

Doing Business in the Oil & Gas Sector: Opportunities for German Companies 2019



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Introduction

German Chambers of Commerce Abroad: Enable business opportunities for German companies

The globalization of the economy permanently offers new opportunities, but also presents challenges like trade barriers to German companies. The network of German Chambers of Commerce Abroad (AHKs) advises, consults and represents German companies worldwide that wish to start, develop or expand their business activities abroad. Besides analyzing business opportunities, the AHKs main tasks is identifying, labelling and minimizing the risks in foreign markets. Since the AHKs are institutions of German foreign trade promotion, the organization is growing synchronously with the German export economy.

For more than 120 years, the AHKs serve as reliable partners for companies in their activities abroad. Today, the network represents German business interests in 140 locations in 92 countries. They are membership organizations with approximately 51,000 member companies worldwide. At the same time, the AHKs represent links between cultures. They are at home in two mentalities and in numerous languages.

In Germany and the world over

The close partnership of the AHKs with the 79 chambers of industry and commerce (IHKs) in Germany and their joint umbrella organization Association of German Chambers of Commerce e. V. (DIHK) guarantees an understanding of the needs of the economy. Thanks to the good cooperation of both structures at home and abroad, business enquiries are channeled to experts on location directly and are answered providing solutions fit for the market. Special events at the IHKs concerning a specific country or industry are prepared and conducted in conjunction with the respective AHKs. This is how a direct connection is forged between the economy in Germany and abroad.

The oil and gas sector from a global perspective

One outstanding example for creating a network on a specific purpose is the AHK Global Cluster for Oil & Gas. Whereas oil and gas exploration in Germany is a small industry compared to top producer countries, German exploration and supplier companies do play an important role on the international level. One first approach to support this internationalization

was the publication 'Doing Business in the Oil & Gas Sector: Opportunities for German Companies' by the AHK in Rio de Janeiro in 2012. The purpose was to draw German companies' attention to the potential of the Brazilian oil and gas market.

Given the global importance of this sector, it is evident that the activities of oil and gas suppliers overlap in different countries. Having that in mind, the AHKs in Norway, the United Arab Emirates and Brazil in 2014 agreed on a closer exchange of information about current market developments and joint international projects. The Global Cluster for Oil & Gas was born. In the following years, other countries joined this group for approaches like joint publications and projects: Azerbaijan, Iran, Mexico, Russia, Saudi Arabia and the United States.

Primarily, the purpose of the cluster is to harness synergies of the worldwide AHK network to promote the countries involved, to seize new opportunities in the international oil and gas market, and at the same time to market the competence of the global AHK network.

In February 2018, the 6th nine countries encompassing edition of the publication "Doing Business in the Oil & Gas Sector: Opportunities for German companies" was published. In close collaboration across borders and with the support of various sponsors, an exclusive guide for German companies has been put together as new business opportunities in these nine oil and gas markets arise. And the potential of the cluster is still growing: In 2018, two African countries, Algeria and Nigeria, joined the cluster as well.

Starting on April 2, 2019, the cluster again for the fifth time presents its activities at the Hannover Messe. Together with the local industry of the cluster countries, it is committed toward supporting business opportunities in the global gas and oil industry. Finally, we invite you to learn more about the cluster and find your contact person in the remainder of this publication.

We hope you enjoy reading and wish you all the best of success for your business.

Author: Dr. Volker Treier, Chief Executive of Foreign Trade, Member of the Executive Board | Association of German Chambers of Commerce and Industry (DIHK).

Doing business in the Oil & Gas Sector: Opportunities for German Companies

The mood in the oil and gas industry continued to improve during 2018 as Brent crude oil prices rose throughout the year and reached \$70US per barrel (bbl) in late autumn 2018. However, as concerns of oversupply sent prices down by 30% since early October 2018, observers were reminded of price volatility as the only constant in the industry. As global oil demand exceeded 100 million barrels per day (mb/d) for the first time in history in late 2018, the outlook for the industry remains positive. However, as the aftereffects of the downslide in oil prices in 2014-16 are still valid, producers kept strict capital discipline and focused their activities on production efficiency in proven reserves in the last years. If Brent crude oil prices stabilize around \$65US per bbl in the medium-term, as the International Energy Agency (IEA) estimates, the slight upswing in investment in 2018 could accelerate in the coming years.

Signs of recovery

Total oil and gas upstream investment rose to \$472 billion (bn) US in 2018, a 5% increase compared to 2017, according to the IEA. But given that the industry almost halved its upstream spending from around \$800 bn US in 2014 to \$432 bn US in 2016 and demand rose by more than 5 mb/d in the last three years, the IEA warns of a long-term supply crunch since 2016 due to the slow uptick in capital spending. According to Wood Mackenzie, a consultancy, the six oil and gas majors BP, Chevron, ExxonMobil, Shell, Total and Eni alone would need to

increase annual investment by 20% to fend off a supply crunch by 2025.

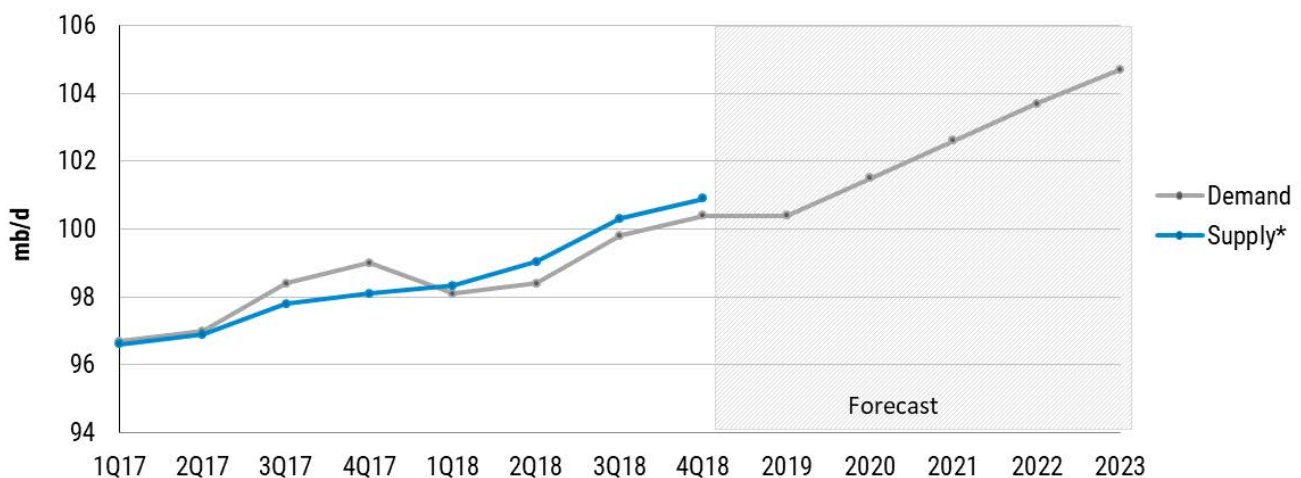
No peak oil in sight – neither in supply nor demand

While the oil market is adequately supplied through 2020, more production is needed in the longer term to meet robust demand, which will climb to 105 mb/d in 2023, according to the IEA. The IEA analysts forecast oil demand to increase by 1.3 and 1.4 mb/d in 2018 and 2019, respectively.

The industrial sector and non-combusted use of fuels will drive this growth, while demand in the transport sector remains relatively flat due to tighter fuel economy standards, efficiency gains and electrification. Petrochemicals, as part of non-combusted use of fuels, are the main driver of demand growth in the future: The IEA forecasts an increase in demand for oil for petrochemicals of 3.2 mb/d by 2030. In 2018, global investment in petrochemicals reached almost \$20 bn US. Substantive investment potential also opens up in the chemicals sector. Feedstock demand for chemicals is set increase substantially by 2040 in each region, with the strongest growth in emerging markets, according to the ExxonMobil 2018 Outlook for Energy.

Global oil production keeps pace in the short to medium term, having passed the 100 mb/d threshold in September 2018. According to the IEA's 2018 Oil Market Report, global production capacity will increase further by 6.4 mb/d to reach

Global Oil Demand/Supply Balance, 2017-23



*No coherent quarterly or yearly forecast available for 2019-23.

Source: OECD/IEA 2018 Oil Market Report | © 2019 Germany Trade & Invest

roughly 104 mb/d by 2023. More than 80% of this growth comes from non-OPEC countries, in particular the US, Brazil and Canada. Light tight oil investments in the US alone make up more than half of the increase, as the US adds 3.7 mb/d production capacity by 2023.

Investments in the offshore sector showed signs of recovery in 2018, as some major projects were sanctioned. This is a positive sign for higher medium-term output. OPEC countries will only increase production capacity modestly to 36.3 mb/d by 2023, the IEA estimates, as the decline in output from Venezuela continues to offset gains in Iraq.

