supply and demand expectations up to 2045 can also be clarified.

Table 2: Demand and supply expectations from 2020-2045

Demand and supply growth 2019-2045	2045	2040	2035	2030	2025	2020	2019	Years
13.1-	34.8	38.0	41.5	44.6	46.8	43.0	47.9	OECD countries demand
22.5	74.3	71.2	67.4	62.6	56.9	47.8	51.8	Outside OECD demand
9.4	109.1	109.3	108.9	107.2	103.7	90.7	99.7	World demand
2.3-	27.7	29.1	30.8	32.3	32.5	28.8	30.0	OECD supply
1.1	37.7	38.5	39.2	39.3	38.3	33.3	35.1	Outside opec supply
10.1	43.9	41.9	39.2	35.9	33.2	30.7	33.8	OPEC supply
10.4	109.3	109.5	109.1	107.4	103.9	92.4	98.9	World supply

Source ; opec, world oil outlook 2045 ,Executive Summary, 2020,p11&p15

2.1.2 Scenario of future prospects in the traditional and renewable energy market :

It is natural and expected that global demand for traditional energy, especially oil, will decline in the future for no reasons, the most important of which is that oil is depleted, the existence of other alternatives to it, and that it is a political and economic commodity, and therefore consumption of it will decline in 2040. The following table shows the competition in the traditional and renewable energy market according to expectations of demand and supply. Global (Abdullatif and Akawee, 2023)

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Table No. 3: shows competition in the traditional and renewable energy market 2020-2040 according to demand and supply expectations.

Scenario 450 (for climate ppm)		**Current policy scenario (reference)**		**New policy scenario**		**Energy sharing ratio**
2040	2025	2040	2025	2040	2025	
58.1%	74.2%	78.7%	79.1%	74%	77.9%	**Percentage of fossil fuels**
10.6%	6.6%	5.2%	5.5%	6.6%	5.7%	**Percentage of nuclear energy**
31.3%	19.2%	16.1%	15.4%	19.4%	16.4%	**Percentage of renewable energy**
Global energy consumption forecasts according to the reference case scenario (2025-2040)						**Energy sources**
2040			2025			_____
%78.4			%81.2			**Percentage of fossil fuels**
%5.6			%5			**Percentage of nuclear energy**
%16.05			%13.8			**Percentage of renewable energy**

Source**:** Prepared by the researcher based on data International energy agency, world energy outlook,2016, p 64

It is noted from the table that in the new policy scenario, traditional energy will have a dominant role in the future of energy. The percentage in 2025 will be 77.9, while it will decrease by 2040 to 74%. The reason for the decrease is in order to reduce pollution and global warming by following the carbon policy, in contrast to the high percentage of renewable energy. 16.4% in 2025 and 19.4% in 2040. As for nuclear energy, it will have a slight increase. However, the current policy scenario expects a decrease not exceeding 1%. That is, the demand for conventional energy in 2025 will be 79.1, and it may decrease in 2040 to 78.7 due to technology development and improvement . As for nuclear energy, it will be almost constant due to environmental and health problems. As for the 450 scenario, the climate will be more severe and severe due to the environment, and the largest share will be of renewable energy compared to the decline in traditional energy. The proportion of traditional energy will be 74% in 2025, to 58.1% by 2040, while renewable energy will rise from 19.2% to 31.3%, and nuclear energy will rise from 6.6%. To 10.%, as a whole, the demand for oil and coal will be reduced between 2025-2040 and in varying proportions, while the share of gas will increase, according to the sustainable development scenario, that is, the value of gas in 2020 will be 3.1 billion cubic tons by 22.9% to 3.4 MMT, in 2040 by 25.7%. %(Madahi , 2012). We conclude from the current policy analysis that traditional energy, despite its decline, will remain important despite the rise in renewable energy. However, the policy scenario will prove the opposite: a greater role for traditional energy will decline, according to the proportions mentioned previously. With the stability of nuclear energy, in the foreseeable future the competition will be intense between traditional and unconventional, on the one hand, and on the other hand. Others, between renewable ones, i.e. the role of fossils in the competition between 2021-2040 and renewable ones in 2040. (Al-Maamouri and Al-Mukhtar,2022) .

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2.1.3 Global energy balance scenario :

Over the centuries, traditional energy has occupied a major role in the energy balance, and it still sits at the forefront, led by oil. It is expected that the next role will be that of gas, at a rate of 26%-28% in the year 2035, after which the role of renewable energy will emerge. Some economists expect that the three decades Fossil fuels will play an important role in the future, and the question here is the extent to which traditional and renewable energy sources contribute to the energy balance in the future. That is, oil will be determined by three scenarios, to predict oil demand, which are the low production scenario, the medium (central) production scenario, and the high scenario. However, the energy balance scenario will clarify these expectations. This can be explained in a table :

Table 4: Future expectations for the global energy balance for the period (2020-2040) BTU

Contribution percentage		change -2020 2040	Annual change	2040	2035	2030	2025	2020	Fuel type/year
2040	2020								
%30	%32	%14	%0.6	205	204	201	195	187	Oil
%26	%23	%36	%1.3	177	169	162	151	139	Gas
%20	%24	%-0.9	-0.4%	133	137	138	140	142	Coal
%7	%5	%66	%2.2	45	41	36	32	31	Nuclear
%8	%9	%9	%0.4	56	55	55	53	52	OrganicFuels
%3	%2	%20	%1.2	18	18	17	16	15	Hydro
%6	%2	%213	%5.1	41	34	28	23	17	Renewable

