Original Article: Geopolitical implications of oil supply chain disruptions

Rezvan Hanif
MSc of Supply Chain, JSOM School of Management, University of Texas at Dallas (UTD), USA (ORCID: 0009-0005-8313-8236)

Use yor device to scan and read the article online

Citation R Hanif, **Geopolitical implications of oil supply chain disruptions,** *EJCMPR* . 2024; 3(5): 55-74.

https://doi.org/11235987

Article info:
Received: **03 September 2024**
Accepted: **11 November 2024**
Available Online:
ID: **EJCMPR-2411-1254**
Checked for Plagiarism: **Yes**
Peer Reviewers Approved by:
Dr. Amir Samimi
Editor who Approved Publication:
Dr. Frank Rebout

Keywords:
Geopolitical implications, supply chain disruptions, oil, and energy.

A B S T R A C T

The global economic landscape is constantly changing and has cast a shadow over the global economy. Just this year (2024), presidential elections, military conflicts, and escalation of tensions have made understanding geopolitical risks especially important for forex traders. Supply chain dynamics refers to various factors and interactions that affect the supply of goods, services, information and financial affairs in a supply chain network. Factors that can affect supply chain dynamics include: changes in consumer demand, market trends, developments technological, regulatory requirements, economic conditions, geopolitical events and disruptions such as natural disasters or pandemics, understanding supply chain dynamics for organizations to effectively manage supply chains, optimize operations, reduce Risks and adaptation to changing market conditions are very important. Both of these conflicts could potentially disrupt the global supply of oil and gas in 2024, and hence geopolitical and supply chain issues are the hot topics of 2024 in the energy field. According to Global Data, a leading data and analytics company, it is important for the oil and gas industry to assess the impact of these issues as they chart their growth plans. Global Data's thematic report, entitled Top 20 oil and gas issues in 2024, includes challenges that can have a significant impact on oil and gas production and supply operations in 2024. Concerns related to the security of energy supply are expected to be the main challenge for the oil and gas business in 2024.

Introduction

Geopolitical risk events known as geopolitical events, such as wars, trade disruptions, and political instability, can affect the global economy through several channels:

1- Financial markets: Sanctions, capital controls and distrust in the future can transform financial markets. In this case, the cost of dealing with risks (risk insurance) increases and as a result the price of assets fluctuates greatly and causes capital flight or risk aversion flows [1].

2- Disruption in global trade: the escalation of tensions and restrictions in trade can disrupt the flow of global trade and the supply chain and harm the global economy. The lack of some sensitive goods such as gold and gas can worsen the situation [2].

3- Inflation and economic growth: the combined effect of these two factors can lead to high inflation and low economic growth [3].

***Corresponding Author Rezvan Hanif** (rxh220010@utdallas.edu)*

Geopolitics and domestic politics

The impact of geopolitical risks is not only on international relations. World leaders use economic tools such as fiscal and monetary policies to control economic activities. Meanwhile, with populist expansion, new leaders may decide to prioritize short-term interests over long-term stability, in which case we will witness disruptions in trade flows and weak economic growth due to protectionist policies and a sharp increase in government spending. On the other hand, the economic performance of the countries will also affect the outcome of the elections in the future (Figure 1).

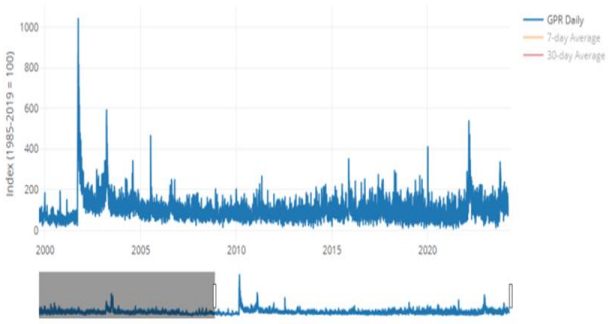

Figure 1. Geopolitical risks (GPR index)

Measuring geopolitical risk (Geopolitical Risk Index (GPR))

The GPR index is a measure for evaluating geopolitical risks [4-6]. This index is used to assess geopolitical risk by examining risk events that are published in the media. However high the GPR number is, it indicates the escalation of bad and risky events and increases the probability that bad and negative events will happen in the future, which leads to more severe and negative consequences. Studies have shown that high figures of this index lead to an increase in the price of crude oil, a decrease in investment, high inflation and weak economic and commercial growth [7].

The main risks of 2024

In 2024, there are several important events that impose a heavy geopolitical risk on the global economy:

1- American elections: the possibility of polarization of the American political environment and Trump's presidency can harm the economic stability of the world's largest economy. In the previous period, Trump showed that he follows unconventional policies and is always looking for a trade war [8].

2- Intensification of conflicts between Israel and Hamas: the expansion of the Gaza war can disrupt the supply of global crude oil and destabilize the financial markets [9].

3- The deepening of the war between Russia and Ukraine: Even if the supply of crude oil is not disrupted, a divided Ukraine can still harm the global economy [10].

4- Other risks: lawlessness in the artificial intelligence industry and policies against the export of minerals [11].

5- Global impact of elections: In 2024, elections will be held in more than 64 countries of the world, and the possibility of changes in the domestic and foreign policies of the countries is high. A change in country leaders can change the landscape of global politics and disrupt the global supply chain [12].

6- Attention of Forex traders: Forex traders must be aware of global geopolitical and risk events and their economic consequences so that they can make wise decisions. Evaluating the GPR index after the elections as well as evaluating political changes in countries can help to find opportunities and risk management in the forex market. Don't forget that knowledge is power and you should use it to your advantage [13].

Revision of the global energy supply chain

Ravindra Puranik, an oil and gas analyst at Global Data, says: The consequences of the Russia-Ukraine conflict have led to a review of

the global energy supply chain in the last two years. In addition, the global energy markets must also deal with the growing tensions in the Middle East. Therefore, geopolitics and supply chain dynamics will affect the decisions of oil and gas companies in 2024 [14].

This report also emphasizes the topic (ESG, a set of criteria used by investors and shareholders to evaluate a company's performance and measure its social and environmental impact) and issues that play a role in the global energy transition. In ESG, environmental and social aspects of oil and gas operations are the focus of discussion. Because they are important for long-term sustainability. Global Data examines newer industry themes that support the energy transition toward zero-carbon emission technologies, such as renewables, low-carbon hydrogen, carbon capture and storage (CCS), and electric vehicles (EVs), in terms of their potential impact on the oil business. and evaluates gas in 2024 [15].

Profitability is expected to be critical to financing decarbonization plans in 2024, Puranik continues. In addition, the conflict in Ukraine has also revealed the vulnerabilities of clean energy production and, in a way, has made the prospect of peak oil consumption uncertain. This is likely to favor natural gas and LNG in supporting global decarbonization goals in the medium term. This report evaluates traditional oil and gas themes, namely liquefied natural gas (LNG), shale and integrated refineries, enabling companies to remain competitive in the energy market [16].

Shale oil and gas production

Shale oil and gas production may reach unprecedented levels in 2024. The report also shows how technologies such as artificial intelligence, block chain, cloud computing, cyber security, Internet of Things, robotics and the met averse will impact the oil and gas industry. Several Integrated Oil Companies (IOCs) have actively sought to digitize their operations using digital technologies [17].

These technologies bring new dynamics to improve operational efficiency and security. Puranik concludes: It is expected that oil and gas companies will continue to expand digital technologies in their activities in 2024. As the industry prepares to move forward with greater agility and pursue a long-term energy transition, digital technologies will play a central role in achieving these [18].

As countries strive to reduce their carbon footprints and geopolitical tensions intensify, governments must play an important role in strengthening emerging industries and regional supply chains. While this change is possible, it increases procurement risk. It also requires a balance of risk management between governments and industry to create an effective supply chain [19].

