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THE QATARI EXPERIENCE IN THE NATURAL GAS INDUSTRY AND THE POSSIBILITY OF BENEFITING FROM IT IN IRAQ

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Abstract
In the beginning it was gas, then its fruits fell on the Qataris, development, leadership, and a distinctive experience worthy of study, as Qatar turned the gas in the depths of the Gulf into a ladder that raised it to the ranks of global leadership in this industry.

This advancement did not come by chance, but was serious work full of challenges, difficulties, and opportunities. Wisdom says: (Seize opportunities, for they pass over you like clouds). Qatar seized its opportunity and achieved, in record time, a successful and inspiring experience for others. Hence the idea of the research came to shed light on this experience. To benefit from it in its success story, and what it produced in the face of the challenges and obstacles it experienced, through self-reliance and benefiting from others in their participation in their technology, and thus managed a distinctive experience that was imprinted with its Qatari imprint through successful economic, administrative and technological policies. From here came the possibility of benefiting and applying appropriate Including in the Iraqi gas sector.

Introduction

Today, the world is moving towards clean energy for many reasons , the most prominent of which is pollution. Natural gas is considered one of the most important of these energies as a clean fuel. Over the past few years, global energy markets have witnessed many structural changes that have had a profound impact on many countries of the world. This change and steady growth has affected global energy markets, both renewable and non- renewable . Expectations for non-renewable energy markets indicate the growing and important role played by natural gas in these global markets.

The surrounding conditions and characteristics of natural gas production, its high flexibility in shipping, safety and ease of supply, in addition to the fact that it is one of the most environmentally friendly types of non-renewable energy in terms of pollution levels, make it an important candidate as a fuel for the future.

All of these characteristics make the natural gas production process an efficient and competitive process in the face of all these data, especially the growing demand in global energy markets for liquefied natural gas, specifically from emerging economies and some major countries such as China and Japan . In this context comes a small country with a large area of natural gas reserves and an important experience in the 1990s , namely the State of Qatar , which faced challenges and obstacles that it successfully overcame to assume global leadership in LNG industry across An integrated vision based on strategic planning that aims to develop resources on a broader geographical scale and ensures crossing the boundaries of the national geographical area to ensure the generation of sustainable income through the interconnection of other vital sectors related to manufacturing, marketing and services. In light of the above , the scientific importance of studying this experiment becomes clear . And the possibility of benefiting from it and applying it in Iraq as appropriate. The research started from a problem and a hypothesis, as shown below.

Research problem:

Is the Qatari experience considered a successful and distinguished experience? What is the face of its success and distinction. ?

Is this experience worth studying to be a role model ? What is special about her that makes her a role model for others? What are the circumstances and what are the similarities and similarities with the Qatari experience so that Iraq can benefit from it? What are the lessons learned from it to be applied. ?

Research hypothesis:

Qatar's experience is a distinguished and successful experience and deserves to be emulated and lessons taken from it to benefit from and apply them in Iraq , taking into account some necessary differences.

The importance of the research:

- The importance of research lies in not wasting time, effort and money and starting where others left off. In simulating this experience practically.
- How was the problem of financing investment overcome?
- How was global markets reached and the marketing process achieved?
- What are the policies followed to reach the goals?
- What is the role of energy diplomacy and the Qatar Investment Authority?

Research Aims:

- Statement of the scientific, economic, administrative and technological ideas of the Qatari experience. He explained the implications of the Qatari experience in the natural gas industry.
- Can this be simulated in Iraq? And why. ?
- What is it What type of technology did the Qataris use in the LNG/LPG/GTL natural gas industry and why?

- The research included three detailed sections below, and included an introduction and a summary in Arabic and English, as well as conclusions, recommendations, and sources at the conclusion of the research.

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Chapter One : The theoretical framework : natural gas and the Qatari experience

This chapter deals with two sections:

The first topic: Natural gas (its concept, components , types(

The second section: The Qatari experience in natural gas

The first topic: Natural gas (its concept, components , types)(

1.Natural gas concept:

It is one of the forms of fossil fuels that are extracted from the ground. It is one of the non-renewable energy sources because it took millions of years to form in the ground as a result of organic organisms being exposed to intense heat and pressure for a long period of time. Natural gas is characterized by high combustion efficiency and is considered today a low-cost energy source. It is found in places where oil is found in the organic layers of the earth and coal mines. (Al-Rawi 2016: 32).

Natural gas is also known as a mixture of hydrocarbon gases with some impurities or pollutants resulting from decomposed organic materials. Pollutants also present include water vapor and heavy hydrocarbons. These pollutants are considered undesirable and are usually removed through various natural gas treatment plants (Abdel Ali 2013 : 45).

The components of natural gas are carbon and hydrogen resulting from decomposition, so the gases in it are called hydrocarbon gases that are usually found in natural gas, which are methane and ethane . Propane , butane, pentane, and small amounts of hexane , heptane,

octane, and heavy gases . Then they are linked together and form what is called methane gas, which forms the basis of natural gas, in addition to other gases in small percentages such as helium, nitrogen, carbon dioxide, and others. The use of this gas and its combustion leads to the formation of carbon monoxide, in addition to another group of gases called " greenhouse gases" because they are the most common causes of Climate change on the Earth's surface, global warming, and the melting of the polar ice (Abdullah 2013 : 13)

Gas is considered one of the energy sources that pollutes the environment the least M N Oil i And who Al-Mahrouqa T High efficiency, low cost. Natural gas is an important source of primary energy for the chemical industry, as it is extracted from wells similar to wells . Natural gas in Qatar is divided into two categories : associated gas and non-associated gas. If natural gas is present with... nf i _ In the same field it is called associated gas. If the field contains only natural gas without nf i _ It is called a free or non-associated gas . There are many gas gatherings far from the beach, and the gas is transported by pipe from the coastal production platforms to a collection point on the beach and from there to the gas refinery where it is purified from impurities and unwanted compounds. Gas fields exist both in the sea and on land.

Raw natural gas consists primarily of methane (4CH). And ethane (6 (C 2 H) . Which are considered the shortest and lightest hydrocarbon molecules. It often also contains varying amounts of other compounds, as shown in Table No. 1)

It also contains water vapor, liquid water, salts, acid gases, and very small amounts of mercury, mainly in its elemental form, but it is possible that chlorides and other types are present, and some studies indicate that it contains natural radioactive materials such as radon. The water resulting from the treatment process may also contain Natural gas contains traces of radium, which can accumulate inside pipes and processing equipment, and this can make the pipes and equipment radioactive over time (Al-Khatib: 50)

Table (1): The main components of gas

Weight (%)Section	The ratio (%)Volumetric	Formula Chemical	Component
60	81	CH4 _	Meetha N
7.7		C2H6	eth a n
13.5	6.6	C3H8	Proba n
10.8	4	C4H10	Butane
4.8	1.4	C5H12	Bintan
1.3	1	N2 _	Nitrogen _ _
0.33	0.7	CO2 _	Carbon Dioxide

Source : Nabil Jaafar Abdel Redha, Amjad Sabah Abdel-Aali , The Economics of the Natural Gas Industry, (Basra: Al-Ghadeer Printing and Publishing Limited, 2015) .

1- Types of natural gas :

There are three main types of natural gas: (Abdul Redha et al.: 15-2019)

1- free natural gas (Free gas):

- It is a hydrocarbon compound found in the form of free gases in natural gas fields. It is either:
- Dry gas : This is the gas that consists mainly of methane and ethane , with a smaller percentage of other hydrocarbon gases.

2- wet gas _ _ It is the gas that contains n- tannes and heavier paraffins as liquids at normal temperature and atmospheric pressure.

3- Associated natural gas :

- is dissolved in it , and the majority of it is methane and small amounts of carbon dioxide (CO2) and hydrogen sulfide gas (H2S).

A- Unconventional natural gas gas):

It is divided into the following types:-

- Shale gas__ :

What is meant by shale or stone gas or slate gas is that natural gas that was generated as a result of formational conditions millions of years ago inside the shale rocks due to heat and pressure and remained trapped inside the cavities of those solid rocks that do not allow it to penetrate and also contain crude oil.

- Tight gas_ :

It is a natural gas found in rock formations with low permeability.

- Coal bed gas methane:(

It is the gas that comes with coal seams.

Gas hydrate (Natural gas hydrates:(

It consists of natural gas trapped in layers of ice water.

The second section: The Qatari experience in the natural gas industry

Introduction:

Qatar is considered the third largest country that exports natural gas in the world, and the amount of natural gas reserves in Qatar amounts to about 15 % of the total natural gas reserves discovered in the world. This is equivalent to 900 trillion cubic feet. The largest natural gas expansion in the Middle East region occurred in Qatar, where Qatar's natural gas production rate increased by 17 % . 9 %, which is equivalent to about 5 . 8 billion cubic feet . Qatar has many natural gas sources, and it also contains the largest natural gas fields in the world, which is the South Pars field, which is also called the North Gas Field. This field was discovered in 1971 . Work and production began in 1989 . The South Pars or North Gas Field is located in the Arabian Gulf and is shared by Qatar and Iran. It includes about 50 . 97 trillion cubic meters of natural gas, making it classified as the largest natural gas field in the world. The area of the South Pars field or the North gas field is about 9,700 square kilometers. There are about 6,000 km of them in Qatar's territorial waters, while the rest is in Iranian waters (Tim 2018: 106)

1- Historical development of the gas industry in Qatar:

The first oil well in Qatar was drilled in the "Dukhan 1 " oil field in 1940 , but the beginning of World War II caused a delay in the development of the country's hydrocarbon resources. Qatar enjoyed offshore exploration and production concessions in 1949 , and the first shipment of crude oil was exported from the field on December 31 of that year.

Production of crude oil and gas began in 1965 in the fields of Maidan Mahzam and Bu Hanin in 1972 . In 1977 , Qatar completely nationalized its onshore and offshore oil and gas operations. Currently, the Dukhan field , located 80 km west of Doha, covers an area of 80 km by 8 km, and has a production capacity of 335 thousand barrels per day. The field, which includes 598 wells beginning in 2016 , is divided into three sectors: Khatiya , Fahaheel , and Jaliha/Diab . It also contains four stations where oil and gas are separated, which are Khatiya North Station, Khatiya Main Station, and Fahaheel Main Station. And Jaliha station (Musa : 98)

The North Gas Field for natural gas was discovered in Qatar in 1971 and production began in 1988 , with the first LNG exports heading to Spain in 1997 . The field covers an area of six thousand square kilometers, or about half the area of Qatar. With total recoverable gas exceeding 900 trillion standard cubic feet, this field is considered the largest non-associated gas field in the world . The first commercial production phase began in late 1991 . By 2008 , production averaged 750 million cubic feet of gas and 24,000 barrels per day of stabilized condensate, with gas used primarily in the domestic market and gas condensate for refining and export.

For more than a decade, Qatar has been the world's leading supplier of liquefied natural gas. The country seeks to enhance its market share and increase production by 43 percent by 2024 , i.e. moving from 77 million to 110 million tons annually. While most of Qatar's growth during the decades following independence in 1971 was thanks to crude oil, natural gas succeeded in gaining great importance during the 1990s. In 2018 , Qatar announced its intention to withdraw from the Organization of the Petroleum Exporting Countries (OPEC), which it was one of the first member states to join in 1961 , in order to focus on gas. Qatar’s ambitions indicate that it will be in a strong position to make remarkable progress, especially In light of the increase in global demand for natural gas, forecasts for the year 2040 in “Energy Outlook 2018 ” from British Petroleum (BP) indicate that global demand for gas is expected to grow at a faster pace than oil or coal, with demand for primary energy increasing by one-third over the next 25 years . The added capacity will provide Qatar with the opportunity to increasingly leverage and expand its overall market share (Al- Halafi et al.: 105).