In the run-up to the US re-imposing sanctions on Iran, estimates from S&P Global Platts suggested that oil exports from Iran have fallen by 700 thousand barrels per day (kb/d) by October 2018 and might fall by another 900 kb/d by the end of 2019. Saudi Arabia and Russia are keen to pump as much as possible but have a strong interest in keeping oil prices high, since their economies are heavily dependent on oil and gas revenues.

Gas accompanying the global energy transition

Three major forces will shape international gas markets in the coming years: Surging production growth in the US; China's growing demand; and growing consumption in the industrial sector. Global gas production is set to increase by 10% to 4,116 billion cubic meters (bcm) by 2023, up from 3,740 bcm in 2017, according to the IEA's 2018 Gas Market Report. The US adds 167 bcm by 2023, underlining its position as the world's top producer.

In the Middle East, gas production is expected to increase modestly to 698 bcm by 2023, mainly in Saudi Arabia and Iran for domestic consumption. China will become the

fourth-largest gas producer by 2023, increasing production by 56 bcm over five years. Russia aims to boost production further for export, having hit a record of 690 bcm in 2017.

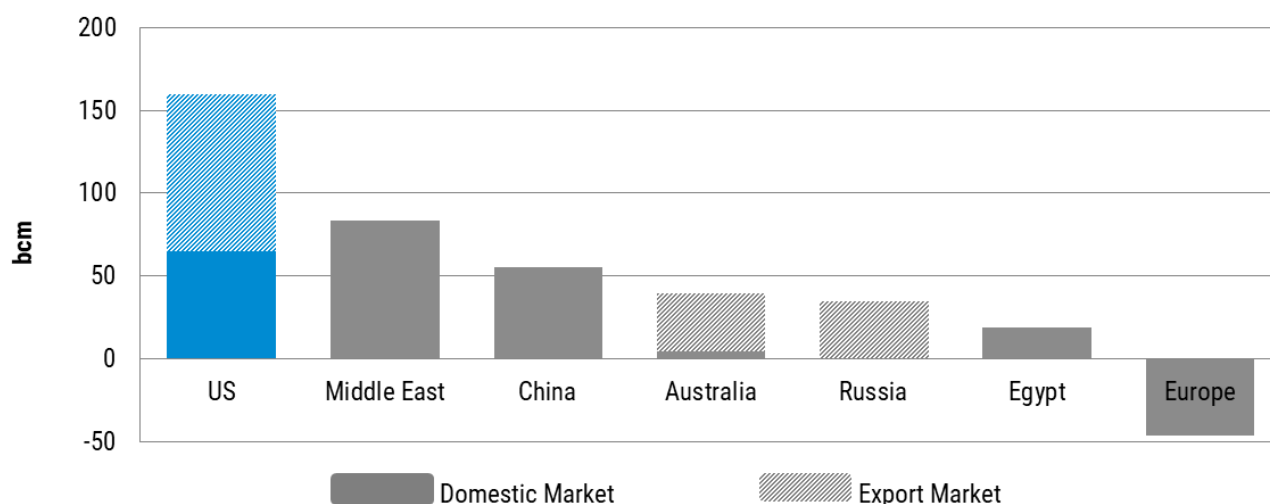
The IEA estimates global gas demand to grow by 376 bcm to reach 4,116 bcm by 2023. More than a third of this demand comes from China, where consumption is forecast to increase by 139 bcm in the next five years. Due to the abundant shale gas production, consumption in North America is to increase by 58 bcm through 2023.

As with oil, industrial customers take the lead in sectoral demand growth in natural gas, adding 174 bcm to global demand in the next five years. By 2023, more than 1,000 bcm will be consumed in industrial processes around the world. More than 50% of this demand growth will take place in the Asia-Pacific region, including China. The heavy industry sector also contributes to this development: Natural gas demand in the heavy industries in emerging markets in India and the rest of the Asia-Pacific region will more than double by 2040 and see steep growth rates in Africa, the Middle East and Latin America, according to ExxonMobil. In the power sector, Asia also plays the leading role: Together with the Middle East, the regions' emerging economies are the main driver of an additional 100 bcm of gas consumed in the global power sector, totaling 1,650 bcm in 2023.

Despite the global energy transition gaining pace, the oil and gas industry can hence look forward to years of growing demand, as new regions and sectors of consumption open up. The articles in this publication highlight the opportunities for the German oil and gas industry in selected markets.

Author: Kilian Dick, Manager Energy Sector | GTAI - Germany Trade and Invest.

Natural gas production growth for selected countries and regions, 2017-23



Source: OECD/IEA 2018 Gas Market Report | © 2019 Germany Trade & Invest

Algeria

Heading for a brighter future

Algeria has been classified as leading in many rankings. According to a 2016 report on Algeria from the U.S. Energy Information Administration (EIA), the country is an international leader in gas production and owns the third largest oil reserves in Africa. The report also states that Algeria possesses the third largest technically recoverable reserves of shale gas worldwide.

Algeria is Africa's largest country at 2,382,000 square km. It is also considered the most politically stable country in North Africa.

Algeria began its oil and gas production in 1958 and shortly afterwards, in 1969, joined the the Organization of the Petroleum Exporting Countries (OPEC). Coincidentally, it is today OPEC's largest member country territorially speaking. It also acts as an intermediary between OPEC and non-OPEC countries.

The Algerian economy relies strongly on its petroleum sector which represents over 25% of the country's gross domestic product (GDP) and 97% of its export earnings. In 2017 alone, Algeria's petroleum exports reached 22,353 million USD .

The oil and gas sectors have been mainly divided between the two state-owned energy groups Sonatrach and Sonelgaz respectively. Sonatrach takes over the E&P activities of Sonelgaz. Due to the enormous strategic importance of the energy sector in Algeria, privatization of the groups is unlikely.

Table 1: Algerian Stakeholders

Sonatrach (Société Nationale pour la Recherche, la Production, le Transport, la Transformation et la Commercialization des Hydrocarbures) is responsible for the development, transport, processing and commercialization of hydrocarbons in Algeria since its foundation in 1963. The energy company operates internationally and claims to be the largest oil company in Africa and the twelfth largest in the world.

Sonelgaz (Société National de l'Electricité et du Gaz) is the state-owned electricity and gas utility in Algeria. Since its founding in 1969, Sonelgaz has held a monopoly on the distribution and sale of natural gas. According to its own data, Sonelgaz supplies over 6 million households with electricity and 3 million with natural gas.

Crude Oil: Algeria is considered Africa's third largest producer of crude oil with proven reserves of 12,200 million barrels. Since its discovery in the 50's, crude oil production steadily increased to 86 Metric tons (Mt) in 2007, only to decrease afterwards, remaining above 60 Mt in recent years. In 1990 production was at 58 Mt, while in 2017 it was at 64 Mt. In 2017 the country exported 632,6 thousand barrels per day (b/d), down from 798 thousand b/d in 2014. More than 70% of these are destined for the European market. The rest are mainly for the Americas.

Natural Gas: Algeria holds the eleventh largest amount of proven natural gas reserves world-wide, with proven reserves of 4,504 billion cubic meters (Bm3) . Production increased slowly but steadily in the past 28 years, starting at 46 Bm3 in the 90's and peaking at 95 Bm3 in 2017 . Exports have remained above 40,000 million cubic meters (Mm3) annually in recent years. In 2017 alone, the country exported 53,890 Mm3 of natural gas (up from 43,420 Mm3 in 2015). The government aims to increase exports to over 57,000 Mm3 by 2019. The country's main client is Europe, which receives approximately 80% of Algeria's exports.

Shale gas: AAlgeria carries 740 trillion cubic feet (Tcf) barrels of technically recoverable shale gas found in a total of five basins . Currently shale gas has not been exploited in Algeria. The government is considering it for the future and has carried out in-depth studies with, among others, the company Repsol. However, current drilling and facility costs, fiscal terms, as well as a lack of infrastructure, make this market niche not yet profitable. Furthermore, the country risks social strikes due to potential water shortages in the regions in which shale-gas can be found.

Following the above statistics, the Algerian petroleum sector is not exactly booming. While the production of oil has decreased in Algeria since 2008, production of gas has increased. In fact the country has needed to import a large quantity of petroleum products in order to cover its demand. Lack of local strategy, little incentive for foreign investors and a growing local demand for energy due to high subsidies contribute to this phenomenon. To top it all off, the fall in world market prices in oil in 2014 has led to decreased government expenditure and hence, project cancellations. **This is now about to change.**

Natural gas and oil account for almost all of Algeria's total energy consumption. A growing population of 42 million inhabitants

in 2017, increased rate of urbanisation, and particularly, subsidies have led to increased local energy requirements. Algeria subsidises local oil and gas prices, especially for domestic use. The prices are considered to be among the cheapest worldwide. According to a World Bank report from 2014, Algeria will need to double its energy production by 2020 in order to keep pace with growing local demand. The electricity demand alone increased by 7% annually between the years 2006 and 2012. Increasing hydrocarbon prices for the domestic sector is not an option. Previous attempts to do so have led to social unrest. Instead, the government increased prices in the services and industrial sectors in 2016.

