Kuwait's O&G Contractual Framework and the Development of a Modern Natural Gas Industry

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Abstract

Since 2008 Kuwait has been experiencing natural gas shortages with serious implications for the development of its economy. The exploration and then the production of both non-associated (from new gas fields) and associated (from complex crude oil fields) natural gas require the assistance of IOCs which possess the necessary expertise. Given the harsh Kuwait's political debate about awarding IOCs with more interesting contracts, up to now IOCs have been only granted TSAs (now upgraded to ETSAs) which they subscribe for not being completely cut off from Kuwait's O&G market. In the first chapter, this paper analyzes Kuwait's O&G contractual framework since the 1930s to today's ETSAs. The second chapter is instead an analysis of Kuwait's natural gas industry which is now not sufficient anymore to satisfy the country's gas needs. Considering the long-term timeframe for developing domestic non-associated gas fields, importing expensive LNG - which was initially regarded as a temporary solution - will probably be structured in a more permanent basis.

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Abbreviations and Units of Measurement

AOC - Arabian Oil Company
APOC - Anglo Persian Oil Company
Bbl - Billion Barrel
Bbl/d - Billion Barrel per Day
Bcf/d - Billion Cubic Feet per Day
Bcm - Billion Cubic Meter
Bcm/y - Billion Cubic Meter per Year
BG - British Gas
BGC - Basrah Gas Company
BP - British Petroleum
BTU - British Thermal Unit
EIA - Energy Information Administration
EOR - Enhanced Oil Recovery
ETSA - Enhanced Technical Service Agreement
EU - European Union
FDI - Foreign Direct Investment
Ft - Feet
GCC - Gulf Cooperation Council
GDP - Gross Domestic Product
GECF - Gas Exporting Countries Forum
IBBC - Incentivized Buy-Back Contract
IOC - International Oil Company
JV - Joint Venture
KNPC - Kuwait National Petroleum Company
KOC - Kuwait Oil Company
KOGAS - Korea Gas Corporation
KPC - Kuwait Petroleum Corporation
LNG - Liquefied Natural Gas
LPG - Liquid Petroleum Gas
MMcf/d - Million Cubic Feet per Day
MOU - Memorandum of Understanding
NOC - National Oil Company
O&G - Oil & Gas
OAPEC - Organization of Arab Petroleum Exporting Countries
OPEC - Organization of Petroleum Exporting Countries
OSA - Operating Service Agreement
PIC - Petrochemicals Industries Company
PNZ - Partitioned Neutral Zone
PSA - Product Sharing Agreement
Qatar Gas - (QG)
Qatar Petroleum - (QP)
SA - Service Agreement
SOC - Southern Oil Company
TCF - Trillion Cubic Feet
TCM - Trillion Cubic Meters
TPAO - Turkish Petroleum Corporation
TSA - Technical Service Agreement
UK - United Kingdom
USA - United States of America
Introduction

Kuwait is worldwide known as an oil exporting country. At the beginning of 2011 Kuwait owned within its territorial boundaries an estimated 101.5 billion barrels (bbl) of proven oil reserves equal to around 7% of world's total oil resources. In addition, the country has other reserves located in the Partitioned Neutral Zone (PNZ) which is an area shared on a 50-to-50 basis with neighboring Saudi Arabia. This Neutral Zone should contain at least 5 bbl of proven reserves. Added to the reserves within Kuwait's territory, overall total reserves should be equal to around 104 bbl\(^1\).

The country is a member of the Organization of Petroleum Exporting Countries (OPEC) and exports the fourth largest volume of oil within the 12-member organization\(^2\). Petroleum exporting revenues account for around 50% of its overall gross domestic product (GDP), 95% of total export earnings and 95% of Government revenues. Practically, Kuwait's economic performance largely correlates to the oil sector and its economy is one of the least diversified within the Gulf Cooperation Council (GCC)\(^3\). In other words, up to now talking about Kuwait meant talking almost exclusively about oil. Something is now changing.

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\(^1\) EIA, *Country Analysis Briefs Kuwait*, Updated in June 2011, in http://www.eia.gov/countries/cab.cfm?fips=KU
\(^2\) OPEC comprises 12 members: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates and Venezuela.
\(^3\) Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates are the six GCC members. Jordan and Morocco have been invited to join the GCC.
As Middle Eastern economies - with a particular attention given to GCC countries - develop and grow at a consistent rate, they need to have always rising quantities of natural gas. In fact, gas is the ordinary feedstock for power generation, water desalination and other energy-hungry industries like aluminum, steel, cooling, petrochemical and construction. Apart Qatar - which stands in third position in the ranking of natural gas proved reserves - all the other five GCC members are currently experiencing gas shortages (Oman included). Considering that the Middle East is home to 40.5% of proven natural gas reserves (including 15.8% belonging to Iran, a country that is also experiencing the same problems) the current gas shortages are a real paradox meaning that the Middle East's share of gas resources is relatively undeveloped.

Kuwait's gas resources are not as big as the country's oil reserves but still at 1% of world's natural gas reserves with 1.8 trillion cubic meters - the majority of which is associated gas - the country should be in the position of avoiding to import gas. Instead natural gas - being mainly associated gas - in Kuwait has always been considered a problem for the oil sector, a trouble when extracting crude. In practice associated natural gas ended up being flared or burnt when extracting oil.

Since 2009 Kuwait has been obliged to import natural gas in order to reduce recurring electricity crises especially during the summer season (April-October) when electricity demand springs up. What is interesting to understand is the real changeover in dealing with gas in Kuwait. No more it's considered a disgrace when pumping out of the ground oil. Kuwait has recently initiated a spending spree worth $90 billion aimed at expanding both the upstream and downstream sectors. This spending spree should increase oil production capacity to 4 million bbl/d by 2020 from the current 2.5 million bbl/d in 2010. Increasing oil production means in Kuwait increasing the output of gas, given the presence of associated gas in crude oil fields. But continuing to rely on associated gas will not be sufficient so Kuwaiti authorities are propping up the exploration for additional gas reserves in order to satisfy the country's ever-increasing natural gas needs.

Summing up, although augmenting the output of crude oil by 2020, natural gas imports are expected to continue until the country is really able to boost its production of natural gas from gas fields located in Northern Kuwait and offshore along Kuwait's coastline.

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Chapter 1 - Kuwait's Energy Sector Set Up: Opening, Closedown and Partial Reopening of the Market

1.1 Kuwait Before the Oil Age

At the beginning of 1700 Kuwait was inhabited by nomadic populations from neighboring territories: Saudi Arabia, Iran and Iraq. At that time Kuwait was a base for trade flows between India and Africa. Kuwaiti people became rich merchants. One century later the most important merchant families decided to hand over the business of government to an important family, the Al-Sabahs, which was not involved in trade. This family still holds the power today and consequently the current Emir, Sabah IV Al-Ahmad Al-Jaber Al-Sabah, is one of its members. This relationship between the ruling family and the merchant families is at the foundation of the Kuwaiti State and up to nowadays it has been at the cornerstone of the country's politics.

Then in 1899 Kuwait - both the then Emir and the merchant families agreed on this - subscribed a treaty with the United Kingdom (UK). The idea on the Kuwaiti side was to get protection from the Ottoman Empire, while on the UK side it was meant to counterbalance the expansion of German influence in the Gulf (in those years it was proposed the construction of the Berlin-Baghdad railroad). In practice, the UK obtained the control of Kuwait's foreign policy in exchange for protection and of an annual subsidy.

At the beginning of 1900, the desert country was relying mainly on fishing pearls, shipbuilding and trading merchandises between India and Africa. Kuwaitis were around 70,000 and the majority of them used to live in Kuwait City, a trading center. Given the harsh weather conditions agriculture was poorly developed and most food and water had to be imported.

Things changed dramatically for the worse in the 1930s when pearl fishing was not anymore a relevant source of income. In fact, the Japanese Mikimoto developed cultivated pearls which started replacing Gulf's natural pearls.

1.2. The Creation of the Kuwait Oil Company (KOC)

Given the dire economic conditions, there was the hope of getting some financing from oil concessions to foreign oil companies like it was happening in Iran and Iraq. The then Sheik Ahmed (1921-1950) could see the example of Bahrain where oil was discovered in
1932, but at his disappoint the English seemed not too much interested into Kuwait. At that time UK’s Anglo Persian Oil Company (APOC) was already badly economically exposed in both Iran and Iraq and was not thinking of investing additional resources also in Kuwait.

America’s Gulf Oil was instead quite interested into Kuwait but British authorities claimed Kuwait as a territory under their exclusivity right. After Gulf Oil’s strong protests with the Department of State, the Foreign Office communicated to the Americans that the UK was renouncing to its exclusivity right in April 1932. But when the following month (May 1932) oil was discovered in Bahrain, APOC changed immediately its plans. Strategically APOC wanted to avoid what previously happened in Saudi Arabia where the British company lost positions in favor of the Americans.

This was the best outcome for Sheik Ahmed: two groups were now competing for the same territory. It started one year and a half of bids and counterbids between the two oil groups. In the end APOC comprised that the bidding game with Gulf Oil was a too expensive a negotiation for a territory where oil had still to be discovered. The best solution was to find an agreement with Gulf Oil. So, in December 1933, Kuwait Oil Company (KOC) was created. This was a 50% joint venture (JV) between APOC and Gulf Oil. The first step was over. Now it was necessary to negotiate the concession price with Sheik Ahmed.