2- Gas uses.

Qatar was able to benefit from the gas in several ways after it was processed, by selling it, or using it to generate electricity on site using electric generators or a turbine engine . You can also inject gas into the reservoir to enhance or improve oil extraction or be used as a raw material in petrochemical plants, as natural gas is considered the cleanest burning fossil fuel. Natural gas is part of the future of renewable energy. While natural gas competes against renewables for energy market share, the two sources complement each other in supporting global energy needs while reducing carbon emissions.

3- Natural gas is used in Qatar in many sectors:

Among the most important uses of natural gas are the following (Abdul Reda et al. 2015 : 23-32)

A- Electricity generation: Natural gas is the main source of electricity generation

B- Heating: The heat produced by natural gas gives greater warmth than that produced by electric heaters.

C- Cogeneration: Natural gas is used in the process of generating electrical and thermal energy together using some technological means.

D- Transportation: Natural gas has been used as a vehicle fuel since the 1930s.

E- Manufacturing processes: Natural gas is used in many industrial processes; Such as steel iron production, paper industries, and petrochemical industries. Such as the manufacture of plastics, fertilizers, cosmetics, and medicines.

Chapter Two : Vision Qatar integrated (economic, administrative and technological) in the natural gas industry

This chapter includes two sections as shown below.

The first topic: the experience of the Qatari gas industry (Motivations, obstacles, and success factors)

The natural gas industry means those industrial processes designed to purify raw natural gas by removing impurities, pollutants and high molecular mass hydrocarbons to produce what is known as dry natural gas (final sales gas) within Quality standards specified for pipelines for the purpose of marketing them. This industry goes through three stages:

1- Upstream stage :

The operations include exploration, reservoir study, drilling, and extraction (production).

2- Mid -stream :

This stage is in the middle of the upstream and downstream stages, which is the stage of processing the liquefaction of the gas, separating its compounds, getting rid of impurities and harmful substances, converting it into a liquid in order to facilitate its transportation, and then using it as a final product used in the transportation sectors or the chemical and petrochemical industries.

3- Downstream stage :

This is the final stage and includes distributing and marketing the product to the consumer either through a network of pipelines or oil and gas tankers.

can be depicted as in the figure below:

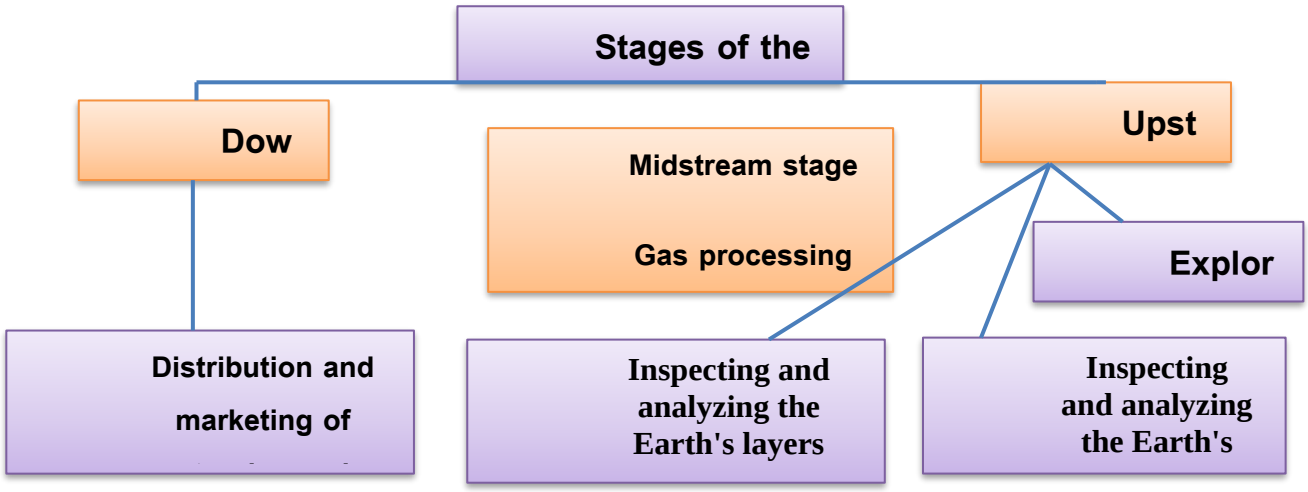


Figure (1): Stages of the gas industry

:Bushra Reda Muhammad, Risk Management and Insurance in Oil Projects (Baghdad .Dar Al-Kutub Al-Ilmiyyah, 2019), p

The second section: Motives and obstacles Qatari gas industry.

The topic can be dealt with in its order, starting with the motivations (Abdul Reda et al. 2015, pp. 85-86). Then the obstacles

main motivations for Qatar's interest in the gas industry.**Increased** importance of gas

A. An increase in the per capita consumption rate of natural gas in the GCC countries.

B. Increasing the volume of industrial consumption of natural gas in the sectors (electricity and energy, the service and household sectors, and the industrial sector of the iron, steel, aluminum and petrochemical industries).

c- Using natural gas to maintain pressure and production in oil fields.

1- Obstacles to the gas industry in Qatar The obstacles can be summarized as follows:

a- The huge natural gas reserves discovered and how to develop investment plans for them.

b- Lack of necessary infrastructure.

c- The high costs of establishing natural gas industry projects.

d- The geographical distance of Qatar from the main markets (Asian, European, American).

e- LNG markets suffer from pricing problems and achieving a balance between supply and demand.

f- The emergence of new competitors, such as the United States of America and Australia, has rapidly strengthened Qatar’s capabilities to increase supply rates to various markets, including Europe.

g- Fear of a glut in supply or impact on Russia’s exports to Europe, given that Qatar is a competitor to Russia in this field (Zeini) 2015)

h- Tactical withdrawal from OPEC to focus on developing gas projects.

1- Challenges of investing in sustainable infrastructure and supporting means of production :

In this regard, the Chairman of the Board of Directors and CEO of the French company Total, Patrick Pouyanné , says that the dynamics of the gas market have changed between yesterday and today, and have contributed to a positive development in this sector, and have also increased the connectivity of countries to each other . He talked about major challenges related to supply lines, especially in the Eastern Mediterranean region, where signs of tension appear between a number of countries in this extended location, and it has become attracted by conflicts that appear to be related to gas exploration, but whose essence is political.

have expanded dramatically for the State of Qatar recently, especially after the US Energy Information Administration revealed, in a recent report, that Doha is heading towards losing its position as the first exporter of liquefied natural gas in the world, to Australia, and the entry of new players into the international gas market. The American network CNBC announced that Australia will snatch from Qatar its title as the largest exporter of liquefied natural gas in the world during the next year, while Australia is working to increase production with a group of export projects worth billions of dollars. The Australian government said that Australia and Qatar continued to compete for It was named the largest exporter of liquefied natural gas in the world in the first 5 months of 2019 , but it was able to export larger quantities of liquefied gas than Qatar in November 2018 and April 2019. The US Energy Information Administration explained that Australia has already surpassed Qatar in capacity. LNG production, as new facilities pushed Australia's export capacity from 2.6 billion cubic feet per day in 2011 to more than 11.4 billion cubic feet per day in 2019. Hence, it can be said that Doha has suffered greatly , for several reasons, from Including that it announced at the end of 2018 its withdrawal from the Organization of Petroleum Exporting Countries (OPEC) to devote itself entirely to developing gas projects. Since that crisis, four Arab countries - the Emirates, Saudi Arabia, Bahrain, and Egypt - cut off their relations with Doha in 2017 , and as a result, the Qatari economy witnessed a decline. It led to a large financial deficit and a decline in the local stock market (Ahmed et al. 2019 :145).

In order to discuss the above, some observations can be made.

The idea began in 1962 from the recommendations of the Arthur D. Littell Company, but it is noted that its actual beginning was in 1991, a period of approximately 30 years. Some analysts explained that the October 1973 war, the Iranian revolution, and the Iran-Iraq war were what hindered the development of the gas wealth, but This does not seem convincing, as the difference between 1962 and 1973 is approximately 10 years, and the difference between the proposal (Arthur D. Little Company 1962) and the Iranian revolution and the Iran-Iraq war of 1980 is approximately 17 years, and therefore it seems that the real reason is that the will and vision were not clear. At that time.

It is also noted that the decline in oil prices coincided in 1991, which affected the Qatari state budget, which led it to seek the opinion of the Arthur D. Little company and implement its recommendations, the most important of which was to invest in the natural gas sector. Indeed,

the Qatari experiment was launched willingly . Solid , flexible management and a clear vision, especially in 1997, and this is what qualified it to reach international level and leadership.

Factors for the success of the national experiment :

1- The availability of political will, a clear vision, and the adoption of successful steps and policies by providing all the necessary requirements to develop the natural gas industry.

2- LNG industry and contracting with major international companies to benefit from their expertise, technology and capital as a strategic partner in most natural gas projects, with the largest percentage remaining for national companies.

3- Introducing the latest technologies available in the natural gas industry and providing financial resources for this, whether through the national budget, investment partners, or through signing long-term contracts to market gas.

4- Using innovative marketing methods, such as building private ports in other countries to receive natural gas shipments, in addition to using various marketing methods, and not focusing on a specific destination.

5- The gas sector has contributed to the development of many related industries.

6- The policies and strategies followed by Qatar in this sector encouraged international companies to enter into joint projects to produce and develop the natural gas industry, which benefited the Qatari economy and the Qatari individual alike (Al-Jawarin: 12-13).

Based on the above, it can be said that the Qatari experience is distinctive and deserves study for the following reasons:Transforming obstacles and challenges into successful opportunities on the ground.

- Great interest in maritime transport and building an advanced fleet .
- Knowing the extent of the capacity of the Qatari state and the limits of its capabilities as a state, taking into account the growth of this capacity in the future, especially the magnitude of gas reserves.
- Qatar did not follow immediate nationalization and preferred a gradual process between itself and foreign companies for several factors, including its lack in the beginning of advanced staff capable of managing technical operations with high efficiency, in addition to the lack of skilled workers, and all of this requires time to build, establish, and develop.
- A careful reading of the technical and geopolitical aspects of the impact of natural gas and its global importance.
- Using negotiation skills and energy diplomacy with great professionalism.
- Taking into account environmental variables and sustainable development goals.
- High flexibility in managing natural resources, especially natural gas, economically, technologically, administratively, and even legislatively.
- The delay in investing in laurel and converting to it from oil occurred in difficult circumstances.

It appears to the researcher, when analyzing Qatar’s vision, that it followed the opposite strategy to the obstacles of the natural gas industry mentioned above, and turned the threat into a successful opportunity. It agreed with international companies to invest its huge natural gas reserves in order to overcome the following problems:

Problems of lack of infrastructure.

1- Technology problems.=

2- Financing problems.

Qatar knows that huge reserves require long, medium and short-term contracts, and through the principle of solid political will and flexible economic management, Qatar has overcome many difficulties and challenges.

It developed the strategic plan, devoted sufficient time to it, and carried out a set of studies to invest in the North Field in an optimal way. This strengthened the Qataris' awareness of the transformation of natural gas into the world's preferred fuel in the energy generation and industry sector (Abdul -Rida et al. 2015: 68).