SOURCE: G. Hopkins, "OUTLOOK FOR ENERGY: A PERSPECTIVE TO 2040, *Exxon Mob.*, no. 1692, p48, 2019

Expectations indicate a group of planned programs, including "supporting research in reducing the use of fossil fuels that cause environmental pollution while seeking other energy alternatives, with a focus on the transportation sector that uses the largest portion of fossil fuels, i.e. replacing them with biomass energy, i.e. replacing oil and gas, such as The use of soybean fuel and animal fats as fuel for transport aircraft and land transport, as well as the replacement of oil and gas with geothermal and solar energy in generating electricity, (Norouzi and Ziarani , 2019) 'The vision of the impact of government support policy towards energy alternatives on traditional energy can be clarified through the Mizan scenario. Energy during the period 2020-2040 in the figure below.

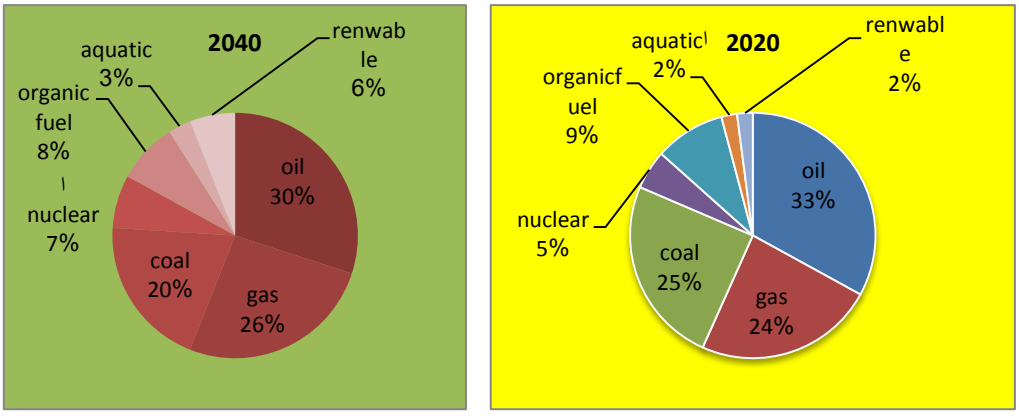

Figure 1: Energy balance scenario from 2020-2040 based on data from Table (4)

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It is noted from the figure that the energy balance scenario shows reliance on alternative energy, especially gas, if expectations indicate that the contribution of traditional energy will be 76%, in 2040, while in 2020 it was about 82% despite the Corona pandemic, meaning alternatives increased by 24%, and it has been shown that there is a difference. From one year to another, the future energy issued by the same entity can also be clarified. The three future energy forecasts for 2020-2050 can also be clarified.

Table 5: Future expectations for the energy balance for the period from 2020-2050

Percentage of growth difference between 2019 and 2020 forecasts	Reference case			Zero emissions			Rapid sustainability			Status Power Type
	2050	2050	2025	2050	2050	2025	2050	2050	2025	
% -4.3	%24	93	101	%7	31	98	%14	52	98	Oil M/B/D
% -3.6	%26	5305	4297	%13	2527	4060	%21	3950	4307	Gas Billion Q3
% -0.9	%17	123	158	%2	12	155	%4	24	156	Coal EJ
% 0.8	%4.2	51	24	%9	57	24	%7	44	24	Nuclear EJ
% 0.8	%7.1	51	38	%10	62	38	%9	57	38	Hydro EJ
% 3.6	%22	161	34	%59	370	52	%44	277	39	Renewable EJ

SOURCE : bp, energy outlook 2020 edition . http://www.bp.com/energyoutlook

The table shows that the future scenario for the three cases requires a zero emissions scenario, that is, rapid sustainability through investments and transformations in the field of energy, with an annual investment rate of approximately $800 billion compared to the reference scenario of $400 billion, which is the same as the estimated investments for oil and gas in zero carbon emissions, that is, an amount Reference scenario of $750 billion, (bp,2020), In conclusion, the future of energy sources in the energy balance depends on the investments directed to each energy source, and the most likely is the medium-term scenario based on annual investments, meaning that the shift in energy consumption requires a gradual and large shift in investment, and based on an in-depth analysis of current trends, the American company has proposed AT Kearney presented three basic scenarios for the future from now to 2040, classified on four basic dimensions, including: stability of the geopolitical system, global macroeconomic flows, technological innovation, and the global regulatory environment. If a scenario is required to be achieved according to rising temperatures At 1.5 degrees Celsius, investments worth 5.7 trillion dollars must be provided until 2030, meaning directing -0.7 trillion dollars annually from fossil fuels in order to support renewable energy, and the rest will be financed by investments from the private sector, while providing approximately 85 million new jobs in 2030. This requires preparing and training cadres. , with energy consumers and carbon emitters being forced to implement more plans and programs in investments, with the emergence of the role of the G20 and G7 in the energy transition. (IRENA , 2022).