To thrive in the ever-changing energy industry, Rystad Energy strongly recommends that companies prioritize procurement functions within their corporate organization and that governments increase their business and industrial market intelligence. Procurement plays a vital role in the supply chain strategy, and at the same time prioritizes affordability and sustainability. This process requires careful market research, skillful negotiation and continuous monitoring to optimize efficiency and minimize costs [20].

A planned procurement strategy can make a big difference for energy companies trying to cut costs, reduce their carbon footprint and promote sustainability. The risks associated with low carbon resources are significantly lower than oil and gas exploration and extraction. While there is great uncertainty in expected oil and gas production, the main risk is for low-carbon resources. Unlike fossil fuel extraction, renewable projects are developed closer to end consumers, reducing political risk and exposure to geopolitical disruptions [21].

However, geopolitics still play an important role in the development of renewable energy. Because low carbon supply chains are heavily dominated by a few countries. The Covid-19 pandemic and ongoing conflicts have driven up costs due to quarantines and resource issues, causing renewable technology costs to increase by 50-100%. As a result, projects have exceeded their budgets and suffered delays, cancellations and financial problems [22].

Supply chain bottlenecks have also been a major headache for developers. A lack of supply chain capacity has caused problems for high-voltage electrical equipment, grid-connected construction companies, wind-powered ships, data chips and critical minerals. As a result, many developers are at risk of not receiving essential deliverables on time. Supply chains for oil and gas equipment and services are relatively fragmented and geographically diverse, with suppliers from Europe, the United States, Russia, the Middle East, and mainland China [23].

However, the renewable energy supply chain is highly concentrated and dominated by a few suppliers, with a clear focus on China and a handful of other countries for mineral extraction. This makes renewable energies more vulnerable than oil and gas. Because there are fewer supplier options and more reliance on specific countries or regions [24].

This means that procurement officers in renewable energy need to apply careful risk management. Governments have a role to play in this changing landscape and need a deep understanding of the sectors and supply chains they regulate. Also, have the risks and challenges that these sectors are facing. By doing so, governments can provide valuable guidance and support to companies to help them navigate these changing dynamics and succeed in the global marketplace [25].

The consequence of the growth of geopolitical tensions on oil markets

Many oil analysts expect, in the long term, as the importance of American shale declines, the world will become more dependent on Middle East oil production. However, the current geopolitical turmoil has created disruptions in the major oil-producing countries in the Middle East and raised questions about the region's ability to supply the global market in the long term [26].

The International Energy Agency has repeatedly warned that although US shale oil will oversupply the market in the short term, it will not be able to meet future demand. By the mid-2020s, there may be more reliance on the Middle East, just like in the past, because there are many questions about the longevity of American shale. However, according to the report of the Oxford Institute for Energy Studies, the deterioration of the geopolitical landscape in the Middle East may cause long-term damage to the energy sector of this region [27].

Geopolitical threats appear in various forms in the Middle East and North Africa, and as far as oil markets are concerned, these geopolitical problems are not yet fully apparent. The saturation of the US shale supply has freed the oil market from instability and unrest. Also, while there have been many conflict centers and possible threats are not few, but disruptions in oil production have remained minimal. In fact, Iran has increased its production after the lifting of international sanctions, and Libya and Nigeria have significantly improved their production. However, geopolitical events are sowing the seeds for future supply problems. For example, Middle Eastern governments increase spending on security and defense as tensions increase, and huge spending means they need higher revenue [28].

As a result, many large oil producers will need higher oil prices to finance their budgets. Current geopolitical tensions prevent necessary

investments in new production capacity. For example, although Iran has been able to restore a large amount of its upstream production since the sanctions were lifted, it seems that the Trump administration is raising tensions and it is not clear where this conflict will end, but in Currently, it has prevented investment in Iran's oil and gas production capacity [29].

The French oil company Total is trying to invest in the Phase 2 project of South Pars, but it has announced that it may withdraw for this purpose if the US sanctions return. In the meantime, tensions in other places have prevented investment in production capacity.

For years, the Kurdistan Regional Government has tried to attract upstream investment, but the dispute with the central government in Baghdad will prevent the region from raising production. Also, in the case of Libya, the internal unrest in this country not only leads to the disruption of production from time to time, but also prevents this country from reaching its full production capacity [30].

The International Energy Agency predicted that Libya's production will increase to 3 million barrels per day by 2030, but at this point, such an event seems far from reality. Libya's oil production has decreased from 1.6 million barrels per day before the country's war, and now remains about 1 million barrels per day. Although this does not appear to be a major problem at the moment, geopolitical instability will become increasingly problematic as supply in oil markets becomes increasingly constrained. Currently, oil reserves have decreased significantly and unexpected disruptions in supply have had a greater impact on the market. This issue is mainly due to the low floating capacity, which is about 2 million barrels per day, which is historically very low [31].

When OPEC adjusts its current supply cap, floating capacity will further decrease, preventing the organization from bringing new production to market. The International Energy Agency predicts that global floating capacity will decrease to about 1.24 million barrels per day by the third quarter of 2019, which is extremely small [32].

According to the Oil Price report, as the years pass and the demand grows, the world market will need more OPEC production. According to the Oxford Institute for Energy Studies, ongoing geopolitical turmoil may prevent the organization from realizing new supply in the future. The oil markets are well supplied in the short term with the growth of shale production and the prospect of OPEC production returning, but there are serious questions about supply problems in the long term.

Revision of the global energy supply chain

Ravindra Puranik, an oil and gas analyst at Global Data, says: The consequences of the Russia-Ukraine conflict have led to a review of the global energy supply chain in the last two years. In addition, the global energy markets must also deal with the growing tensions in the Middle East [33].

Therefore, geopolitics and supply chain dynamics will affect the decisions of oil and gas companies in 2024. This report also emphasizes the subject of ESG, i.e. the set of criteria used by investors and shareholders to evaluate a company's performance and measure its social and environmental impact, and issues that play a role in global energy transition. Saudi Arabia has announced that it supplies oil from its reserves to its long-term contract customers. In recent months, Saudi Arabia exported 8.6 to 9.6 million barrels of oil per day and consumed 2.5 million barrels in domestic refineries [34].

Saudi Oil Minister Abdul Aziz saying: domestic oil refining has decreased to 1.9 million barrels per day, but most of the domestic refineries in Saudi Arabia use light crude oil. The Kepler Research Institute announced that Saudi Arabia's oil reserves were 1.68 million barrels on September 15, of which 38.8 million barrels

were stored on the east coast and 29.3 million barrels were stored on the west coast. If Saudi Arabia withdraws 2.8 million barrels per day from its reserves for export, the reserves will run out in 25 days. If 600,000 barrels per day of domestic refining feed is also cut, then the stockpiles will last 32 days [35].

Saudi Arabia has leased storage tanks abroad. Saudi Arabia has made reserves in Sumad, Egypt, Okinawa, Japan, and Rotterdam, the Netherlands. According to the information of JODI, Saudi Arabia has stored 179.8 million barrels of oil in these centers, but the type of crude oil is important, and the crude oil stored in these tanks is more of heavy and sour crude oil, and Saudi customers especially In Asia, they need light and sweet crude oil, and their long-term contracts with Aramco were also for this type of crude oil.

If Aramco gives its customers sour crude oil instead of sweet and light crude oil, it must pay for the damage caused by the decrease in the quality of crude oil and the possible damages caused to the refining facilities if sour and heavy crude oil is used [36].

