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THE IMPACT OF UNCONVENTIONAL OIL ON THE ECONOMIC DEVELOPMENT IN TRADITIONAL OIL-PRODUCING COUNTRIES

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ABSTRACT. The importance of research is reflected in the focus on non-traditional oil sources such as shale oil and oil sands as well as other types and to show the high growth of production from these sources, whether this is currently (2020) or through the future, as a result of technological development, which has contributed significantly to overcoming the difficulties that were an obstacle to the exploitation of these sources. Moreover, it has made it more economically viable than ever as a result of lower production costs, as the production of a barrel of oil from non-traditional sources in some countries has reached between (20-25) dollars, creating repercussions as a result of this development in production from non-traditional sources on countries that depend on the management of their economies on traditional oil revenues at present (2020). The future, which appears directly in the oil sector and its revenues, and it can be said that there are shifts in the world oil markets that have been emerging for some time as a result of the high rates of unconventional production of energy sources, which has caused a crowd with traditional resources on their shares in the energy markets, in addition to the concentration of these resources from oil sources. Non-traditional countries outside OPEC and in very large quantities such as North America as well as other countries but in lower proportions, which led to a decrease in the rate of import of these countries for oil and higher export rates, in contrast to the decline in exports of traditional oil producing countries to those countries, resulting in a decrease in their oil revenues as well as a decrease in the price rate as a result of the high oil supply rates in the world energy markets.

JEL Classification: J60, J64, J68

Keywords: Unconventional Oil, Oil Sources, non-traditional oil, shale oil

Introduction

Energy sources and uses have undergone many changes in previous years, as the global energy mix has gradually become diverse, as technological development has helped to dispel the difficulties that have been a barrier to the exploitation of many diverse oil resources ,

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whether traditional or non-traditional, after the traditional energy sources (coal, oil, natural gas), Nuclear energy is the key to supplying the world with the energy sources it needs, and then things are changing, as technological development has created a new transformation of unconventional energy resources, making it take more space in the global energy mix after the sucking of unconventional oil is not. It was an important component of the global energy mix and the main dependence and control of the world's energy supply was primarily the traditional source of oil. In the second decade of the 21st century, the shale oil revolution initiated by North America changed the balance, taking oil from non-conventional resources, increasingly representative of the global energy mix, rising from zero to nearly 15% of the total contribution to meeting global oil demand in 2020 and is expected to increase over time. This situation has created a shift in global oil markets that has been positively reflected in some countries such as North America as well as others with non-traditional resources, which has contributed to reducing their dependence on the outside to meet the energy resources they need, which has had implications for the economies of other countries primarily dependent on the export of hydrocarbon resources to provide their revenues. The development of non-traditional resource production has been an obstacle to other countries with traditional energy market production, which has reduced their oil exports to world countries, causing repercussions on their economies, namely, the low value of their exports and returns, which has affected other sectors of the economy, as well as the implementation of strategies developed for the energy sector, both in reality and in the future.

1. Literature review

In general, there is no specific and precise definition agreed upon by specialists of non-conventional energy sources, as unconventional oil and gas (non-conventional energy) is referred to as a product of unconventional fields and by non-traditional production methods, and the concept of non-conventional energy sources (shale oil, oil shale, oil sands, very heavy oil, shale gas and reserved gas) can be defined... Etc.) as these hydrocarbon sources, which cannot be explored, developed and produced by traditional methods, as they require new production methods and techniques and need new treatments to deal with the property of the location of non-traditional sources inaccessible and their exceptional installation simply symbolizes the unconventional concept of the production methods used in addition to the types of rocks and reservoirs where non-traditional oil and gas are available of various types, It is worth mentioning that what is traditional and non-traditional is not fixed but changes with the passage and progress of time, as what is unconventional today may be seen as ad-fry in the long run, and these sources include:¹

1 Shale Oil: Shale Oil

2- Oil shale: Oil Shale

¹ Ali Rajab, the reality and prospects of the unconventional oil and natural gas industry in North America Its reflections on member states, the Journal of Oil and Arab Cooperation, are published by the Organization of Arab Petroleum Exporting Countries (OPEC), Issue 152, Volume 41, 2015, p. 14.