2.2 Renewable energy transition :

Despite the presence of fossil fuels in huge quantities for producing countries, there is no possibility of continuing and relying on them in the stage of economic growth, because it faces economic, social, environmental and political pressures before consuming countries. Any shortage of fossil fuels forces the world to switch to what is called (clean energy). (Abdul Hussein , 2011) Anticipating the global energy situation “requires introducing fundamental changes to the prevailing energy situation dominated by fossil fuels by introducing renewable energy to form an important part of global energy consumption after its contribution was a small part. The bottom line is, despite From an increase in production and discoveries, but this increase is not in line with the rates of global consumption of oil and its derivatives due to the

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inability to establish new oil ambushes that day. That is, the problem that will face the world after 2030 or 2045 is not the presence of production or the presence of a surplus that has no buyers, but rather the real problem is the lack of The presence of sufficient quantities of oil due to the depletion of huge oil fields, the decline in production, and the failure to meet the needs of consumers. This is what prompted oil and gas experts at the French Institute to weigh in, including the expert (Yves Ma Thieu), about the decline in production by 2040, and research and thinking about energy alternatives, including renewable ones, (Abab , 2018) and the factors in promoting this trend can be briefly identified, including

2.2.1 Environmental and climate change:

The current energy sector began to face pressures, and some used to call it the term (energy security), which means safe and continuous energy with stable prices, but the challenge that voices began to raise is a fundamental pillar of energy security, which is the climate and environment challenge, and pressures escalated around the issue of pollution and how to reduce the emission of harmful gases. Because of the phenomenon of global warming to get rid of methane and carbon gas, and its increase increases the rise in global temperature in the world (Abdullah and Abdullatif , 2021), and the time has come to address this problem through binding government measures towards the use of renewable energy free of carbon, and on the sidelines of this, the (Kyoto) Agreement was concluded. It is an agreement concerned with the climate that was announced by the United Nations in Brazil at the Earth Margin Summit, including 19 Arab countries, with the aim of reducing emissions by oil-producing countries by 50% by 2020. (OAPEC, 2008) The challenge of decarbonization indicates that it needs greater support on At the global level, as well as policies to facilitate permits and approval faster for energy and low-carbon infrastructure (Mohammed and Saleh, 2016). What has increased the disruption in energy supplies and energy shortages is the Russian war, and this increases the demand for renewable energy due to the shortage in supply, meaning it requires moving to a low-carbon world. Carbon: What role will oil have for the next 15-25 years, with a greater role for gas? (pb, 2023) In 2021, the International Energy Agency published its report on net zero by 2050, a roadmap for the energy sector. After the Covid-19 pandemic, the economy rebounded and the markets witnessed a rise in energy prices. Which led to the emergence of energy concerns, meaning emissions rose frighteningly after 2021, and carbon emissions from fossil fuels and non-renewable waste can be explained.

Table 6: Carbon dioxide emissions in the world from fossil fuels

CAGR 2021%			Stated policy scenario (mt co_2)					Content
2050	2030	2050	2040	2030	2021	2020	2010	Total
0.5	0.1-	31979	33861	36211	366639	34779	32893	Total CO_2
0.5-	0.2-	28946	30800	33135	33680	31904	30643	Materials of combustion (+)
1.5-	1.1-	9863	11553	13695	15106	1435	13855	Coal
0.1	0.6	11094	11248	11412	10850	10194	10576	oil
0.0	0.4	7629	7675	7774	7520	7162	6067	Natural Gas
20	2.5	360	324	254	204	213	146	Bioenergy and Waste
13	18	58	28	8	2	1	--	Industrial Removals (-)
0.0	0.0	1	1	1	1	1	--	Biofuel Production
15	27	58	27	8	1	--	--	Direct Air Capture

Source; bp , statistical Review of World Energy , 2022,p12

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The evidence indicates that current policies are much less than what is required during the critical period between now and 2030 to fulfill collective emissions reduction commitments. By 2030, they fall slightly below the level they were in 2021, while the bold action plan contained in the nationally determined contributions leads to a faster reduction in emissions and as Another table can be clarified that shows us the size of the emission resulting from the use of primary energy

Table 7: Carbon dioxide emissions from primary energy for the period (2011-2021) million tons

the growth% -2011 2021	2021	2020	2019	2018	2017	2014	2011	Countries
%0.6	11292.5	10744.7	12083.5	12459.4	12346.5	12518.7	12842.4	OECD countries
%1.3-	22591.5	21333.9	22012.3	21689.2	21079.9	20301.4	19062.2	Countries outside the OECD
%1.7	27728.2	2564.2	2931.5	3069.0	3095.7	2980.8	3300.8	EU
%1.9-	33884.1	32078.5	34095.8	34148.5	33426.4	32820.2	31904.6	The world