A large part of the success of the Qatari experience in developing the natural gas industry is due to the approach of the Qatari government, which worked to encourage foreign investment through stable financial and regulatory policies, and in light of an ambitious economy based on the market system. This renaissance was not a coincidence, but rather came as a result of economic developments. The Qatari experience It is unique not only in managing natural gas reserves and production and liquefaction stations, but it also included shipping and receiving stations in line with the scope of the project and has thus become one of the largest exporters of natural gas in the world (Muhammad et al. 2020: 79).

Three can be monitored Strategies that overlap and complement each other , and will be discussed in two sections, as shown below.

The second section: economic strategy and administrative policies

The first requirement is the economic strategy : It includes four policies, which are as follows

1- of Scale Policy

Which aims to increase revenues and reduce expenses.

When Qatar started the liquefied natural gas industry, it faced great challenges, but it benefited from two important events that combined to increase demand for its natural gas:

a- Reducing costs at various stages of the liquefied natural gas (LNG) processing chain .

b- Widespread use of compact gas turbines.

Qatar has reshaped its strategy and redirected its gas resources from the stage of being satisfied with generating energy locally and producing petrochemicals for export to global markets (Dargen 2021:6).

After 2010, when Qatar fell from its position to second place after Australia, Qatar faced two new challenges: (Dargen 2021:6).

1- The abundance of liquefied natural gas (LNG) is a result of other countries entering into competition against Qatar, such as Russia, America and Australia.

2- Decreased demand in 2014 and beyond .

It can be said that the increase in supply of gas and the decrease in demand for it will inevitably lead to a decrease in prices . It can also be said that Qatar's policy was derived from the relationship of elasticity of the commodity, but the decrease in prices may have led the Qataris to adopt the second form of this strategy , which says that the non-essential commodity cannot

Raising its price, or even increasing its quantities, in order to obtain and maintain the total revenue undiminished from what was previously mentioned.

Therefore, in 2017, the Qatari leadership decided to lift the voluntary suspension of production in the North Field, and in 2019 it announced its new plan to reach production from (77) million tons annually to (126) million tons annually by 202727.

From the beginning, maximizing revenues and reducing costs lies in economies of scale, which indicate that increasing the production volume in the early stages will result in costs decreasing in the long run and being less and less, which means that the curve of average costs in the long run slopes downward to express the resulting decrease . in its value until it reaches its lowest value, and this is due to what is called (economies of scale), that is, the advantages that accompany the volume of production and decreasing costs in the long run, and among these savings are the following (Kazim 2013: 230-231 (

- Losses resulting from the increased degree of specialization and division of labor. With a large size of the facility and an increase in employees, the degree of specialization and division of labor will increase among all workers in the facility, thus achieving greater benefit from the principle of division of labor.
- savings resulting from the use of larger equipment and machines with higher production efficiency , especially as there are some indivisible equipment and machines, and the use and development of modern technology will lead to increasing and developing production and reducing costs.
- savings resulting from attracting experts, managers, and those with rare competencies and experience, and benefiting from them in following modern methods of management and increasing their efficiency.
- savings resulting from the large establishment obtaining marketing advantages when purchasing due to gaining better conditions and quality of production requirements on the one hand, and also obtaining greater competitive capabilities when selling, and thus its greater ability to introduce new goods to the market.
- savings resulting from a large facility obtaining multiple financial savings due to the confidence of financial institutions in the solidity of its financial position, which is represented by obtaining loans easily and at a lower cost.
- Risk savings: The risks to which large establishments are exposed can be reduced by diversifying production and diversifying the markets in which they distribute their production, as well as diversifying the sources of the establishment's access to its requirements involved in production.

3- Economic rent-seeking policy:

There are some studies that neglect to include rent as a financial part or share that belongs to the state, as these studies compare the profitability of oil and the profitability of gas, and estimate the difference between the cost and the selling price as a profit and then attribute it to investments to extract what they call the rate of return on investment (Abdullah 2013 : 18).

The shortcoming in this analysis is that it ignores the right of the country exporting the natural hydrocarbon resource (oil or gas) to obtain rent as its fair share as it is the price for the depletion of this resource, and this price is taken independently of the investments that were spent in searching for, developing and producing from the fields, and this share Or the fixed

share was known as royalty , which is a specific percentage of oil production that the host country receives, regardless of the project's profitability or loss (Abdullah 2013 : 18).

4- The policy of flexible dealing with OPEC disease:

Qatar has begun a flexible policy with the gas exporting countries, which have been lenient with some of the commonly accepted conditions in gas contracts. This matter or disease is similar to the disease of the OPEC organization, which can be called OPEC disease (OPEC disease), which is the conflict and difference between the public interest and the private interest. If the latter is given priority, the power will be weakened . Negotiating and bargaining towards consumers, and the market transforms, just as it transformed in OPEC, from a producers' market to a consumers' market.

The negotiating position of the exporting countries weakens in the face of gas importers from industrialized countries and others, which are supported by their companies and banks that control gas export financing, and the lack of coordination between them. Then, the importers will be able to waive many conditions contained in gas contracts and purchases, such as:

a- Take -or - Pay condition .

b- Minimum price condition

These two conditions provide the gas exporting state or its companies with a minimum level of cash flow and allow it the opportunity to obtain easily and with reasonable conditions the loans necessary to finance the project. However, the Omani project for liquefying and exporting gas waived the minimum condition, which encouraged importers of Qatari gas to demand the cancellation of the condition from their contracts and it was achieved for them. This condition (Abdullah: 18).

5- Income diversification policy, which is completely consistent with the sum of points 2 and 3 of the technological policies, as will follow.

The second requirement: strategy Administrative : It is possible State it with the following points :

1- The policy of using companies as soft tools for the state and its economic arms to manage gas wealth inside and outside the country. This strategy varies in terms of paying attention to companies and giving them an important economic role by multiplying them at times, merging and streamlining them at other times, streamlining and reducing their workers, or creating new companies that perform new roles (Dargen: 8-9)

Qatargas was established in 1984, in partnership with the French Total, Mobil, and two Japanese companies. It began its first shipments of liquefied natural gas (LNG) to Japan in 1997 (Abdullah 2013 : 16).

The second company is Ras Gas, which was founded in 1993 and began production in 1999. Its ownership is divided between Qatar Petroleum (63%), Exxon Mobil Company (25%), the Japanese Itochu Company (4%), and the Japanese Liquefied Natural Gas Corporation (3%) . And the Korean Kogas Corporation (5%). The company works to produce natural gas from three offshore platforms in the North Field (Al-Jawarin.(

Six Ras Gas stations were established, and the table below shows the year in which the station was established, its production capacity, and the increase in production capacity from any station, in addition to contracted exports and actual exports.

It is worth noting that the capital cost of the two units is estimated at approximately $3.3 billion, noting that the cost of the second unit does not exceed one-third of the cost of the first unit, which reflects the importance of "economies of scale" in this industry (Abdullah 2013: 19).

2- The policy of finesse in negotiations:

Justin Dargin states that no other country can match Qatar in terms of the ability to renegotiate old contracts and conclude new contracts that are restrictive to both parties (Abdullah 2013 : 7).

In 1996, the Korean company was able, with the help of Shell, to contract with the State of Oman to increase its purchases of liquefied gas to (4) million tons annually in exchange for Oman abandoning the minimum condition, and thus the way was opened to re- negotiate with Qatar to obtain similar treatment (Abdullah 2013 : 19).

3- Maneuvering and financial management policy:

In continuation of the above regarding the negotiations with the Korean company, the latter was able to obtain a 5% share of the ownership of the Qatari company, in exchange for increasing its purchases from (2.4) million tons to (4.8) million tons annually, based on the lower cost. The second unit of liquefaction will improve the economics of the project (Abdullah 2013 : 19(

On the other hand, in 1996, RasGas was able, with the help of Mobil, to offer bonds in the company's name on the global capital markets, which were fully covered. Thus, the company obtained $1.2 billion from two issuances, the first of which was redeemed in 2006 with interest (7.6%) and the second in 2014 with interest. (8.3%.)

Financing by issuing bonds in the capital market is considered the first of its kind for a liquefied gas project.

It is worth noting that the explanation for the ease of underwriting is that the contract with the Korean company guaranteed the marketing of the production of the first two units for a period of (25) years, in addition to the two Japanese companies obtaining (7%) of the ownership of the company after they promised to provide soft loans to cover Qatar's share of the capital in the company. A limit of $900 million to be recovered from Qatar's share in production, thus Qatar's share decreased to (63%) and ExxonMobil to (25%) (Abdullah 2013 : 19).

4- Policy of interest in transportation, marketing and innovative marketing:

Marketing includes transportation by pipeline or transportation by sea tankers designated for this purpose. Therefore, Qatar has worked to build many ports to receive the liquefied gas that it produces in many countries of the world. It has built (South Hook) port in the United Kingdom, which was officially opened in 2009. A joint venture between Qatar Petroleum (70%) and Exxon Mobil (30%). The port's capacity is 15.6 million tons annually of liquefied gas. The Adriatic Port was also built in Italy, which is the first floating port in the world that was manufactured to import liquefied natural gas, store it, and return it to its gaseous state. It is a joint project between Qatar Petroleum (45%) and Exxon Mobil also (45%), and the (10%) The rest is for Edison Company, and the port's capacity is (6) million tons per year (Al-Jawarin : 9).

South Hook Port and the Adriatic Port represent a new and innovative method of marketing.

As for pipeline transportation, it is represented by the (Dolphin) project, under which Qatar markets natural gas to the United Arab Emirates and the Sultanate of Oman, as it aims to extend gas pipelines under the waters of the Arabian Gulf to them. Its cost amounted to (3.5) million dollars to export (2) billion cubic feet of natural gas. . Dolphin Investment Company, owned by the Abu Dhabi government, has authorized (51%) of its shares, Total (24.5%) and Occidental American Petroleum (24.5) to build a 488-inch line with a distance of (4000) km. The design capacity of this line is (3.2) billion cubic feet per day (Al-Jawarin : 9)

The Qatar Gas Transport Company was established in 2004 with the aim of transporting and exporting liquefied gas produced by Qatar, by building a large tanker fleet with the number of tankers reaching more than (60) tankers during the second decade of the third millennium (Al-Jawarin: 9).

5- Energy diplomacy:

Energy policy differs from energy diplomacy in two points: (Schallow 2023: 14242).

a- Energy policy focuses on achieving and promoting national economic interests, while energy diplomacy focuses on helping national decision-makers in various ways achieve their goals in the field of energy at the international level, and energy diplomacy is considered more like a sub-element of energy policy.

B- Energy policy also differs from energy diplomacy in the new actors and factors associated with it. Energy policy brings new opportunities through actors and elements, while energy diplomacy brings complications in sharing and distributing fossil energy resources. In this context, energy diplomacy serves by using reserves as an element of pressure . International, for example, or the use of specific locations on energy transport routes to maximize national interests that flow into energy policy as two sub-cranes in a large river.

C- Energy diplomacy is defined as a set of means used by representatives of the international arena to avoid potential risks in interaction within the energy market and the dimensions of risks affecting energy security (Shalaw 2023: 156).