Another point that is emphasized by energy market experts is the amount of strategic reserves of consuming countries. Strategic storages are created with the aim of meeting the demand and consumption of oil in consuming countries in case of a serious disruption in supply and stoppage of imports. The total strategic oil reserves in the world are estimated to be 1.4 billion barrels, and this amount will last up to 245 days to cover production reduction of 5.7 million barrels per day in Saudi Arabia, which is equivalent to about 8 months. The International Energy Agency announced that the strategic reserves of the members of the Organization for Economic Co-operation and Development (OECD) are sufficient to meet the needs of this group for 60 days [37].

In the meantime, America's strategic reserves are about 600 million barrels, but as mentioned, currently the largest demand for oil is from developing countries in Asia, including China and India, and these countries do not have significant strategic reserves, except for Asian countries. which are members of the OECD. For example, China's strategic reserves are 550 million barrels, which can handle domestic demand for 55 days. Japan has acceptable strategic reserves.

This country has 3.528 million barrels of storage, which will supply the country's demand for 198 days. In this context, India's strategic stockpiles are very low. This country has 39 million barrels of storage and can only supply domestic consumption for 9 days. In addition, the Indian economy is very vulnerable to the increase in oil prices, and any disruption in the supply of crude oil that causes an increase in oil prices creates a serious challenge for the country's economy.

In August this year, India imported 66.19 million tons or 4.7 million barrels per day of oil, which is 5.5 million barrels per day more than the same period last year. This shows the increasing need of this country to import oil. South Korea has 214.2 million barrels of strategic storage, which can handle domestic consumption for up to 71 days. In general, it seems that although the amount of strategic reserves is significant in a number of consuming countries, firstly, the growth of oil demand in the world is more among the developing countries located in Asia and having reserves. oil reserves are not acceptable, and secondly, a number of consuming countries are either unable to invest in this type of investment due to high storage costs, or they do not see significant benefits in having strategic oil reserves in the equation of profit and loss [38].

Another important factor that many experts emphasize is the increase in oil shale production in America. The fact is that the increase in oil production in America, firstly, has widened the geography of energy supply, and secondly, it has

minimized America's dependence on oil imports, and in fact, it has turned America into a net exporter of oil and gas, and these political and geopolitical equations the past has changed in the Persian Gulf region as a center of conventional energy supply [39].

The US Energy Information Administration announced that US oil production reached 12,082 million barrels per day in June of this year, of which 8.843 million barrels per day were produced from oil shale. In fact, the increase in oil production in the United States has largely reduced the impact of price shocks caused by disruptions in oil supply, but the impact is greater because the world's largest consumer has become the largest producer and there is no need to use oil to meet its demand. It does not have the reserves of other countries, but the claim that the growth of oil shale production can compensate for the disruption in the supply of other producers in the short term is not true.

Because, firstly, assuming that American oil companies want to increase their production considering that shale oil has a short supply cycle, it cannot meet the market's need for oil in the short term. Because drilling, completion and preparation of new products requires 90 to 180 days, and secondly, America's export infrastructure is limited and now it is working almost at maximum capacity, and assuming an increase in oil shale production, more export capacity in the oil terminals of this country. There is no country [40].

Another issue that should be considered is the transportation of crude oil and products and the oil tanker market, which is under pressure in the current situation. Disruption in the global flow of crude oil after the attack on Saudi Arabia's oil facilities has caused American crude oil exporters to face a shortage of tankers to meet the increased demand for oil shipments. The average freight rate paid to owners of very large tankers increased by more than $4,500 to $36,511 per day on the US Gulf to China route. The rate of smaller Aframax tankers from the US Gulf coast to the Mediterranean increased by $1,815 and reached $25,231 per day. The transportation rate for super tankers on the route from America to China increased by $5,000 and reached $35,711 per day [41].

The attack on Aramco facilities has been so important that other developments in the oil markets have been almost ignored. It is possible that one or more disruptions in the supply of the world's energy security will face a more serious challenge and even cause a crisis.

Based on what has been mentioned, it can be said that currently the oil markets are not ready to tolerate another disruption in supply, but there is a potential for disruption. More than a week ago, Nigeria's Bonny Light Oil faced an emergency after a pipeline was disrupted. This pipeline has been repeatedly attacked by armed groups in the past few years.

On the other hand, the pressure of American sanctions on Venezuela has increased. Venezuela may face a further reduction in its oil exports due to the tightening of US sanctions and buyers' concerns about Washington's punishment. Now that the country's storage tanks are full, Venezuela may be forced to limit upstream production [42].

Again, on the African continent, in Libya, the war over the control of the national oil company has intensified. In the past, the war over the right to export oil had disrupted the supply of crude oil in this country. The attack on Aramco facilities showed the weaknesses of the world's energy security, even with the progress made in this area.

Apart from the mentioned cases in the field of oil markets and oil economy, it can be concluded that without full military capability, the energy security of countries, especially the major oil producers, and the energy security of the world will sometimes face serious challenges. This is where the energy field and the military field eat

butter at each other, but the point to think about is that Saudi Arabia's extensive military spending could not even provide the security of one of the country's most secure and sensitive facilities. The main question now is why Saudi Arabia's radar systems, which it bought from America at a very high cost, could not stop the drone attacks. Saudi Arabia has the third largest annual military budget in the world [43].

In 2018, Saudi Arabia's military spending amounted to 67.6 billion dollars, which is the third largest military expenditure in the world after the United States and China. Military spending accounts for a significant portion of Saudi Arabia's gross national product. This figure was 8.8% in 2018.

The Global Fire Power website, a specialist in the field of evaluating the military capabilities of countries, has ranked Saudi Arabia in the 25th rank of the world's armies. The Saudi Air Force has 20,000 personnel and 16,000 people serve in air defense. 2,500 people are among the Yemeni strategic missile forces.

However, the recent attacks on oil facilities, airports and other strategic facilities in Saudi Arabia show that only military spending and increasing military personnel are not enough for the security of a country, and skills and expertise in all sectors and ranks of the military system, especially in the sectors Management and training of human resources is more important. Part of this ineffectiveness in dealing with threats in Saudi Arabia may be related to a quasi-paradigmatic shift. It is because of this that the world may be approaching the end of the era of conventional military equipment [44].

Cyber wars and the use of advanced technologies such as the use of drones will probably change the nature and type of confrontation between countries.

Developments in the global oil and energy markets are happening at a much faster rate than in the past, and the factors affecting oil prices and the fundamental factors of the oil markets are numerous and more complicated, and the analysis of the conditions governing the markets and the prediction of possible future developments It makes things more difficult, but despite this, supply, demand, excess production capacity, the amount of oil reserves, and political and geopolitical conditions, especially in important production and consumption centers, are still the most important fundamental factors of oil markets.

There may be more chess pieces in the oil markets, but the chessboard is the same as it always has been. The attack on Aramco's oil facilities was a serious threat to energy security, although the impact of this supply disruption on crude oil prices was not as great as the oil shocks of the 1970s and 1980s. First of all, with the increase in the production of unconventional crude oil in America, the geography of energy supply has expanded and the world's largest consumer has become the world's largest producer and net exporter of oil and gas [45].

This has not only affected the equations of the oil markets; it has changed the geopolitical equations of the Persian Gulf region as the center of conventional crude oil production in the world. On the other hand, the amount of strategic reserves of the consuming countries and Saudi Arabia was able to prevent extreme price fluctuations to some extent, but other problems such as the quality of stored crude oil and the limited reserves of a number of developing countries that have the greatest growth in global oil demand dedicated to them, revealed the weaknesses and challenges in providing the world's energy security.

Another important issue is that the tolerance threshold for disruption in the supply of global markets is at this level. This is while there is the potential to disrupt the supply of Libya, Nigeria and Venezuela, and if it happens in the current situation, there may be more price fluctuations. Another point to consider is the gradual change in the nature of military confrontation.