This strategy also supports the country's mission to increase its share of electricity generated by renewable energy. Photovoltaic and wind technologies in particular are planned to cover 40% of Algerian energy requirements by 2030. Nevertheless, slow implementation and fast-paced industrialisation will continue to require an increase in gas production.

If Algeria does not increase its oil production soon, its reserves are estimated to be depleted within 32 years. The country is aware of the situation and has already taken action.

Current Projects in Upstream Activities and the Launch of Off-shore Operations

In order to meet local energy requirements, as well as render the Algerian petroleum market more competitive, Sonatrach plans to invest approximately 50 billion USD over the next five years. During this time frame, 10 billion USD annually are to be injected into all areas of the value chain: exploration and production (E&P), optimization of resources, management and staff training. Projects of the first off-shore operations are also in the pipeline. With these measures, the government has targeted to increase its output of oil and gas by 14% and 13% respectively.

To support this venture, Sonatrach entered into bilateral agreements with nine of its current partners. In 2017 alone, Sonatrach concluded multiple deals with Total (France), Eni (Italy), Repsol & Cepsa (Spain), Anadarko (USA), Maersk (Denemark), Pertamina (Indonesia) and Talisman (Canada). The agreements focus primarily on improving Algeria's upstream activities, developing the off-shore sector and E&P, and optimising recovery methods.

In 2018 Sonatrach entered into fixed contracts for the production of petroleum by-products. With Total the company plans two factories for the production of dehydrogenation of propane and polypropylene. For the same products, Sonatrach plans to sign a contract with a Turkish partner for factories

to be operated in Turkey. Additional projects are in the works to produce steam cracker with Eni and the transformation of butane and methanol with other partners.

According to official sources, Algeria spent over 8 billion USD for the development of E&P activities in 2017. In July 2018, the government announced the discovery of 17 on-shore oil and gas deposits, up from 14 in 2017.

Algerian off-shore activities are expected to commence in the beginning of 2019. The exact location has not yet been announced. In a recent interview given to Oxford Business Group, Sonatrach indicated that two international firms have been contracted to use data with detailed seismic analyses. In a press release from March 2018, the CEO of Sonatrach mentioned that seismic studies are being carried out in the regions of Oran and Bejaia. The group is looking for experienced partners to develop this, for the country is still alien domain.

In order to lure foreign investors, the Ministry of Energy is currently working on improving venture conditions. While there is nothing definite yet, some speculation has occurred. The government seeks to improve its fiscal incentives to reflect current hydrocarbon prices. A revision of income tax on oil revenues is also in discussion. Furthermore, the wariness caused by the long and tedious administrative bureaucracy between filing for an E&P license and confirmation was brought to the attention of Sonatrach CEO, Mr. Abdelmoumen Ould Kaddour, during the annual World Gas Conference in Washington in June 2018. It is therefore possible that the government will try to ease procedures. According to reports, the current 49:51 foreign ownership ratio will not change.

Market Opportunities for German Companies

The Algerian petroleum market offers excellent business opportunities for companies supplying machines and equipment for upstream activities. A particular niche currently is digitalisation. Sonatrach is looking to develop a "Smart Oil Field" through digital optimisation of its entire value chain starting from Marketing and Sales activities to E&P, Trade, Risk, and Pipeline Transport. Furthermore, the off-shore sector is about to kick-off. Algeria is looking for experienced partners to support its development. In a smaller but no less important context, the continuation of exploration and feasibility studies for shale gas represents a unique opportunity.

German services and products are internationally recognized for their high quality standards and are, therefore, greatly valued in Algeria. Multiple German companies, such as BASF AG, Bentec GmbH, Evonik GmbH, Endress + Hauser, Linde Gas AG, Mawometer, Messer AG and Siemens AG, and Thyssen

Krupp AG, already enjoy long-standing partnerships with Sonatrach and Sonelgaz.

Siemens Algérie for example has supported Sonelgaz since 1962 with the production of electricity through the supply of turbines, control instrumentation and maintenance contracts. The company also installed over 100 substations for the transport of high voltage electricity. With Sonatrach, Siemens is involved in upstream activities through turbines for the power generation of oil sites, as well as for the transport of compressed gas via pipeline. Recently Siemens is helping Sonatrach to digitalize its operations.

In 2014, Bentec landed a multimillion Dollar contract for the supply of drilling equipment to Sonatrach's subsidiary Enafor.

While Algeria is a lucrative market, it is also risky. A prerequisite for a successful market entry is thorough preparation and the establishment of personal relationships with customers and / or partners. This takes time and financial investment. In addition, some flexibility and adaptability is required. As a rule of thumb, only long-term commitments are recommended as customers value long-term support and after-sales service. Without a local partner, business success is much harder to achieve.

Author: Sabrina Abdelatif, Project Manager | AHK Algeria.

Table 2: SWOT Analysis of the Algerian Petroleum Sector

Strengths • Virtually no foreign debt; • Big domestic market; • Equipped with raw materials: Crude oil and natural gas, phosphate, iron ore.	Weaknesses • Unilateral focus of the economy on gas and oil exports; • Dominant public sector; • Difficult business climate.
Opportunities • Government currently investing E&P with foreign partners; • Upstream activities; • Niche markets: off-shore operations and shale gas exploration; • Generally, important project market.	Threats • Loss of purchasing power and rising unemployment cause social tensions; • Financing bottlenecks in major state projects.



ACOSCO Adrege Cogema Sud Corporation Since 1998

ACOSCO Adrege Cogema Sud Corporation is a Limited Liability Company with a share capital of 320.000.000,00 DA in the 100% of the ZERGAT KHANOUS family and founded in 1998. ACOSCO has become a reference in the field of public works and civil engineering with the realization of many prestigious works in In Amenas in the wilaya (province) of Illizi in south-eastern Algeria

Essentially concentrated in the field of public works and civil engineering, the activities of ACOSCO also cover the provision of accommodation with complete restoration, provision of personnel, provision of equipment maintenance, transport of products and services materials as well as engineering and all drilling services. Its activity is expanding, mainly in the regions of In Amenas and Hassi Messaoud in the wilayas of Illizi and Ouargla.

The turnover increased significantly since 2011 with an Average evolution of 1 055 997,30 USD between 2014 and 2016.

Geographical scope

ACOSCO is present in different strategic wilaya in Algeria. The company has sufficient human and material resources to best meet the market demand:

The head office of ACOSCO is located in IN AMENAS and 7 others subsidiaries in different wilayas of Algeria; ACOSCO ALGIERS, ACOSCO DJELFA, ACOSCO GHARDAIA ,ACOSCO LAGHOUAT, ACOSCO ILLIZI, ACOSCO HASSI MESSAOUD, ACOSCO OUARGLA.

The company has an annual performance capacity of 1.400.000 hours and a staff of 1225 employees divided into 3 categories: Management, Operations, and Specialization.

Areas of intervention

The company operates in several sectors such as:

- Electric power generation
- Construction material
- Environment
- Agri-food industry
- Production and treatment of hydrocarbons
- Hydrocarbon transportation

Business objectives

the company is engaged in a process of continuous improvement through the implementation of a quality management system in accordance with ISO 9001 version 2008 in order to offer the best quality service to its customers who are mainly large companies specializing in energy and hydrocarbons. The most important customers are: Sonatrach, bp, Statoil, REPSOL, Turbomach, BP Amoco, KBR, EMEC, JGC, Schlumberger, WesternGeco, Weatherford, BAKERHUGHES, HESS, Ourhoud, CGG, JOHN Energy Ltd, Tassili Airlines.

To satisfy its customers the company has set itself strategic objectives:

- The high performance of services thanks to the assurance of a continuous improvement process
- The satisfaction of customers as well as all interested parties (stakeholders)
- Integrate health, safety and environmental functions into an integrated and efficient Management System approach
- Trained, qualified and highly efficient staff combining efficiency and effectiveness.



Cables & Accessories

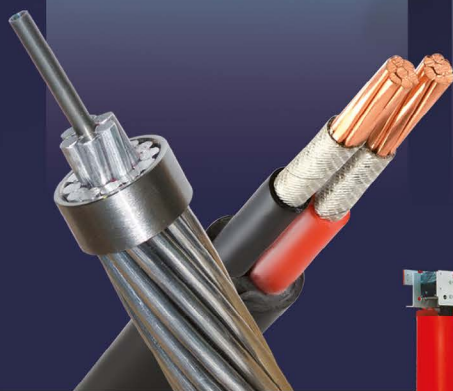
- Power cables
- Special cables
- Winding wires
- Raw materials
- Cable accessories

Transformers

- Power transformers
- Oil immersed distribution transformers
- Cast resin transformers
- Modular Solutions
- Installation and maintenance service.