D- Energy diplomacy has been used as soft power by the Gulf Cooperation Council countries, especially Qatar, to play an important role through aid and investment to Arab and Asian countries. Qatar has also resolved conflicts, as in mediation between competing parties in Lebanon in 2008, and in Sudan (Shalaw 2023: 351(. (

The Qatar Investment Authority is the political instrument of Qatari energy diplomacy. Sheikh Tamim bin Hamad Al Thani visited the Russian Federation on January 18, 2016 to discuss geopolitics in the Middle East and oil and gas issues. He stated that “the Russian Federation plays a leadership role in world stability,” while the President said Vladimir Putin stated that “Qatar is an important element in the situation in the Middle East and the Arabian Gulf” (Qalajiya 2019: 159).

Aware among the Qataris of the important and growing role of the Russian Federation in the Middle East, they are trying to expand their influence to Moscow by displaying their enormous wealth, and Qatar constitutes a useful partner for the Russian Federation in terms of alternative sources, financing and investment (Qalajiya 2019 : 159).

The Qatar Investment Authority is considered one of the most important sovereign wealth funds in the world and owns more than $2.5 billion in the Russian Federation from federal

assets in VTB Bank and Moscovo Airport . In 2016, it invested $11.3 billion in the Russian company Rosneft (Qalajiya 2019: 160).

The third topic: technological strategy : It can be divided into the following points:

.1Technology policy related to invasive industry stages:

It is known that the stages of the gas industry begin with exploration and drilling, then processing and liquefaction, then transportation and marketing. Recently, advanced technology has been introduced to the gas industry for liquefying natural gas and the natural gas processing process. The Pearl Factory in Qatar - one of the largest factories for converting natural gas into liquid petroleum products - used this technology in 2011 (Mills 2018:45.(

These products, such as naphtha, diesel, and various oils, are for export purposes, as this project and other projects depend on manufacturing (syngas) and converting it into liquids according to Fisher Tropsch technology, which requires high-cost, environmentally friendly, high-quality investments with high economic returns (Abdel Reda et al. (2015: 45(

.2Multiple Products Policy:

There is a trend in Qatar towards diversification in gas technology. LNG (□) technology is different from LPG (□) and different from GTL (□), and Qatar seeks to benefit from the integration between LNG and GTL in order to reduce costs because they can share hydrogen processing units (Abdul Redha et al. (2015: 48(

.3Policy to move towards energy-intensive industries related to oil and gas:

These industries are headed to benefit from comparative advantage on the one hand and diversification on the other hand (Dargen: 9(

.4Policy for eliminating the gas pricing dilemma:

The dilemma of gas pricing is that the price of gas in the local market is - usually - linked to the price of a petroleum product such as diesel in the domestic and commercial sectors, and such as diesel or coal in the industrial and electricity generation sectors, where the average price is determined according to the weighted average of the quantities consumed in each sector (Abdullah 2013: 14.(

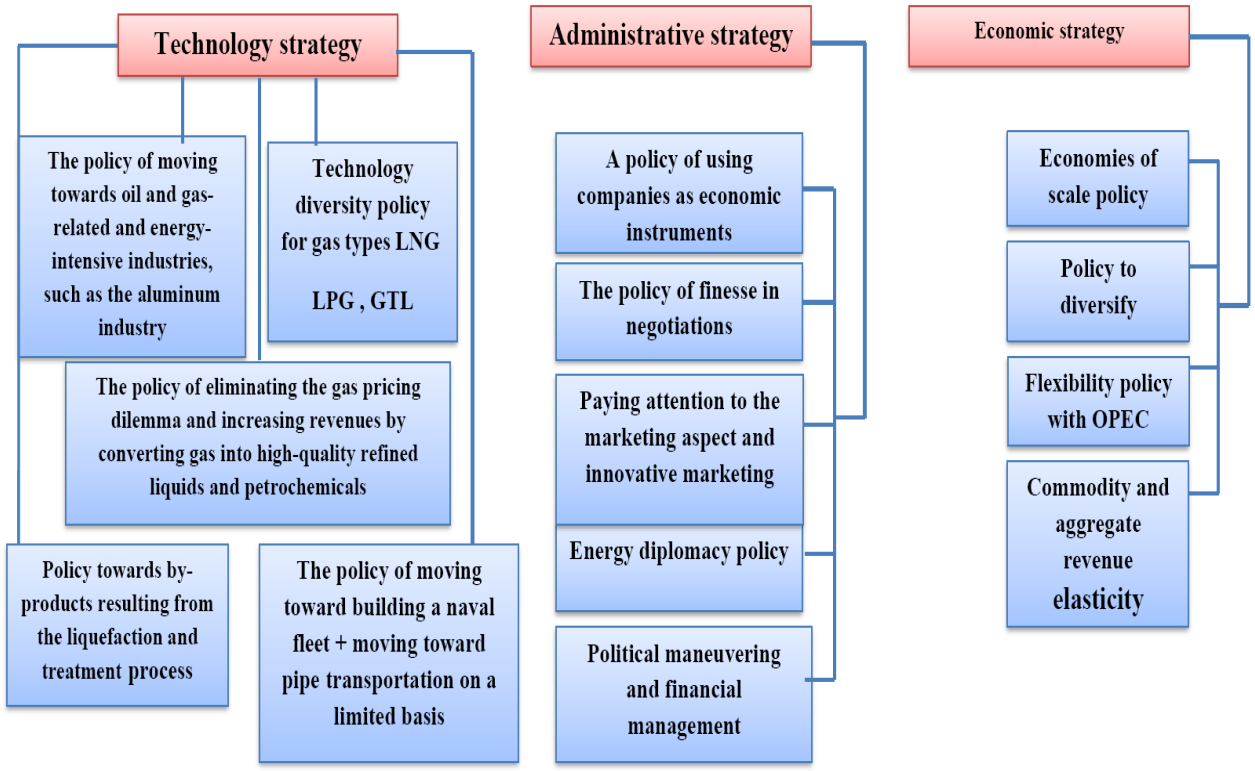
It has been noted that gas prices are often lower than oil prices due to the absence of a global market for gas in which its price is determined, as well as the dependence of its price on negotiations between the exporter and the importer, with the balance of negotiation prevailing in favor of the importer, who has many reasons to control the capabilities of the project in terms of financing or Marketing or technology used (Abdullah 2013: 14(

Regional oil prices are considered relatively low in the first months of 2021 when compared to the global price of oil, and Qatar seeks to get rid of this dilemma and increase revenues by converting natural gas into high-quality, refined products of gas liquids and petrochemicals (Dargen: 9 .5(Transportation Attention Policy:

In 2004, Qatar established the Qatar Gas Transport Company by tanker, which aims to transport and export liquefied gas produced by Qatar by building a large tanker fleet with a number of tankers reaching 60 during the second decade of the third millennium (Al-Jawrain: 9.(

On the other hand, Qatar has entrusted the laying of pipelines to transport gas to its neighboring countries (the Emirates and Oman). The Dolphin project was established at a cost estimated

at (3.5) billion dollars to export (2) billion cubic feet of gas. This project aims to provide large quantities of gas via a pipeline. Gas pipelines under the waters of the Gulf for a period of (20) years starting in 2006 (Al-Jawarin: 9)



Chapter Three: Problems and proposed solutions for developing the natural gas industry in Iraq and the possibility of Iraq benefiting from the Qatari experience

This chapter includes two sections as follows

The first section: Problems and proposed solutions for developing the natural gas industry in Iraq. It includes two requirements, as shown below.

(1Problems of the natural gas industry in Iraq: They can be summarized as follows:

A. The disturbance in the security situation that negatively affects the stability of workers and their continued presence during work.

B. Decrease in feed gas rates for the North Gas and South Gas Company. The planned production capacity in the South Gas Company, for example, is 450 mqm/day, while the amount of feed actually received is 292 mqm/day on average, and thus the planned feeding deficit is about 158 mqm/day. As an average; Which affects the amount of liquid gas produced daily from 2500 tons/day to 956 tons/day, meaning a deficit of (1544) tons/day. This deficit causes a severe crisis in the amount of liquid gas prepared for daily consumption, at a time when large quantities are being burned. From the natural gas associated with oil (Ahmed et al.: 104-105(

C. Frequent mechanical and electrical malfunctions, and the lack of reserve materials at the required level, which is reflected in the deterioration of periodic and annual maintenance operations due to the obsolescence of devices and equipment as their useful life has ended,

which necessitates updating devices and equipment because they have become insufficient and inefficient.

D. Failure to allocate funds to rehabilitate, develop and expand gas facilities, continuous power outages to companies and the lack of sufficient electrical generators to operate the factory, which reduces the amount of planned production.

E. Weak coordination between the oil sector and the gas sector within the Ministry of Oil, lack of interest in gas wealth among constitutional institutions and lack of accountability regarding gas flaring, the need for a law that prevents gas flaring and encourages investment in building and developing the gas sector. (Hussein, 2013, p. 45.(

F. Lack of field processing technology for associated natural gas in oil fields; The treatment process begins by isolating the oil from the associated gas in the Gas-Oil Separator stations, to which the oil arrives from the well head, to separate the natural gas from the petroleum liquids, and then pump it to the natural gas compressors and burn the unwanted gases. The problems of the insulators appear in the oil fields of the South Oil and North Oil Companies due to their age and technical obsolescence. The operational problems of the insulators come first, which are represented by the exit of oil in large quantities and its passage to the natural gas processing plants, as they are supposed to contain a primary buffer to isolate the oil from the gas. Natural and prevents it from reaching and then crossing over to the flame, which forms black smoke. Often neglecting this condition leads to additional amounts of oil escaping through the burner, causing large fires. The report issued by the South Oil Company indicated that the South Oil Company's fields and facilities were exposed to severe damage amounting to 8-90% due to the last war (2003). However, it undertook the reconstruction process by relying on its own capabilities, so the gas isolation stations in the Zubair field and others were rehabilitated. In Al-Himar and the Rafidites, there are ruins of pipes and scraps.

G. The introduction of gas compressor station technology, and the small number of them in oil fields. For example, only a natural gas capstan of compresses origin is operating in the Zubair field, and in the Rumaila field also a capstan of compresses origin is operating. The dry gas compressor (KO3), which is relied upon to market natural gas, which is produced from the southern oil fields, stopped working for a full year, due to technical problems in the turbine engine, the lack of spare materials and necessary spare parts, and the occurrence of cracks in the compressor's lubrication pipes. Problems in the propaganda cooling compressor and problems in the capacitors of the condensate that are burned with natural gas, which led to the stopping of work in a complete way as a result of the pressure of pressure in the gas feeding in the southern gas company in 2009, the matter that generates the number of problems to facilitate the factory of the chapter of the fluids) (NGL) with the required quantities of natural gas, and then another problem was generated, which was the company's lack of ability to provide liquefied petroleum gas for domestic and industrial use, and as a result it was imported to cover the deficit in local demand.

H. The South Gas Company is operating at a low percentage of its designed capacity, and there is a clear weakness on the part of the company's management in rehabilitating the idle stations and addressing the problems suffered by the various operational stations, and the weakness of the technical capabilities of its staff in operation and maintenance and in identifying and treating compressor problems, and the company's lack of interest in gas

specifications. The product is in terms of the still high percentage of sulfur content, which causes several problems during transportation and processing for subsequent industries, and the presence of high humidity with the marketed liquefied gas, as well as the low efficiency of cooling systems, especially in the summer due to frequent power outages.

I. Natural gas transportation pipelines suffer from several technical obstacles, such as negligence and weak control and supervision. Pipelines transporting natural gas liquids are exposed to corrosion due to the aging of these pipelines, delayed treatment, weak procedures followed in using modern technologies to maintain them, weak protection procedures for them, and lack of treatment. Pollutants present in natural gas before it is transported by pipeline, especially sulfur, high humidity, and high mercury levels due to aging treatment equipment.