This issue is important from the point of view that in parallel with the developments in the military field, the type of protection of energy facilities and other strategic facilities should be changed. These attacks showed that, firstly, the nature of military attack has changed, and secondly, the cost of military and the recruitment of personnel without expertise and efficient management cannot ensure the security of a country, and thirdly, advanced military capabilities are not only available to governments, and non-governmental actors can also Hostile state actors challenge energy security [45].

Finally, securing the energy security of the Persian Gulf region and the world depends on the creation of peace and stability for all actors in the region, and since no actor lives in a vacuum and is influenced by the pressures of other actors and developments around him, like a game of billiards, safe political conditions and The geopolitics of producing and consuming countries and stability in all countries and for all actors is the guarantor of energy security in the region and the world.

Discussion

Scenario I: Israeli attack on Iran's oil infrastructure

Iran is an important oil country with high reserves. Tehran is a member of the Organization of Petroleum Exporting Countries (OPEC), but it is not subject to the quantitative restrictions of this cartel and Tehran is allowed to benefit from this privilege. Although then US President Donald Trump imposed sanctions on Iran's oil exports in 2018 over its nuclear program, Iran recently produced about 3.8 million barrels per day, according to ratings agency Standard & Poor's. This figure includes approximately 4% of global production, a large part of which goes to Asian markets, especially China. This trade is an important source of income for Iran, even if Iranian oil is sold at a discount. Due to the great importance of oil exports for Iran's economy, the Zionist regime has made an attack on Iran's oil infrastructure one of the options. In the meantime, one of the possible targets is Khark Island, located about 30 kilometers off the coast of Iran in the Persian Gulf, where Iran's most important export terminal is located.

Scenario II: The Strait of Hormuz is blocked.

If Iran blocks the Strait of Hormuz, the world's oil supply will be threatened. This will have serious implications for the global economy and, according to UBS estimates, could push oil prices to over $100 per barrel. The Strait of Hormuz is the strait that connects the Persian Gulf to the Gulf of Oman, which is known as the bottleneck of global oil trade. In fact, more than a fifth of the world's oil from producers such as Saudi Arabia, Kuwait, Iraq and the United Arab Emirates is exported this way. Qatar also sends liquefied natural gas (LNG) through this route. At the narrowest point, there is less than 50 kilometers between the coasts of Iran and Oman, and the shipping channels used by oil tankers are only 3 kilometers wide. Despite the recent missile attack, most experts believe that Iran will not block the Strait of Hormuz anytime soon.

Scenario III: the oil business will be spared

Iran's recent attack on Israel was far-reaching, but not historically unique. In April of this year, missiles were fired from Iran towards Israel, but there was no serious tension. As a result, the price of oil reached around 88 dollars per barrel for a short period of time, but it quickly decreased again. Israel is likely to consider the harsh consequences of an attack on Iran's oil facilities and assess its high political and financial costs. Recently, Standard & Poor's lowered Israel's credit rating by one level. Of course, Fitch had previously downgraded Israel's credit rating. However, Israel's government bond rating remains at investment

grade, which is important for investors. In sum, the increase in oil prices now depends on Israel's reaction, and if Iran's oil infrastructure is spared, the market atmosphere can calm down and even the price of oil can decrease again.

Although oil supply continues uninterrupted and a return to more stable prices seems possible, the oil market is likely to be volatile in the coming weeks. If Israel actually targets Iran's oil facilities, prices could rise sharply again. A loss of 1.5 million barrels per day would be significant for the global economy and would further destabilize the energy market.

Doubts in the capacity of OPEC Plus

Despite the current crisis, there are also signs that oil supply could rise again in the coming months. Because OPEC Plus, a coalition of OPEC countries and Russia, plans to return some of its currently closed capacities to the market. This possible solution, which was announced in December, can reduce the price pressure. However, doubts remain about whether OPEC+ will release its capacity as planned. Because there have been frequent delays in the past. In the United States, crude inventories unexpectedly rose by 3.89 million barrels last week, the most in five months, but they are not coming into the market as artificial shortages caused by OPEC+ continue. Analysts see this trend as an attempt to keep prices high in order to profit from uncertainty.

Negative impact on China

As can be seen, the attack on Iran's oil facilities will have a global impact. Because Iran is one of the main oil producers in the world, but in the meantime, China and Kamla Harris will accept the most negative impact from the situation. More than 90% of Iran's oil exports go to China every month. Since the beginning of the year, this share has averaged 1.4 million barrels of oil per day, or about 15 percent of Beijing's total oil imports. Due to the sanctions, according to some unofficial claims, China can buy its oil cheaper from Tehran than from other suppliers in the Persian Gulf or Russia. Also, Beijing is highly exposed to disruptions in the global oil supply chain. Because this country is the largest importer of oil in the world and three quarters of its consumption is supplied from abroad. If Israel attacks Iran's oil sector, China should be able to compensate for the decrease in its imports for a while by using its national reserves. According to recent estimates, Beijing can last two years without Iranian oil. In this scenario, more than anything, it is Iran's potential response as well as disruptions in sea routes that can have negative consequences for China.

The possibility of Kamala Harris losing votes

Although foreign policy is generally not among the main concerns of voters, several factors can influence voting in the context of regional escalation. Historically, rising oil prices have played a negative role in US presidential campaigns, with Carter's defeat coinciding with rising oil prices. Also, presidents Ford and George H. W. Bush have also lost in the presidential elections due to the increase in prices. However, this year's situation is unprecedented. Current President Joe Biden is not running for re-election.

However, voters associate Kamala Harris with a history of Democratic administration in the White House. In the event of an increase in the price of crude oil and only five weeks before the presidential election, Trump accused the Democratic candidate of being responsible for the increase in the price of gasoline in the United States and considered him the cause of the situation. The former president also reiterates his claim that his presence in the White House is enough to deter the world from conflict.

The role of the war between Russia and Ukraine in energy developments

While economic sanctions have disrupted the energy market, affected countries have created parallel channels to bypass most of the sanctions. The fourth development is the war between Russia and Ukraine, which started in February 2022 [46].

The Russian invasion was a major catalyst in the move toward parallel energy ecosystems. In 2021, Russia accounted for 45% of all European Union (EU) gas imports and was one of its main sources of oil. Although the EU continues to import Russian oil and gas, there has been considerable effort to isolate and develop other sources such as Angola and Guyana. However, it is the United States that has replaced Russia as the EU's main source of oil, accounting for 46 percent of liquefied natural gas (LNG) imports in 2023. Closer US-EU cooperation on energy is likely to continue. While the combination of the above factors will lead to greater energy interdependence and cooperation between the United States and Europe, it will also lead to greater cooperation between China, Russia, Iran and North Korea and Venezuela.

In 2023, Russia will overtake Saudi Arabia to become China's largest oil supplier. Russia's oil export to China is a little over 60 billion dollars, which is 19% of China's oil import. Russia is also one of the major suppliers of natural gas to China, which has seen record highs in 2023 and 2024, and is another important source of trade for the Russian economy. Western sanctions on Iranian and Russian oil and gas, as well as financial intermediaries, have resulted in an opaque exchange system that operates outside the Western economic system.

Iran, Russia and China have created an alternative market for the embargoed oil

Another component of the polar energy system is the triangle of Iran, China and Russia. Western sanctions on Iranian and Russian oil and gas, as well as financial intermediaries, have resulted in a non-transparent exchange system that operates outside the Western economic system. Iran, Russia and China have created an alternative market for embargoed oil where payments are in Chinese currency. This oil is often carried by "dark fleet" tankers that operate outside of maritime regulations and take steps to conceal their activities. The results of this system are:

- ✓ Inflow of much needed capital for Iran and Russia.
- ✓ Cheap oil for China.
- ✓ Erosion of Western sanctions and reduction of the importance of the US dollar in world trade.