Source; bp , statistical Review of World Energy , 2022,p12

2.2.2 Energy security :

In 2021, dire factors dominated after the pandemic, which is the Russian-Ukrainian war, and its loss of lives and societies. From an energy perspective, it appears that the disturbances in Russian energy supplies and the resulting global energy shortage, especially gas, which Europe was affected by, are likely to have a material and lasting impact on The energy system: After the rise in energy prices, global energy policies and discussions in recent years have focused on the importance of removing carbon from the energy system and moving to net zero. The events of the Russian war were a reflection for all of us that this transition also needs to take into account energy security and the ability to afford its costs. That is, there are three dimensions of the energy system together: security, affordability, and sustainability. The triple energy dilemma requires a successful and permanent energy transfer in all its elements, and even in 2022, it did not include an analysis of the potential effects of the war. As a result, the scenario was updated, which is the passage of a law reducing energy consumption. Inflation in the United States and war is still looming on the horizon. Based on this, energy security concerns have increased and could have significant impacts on energy markets. Based on this, the desire of consuming countries was to enhance their energy security by reducing dependence on imported energy, which is dominated by fossil fuels and alternatives. This is converting it into locally produced renewable energy," if the war continues in order to fill the shortage, meet demand, and confront rising prices. (pb,2023), and the energy transition will need three main scenarios, which are accelerated, net zero, and good momentum, and it can give results on Over the coming years. The continued rise in carbon emissions, rising temperatures, and increasing weather phenomena in recent years will play a greater role than ever before in the decisive transition to a zero-emissions future. The Russian war has brought to the fore the complexity and interconnectedness of the current global energy system. I hope that the energy outlook will accelerate to Global net zero in the future. Providing energy has become a security issue. The tensions witnessed in the energy markets in oil-producing countries make any threat facing them become a source of danger to Western countries. The energy security concern of consuming countries is how to get rid of oil and rely on alternative energies. (Al-Madani ,2009), oil will be a source of danger not only to America, but also to the global economy, and it constitutes a threat to national security, so it must be dispensed with (Greensan, 2009),Summary of energy security: The major industrialized countries see that the issue of dependence on traditional energy, especially oil, has become a threat to economic and political security. And

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environmentally, it pollutes the environment on the one hand, and on the other hand, production and reserves outside its countries, and this threatens it in the event that the supplies are exposed to any emergency or other reasons. In the sense that the existence of energy alternatives does not mean the abolition of renewable energy because it remains a component of the sustainability of life, as the presence of alternative energies, especially renewable energy security concerns, has decreased. Which was based on the assumed age of oil (Al-Mamouri and Al-Mukhtar, 2022).

2.2.3 Oil prices and energy costs:

Oil was and still is one of the most important sources of energy due to its multiple uses and it has a role in the global energy balance, but the total and increasing dependence on it for consumption will lead to the depletion of its reserves and thus an increase in prices. This leads to the search for new sources, especially in the field of electrical energy, and since the rise Prices, or what was called the first oil crisis in the seventies, especially the first shock, which caused the producing countries and OPEC countries to lose control over prices. This is one of the effects of the shocks, in addition to the growing role of the consuming countries, represented by the International Energy Agency. (Al-Lami and Al-Kubaisi, 2018) There has been new thinking about new energy sources and they have the ability in the future to compete with fossil fuels, whose prices continue to rise while the technological development of renewable energy, (Howell and Nakhla, 2008). Also, some oil-producing countries such as Iraq are affected by prices and this is reflected in Government spending (Abdullah and Al-Birmani, 2019), and there are some factors that led to the rise in oil prices in the current century, including the increasing demand for oil by emerging countries, especially India and China, which have become competing with the major industrial countries, that is, the development of consumption that has been established outside the OECD. (Rohl ,2009)

1- New discoveries of major fields with the introduction of modern technologies to invest in the most expensive areas, while demand continues to increase due to economic and population growth. Oil prices reached more than $100 per barrel by the end of 2021.

2- Among the price increases is also the increase in capital costs, according to the Cambridge Energy Research Report (CERA), that is, the increase in investment costs for extractive projects, which has an impact on oil industry projects, which prompts the search for energy alternatives because they become more competitive compared to oil. (Daadoush and Ziara, 2019)

3- The tax policy followed in consuming countries and industrial countries, that is, the tax imposed on the price of a barrel of consumable oil. There are countries where the price of the tax exceeds the price of a barrel of oil. The goal behind imposing the tax was to reduce oil consumption and give a greater role to alternative or renewable energy and make it More competitive, in addition to reducing environmental pollution, (Hussein and Hamdan , 2020)

4- It is a decrease in the level of production compared to reserves, that is, reaching what is called the peak of production, or what is called the oil peak, or called the Hébert peak, meaning the highest level of production compared to reserves with increasing consumption, that is, there are those who have reached a peak with a decrease in production. Reserve, that is, the stage of oil depletion, and this may happen inevitably in the future, that is, after 2035. (Al-Hiti , 2000). The International Energy Agency published its report in 2010 stating that we have reached the peak of oil production, and many fear it in the long term. What confirmed its support is the BP report (favorite (2010) A table can be clarified from the perspective of international energy agencies, the contribution of fossil fuels and its impact on future demand.

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Table No.8: Percentage of fossil fuels out of total future energy demand

2045	2025	power source	The side
%29	%36	Oil	BP
%26	%25	Gas	
%19	%25	Coal	
%74	%86	Fossil Fuel	
%55	%61	Oil + Gas	
%28	%31	Oil	OPEC
%24	%23	Gas	
%17	%24	Coal	
%70	%79	Fossil Fuel	
%53	%54	Oil + Gas	
%24	%27	Oil	EIA
%20	%22	Gas	
%21	%23	Coal	
%65	%72	Fossil Fuel	
%45	%49	Oil + Gas	

Source: Prepared by the researcher based on expectations of future demand for each منOPEC ,World oil Outlook 2021,EIA,World Energy projection System 2021 ,BP-energy – outlook-summary – tables 2020 .