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- 3- Oil sands OIL Sand
- 4 Very heavy oil Extra Heavy Oil
- 5 Shale gas
- 6- Coal-bed Methane (CBM) gas
- 7- Tight gas
- 8 Natural gas hydrates

The reality of traditional and non-conventional oil in the economies of producing countries:

First, traditional oil.

Developments in the world in general and the region in particular have played a major role in influencing crude oil production, whether security or geopolitical events or new projects that have contributed to the resizing of production, and here is a table that shows the amount of traditional crude oil production for the period from 1980 to 2020 and the contribution of OPEC and non-OPEC countries.

Table 1. World production of traditional oil for OPEC and beyond for 1980-2020 ((Million barrels/day)

Years	production OPEC Countries	Production of non-OPEC countries	World production of conventional oil	OPEC contribution rate	Contribution rate of countries outside OPEC
1980	25,5	36,9	62,4	40,86%	59,13%
1990	23,9	41,3	65,3	36,60%	63,24%
2000	32,2	41,6	73,8	43,63%	56,36%
2005	33,2	45,3	80,1	41,44%	56,55%
2009	32,9	45,8	78,7	41,80%	58,19%
2010	34,2	46,7	81,0	42,22%	57,65%
2011	35,0	45,6	80,6	43,42%	56,57%
2012	37,0	45,0	82,1	45,06%	54,81%
2014	36,0	46,0	82,0	43,90%	56,09%
2015	38,3	45,5	83,8	45,70%	54,29%
2017	38,9	47,1	86,0	45,23%	54,76%
2018	36,6	51,7	88,3	41,44%	58,55%
2019	35,0	51,9	86,9	40,27%	59,72%
2020*	34,4	52,5	86,9	39,58%	60,41%

The table is prepared by the researcher based on the data in:

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Source: INTERNATIONAL ENERGY AGENCY , World Energy

Outlook,2006,2010,2011,2012,2013,2015,2016

Organization of the Petroleum Exporting Countries (OPEC) ,world oil outlook,2019.

*Percentages were extracted by the researcher.

*Estimated data

Table 1 notes that world crude oil production reached 62.4 million barrels/j during 1980 and production from conventional oil developed during 1990, with a total global production of 65.3 million barrels/j, opec's share of 23.9 million barrels/ j.

This accounted for up to 36.6% of total world crude oil production, while the share of other non-OPEC countries was 41.4 million barrels per day, accounting for 63.3% of total world production of conventional oil for the same year, but the development of the world through technological progress and high rates of economic growth as well as an increase in the population led to a rise in world crude oil production in 2000. To reach 73.8 million / OPEC countries' share of 32.2 million j, if this percentage accounted for 43.6% of the world's oil production and the share of the total countries outside OPEC was 45,000, 5 million j, this contribution accounted for 61.6% of the world's total production of conventional oil, and it is noteworthy that world crude oil production increased during 2005 as a result of increased demand due to high rates of economic and population growth. Fuel consumption required by transportation and industrial projects increased to 80.1 million barrels/j, while world oil production fell during 2007 to 79.1 million barrels per day, as a result of low global economic growth rates as well as weak global oil demand as a result of fears of a high-level recession as a result of the global financial crisis. Between 2007 and 2008, the successive decline in oil production continued for the following years. In 2009, world oil production reached 78.7 million barrels per day (bpd), after which, as a result of the gradual decline of the global crisis, world oil production gradually rose, reaching 81 million barrels in 2010. From 2012 to 2014, oil did not develop in production, reaching 82 million barrels per day due to the deterioration of prices as a result of the oversupply in the oil market at a greater rate than the increase in demand, with a surplus of 2 million barrels. It reached 83.8 million barrels per day² as a result of increased seasonal demand in the summer for oil and other sources, and the contribution of OPEC countries came by 38.3 million barrels / j.