The depth of China-Iran relations is evident in the fact that in June 2024, China imported 87% of Iran's oil. Iran and Russia have become closer since 2022. The two countries signed a trade agreement in December 2023, distancing themselves from dollar trade, and Tehran has sold weapons to Russia for the war in Ukraine. The other two components of emerging bipolar energy markets are diplomatically isolated North Korea and Venezuela. Venezuela, which was once one of the richest countries in the Western Hemisphere, is now one of the poorest countries. In this regard, policy makers have two options:

- ✓ Increase the security of your global supply chain and deepen your energy efforts.
- ✓ exercise the heavy-handed foreign policy needed to neutralize an increasingly polarized world and avoid deepening economic disengagement.

Given the current situation, the first option will probably win. A topic that should be considered by whoever sits in the White House in January 2025.

Potential drivers of oil prices

Meanwhile, the prospect of conflict between the Zionist regime and Iran has significantly disrupted the oil supply chain. Analysts warn

that any possible direct confrontation could increase global oil prices. Iran's potential retaliatory options can make oil prices rise again. A similar issue was observed in 2019 following the attacks of the Houthis on Saudi Arabia's oil facilities [47].

On the other hand, Iran can expand its previous sanctions to prevent the export of oil to the allies of the Zionist regime as well as this regime itself by the Islamic countries that are members of OPEC. The World Bank has already drawn scenarios for a significant increase in oil prices in the event of a conflict between Iran and the Zionist regime. If the Islamic members of OPEC apply an oil embargo against the allies of the Zionist regime, which is reminiscent of the 1973 oil crisis, we may even witness a more severe price shock in the global energy market.

The role of Washington and Beijing in the oil market

Despite the pressure, both the United States and China, major players with conflicting interests in the Middle East, prefer lower oil prices for their own domestic economic reasons. This common interest can potentially help reduce the risk of further price volatility. There are also alternatives to supply crude oil in the world market. Among non-OPEC producers, countries such as Mexico, Kazakhstan, Azerbaijan and Malaysia can be mentioned. These non-OPEC producers currently export 16,500,000 barrels per day compared to 28,700,000 barrels of OPEC oil.

What about OPEC Plus?

The OPEC+ alliance, which includes Russia, has been able to maintain relative price stability through consistency in its decisions and approvals, despite the efforts of consumer countries to influence and reduce prices. However, the organization is facing increasing pressure to address environmental and energy transition concerns. OPEC Secretary General Haitham Al-Ghais published an article on the OPEC website last week and wrote: He is against the idea of putting energy resources in a fruitless game.

Al-Ghais once again emphasized the essential role of oil in various fields. He wrote: The use of oil and oil products is necessary in the electricity industry and is used in parts such as wind turbines, solar panels and related electrical appliances. He emphasized that supply chain risks for oil products must be accepted and investment in the oil industry is necessary for timely supply. OPEC's position is that all energy sources, including oil, will be needed to meet the energy needs of societies in the future, reduce greenhouse gas emissions, and ensure energy security.

It should be noted that according to research, oil has many positive and negative effects on the economy of oil-rich countries. Exploration, production and extraction of crude oil can directly increase air pollution and have a negative effect on the quality of life of the natives of the region. It is clear to everyone that there is a direct relationship between oil revenues on the one hand and the level of carbon dioxide emissions on the other hand in oil producing countries such as OPEC members. On this basis, it is necessary to reduce the negative effects of oil on the environment by developing investment from oil revenues in economic infrastructure and using appropriate technology [48].

The recent climate change conferences of the United Nations in the Middle East and North Africa region, COP27 in Egypt and COP28 in the United Arab Emirates have emphasized the need for OPEC member countries to focus on clean fuels. Some members, including Saudi Arabia and the UAE, are currently involved in environmental initiatives such as the Oil and Gas Climate Initiative and programs to reduce flare gas waste. As tensions continue in the Middle East and the world grapples with an urgent need

for energy transfers, OPEC finds itself at a serious crossroads.

The agency must balance immediate price stabilization in the fossil fuel market with ongoing environmental concerns. That too in a situation where the energy market is facing a complex and ambiguous geopolitical landscape.

The importance of the Suez Canal and the Red Sea route

The Red Sea route is the fastest sea route between Asia and Europe. Any ship passing through the Suez Canal to or from the Indian Ocean must pass through the Bab al-Mandab strait and the Red Sea. In addition, approximately 30% of the world's traded consumer goods are transported through this route, and about 15% of global maritime trade, including important goods such as grain, oil, and liquefied natural gas, passes through the Red Sea. Accordingly, any delay in the route will lead to congestion in the ports, which will cause an imbalance between supply and demand or the availability of ships, personnel and container resources. Swedish multinational home appliance maker Ikea said the crisis could delay deliveries and limit availability for some products if shipping disruptions continue. Also, Tesla, which has problems in supplying parts for the production of goods, has announced that its production plant in Germany, which produces cars and batteries for Model Y, will be closed from January 29 to February 11 due to a lack of parts. In this regard, the Houthis have said that the attacks will stop if there is a ceasefire and the end of the blockade of the Gaza Strip by Israel, but Israel is in its position, which means that a large part of the companies, especially in Europe and the East Bank, is expected. to experience the same problem. Because the route of the ships is still through the Red Sea. As more shipping companies divert their ships due to the attacks, the number of ships entering the Red Sea has almost halved compared to last year.

Tripling of shipping costs and delays

The number of ships entering the Red Sea has almost halved compared to last year as more shipping companies divert their ships due to the attacks. Also, 90% of the container vessels on this route had to change their route in the first week of January. Market leaders such as Global Container Shipping and Maersk have already diverted a large number of container ships. This will add 6,000 kilometers to journeys connecting Europe to Asia, potentially taking up to two weeks. This means that in the midst of the Red Sea crisis, prices are rising. Because there are not enough containers. Meanwhile, higher transportation costs, fuel prices and insurance costs are likely to follow current economic trends and be passed on by businesses to customers [49].

How can businesses mitigate the impact of these disruptions?

Achieving real-time visibility plays an important role in optimizing and effectively managing container routes. While integrated transportation management in supply chain operations helps businesses minimize cost overruns and ensure smoother operations for industry and consumers.

Domino effect on production plans

The Red Sea crisis has affected production operations in ports that no longer have the same level of service. On the other hand, the global supply chain operates on a just-in-time basis, where each part is imported as it is needed for production. So any delay will have a ripple effect throughout the production chain. Even though most companies operate with some level of safety stock in place, supply chains require just-in-time fixed services and air and sea links. Even though most companies operate with some level of safety stock in place, supply chains require just-in-time fixed services and air and sea links. Accordingly, having flexible production

processes is one of the key pillars of risk flexibility.

By incorporating flexibility, businesses can better adapt to unexpected market changes and challenges and mitigate potential negative impacts. As the Chinese New Year approaches, there is anticipation that the late return of ships to Asia may lead to further delays and cancellations. Almost every rerouted ship has 10,000 containers, each of which has its own journey that needs to be rescheduled.

This issue can mean that some products will reach the shelves and be available to consumers later if the stock runs out. The economic growth of England in the first three months of 2024 reached 0.7%, which indicates that the country has come out of a weak economic recession, and the highest growth is related to the service sector. The forecast of an increase in gasoline consumption on the eve of the beginning of the summer holidays in the United States and the possibility of an increase in the demand for intermediate distillation products in the European market may lead to an increase in the demand for petroleum products in the coming weeks.

