

A PROSPECTIVE VISION FOR IRAQ'S OIL SECTOR IN LIGHT OF PRODUCTION DEVELOPMENT AND THE FUTURE OF GLOBAL OIL MARKETS FOR THE PERIOD (2010-2020)

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ABSTRACT

It is necessary to base an economic sector's forward-looking vision on the reality and availability of the facts to construct an overall actually. In order to assess the possibilities accessible and to choose the suitable alternative based on the available capabilities. As a result, strategic factors must be addressed in terms of significance and dealt with in order of importance and priority. Studying and analysing the internal and external elements that influence oil production and exports in Iraq in accordance with Iraq's strategic vision for the Iraqi oil industry. It is important to achieve a forward-looking vision for the oil sector and its future prospects within the global energy balance.

Keywords: *Global oil demand, oil production, shale oil*

INTRODUCTION

In Iraq, the oil industry serves as the foundation for all economic activity, and oil profits are the most significant source of funding for all economic programs, and it is nearly the only funder of the state's general budget. As a result, this wealth must be handled in a way that maximizes benefit while minimizing waste, by exploiting Oil wealth in a rational and rational way that ensures this is achieved, particularly decisions related to production and export quantities, as well as oil pricing and current and future marketing methods. In the middle of this, this sector confronts a number of obstacles and constraints, which we shall examine in the three sectors that comprise the majority of the oil industry's activity.

RESEARCH PROBLEM:

Since low oil prices and the consequent drop in oil income have made it more important than ever to invest in non-productive oil operations, Iraq's economy has been plagued by a rentier crisis. As a result, excessive spending and wasteful conduct with public funds have become commonplace.

RESEARCH GOAL

Indicating the importance of other transformational oil operations and reducing the focus on the aspect of increasing production, as well as analyzing the global energy balance and the oil share from it, as well as the role of activating oil operations in raising Iraq's financial returns.

RESEARCH HYPOTHESIS

The hypothesis is based on (the role and importance of oil in the global energy balance will not decrease during the next five decades).

RESEARCH METHODOLOGY

The researchers used the deductive approach based on the descriptive analytical method, to know the importance of oil and its comparison with other energy sources in the future, as well as analyzing the total and partial productivity of energy sources in the world.

RESEARCH STRUCTURE

The research was divided into three sections, the first section dealt with the prospect of oil production and exports in Iraq in light of global supply and demand expectations. The second topic included the reality of oil operations in Iraq and its future prospects for the period (2003_2020), and the third topic included a future vision for global oil markets in light of the expected scenarios for energy. And finally, the conclusions and recommendations.

THE FIRST TOPIC: FORESEEING OIL PRODUCTION AND EXPORTS IN IRAQ IN LIGHT OF GLOBAL SUPPLY AND DEMAND EXPECTATIONS

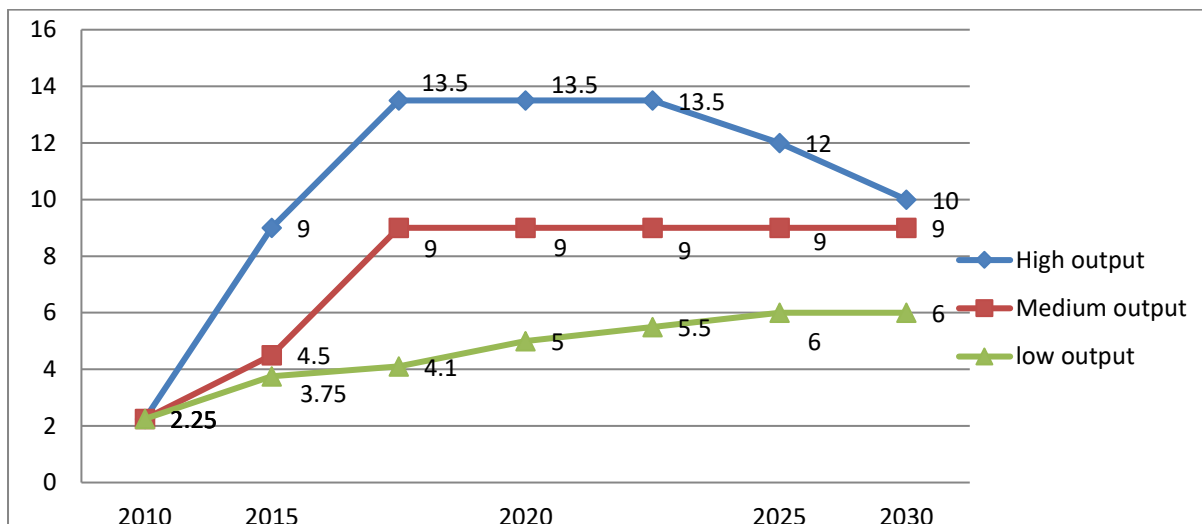
FIRST: OIL PRODUCTION IN IRAQ

Within the Integrated Energy Strategy (2013-2035), the Iraqi government identified three scenarios for oil production in Iraq that differ from all expectations of international oil organizations, and they were as follows: (Presidency of the Council of Ministers, 2013: 36)

- 1- High production scenario: According to this scenario, oil production will reach (13) m/b/d, and by the year 2017*, as this production, despite its unrealism, complies with the contractual production obligations of licensing contracts amounting to (12.5) m/b/d It is assumed that production will decrease after 2023 to reach less (10) m/b/d.
- 2- Medium production scenario: it is expected that oil production will reach (9) m/b/d in 2020, and maintain peak production until 2030.
- 3- Low production scenario: It is scheduled to reach the peak of oil production to (6) m/b/d in 2025, and to maintain it until the end of the energy strategy.