J. Administrative and financial corruption is one of the main obstacles to the possibility of developing the natural gas industry in Iraq, which is represented by the low performance of the institutions operating in the Ministry of Oil, the absence of accountability and transparency, the widespread phenomenon of forgery of official documents, the complexity of official transaction procedures within oil departments, and the increasing phenomenon of bribery. Among the Ministry's employees are encounters with regard to providing services that are part of the duties of the public job, failure to adhere to training and development plans, failure to employ financial allocations for appropriate purposes of development, and failure to match training and qualification opportunities with job specializations. The number of corruption cases that were investigated in the Ministry of Oil in 2011 was about 400, and there were 185 pending cases from 2010, and the value of the financial cases that were investigated amounted to about 183 billion Iraqi dinars and 8 million US dollars. A report by the Integrity Commission also revealed that there were 250 cases in the Ministry of Oil in 2009, including cases of bribery, forgery and embezzlement, and there were 13 arrest warrants in 2009 issued against those of the rank of general manager or above. It is also noted that the phenomenon of financial and administrative corruption has spread in the field of contracts and tenders, which has paved the way for entering into secret negotiations with suppliers, concluding agreements and receiving materials that do not conform to the specifications stipulated in the contracts, and the inaccuracy of laboratory tests as a result of the lack of specialized personnel. Inaccuracy in determining the quantities required The actual need, the decline in procedures for executing purchase and sale contracts, and the lack of clarity in determining the method of executing purchase orders; In terms of it being a general tender, a direct invitation, or the only method of presentation, and according to the value of the order amount. In addition to accepting and approving bids even though they do not meet the conditions of the announced tender or invitation, especially with regard to initial insurance, or the expiration of the validity of the offers, and the lack of studies of the estimated costs of the contracts required before preparing the tender documents due to the weakness of specialized personnel, lack of exposure to the global market, and weak terms and conditions. The contracts concluded and the authorities responsible for drafting these contracts and tenders not having sufficient experience or lack of accuracy in selecting the competencies concerned with preparing these specifications by the departments of the various oil companies. Which leads to continuous change in the clauses of contracts signed for projects by oil companies during implementation,

which results in confusion for the implementing companies and delay in project implementation due to having to redo the work, and the emergence of several legal problems during contracts due to failure to take into account the applicable contractual legislation and the conclusion of contracts. Weak legal formulas. It is noted that the lengthy duration of the administrative procedures adopted in referring tenders and opening documentary credits, the reluctance of the local companies implementing the projects and their inefficiency in implementation due to lack of experience and the failure of the offers received for equipment to conform to the specifications of the required materials or their failure to conform to the specifications in the supply contract, and the delay of the various committees. (Bid opening committees, study and analysis committees) in implementing the work entrusted to them within the specified time, and then delaying the referral and conclusion of contracts, and finally inflating the costs of implementing contracts by the supplying companies.

It is also noted that the phenomenon of receiving materials manufactured by private companies supplying oil installations that do not conform to specifications, and receiving and accepting processed materials, is also noted, despite a lack of required documents such as a certified certificate of origin and an agreed-upon inspection certificate. It is noted that there is a complete absence of conducting economic and technical feasibility studies for most of the projects that are contracted to be implemented or that are prepared at weak levels, which leads to a waste of public money and a stumbling block in the project implementation process. The lack of security stability has also led to many incidents of attacks and sabotage, for example during... Three years (2004-2006) the pipelines stopped working for a period of 651 days, or about 8.1 years. Iraq's losses from the halted oil export revenues were estimated at $6.8 billion, and this loss was reinforced by the cessation of the strategic pipeline linking the northern distribution network to the southern export ports. In addition to the losses estimated at about $3 billion annually as a result of the explosion of oil wells, refinery processing lines, product transport pipelines, etc. Due to the unstable security situation, the implementation of the project to develop the Hamrin natural gas field, which is being signed between the Northern Gas Company and the Canadian OGI Company, was halted, as it reached... Most of the equipment.

2- Proposed solutions to develop the natural gas industry in Iraq:

The following must be done:

A. Accelerating and maximizing gas investment in Iraq, by establishing legislation that prevents gas burning by the government and foreign companies operating in the energy sector, and obliges the government to provide funds to the gas sector while setting an immediate time limit to reach the zero point of gas burning.

B. Establishing an effective and binding mechanism for cooperation between the oil sector and the gas sector within the Ministry of Oil and following up on the results of the Parliamentary Oil and Energy Committee and the provincial councils that are exposed to damage as a result of gas burning.

C. Issuing a special law for investment in the gas sector and openness to the gas industry in the world

D. Establishing a national gas company with international gas industry standards, supported by the federal government, parliament, local governments, government oil and gas companies,

and foreign oil companies working in the development of oil and gas fields in Iraq are called upon to cooperate and work urgently to stop gas burning, accelerate the investment of the country's gas wealth, and build a national gas industry. Modern and catching up with the golden age of gas in the world. It is noteworthy that Iraq exported the first batch of condensed natural gas in 2018 (C5 Plus) in an amount of ten thousand cubic meters, from the Khor Al-Zubair oil port in Basra, thus entering the gas market after it had entered decades ago. Oil market (Al-Rawi 2016: 89(

E. Developing backward gas technology with the transfer and localization of appropriate technology for the country.

(3The second topic: The possibility of Iraq benefiting from the Qatari experience

Qatar has tried to benefit from the manufacture and liquefaction of natural gas due to the advantages achieved in the field of reducing environmental pollution, until it became one of the first countries to export and liquefy gas, as well as reaching the stage of local self-sufficiency. Qatar's experience is relatively short in producing and exporting gas, which can Through it, we can benefit from its experience in Iraq in the field of optimal exploitation of this resource and increase investment in it by adopting the following matters: (Boesch 2017: 57-58)

A. The necessity of planning to follow the modern methods adopted by the State of Qatar to raise the level and growth of the gas industry, especially since Iraq possesses the technical qualifications and competencies that support this and to help it facilitate contracts with major companies specialized in this field, especially since there are contracts that have been concluded with foreign companies. Within the second, third and fourth licensing rounds.

B. The necessity of adopting the technologies of this industry, represented by the gas-to-liquids (GTL) technology that Qatar has adopted, as this can help finance the Iraqi general budget, which suffers from a deficit during years in which global crude oil prices decline.

C. Qatar relies on marketing gas through advanced pipeline networks that contribute to delivering it to global and local consumption sites, which requires the Iraqi government to build these networks to be a competitive and effective member in the region.

D. Expansion of research and exploration, expansion of the base of reserves and optimal investment of natural gas.

E. Qatar's use of the latest technologies and keeping pace with modern technology, which contributed to reducing costs and production efficiency due to economies of scale, which the gas industries in Iraq lacked.

F. Planning and implementation to transform depleted resources into economic wealth that achieves various sources of income. This is a step taken by Iraq ahead of many countries, as it established fertilizer, petrochemical, iron and steel plants that contribute to the development of the national economy, but wars and the deterioration of the security situation led to a decline in these industries.

G. The necessity of contracting with the international companies that Qatar has contracted with, represented by companies such as (Total, Maersk, Pennzoil, the BG Group of Companies, and the Japanese Mitsubishi, which contributed to the discovery of gas fields such as the Al-Rabban field and the North Field, even though Iraq had implemented them after 2008 through licensing rounds). The third and fourth, and the establishment of the Basra Gas

Company, and the establishment of gas liquefaction plants, which are industries that are still lacking in the gas industries in Iraq, which are among the basics of the gas industry due to their contribution to raising production and exports, especially since Iraq possesses large reserve reserves of associated natural gas (Buish 2017: 57-58)

H. Building an investment fund similar to the Qatar Investment Fund and adopting energy diplomacy through it.

I. Benefiting from by-products resulting from gas processing, such as sulfur and others, to compensate for and reduce some costs.

Conclusions:

1. Gas investment in Qatar had major repercussions on the economy through economies of scale that maximized revenues and reduced costs.

2. Qatar considered the gas sector to be the largest and most important economic sector after it was subjected to sanctions by OPEC.

3. Gas investment in Qatar was carried out by giant companies with a long history in this field and their technical and economic reputation, which puts them in a safe position in terms of extraction, supply and demand in the global market.

4. The inefficiency of the current Iraqi gas isolation, compression and desalination stations, making them unable to meet local needs.

5. Building the gas industry in Iraq with all its facilities requires a relatively long period of time, especially in current circumstances, provided that we work hard and fight corruption.

6. The industrial facilities currently in Iraq are technologically outdated and need modernization and renovation.

7. Weak coordination between the Iraqi oil sector and the gas sector within the Ministry on the one hand and between the legislative authorities and the committees concerned with them.

8. Weak management in the sub-divisions of the gas sector in Iraq.

9. The absence of any text in the Iraqi Constitution that prohibits gas burning or regulates investment in this field - failure to allocate sufficient funds for the rehabilitation, development and expansion of gas facilities.

10. There is great harm in the Iraqi parliament not legislating the oil and gas law because of the quota system used in state administration.

11. The necessity of building a local and international gas network linking Iraq to its region.

Recommendations

Establishing local and global networks in order to connect Iraq with its regional surroundings.

1. Moving towards investing in gas fields and increasing research and exploration activities around gas fields

2. Develop a strategy to benefit from the associated gas and not burn it under any circumstances, and set a security ceiling for that.

3. Introducing gas into all possible sectors, activating its industry, and linking it to the agricultural, industrial, service (tourism and hotels), domestic, commercial, and electricity and transportation sectors.
4. Accelerating the legislation of the Oil and Gas Law, which has been in place for more than 15 years, and amending the law in line with recent developments in the gas industry, preventing its burning, and the necessity of accelerating its investment.
5. Modernizing gas infrastructure, establishing pipelines, and building fleets for oil in the short and medium term, and gas in the long term.
6. Increasing the number of underground storage projects in order to store associated gas instead of burning it until its exploitation and investment are completed.
7. Extending gas transmission pipelines to all homes and homes in Iraqi cities for the purpose of using them for heating, cooking, and other household uses as a clean fuel, in addition to not relying on oil derivatives.
8. Opening gas plants in each governorate, the purpose of which is to refine gas and benefit from its derivatives to cover the local need, and seriously consider exporting in the event of a surplus.
9. Using gas to generate electricity, i.e. opening electricity generation stations powered by natural gas in the short term.
10. Connecting Iraq to local and international pipeline networks for the purpose of transporting gas.
11. Opening academic fields concerned with studying gas in terms of extractive industries, manufacturing industries, and economic and administrative sciences related to it.
12. Searching for giant companies with a long history in research, exploration, development, sale and investment operations for the purpose of investing in natural gas in Iraq.
13. Comprehensive reconstruction of all gas extraction and manufacturing facilities and conducting engineering inspections on all equipment.
14. Establishing the National Gas Company to take care of gas affairs.
15. Establishing a university affiliated with the Ministry of Oil in accordance with international and Iraqi standards concerned with graduating engineering, administrative and economic cadres and twinning them with major international universities, taking into account the high level of training with foreign and local companies operating in Iraq and developing their cadres through on-the-job training.