This accounted for up to 45.7% of the total contribution of OPEC countries to the world production of conventional crude oil and the amount of the contribution of countries outside OPEC by 45.5 million barrels/ J, which accounted for 54.3% of the contribution to world oil

² Arab Center for Research and Policy Study, Implications of falling oil prices on exporting countries, Qatar, Doha, 2015, p. 2.

production, in addition to the significant increase in world production of conventional oil during 2018, With a production rate of 88.3 million barrels per day, OPEC countries accounted for 36.6 million barrels per day (bpd), accounting for 41.44 percent of total world production and the share of countries. Other non-OPEC amounts to 51.7 million barrels/ J, accounting for 58.55% of total world conventional oil production and as a result of a range of reasons, foremost among them opec's agreement with some non-OPEC countries to reduce the rates of Crude oil production due to low demand and increased supply in order to maintain prices reached oil production during 2019 by 86.9 million barrels / the non-OPEC countries maintained their share in production, amounting to 51.9 million barrels / in contrast, the decline in opec's total share to reach 35 million barrels / this amount constitutes up to 40.27% of total world production of conventional oil in addition to this is expected to see OPEC countries are expected to see a further decline in production in 2020, with world production of conventional crude oil expected to reach 86.9 million barrels, maintaining the production rate for 2019, but OPEC's share will decline further, at 34.4 million barrels.

Second, unconventional oil:

The need to deal with the rapid depletion of traditional oil reserves in some locations of the world, especially after the resulting rise in prices, stimulated development and innovation in extraction activities and techniques, as the duration of these price increases was accompanied by an increase in spending in the fields of production and innovation, most of which were conducted in major global companies and advanced economies operating in the sectors of oil. The rapid increase in oil demand, particularly from large emerging market economies such as China, India and other countries, has pushed prices higher.³

It encouraged continued investment in shale oil formations and other non-traditional energy sources that were previously economically useless, due to low oil prices and lack of appropriate technologies, and since the simultaneous movement between oil prices and capital expenditures in non-traditional sources is similar to the situation and costs of sources. Traditionally, expenditures associated with non-traditional sources include technological changes that contribute to changing the response of oil production and make its production require a lower level of costs and make the interval between initial investment in non-traditional sources and production require a shorter period of time.⁴ This has made an increase in production from non-

³ box Cash International, report recover Economy World, Edition Arabic, 2017, 59 ص.

⁴ box Cash International, report horizons Economy World, source Former, 59 ص.

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traditional sources of energy, as shown in the table below, which refers to the global development of unconventional oil production for a time series from 1980 to 2020.

Table 2. World non-conventional oil production for 1980-2020

Years	Total world production of unconventional oil (1 million barrels / j)
1980	0,2
1990	0,4
2000	1,2
2007	1,6
2008	2,8
2009	2,3
2012	5,0
2014	7,6
2015	8,4
2018	10,7
2019	12,5
2020*	14,4

The table is prepared by the researcher based on the data contained in :

Source: INTERNATIONAL ENERGY AGENCY , World Energy Outlook ,2008-2016.

Organization of the Petroleum Exporting Countries (OPEC) , world oil outlook,2019

*Estimated data

The table above shows significant changes in production, in 1980 the world production of unconventional oil was very low and came by 200 thousand barrels / J , this amount began to gradually rise for a number of reasons related to the increased spending on innovations that contributed to overcoming the difficulties .

It made the production of this type of oil economically viable , so production began to develop significantly and rapidly, through table 2 noted the significant increase that occurred during 2011, 2012 and 2014, respectively, reaching 7.6 million barrels/j in 2014, taking advantage of developments in extraction that contributed to the increase in oil supplies in the world. World non-conventional oil production in 2019 was 12.5 million barrels per day and non-conventional oil production is expected to continue to rise by 14.4 million barrels per day in 2020.