The JV between the British and the Americans was absolutely bad news for Kuwait. An agreement between the two companies was really depriving Sheik Ahmed of his most powerful contracting tool, an auction. Notwithstanding this, Kuwait was very capable in understanding and then utilizing the experiences of the oil concessions previously assigned in Iraq, Iran and Saudi Arabia. The negotiation for the concession was tough and was over only after one year in December 1934. KOC got a 75-year oil concession for the whole Kuwaiti territory. Sheik Ahmed obtained an initial payment worth 450,000 rupees.

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(£35,000), a guaranteed minimum annual payment of 95,000 rupees ((£7,150) until oil discovery and then as soon as oil could be extracted for commercialization a minimum amount of 250,000 rupees (£18,800) in royalties. In practice, KOC would pay $0.13 a barrel⁶ and it got full ownership of petroleum and derivative products from onshore Kuwait, all Kuwaiti islands and the territorial waters.

Oil was then discovered in 1938 and in a few years the Kuwaiti economic conditions improved consistently. In 1961, Kuwait had a population of 320,000 of whom 50% were nationals with one of the world's highest per capita income. Kuwaiti people received free healthcare, education and many other additional services. After the discovery of oil the risk connected with oil explorations abased and it emerged that a good portion of the Gulf area was very profitable in relation to oil exploitation. Since the 1950s Middle East countries started to ask for improved stakes in the oil business. For example, in Kuwait state participation was required when releasing small concessions to Aminoil in 1948 and to Arabian Oil Company (AOC) in 1959.

But the real turning point was in 1951 when KOC modified its concession with the State of Kuwait on the basis of a 50/50 agreement meaning that from now on Kuwait would get half of the profits. In addition, KOC prolonged by 17 years the duration of its concession. Worldwide the relationships between owners of energy resources like oil and gas and international oil companies (IOCs) were changing. In those years Venezuela moved away from a concession regime to profit sharing agreements (PSAs). Nationalization winds were blowing on the concession regime still applied in the energy sector.

From the 1960s it emerged the confrontation between the Emir and the Government on one side and the National Assembly/Parliament - composed by members of the most relevant merchant families and the tribal leaders - on the other side. This confrontation is alive still today. In fact, the National Assembly/Parliament has always been a powerful institution that is fundamental for addressing all major political, economic and social Kuwaiti transformations. Accepting the nationalization doctrine, the Parliament espoused the nationalization process of Kuwaiti commodities: oil and gas.

The 1962 Kuwait's constitution reflects the changed atmosphere in dealing with the management of natural resources. The National Assembly's effort brought in the inclusion in the constitution of articles No. 21 and No. 152 that directly affirm that the State owns and controls all oil resources. The National Assembly put inside the constitution these two articles as two obstacles to an easy involvement of IOCs in the Kuwaiti oil & gas sector.

On the one hand, the members of the National Assembly since 1962 have been interpreting articles 21 and 152 in a very strict and literal manner, i.e. any agreement concerning natural resources needs Parliament’s approval. On the other hand, the Government and then the public holding controlling the Kuwaiti oil & gas sector, the Kuwait Petroleum Corporation (KPC, see below Chapter 1.4: The 1975 Complete Nationalization of the Energy Sector, Oil Included) have been interpreting article 152 more openly meaning that the Parliament is supposed to approve only new concessionary agreements and not operating service agreements (OSAs). Occurring disagreements between the two positions about the correct interpretation of article 152, the case could be referred to the Constitutional Court which has the final word about constitutional interpretations.

It goes by itself that it's a very delicate argument and that the Government is never willing to have a confrontation with the Parliament to be ruled by the Constitutional Court. A Constitutional Court’s ruling in favor of the Parliament could in fact be very dangerous for the Kuwaiti political environment.

**1.3. The Nationalization of Kuwait's Natural Gas**

From the 1960s onwards, the National Assembly did not accept KOC's practice of flaring off the natural gas released when extracting oil. It's quite normal to get associated gas when extracting oil and in many oil fields it's exactly the gas pressure to push oil

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7 ABULHASAN, A. M., *Future Relations Between Kuwait Petroleum Corporation and the International Oil Companies*, Fletcher School of Law and Diplomacy, Tufts University, Medford, May 2004 in http://fletcher.tufts.edu/Congratulations/faces/~/media/Fletcher/Microsites/congratulations/PDFs/Abulhasan-Arwa.ashx, accessed on November 16, 2011
towards the surface. Associated gas can exist separate from the crude oil in the underground formation, or dissolved in the crude oil. The release of natural gas when producing crude oil is dangerous because gas may explode. In general, there are four solutions for getting rid of this problem:

A) Flare the obtained gas in a controlled manner (easy to be accomplished)

B) Commercialize and subsequently sell the gas in a close market (the proximity of a market was a fundamental element especially in the past)

C) Reinject the gas back into the reservoir in order to maintain constant the pressure of the oil well (this procedure is both complicate and expensive)

D) Stop producing crude oil (economically the worst scenario)

In Kuwait, following economic and easiness considerations KOC chose to flare gas. Every day several million cubic feet of gas were flared. For the National Assembly - but it would be correct to say for the public at large - flaring gas was absolutely wrong because it hold back Kuwait from having a feedstock fundamental for electric power generation and desalinization. The issue of gas utilization started to be discussed in Parliament since 1969. The Government was reluctant to discuss this topic with the IOCs but it was under attack by the Parliament which was calling for full nationalization of natural gas.

After a couple of years, in July 1971, the Kuwaiti Minister of Oil and Gas had a meeting in London with the executives of British Petroleum (BP, previously APOC) and Gulf. The Minister carefully explained that the Government absolutely wanted to avoid a full scale confrontation with the Parliament in relations to gas and that a solution was needed. Missing a solution the only viable alternative was gas nationalization. The meeting was a failure and the proposal did not get the sufficient consideration by the two companies which denied the Kuwaiti Parliament its actual influence over the country's politics. When on October 28, 1971 the Kuwaiti Parliament reconvened after the summer break gas nationalization was the moment's hot topic. Then, by order of the Parliament the gas industry was de facto nationalized. The result of the nationalization was a relevant increase in the utilization of gas.

1.4. The 1975 Complete Nationalization of the Energy Sector, Oil Included

Nationalization winds were already blowing over the MENA region and oil was becoming a nationalistic tool used to shape domestic and international politics. In May 1962 KOC spontaneously renounced to concession rights with reference to half the

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initial concession. The renounced area was assigned to the Kuwait National Petroleum Company (KNPC), a company established in 1960. Its shareholders were for 60% public and for the remaining 40% private. In addition to this, the company had the monopoly for the distribution of oil products within Kuwait.

The traditional system of oil concessions was changing towards two extremes: pure nationalization (supported by the Arab League) and participation supported by some Arab technocrats. The first real nationalization happened in Libya in December 1971 (not considering the minor one in Algeria in 1967). Other nationalizations followed in Algeria, Venezuela and Iraq.

Completely different was the strategy of participation followed by another group of countries led by Saudi Arabia and including Abu Dhabi, Kuwait, Qatar, Iran and in part Iraq. According to the pragmatic philosophy of Yamani [Saudi Arabia's oil minister Zaki Yamani], their aim was to take control of the oil industry gradually without threatening the stability of the markets and taking into account the time needed to acquire full awareness of its operating mechanisms. This strategy coincided precisely with the wishes of the western companies⁹.

In January 1973, the Kuwaiti Government approved the General Participation Agreement championed and negotiated in New York City by Saudi Arabia's Oil Minister Zaki Yamani on behalf also of the other Arab countries. According to this agreement the companies agreed to hand over a growing share of their businesses: starting with 25% in 1973 to reach 51% in 1981. In other words, KOC's 25% should be nationalized immediately following compensation equal to the book value of the to-be-nationalized infrastructures. Within 1982 the Kuwaiti Government would get the majority of the company's shares.

Kuwait's National Assembly refused ratifying the agreement claiming instead that it was necessary to immediately nationalized the whole company and accusing the Government to be too much patronizing with KOC’s owners British Petroleum and Gulf. Limited trust between the National Assembly and the Government will be a constant element of their relation during the decades and it is still so today.

In the summer of 1973 Kuwait announced of willing to renegotiate its participation quota in KOC with the aim of getting the majority of its capital immediately. In September 1973 Kuwait hosted the 11th meeting of the Organization of Arab Petroleum Exporting Countries (OAPEC, not to be confused with OPEC) and the nationalization principle was approved. Then, following the October 1973 Yom Kippur war, events moved forward very fast. Kuwait's Oil and Finance Minister Abdal Rahman Atiqui met with KOC's officials for renegotiating the shareholders' quotas. The Minister asked for obtaining KOC's 50% shares but lately this agreement did not satisfy the Parliament. Then, in January 1974 the Minister reached an agreement for the 60% of the company

and the Parliament ratified this agreement the following May. BP and Gulf received a $112 million compensation according to the value of the nationalized infrastructures.

After the parliamentary elections of January 25, 1975, the opposition party strongly criticized the energy policy of the Government which was considered too much in line with the interest of Big Oil and the USA. Following these tensions in March 1975, the new Kuwaiti Oil Minister Al Kazemi announced the intention of nationalizing the remaining 40% shares still in the hands of the BP-Gulf joint venture\textsuperscript{10}. The two companies opposed such a move underlining the fact that they literally helped the Kuwaiti energy sector to be set up. Their attempts were to no avail in order to reverse the nationalizing trend. And in specific, nationalizing the commodities was considered by Arab countries an act of sovereignty. BP and Gulf asked for a compensation worth $2 billion but in the end they got only $50 million. Similarly for them it was not possible to get Kuwaiti crude at a preferential price from then onwards.