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Chapter One : The theoretical framework : natural gas and the Qatari experience

This chapter deals with two sections:
The first topic: Natural gas (its concept, components , types(
The second section: The Qatari experience in natural gas

The first topic: Natural gas (its concept, components , types)(

2- Natural gas concept:

It is one of the forms of fossil fuels that are extracted from the ground. It is one of the non-renewable energy sources because it took millions of years to form in the ground as a result of organic organisms being exposed to intense heat and pressure for a long period of time. Natural gas is characterized by high combustion efficiency and is considered today a low-cost energy source. It is found in places where oil is found in the organic layers of the earth and coal mines. (Al-Rawi 2016: 32).

Natural gas is also known as a mixture of hydrocarbon gases with some impurities or pollutants resulting from decomposed organic materials. Pollutants also present include water vapor and heavy hydrocarbons. These pollutants are considered undesirable and are usually removed through various natural gas treatment plants (Abdel Ali 2013 : 45).

The components of natural gas are carbon and hydrogen resulting from decomposition, so the gases in it are called hydrocarbon gases that are usually found in natural gas, which are methane and ethane . Propane , butane, pentane, and small amounts of hexane , heptane, octane, and heavy gases . Then they are linked together and form what is called methane gas, which forms the basis of natural gas, in addition to other gases in small percentages such as helium, nitrogen, carbon dioxide, and others. The use of this gas and its combustion leads to the formation of carbon monoxide, in addition to another group of gases called " greenhouse gases" because they are the most common causes of Climate change on the Earth's surface, global warming, and the melting of the polar ice (Abdullah 2013 : 13)

Gas is considered one of the energy sources that pollutes the environment the least M N Oil i And who Al-Mahrouqa T High efficiency, low cost. Natural gas is an important source of primary energy for the chemical industry, as it is extracted from wells similar to wells . Natural gas in Qatar is divided into two categories : associated gas and non-associated gas. If natural gas is present with... nf i _ In the same field it is called associated gas. If the field contains only natural gas without nf i _ It is called a free or non-associated gas . There are many gas gatherings far from the beach, and the gas is transported by pipe from the coastal production platforms to a collection point on the beach and from there to the gas refinery where it is purified from impurities and unwanted compounds. Gas fields exist both in the sea and on land.

Raw natural gas consists primarily of methane (4CH). And ethane (6 (C 2 H) . Which are considered the shortest and lightest hydrocarbon molecules. It often also contains varying amounts of other compounds, as shown in Table No. 1)

It also contains water vapor, liquid water, salts, acid gases, and very small amounts of mercury, mainly in its elemental form, but it is possible that chlorides and other types are present, and some studies indicate that it contains natural radioactive materials such as radon. The water resulting from the treatment process may also contain Natural gas contains traces of radium, which can accumulate inside pipes and processing equipment, and this can make the pipes and equipment radioactive over time (Al-Khatib: 50)

Table (1): The main components of gas

Weight)Section (%	The ratio)Volumetric (%	Formula Chemical	Component
60	81	CH4 _	Meethan
7.7		C2H6	eth a n
13.5	6.6	C3H8	Proba n
10.8	4	C4H10	Butane
4.8	1.4	C5H12	Bintan
1.3	1	N2 _	Nitrogen _ _
0.33	0.7	CO2 _	Carbon Dioxide

Source : Nabil Jaafar Abdel Redha, Amjad Sabah Abdel-Aali , The Economics of the Natural Gas Industry, (Basra: Al-Ghadeer Printing and Publishing Limited, 2015) .

3- Types of natural gas :

There are three main types of natural gas: (Abdul Redha et al.: 15-2019)

4- free natural gas (Free gas):

- It is a hydrocarbon compound found in the form of free gases in natural gas fields. It is either:
- Dry gas : This is the gas that consists mainly of methane and ethane , with a smaller percentage of other hydrocarbon gases.

5- wet gas _ _ It is the gas that contains n- tannes and heavier paraffins as liquids at normal temperature and atmospheric pressure.

6- Associated natural gas :

- is dissolved in it , and the majority of it is methane and small amounts of carbon dioxide (CO2) and hydrogen sulfide gas (H2S).

E- Unconventional natural gas gas):
It is divided into the following types:-

- Shale gas__ :

  What is meant by shale or stone gas or slate gas is that natural gas that was generated as a result of formational conditions millions of years ago inside the shale rocks due to heat and pressure and remained trapped inside the cavities of those solid rocks that do not allow it to penetrate and also contain crude oil.

- Tight gas_ :

  It is a natural gas found in rock formations with low permeability.

- Coal bed gas methane:(

  It is the gas that comes with coal seams.

  Gas hydrate (Natural gas hydrates:(

  It consists of natural gas trapped in layers of ice water.

The second section: The Qatari experience in the natural gas industry

Introduction:

Qatar is considered the third largest country that exports natural gas in the world, and the amount of natural gas reserves in Qatar amounts to about 15 % of the total natural gas reserves discovered in the world. This is equivalent to 900 trillion cubic feet. The largest natural gas expansion in the Middle East region occurred in Qatar, where Qatar's natural gas production rate increased by 17 % . 9 %, which is equivalent to about 5 . 8 billion cubic feet . Qatar has many natural gas sources, and it also contains the largest natural gas fields in the world, which is the South Pars field, which is also called the North Gas Field. This field was discovered in 1971 . Work and production began in 1989 . The South Pars or North Gas Field is located in the Arabian Gulf and is shared by Qatar and Iran. It includes about 50 . 97 trillion cubic meters of natural gas, making it classified as the largest natural gas field in the world. The area of the South Pars field or the North gas field is about 9,700 square kilometers. There are about 6,000 km of them in Qatar's territorial waters, while the rest is in Iranian waters (Tim 2018: 106)

4- Historical development of the gas industry in Qatar:

The first oil well in Qatar was drilled in the "Dukhan 1 " oil field in 1940 , but the beginning of World War II caused a delay in the development of the country's hydrocarbon resources. Qatar enjoyed offshore exploration and production concessions in 1949 , and the first shipment of crude oil was exported from the field on December 31 of that year.

Production of crude oil and gas began in 1965 in the fields of Maidan Mahzam and Bu Hanin in 1972 . In 1977 , Qatar completely nationalized its onshore and offshore oil and gas operations. Currently, the Dukhan field , located 80 km west of Doha, covers an area of 80 km by 8 km, and has a production capacity of 335 thousand barrels per day. The field, which includes 598 wells beginning in 2016 , is divided into three sectors: Khatiya

, Fahaheel , and Jaliha/Diab . It also contains four stations where oil and gas are separated, which are Khatiya North Station, Khatiya Main Station, and Fahaheel Main Station. And Jaliha station (Musa : 98)

The North Gas Field for natural gas was discovered in Qatar in 1971 and production began in 1988 , with the first LNG exports heading to Spain in 1997 . The field covers an area of six thousand square kilometers, or about half the area of Qatar. With total recoverable gas exceeding 900 trillion standard cubic feet, this field is considered the largest non-associated gas field in the world . The first commercial production phase began in late 1991 . By 2008 , production averaged 750 million cubic feet of gas and 24,000 barrels per day of stabilized condensate, with gas used primarily in the domestic market and gas condensate for refining and export.

For more than a decade, Qatar has been the world's leading supplier of liquefied natural gas. The country seeks to enhance its market share and increase production by 43 percent by 2024 , i.e. moving from 77 million to 110 million tons annually. While most of Qatar's growth during the decades following independence in 1971 was thanks to crude oil, natural gas succeeded in gaining great importance during the 1990s. In 2018 , Qatar announced its intention to withdraw from the Organization of the Petroleum Exporting Countries (OPEC), which it was one of the first member states to join in 1961 , in order to focus on gas. Qatar’s ambitions indicate that it will be in a strong position to make remarkable progress, especially In light of the increase in global demand for natural gas, forecasts for the year 2040 in “Energy Outlook 2018 ” from British Petroleum (BP) indicate that global demand for gas is expected to grow at a faster pace than oil or coal, with demand for primary energy increasing by one-third over the next 25 years . The added capacity will provide Qatar with the opportunity to increasingly leverage and expand its overall market share (Al- Halafi et al.: 105).

5- Gas uses.

Qatar was able to benefit from the gas in several ways after it was processed, by selling it, or using it to generate electricity on site using electric generators or a turbine engine . You can also inject gas into the reservoir to enhance or improve oil extraction or be used as a raw material in petrochemical plants, as natural gas is considered the cleanest burning fossil fuel. Natural gas is part of the future of renewable energy. While natural gas competes against renewables for energy market share, the two sources complement each other in supporting global energy needs while reducing carbon emissions.

6- Natural gas is used in Qatar in many sectors:

Among the most important uses of natural gas are the following (Abdul Reda et al. 2015 : 23-32)

F- Electricity generation: Natural gas is the main source of electricity generation
G- Heating: The heat produced by natural gas gives greater warmth than that produced by electric heaters.
H- Cogeneration: Natural gas is used in the process of generating electrical and thermal energy together using some technological means.
I- Transportation: Natural gas has been used as a vehicle fuel since the 1930s.
J- Manufacturing processes: Natural gas is used in many industrial processes; Such as steel iron production, paper industries, and petrochemical industries. Such as the manufacture of plastics, fertilizers, cosmetics, and medicines.

Chapter Two : Vision Qatar integrated (economic, administrative and technological) in the natural gas industry

This chapter includes two sections as shown below.

The first topic: the experience of the Qatari gas industry (Motivations, obstacles, and success factors)

The natural gas industry means those industrial processes designed to purify raw natural gas by removing impurities, pollutants and high molecular mass hydrocarbons to produce what is known as dry natural gas (final sales gas) within Quality standards specified for pipelines for the purpose of marketing them. This industry goes through three stages:

4- Upstream stage :

The operations include exploration, reservoir study, drilling, and extraction (production).

5- Mid -stream :

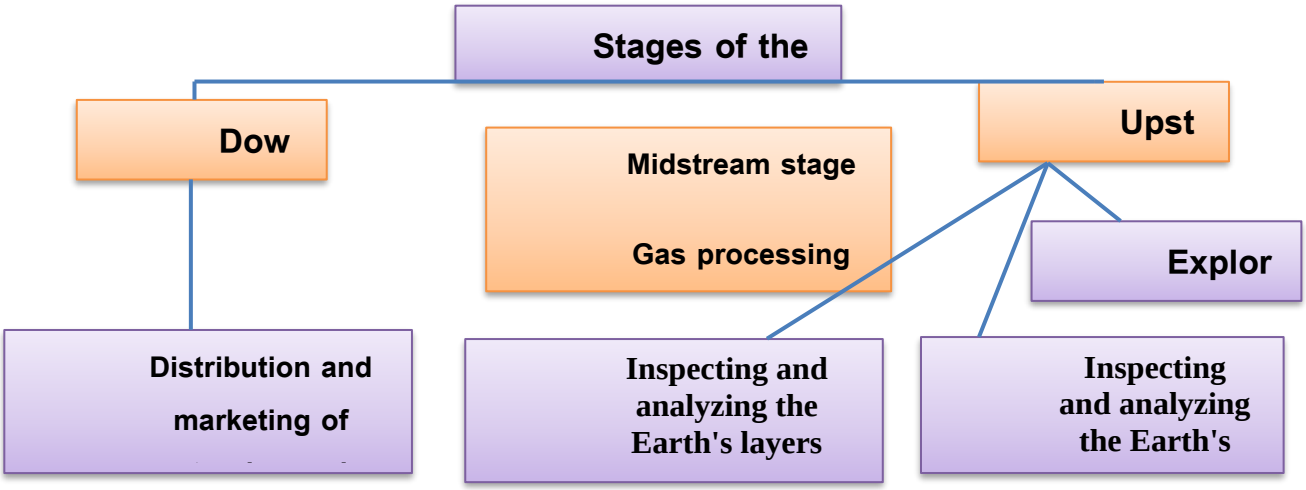
This stage is in the middle of the upstream and downstream stages, which is the stage of processing the liquefaction of the gas, separating its compounds, getting rid of impurities and harmful substances, converting it into a liquid in order to facilitate its transportation, and then using it as a final product used in the transportation sectors or the chemical and petrochemical industries.