Due to periodic maintenance and low utilization rate in China's independent refineries, it is expected that the activities of Chinese refineries will stagnate in the coming weeks, but it is possible that the seasonal increase in diesel demand will accelerate the growth of refined product production and, as a result, the increase in crude oil demand. According to Platts, following the drop in demand for gasoline and diesel in China, reduction in refinery profits and periodic maintenance plans, the activity of China's state-owned refineries declined in June. About 1.43 million barrels per day of China's state-run refining capacity was non-operational in June. The average utilization percentage of China's 22 state-owned refineries fell from 78.7% in May to 78.4% in June 2024, which is the lowest figure in the last 22 months. From the total daily refining capacity of 10,800,000 barrels of crude oil of these refineries, there has been a demand for refining 8,470,000 barrels per day in June 2024. It is estimated that due to the weak demand for refined products in China in July, there will be no improvement in the refining capacity of China's state-owned refineries next month, but on the other hand, due to the completion of maintenance programs of private sector refineries, a different behavior in This section exists.

The demand for diesel fuel in the industrial and household sectors has remained stable, but in the transportation sector, due to the growth of gas fuel for heavy vehicles, the demand for diesel fuel in the Chinese market has decreased. In May 2024, Russian oil imports from India had an unprecedented increase and reached 2,100,000 barrels per day, which was caused by the increase in oil price discounts following the decrease in Chinese demand.

This brought Russia's share in the Indian oil market to about 41%. On the other hand, Saudi Arabia's oil imports from India fell to the lowest level in the last 10 months, the main reason of which is Aramco's decision to increase oil prices in long-term oil sales contracts for the second consecutive month in May 2024.

According to Platts, the demand for American light crude oil from South Korean refineries to produce intermediate distillation products has increased, so that with a 72% growth compared to last year, the import of American light crude oil from this country in May 2024 will reach reached 589 thousand barrels per day. Meanwhile, refining profits in May 2024 have dropped from $15 per barrel in the first three months of the year to $5.4 per barrel. It is worth noting that the total import of South Korean crude oil in the first five months of 2024 increased from 2 million 830 thousand barrels per day in the same period last year to 2 million 910 thousand barrels per day.

Among these, the import of crude oil originating in the United States increased by 23.1% from 382,000 barrels per day to 470,000 barrels per day, which has grown the most after the import of crude oil from the United Arab Emirates. Meanwhile, the growth of South Korea's crude oil imports from Kuwait, Qatar and Saudi Arabia has slowed down in the same period.

According to Platts, due to the problems of payment of expenses and the increase in debts of oil companies in Libya, "Shelmberge" company has announced that it will not provide new well drilling and completion services to Libyan companies from July 2024 and will not use the business opportunity of drilling and well completion operations. Libya will leave. The Iraqi government has launched a tender for the construction of a 450-kilometer oil pipeline from Rumila to the Haditha terminal in the east of the country with a daily capacity of 2.5 million barrels in order to diversify exports and replace the export route from the Persian Gulf.

The purpose of building this pipeline is to create export capacity from the Haditha export terminal to the countries of Turkey, Jordan and Syria, in addition to supplying feed to domestic refineries and power plants. Maintenance operations at Russia's busiest oil ports pushed crude oil shipments to their lowest level in three months last week.

Because the terminals of "Primorsk" in the Baltic Sea and "Kuzmino" in the Far East stopped the movement of ships for four days in the week ending June 23, as Bloomberg reported on Tuesday, last week the export of Russian crude oil by sea was 660 million barrels per day decreased compared to the previous week and reached the lowest figure in more than three months, i.e. 3.4 million barrels per day. According to Platts reports, while from January to May 2024, Russia's diesel fuel production dropped by 2% compared to the same period last year, but the country's diesel fuel exports reached 752,000 barrels per day in the week ending June 21.

According to the Reuters report, changing the route of Russian oil exports to China and India has played an important role in maintaining Russian financial flows and increasing the country's defense budget, which shows the high adaptability of Russian energy, so that its income increased from 529 billion rubles in June 2023 has reached 794 billion rubles in May 2024. Russian oil and gas revenues are expected to increase the Russian federal budget by 21% in 2024 compared to 2023. In this way, with the reduction of subsidies allocated to refineries in order to strengthen the economy against Western energy sanctions, it is predicted that in June 2024, Russia's oil and gas revenues will increase by 50% and reach 9.4 billion dollars. It is also expected that Russian crude oil exports will decrease due to Russia's agreements in OPEC Plus and the increased activity of its domestic refineries.

This issue will reduce the transfer rate of crude oil exports from the western ports of Russia in June 2024. According to Platts reports, the number of drilling rigs in the US increased by three devices to 627 rigs in the week ending June 12, 2024. In this period, the number of crude oil and gas rigs increased by 10 and decreased by 7 to 522 and 105 rigs, respectively. Analysts attribute the decline in the number of gas rigs largely to increased upstream operational efficiency due to faster drilling, reduced drilling and well completion times, more production technology with reduced operations, as well as increased consolidation and acquisition of shale fields. According to the Reuters report, in the continuation of the activities of acquisition and transfer of oil companies, the Spanish company "Repsol" announced that it sought to transfer 49% of its share of 100% ownership in the oil shale fields of the Eagle Ford area, which has a production capacity of 50,000 barrels per day.

It is worth 2 billion dollars. The reports of "Energy Intelligence" magazine show that the supply of crude oil in non-OPEC+ countries will undergo changes, so that the threats caused by the possible disruptions of seasonal hurricanes in the Gulf of Mexico, as well as the occurrence of forest fires in Canada, along with the slow supply of crude oil from The American side should be taken into consideration.

While, due to the lack of investment, the daily production of 1,700,000 barrels of crude oil in Angola has fallen below 1,100,000 barrels per day within the last decade due to the natural drop in production, and this country is due to differences with other OPEC members. Plus, has left OPEC. The CEO of "Afentra", one of the companies active in the development of oil fields in this country, announced that he plans to increase the production of crude oil in this country with the cooperation of international companies and attracting capital.

In the week ending June 21, 2024, US commercial crude oil storage increased by 3.6 million barrels to 460.7 million barrels. The commercial stocks of gasoline and intermediate distillation products of this country increased by 2 million 700 thousand barrels and decreased by 300 thousand barrels to 233 million 900 and 121 million 300 thousand barrels, respectively. An increase in commercial gasoline storage indicates an increase in refinery activities to supply fuel.

According to the report of "Plats" magazine, in the port of Fujairah of the United Arab Emirates, the storage of petroleum products in the week ending on June 24, 2024, with an increasing trend compared to the previous week, reached 17 million and 812 thousand barrels with an increase of 1%, which is from the end of the year. 2023 has increased by 2.7% so far. Reserves of light refined products, including gasoline and naphtha, increased by 2.8% compared to last week and reached 5,981,000 barrels. During this period, stocks of heavy refined products increased by 5.6% to 9.271 million barrels. Stockpiles of intermediate distillate products, including diesel and aviation fuels, decreased by 16% to 2,580,000 barrels, which has decreased for the third consecutive week compared to March 25, 2024.

The export of petroleum products from the UAE port of Fujairah reached 640,000 barrels per day in June 2024, with an increasing trend compared to the previous month. China's exports increased in May 2024 and experienced a growth of 7.6 percent compared to the same period last year, which was higher than the 1.4 percent growth of the country's exports in the first half of 2024, which was the opposite of the trend seen in 2023. was observed The most important factor in China's export increase was the growth of car exports, especially new electric cars, which grew by 33% in May 2024 compared to the same period in 2023. The biggest export destination for Chinese cars is Russia, which has witnessed a threefold growth in demand for Chinese cars in the past few years. Exports of Chinese cars to countries that are not members of the Organization for Economic Development and Cooperation, such as South America, Africa, and Southeast Asia, have also increased.