The following steps were the kuwaitization of KOC's personnel and the nationalization of KNPC. The entire oil sector was under the control of the Supreme Petroleum Council (SPC, headed by the Prime Minister) which had been established thanks to Decree for Establishing the Supreme Petroleum Council of August 26, 1974. The basic idea behind the institution of the council was to have an institution for drawing the general policy of petroleum wealth within the framework of the national economic and social development plan.

Lately, on January 27, 1980 it was created the 100% government-owned Kuwait Petroleum Corporation (KPC), which is Kuwait's national oil company. It's based in Kuwait City and it's an umbrella company incorporating several fully-owned subsidiaries. KPC manages domestic and foreign oil and gas reserves. Some of its subsidiaries like KNPC (Kuwait National Petroleum Company), Petrochemicals Industry Company (PIC) and Kuwait Oil Company (KOC)\textsuperscript{11}

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\textsuperscript{11} Here it's considered not the original KOC created by Anglo Persian Oil Company (then British Petroleum) and Gulf Oil in 1933 but the mixed private/public company born in 1974 whose 60% belonged to BP/Gulf while the remaining 40% to the Kuwaiti State.
had been created in the 1960s by the State in conjunction with private investors. By 1980, thanks to Law No. 6 of 1980 (establishing KPC), they all were transferred to KPC's full ownership.

Finally, in 1986 the Ministry of Oil was established as separate from the Ministry of Commerce & Industry and it started to have policy-making powers in conjunction with SPC. In specific, the Minister has been given a supervisory role over all public institutions related to the oil and gas sectors.

1.5. Recent Years' Attempts Aimed at Reversing the Complete Nationalization of the Energy Sector (Oil & Gas) - The Kuwait Project

Thanks to the nationalizations of natural gas in 1971 and of oil in 1975, Kuwait’s energy sector was totally nationalized and no IOC was allowed to operate in the country. During the nationalization period, the only IOC which had (and still runs this activity today) business relationships with Kuwait was America's Chevron which had operations onshore in the so called partitioned neutral zone between Kuwait and Saudi Arabia.

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*Source: (2011) A. BACCI's Elaboration Based on 2011 Booz&Co. Data*

In this area Saudi Arabian Chevron Inc. and KOC explore for and produce oil and gas. The energy production from this area is shared between the two countries.
Nowadays although with great difficulties for IOCs it's possible to operate in Kuwait through service agreements (SAs). In practice in the MENA region Saudi Arabia's energy sector is the only one still totally close today (in reality, Saudi Arabia has attempted to find more natural gas by allowing IOCs a partial access that it instead does not permit in the oil sector where Saudi Aramco rules). The table above shows the current different approaches to energy contracts in the MENA region.

The nationalized KOC had in 1975 advanced technological skills and was by that time capable of extracting crude oil without the assistance of IOCs. This was possible because in general Kuwait's oil fields - between them there is Burgan the second largest crude oil field in the world (it started production in 1938) - are easy to operate. In 1975, the on-production crude oil fields were onshore, at an early stage of development and with high underground pressure. In practice, it was necessary just to vertically drill wells (between 3,500 and 5,000 ft) and then oil would flow to surface. By 1990, KPC was the only Third World's state-owned company capable of selling its oil using its own brand name and through its own service stations. It was with no doubt an important milestone for Kuwait.

The full closing of the oil & gas sector to IOCs lasted for 15 years. Practically, the course of events was changed by First Gulf War (August 1990-February 1991). Since the liberation of Kuwait in 1991 it appeared clear that the oil sector was in a difficult situation owing to the ruinous Iraqi invasion. KPC immediately looked for technical assistance from IOCs and there was a tacit understanding that once the oil industry was reconstructed the upstream sector would be open to the assisting IOCs. Effectively, since 1991 some IOCs have been involved in the upstream sector providing simple technical assistance. Two years later surfaced the idea of allowing the IOCs not only to provide technical assistance but also to invest in the upstream with reference to a new-and yet-to-be-developed project called Project Kuwait which targeted to increase oil production capacity from four northern oil fields: Raudhatain, Sabriya, al-Ratqa and Abdali. Apart from general advantages that could be obtained from the

What Advantages May derive from IOCs Involvement?

For KPC there are at least four major advantages that could derive from IOCs' involvement into Kuwait's oil sector. They are:

A) Achieve cost savings while at the same time improve the efficiency.

B) Train a skilled Kuwaiti labor force and create new jobs.

C) Update and improve the technological level of Kuwait's oil & gas industry.

D) Recreate with IOCs new working relationship that could be very useful in the long run.
involvement of IOCs (see the above box) one reason emerged above all: securing military support from abroad. The initiative of developing oil fields located on the border with Iraq and of requesting the active role of IOCs was backed by the idea that having foreign workers stationing in the area of Project Kuwait would facilitate military alliances with the countries to which belonged the involved IOCs. At this regard, it should be understood that Saddam Hussein lost the war but still held power in Iraq. In practice, Kuwait wanted to create a sort of economically driven buffer zone making the border area much safer.

In the meanwhile, under a 1994 agreement with the KOC, Chevron subsidiaries provided technical expertise for the continued development of the Burgan Field. The KOC agreement expired in 2008. Recalling Chevron for service agreements in relations to Burgan was quite obvious in 1994. In fact, Gulf Oil Corp., which became part of Chevron in 1984, discovered Kuwait's super-giant Burgan Field in 1938 and had been working there up to 1975. The Burgan discovery helped transform Kuwait into a top oil producer. Another example of technical service contract was the one awarded in 1994 to Burgan Equipment Co., a private company based in Kuwait (it's not an IOC), soon after the liberation. It consisted of supplying, installing and commissioning training equipment in the KPC training center. This service agreement was completed successfully but on the Project Kuwait side, the 1995 initial proposals from KPC were opposed by both the Parliament and the SPC.

Then at the end of the 1990s it appeared clear that Kuwait's oil & gas sector was behind its production potential. Already there was the need to explore for and then develop more difficult oil fields - like those located in the northern part of the country - than the ones that had been pumped for the previous 50 years. On-production crude oil fields were mature so that their internal pressure was not sufficient for permitting an easy oil recovery. As well the giant oil field Burgan, the cash cow oil field was at risk of being permanently damaged. This situation was partly due to a regulatory system banning
foreign ownership of hydrocarbon resources. In short, KPC and its subsidiaries, although trained, were missing the skills for working oil and gas out of difficult fields. It was a too big bet for KOC to work alone. It was uneconomically for KOC to assume full risk in completely handling new difficult oil fields given the infancy of its ability in harnessing top-notch technologies.

Finally, the Supreme Petroleum Council made the appropriate decision in 1997 and understood the non-lingered necessity of opening the O&G sector to IOCs. The plan was to invite selected IOCs (Chevron, Conoco, ExxonMobil, Total, Shell, BP and ENI) to participate in developing oil fields located in North and West Kuwait. Technically, the big change happened in March 2001 when the National Assembly passed Law No. 8/2001 Foreign Direct Capital Investment Law, which partially facilitated some foreign direct investments (FDIs) also in the Kuwaiti energy sector. In fact, according to article 3 (and to the Explanatory Memorandum to Law No. 8/2011) the procedure for foreign investments in natural resources is now permitted but not with a simple license like it happens in other sectors but only pursuant to a law and for a limited period of time. In other words, the Parliament needs to know and approve every contract that is going to be subscribed between KPC and any IOC.

The target is preventing corruption and ensure transparency in investment practices. This law spurred one more time a lot of debate given the different mindsets in relations to the energy sector: opening (although through just service agreements) or closedown to IOCs. But following this law, KPC announced reinvigorated plans to permit foreign companies to develop the oil fields located in North Kuwait. In the end, this law proved useful to implement improved service agreements although it took nine years before signing the first such contract with an IOC.

And in relations to the development of the oil fields located in North Kuwait, swiftly KPC started lobbying in favor of modifying Kuwait’s oil & gas sector regulatory regime asking for permitting IOCs to participate to the oil industry through operating service agreements (OSAs).

For KPC three principles should govern the relationship between Kuwait and IOCs:

**Article (3)**

Any commitment to invest one of natural resources or public utilities shall be made only pursuant to a law and shall be for a limited period. Preliminary procedures shall guarantee the facilitation of searches, inspection, detection and the achievement of openness and competition. Such agreements, contracts or obligations granted prior to the execution of the Constitution or this Law may only be renewed or amended pursuant to a law.

Law No. 8/2001
A) OSAs should be consistent with Kuwait’s constitution

B) Kuwait would have the ownership of all the produced oil and gas and the obtained revenues

C) IOCs would not get any ownership title over crude oil and gas

The draft legislation regarding OSAs (they were planned to have a 25-year duration) was introduced in parliament in 2003. In order to get IOCs investment it was established an incentivized buy-back contract (IBBC) neither implying a PSA nor a concession. OSAs i.e. the operative services agreements would in detail define IOCs’ position.

According to this draft, Kuwait would have sovereign control over the production and would manage the strategic side, while IOCs would control the operational management providing for services and construction primarily on a contractual basis.