6- Downstream stage :

This is the final stage and includes distributing and marketing the product to the consumer either through a network of pipelines or oil and gas tankers.

can be depicted as in the figure below:

Figure (1): Stages of the gas industry



) Bushra Reda Muhammad, Risk Management and Insurance in Oil Projects .Baghdad: Dar Al-Kutub Al-Ilmiyyah, 2019), p

The second section: Motives and obstacles Qatari gas industry.

The topic can be dealt with in its order, starting with the motivations (Abdul Reda et al. 2015, pp. 85-86). Then the obstacles

main motivations for Qatar's interest in the gas industry Increased .importance of gas

C. An increase in the per capita consumption rate of natural gas in the GCC countries.
D. Increasing the volume of industrial consumption of natural gas in the sectors (electricity and energy, the service and household sectors, and the industrial sector of the iron, steel, aluminum and petrochemical industries).
d- Using natural gas to maintain pressure and production in oil fields.

2- Obstacles to the gas industry in Qatar The obstacles can be summarized as follows:

i- The huge natural gas reserves discovered and how to develop investment plans for them.
j- Lack of necessary infrastructure.
k- The high costs of establishing natural gas industry projects.
l- The geographical distance of Qatar from the main markets (Asian, European, American).
m- LNG markets suffer from pricing problems and achieving a balance between supply and demand.
n- The emergence of new competitors, such as the United States of America and Australia, has rapidly strengthened Qatar's capabilities to increase supply rates to various markets, including Europe.
o- Fear of a glut in supply or impact on Russia's exports to Europe, given that Qatar is a competitor to Russia in this field (Zeini) 2015)
p- Tactical withdrawal from OPEC to focus on developing gas projects.
2- Challenges of investing in sustainable infrastructure and supporting means of production :

In this regard, the Chairman of the Board of Directors and CEO of the French company Total, Patrick Pouyanné , says that the dynamics of the gas market have changed between yesterday and today, and have contributed to a positive development in this sector, and have also increased the connectivity of countries to each other . He talked about major challenges related to supply lines, especially in the Eastern Mediterranean region, where signs of tension appear between a number of countries in this extended location, and it has become attracted by conflicts that appear to be related to gas exploration, but whose essence is political.

have expanded dramatically for the State of Qatar recently, especially after the US Energy Information Administration revealed, in a recent report, that Doha is heading towards losing its position as the first exporter of liquefied natural gas in the world, to Australia, and the entry of new players into the

international gas market. The American network CNBC announced that Australia will snatch from Qatar its title as the largest exporter of liquefied natural gas in the world during the next year, while Australia is working to increase production with a group of export projects worth billions of dollars. The Australian government said that Australia and Qatar continued to compete for It was named the largest exporter of liquefied natural gas in the world in the first 5 months of 2019 , but it was able to export larger quantities of liquefied gas than Qatar in November 2018 and April 2019. The US Energy Information Administration explained that Australia has already surpassed Qatar in capacity. LNG production, as new facilities pushed Australia's export capacity from 2.6 billion cubic feet per day in 2011 to more than 11.4 billion cubic feet per day in 2019. Hence, it can be said that Doha has suffered greatly , for several reasons, from Including that it announced at the end of 2018 its withdrawal from the Organization of Petroleum Exporting Countries (OPEC) to devote itself entirely to developing gas projects. Since that crisis, four Arab countries - the Emirates, Saudi Arabia, Bahrain, and Egypt - cut off their relations with Doha in 2017 , and as a result, the Qatari economy witnessed a decline. It led to a large financial deficit and a decline in the local stock market (Ahmed et al. 2019 :145).

In order to discuss the above, some observations can be made.

The idea began in 1962 from the recommendations of the Arthur D. Littell Company, but it is noted that its actual beginning was in 1991, a period of approximately 30 years. Some analysts explained that the October 1973 war, the Iranian revolution, and the Iran-Iraq war were what hindered the development of the gas wealth, but This does not seem convincing, as the difference between 1962 and 1973 is approximately 10 years, and the difference between the proposal (Arthur D. Little Company 1962) and the Iranian revolution and the Iran-Iraq war of 1980 is approximately 17 years, and therefore it seems that the real reason is that the will and vision were not clear. At that time.

It is also noted that the decline in oil prices coincided in 1991, which affected the Qatari state budget, which led it to seek the opinion of the Arthur D. Little company and implement its recommendations, the most important of which was to invest in the natural gas sector. Indeed, the Qatari experiment was launched willingly . Solid , flexible management and a clear vision, especially in 1997, and this is what qualified it to reach international level and leadership.

Factors for the success of the national experiment :

7- The availability of political will, a clear vision, and the adoption of successful steps and policies by providing all the necessary requirements to develop the natural gas industry.

8- LNG industry and contracting with major international companies to benefit from their expertise, technology and capital as a strategic partner in most natural gas projects, with the largest percentage remaining for national companies.
9- Introducing the latest technologies available in the natural gas industry and providing financial resources for this, whether through the national budget, investment partners, or through signing long-term contracts to market gas.
10- Using innovative marketing methods, such as building private ports in other countries to receive natural gas shipments, in addition to using various marketing methods, and not focusing on a specific destination.
11- The gas sector has contributed to the development of many related industries.
12- The policies and strategies followed by Qatar in this sector encouraged international companies to enter into joint projects to produce and develop the natural gas industry, which benefited the Qatari economy and the Qatari individual alike (Al-Jawarin: 12-13).

Based on the above, it can be said that the Qatari experience is distinctive and deserves study for the following reasons:Transforming obstacles and challenges into successful opportunities on the ground.

- Great interest in maritime transport and building an advanced fleet .
- Knowing the extent of the capacity of the Qatari state and the limits of its capabilities as a state, taking into account the growth of this capacity in the future, especially the magnitude of gas reserves.
- Qatar did not follow immediate nationalization and preferred a gradual process between itself and foreign companies for several factors, including its lack in the beginning of advanced staff capable of managing technical operations with high efficiency, in addition to the lack of skilled workers, and all of this requires time to build, establish, and develop.
- A careful reading of the technical and geopolitical aspects of the impact of natural gas and its global importance.
- Using negotiation skills and energy diplomacy with great professionalism.
- Taking into account environmental variables and sustainable development goals.
- High flexibility in managing natural resources, especially natural gas, economically, technologically, administratively, and even legislatively.
- The delay in investing in laurel and converting to it from oil occurred in difficult circumstances.

It appears to the researcher, when analyzing Qatar's vision, that it followed the opposite strategy to the obstacles of the natural gas industry mentioned above, and turned the threat into a successful opportunity. It agreed with international companies to invest its huge natural gas reserves in order to overcome the following problems:

Problems of lack of infrastructure.

3- Technology problems.=
4- Financing problems.

Qatar knows that huge reserves require long, medium and short-term contracts, and through the principle of solid political will and flexible economic management, Qatar has overcome many difficulties and challenges.

It developed the strategic plan, devoted sufficient time to it, and carried out a set of studies to invest in the North Field in an optimal way. This strengthened the Qataris' awareness of the transformation of natural gas into the world's preferred fuel in the energy generation and industry sector (Abdul -Rida et al. 2015: 68).

A large part of the success of the Qatari experience in developing the natural gas industry is due to the approach of the Qatari government, which worked to encourage foreign investment through stable financial and regulatory policies, and in light of an ambitious economy based on the market system. This renaissance was not a coincidence, but rather came as a result of economic developments. The Qatari experience It is unique not only in managing natural gas reserves and production and liquefaction stations, but it also included shipping and receiving stations in line with the scope of the project and has thus become one of the largest exporters of natural gas in the world (Muhammad et al. 2020: 79).

Three can be monitored Strategies that overlap and complement each other , and will be discussed in two sections, as shown below.

The second section: economic strategy and administrative policies

The first requirement is the economic strategy : It includes four policies, which are as follows

3- of Scale Policy

Which aims to increase revenues and reduce expenses.

When Qatar started the liquefied natural gas industry, it faced great challenges, but it benefited from two important events that combined to increase demand for its natural gas:

c- Reducing costs at various stages of the liquefied natural gas (LNG) processing chain.
d- Widespread use of compact gas turbines.

Qatar has reshaped its strategy and redirected its gas resources from the stage of being satisfied with generating energy locally and producing petrochemicals for export to global markets (Dargen 2021:6).
After 2010, when Qatar fell from its position to second place after Australia, Qatar faced two new challenges: (Dargen 2021:6).

6- The abundance of liquefied natural gas (LNG) is a result of other countries entering into competition against Qatar, such as Russia, America and Australia.
7- Decreased demand in 2014 and beyond .

It can be said that the increase in supply of gas and the decrease in demand for it will inevitably lead to a decrease in prices . It can also be said that Qatar's policy was derived from the relationship of elasticity of the commodity, but the decrease in prices may have led the Qataris to adopt the second form of this strategy , which says that the non-essential commodity cannot Raising its price, or even increasing its quantities, in order to obtain and maintain the total revenue undiminished from what was previously mentioned.

Therefore, in 2017, the Qatari leadership decided to lift the voluntary suspension of production in the North Field, and in 2019 it announced its new plan to reach production from (77) million tons annually to (126) million tons annually by 202727.

From the beginning, maximizing revenues and reducing costs lies in economies of scale, which indicate that increasing the production volume in the early stages will result in costs decreasing in the long run and being less and less, which means that the curve of average costs in the long run slopes downward to express the resulting decrease . in its value until it reaches its lowest value, and this is due to what is called (economies of scale), that is, the advantages that accompany the volume of production

and decreasing costs in the long run, and among these savings are the following (Kazim 2013: 230-231 (

- Losses resulting from the increased degree of specialization and division of labor. With a large size of the facility and an increase in employees, the degree of specialization and division of labor will increase among all workers in the facility, thus achieving greater benefit from the principle of division of labor.
- savings resulting from the use of larger equipment and machines with higher production efficiency , especially as there are some indivisible equipment and machines, and the use and development of modern technology will lead to increasing and developing production and reducing costs.
- savings resulting from attracting experts, managers, and those with rare competencies and experience, and benefiting from them in following modern methods of management and increasing their efficiency.
- savings resulting from the large establishment obtaining marketing advantages when purchasing due to gaining better conditions and quality of production requirements on the one hand, and also obtaining greater competitive capabilities when selling, and thus its greater ability to introduce new goods to the market.
- savings resulting from a large facility obtaining multiple financial savings due to the confidence of financial institutions in the solidity of its financial position, which is represented by obtaining loans easily and at a lower cost.
- Risk savings: The risks to which large establishments are exposed can be reduced by diversifying production and diversifying the markets in which they distribute their production, as well as diversifying the sources of the establishment's access to its requirements involved in production.

8- Economic rent-seeking policy:

There are some studies that neglect to include rent as a financial part or share that belongs to the state, as these studies compare the profitability of oil and the profitability of gas, and estimate the difference between the cost and the selling price as a profit and then attribute it to investments to extract what they call the rate of return on investment (Abdullah 2013 : 18).