The contribution of traditional and non-conventional oil to the oil market:

It can be said that non-conventional oil is occupying an important space in the oil market and this is clearly evident from the following table, which shows the proportion of the world's production of unconventional oil and its gradual increase in its contribution over successive years.

Table 3. Contribution of conventional and non-conventional oil to world oil production for 1980-2020 (1 million barrels/day)

Years	Global production of traditional oil	Global production of unconventional oil	Total	The proportion of contributions to unconventional oil production in the world	The contribution of traditional oil in the world
1980	62,4	0,2	62,42	0,3%	99,9%
1990	65,3	0,4	65,7	0,6%	99,3%
2000	73,8	1	74,8	1,3 %	98,6%

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2008	80,1	1,8	81,9	2,1 %	97,8%
2009	78,7	2,3	81,0	2,8 %	97,1%
2010	81,0	2,7	83,7	3,2 %	96,7%
2011	80,6	3,9	84,5	4,6 %	95,3%
2012	82,1	4,4	86,5	5,0 %	94,9%
2014	82,0	6,8	88,0	7,7 %	93,1%
2015	83,8	8,1	91,9	8,8 %	91,1%
2017	84,177	8,325	92,502	9,0%	91,0%
2018	88,3	10,7	99,0	10,80%	89,19%
2019	86,9	12,5	99,4	12,57%	87,42%
2020*	86,9	14,4	101,3	14,21%	85,78%

The table is prepared by the researcher based on the data contained in:

Source: INTERNATIONAL ENERGY AGENCY , World Energy Outlook , 2017 ,2016

,2015,2013,2012,2011,2010,2006.

Source: Organization of the Petroleum Exporting Countries (OPEC) , world oil outlook ,2019.

*Estimated data

The table shows changes globally in conventional and non-conventional oil production and the contribution ratios of these two types to the oil market. In 1980, the contribution of unconventional oil was very low to 0.5% of total world oil production, and the largest share in the provision of oil supplies was exclusive to conventional oil, which in the same year was 99.9% and over a 10-year period there was no significant change in the oil market, bringing the total world production to 99.9 per cent. Oil by 65.7 million barrels/j in 1990, The share stakes of conventional oil were as high as 99.3%, while non-conventional oil was limited to 0.6%, which is limited despite its rise from 1980, the development of production, increased demand for oil and high rates of economic growth in the world and as a result of technological advances and innovations that contributed significantly to increased opportunities in the production of unconventional oil and made it more economically viable than Previously, the contribution of unconventional oil to the oil market began to gradually escalate during 2014 and 2015, respectively, saw a rise in the production of unconventional oil, in contrast to a decline in the share of conventional oil shares in the world oil market, with the volume of production of non-conventional oil in 2014 reaching 6.8 million barrels/j, which accounted for up to 7.7% of the world's total oil production, while the scale is observed to decrease by a percentage of 7.7% of the world's total oil production. The contribution of traditional oil to the balance of the oil market despite the increase in production by a low percentage, with its participation rates for the same year reached 93.1% in addition, production and contribution to the world oil market continued to go the same way, although demand and production for oil in general increased in the whole world, but the balance of ratios for traditional and non-traditional oil is changing over time, noting table (3) sees that 2018 and 2019 saw an increase Non-conventional oil contributed to world production, amounting to 10.7 and 12.5 million barrels of non-conventional

oil, respectively, accounting for 10.80% and 12.57% respectively of the total contribution of conventional G.J. oil to world production, in addition, is expected to see a rise in total production of non-conventional oil, in addition to the expected increase in total production of non-conventional oil, It is expected to rise to 14.21 percent of the total contribution to world oil production.