It is clear that the set production strategies are unrealistic, with the exception of the third strategy within the government’s plan, as the strategies set did not take into account the limited capabilities of the oil sector, as well as the expectations of oil markets, as well as the expectation of a high price per barrel (\$100-125), and the assumption that oil prices will remain high in the future. It also did not take into account the low prices. Figure 1 shows the oil production scenarios according to the Integrated Energy Strategy 2013-2030.

Figure (1) Scenarios of crude oil production in Iraq for the period 2013-2030 (million barrels)



Source: Presidency of the Council of Ministers, Integrated National Energy Strategy (2013-2030).

In accordance with the integrated strategic production plans for energy, it is scheduled to include initiatives to coincide with the increase in production that support the targeted production quantities within the short term first and transfer them to the medium and long term. The initiatives include the infrastructure necessary to reach the target production level, as well as accelerating the pace of extractive operations, especially in giant oil fields* And the establishment of a sea water injection system and the construction of an oil discharge system, starting with wells, tanker pipelines, and units for separating types of crude oil (Abdul-Hussein, 2019: 75).

Here, it should be noted that the formulation of the future oil production strategy is punctuated by many loopholes, as it neglects many factors and variables locally, regionally and globally, as the presence of large oil reserves in Iraq and the ease and low cost of extraction compared to other countries are not the only factor when determining future production plans. Rather, the strategy must include a set of variables, including:

- 1- The deterioration of the infrastructure of the oil industry in Iraq (extraction, transportation, unloading stations, and storage and export warehouses).
- 2- The seismic survey data is weak and does not include all oil regions of Iraq.
- 3- Not developing a financing strategy for supporting projects to increase production quantities and relying on estimated future oil revenues.

- 4- The glut of global oil supply, and the inability of global oil markets to absorb production increases without affecting prices.
- 5- Exaggerated estimates of future oil prices, as the price of a barrel was estimated between (100-125 dollars).
- 6- The strategy overlooked Iraq's export share within OPEC.

There are factors that cannot be controlled when formulating a future vision for production plans, especially the conditions of supply and demand for oil in global markets. The internal factors can be controlled when implementing the strategy, following up on the achievement plan, and adjusting imbalances during the implementation of the stages of increasing production quantities, but it is not possible to predict the future of global markets nor The impact on it in the future, especially within the technological developments in the field of energy use and the policies of orientation towards alternative energy in most countries of the world, so we will address the expectations of global demand and supply for oil and determine the future quantities that can be produced in Iraq within the Organization of OPEC.

SECOND: FUTURE FORECASTS FOR GLOBAL OIL DEMAND

Despite the decline in global economic activity after the outbreak of the Corona pandemic, most reports of international oil organizations indicate an increase in demand for oil after 2022, driven by the increase in global population growth and the return of the global economy to levels before the Corona pandemic.

The report of the Organization of the Petroleum Exporting Countries (OPEC, oow, 2020) indicated an increase in the world's demand for oil by (15) m/b/d, by 2045, and that the total demand was (109.1) m/b/d, compared to the previous year. 2019 (opec, 2020:15). Table (1) shows global oil demand forecasts until 2045.

Table (1) Forecast of future global demand for oil for the period (2019-2045) million barrels

	2019	2020	2025	2030	2035	2040	2045	The growth 2019-2045
OECD countries	47.9	43.0	46.8	44.6	41.5	38.0	34.8	13.1 -
Countries outside the OECD	51.8	47.8	56.9	62.6	67.4	71.2	74.3	22.5
World	99.7	90.7	103.7	107.2	108.9	109.3	109.1	9.4

Source: OPEC, World Oil outlook 2045, Executive Summary, 2020, p11.

It is noted from the table the stability of global demand for oil after 2025, and in view of the fluctuations in the oil markets during the medium term, as it is expected that demand will recover after 2022 and demand will return to what it was in 2019, in contrast to the demand of OECD countries, which is declining in the long term, especially after In 2030, however, the growth in demand from developing countries compensates for this decline, as it is expected that their oil demand will rise to (74.3) m/b/d, i.e.

an increase of (22.5) m/b/d, and as for global demand, it will exceed (100) m b/d after 2022 to reach (109.1) m/b/d by 2045.