Practically, IOCs would be remunerated for 50% of operating costs on a monthly basis and for 50% of capital costs over a 10-year period. IOCs' compensation was based on a variety of fees (an old oil fee to be paid on production that could be produced by KOC, an oil fee to be paid on production over the old oil curve, a gas fee, an allowance for recovering the invested capital and another allowance for annual capital investments) with the aim of covering costs, incentivizing a positive behavior and rewarding the obtained results. According to the draft, there was also the idea of permitting foreign investors to transfer their OSAs to another foreign investor, to repatriate capital and profits and to be entitled to compensation in the case of a takeover by the State.

<table>
<thead>
<tr>
<th>Analysis of Kuwait Project's OSAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obligations and Rights</td>
</tr>
<tr>
<td>Rate of return on investment</td>
</tr>
<tr>
<td>Risks</td>
</tr>
<tr>
<td>Booking reserves</td>
</tr>
<tr>
<td>Production and market control</td>
</tr>
<tr>
<td>Management control</td>
</tr>
<tr>
<td>Stable fiscal terms</td>
</tr>
<tr>
<td>Constant predictable cash flow</td>
</tr>
<tr>
<td>Maximum added value</td>
</tr>
<tr>
<td>Oil price risk</td>
</tr>
<tr>
<td>Operation risk</td>
</tr>
<tr>
<td>Leverage on economic development</td>
</tr>
<tr>
<td>Technology transfer</td>
</tr>
</tbody>
</table>

Violating the terms of an OSA - at least as prescribed by the draft legislation - would include an initial warning, the withdrawal from the investment and at last the liquidation of the investment.

The proposed relationship between Kuwait and IOCs in the Kuwait Project is the natural evolution from what we have today. It is this second phase of our relation that takes into account the strengths and limitations of the existing relation. The Kuwait Project proposes to expand IOCs role from an advisory role to a fields’ management and operation role, where IOCs will act as a super contractor under the guidance and strategic management of the state. ... In essence, Kuwait requires the type of relationship with IOCs, which is primarily based on operating services where IOCs are paid a fee per bbl of oil produced.\(^\text{12}\)

In 2005, the Financial and Economic Affairs Committee of the Parliament issued a favorable report about the draft but in the same year the State Audit Bureau had reservations about the constitutionality of the legislation. After the issue was raised the committee withdrew its report espousing the unconstitutionality of the draft law.

The problem was in the fact that for the Government there was no need to have a specific law for authorizing a specific IOC to work in Kuwait under a service agreement while for the Parliament a case by case law was required (different interpretation of article 152 of the Kuwaiti constitution). The Government considered that there were the numbers for approving the draft law in the Parliament but it postponed the vote to early 2006. In January 2006, the Emir Jaber III al-Ahmad al-Jaber al-Sabah died and the new Emir, Sheikh Sabah IV Al-Ahmad Al-Jaber Al-Sabah, following an increasing confrontation between the Parliament and the Government dissolved the former. Since then the relationships between the Parliament and the Government have been very

---
tense with the former accusing many ministries (including the Ministry of Oil) of corruption.¹³

But still in 2007 the situation was totally frozen in relations to legislating concerning the energy sector, so the Emir expressly conceded to Parliament the power to approve every IBBC related to Project Kuwait. But such a move did not prove to be good for speeding up the project because the Parliament continued delaying it. And given the difficulties to get some IOCs working for Project Kuwait until a couple of years ago there was the idea that neither an improved version of TSAs nor OSAs could ever materialize in Kuwait.

At this regard, it needs to be pointed out that IOCs' country managers were (and probably still are) not convinced about the attractiveness of the offered contractual terms and even if the draft law was approved there would be the risk that all IOCs may decline to bid. Plus, maintaining relationships with counterparts such as the oil minister and KPC and related subsidiaries' CEOs who serve for very short terms is an additional hurdle. In 2009, Chevron and BP, which had been assisting Kuwait since post-First Gulf War reconstruction, finally withdrew their senior executives after giving up on finalizing an agreement.

¹³ The Prime Minister Sheikh Nasser has so far resigned seven times since he was appointed prime minister in Feb 2006.
1.6. The Current Contracts for IOCs: Enhanced Technical Service Agreements (ETSAs) for both the Oil and the Gas Sectors.

Given the stalemate with no real progress for Kuwait Project, in the last years both KPC and IOCs’ managers have been pursuing as a viable alternative the so-called enhanced technical service agreements (ETSAs). Not implying any level of foreign control over oil and gas (absence of any bookable reserves)\(^\text{14}\), they aren't OSA equivalents while they still are one step ahead than normal TSAs. In fact, the State of Kuwait would pay premium prices to have IOCs' engineers assigned as long-term consultants to KOC. Moreover, high fixed fees would be coupled by variable performance-based payments related to the achievement of production targets. ETSAs are a hybrid between PSAs and traditional TSAs. In the end, ETSAs would incentivize international companies to increase their scope and level of involvement in upstream activities obtaining at the same time more supervisory authority.

But the real advantage of ETSAs lies in not requiring any approval by the Parliament although it's clear that they could still spark a loud political debate depending on the magnitude of the paid fees and the size of the IOC's footprint. It's evident that the continued power struggle between the Parliament (protecting its right to legislate) and the Government (feeling itself to much bound by Parliament's approbation) is not helping also the implementation of ETSAs. And the State Audit Bureau is suspicious

\(^{14}\) Oil and gas reserves are the principal assets of an O&G company and booking is the process by which reserves are added to the company's Balance sheet. This is done according to a set of rules developed by the Society of Petroleum Engineers (SPE).

"The essence of upstream investment is the ability to book new reserves. Booking reserves means that the corporation has the contractual right to produce the reserves even if it does not actually own the reserves. Booking is a vehicle under US securities law used for accounting purposes. The producing countries generally care about reserve ownership in a legal and political sense and less about booking reserves. In fact, according to the laws of most countries a corporation can no longer own subsoil resources but can book them, indicating an ability to increase its production.

The benefit of booking new reserves is that it signals to the investment community that the company has tangible assets that can support earnings growth. Also, booking new reserves will present a good outlook on consistency and sustainability of future earnings to investors. By showing that IOCs can add to their reserves the IOCs hope to convince investors to buy their shares and financial analysts (like Morgan Stanley, Merrill Lynch etc.) to recommend their companies to investors. Because the analysis of the future value of the company and its share price is dependent on maintenance and growth of reserves, the IOCs must constantly replace reserves declining through production" in ABULHASAN, A. M., Future Relations Between Kuwait Petroleum Corporation and the International Oil Companies, Fletcher School of Law and Diplomacy, Tufts University, Medford, May 2004 in [http://fletcher.tufts.edu/Congratulations/faces/~/media/Fletcher/Microsites/congratulations/PDFs/Abulhasan-Arwa.ashx](http://fletcher.tufts.edu/Congratulations/faces/~/media/Fletcher/Microsites/congratulations/PDFs/Abulhasan-Arwa.ashx)
about why the Kuwaiti Government is paying ten times more for an ETSA than a usual TSA.

All this said ETSAs are not a panacea for the current stalemate. In fact, IOCs are less enthusiastic of this kind of contracts than the planned OSAs, formerly targeted at Project Kuwait. There is also the possible danger that given the not quite appealing contractual conditions IOCs may be tempted to maximize short-term returns (like for instance maximizing production) versus a more strategically-oriented business plan. As a matter of fact, IOCs consider ETSAs as viable option as long as the received fees could cover their costs (also with no profit at all). In practice, they would have the same stand with ETSAs as per TSAs: subscribing these contracts just for being into a relationship with KOC and so being well positioned could it be possible in the future to be awarded an OSA. Fees - and IOCs would also be interested into getting production incentives - should cover costs otherwise there is no real interest into entering a market for simply losing economic resources.

Another unclear point is if ETSAs can be a consistent substitute for OSAs and can permit also the implementation of Project Kuwait. But again the kernel of the issues rotates all around the necessity of tracing a fair balance between KPC on the one side, and IOCs on the other side. The correct incentive - although with ETSAs - could permit IOCs to be focused on the long term and on technological quality.

Finally in February 2010, Shell signed an ETSA to exploit some 2005-2006 oil discoveries (20-25 billion barrels of heavy and sour oil) in the Sabriya and Umm Niqa areas in Northern Kuwait. Currently this project is proceeding slowly. Similarly, in August 2010, still in Northern Kuwait, British Petrofac signed another ETSA with KOC for boosting production capacity in the Raudhatain and Sabriya oil fields.

The future is unclear about either maintaining the status quo (remaining within ETSA contractual scheme) or developing an eventual and alternative type of agreement between KPC and IOCs. Honestly, there is no silver lining if a fair balance isn't established between Kuwait on the one side, and IOCs on the other side. At this regard, a good example comes from Iraq and Kurdistan (an autonomous region of Iraq). In fact, while Baghdad does offer just service contracts with low fixed earnings, in Kurdistan there are already on offer conventional contracts with their fairer profit share for IOCs. It goes by itself that IOCs are at present reaping service contracts in Iraq only under the auspices of getting improved and fairer contracts in the future, while the appealing and interesting Kurdistan contracts are hampered by the bickering between Iraq and Kurdistan on how to divide the spoils from the hydrocarbon riches.
Moreover, it is worth underlining that Kuwaiti population - accustomed to a high standard of living from cradle to grave thanks to an ever-present welfare where the state fully covers some priority costs (healthcare, housing and education) and subsidizes some secondary costs (fuel, electricity and water) - does not identify any real and urgent economic need for allowing IOCs to work in Kuwait under different terms and with an increased operative role. A great many population deem Kuwait's commodities to be integral part of Kuwaitis' national patrimony which has to continue staying in Kuwait's hands.