3.2 Implications of renewable energy for Iraq:

According to the renewable energy report issued by the International Energy Agency in 2020, the capacity of renewable energy will increase by about 200 megawatts by 2020, and this is due to the development of wind energy, solar energy, and others, especially in the countries of America and China, by 30%, from wind and sun, and that renewable energy sources are outside The electricity sector, which is still suffering from the effects of the Corona pandemic (Irean , 2020), with increased investments in renewable energy and an increase in its contribution to the global energy mix by 2030, this at the global level. As for Iraq, it suffers from a shortage of energy, especially electricity, despite the availability of fossil fuels in huge quantities, in addition to the renewable energy available to it (sun, wind, hydrogen, etc.), despite the huge amounts spent on this sector. Iraq needs to develop the energy sector to meet the requirements of development and confront climate challenges, given that Iraq is a member of the Paris Agreement and the availability of clean energy is a basic condition for achieving sustainability. However, Iraq's energy policy has not changed and remains dependent on the depleted oil sector, but the development of this sector can achieve sustainability. As oil prices are unstable and are exposed to shocks from time to time, it is necessary to establish sovereign wealth funds to reduce these shocks. (Hassan and Al-Idami , 2019)

2.3.1 The path to transition to renewable energy in Iraq:

The speed of the transition to renewable energy depends on the conditions and capabilities in the stages of its development. The developed countries relied on their material and scientific capabilities (Ayyash: 1990). However, the transition process must be easy so that it does not cause an increase in costs in terms of technology and administrative practices, and energy proposals can be clarified. There are several obstacles facing the development and spread of renewable energies in Iraq, including (structural and institutional, technical and technological obstacles, awareness-raising, economic and financial, climatic, environmental and political obstacles). The transformation requires overcoming these obstacles despite the potential that Iraq enjoys to (Solar brightness, wind, thermal...etc.) allows for the establishment of renewable energy facilities, and these projects can be financed without borrowing due to the availability of surplus funds from oil operations, along with the presence of human and educational capabilities. (Al-Mohammadi: 2017) In light of these capabilities, transformation can be achieved. But here is the question: Why is Iraq far from moving towards renewable energies,

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especially in the electricity sector? The answer to that is that it suffers from the institutional side responsible for implementing these projects and executing plans. However, it suffers from corruption, will, and the absence of a strategy, and if there is a strategy, it suffers from implementation, which makes it Lagging and useless projects. (Ali, 2020), that is, the absence of governance and institutions is the main obstacle to development, that is, Iraq's institutions are still ineffective in meeting the needs of the citizen, and the other factor, which is the plans drawn up, are still ineffective despite the availability of capabilities, as we mentioned previously, and the first ambitious plan was developed in In the 1980s to generate energy in the Jadriya area in Baghdad, but wars and economic factors prevented this. However, the projects announced by the government, especially solar energy, are projects that are not subject to a strategy. They help bring technology and experts from abroad and the absence of clear basic legislation for investment and the lack of integration. Between the public and private sectors, this makes it a backward energy. Of course, if we want to advance this sector, it requires developing a strategy for renewable energy, legal frameworks, providing all material, human, and logistical resources, and overcoming bureaucracy. The strategy for renewable energy in Iraq from 2020-2050 is to achieve a balance between production, consumption and environmental commitment, that is, raising the contribution of clean energy by up to 30% by 2050. (IPCC, 2011) It is also possible to clarify the nature of Iraq's lack of orientation towards renewable energy.

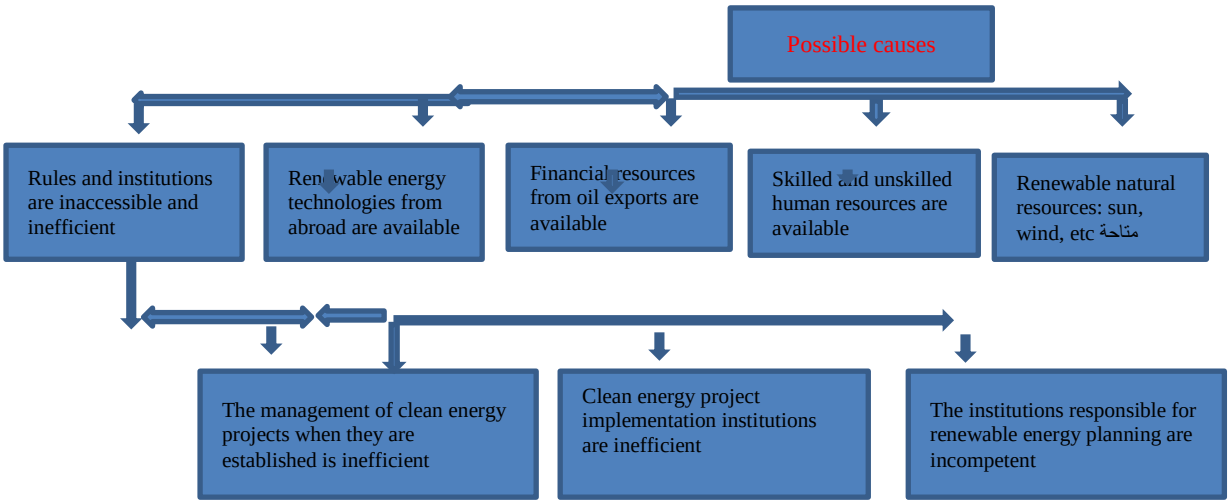

Figure 2: Source: ((The problem of not shifting towards renewable energy in Iraq)) prepared by the researcher