THIRD: EXPECTATIONS OF THE FUTURE SUPPLY OF OIL

Most of the future forecasts indicate an increase in the quantities supplied of crude oil during the next three decades, and it is expected that the quantity of global oil supply will increase until the year 2040 by (17.1) m/b/d than it is in 2020, and the total supply of oil is (109.4) M / b / y, and the contribution of OPEC to the increases in oil supply is about (13) m / b / y, as the oil supply is expected to decline for many countries after 2030 (Mark, 2018:23). Table (2) shows global oil supply forecasts for the period 2019-2045).

Table (2) future forecasts for the global oil supply for the period (2019-2045) million barrels

	2019	2020	2025	2030	2035	2040	2045	the growth 2019-2045
OECD countries	30.0	28.5	32.5	32.3	30.8	29.1	27.7	2.3 -
Countries outside OPEC	35.1	33.3	38.3	39.3	39.2	38.5	37.7	1.1
OPEC	33.8	30.7	33.2	35.9	39.2	41.9	43.9	10.1
World	98.9	92.4	103.9	107.4	109.1	109.5	109.3	10.4

Source: OPEC, World Oil outlook 2045, Executive Summary, 2020, p15.

Table (2) highlights the central role that markets can play and the future policy designed to meet the challenges of meeting the energy needs of more than (10) billion people who aspire to improve their living conditions, as well as the opportunities and challenges related to doing so in a safe and sustainable manner. Population growth and income are the two strongest driving forces for increasing demand for oil, and the next two decades are likely to witness global integration and high growth for middle and low-income economies, and is likely to rise by (100%) as well as the growth rate of per capita energy until 2045 at a rate of (0.7%) annually, which is reflected in the global oil supply. It is expected that (77%) of the global supply growth will come from OPEC countries, bringing the total supply to (109.3) m/b/d after 2040.

FOURTH: THE ORIENTALIZATION OF OIL PRODUCTION IN IRAQ

After reviewing the forecasts of demand and supply of global oil, a plan for oil production in Iraq can be formulated within the expectations and prospects of the future oil market in a way that avoids overestimating the local capabilities of the oil sector in Iraq and within the limits of the oil organizations' expectations of the ability of future markets to absorb the quantities of supplied and required oil within the forecast limits With the growth of the population and global economic activity, to build a model for the quantities of oil production during the next two decades commensurate with the local capabilities of the oil sector in Iraq and takes into account the external factors affecting future oil supplies, and through Table (29) which reviews a model of the quantities of Iraqi oil production within the Organization of Petroleum

Exporting Countries Assuming that the production quantity ratio remains constant for the period (2020-2040).

Table (3) Forecasting the production, consumption and exports of Iraqi oil for the period (2020-2040) million barrels

	2020	2025	2030	2035	2040	Growth 2020-2040
Domestic consumption	0.736	0.798	0.866	0.939	1.027	1.68
exports	2.99	3.98	4.20	4.70	5.02	2.62
oil production	4.11	4.87	5.46	6.04	6.44	2.34

- Source: the researcher's work. Reliance on: Ministry of Oil, Studies and Information Department, Information Division, unpublished data, 2021.
- Table (2) data.

According to the expectations of Iraqi oil production until 2040, the peak production will reach (6.44) m / b / d and with a compound growth rate (2.34%), and it is expected that the amount of exports according to the low global demand growth rate will reach (5) m / b / d at the end of the period. As for the percentage of domestic consumption, which is expected to exceed one million barrels, the data in the above table is within the low assumption, and according to the growth rates for the past ten years, as Iraq's exports represent 12% of OPEC exports and (5) globally.

Increasing the pace of expansion of production capacities according to the high and medium production scenario of the National Energy Strategy increases the uncertainty about future expectations within external constraints and internal challenges (technical, security and political), and Iraq's commitment to the low production plan achieves a number of goals, including:

- 1- Improving the position of the OPEC + policy aimed at reducing production quantities in the short term and the possibility of extending the agreement for the coming years.
- 2- Increasing production capacities without the possibility of exporting them, Iraq bears large financial burdens, as the cost of increasing an additional barrel ranges between (7000-15000 dollars), in addition to the subsequent infrastructure.
- 3- Maintaining price stability in the global oil market, and avoiding offering additional quantities in markets that are already saturated with oil.

THE SECOND TOPIC: THE REALITY OF OIL OPERATIONS IN IRAQ AND ITS FUTURE PROSPECTS

The transformational operations of the Iraqi oil industry witnessed a significant decline at the beginning of the imposition of the economic blockade from the nineties of the last century until 2003, in addition to the destruction of the infrastructure of the oil industry in 2003 from military operations, sabotage and looting, which made their reality worse, especially the refining and liquidation facilities, storage tanks and oil separation And unloading stations and transport pipelines throughout Iraq (Al-Dubaisi, 2016: 146). With the beginning of the expansion of oil production, modest rehabilitation and

maintenance operations were carried out to keep pace with the increase in oil production and to meet part of the local demand for petroleum products. In this aspect, we will discuss the main operations in this sector, which are (refining, distribution, and marketing).