Projects & Development

- Transmission & distribution
- Engineering and generation



Azerbaijan

Growth is recovering amid higher oil prices, expanding natural gas production and fiscal stimulus measures

Following the sharp decline (-3.1%) in the Azerbaijani economy in 2016, the year 2017 recorded slight growth (+0.1%) as the adverse effects of the earlier collapse of oil prices and exchange rate vulnerability began to recede. The subsequent decline in industry (-4.2%) in 2017, reflecting the diminishing oil sector (-5%), was offset by advances in agriculture (+4.2%) and services (+3.5%). After a sharp (-27.6%) plunge in 2016, contraction in the construction sector decelerated to -1.5% in 2017, mainly due to work on the Shah Deniz gas field and the Southern Gas Corridor pipeline. State capital expenditure in the agriculture and education sectors has also contributed to resurgence of the construction sector.

A rebound in the global commodity prices and firming exchange rate have underpinned the cyclical economic recovery in 2018. These coupled with moderating inflation and fiscal stimulus measures by the government further supported the pickup. In fact, the oil and gas sector accounted for 86% of 5.7 billion USD worth of foreign direct investment (FDI) in 2017, despite the declining investments directed to this sector. The State Statistical Committee of the Republic of Azerbaijan reported a 1.4% rise in GDP in 2018. With oil production and oil exports picking up marginally, the oil sector has reversed a slowdown to grow by 0.6% after four years of contraction, while the non-oil sector grew by 1.8%. The World Bank forecasts Azerbaijan's GDP to grow by 3.6% this year and to stabilize around 3.3% in 2020, driven essentially by the non-oil sector.

After accelerating rapidly in 2017 (to 13.9%), inflation has subsided substantially since early 2018, falling to 3%. This allowed the government to ease its monetary policy. As a result, the Central Bank cut the interest rate from 15% in January 2018 to 10% in June 2018. Yet the banking sector remains vulnerable, despite recent progress made in carrying out some important structural reforms. The remaining challenges and potential external shocks require more result-oriented and far-reaching reforms to make a truly lasting impact on the ground.

Oil and Gas industry remains the main growth driver of the economy

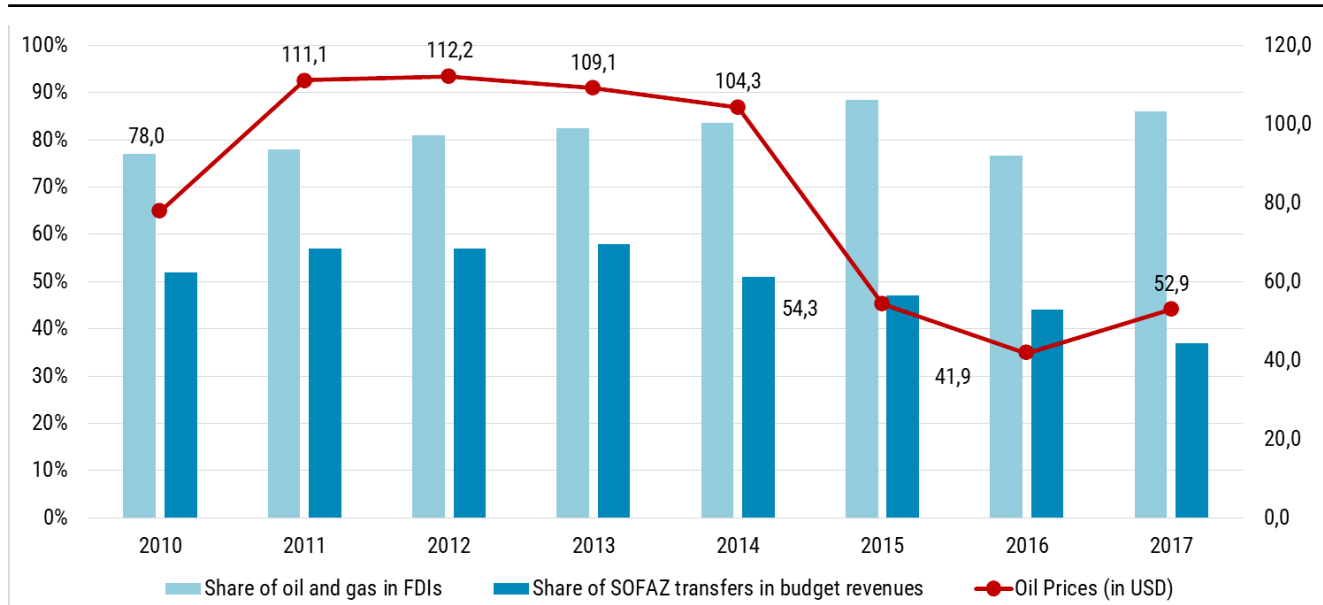
After the early 1990s economic and political turmoil, Azerbaijan underwent severe economic recession, which was further aggravated by military aggression and political traumas. The

rapid economic transformation and development of Azerbaijan since then is mainly attributed to the signing of the Production Sharing Agreements (PSAs) between SOCAR (the State Oil Company of the Republic of Azerbaijan) and the international oil giants in 1994. The construction of the Baku-Tbilisi-Ceyhan oil pipeline, as well as favourable investment conditions and important tax exemptions, have been instrumental in stimulating a huge amount of FDI flows into the sector. As of June 2018, the total amount of investments in the Azerbaijan's oil and gas sector exceeded 80 billion USD, according to SOCAR. The lion's share of investments was obviously directed to the development of the Azeri-Chirag-Gunashli oil field and Shah Deniz gas field.

To guarantee the saving and effective management of the revenues generated from implementation of oil and gas agreements, the State Oil Fund of Azerbaijan (SOFAZ) was established by a Presidential decree dated December 1999. The SOFAZ, which has been the main source of transfers to the state budget, constituted over 50% of the budgetary revenues during 2010-2014. When the oil prices plunged by 50% in 2015, the SOFAZ revenues dropped significantly from 16.2 billion USD in 2014 to 5.9 billion USD in 2016. The transfers were subsequently decreased to account for 37% of the approved state budget of 2017. In virtue of increase in the average annual oil prices (from 42 USD in 2016 to 53 USD in 2017), the Fund transfers are expected to increase again from 6.1 billion AZN in 2017 to 10.9 billion AZN to constitute 49.5% of the estimated state budget in 2018. Although economic diversification is an overriding government priority, the oil and gas sector is to dominate state budget revenues again.

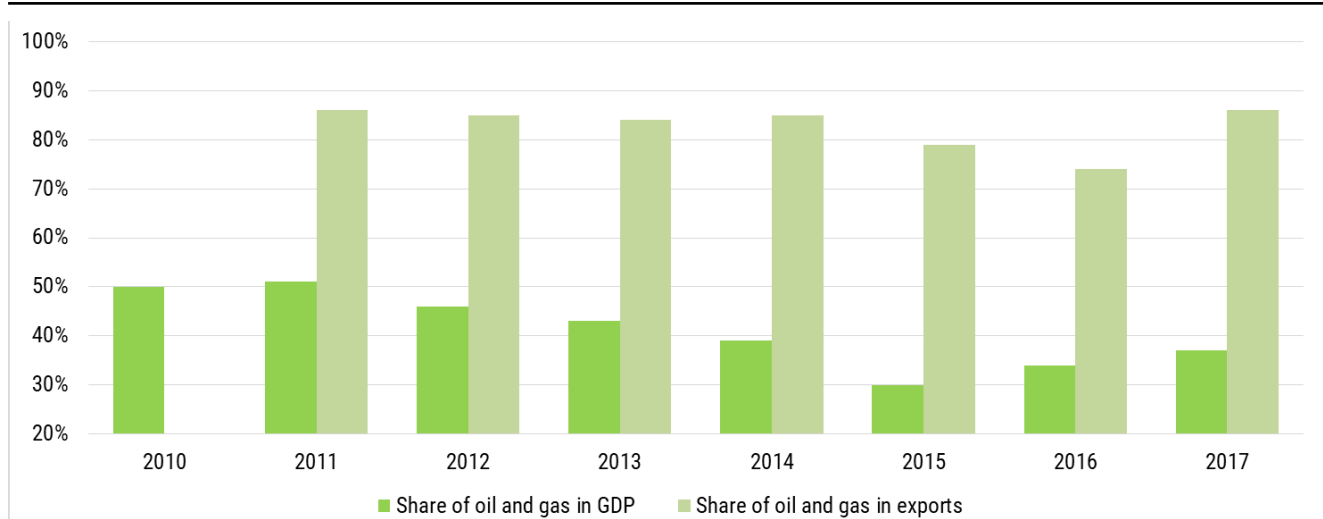
The proven oil and gas reserves of Azerbaijan remained unchanged in 2018 and stood at respectively 7 billion barrels (0.4% of the world proved oil reserves) and 1.1 trillion cubic meters (0.6% of the world proved gas reserves). After the restatement and extension of PSAs deals between the government of Azerbaijan and international oil companies in 2017, five new oil production wells were drilled at the Azeri-Chiragli-Gunashli (ACG) block of oil and gas fields in the first quarter of 2018, as reported by BP. Investments as part of the new agreement on the development of the ACG block fields are expected to exceed 40 billion USD during the next 32 years.