2.3.2 Appropriate investment policy for developing the oil sector:

The status of the investment climate is evident through its impact on attracting local and foreign investments. After 2003, contracts for the so-called licensing rounds were signed or created (Mohammed and Ziara, 2017). Some believe that foreign investment is necessary for several reasons: It requires exploiting full oil capabilities, in order to Securing sufficient financing to maintain current production capacity on the one hand, and expanding future production capacity requirements on the other hand (through foreign investment, foreign currencies and capital can be obtained to secure this financing). Foreign investments help provide job opportunities and acquire skills through training and qualifying human resources, and all of this depends on the conditions and controls set by the state. Creating new markets for export, especially since oil companies have the best means and capabilities that enable them to access global markets because of their high marketing skills. Foreign investments have a role in transferring modern technology, technical and administrative skills, and transferring knowledge through international oil companies, as well as About its ability to stimulate competition, innovation, capital formation, and expansion of trade, which leads to accelerating the pace of

economic development and growth. It included several regions of Iraq and was distributed among many companies in the first and second round, (Muhammad and Saleh, 2016). A table of the rounds of licenses granted and service contracts can be clarified. Production volume and extraction costs.

Table 9: Fields included in the licensing rounds granted to international companies

Governorate	Service fee $/b	Production Oil: 1000 b/d Gas: Billion m3/year				Type	Company Name	Reserve (billion barrels)(	Field name	Licensing round
		القمة الجديدة	القمة	2012	The first					
Wasit	6.00	--	120	129	25	Oil	Petrochina	1.0	Al-Ahdab	2008
Basra	2.00	2.1	2.850	1.279	1.173	Oil	BP	17.3	Al-Rumaila	First licensing round 2009
Basra	2.00	0.85	1.200	225	201	Oil	Eni	7.8	Al-Zubair	
Maysan	2.30	--	450	91	97	Oil	Cnooc	2.4	Maysan Group	
Basra	1.90	1.6	2.325	417	268	Oil	Exxonnobil	43.3	West Qurna 1	
Basra	1.15	1.2	1.800	----	120	Oil	Lukoil	43.3	West Qurna 2	Second licensing round 2010
Basra	1.39	==	1.800	21	175	Oil	Shell	12.0	Majnoon	
Maysan	1.40	400	535	34	70	Oil	Petrochina	4.9	Halfaya	
Nasiriyah	1.49	==	230	---	35	Oil	Petronas	4.4	Gharraf	
Wasit	5.50	==	170	----	15	Oil	Gazpromneft	0.8	Badra	
Mosul	5.00	==	120	2	30	Heavy Oil	Sonangol	1.5	Qayyarah	
Mosul	6.00	==	110	---	20	Heavy Oil	Sonangol	1.1	Najma	
Anbar	5.50	===	4.10	=	1.03	Gas	Kogas	----	Akaz	Third licensing round 2010
Diyala	7.00	=	3.10	=	0.78	Gas	Tpao	----	Mansouriya	
Basra	7.50	=	1.00	=	0.26	Gas	Kuwait energy	-----	Siba	
Diyala	5.38		n/a	=	n/a	Gas	Pakistan petroleum	=	Block 8	
Basra	6.24		n/a	=	n/a	Gas		=	Block 9	
Nasiriyah	5.99		n/a	=	n/a	Oil		=	Block 10	
Najaf and Muthanna	5.00		n/a	=	n/a	Oil		=	Block 12	
Diyala	=	=	=	=	=	Oil	Geo Guide	=	Naft Khana	Fifth licensing round, submitting the application 2018,
Maysan	==				=	Oil	Geo Guide	=	Al-Hawizeh	
Basra	=	=	=	=	=	Oil	United Energy Group	=	Sinbad	

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Basra	=	=	=	=	=	Oil	Crescent Company	=	Khader Al-May	and once the license is officially approved
Kirkuk	=	=	=	=	=	Gas	Al Hilal	=	Kalabat - Kamar	
Diyala						Gas	Crescent UAE Petroleum Company	=	Anjana - Khashm Al-Ahmar	
		8.18	11.7 10	2.198	2.229			96.5		Total oil
			8.20		2.07					Total gas

Source: Mirza, Ali, Iraq: Economic Reality and Pests, The First Conference of the Iraqi Economists Network, Beirut, 2013.
- Abdel Reda, Nabil Jaafar, Iraqi oil from concession contracts to licensing rounds, Beirut, Al-Basair House and Library, 2013, p. 197,
- Abdul Hussein, Mustafa, the energy sector, challenges of infrastructure, economics and politics (The Iraqi Case 9, Dar Sutour for Publishing and Distribution, Baghdad, 1st edition, p. 232, 2019
- DaVinci Management Consulting Limited, Geneva Group, Oil and Gas in Iraq, 2020, p26

From the nature of the investment, we note that they are not service contracts nor production sharing contracts, as they are sharing contracts. This type takes Iraq back to the past when foreign companies controlled oil before nationalization in light of the administrative, financial and legal chaos and the failure to bear the costs of pollution, during which diseases began to spread frighteningly. 'And not taking into account the rights of future generations