First: The reality of oil refining and its future prospects

The refining capacity of the current oil refineries does not suit the type or quantity of domestic demand, as it produces surplus types of domestic demand, while other types suffer from shortages, which requires importing the deficit from abroad, which carries the Iraqi economy huge sums, as it amounted to (2.5) billion dollars in 2018 (Mehdi, 2018: 26. Therefore, the strategic plan seeks to increase the quantity and quality of petroleum products to meet the growth of medium and long-term domestic demand.

Iraq's refineries are distributed over three main regions, the northern, central and southern, and each region includes a group of small refining units, and the total design capacity is (900) thousand barrels. A group of projects to service, including the Karbala refinery project with a production capacity of (140) thousand / b / y, the Maysan refinery project (150) and Nasiriyah (150) thousand / b / y, and the development of the Basra refinery and raising its production capacity to (450) thousand / b / J, as the long-term strategy aims to raise the refineries' capacity quantitatively and qualitatively to (1.6) m/b/d, which includes developing existing refineries and establishing new refineries according to techniques and specifications that suit local demand and heavy crude oil, and raising the extraction capacity to international levels (Abdul Al-Hussein, 2019: 127.

Table (4) the production capacity of the refineries according to the main areas, actual and under construction (thousand barrels per day)

Region	Refinery	2010		2019		Refinery expansion capacity to 2030	
		Design	Actual	Design	Actual	Under construction and update	Scheme
company refineries North	Peggy 1,2,3	310	232	310	33	57	
	Kirkuk	30	30	56	30		
	Chinese	30	25	20	30		
	The island modern	20	0	0	0		
	Qayara	16	10	16	16		
	couscous	14	4	14	14	3	210
company refineries Central	session	10	8	10	7		
	Karbala	210	140	180	140		
	Najaf	-	-	-	-	140	
	Samawa	30	20	30	30		
	Diwanayah	30	20	30	30		
company refineries the South	Basra	10	7	20	20		
	Nasiriyah	140	123	210	200	70	300
	Maysan	30	24	30	30	150	
Sum	30	10	30	30	150		
		910	663	712	619	700	

- Source: Ahmed Mehdi, Iraqi Oil industry evolution and short and medium-term prospects, Energy Markets Strategist, Livingstone Partners, Oxford Institute for Energy Studies, October 2018, p 23-25.
- OAPEC, Annual Statistical Report, Kuwait, 2020.

- Ministry of Oil, Department of Projects and Studies, Information Division, unpublished data, 2019.

The refining capacity is scheduled to rise to (860) thousand / b / d, with the entry of Karbala refinery into production, despite the production being higher than local consumption. However, there is a difference in the types and quantities produced with the local demand, as Iraq imports (97) thousand / b / d, of the two substances (gasoline, kerosene), which refineries are unable to produce.

The Ministry of Oil announced plans to expand the refinery's energy capacities up to (1.6) m/b/d, after completing the rehabilitation of the Baiji refinery and contracting to establish the Faw refinery with a capacity of (300) thousand/b/y (OAPEC, 2019: 227). According to what is planned during the next five years, it will stop importing oil derivatives and exporting the surplus abroad.

SECOND: CRUDE OIL DISTRIBUTION (TRANSPORTATION, STORAGE)

The transportation and distribution of crude oil and its derivatives is one of the basic and necessary infrastructure for the manufacturing sector, whether it is the local network for transporting between the source and refineries, or the transportation of crude oil for the purpose of exporting abroad. And commitments to increase production within the licensing rounds. The international oil companies were responsible for developing the production fields, and it fell on the shoulders of the Iraqi companies (Basra Oil Company and the State Company for Oil Projects) responsible for building and developing the necessary infrastructure for transportation and export, to keep pace with developments and increase the local capacities of refineries, as well as the rise in the production capacity of crude oil, and Table (6)) Shows oil pipelines transportation and storage capacities in Iraq.

Table (5) pipelines transporting oil and its derivatives and storage capacities in Iraq (2019)

Actual 2019					Planned
Type	number of lines	Height (How many)	Diameter (inch)	Ability Thous./ B	Ability Thous./ B
oil derivatives	9	1921	8 – 22	540	1150
Crude Oil	15	3352	12-48	4000	11700
storage capacity*	30.8 m/b				61.6 m/b

- Source: Ministry of Oil, Projects and Studies Department, Information Division, unpublished data, 2019.
- The Cabinet, the Integrated National Energy Strategy, 2013: 113.