The repercussions of unconventional oil in the economies of traditional oil-producing countries:

Many countries with a variety of non-traditional energy sources, such as shale oil and shale gas, as well as other types of non-traditional sources of work, have sought and continue to seek to exploit these resources at their disposal, helped by the development of technology, which has increased opportunities for the exploitation of these resources and made it possible to produce them under different geological conditions and realities from region to region. Moreover, this development has contributed to overcoming many obstacles and difficulties that were a serious obstacle to the exploitation of these available resources in greater proportions than conventional resources. Moreover, progress in the field of non-traditional energy sources has reduced the cost of producing these sources, making them more economically viable, as it has cost the production of unconventional oil in some regions of the world by \$22 per barrel from 90 Dollars⁵, as competition in some countries in their production of traditional resources and many of the experiences of these countries have been successful, notably the United States of America and Canada as well as other countries, which contributed to shifts in the world oil markets and the balance of power in the energy market began to change little by little in the medium and long term as well as reality, as the increase in the contribution of unconventional oil production to the global energy balance led to a decrease in the contribution of Traditional oil, which has implications for countries that rely on their production of conventional oil for revenues managed by their economies as a result of their low contribution ratios to the world energy markets due to the crowding of non-traditional energy sources, can be explained by the following table:

Table 4. Total exports and external imports of crude oil to the North American continent for the period from 2004 to 2019 (Million barrels)

⁵ box Cash International , future Oil Sustainability Finance in area dole council collaboration Gulf , 2020, pp 10 .

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Years	Oil production	North America					Percentage of oil exports %
	Unconventional	Imports	Exports	Canada's imports	United States	Oil demand	OPEC Organization
2004	—	14,337,7	1,382,5	1,188,1	13,145,0	—	53,5%
2005	—	14,938,9	1,404,4	1,220,2	13,714,0	—	55,3%
2006	—	14,857,3	1,464,6	1,145,5	13,707,0	—	55,5%
2007	1,6	14,612,3	1,533,1	1,138,7	13,468,0	—	56,3%
2008	2,8	14,094,2	1,579,7	1,173,2	12,915,0	—	56,6%
2009	2,3	12,786,3	1,537,3	1,089,5	11,691,0	21,043	54,7%
2010	2,7	12,814,6	1,519,9	1,015,8	11,793,0	21,563	55,8%
2011	3,9	12,424,5	1,731,1	988,5	11,436,0	21,360	57,7%
2012	5,0	11,529,2	1,823,9	931,2	10,598,0	20,945	60,6%
2013	—	10,272,9	2,192,7	868,9	9,859,0	21,393	58,7%
2014	7,6	10,546,3	2,627,0	805,3	9,241,0	21,496	57,2%
2015	8,4	10,255,2	2,765,8	806,2	9,449,0	21,591	56,4%
2016	—	11,189,1	3,332,8	1,134,1	10,055,0	22,160	56,5%
2017	8,3	11,218,9	4,052,2	1,077,3	10,141,6	22,405	55,0%
2018	10,2	10,974,9	5,152,6	1,048,1	9,926,8	22,848	53,9%

The table prepared by the researcher by looking at the data contained in:

Source: Organization of the Petroleum Exporting Countries (OPEC), Annual statistical Bulletin, 2019,
www.opec.org.

Source: INTERNATIONAL ENERGY AGENCY, World Energy Outlook, 2016, 2013, 2010, 2009.

It is clear from the table that oil demand in North America did not decrease in the duration until 2018, in contrast to if the demand was compared with the oil imports of the continent, it is noted that there is a significant decrease in the imports of north American oil, with a total import during 2004 of 14,337.7 million barrels. Tracking subsequent years, table 4 notes that the continent's total oil imports decreased significantly, reaching 12,424.5 million barrels in 2011, and this decline continued to reach the year 2018, with a total imports of 10,974.9 million barrels of crude oil by North America, compared to the total exports of north American crude oil, there is a significant increase in its total exports. In 2004, oil exports grew significantly to 2,192.7 million barrels per year. 2013, north American total exports continued to rise to 5,152.6 million barrels in 2018, largely due to increased oil production rates from non-traditional sources in North America. Such as shale oil in the United States of America and oil sands in Canada as well as other types, which has implications for those countries that depend on traditional oil exports and the revenues generated by their economic affairs, as is clear in OPEC countries, noting that the total exports of traditional crude oil to OPEC countries have not developed, on the contrary, declined in recent years. OPEC's export contribution to world

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exports reached 55.3 percent of world oil exports in 2005 and subsequently increased to 60.6 percent of total world crude oil exports in 2012, but then saw a significant decline. This has had implications for the total revenue sought by these countries as a result of the decline in their total hydrocarbon resources, mainly conventional crude oil, as a result of the crowding out of non-conventional oil sources for their shares in the energy markets. However, the contribution rate fell significantly to 87.42 percent of the world's total oil production, while the contribution of unconventional oil rose from nearly zero to nearly 12.57 percent of the world's total crude oil production in 2018 .