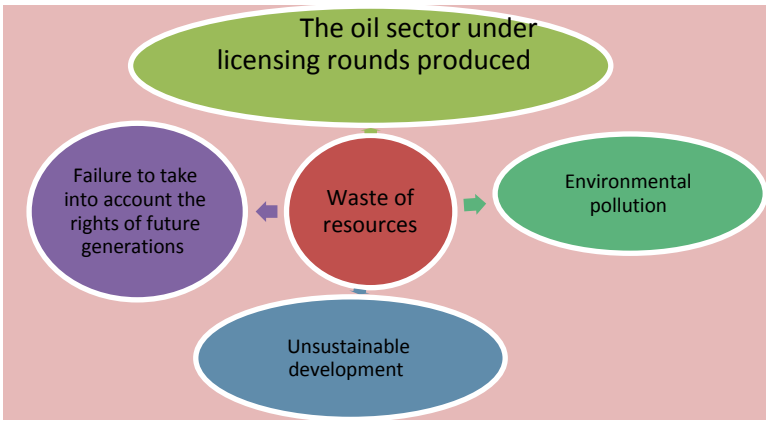

Figure 3: The Iraqi oil sector without the ambition of licensing rounds

2.3.3 The future of Iraqi oil:

The energy field is an integral part of the broader Iraqi economy, as oil and gas represent approximately 60% of GDP and 99% of export revenues, and the economy is most dependent on oil. The global energy sector is undergoing major changes (Al-Sammak , 1981), and Iraq now has the ability to confront the challenges. In the field of energy on the short and long horizon, Iraq possesses enormous oil wealth, especially after the improvement of the technological situation. It has become more dependent on the oil industry with the passage of time, (Abdullah and Abdullatif , 2021) which has made it take an economic position in the international oil market, and it has The Iraqi oil sector passed a very turbulent period well in the past decade, and was able to double production despite the circumstances that Iraq went through, but it did not meet the ambition. The next stage of Iraqi oil development will depend not only on international market conditions, but will also depend on three factors within the reach of Iraqi governments: ensuring a sufficient amount of water for injection depends on the investment of seawater, attracting foreign capital, and a stable political and security environment, in order to reach To

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approximately (6) million barrels per day of production, and in 2030, Iraq will surpass Canada, given the conditions we mentioned, and become the fourth largest producer in the world.[1] as in the following figure.

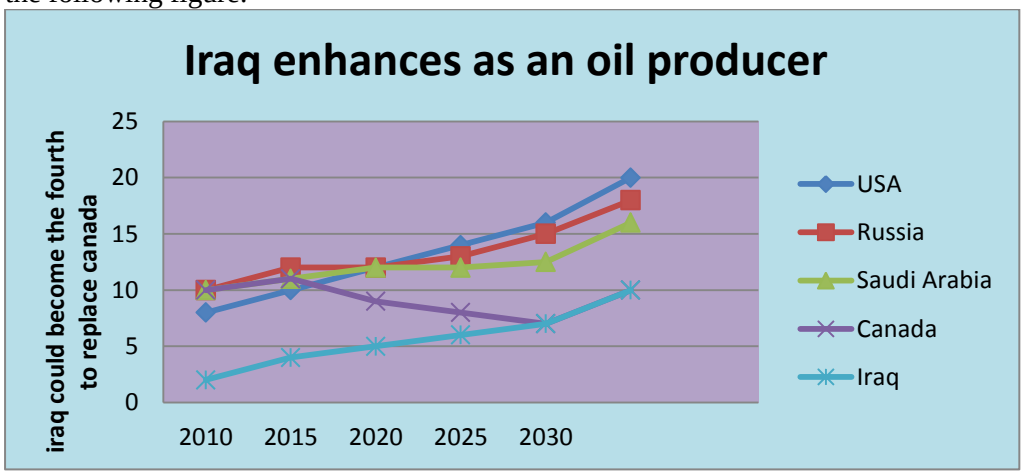

Figure 3: Iraq's oil position in 2030: based on the expectations of the International Energy Agency.

The drawing shows that Iraq can overtake Canada to become the fourth largest oil producer by 2030, if the elements mentioned above are available, despite the countless barriers in addition to the difficulty and cost of hydrocarbon projects in Iraq (Shamkhi and Ahmed & Majeed,2022), however, this does not detract from the fact that, from a technical standpoint, oil projects in Iraq are the least expensive projects in the world. Iraq's production is expected to grow in the next ten years, and it is expected that production in 2030 will represent 6% of global oil production. (Bergas, 2000) After what was 3% in 2010, gas production in Iraq suffers from a major imbalance, especially the electricity sector, in which most of the stations were built on gas. The resource and reserves are large and the total volumes of gas are also large, but until the present time the country is facing a major shortage. In electrical energy due to gas, (Daddoush , 2020), more than half of the gas extracted in Iraq is burned (associated gas), and depends on imports from neighboring countries, and Iraq has (9) sites, while the government decided to invest in it and sign with the French Total (IEA, 2019). In the end, in order to reach reasonable expectations, we must consider factors or assumptions that range in accuracy from what is certain and possible, in light of future expectations, because most expectations indicate that global demand will increase and that this increase must be matched by an increase in production. (Ali: 2023) Iraq is able to cover this increase within specific oil countries, and we can refer to the observations of (OPEC: 2020), and expertise, technologies and cooperation must be transferred between Arab countries and the localization of technology, especially in the field of energy. (Barihi and Nassouri , 2010)

4- Results :

Through what was discussed in the research, we reach a set of conclusions The study concluded that oil will not be depleted tomorrow, despite the pressures towards this depleting resource, especially this problem facing the producing countries, and Iraq is part of these countries. Therefore, Iraq, as an oil producer, must take practical steps to reduce dependence on oil and move towards alternatives and developing them, that is, searching for sources Environmentally friendly to reduce the phenomenon of pollution, taking into account that the

[1]This scenario can be applied through the current and declared policy all over the world, that is, the new policy scenario in global energy expectations, which includes the contribution of the nationally defined Iraq 'ndc, to reduce the emissions of the carbon dioxide by 14% of the usual work scenario 2035, and these policies do not approach Achieving the sustainable development goals, but also includes the global level at the climate level that will change this view.