Table (5) shows that the current capacities and possible storage capacities are not commensurate with future plans to increase production despite the development of several projects to expand the pipeline network to transport crude oil and its derivatives, but the sabotage operations that it witnessed, especially the northern region from 2014 to 2017, as a result of the war and its exit from The Ministry of Oil seeks to develop oil transportation pipelines and raise storage capacities to suit future plans to increase production, as it is scheduled to develop and restart the Turkish and Syrian pipelines, as well as develop the strategic line (Mills, 2018: 82), as part of the future strategy to reach the pipelines capacity in the future

to reach (11.7) m/b/d, as well as increasing crude oil storage capacities to meet future requirements by diversifying export outlets. However, security stability often prevents this, and exports are currently dependent on the southern region.

THIRD: CRUDE OIL MARKETING

The stage of oil marketing is the last for the operations of the oil industry, and despite its great importance, no comprehensive analytical and economic studies with strategic dimensions have been conducted on marketing and exporting crude oil and its products compared to those conducted in exploration, field development, manufacturing and licensing contracts, and attention was focused on the quantities of exported oil. Monthly and the returns generated from it (Al-Badran, 2017: 3). The challenges of marketing crude oil are represented in the type of markets, the quantities of production to be marketed and the most appropriate transportation path, as well as the adaptation of export infrastructure in terms of type and quantity.

Iraq enjoys a strategic location suitable for global oil markets, and the possibility of its access in easy ways to the continent of Europe, Asia and America, as the fields of the southern region are near the port of Basra and the possibility of a transfer across the Arabian Gulf to Asia via the Indian Ocean or to Europe and America via the Suez Canal, and the northern fields can be transferred Through the pipelines through Turkey and Syria, and then the Mediterranean, all the way to Europe. Table (6) shows Iraq's oil exports by different destinations worldwide.

Table (6) Iraq's exports by destination globally (thousand barrels per day)

destination year	2012	2013	2014	2015	2016	2017	2018	2019	the growth %
Europe	546.7	534.9	625.2	844.8	981.8	987.8	892.8	1070.1	8.7
North America	559.0	432.7	411.7	220.0	416.9	598.4	503.1	300.4	7.4-
Asia	1205.2	1412.9	1465.9	1876.2	2270.6	2130.4	2419.3	2506.8	9.5
South America	105.4	0.0	12.7	63.8	134.3	27.4	28.6	8.1	27.4-
Africa	0.0	0.0	0.0	0.0	0.0	17.0	18.2	45.9	13.2
Arab countries	7.1	9.8	0.0	0.0	0.0	41.0	0.0	35.9	22.4
Total	2423.4	2390.4	2515.5	3004.9	3803.5	3802.0	3862.0	3968.2	6.35

Source: opec, annual statistical bulletin, 2020, p46.

Table (6) shows the growth in demand from Asian markets, as it amounted to (49%) of oil exports in 2012 and rose to (63%) in 2019, followed by European markets, as the percentage of exports in 2012 reached (25%) and rose to (27) % in 2020, despite a slight increase in the percentage of exports to Europe, but the exported quantities doubled during the period, due to the increase in the total Iraqi oil exports, and as for the Americas, a low growth level of exports was recorded, especially to America due to the high

production it has and it has become an oil exporter After 2012 *. And that the Asian and European markets account for more than (91%) of exports, and this is due to two reasons, the first of which is the weakness of the oil marketing strategy in many countries of the world, and the high demand from these markets, especially the high demand from China and India, and the decline in oil exports to other countries of the world. Indicates the weakness of the oil marketing policy followed. It is necessary to develop a marketing plan that includes all consuming countries and not rely on European and Asian markets and specific countries. Rather, it must expand in European and Asian markets and find new markets that meet the increase in future exports, as the policy of mixing types of oil has become an old method, and the need to focus in the future on the production of light oil Especially the high demand for it, and this requires separating the types of oils and providing large storage capacities that meet the requirements of the future marketing policy, as well as managing oil production from the fields to keep pace with the marketing plan. The northern and western regions and the financial constraints necessary to establish the targeted investments.

THE THIRD TOPIC: A FUTURE VISION FOR GLOBAL OIL MARKETS IN LIGHT OF THE EXPECTED SCENARIOS FOR ENERGY

There is no doubt that the future oil markets are affected by the same factors that affect today’s markets, but there are some influencing factors whose path cannot be accurately predicted, and here the factor of uncertainty and uncertainty rises, as on the one hand, technological progress and future energy policies change the course of future expectations on energy in a way. On the other hand, there are factors that are inevitable, such as population growth and the rise in the average per capita income globally, so we will shed light on the primary indicators of energy, and try to mix what is inevitable with factors that are largely unpredictable, to see the future scene of the energy markets in general and oil Especially .

FIRST, THE GLOBAL ENERGY BALANCE SCENARIO

It is certain to rely on fossil fuels as a major source of energy during the next three decades, but the most important question lies in the extent of the contribution of all future energy sources to the global energy balance, and table (7) shows global energy balance forecasts for the period (2020-2040).