Graph 1: Oil and gas sector is the major component of the Azerbaijani economy



Source: SOFAZ Annual Report 2017; The Central Bank of the Republic of Azerbaijan

Graph 2: Oil and gas sector is the major component of the Azerbaijani economy



Source: State Statistical Committee of the Republic of Azerbaijan; State Customs Committee

2018 marked the official opening of the Southern Gas Corridor (SGC) in Baku and launching of the Trans Anatolian Pipeline (TANAP) project in Turkey. The commencement of commercial gas delivery to Turkey from the Shah Deniz 2 development project, one of the main milestones in the realisation of the SGC, was completed on schedule and within budget, as stated by BP and SOCAR. Progress in the construction of the third main phase of the SGC, the Trans Adriatic Pipeline (TAP) envisaging transportation of the Caspian gas to Europe exceeds 70% currently. Construction of the offshore section of the TAP is expected to start in 2019. Moreover, within the concept of expanding the SGC, the work is underway to start

construction of Interconnector Greece-Bulgaria (IGB) and possibly Ionic Adriatic Pipeline (IAP) branching off the TAP to the Balkans.

The 40 billion USD SGC project is believed to be one of the most significant undertakings in the region and will initially deliver over 10 billion cubic meters of natural gas a year in the next 25 years to nine European utility companies. The first shipment of Azerbaijani gas to Europe from Shah-Deniz field is scheduled for 2020. Germany's Uniper will purchase a total of 40 billion cubic meters of gas. The cooperation contract signed between the Azerbaijan's energy giant SOCAR and Uniper is valid until 2044 and includes strategic partnership in technology,

exploration, management training, and exchange programs. In the background of its energy diversification strategy, Germany is considerably interested in the further development of the SGC project. The Budgetary Committee of the Federal German Parliament (Bundestag) recently approved guarantees for the allocation of a loan worth 1.5 billion USD in the UFK format for TANAP and Shah Deniz 2 for 15 years by a syndicate of banks, including the German development bank KfW and Citibank.

German companies stand for the best quality in the Azerbaijani market

Trade turnover between Azerbaijan and Germany has recovered by around 60% in 2018 (although from a very low base of 894,119.47 USD in 2017) amid higher oil prices and firming currencies. Azerbaijan is Germany's main trade partner in the South Caucasus and the sixth largest supplier of crude oil to the country. With the recent launch of the SGC, Azerbaijan is also a key strategic partner of Germany and Europe in diversifying sources of energy supplies. The "Made in Germany" brand, in turn, stands for high quality and enjoys an excellent reputation in the Azerbaijani market. When financial circumstances permit, Azerbaijani companies and producers prefer machinery and equipment, as well as chemical products and raw materials, produced by German manufacturers.

The machinery, plants, and equipment remained the largest group of imported goods with a share of 23% in total imports (11.5 billion USD) in 2018. The demand is likely to increase even further, given that imports of equipment to the country within framework of projects of reconstruction of oil refineries is exempted from customs duties starting from May, 2018. Moreover, a more promising economic outlook and the government's ongoing strategy of diversifying the economy paves the way for the German machinery suppliers and engineers. Uniper, Siemens, BASF, SAP, Liebherr, DHL and Econ Industries are global German players already operating in the oil and gas industry of Azerbaijan and are positively associated with high expertise and quality, matching the current market demand.

EKOL Engineering Services CJSC owned by SOCAR (51%) and a German Lancer Services S.A. (49%) have successfully established a cooperation with a range of German manufacturers of plants and equipment. Similarly, based on a contract signed between SOCAR and Econ Industries GmbH in 2016, two VacuDry® 12.000 vacuum distillation plants were purchased and installed at the Waste Management Centre of Ecology Department to provide treatment of drill cuttings and oily cuttings formed during oil and gas operations. FACET

Separation System was contracted to supply an industrial wastewater treatment plant while Börger, NETZSCH, and VX provided the company with oily sludge transportation pumps, which are currently being operated on the sites.

In addition to the above-mentioned long-term gas supply contract, Uniper is actively involved in a number of projects in Azerbaijan. The company created a successful Joint Venture (JV) with SOCAR on May 2016 for production of a steam turbine generator unit to enhance economic efficiency and production volume. A 51% share of the JV belongs to SOCAR and Uniper holds the rest. The JV will gain additional value by modernizing and expanding the electricity and steam generation facilities at the SOCAR chemical complex in Sumgayit Azerikimya. The German government is assisting the project with an investment volume of around 30 million EUR through a HERMES export credit guarantee. The launch of new facilities relying on German technology is scheduled for early 2020.

While the number of production wells is increasing at the country's two largest blocks of oil and gas fields (ACG and Shah Deniz), SOCAR has reached agreements with a number of foreign companies on identification and initial exploration of seminal oil- gas structures in the Azerbaijani sector of the Caspian Sea. Works on Absheron and Umid fields' development have started jointly with France's Total, whereas BP is to explore promising offshore North Absheron and Shafag-Asiman block of fields as well as onshore Gobustan fields. The first output from new oil and gas fields is to be received in 2020-2021 as reported by SOCAR. Considering that the international oil companies are the main clients of German companies operating in the country, these new exploration and development projects will create long-term prospects for German companies as contractors of the oil majors in 2019-2020.

Digitalization has recently become a crucial topic of the oil and gas sector. The companies are currently shifting their operating model to adopt new technologies in order to increase cost competitiveness of Caspian basin, to develop re-skilling programs and to adopt innovative solutions. SOCAR counted on a German SAP to digitalise production data processing, to increase transparency and accuracy of production planning, as well as to ensure information efficiency in the reporting process. Following the launch of the SAP upstream operations management system the risk of production losses is reported to decrease by 80%. In this view, the upstream industry opens up great opportunities to German companies offering information technologies and digital services in the oil and gas industry.

Going forward, the development of the long-term energy strategy remains one of the key priorities in Azerbaijan. The

Azerbaijani government aims to attract new sources of private investments into the energy sector in 2020-2022 by ensuring a more effective, flexible and transparent legislation and regulatory framework. With that, there will be new chances for German companies to further position themselves in the market as providers of technology, equipment and expertise by establishing JV with SOCAR or by directly participating in tendering processes.

Current Projects: Downstream industry offers new opportunities for German companies

Given the recently launched huge extraction and production projects, the upstream industry will remain the main strength of Azerbaijan's oil and gas sector also in the next couple of years. However, within the diversification policy of the government, the current focus of the development strategy is maximizing integration of Azerbaijan's upstream-midstream-downstream oil and gas value chain. Hereby the main objective is to expand and upgrade the petrochemical industry of the country, which is predominantly based on the continued processing of oil and gas.

The SOCAR's Gas Processing and Petrochemicals Complex (GPC) project was launched in 2016 at Garadagh district, 45 km south of Baku. It is believed to mark the beginning of a new era in development of Azerbaijan's downstream industry, which will strengthen the position of the country in the global petrochemical market. The new complex will include a gasoline-powered ethylene pyrolysis plant with a capacity of 610,000 tons, a propylene plant with an annual production capacity of 130,000 tons, and a polyethylene plant with a capacity of 600,000 tons, among other facilities. France's Technip was awarded a service contract for the engineering design of a new gas processing plant with a capacity of 10 billion cubic meters per year and a new petrochemical plant including a steam cracker. Another French company, Axens, was selected by SOCAR to provide advanced technologies, catalysts, and adsorbents for its GPC complex. Technology licensing and associated design work for a polyethylene plant at the complex is to be completed by a Univation Technologies LLC. Based on the agreement between Univation and a German Linde AG, Linde Engineering will complete the basic engineering design package for the plant. The construction of the facility is scheduled to begin in early 2019 and finish by 2022. SOCAR Polymer is now aiming to attract foreign investments in the construction of the complex, the approximate cost of which is estimated at 4.2 billion USD.

In 2015, Azerneftlyag oil refinery was liquidated and merged with Baku Oil Refinery to optimize the operating

costs and improve business process by consolidating the refineries under the integrated management structure. The modernization and reconstruction process of Heydar Aliyev Oil Refinery is currently at the EPC (engineering, procurement and construction) stage. The upgrading process will be completed in 2021, increasing the quality of the production and capacity of the refinery from 6 million to 7.5 million tons of oil per year. After modernization, the operational period of the refinery will be extended to 2040. According to the latest communication from SOCAR, the construction of a bitumen unit is underway. The company is presently at the stage of selecting a contractor for the dismantling, transfer and installation of the primary oil-processing unit together with atmospheric and vacuum distillation units at a new site. The entire project of the unit's transfer is to be completed by late 2020. The reconstruction plan is fully financed by the state including the funds recently allocated by SOFAZ. The total cost of the project is estimated at nearly 2.2 billion USD.