The shortcoming in this analysis is that it ignores the right of the country exporting the natural hydrocarbon resource (oil or gas) to obtain rent as its fair share as it is the price for the depletion of this resource, and this price is taken independently of the investments that were spent in searching for, developing and producing from the fields, and this share

Or the fixed share was known as royalty , which is a specific percentage of oil production that the host country receives, regardless of the project's profitability or loss (Abdullah 2013 : 18).

9- The policy of flexible dealing with OPEC disease:

Qatar has begun a flexible policy with the gas exporting countries, which have been lenient with some of the commonly accepted conditions in gas contracts. This matter or disease is similar to the disease of the OPEC organization, which can be called OPEC disease (OPEC disease), which is the conflict and difference between the public interest and the private interest. If the latter is given priority, the power will be weakened . Negotiating and bargaining towards consumers, and the market transforms, just as it transformed in OPEC, from a producers' market to a consumers' market.

The negotiating position of the exporting countries weakens in the face of gas importers from industrialized countries and others, which are supported by their companies and banks that control gas export financing, and the lack of coordination between them. Then, the importers will be able to waive many conditions contained in gas contracts and purchases, such as:

c- Take -or - Pay condition .

d- Minimum price condition

These two conditions provide the gas exporting state or its companies with a minimum level of cash flow and allow it the opportunity to obtain easily and with reasonable conditions the loans necessary to finance the project. However, the Omani project for liquefying and exporting gas waived the minimum condition, which encouraged importers of Qatari gas to demand the cancellation of the condition from their contracts and it was achieved for them. This condition (Abdullah: 18).

10- Income diversification policy, which is completely consistent with the sum of points 2 and 3 of the technological policies, as will follow.

The second requirement: strategy Administrative : It is possible State it with the following points :

6- The policy of using companies as soft tools for the state and its economic arms to manage gas wealth inside and outside the country. This strategy varies in terms of paying attention to companies and giving them an

important economic role by multiplying them at times, merging and streamlining them at other times, streamlining and reducing their workers, or creating new companies that perform new roles (Dargen: 8-9)

Qatargas was established in 1984, in partnership with the French Total, Mobil, and two Japanese companies. It began its first shipments of liquefied natural gas (LNG) to Japan in 1997 (Abdullah 2013 : 16).

The second company is Ras Gas, which was founded in 1993 and began production in 1999. Its ownership is divided between Qatar Petroleum (63%), Exxon Mobil Company (25%), the Japanese Itochu Company (4%), and the Japanese Liquefied Natural Gas Corporation (3%) . And the Korean Kogas Corporation (5%). The company works to produce natural gas from three offshore platforms in the North Field (Al-Jawarin.(

Six Ras Gas stations were established, and the table below shows the year in which the station was established, its production capacity, and the increase in production capacity from any station, in addition to contracted exports and actual exports.

It is worth noting that the capital cost of the two units is estimated at approximately $3.3 billion, noting that the cost of the second unit does not exceed one-third of the cost of the first unit, which reflects the importance of "economies of scale" in this industry (Abdullah 2013: 19).

7- The policy of finesse in negotiations:

Justin Dargin states that no other country can match Qatar in terms of the ability to renegotiate old contracts and conclude new contracts that are restrictive to both parties (Abdullah 2013 : 7).

In 1996, the Korean company was able, with the help of Shell, to contract with the State of Oman to increase its purchases of liquefied gas to (4) million tons annually in exchange for Oman abandoning the minimum condition, and thus the way was opened to re- negotiate with Qatar to obtain similar treatment (Abdullah 2013 : 19).

8- Maneuvering and financial management policy:

In continuation of the above regarding the negotiations with the Korean company, the latter was able to obtain a 5% share of the ownership of the Qatari company, in exchange for increasing its purchases from (2.4) million tons to (4.8) million tons annually, based on

the lower cost. The second unit of liquefaction will improve the economics of the project (Abdullah 2013 : 19(

On the other hand, in 1996, RasGas was able, with the help of Mobil, to offer bonds in the company's name on the global capital markets, which were fully covered. Thus, the company obtained $1.2 billion from two issuances, the first of which was redeemed in 2006 with interest (7.6%) and the second in 2014 with interest. (8.3%.)

Financing by issuing bonds in the capital market is considered the first of its kind for a liquefied gas project.

It is worth noting that the explanation for the ease of underwriting is that the contract with the Korean company guaranteed the marketing of the production of the first two units for a period of (25) years, in addition to the two Japanese companies obtaining (7%) of the ownership of the company after they promised to provide soft loans to cover Qatar's share of the capital in the company. A limit of $900 million to be recovered from Qatar's share in production, thus Qatar's share decreased to (63%) and ExxonMobil to (25%) (Abdullah 2013 : 19).

9- Policy of interest in transportation, marketing and innovative marketing:

Marketing includes transportation by pipeline or transportation by sea tankers designated for this purpose. Therefore, Qatar has worked to build many ports to receive the liquefied gas that it produces in many countries of the world. It has built (South Hook) port in the United Kingdom, which was officially opened in 2009. A joint venture between Qatar Petroleum (70%) and Exxon Mobil (30%). The port's capacity is 15.6 million tons annually of liquefied gas. The Adriatic Port was also built in Italy, which is the first floating port in the world that was manufactured to import liquefied natural gas, store it, and return it to its gaseous state. It is a joint project between Qatar Petroleum (45%) and Exxon Mobil also (45%), and the (10%) The rest is for Edison Company, and the port's capacity is (6) million tons per year (Al-Jawarin : 9).

South Hook Port and the Adriatic Port represent a new and innovative method of marketing.

As for pipeline transportation, it is represented by the (Dolphin) project, under which Qatar markets natural gas to the United Arab Emirates and the Sultanate of Oman, as it aims to extend gas pipelines under the waters of the Arabian Gulf to them. Its cost amounted to (3.5) million dollars to

export (2) billion cubic feet of natural gas. . Dolphin Investment Company, owned by the Abu Dhabi government, has authorized (51%) of its shares, Total (24.5%) and Occidental American Petroleum (24.5) to build a 488-inch line with a distance of (4000) km. The design capacity of this line is (3.2) billion cubic feet per day (Al-Jawarin : 9)

The Qatar Gas Transport Company was established in 2004 with the aim of transporting and exporting liquefied gas produced by Qatar, by building a large tanker fleet with the number of tankers reaching more than (60) tankers during the second decade of the third millennium (Al-Jawarin: 9).

10-

Energy diplomacy:

Energy policy differs from energy diplomacy in two points: (Schallow 2023: 14242).

b- Energy policy focuses on achieving and promoting national economic interests, while energy diplomacy focuses on helping national decision-makers in various ways achieve their goals in the field of energy at the international level, and energy diplomacy is considered more like a sub-element of energy policy.

F- Energy policy also differs from energy diplomacy in the new actors and factors associated with it. Energy policy brings new opportunities through actors and elements, while energy diplomacy brings complications in sharing and distributing fossil energy resources. In this context, energy diplomacy serves by using reserves as an element of pressure . International, for example, or the use of specific locations on energy transport routes to maximize national interests that flow into energy policy as two sub-cranes in a large river.

G- Energy diplomacy is defined as a set of means used by representatives of the international arena to avoid potential risks in interaction within the energy market and the dimensions of risks affecting energy security (Shalaw 2023: 156).

H- Energy diplomacy has been used as soft power by the Gulf Cooperation Council countries, especially Qatar, to play an important role through aid and investment to Arab and Asian countries. Qatar has also resolved conflicts, as in mediation between competing parties in Lebanon in 2008, and in Sudan (Shalaw 2023: 351(. (

The Qatar Investment Authority is the political instrument of Qatari energy diplomacy. Sheikh Tamim bin Hamad Al Thani visited the

Russian Federation on January 18, 2016 to discuss geopolitics in the Middle East and oil and gas issues. He stated that "the Russian Federation plays a leadership role in world stability," while the President said Vladimir Putin stated that "Qatar is an important element in the situation in the Middle East and the Arabian Gulf" (Qalajiya 2019: 159).

Aware among the Qataris of the important and growing role of the Russian Federation in the Middle East, they are trying to expand their influence to Moscow by displaying their enormous wealth, and Qatar constitutes a useful partner for the Russian Federation in terms of alternative sources, financing and investment (Qalajiya 2019 : 159).

The Qatar Investment Authority is considered one of the most important sovereign wealth funds in the world and owns more than $2.5 billion in the Russian Federation from federal assets in VTB Bank and Moscovo Airport . In 2016, it invested $11.3 billion in the Russian company Rosneft (Qalajiya 2019: 160).

The third topic: technological strategy : It can be divided into the following points:

.1Technology policy related to invasive industry stages:

It is known that the stages of the gas industry begin with exploration and drilling, then processing and liquefaction, then transportation and marketing. Recently, advanced technology has been introduced to the gas industry for liquefying natural gas and the natural gas processing process. The Pearl Factory in Qatar - one of the largest factories for converting

natural gas into liquid petroleum products - used this technology in 2011 (Mills 2018:45.(

These products, such as naphtha, diesel, and various oils, are for export purposes, as this project and other projects depend on manufacturing (syngas) and converting it into liquids according to Fisher Tropsch technology, which requires high-cost, environmentally friendly, high-quality investments with high economic returns (Abdel Reda et al. (2015: 45(

.2Multiple Products Policy:

There is a trend in Qatar towards diversification in gas technology. LNG (□) technology is different from LPG (□) and different from GTL (□), and Qatar seeks to benefit from the integration between LNG and GTL in order to reduce costs because they can share hydrogen processing units (Abdul Redha et al. (2015: 48(

.3Policy to move towards energy-intensive industries related to oil and gas:

These industries are headed to benefit from comparative advantage on the one hand and diversification on the other hand (Dargen: 9(

.4Policy for eliminating the gas pricing dilemma:

The dilemma of gas pricing is that the price of gas in the local market is - usually - linked to the price of a petroleum product such as diesel in the domestic and commercial sectors, and such as diesel or coal in the industrial and electricity generation sectors, where the average price is determined according to the weighted average of the quantities consumed in each sector (Abdullah 2013: 14.(

It has been noted that gas prices are often lower than oil prices due to the absence of a global market for gas in which its price is determined, as well as the dependence of its price on negotiations between the exporter and the importer, with the balance of negotiation prevailing in favor of the importer, who has many reasons to control the capabilities of the project in terms of financing or Marketing or technology used (Abdullah 2013: 14(

Regional oil prices are considered relatively low in the first months of 2021 when compared to the global price of oil, and Qatar seeks to get rid

of this dilemma and increase revenues by converting natural gas into high-quality, refined products of gas liquids and petrochemicals (Dargen: 9(

.5Transportation Attention Policy:

In 2004, Qatar established the Qatar Gas Transport Company by tanker, which aims to transport and export liquefied gas produced by Qatar by building a large tanker fleet with a number of tankers reaching 60 during the second decade of the third millennium (Al-Jawrain: 9.(

On the other hand, Qatar has entrusted the laying of pipelines to transport gas to its neighboring countries (the Emirates and Oman). The Dolphin project was established at a cost estimated at (3.5) billion dollars to export (2) billion cubic feet of gas. This project aims to provide large quantities of gas via a pipeline. Gas pipelines under the waters of the Gulf for a period of (20) years starting in 2006 (Al-Jawarin: 9)