Table (7) future forecasts for the global energy balance for the period 2020-2040 (Quadrillion BTU)

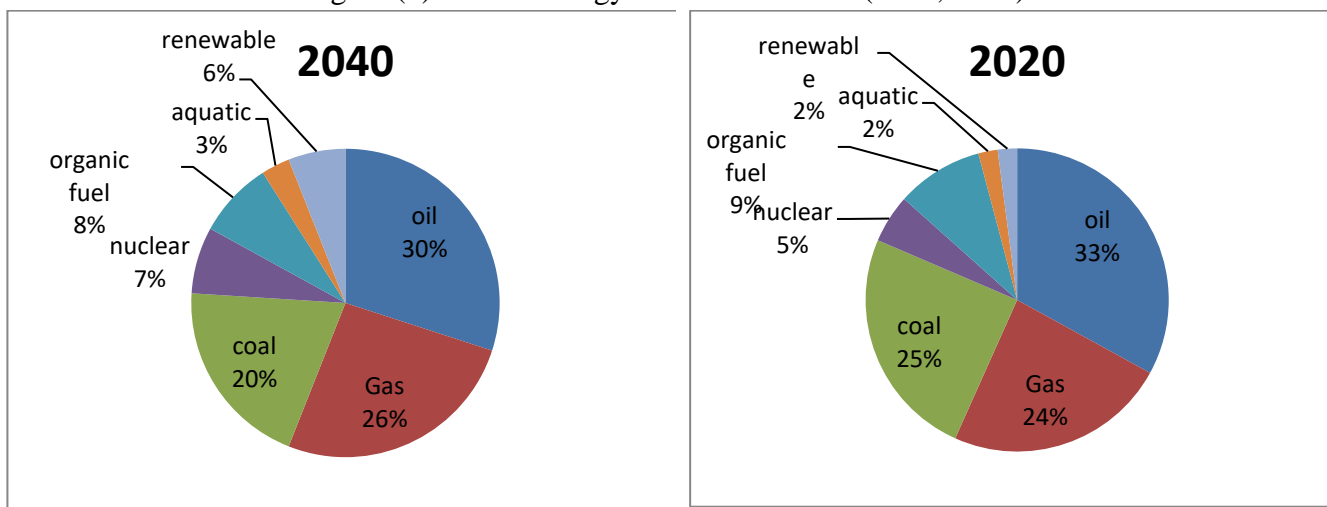
fuel type/year	2020	2025	2030	2035	2040	Annual change	Change 2020-2040	Contribution percentage	
								2020	2040
oil	187	195	201	204	205	0.6%	14%	32%	30%
Gas	139	151	162	169	177	1.3%	36%	23%	26%
coal	142	140	138	137	133	%0.4-	0.9-%	24%	20%
nuclear	31	32	36	41	45	2.2%	66%	5%	7%
organic fuel	52	53	55	55	56	0.4%	9%	9%	8%

aquatic	15	16	17	18	18	1.2%	20%	2%	3%
renewable	17	23	28	34	41	5.1%	213%	2%	6%

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

The expectations in Table (7) are based on a set of planned policies, including government support for research in the field of reducing the use of fossil fuels, and encouragement of other fuels such as biomass for transportation, as some major oil and gas companies invest in replacing diesel fuel from plants (Biofuels) such as soybeans, palm and animal fats for jet fuel and commercial transportation, as well as the replacement of fossil fuels with other energy sources such as solar energy and geothermal energy in sectors such as electricity generation and housing (Norouzi and Ziarani, 2019:108). The impact of the government support policy to increase the trend for alternatives to fossil fuels can be seen through the expected scenario of the global energy balance during the period (2020-2040) in Figure (2).

Figure (2) Global Energy Balance Scenario (2020, 2040)



Source: Prepared by the researcher based on data from Table (7).

It is noted through Figure (2) and according to the reference scenario of the global energy balance that there will be an increase in dependence on alternative energy in the future, as expectations indicate the contribution of traditional fossil energy by (76%) in 2040, after it was in 2020 (82%) of the total energy used, and an increase in the contribution of Other sources in 2040 to (24%). However, there is a big difference from year to year for future energy prospects issued by the same parties, and Table (8) shows the global energy balance forecasts for the three future cases (2020-2050).

Table (8) future forecasts for the global energy balance for the period 2020-2050

Status Power Type	Fast Sustainability			Zero emissions			reference case			Growth difference percentage between 2020- 2019 forecasts
	2025	2050	2050	2025	2050	2050	2025	2050	2050	
oil m/b/j	98	52	14%	98	31	7%	101	93	24%	4.3- %
Gas billion s 3	4307	3950	21%	4060	2527	13%	4297	5305	26%	3.6- %
EJ . charcoal	156	24	4%	155	12	2%	158	123	17%	0.9- %
Nuclear EJ	24	44	7%	24	57	9%	24	51	4.2%	0.8 %
Aquatic EJ	38	57	9%	38	62	10%	38	51	7.1%	0.8 %
Renewable EJ	39	277	44%	52	370	59%	34	161	22%	3.6 %

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

It is noted from Table (8) the future scenarios of the global energy balance for the three cases, as the scenario of rapid sustainability and zero emissions requires large levels of investment and fundamental shifts in the investment pattern of energy sources, and an annual investment rate ranging between (700-800) billion dollars compared to the reference scenario, which ranges Between (300-400) billion dollars, which is the same estimated investments for oil and gas in the zero emissions scenario, while the annual investment rate for the reference scenario is estimated at about (750) billion dollars (bp,2020:134). Based on this, the future contribution of energy sources in the global energy balance depends mainly on the volume of investments directed to each source of energy, and it is possible to infer during the medium period the scenario closest to application through the levels of investment directed to it annually, especially that the transformation in the pattern of energy consumption requires a transformation Gradual in consumption and significant in investment.