With 184,000 tons of design production capacity a year, the Polypropylene (PP) plant was launched in July 2018. By the end of the year, the High Density Polyethylene (HDPE) plant is expected to start operations with 120,000 tons of design capacity per year. The company reports that the procurement orders are now complete and the overall cost for the construction of the complex is expected to exceed 800 million USD. Until 2015 the project was financed from the state budget and then a loan agreement was signed with foreign banks, Deutsche Bank among others, on export financing worth 500 million euros. Moreover, the relevant licensing agreements were signed with a Danish Haldor Topsoe and a Dutch Stamicarbon B.V. respectively for production of ammonia and urea. The plant will produce 1,200 tons of ammonia and, subsequently, 2,000 tons of urea per day.

The plants newly established or modernised in 2018 and 2019 are expected to at least double the annual value-added output of chemical and plastics industry from today's \$500 million.

In support of local producers, five industrial parks, two high-tech parks and two agro-parks with special tax and customs privileges and simplified administrative procedures, have been established in Azerbaijan as of January 2018. Founded in 2009, Sumgait Technologies Park (STP) is a unique complex comprised of 12 specialized factories with more than 30 production sites and is the largest manufacturer of cable and polymeric products in the region. Being one of the largest industrial production centers in the region, STP has built a successful collaboration with a number of German companies such as Herman Krauss Maffei, Kaeser Kompressoren, NIEHOFF, TROESTER, Zoller GmbH, Werth Messtechnik GmbH

Table 1: Overview of the ongoing projects in the downstream industry

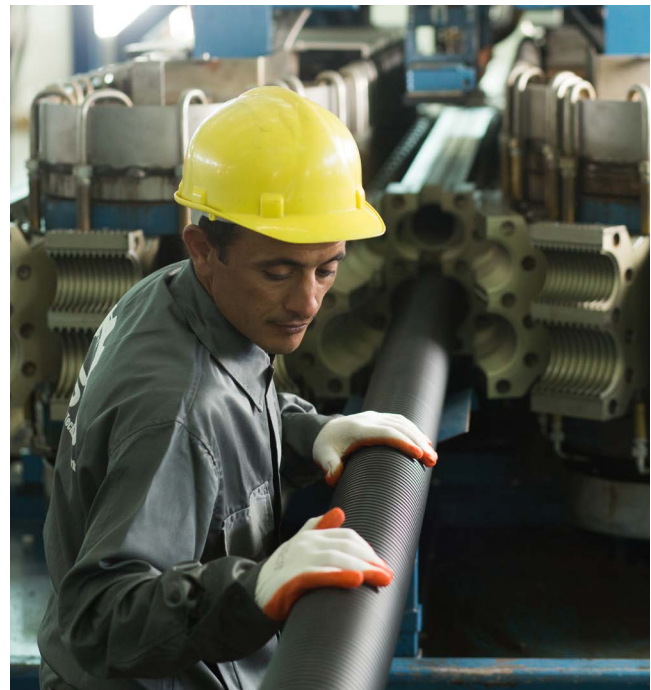
Project	Developer	Contractors	Planned Completion Date
The Southern Gas Corridor: South Caucasus Pipeline (SCP) Trans Anatolian Pipeline (TANAP) Trans Adriatic Pipeline (TAP) Ionian-Adriatic Pipeline (IAP) Interconnector Greece-Bulgaria (IGB)	SGC Closed Joint-Stock Company (Ministry of Economy of Azerbaijan and SOCAR)	BP, Botas, Snam S.p.A, Fluxys, Enagás, Axpo	Completed 2018 June (TANAP) By 2019 (TAP) By 2020 (IAP) By 2020 (IGB)
Azeri-Chirag-Deepwater Gunashli	SOCAR	AzACG SOCAR, BP, Chevron, INPEX, Statoil, ExxonMobil, TP, ITOCHU, ONGC Videsh Limited	2049
SOCAR Oil and Gas Processing and Petrochemical Complex (OGPC) in Baku	SOCAR, SOCAR GPC	Technip, Axens Univation Technologies, Sinopec Tech, Fluor	By 2022
Modernization and expansion of Heydar Aliyev Oil Refinery in Baku	SOCAR	Pörner Group, Air Liquide Axens, UOP LLC, KT-Kinetics Technology, Foster Wheeler.	By 2020

Source: SOCAR, SOCAR Polymer

and DMT Foundry. Since 2011, STP is officially authorised to distribute, install and serve Germany based Kaeser products and equipment in Azerbaijan.

Moreover, STP offers qualitative and affordable products as a manufacturer of many products in Azerbaijan's oil and gas sector and works in a close partnership with international companies like BP, Halliburton, Maire Tecnimont and Samsung Engineering. All STP products (high-quality steel fittings, valves and flanges, armature, aluminium profiles, explosion-proof electrical junction boxes, electric slots and panels, ventilation systems, sandwich panels, solar collectors, payment terminals as well as technical gases) comply with international standards and regulations (e.g. ISO 9001, ISO 14001, OHSAS 18001, Schneider Electric, KEMA and ASME certificates).

The oil and gas sector, as well as the petrochemical industry, are the fields with great prospects for cooperation with German companies in 2019-2020. These companies can be involved in the development of feasibility studies, in the provision of engineering design and technical consultations, as well as in



Source: Sumgait Technologies Park (Source STP)

repair and rehabilitation of the existing and envisaged plants. Furthermore, ongoing and planned projects pave the way for German companies to ensure their presence in the new markets in Azerbaijan by setting up a local representation and/or JV with SOCAR. SOCAR has established a number of JVs with international and local companies across the different sectors including the German Uniper. The government is interested in strengthening international cooperation, enhancing application of international standards, and ensuring the transfer of innovative technologies. Therefore, the current and planned projects in the oil and gas industry offer lucrative market entry potential and new investment opportunities for German companies. All procurement announcements of goods and services falling under the requirements of conducting tenders are published on SOCAR's website. With its well-established network and local expertise, the German-Azerbaijani Chamber of Commerce is ready to actively support German companies in finding a local partner in Azerbaijan or in entering the market.

Author: *Nigar Bayramli, Head of Market Analysis and Communication
Department | AHK Azerbaijan.*



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Brazil

Brazil and energy transition - Opportunities for the oil & gas industry

Brazil has given the world clear signs of its great potential to be one of the nations leading the global energy transition process, which is a relentless and fast-growing movement happening all around the world.

The country already has a diverse energy matrix with a high rate of renewable sources, which places us in a prominent position. But we cannot miss the opportunity to develop all our vocations and alternatives for energy supply.

This is where the oil and gas industry comes in. In particular the huge pre-salt reserves, capable of promoting a deep change in the economy, with a positive impact on employment, income and tax revenue and, above all, on our quality of life.

In two years, Brazil has solved many complex regulatory issues, by ending Petrobras' exclusivity of operation in the pre-salt, adopting a fixed bid rounds schedule and simpler and more realistic local content rules.

The tax environment has also improved to attract investments, with the renewal of Repetro, a special customs regime. This regulatory evolution allowed Brazil to become a new development and investment hub, as we have seen in the last bid rounds.

Recent figures already illustrate how much Brazil has advanced with the pre-salt and investments of the oil and gas industry after this regulatory improvement. In just over a year, the

bidding rounds yielded 7 billion USD in six auctions, under both the concession and production sharing regimes.

ANP estimates, as a result of these auctions, that about 112 billion USD will be invested and domestic production will grow up to 2.5 million barrels per day (bpd).

The volume of resources to be injected into the Brazilian economy will more than double the number of jobs (both direct and indirect) by 2022 - from the current 400,000 to 873,000.

From 2007 to 2017, the Brazilian government collected 350 billion USD in taxes and government participation from oil and gas activities. ANP expects that by 2054, the revenue potential of the oil & gas industry is 1.5 trillion USD, a figure that represents an average of 42 billion USD per year.