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world will abandon fossil fuels in the future, according to Hubbert's theory, or replace alternative sources. Its economy must be protected, its sources diversified, laws must be legislated, investment increased, and its geographical location must be exploited to exploit renewable energy.

Conclusions :

Through what was discussed in the research, we reach a set of conclusions:

1- The world, sooner or later, will move towards renewable energy in order to achieve three goals: the environment, energy security, and reducing consumption of fossil fuels, especially since Iraq has enormous potential in solar radiation, wind, etc., and that it still suffers from a shortage of energy, especially electricity. Energy and wind can be exploited. No electricity production with the issuance of the necessary legislation and laws for renewable energy investment .

2- Unifying international efforts aimed at encouraging environmentally friendly economic activities and exchanging expertise and technological information in order to reduce emissions and guarantee the energy rights of future generations.

3- It is expected, according to official reports, that the demand for oil will continue between 2035-2045. This requires the development of this vital sector, which is involved in many petrochemical industries, with the provision of government support.

4- Renewable energy has obstacles and defects like traditional energy. For example, solar energy requires huge areas, energy needs abundance, and nuclear faces radiation, security risks, etc., which will delay making these sources an alternative to oil.

They also did not obtain production capacity and did not take into account the infrastructure to increase Exports.

5- The plans and formulation of the integrated national energy strategy do not fit with Iraq's capabilities and contain many gaps, whether they are current or future plans, that is, they gave freedom and space to foreign oil companies to exploit the most important resource on which Iraq depends.

Authors Declaration:

Conflicts of Interest: None

-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, Which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.

- Ethical Clearance: The Research Was Approved By The Local Ethical Committee in The University.

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مستقبل التنافس والتحول في سوق الطاقة العالمي بين الطاقة الاولية والمتجددة وتداعياتها على العراق

حسام سالم عبدالله
جامعة بغداد / كلية الادارة والاقتصاد
قسم الاقتصاد
hussamsailmaltea@gmail.com

جاسم محمد مصحب
جامعة بغداد / كلية الادارة والاقتصاد
قسم الاقتصاد
Jasim.m@coadec.uobaghdad.edu.iq

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مستخلص البحث:
يعتبر النفط الجزء المهم والمسيطر في عالم الطاقة , وخاصة الدول الصناعية والناشئة , من حيث الصلابة والانتاج ومن الصعب الاستغناء عنة وخاصة في قطاع النقل , لقد كان للنفط والغاز دور مهم في دفع الحركة الاقتصادية للأمام , عبر التاريخ , وعلى الرغم من اهميته الا انه يعد جزء الاكبر من ملوثات البيئة ,اخذت اغلب دول المتقدمة البحث عن الطاقة المتجددة بمختلف انواعها لأسباب امنية , اقتصادية , بيئية ,رغم كلفتها الباهظة مقارنة بالوقود الاحفوري .
وكان هدف البحث , التعرف على التوقعات العالمية لمصادر الطاقة المتجددة وغير المتجددة , وايضا التعرف على تداعيات مصادر الطاقة المتجددة على التقليدية ومنها العراق الذي يعتمد كليا" على النفط , واثبت الدراسة من خلال الفرضية , لن ينخفض دور النفط للعقود القادمة في ميزان الطاقة العالمي رغم الضغوط الاقتصادية والبيئية ومنافسة الطاقة المتجددة اتجاه المورد الناضب , وان الدور الاكبر سيكون للغاز ايضا".
وتوصل البحث الى عدة نتائج, ان النفط لن ينضب غدا" رغم الضغوط اتجاه هذا المورد الناضب وخاصة هذه المشكلة تواجه البلدان المنتجة والعراق جزء من هذه البلدان , وعليه على العراق باعتباره منتج للنفط والغازان يتخذ خطوات عملية تقليل الاعتماد على النفط وتوجه نحو البدائل وتطويرها ,,من خلال استثمار صناعته النفطية وتطويرها للنهوض بالطاقة المتجددة التي تكون مكملة في المدى القصير وبديلة في المدى الطويل , اي البحث عن مصادر صديقة للبيئة للحد من ظاهرة التلوث , مع الاخذ بالاعتبار ان العالم سيترك الوقود الاحفوري في المستقبل , حسب نظرية هوبيرت او استبدال المصادر البديلة يجب حماية اقتصادها وتنويع مصادرها, وتشريع القوانين وزيادة الاستثمار واستغلال موقعه الجغرافي الذي يتمتع بميزة نسبية , في استغلال الطاقة المتجددة .

نوع البحث: ورقة بحث
المصطلحات الرئيسة للبحث: الطاقة التقليدية , الوقود الاحفوري ,ميزان الطاقة العالمي, الاستهلاك , الطاقات المتجددة ,النفط العراقي.