While the United States has imposed a 100% tariff and the European Union has imposed a 48% tariff on Chinese car imports. First, trade tensions are expected to increase in the world and the US will impose new tariffs on green technology industries. This issue can lead to the strengthening of China's economic relations with countries such as Russia and the countries of South America and Southeast Asia. Second, it is expected that the inflationary pressures in the economies of non-OECD countries, such as Russia, will decrease and imports from China will increase with the deepening of economic relations with China. The third consequence in terms of impact on energy demand is that it is estimated that the increase in China's car exports, as well as the support policies of the

Chinese government for the domestic consumption of domestically produced cars, will lead to the growth of the country's oil demand by 710 thousand barrels per day. US gasoline consumption is likely to increase in July due to increased road travel.

Also, with the increase in the demand for middle distillate products in the European market, the growth in the demand for oil products is likely in the coming weeks. It is expected that the consumption of Chinese refinery feed in the coming weeks will face stagnation due to periodic repairs of refineries, as well as a decrease in the demand for feed from independent refineries. Despite this, it is likely that from the beginning of August, with the seasonal improvement of diesel demand, the growth of crude oil demand for refining purposes will accelerate. Also, Brazil's crude oil production should recover again after completing a period of repairs that was longer than recent periods and lead to an increase in the supply of crude oil in the market.

Conclusion

Geopolitical tensions in the Middle East region have increased due to the Zionist regime's threats of a military attack on southern Lebanon. The increase in equipment and military forces of both sides, the bombardment of a village on the border of the two countries by the Zionist regime, and the order for American citizens to leave Lebanon have increased the possibility of increasing tensions. Due to the sending of American military equipment to Ukraine and the threat of an attack on the Russian port of Astrakhan by drone, the Russian refinery operations, which have been affected by the Ukrainian drone attacks, have reached 4 million and 800 thousand barrels per day. According to Platts report, until last week, about 452,000 barrels per day of Russian refinery capacity was taken out of orbit under the influence of drone attacks.

Meanwhile, the new drone strike strategy is to target Russian oil storage resources. In the latest wave of Ukrainian drone attacks, the storage site of the Tambov region connected to the Druzhba oil pipeline was targeted. According to "Platts" reports, the developments in the global price of gasoline market will have a great impact on the American elections, and most voters pay attention to sudden increases in gasoline prices. The low price of gasoline is the desired issue of both Republican and Democratic parties. While it seems that gasoline prices will increase in the months leading up to the American elections, the forecast of seasonal hurricanes until November 2024 will also cause more pressure on the market of light refining products. The approach of the Biden government towards the use of the strategic oil reserves of the United States indicates a special attention to the price of gasoline. American economic data shows relative stability of the inflation rate in May 2024 compared to April. Household consumption expenditure data shows a meager growth of 0.1 percent in May 2024 after a low growth of 0.3 percent in April. While the price of goods decreased by 0.4% in May 2024 compared to April, the rate of services increased by 2%. Inflation rate reached 2.6% in May, which was a slight change compared to 2.7% inflation rate in April 2024 and the lowest inflation rate since March 2021. It is worth noting that, while the inflation rate is higher than the 2% target rate of the Central Bank of the United States of America, but the mentioned economic data, the hope of economic experts on the chance of lowering the interest rate of the Central Bank of the United States of America by September this year has increased from 64% to 68%.

References

[1]Raut, R.; Narkhede, B.E.; Gardas, B.B.; Luong, H.T. An ISM approach for the barrier analysis in implementing sustainable practices The Indian

oil and gas sector. Benchmarking Int. J. **2018**, 25, 1245–1271. [Google Scholar] [CrossRef]

[2]Mahmood, Y.; Afrin, T.; Huang, Y.; Yodo, N. Sustainable Development for Oil and Gas Infrastructure from Risk, Reliability, and Resilience Perspectives. Sustainability **2023**, 15, 4953. [Google Scholar] [CrossRef]

[3]Isallah, H. The Impact of the Petroleum Industry Act on Corporate Social Responsibility and Taxation in Nigeria's Upstream Oil and Gas Sector: A Path towards Sustainable Development. Sustainability **2023**, 15, 15538. [Google Scholar] [CrossRef]

[4]Florescu, M.S.; Ceptureanu, E.G.; Cruceru, A.F.; Ceptureanu, S.I. Sustainable Supply Chain Management Strategy Influence on Supply Chain Management Functions in the Oil and Gas Distribution Industry. Energies **2019**, 12, 1632. [Google Scholar] [CrossRef]

[5]Alshammari, K.H.; Alshammari, A.F. Green Innovation and Its Effects on Innovation Climate and Environmental Sustainability: The Moderating Influence of Green Abilities and Strategies. Sustainability **2023**, 15, 15898. [Google Scholar] [CrossRef]

[6]AlNuaimi, B.K.; Mazrouei, M.A.; Jabeen, F. Enablers of green business process management in the oil and gas sector. Int. J. Product. Perform. Manag. **2020**, 68, 1671–1694. [Google Scholar] [CrossRef]

[7]Czachorowski, K.V. Cleaning Up Our Act: Systems Engineering to Promote Business Model Innovation for the Offshore Exploration and Production Supply Chain Operations. Sustainability **2021**, 13, 2113. [Google Scholar] [CrossRef]

[8]Elsayed, N.; Ammar, S. Sustainability governance and legitimisation processes: Gulf of Mexico oil spill. Sustain. Account. Manag. Policy J. **2020**, 11, 253–278. [Google Scholar] [CrossRef]

[9]Jagoda, K.; Wojcik, P. Implementation of risk management and corporate sustainability in the Canadian oil and gas industry: An evolutionary perspective. Account. Res. J. **2019**, 32, 381–398. [Google Scholar] [CrossRef]

[10] Busco, C.; Giovannoni, E.; Granà, F.; Izzo, M.F. Making sustainability meaningful: Aspirations, discourses and reporting practices. Account. Audit. Account. J. **2018**, 31, 2218–2246. [Google Scholar] [CrossRef]

[11] Phatak, S.; Sople, V. Drivers and Barriers of Sustainable Supply Chain: A Literature Review on Indian Perspective. Int. J. Bus. Insights Transform. **2018**, 12, 17–25. [Google Scholar]

[12] Lau, H.C.; Tsai, S.C. Toward Cleaner and More Sustainable Cement Production in Vietnam via Carbon Capture and Storage. Sustainability **2024**, 16, 942. [Google Scholar] [CrossRef]

[13] Zihan, W.; Makhbul, Z.K.M.; Alam, S.S. Green Human Resource Management in Practice: Assessing the Impact of Readiness and Corporate Social Responsibility on Organizational Change. Sustainability **2024**, 16, 1153. [Google Scholar] [CrossRef]

[14] Doni, F.; Corvino, A.; Martini, S.B. Corporate governance model, stakeholder engagement and social issues evidence from European oil and gas industry. Soc. Responsib. J. **2021**. ahead-of-print. [Google Scholar] [CrossRef]

[15] Villegas, L.E.; Acuña-Duarte, A.A.; Salazar, C.A. Corporate Social Responsibility and the Willingness to Eco-Innovate among Chilean Firms. Sustainability **2023**, 15, 9832. [Google Scholar] [CrossRef]

[16] Narimissa, O.; Kangarani-Farahani, A.; Molla-Alizadeh-Zavardehi, S. Drivers and barriers for implementation and improvement of Sustainable Supply Chain Management. Sustain. Dev. **2020**, 28, 247–258. [Google Scholar] [CrossRef]

[17] Otsubo, Y.; Chapman, A.J. Assessing Corporate Vendor Selection in the Oil and Gas Industry: A Review of Green Strategies and Carbon Reduction Options. Sustainability **2023**, 15, 16249. [Google Scholar] [CrossRef]