The government needs to figure out how to strike the right balance between ownership and competitiveness

Saedeldeen A Akashah, Chairman of Kuwait Catalyst Company, a refining industry solution provider company
Summing up, today's private sector's role in Kuwait's O&G sector is limited to contracts related to providing at maximum ETSAs at the upstream level. Political discord between a royally-appointed Prime Minister and the partially-elected Parliament are stalling possible and necessary reforms.

1.7. Organizational Structure of Kuwait's Energy Sector with No Differentiation Between Oil and Gas Companies

In 1980 it was created the 100% government-owned Kuwait Petroleum Corporation (KPC), which is Kuwait's national oil company owing all the national oil and gas reserves. Based in Kuwait City, KPC has a network of fully-owned subsidiaries covering several different activities within the oil & gas sector: exploration, refining, oilfield services, product shipping and petrochemicals. The table below shows the structure of the O&G industry in Kuwait with the specific role performed by all KPC's subsidiaries.

<table>
<thead>
<tr>
<th>Holding</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuwait Petroleum Corporation (KPC)</td>
<td>Governmental umbrella company</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subsidiaries</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuwait Oil Company (KOC)</td>
<td>Crude oil exploration and development</td>
</tr>
<tr>
<td>Kuwait National Petroleum Company (KNPC)</td>
<td>Oil refineries across Kuwait</td>
</tr>
<tr>
<td>Kuwait Petroleum International (KPI aka Q8)</td>
<td>Refineries and marketing business overseas</td>
</tr>
<tr>
<td>Kuwait Foreign Petroleum Exploration Company (KUFPEC)</td>
<td>International oil exploration</td>
</tr>
<tr>
<td>Kuwait Oil Tanker Company (KOTC)</td>
<td>Crude oil shipping</td>
</tr>
<tr>
<td>Kuwait Aviation Fueling Company (KAFCO)</td>
<td>Aircraft fuel</td>
</tr>
<tr>
<td>Kuwait Gulf Oil Company (KGOC)</td>
<td>O&amp;G exploration and production in the PNZ</td>
</tr>
<tr>
<td>Equate Petrochemical Company (EQUATE)</td>
<td>Petrochemicals (it's formed by PIC and Dow Chemical)</td>
</tr>
<tr>
<td>Petrochemicals Industries Company (PIC)</td>
<td>Petrochemicals and fertilizers</td>
</tr>
<tr>
<td>Petroleum Training Center (PTC)</td>
<td>Training &amp; career development within KPC companies</td>
</tr>
<tr>
<td>Oil Sector Services Company (OSSC)</td>
<td>Constructions, maintenance, security, fire-fighting and healthcare</td>
</tr>
<tr>
<td>Oil Development Company (ODC)</td>
<td>Facilitating operational service contracts (OSCs) with IOCs</td>
</tr>
</tbody>
</table>

In Kuwait there aren't different companies - while belonging to the same holding - dealing only with gas or only with crude oil. In 1938, oil was discovered and since then the country had been producing but crude oil up to the beginning of 1970s when the recovery of associated natural gas was added to crude oil production. In other words, there is no single subsidiary dealing only with gas or oil as is for instance the case in Qatar with Qatar Petroleum (QP) for oil and QatarGas (QG) for gas.
Chapter 2 - Analysis of Kuwait's Natural Gas Sector

2.1. Natural Gas Reserves and the Development of Middle East Gas Industry

Since last century, the Middle East area has been deemed as one of the key regions for oil and gas. The table below shows the first twenty-five countries ranked according to the world's proved natural gas reserves. It immediately stands out that Iran, Qatar, Saudi Arabia, UAE, Iraq and Kuwait, are respectively in second, third, fourth, seventh, eleventh and twenty-first position. Together, their share of natural gas proved reserves amounts to a staggering 39.5%. The share of the six GCC countries is equal to 22.5%.

<table>
<thead>
<tr>
<th>Countries</th>
<th>End of 1990 tcm</th>
<th>End of 2000 tcm</th>
<th>End of 2009 tcm</th>
<th>End of 2010 tcm</th>
<th>Share of total tcm</th>
<th>R/P Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>n/a</td>
<td>42.3</td>
<td>44.4</td>
<td>1580.8</td>
<td>44.8</td>
<td>23.90%</td>
</tr>
<tr>
<td>Iran</td>
<td>17</td>
<td>26</td>
<td>29.6</td>
<td>1045.7</td>
<td>29.6</td>
<td>15.80%</td>
</tr>
<tr>
<td>Qatar</td>
<td>5.2</td>
<td>4.6</td>
<td>4.2</td>
<td>894.2</td>
<td>25.3</td>
<td>13.50%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>5.2</td>
<td>6.3</td>
<td>4.5</td>
<td>283.1</td>
<td>3.3</td>
<td>13.50%</td>
</tr>
<tr>
<td>United States</td>
<td>5.2</td>
<td>8.1</td>
<td>7.7</td>
<td>272.5</td>
<td>5.2</td>
<td>13.50%</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>n/a</td>
<td>2.6</td>
<td>2.9</td>
<td>283.6</td>
<td>8.1</td>
<td>13.50%</td>
</tr>
<tr>
<td>UAE</td>
<td>5.2</td>
<td>6.3</td>
<td>6.1</td>
<td>99.2</td>
<td>6</td>
<td>13.50%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>5.2</td>
<td>4.1</td>
<td>2.6</td>
<td>213</td>
<td>6</td>
<td>13.50%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>4.4</td>
<td>4.2</td>
<td>4.6</td>
<td>99.2</td>
<td>6</td>
<td>13.50%</td>
</tr>
<tr>
<td>Algeria</td>
<td>3.4</td>
<td>3.2</td>
<td>3.2</td>
<td>118.9</td>
<td>3.2</td>
<td>13.50%</td>
</tr>
<tr>
<td>Iraq</td>
<td>3.1</td>
<td>3.2</td>
<td>3.2</td>
<td>111.9</td>
<td>3.2</td>
<td>13.50%</td>
</tr>
<tr>
<td>Australia</td>
<td>2.8</td>
<td>4.1</td>
<td>4.2</td>
<td>186.9</td>
<td>4.5</td>
<td>13.50%</td>
</tr>
<tr>
<td>China</td>
<td>2.8</td>
<td>4.2</td>
<td>2.9</td>
<td>192.7</td>
<td>4.5</td>
<td>13.50%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.8</td>
<td>1.4</td>
<td>2.8</td>
<td>103.1</td>
<td>2.8</td>
<td>13.50%</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>n/a</td>
<td>1.4</td>
<td>2.8</td>
<td>213</td>
<td>6</td>
<td>13.50%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1.4</td>
<td>1.8</td>
<td>2.5</td>
<td>78</td>
<td>2.8</td>
<td>13.50%</td>
</tr>
<tr>
<td>Egypt</td>
<td>1.4</td>
<td>1.9</td>
<td>1.9</td>
<td>86.2</td>
<td>2.8</td>
<td>13.50%</td>
</tr>
<tr>
<td>EU</td>
<td>2.7</td>
<td>2.3</td>
<td>2.4</td>
<td>52.1</td>
<td>3.2</td>
<td>13.50%</td>
</tr>
<tr>
<td>Norway</td>
<td>1.7</td>
<td>1.3</td>
<td>2.3</td>
<td>111.9</td>
<td>3.2</td>
<td>13.50%</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>n/a</td>
<td>1.4</td>
<td>2.8</td>
<td>213</td>
<td>6</td>
<td>13.50%</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1.5</td>
<td>1.4</td>
<td>1.5</td>
<td>63.1</td>
<td>1.8</td>
<td>26.4</td>
</tr>
<tr>
<td>Canada</td>
<td>2.2</td>
<td>1.7</td>
<td>1.7</td>
<td>61.5</td>
<td>1.5</td>
<td>26.4</td>
</tr>
<tr>
<td>Libya</td>
<td>2.2</td>
<td>1.4</td>
<td>1.5</td>
<td>54.7</td>
<td>1.5</td>
<td>26.4</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.8</td>
<td>1.3</td>
<td>1.5</td>
<td>41.5</td>
<td>1.2</td>
<td>26.4</td>
</tr>
<tr>
<td>Ukraine</td>
<td>n/a</td>
<td>1.4</td>
<td>1.5</td>
<td>33.1</td>
<td>1.5</td>
<td>26.4</td>
</tr>
</tbody>
</table>

Notes

1 tcm = trillion cubic meters
1 tcf = trillion cubic feet
Proved reserves of natural gas: Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions.
Reserves-to-production (R/P) ratio - If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

These numbers should suggest that Middle East has a huge quantity of available natural gas (apart Qatar's, much of this consists of associated reserves and for OPEC members this means that the production is restricted by OPEC quotas) and that gas shortages should be practically a nonsense.

On the opposite, in the last five years, many Middle East countries have been experiencing gas shortages with all the subsequent bad economic outcomes. With the exception of Qatar, the natural gas industry in the Middle East has always been considered in second position behind the oil industry. While petroleum was getting powerful investments, natural gas was developed with poor economic resources (not to mention that at the beginning of the oil industry associated gas was flared or burnt), lacking storing and transporting infrastructures and following an almost inexistent regulatory framework. Behind this absence of investments there was probably across all countries the practice of maintaining low domestic gas prices (subsidized prices introducing market distortions). Without any incentive both private companies and governments were not much inclined towards pouring in resources for natural gas exploration, production and infrastructure. Moreover, in order to develop the natural gas industry many different factors do need to act towards that end: the political environment, the presence of the required technology, investments availability and some country-specific reasons\textsuperscript{15}.