SECOND: THE SCENARIO OF UNCONVENTIONAL OIL PRODUCTION

The production of unconventional oil (shale, sandy) has increased during the past five years at accelerating rates, as production in 2020 reached (12.6) m/b/d compared to (7.4) m/b/d in 2015, which spread misleading on conventional oil. And it has become one of the factors affecting the global oil markets, but the future of production from these sources is affected by the directions of future policies for energy sources. Figure (3) shows the scenario of unconventional oil production until the year 2050.

Figure (3) Shale and sand oil production scenario (million barrels)



- SOURCE: U.S. EIA, Annual Energy Outlook 2021 Release at the Bipartisan Policy Center February 3rd, 2021 | Washington, DC, P17.
- CERI, Canadian Oil Sands Production and Emissions Outlook (2020-2039),P18-20.

Figure (3) shows that there are three scenarios (high, low, reference) and that there is a two-way causal relationship between global oil prices and the amount of shale and sand oil production, as the increase in oil prices leads to an increase in shale and sand oil production, and thus to an increase in the supply of oil. Then lower prices, this relationship is the basis for the three future scenarios of unconventional oil production.

THIRD: ANALYSIS OF FUTURE OIL PRICES

There is no doubt that the future of the global oil markets is surrounded by a lot of uncertainty and to be sure, especially that it is affected by several factors outside supply and demand as we explained earlier, but according to the current oil market data and future energy scenarios, the main variables can be predicted as follows:

1- Analysis of future oil prices: The determination of oil prices is based on the classical school, specifically the Hotlink* model of depleted resources. Oil is a depleted resource, so its prices must include an added value in addition to its direct value. The supply of oil in the world is fixed (Fattouh, 2018:13). However, this analysis is not appropriate, especially with the current oil markets, nor with energy markets in general, especially in the current era of abundance. It is certain that the demand for oil will continue at levels close to the current or greater than it, but at any price per barrel in light of markets witnessing high competition between producers, as the average cost (40%) of oil production globally is less than (15\$) per barrel. , while the largest producers in the Middle East had an average price (financial break-even)* per barrel of about (\$60) per barrel in 2017 (IMF, 2017:58). And that most of the oil-producing countries suffer from a financial deficit and are trying to increase the amount of production to fill this deficit, especially with the high volume of their deficit due to previous hikes

in oil prices, which put the oil markets into a permanent glut of supply from these countries, and of course the global oil investments decline with the drop in prices, which constitutes Pressure on the producing countries to increase their production in the medium term due to the decrease in supplies and the rise in prices again.

- 2- Oil prices and the global supply of oil: There is no doubt that high oil prices achieve higher oil revenues for producing countries and also stimulate an increase in oil investments, but on the other hand, it stimulates major oil companies to search and discover oil in areas that are not economically viable, as well as increase investment in non-viable oil reservoirs. Conventional, which is reflected in the medium and long term if prices remain high due to the increase in oil supply and the intensity of competition in global markets, as shale and sand oil producers can achieve a profit margin even with low prices (EIA,2021: 24-26). In the case of medium and high prices, global supply rises to levels that exceed the market's ability to bear them.
- 3- Oil prices and renewable energy: The rise in oil prices above the \$100 barrier pushes the global economy in two directions: the first trend, increased dependence and a trend towards oil alternatives, whether renewable or non-renewable energy, especially in developing countries. As for the second trend, an increase Efficiency of energy use, especially oil, and the search for possible alternatives to replace, and the approach of the average cost of consuming oil from renewable sources, and thus the consuming countries are directed to switch towards alternatives, but in the medium and long term, and this requires the stability of oil prices during this period.
- 4- Oil prices and OPEC: The reserves of the OPEC countries are estimated at about (72%) of the world's oil reserves, and if we add the OPEC + countries, the reserves rise to (85%), and about (59%) of the total global production, and the countries of the world depend on OPEC's exports + By (68%), and according to future expectations, OPEC production will increase in 2050 to (43%) of global production, compared to 2020 (31%) (bp, 2020: 87). But the important question remains, at what price per barrel? Most of the OPEC countries are rentier or in the process of growth and depend on oil revenues to finance their public budgets, and therefore these countries depend on the financial break-even price, i.e. between (60-70 dollars) per barrel, and any decrease below this rate will be faced by member states with restrictive policies The offer to raise the price as happened previously, and it is expected that cooperation between OPEC + countries will continue to maintain price levels at the level of financial parity, while the high prices push some OPEC countries to increase their production and raise the intensity of competition between OPEC and the rise in production outside OPEC, as well as an increase in the trend towards Renewable and non-renewable alternatives.