[18] Feng, M.; Yu, W.; Wang, X.; Wong, C.Y.; Xu, M.; Xiao, Z. Green supply chain management and financial performance: The mediating roles of operational and environmental performance. Bus. Strategy Environ. **2018**, 27, 811–824. [Google Scholar] [CrossRef]
[19] Lopes, L.J.; Pires, S.R.I. Green supply chain management in the automotive industry: A study in Brazil. Bus. Strategy Environ. **2020**, 29, 2755–2769. [Google Scholar] [CrossRef]
[20] Pinto, L. Green supply chain practices and company performance in Portuguese manufacturing sector. Bus. Strategy Environ. **2020**, 29, 1832–1849. [Google Scholar] [CrossRef]
[21] Zhou, L.; Nunes, M.B. Doing qualitative research in Chinese contexts Lessons learned from conducting interviews in a Chinese healthcare environment. Libr. Hi Tech **2013**, 31, 419–434. [Google Scholar] [CrossRef]
[22] Teixeira, A.A.; Moraes, T.E.D.C.; Stefanelli, N.O.; de Oliveira, J.H.C.; Teixeira, T.B.; de Souza Freitas, W.R. Green supply chain management in Latin America: Systematic literature review and future directions. Environ. Qual. Manag. **2020**, 30, 47–73. [Google Scholar] [CrossRef]
[23] Jatav, S.; Nema, J. Green Supply Chain Management: Drivers, Practices and Performance. IUP J. Oper. Manag. **2021**, 20, 45–71. [Google Scholar]
[24] Abdullah, M.I.; Sarfraz, M.; Qun, W.; Javaid, N. Drivers Of Green Supply Chain Management. LogForum **2018**, 14, 437–447. [Google Scholar] [CrossRef]
[25] Abebaw, H.; Virdi, S.S. Green Supply Chain Management Practices in Ethiopia's Leather and Leather Product Industry. IUP J. Supply Chain. Manag. **2019**, 16, 25–42. [Google Scholar]
[26] Alghababsheh, M.; Gallear, D.; Rahman, M. Balancing the Scales of Justice: Do Perceptions of 'Buyers Justice' Drive Suppliers' Social Performance? J. Bus. Ethics **2020**, 163, 125–150. [Google Scholar] [CrossRef]
[27] Ali, S.S.; Kaur, R.; Ersöz, F.; Altaf, B.; Basu, A.; Weber, G.W. Measuring carbon performance for sustainable green supply chain practices: A developing country scenario. Cent. Eur. J. Oper. Res. **2020**, 28, 1389–1416. [Google Scholar] [CrossRef]
[28] Gruner, R.L.; Power, D. Analogical reasoning guidelines: A review and application to sustainable supply chains. Supply Chain. Manag. Int. J. **2021**, 26, 153–173. [Google Scholar] [CrossRef]
[29] Khairani, N.S.; Kasim, E.S.; Rajamanoharan, I.D.; Misman, F.N. Critical Success Factors of Green Supply Chain Management: Case Evidence of a Malaysian Automotive Manufacturer. Asia-Pac. Manag. Account. J. **2017**, 12, 105–127. [Google Scholar]
[30] Prasad, D.S.; Pradhan, R.P.; Gaurav, K.; Chatterjee, P.P.; Kaur, I.; Dash, S.; Nayak, S. Analysing the critical success factors for implementation of sustainable supply chain management: An Indian case study. Decision **2018**, 45, 3–25. [Google Scholar] [CrossRef]
[31] Raman, R.; Sreenivasan, A.; Ma, S.; Patwardhan, A.; Nedungadi, P. Green Supply Chain Management Research Trends and Linkages to UN Sustainable Development Goals. Sustainability **2023**, 15, 15848. [Google Scholar] [CrossRef]
[32] Tseng, M.-L.; Islam, M.S.; Karia, N.; Fauzi, F.A. literature review on green supply chain management: Trends and future challenges. Resour. Conserv. Recycl. **2019**, 141, 145–162. [Google Scholar] [CrossRef]
[33] Zhu, Q.; Qu, Y.; Geng, Y.; Fujita, T. A Comparison of Regulatory Awareness and Green Supply Chain Management Practices Among Chinese and Japanese Manufacturers. Bus. Strategy Environ. **2017**, 26, 18–30. [Google Scholar] [CrossRef]
[34] Aslam, H.; Waseem, M.; Khurram, M. Impact of Green Supply Chain Management Practices on Corporate Image: Mediating role of

Green Communications. Pak. J. Commer. Soc. Sci. **2019**, 13, 581–598. [Google Scholar]
[35] Jawaad, M.; Zafar, S. Improving sustainable development and firm performance in emerging economies by implementing green supply chain activities. Sustain. Dev. **2020**, 28, 25–38. [Google Scholar] [CrossRef]
[36] Rentizelas, A.; de Sousa Jabbour, A.B.L.; Al Balushi, A.D.; Tuni, A. Social sustainability in the oil and gas industry: Institutional pressure and the management of sustainable supply chains. Ann. Oper. Res. **2020**, 290, 279–300. [Google Scholar] [CrossRef]
[37] Munodawafa, R.T.; Johl, S.K. Measurement development for eco-innovation capabilities of Malaysian oil and gas firms. Int. J. Product. Perform. Manag. **2021**, 71, 3443–3465. [Google Scholar] [CrossRef]
[38] Singh, A.S. Conducting case study research in non-profit organisations. Qual. Mark. Res. Int. J. **2014**, 17, 77–84. [Google Scholar] [CrossRef]
[39] Yin, R. Validity and generalization in future case study evaluations. Evaluation **2013**, 19, 321–333. [Google Scholar] [CrossRef]
[40] Verleye, K. Designing, writing-up and reviewing case study research: An equifinality perspective. J. Serv. Manag. **2019**, 30, 549–576. [Google Scholar] [CrossRef]
[41] Silverman, D. Doing Qualitative Research: A Practical Handbook, 3rd ed.; Sage Publications: London, UK, 2010. [Google Scholar]
[42] Seuring, S.A. Assessing the rigor of case study research in supply chain management. Supply Chain. Manag. Int. J. **2008**, 13, 128–137. [Google Scholar] [CrossRef]
[43] Saunders, B.; Sim, J.; Kingstone, T.; Baker, S.; Waterfield, J.; Bartlam, B.; Burroughs, H.; Jinks, C. Saturation in qualitative research: Exploring its conceptualization and operationalization. Qual. Quant. **2018**, 52, 1893–1907. [Google Scholar] [CrossRef] [PubMed]
[44] Rowley, J. Using Case Studies in Research. Manag. Res. News **2002**, 25, 16–27. [Google Scholar] [CrossRef]
[45] Qu, S.Q.; Dumay, J. The qualitative research interview. Qual. Res. Account. Manag. **2011**, 8, 238–264. [Google Scholar] [CrossRef]
[46] Ndubisi, N.O.; Al-Shuridah, O.; Capel, C. Greening multinational enterprises in the oil, gas and petrochemicals Environmental sustainability and the moderation role of environmental sensitivity. Int. J. Manpow. **2020**, 41, 967–985. [Google Scholar] [CrossRef]
[47] Kitsis, A.M.; Chen, I.J. Do motives matter? Examining the relationships between motives, SSCM practices and TBL performance. Supply Chain. Manag. Int. J. **2020**, 25, 325–341. [Google Scholar] [CrossRef]
[48] Carruthers, J. A Rationale for the Use of Semi-structured Interviews. J. Educ. Adm. **1990**, 28, 63–68. [Google Scholar] [CrossRef]
[49] Alam, M.K. A systematic qualitative case study: Questions, data collection, NVivo analysis and saturation. Qual. Res. Organ. Manag. Int. J. **2021**, 16, 1–31. [Google Scholar] [CrossRef]
a. Pathiranage, Y.L.; Jayatilake, L.V.K.; Abeysekera, R. Case Study Research Design for Exploration of Organizational Culture Towards Corporate Performance. Rev. Int. Comp. Manag. **2020**, 20, 361–372. [Google Scholar]