In today's Middle East, the only countries where natural gas production tops domestic consumption are Egypt, Qatar\textsuperscript{16}. These countries are net exporters. The other countries are all experiencing natural gas shortages. An interesting example is the UAE. In five years this country moved from being a net exporter to becoming a net importer.

Natural gas is needed because the Middle East economies (and in specific GCC economies) are developing and growing at a so significant rate with the consequence of demanding ever-increasing quantities of natural gas which is the main feedstock for electricity generation, water desalination\textsuperscript{17} and the petrochemical industry (and obviously a number of other industries like steel and aluminum). Moreover, for power...
plants the swing towards gas is supported by its greater efficiency and environmental friendliness than utilizing heavy fuel oil or coal.

Given the current situation, some Middle East countries are already obliged to import natural gas or to look for alternative energy sources notwithstanding the fact that globally there is a surplus of natural gas.

Kuwait is one of the Middle East countries where there is natural gas but at the same time the industry is underdeveloped. Kuwait's gas resources are not as big as the country's oil reserves but still at 1% of world's natural gas reserves with 1.8 trillion cubic meters - the majority of which is associated gas - the country should be in the position - if the natural gas industry was well managed, of being self-sufficient in relations to its necessities.

In the last years occurred relevant discoveries of non-associated natural gas in North Kuwait. And IOCs showed interest for these discoveries. Up to date the involvement of Big Oil into gas projects in Kuwait has been characterized by the same two impediments as the oil sector: unattractive contractual conditions summed to political uncertainties about how managing Kuwait's O&G sector.

In practice in Kuwait there is no factual shortage of natural gas under the ground (onshore) or the seabed (offshore), but - and this is the real problem - there is a serious deficiency in investment and policies to get it out\(^\text{18}\).

In order to develop Kuwait's still embryonic natural gas industry and consequently tackling the ever-more-occurring gas shortages, today's strategy is based upon two pillars:

A) Exploring and then developing domestic non-associated natural gas fields

B) Importing natural gas with different means of transportation.

### 2.2. Gas Exploration & Current Gas Production

According to EIA, in 2010 Kuwait produced 1.17 billion cubic feet per day (Bcf/d) with an 8% increase than in 2009. This gas is mainly associated and this means that domestic natural gas supplies are directly linked to OPEC's crude oil production quotas. Pumping

out less crude means for Kuwait having at disposal less natural gas while the country needs ever-increasing quantity of gas for generation of electricity, water desalination, the petrochemical industry and the enhanced oil recovery (EOR) techniques which are required for boosting the rate of oil recovery. In 2010, around 85% (1 tcf/d) of the overall natural gas production came from associated gas, while non-associated gas accounted for a quantity comprised only between 150-200 million cubic feet per day (MMcf/d).

Up to the 1971 natural gas nationalization, associated gas in Kuwait had always been considered a problem for the oil sector - a trouble when extracting crude. In practice associated natural gas ended up being flared when extracting oil. Instead, after 1971 natural gas has been employed as a domestic feedstock in different activities and since then - although an improved utilization - Kuwait has been consuming ever-increasing quantity of natural gas for different utilizations (between them: electricity, water desalination, petrochemical industry and by now also EOR).

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### Kuwait's Natural Gas Production in Billion Cubic Meters (Bcf/d)

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2010 Share of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>9.6</td>
<td>10.5</td>
<td>9.5</td>
<td>11</td>
<td>11.9</td>
<td>12.2</td>
<td>12.5</td>
<td>12.1</td>
<td>12.8</td>
<td>11.2</td>
<td>11.6</td>
<td>0.40%</td>
</tr>
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</table>

Source: BP Statistical Review of World Energy June 2011 - What's Inside?

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### Enhance Oil Recovery Technique (EOR)

EOR, aka known as tertiary recovery, is a generic term used to define some techniques that could be used in order to increase the amount of crude oil from an oil field.

With EOR techniques the percentage of extracted oil could be around 30-60% and even more compared with 20-40% using primary or secondary recovery.

There are four EOR techniques:

1. Gas injection
2. Chemical injection
3. Microbial injection
4. Thermal recovery

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What is important to understand is that dependence upon gas imports is not a recent phenomenon but that it dates back at least 20 years. In fact, prior to the 1990 Iraqi invasion, Kuwait was becoming dependent upon importation of Iraqi natural gas. Afterward, the 1990 invasion messed up things and once war was over this natural gas relationship with Iraq was undoable. In practice, since 1990 specific plans for importing natural gas surfaced the Kuwaiti political debate and in specific two countries were
essentially considered as gas suppliers: Qatar and Iran. Basically, twenty years ago there was the idea of importing natural gas and not of exploring for domestic non-associated natural gas. At least at the beginning Kuwait was able to compensate for gas shortages through the availability of cheap fuel for energy necessities and through naphtha as a petrochemical feedstock. But following this policy, today's 70% of electricity generation in Kuwait derives from crude oil. KOC has recently announced its intention of reaching a production target of 4 Bcf/d by 2030. This value is approximately four times the 2010 gas production.

In order to increase the production of non-associated gas the first ranked option is developing gas fields from North Kuwait. Another possibility could be exploring offshore but Kuwait's fiscal and political situation do not proactively work towards this target.

In 2006 was discovered the Jurassic non-associated gas field possessing an estimated 35 trillion cubic feet (Tcf) of reserves. Preliminary studies completed by Schlumberger and Shell suggest to consider the field as one of the most challenging fields in the world given two factors: the geological composition and the technical complexities. This gas is mostly condensate plus it's very sour containing high concentrations of toxic and corrosive hydrogen sulphur. Initially, a first phase projected to obtain 175 MMcf/d and 50,000 bbl/d of condensate by 2008 but it apparently releases only 140 MMcf/d. The second phase, due on line by 2013, should have a production capacity of 500 MMcf/d and it is implemented by Kuwait's Kharuf National and Italy's Saipem. At the beginning Jurassic's development plan envisaged a 600 MMcf/d by 2012 and 1 bcf/d with also 350,000 bbl/d of light crude or condensate by 2015. Experts say that this target is unlikely right now. Shell is developing the Jurassic gas field through its February 2010 ETSA valued at $700 million.

This deal is currently considered a sort of landmark deal because it is helping to boost non-associated gas production (and consequently boosting the country's domestic utilities facilities) but also because it should finally point to a Kuwait's real interest to collaborating with IOCs in order to develop Kuwait's upstream activity. In specific, if KPC does have some know-how in dealing with oil, it's really missing the

The Shell deal is a major turnaround for Kuwait, and should pave the way for IOCs to do more work in the country.

Sara Akbar, Managing Director of Kuwait Energy, an independent O&G company

If more gas is produced domestically, not only will this reduce the need for costly imports required to meet local electricity demand, but it can help grow the local petrochemicals industry, which will serve as a critical diversification effort for the country by providing a value-added export revenue stream.

Ahmed Moti, Shell Kuwait's Chairman and Managing Director
required technical skills for extracting gas and heavy oil.

Another possible solution for increasing Kuwait's quantity of non-associated gas is the Dorra gas field which is located offshore in the PNZ. Three countries are sharing this field: Kuwait, Saudi Arabia and Iran (the latter calls the field Arash). Kuwait and Saudi Arabia announced plans to start production by 2017 being able to produce a quantity of gas comprised between 500 and 800 MMcf/d. Iran for the moment only said that it would develop by itself its own side of the field. As to the current political tensions between Arab countries on the one side, and Iran on the other side, it's highly presumable that the development of this gas field won't be void of disputes between the neighboring countries.

Increasing the availability of natural gas does have scarce meaning if contextually Kuwait isn't expanding its gas processing infrastructure. At this regard, South Korea's Daelim is constructing Kuwait's fourth gas processing plant with an 800 MMcf/d capacity. This new unit (biggest to date)

The major challenge that we have is gas. We see the energy demand in Kuwait rapidly increasing and the gas has great value for the country. During peak demand time in the summer due to power consumption we are importing energy and this is a concern.

Additionally, it is cleaner for the environment than the fuel we are burning and also, in the non associated gas production we are not limited by OPEC and we can produce what we want to produce. We can replace the oil that is burned and consumed by power plants to free it for export.

KOC's Chairman and Managing Director, Sami Al Rushaid
located on the site of the Ahmadi refinery is scheduled to increase in 2013 Kuwait's gas processing capacity to 2.3 Bcf/d. A fifth gas processing plant is in the planning stages and if completed will augment the overall gas processing potential to more than 3 Bcf/d. All this said, also on completion of the fourth and fifth trains, Kuwait won’t be able to meet the growing levels of its domestic demand.

Realistically, it is quite likely that Kuwait's gas production will only cater to the country's domestic needs. In fact, the aggressive exploration program aimed at expanding non-associated gas reserves (there is optimism about finding additional reservoirs) is targeted at satisfying domestic needs. KOC officials point out that it's not probable for Kuwait to become a major gas exporter. Kuwait is only a small-quantity exporter of liquid petroleum gas (LPG) extracted from natural gas.