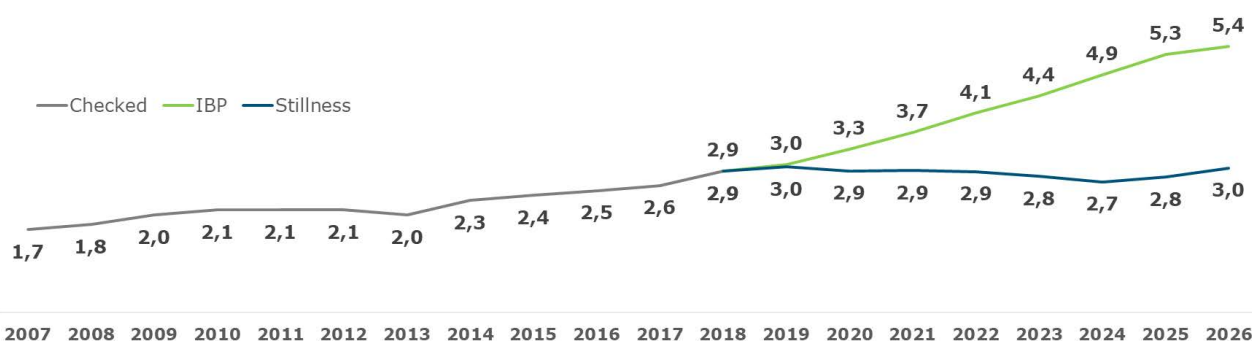
For these expectations to become reality, we must adopt a strategic approach with the cooperation of all oil and gas players. We must also carry on with the reform of the regulatory environment, which is a must-do to maintain the attractiveness and competitiveness of the oil and gas industry.

Brazil has an extraordinary window of opportunity in the next few decades to develop these reserves, while it is still possible to extract the best value for society.

The reason is that, in the next decades, the world will reach a peak of oil consumption. That is why Brazil must take advantage of its production potential as quickly as possible.

What we will be in the future depends on the decisions we make today

History and projections for oil production
2007-2026, Million barrels / day

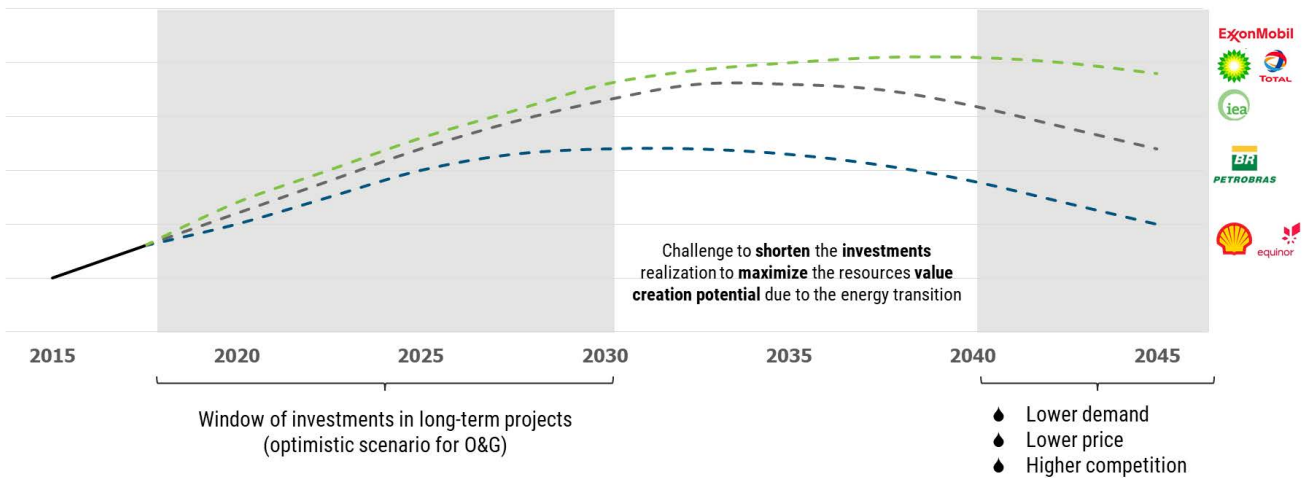


Source: Prepared by IBP with data from GEE/UFRJ

The next decade can represent O&G's industry last window of investments

Forecast peak in oil global demand according to major industry players

Schematic curves, consistent with the peak demand forecast of each agent



Source: Elaborated by IBP with data retrieved from the companies' outlooks

In this scenario, it is important to highlight natural gas, which production in the pre-salt will grow even more in Brazil. With lower levels of greenhouse gas emissions among fossil fuels, natural gas is considered the transition fuel towards a low carbon economy. It is to be used to generate energy in urban mobility and to supply both industrial and domestic users.

In addition to employment, development, investments and tax and royalties, the oil and gas industry brings benefits that can turn into well-being for society. It creates more funds for health and education in a world in which energy is increasingly becoming a factor for social inclusion.

Global energy consumption will grow. For example, about a third of the world's population still lacks clean energy sources for

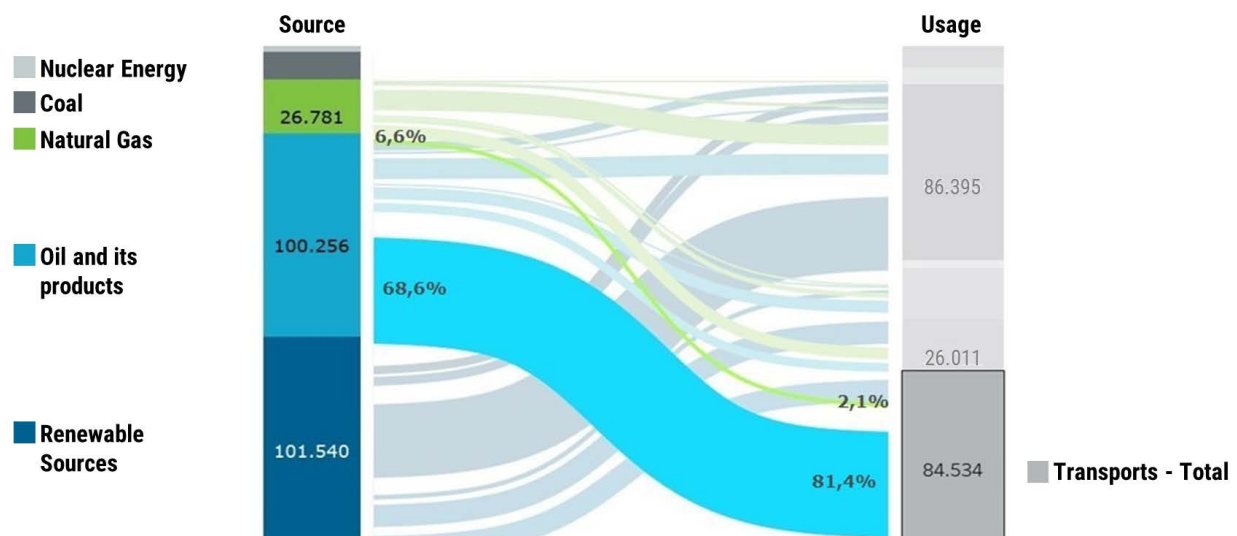
cooking. The oil and gas industry undergoes a transformation to continue contributing to social and economic development on a global scale.

All these developments will touch the future generations, who will surely also have more energy generation alternatives.

Despite the diversity of sources, the oil and gas industry will coexist and forecasts point to an increasingly diverse matrix, complementary to renewable sources. Our future, however, depends on the current and future choices. Hopefully, Brazil will know how to pave the best way in this transitional stage.

Author: Milton Costa Filho, General Secretary, IBP-Brazilian Petroleum, Gas and Biofuels Institute.

Oil Dependency in the transport industry in 2017 (10³ tep)



Source: Prepared by IBP with EPE data

A stylized map of Europe in a light yellow color, set against a darker yellow background. The map is centered and serves as a backdrop for the text and icons. In the top right corner, there is a blue rectangle with the word 'wintershall' in white. The German words are listed in the center of the map in a bold, sans-serif font. To the left of the words, there are three oil pumpjack icons. To the right of the words, there is a silhouette of the Brandenburg Gate. At the bottom left of the map, there is another oil pumpjack icon.

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Heimat
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Energiewende
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Mexico

Mexico as a business destination

Mexico is considered one of the most competitive countries for investments worldwide due to many factors, such as a strategic geographical position in the North American region; competitive costs, with a young and talented population; economic growth and the ability to manufacture high technology products. Furthermore, it ensures an open economy and access to the most important markets worldwide through a network of free trade agreements. According to the World Investment Report 2017 published by the United Nations Conference on Trade and Development (UNCTAD), in 2016, Mexico ranked 16th place as foreign direct investment recipient, and 7th among developing economies.

With the formal termination of the renegotiation of the North American Free Trade Agreement (NAFTA) and the signing of the new United States–Mexico–Canada Agreement (USMCA) between the United States, Canada and Mexico, foreign companies now have a safer outlook on the economic perspectives of the Mexican market and the region. Each country's legislature must still ratify the agreement, which means that it is still pre-liminary.

Nevertheless, the termination gives Mexico more economic stability because foreign companies now have guidelines that they can use as to orient themselves.

Overview of the Mexican Oil Sector

Mexico is one of the most prolific offshore and onshore regions in Latin America with one of the world's largest unexplored resources of oil and gas. There is a lot of potential, considering that 70 percent of Mexico's estimated recoverable resources are yet to be tapped and developed.