Conclusions

Fossil fuels have historically played a pivotal role and continue in serving as the primary means to fulfill the worldwide energy requirements. Emerging alterations in energy markets have been seen due to the increasing presence of non-traditional energy sources, resulting in a consequential redistribution of global power dynamics. The global energy landscape has seen a notable advancement in the generation of energy from non-conventional sources. This has played a significant role in bolstering the world's energy supply and has constituted a substantial component of the overall energy composition. Non-conventional energy resources are mostly found in non-OPEC countries, like the United States of America, Canada, and Argentina, among other nations but in smaller numbers. The use of advanced technology has proven helpful in surmounting challenges that previously impeded the extraction and utilization of non-conventional resources. Consequently, this has resulted in heightened output levels and reduced obstacles. The expansion of production derived from non-conventional sources plays a role in displacing traditional oil-producing nations in terms of their market shares in the energy sector, thus leading to a decline in their oil income. The global demand for energy sources is seeing an upward trajectory, although with regional variances, due to advancements in the production of alternative energy sources including shale oil, shale gas, and other renewable resources. The global demand for natural gas, including both conventional and unconventional sources, has seen a notable upsurge as a result of climate legislation aimed at mitigating emissions and curbing environmental pollution. Countries with non-traditional energy resources have a low level of dependence on imported energy sources, while concurrently demonstrating a high propensity for exporting energy to the global market. Nations heavily dependent on traditional resources, such as conventional oil and natural gas, should consider diversifying their sources of national income. It is crucial for these countries to avoid just relying on the exportation of oil and instead actively seek other avenues for generating revenue. Efforts should be made to efficiently use the associated gas generated during the conventional oil production process, in order to address the increasing worldwide demand and mitigate the environmental degradation associated with its wasteful disposal. One potential strategy to mitigate the impact of oil price variations on the economy involves using oil profits derived from oil exports to foster the growth of other sectors and implementing construction projects that create money for the state. This approach aims to diversify the economy and lessen its reliance on oil as the primary source of revenue. By investing in the development of other sectors and creating income-generating construction projects, the adverse impacts of oil price fluctuations may be mitigated. This study aims to explore and enhance energy strategies used in the production and extraction of both conventional and non-conventional energy sources, with the objective of mitigating their adverse environmental impacts. The promotion of collaboration among major stakeholders in

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the energy market is crucial for the purpose of ensuring price stability and mitigating variations in energy source costs.

References

- 1 Hassan Latif and others , environmental economy , Iraq , Najaf , 2019 .
- 1 Ali Rajab, the reality and prospects of the unconventional oil and natural gas industry in North America and its reflections on member states, Oil magazine and Arab Cooperation, issued by the Organization of Arab Petroleum Exporting Countries (OAPEC), Issue 152, Volume 41, 2015.
- 1 IMF , World Economic Outlook Report , Arabic Edition , 2017.
- 2- IMF , future of oil and financial sustainability in the GCC region , 2020.
- 3 Arab Center for Research and Policy Study , implications of falling oil prices on exporting countries , Qatar , Doha , 2015 .
- 1-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2006
- 2-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2008
- 3-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2010
- 4-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2011
- 5-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2012
- 6-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2013
- 7-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2015
- 8-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2016
- 9-INTERNATIONAL ENERGY AGENCY , World Energy Outlook,2017
- 10-Organization of the Petroleum Exporting Countries (OPEC) , world oil ou