2.3. An Ever-Increasing Consumption and the Necessary Gas Imports

In 2010, Kuwait utilized around 529 Bcf of natural gas. This value is equal to 1.45 Bcf/d against a production amount of 1.17 Bcf/d (approximately the gap is equal to around 270-280 MMcf/d). Virtually, in 2010, the country consumed around 24% more than the produced quantity. This problem is not new but it was emerging also before the 1990
Iraqi invasion. What is happening is that since 2008 Kuwait has been unquestionably consuming more natural gas than it has produced. The country has been experiencing in the recent years gas shortages which translated into electricity outages especially during summer months (April-October). Outages brought in the shutdown of refinery and petrochemical operations in order to provide electricity to the population but this resulted in consistent losses for Kuwait's economy. A possible solution - apart increasing the production of domestic non-associated gas which in any case would not be sufficient for covering all consumption requirements and would take several years while the problem is already a reality- is importing natural gas.

Gas imports may be implemented in two ways:

A) through pipeline or

B) as liquefied natural gas (LNG).

Pipeline imports for Kuwait mean importing gas from Iran, Iraq or Qatar. But this solution - if it isn't to be ruled out given different political tensions between neighboring countries - will be implemented in at least the medium term. At the end of 2009 beginning of 2010 there had been some talks about the opportunity of building a 570-kilometer (mainly submarine) pipeline transporting 3-4 billion cubic meter per year (Bcm/y) of South Pars field's gas from Iran to Kuwait's border. At present this plan is not progressing at all. According to some analysts, settling eventual disputes with Iran in relations to the development of the Dorra offshore gas field (non associated gas) located off the coast of the PNZ could speed up things with the pipeline project but in the last twenty years there had been a lot of discussions with Iran about pipelines for achieving nothing. In other words, much ado about nothing.

<table>
<thead>
<tr>
<th>Kuwait's Purchase of LNG Cargos</th>
<th>Year</th>
<th>Number of Cargos</th>
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<tbody>
<tr>
<td></td>
<td>2009</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>estimated 43-47</td>
</tr>
</tbody>
</table>

In the end, the most viable although expensive solution for importing gas to Kuwait is to liquefy it. The country became the second in the region to turn to LNG imports after Dubai. This solution is getting more and more credit especially after the October 2011 Kuwait's decision of abandoning the development of nuclear power energy. In fact, Kuwait was supposed to utilize nuclear energy in the long run. In 2009, it announced the intention of establishing a nuclear commission and the following year in January 2010 the country announced a 20-year deal with France's Atomic Energy Commission for developing nuclear energy in
The initial plan was to build 4 nuclear plants by 2022 (one had to be located on the island of Warba and a second one on the island of Bubiyan, which both now have been reclaimed by Iraq for more than 70 years). Although other regional countries remain committed to nuclear power plants, it's very difficult for Kuwait's leaders to proceed with the nuclear program especially considering the strong parliamentary opposition to the program.

In 2010, Kuwait imported 270-280 MMcf/d of LNG sourced mainly from Oman, Egypt and Trinidad and Tobago. But the country is also taking re-exports of LNG from Qatar via Abu Dhabi. This is a direct consequence of the fact that three years ago Saudi Arabia blocked a projected pipeline from Qatar to Kuwait.

LNG gas imports rose from 11 cargos in 2009 to an estimated 43-47 in 2011 (meaning a 409% increase in only two years considering 45 cargos for 2011). And in 2011 Kuwait will import up to 42% more LNG than the previous year having extended the buying period into November.

Natural gas demand is highly seasonal depending on several factors. Weather conditions, income, demographic trends, consumer & politicians preferences, alternative fuels have all an impact.

LNG may be traded thanks to spot contracts (short-term contracts) or medium-to long-term contracts. Since 2009 Kuwait has been implementing both spot contracts (the country is thought of buying British Gas Group cargos originating from Trinidad and Tobago) and medium-term contracts like the 4-year contracts with Netherlands' Vitol, an energy trader, and Shell. Which price structure these two typologies of contracts follow when one counterpart is Kuwait is not so clear. While it's presumable that cargos originating from the Atlantic Basin may be

The Three Regional LNG Gas Markets

At the world level there exist three up-to-now-separated regional LNG gas markets:

1) the North American market which trades mostly at spot rates.

2) the European market which imports gas through long-term contracts indexed to oil.

3) the Asian market where contracts are the most expensive at around $2-$3/mmBtu higher than in Europe.

The three regions were largely separate, with unique suppliers, pricing arrangements, project structures, and terms.

The introduction of LNG trade at the global level could push towards an improved price correlation between the different regions.

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10 The Kuwait Investment Authority (KIA) with $794 is the third largest investor in French nuclear giant Areva.
priced according to that region’s pricing structure, for the signed medium-term contracts there is less transparency. The contracts for LNG shipments signed with Vitol and Shell do not precise the price to be paid. The only released comment said that cost would be calculated according to delivery criteria and to a formula linked to crude oil. Both companies could be providing Kuwait with LNG from a secure portfolio of geographically-differentiated options. It would be interesting to understand how to price intraregional LNG trade (for instance between two GCC countries) occurring within a less-than-3,000-mile distance. In fact, 3,000 miles is the minimum distance for economic viability of the LNG business. Up to now LNG movements from the Gulf were interregional mainly oriented from Middle East to Asia and not intraregional. Selling to Asian countries the price was established according to the Asian LNG market. Currently, only the UAE and Kuwait are importing LNG. Bahrain will begin importing it around 2014 and recent rumors (October 2011) from Oman say that the country could build an import terminal for LNG to tackle a shortage of fuel which may impact both Omani industry and power generation.

<table>
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<tr>
<th>Analysis of LNG Spot Contracts</th>
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<tbody>
<tr>
<td>Pros</td>
</tr>
<tr>
<td>The share of liquid markets in the overall LNG market mix is growing</td>
</tr>
<tr>
<td>Flexibility</td>
</tr>
<tr>
<td>Margins deriving from opportunistic spot transactions</td>
</tr>
<tr>
<td>Acceptability of spot LNG risk for LNG producers (and lenders) is increased</td>
</tr>
<tr>
<td>Midstream and downstream investments offer room for spot transactions</td>
</tr>
</tbody>
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At the beginning of 2009, Kuwait was in talks with RasGas, a JV of QP and ExxonMobil. The negotiations were aimed at subscribing a long-term deal for the supply of LNG. The deal was not finalized because KPC did not accept the requested price. QatarGas had already secured long-term contracts and so was not available. KPC has also been purchasing spot LNG. Part of this spot LNG seems to come from Trinidad & Tobago with a major discount by British Gas (BG). Shell’s QatarGas-IV train was available for serving Kuwait because this train was originally destined to serving the US market where currently instead there is a lot of surplus of domestic gas and consequently prices are low. In practice, Shell had a surplus to be easily diverted towards Kuwait and UAE although with no economic convenience on the buyer's side.
And in August 2009, UK's Shell made its first LNG delivery to KPC's floating terminal to help meet peak summer demand. The country uses Excelerate's (an LNG importing and regasification company) tankers as a floating import terminal at the Mina Al-Ahmadi gas port (up to 500 MMcf/d of LNG). The following year, in April 2010, KPC signed two very similar contracts for receiving LNG for the summer months (April-October) from 2010 to 2013. One was signed with Vitol, while the second contract was signed with Shell. With these two agreements KPC wanted to import 2.1 million tons a year of LNG. This amount corresponded to five LNG cargos per month: three supplied by Shell and two by Vitol. Thanks to these two deals Kuwait should be able to avoid burning around 800,000 crude oil barrels per day.

Last April, Kuwait started some negotiations with Royal Dutch Shell - a company that has quite well established contractual relationships with Kuwait - in order to import LNG from South Iraq. Prior to the 1990/1991 First Gulf War, Iraq exported significant volumes of natural gas to Kuwait.

Last April, Kuwait started some negotiations with Royal Dutch Shell - a company that has quite well established contractual relationships with Kuwait - in order to import LNG from South Iraq. Prior to the 1990/1991 First Gulf War, Iraq exported significant volumes of natural gas to Kuwait. This gas came from Iraq’s southern Rumaila field through a 40-inch, 100-mile, 300 MMcf/d pipeline to Kuwait at Ahmadi. This time Kuwait is not dealing with the Iraqi Government (the Kuwaiti Parliament would block any deal that put Kuwait directly dependent on Iraq's Government) but with an IOC like Shell. Kuwait would like to implement this project in maximum 1.5 year but it's with no doubt quite a short timeframe.
At this regard, it should be underlined that only in November 2011 Shell signed a $17.2 billion associated gas-gathering and monetization joint venture (JV) called Basrah Gas Company (BGC, 51% Iraq’s South Gas Company 44% Shell and 5% Japan’s Mitsubishi) for three major Iraqi oil fields (Rumaila, Zubair and West Qurna all literally close to the Iraqi-Kuwaiti north border). This 25-year-lasting deal will help Iraq to capture more than 700 million cubic feet per day of gas. Shell officials previously affirmed that using a floating LNG terminal the first shipment could arrive within 18 months of signing a contract. This Iraqi gas - whose 70% is currently flared - is supposed to support electricity generation in Iraq but given that some power plants have still to be constructed in the first years of the construction project there will be some gas surplus available for export. Probably working with LNG could give some flexibility but it should be considered that being the distance less than 3,000 miles, the economic viability of the project is all to be found and it seems better to fix the old pipeline halted in 1990.