CONCLUSIONS

- 1- The feature of instability and lack of balance in the global oil markets is the prevailing situation and that any stability witnessed by the markets soon disappears because the markets are affected by non-economic factors more than economic factors.
- 2- On the direct and indirect economic factors, whose impact varies according to the time periods and the extent of the expansion of the scope and intensity of their impact on economic activity and thus the global oil markets?

- 3- Shale and sand oil producers can achieve a profit margin even with low prices, and in the case of medium and high prices, global supply rises to levels that exceed the market's ability to bear them.
- 4- It is expected that the demand for oil will continue at levels close to the current or greater than it, but at any price per barrel in light of markets witnessing high competition between producers, as the average cost (40%) of oil production globally is less than (15\$) per barrel, while the largest producers in the Middle East have an average (financial break-even) price of about \$60 per barrel.

RECOMMENDATIONS

- 1- The need to develop a strategic vision for the future of the relationship between Iraq and OPEC, especially the plans to be implemented to increase Iraqi oil exports, through renegotiation within the organization and the division of quotas among the members of the organization in line with the OPEC + agreement.
- 2- Amending OPEC's policy of supplying oil to member states, and following a strategy for its exports that includes short, medium and long-term plans. Each plan is appropriate to the state of the global energy and oil markets in particular, and the need to take into account projects for developing energy alternatives when implementing the strategy. As for short-term plans, they are directed to the interface of the oil storage policy strategic.
- 3- The necessity to expedite the establishment of a sovereign fund for oil revenues to be financed with additional revenues for Iraq's exports (4) M / B / J, and managed by independent bodies that ensure the achievement of the highest returns for the fund's investments, internally or externally, with the adoption of international financial standards for managing the fund.
- 4- Stabilizing oil exports in Iraq at (4) m / b / y and approving the revenues obtained from it, whatever the oil prices, and any future addition to exports must be directed to sovereign funds to take into account the rights of future generations.

REFERENCES

- 1- OPEC, OOW, World Oil outlook 2045, Executive Summary, 2020.
- 2- OPEC, Annual statistical bulletin, Vienna, 2020.
- 3- G. Hopkins, "OUTLOOK FOR ENERGY: A PERSPECTIVE TO 2040," Exxon Mob., no. 1692, p48, 2019.
- 4- N. Norouzi, M. Fani, and Z. K. Ziarani, "The fall of oil Age:A scenario planning approach over the last peak oil of human history by 2040," J. Pet. Sci. Eng., vol. 188, no. November 2019, p. 106827, 2020, doi: 10.1016/j.petrol.2019.106827.
- 5- : bp, energy outlook 2020 edition . <http://www.bp.com/energyoutlook>
- 6- : U.S. EIA, Annual Energy Outlook 2021 Release at the Bipartisan Policy Center February 3rd, 2021, Washington, DC.
- 7- CERI, Canadian Oil Sands Production and Emissions Outlook (2020-2039).
- 8- Bassam Fattouh, Peak oil demand and long-run oil prices, Group Chief Economist, BP PLC, 2018.
- 9- IMF Regional Economic Outlook, Middle East and Central Asia, October 2017.

- 10- Ahmed Mehdi, Iraqi Oil industry evolution and short and medium-term prospects , Energy Markets Strategist, Livingstone Partners, Oxford Institute for Energy Studies , October 2018.
- 11- The Presidency of the Council of Ministers, Integrated National Energy Strategy (2013-2030).
- 12- Abdul-Hussein, Mustafa, The Energy Sector: Challenges of Infrastructure, Economy and Politics (The Iraqi Case), Dar Sutour for Publishing and Distribution, Baghdad, 1st Edition, 2019.
- 13- The researcher's work is based on: Ministry of Oil, Studies and Information Department, Information Division, unpublished data, 2021
- 14- Al-Dubaisi, Hassan Rashak Ghayyad, the competition between OPEC and the oil-producing countries and its political and economic repercussions on the transformed countries (Iraq as a model) doctor's thesis, Al-Alamein Institute for Graduate Studies, Najaf, 2018.
- 15- OAPEC, Annual Statistical Report, Kuwait, 2019, 2020.
- 16- Iraqi Ministry of Oil, Projects and Studies Department, Information Division, unpublished data, 2019.
- 17- Mills, Robin, The Future of Iraqi Oil, Al-Bayan Center for Studies and Planning, Series 16, Baghdad, 2018.
- 18- Al-Badran, Fadel Ali Othman, Organization of Petroleum Exporting Countries (OPEC) at the end of the first quarter of 2017 - a breakthrough for the crisis or crisis after crisis?, Iraqi Economists Network.