Still in Iraq, in October 2010, Kuwait Energy Company, an independent O&G company from Kuwait, was awarded a 20-year contract for developing Siba and Mansuriya gas fields. Siba field is located in Basra Governorate and Mansuriya field in Diyala province. Kuwait Energy Company jointly bid with the Turkish Petroleum Corporation (TPAO), the national oil company of Turkey, for both gas fields. Kuwait Energy will be the operator of Siba, participating with a 60% contractor share while TPAO will have a 40% participation. TPAO will be the operator of Mansuriya, participating with a 50% contractor share. There, Kuwait Energy Company and Korea Gas Corporation (KOGAS) will have respectively a 30% and a 20% participation. In particular, Siba - which is the smallest with 34 billion cubic meter (bcm) - could provide Kuwait with Iraqi gas but political relations are not yet well defined in order to materialize the project. Plus, before 2016 it's unlikely to have gas to export.

With no doubt dependence on gas imports is deemed a source of energy insecurity especially in a very unstable region as the Gulf, but alternative solutions do not abound, especially considering the current political tensions in the Gulf area. And the same Kuwait is not immune to this climate of instability (since 2006 the Prime Minister has resigned seven times because of political turmoil).

20 "They are the 17.8 billion-barrel Rumaila field being developed by a BP-CNPC consortium, the 4.1 billion barrel Zubair field, handled by an Eni-led consortium and partners Occidental Petroleum Corp. and KOGAS, as well as the 8.6 billion barrel West Qurna Stage 1, which is being developed by ExxonMobil-Shell consortium" in SALAHEDDIN, S., Iraq Signs Gas Deal with Shell, Mitsubishi, in Associated Press, November 27, 2011, in http://hosted.ap.org/dynamic/stories/M/ML IRAQ GAS DEAL?SITE=FLFNW&SECTION=HOME&T EMPLATE=DEFAULT
2.4. KUFPEC's Investment in North-Western Australia's LNG Projects

The Australian projects represent for KUFPEC, Kuwait's company for foreign petroleum exploration, part of a plan aimed at increasing Kuwait's access to global gas supplies and improving its O&G technical expertise. Other KUFPEC's projects are also developed in Pakistan, Indonesia and Malaysia with similar targets. But Australia offers two interesting advantages: very stable fiscal terms and high geological potential.

In particular, two operations stand out in Australia: the partnership with the United States' O&G company Apache and the participation as equity holder of the Wheatstone Project.

KUFPEC joined forces with Apache to explore and develop gas prospects including the Julimar and Brunello fields in the Carnarvon Basin, off the north-west coast of Australia. The partnership has licenses for areas located close to the Wheatstone gas field (Chevron has 100% interest there) and to the Gorgon and Pluto gas fields where two other large LNG projects are under development.

Then, in October 2009, KUFPEC-Apache signed an agreement with Chevron to supply gas to Wheatstone LNG plant (located at Ashburton North, Western Australia and operated by US' Chevron) in return for equity stakes in the project. Presently, KUFPEC owns 7% of the project. In specific, KUFPEC-Apache will be supplying gas from their Julimar-Brunello JV block (where KUFPEC has a 35% interest, while the remaining 65% belongs to Apache) which is operated by Apache. On completion, the Ashburton North plant will receive gas from Wheatstone, Lago, Brunello and Julimar gas fields and it will have a production capacity of 15 million tons.  

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21 The Wheatstone Project is a JV between the Australian subsidiaries of Chevron (operator, 73.6%), Apache (13.0%), Kuwait Foreign Petroleum Exploration Company (KUFPEC) (7.0%) and Shell (6.4%).
2.5 LNG Isn't a Temporary Measure and Needs Better Management

With no doubt no country would like to be dependent upon importing energy resources. And Kuwait does not shirk this unwritten rule when dealing with gas needs. Once the construction of nuclear power plants in Kuwait was ruled out it appeared evident that LNG imports would not be just a temporary measure but that they would be part and parcel of Kuwait's energy mix. At the beginning LNG importation was considered just as a move for getting additional energy especially in summer months with simple LNG cargo purchases from international energy companies (for instance Shell). Now such purchases do not suffice and LNG trade should be organized in a much more organized and permanent basis. At least Kuwait could try - as it is partially doing - to increase its domestic production of both associated and non-associated gas with the final target of limiting LNG imports.

In order to receive LNG supplies on a permanent basis some steps need to be implemented soon both with reference to the infrastructure side and to the contractual side. On the one end, for a cash-rich country like Kuwait, it's not difficult to built new gas infrastructures. At this regard, there are already some plans to build a permanent LNG regasification facility to take the place of the current LNG infrastructure at the Mina Al-Ahmadi gas port. On the other end, defining a strategy for long-term LNG supplies from a bilateral and reliable supplier could be not so easy. In the last two years Shell and Vitol provided for the required gas necessities but at the end of 2013 summer season those contracts will be expired. Kuwaiti officials point out that they will buy gas on the open market but it seems quite a bet not signing any long term contract with an LNG producing country.

Although up to now there was no room for an accord with either QG or RasGas, a candidate for an LNG contract relationship is Qatar which is capable of producing 77 million tons of LNG per year and is by far the largest LNG exporter in the world. Kuwait being geographically close to Qatar (Kuwait City is just 357 miles from Doha) which has the world's third proven natural gas reserves would be a too great an opportunity to relinquish the Qatari gas although the proximity reduces the economic viability of utilizing LNG.

Perhaps Kuwait and Qatar will have to reassess their pricing structures: the latter reconsidering the selling price structure and the former the purchasing price structure. Taking into account Qatar's LNG glut (it will have to sell LNG more to Asia than to America as previously planned), Qatar may well agree to sell for a lower price. Kuwait

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22 CARLISLE, T., Kuwait Eyes LNG Project Down Under, The National, April 7, 2011, in http://www.thenational.ae/business/energy/kuwait-eyes-lng-project-down-under
instead needs to raise the price it's willing to pay for LNG shipping\textsuperscript{23}. In effect, considering the global oversupply of LNG, both Qatar and Oman could start renegotiating their LNG export agreements (in general including off-take or take-or-pay conditions). In this way these countries would have more natural gas to be traded at the intraregional level (for instance between GCC countries)\textsuperscript{24} that is a market which in the next years will be booming.

**Conclusion**

Importing natural gas to Kuwait - an oil-rich country which possesses also 1% of the world's natural gas proved reserves - seems a paradox, but it's real and it's happening right now. Also some other GCC countries, all with consistent natural gas resources, already started importing gas or are developing plans for gas importation.

After Kuwait's O&G complete nationalization (gas in 1971 and oil in 1975), no IOC was allowed to operate in Kuwait. The O&G sector became closed to foreign intervention. The only exception was Chevron in the PNZ. Then, after the end of the First Gulf War (1990-1991) following the war damages and understanding that the era of easy oil was close to an end, Kuwaiti authorities permitted IOCs to sign TSAs (now ETSAs) in relations to Kuwait's O&G sector. These contracts proved not very successful on both sides of the deal. In fact, IOCs are not able to make a profit and Kuwait is not getting the modernization and upgrade of its O&G sector.

The current contractual framework seems unable to produce the corrective measures for solving the problem of gas shortages. Kuwait would like to increase its production of non-associated gas fields but this task is not easy because KPC does not have the skills for developing both onshore geological and technically complex gas fields and offshore gas fields. All these said, gas shortages are today's problem and the development of non-associated gas fields - assuming that IOCs could better assist KPC in the development operations - will require some years before giving a reliable and consistent output (at the Dorra offshore gas field there could be also political problems with Iran).

Apart, the non deferrable reform of the contractual O&G framework, in order to be successful in avoiding gas shortages Kuwait's strategy should be based on the following 5 pillars:

\begin{itemize}
  \item \textsuperscript{23} GAVIN, J., *Kuwait Turns Towards LNG After Ditching Nuclear*, 6 Natural Gas Daily, October 21, 2011, in \url{http://interfaxenergy.com/free/NatGasDaily.pdf}
  \item \textsuperscript{24} BOOZ&CO., *Gas Shortage in the GCC How to Bridge the Gap*, 2010 in \url{http://www.booz.com/media/uploads/Gas_Shortage_in_the_GCC.pdf}
\end{itemize}
1) Develop Kuwait's non-associated gas from the gas fields located in the northern part of the country

2) Develop the Dorra offshore non-associated gas field located in the PNZ

3) Purchasing LNG on a permanent basis both in the spot market and with medium-term agreements.

4) Importing natural gas via pipelines from neighboring countries

5) Directly investing into LNG operations abroad (KUFPEC)

All these five pillars may give positive outcomes but it should be understood that in the near-to medium-term the only available and fast solution (for instance with floating terminals) for covering Kuwait's natural gas consumption in excess of natural gas domestic production is through LNG spot and medium-to long-term contracts. It's true that when LNG shipments are routed for less than 3,000 miles - and it's quite probable to have LNG shipped to Kuwait from countries located within the Persian Gulf (615 miles long at its longest and 180 miles wide at its widest - it's difficult for the buyer (in this case Kuwait) to have also a sort of economic viability. The problem is that the regional political instability makes very difficult to realize pipelines. But with no doubt, pipelines would be much more economically convenient than importing LNG for short distances like within the Persian Gulf.

If Kuwait is going to import LNG on a more-than-temporary basis it would be advisable to have some reliable suppliers with medium-to long-term contracts more than just spot contracts. A candidate supplier could be Qatar although the proximity of the two countries eats out any economic convenience for Kuwait. The failed negotiations between Kuwait on the one side and RasGas on the other side well testifies the difficulties of reaching an agreement with narrow economic margins. At this regard, it would be interesting to obtain full disclosure about the price paid by Kuwait in relations to the two medium-term LNG contracts with Vitol and Shell. For the moment the only thing that is sure is that at least for the next three years alternatives to LNG imports do not abound.
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