Moreover, onshore fields discovered in Mexico are 17 percent larger than the average recoverable reserves in US fields and three times greater than Brazilian and Columbian fields.

Despite the petrol price decrease, international petroleum enterprises are highly interested in the Mexican market. In 2018, oil production has dropped significantly under 2 million barrels a day due to lack of technology and old refineries which lack investment. The state-owned oil company Mexican Petroleum (Petróleos Mexicanos, Pemex) will not be able to maintain itself without foreign or state investment. At the moment, Pemex operates nine natural gas processing plants and six refineries with a capacity of 1,640 million barrels per day; however, the utilization rate is only 66 percent.

For this reason, Pemex is planning the modernization and transformation of its six refineries as well as the existing petrochemical installations for gas treatment. Furthermore, the construction and modernization of facilities for the storage of natural gas reserves are primary goals for the sector and will need foreign investment to maintain the country as a major non-OPEC oil producer. Those are great investment opportunities for German companies.



Source: Industria Petrolera Mexicana

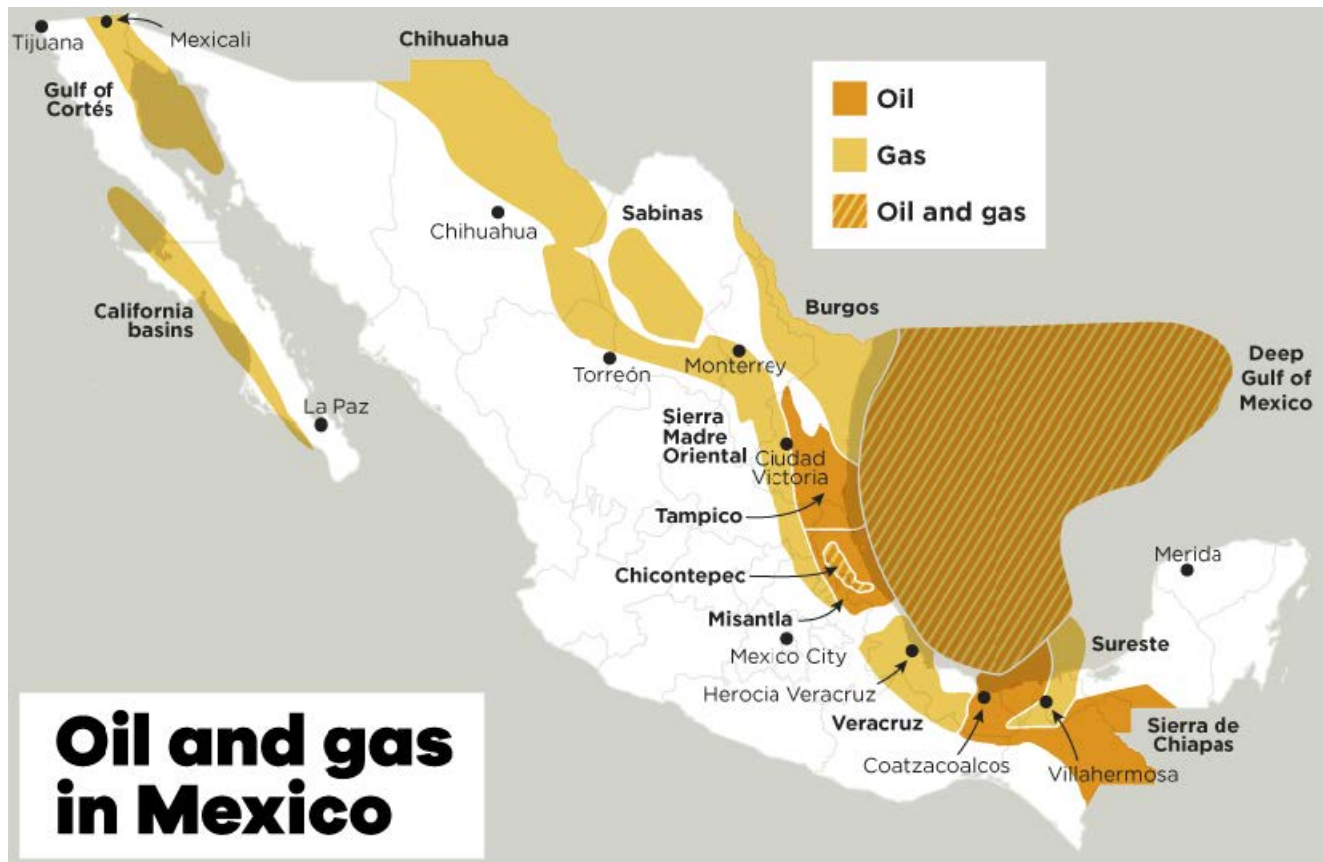
Overview of the Mexican Gas Sector

Mexico has the worldwide ninth-highest gas demand, which cannot be covered by national production. Mexico has an estimated 17 trillion cubic feet (Tcf) of proven natural gas reserves. However, higher levels of natural gas consumption will likely depend on more pipeline imports from the United States or liquefied natural gas (LNG) imports from other countries. Mexico is already a net importer of natural gas with an average of about 123 barrel per day in 2017. Those are about 80 per cent of Mexico's natural gas imports. Mexico has an estimated 545 Tcf of recoverable shale gas resources – the sixth largest in the world. The true potential of accessing and developing shale gas in Mexico is hindered by the low availability of required technology and water resources, as well as government policies currently devoted to increasing the supply of low-cost natural gas from the United States.

Currently, the Mexican gas pipeline system, managed by the regulatory authority for natural gas, CENAGAS, covers 14,000 km with a capacity of 6.3 million cubic feet. Mexico encouraged increasing domestic natural gas production by including

unconventional sources in their Round Three auctions which were delayed for lack of bidding interest. Furthermore, it is crucial to expand the gas pipeline system to be able to satisfy the high demand.

latter controls the national gas, refining and petrochemical businesses and affiliated companies (drilling, logistics, fertilizers, ethylene and cogeneration services). Pemex International (PMI), Pemex's international business



Source: Going Global

New implications with the change of government

With taking office of Mexico's new president Andrés Manuel López Obrador on December 1st 2018, four energy policy priorities have been identified: 1) increase domestic oil and gas production; 2) refurbish Pemex's six existing refineries; 3) construct a new refinery in the State of Tabasco; and 4) increase electricity generation, mainly by updating existing hydroelectric plants. Mexico's new president has been opposing his predecessor's energy reform by focusing on the strengthening of the national petroleum sector to reverse the downward trend in Mexican oil production.

In December 2013, Mexico passed its new energy reform, which on the one hand allowed local and foreign private investment into the energy sector and on the other hand a restructure of the state-owned petroleum company Pemex.

Pemex was split in two business divisions: Pemex Exploration and Production, and Pemex Industrial Transformation. The

development subsidiary, continues to exist, as it buys and sells fuel and basic petrochemicals, but not equipment.

The energy reform made it possible for international energy firms to include provisions for competitive production sharing contracts and licenses. The consequence was the entrance of new private actors and international companies. Special interest is found in Mexico's upstream market through the National Hydrocarbons Commission's (Comisión Nacional de Hidrocarburos, CNH) licensing rounds which will be awarded in five rounds between 2015 and 2019.

For that, Pemex presented the areas where it intends to retain exclusive rights of production or to develop production at a future date in 2014. These Round Zero farm outs allowed Pemex to maintain control of 83 percent of reserves (1P, 2P, 3P) for current and future investment and development. Under the reforms, Pemex can partner with other private companies in developing these resources.

In December 2016, CNH, aided by the Ministry of Energy (SENER) and the Ministry of Finance (SCHF), completed four

phases of Round One. In January 2018, they completed the Round Two tendering process. Round One and Round Two involved tendering of selected subsectors of available and potential hydrocarbon resources that include shallow water, onshore mature fields, and deep-water areas.

SENER completed Round 3.1 in March 2018, however in July 2018 CNH announced postponement of Rounds 3.2 and 3.3 until at least February 2019 due to the change of government. Rounds 3.2 and 3.3 would bid for conventional and non-conventional land blocks, including 37 land blocks and nine non-conventional blocks.

In December 2018, it was announced by the new secretary of energy Rocio Nahle, that the two bid rounds rescheduled for February 2019, will be suspended. Mexico is not rescinding the contracts that have already been awarded, but López Obrador wants foreign firms to invest and show they can start production from fields they have discovered.

It is unknown if the search for Pemex's partners (farm outs) for seven terrestrial clusters, that were going to be auctioned the same day, will also be canceled.

It will take some patience to see which other changes will take place in the energy sector. It would be too early to make any predictions about the implications the announced changes will have. It must be seen what the revision of the previous bidding rounds will result in. Nevertheless, it is not expected that the existing contracts will be cancelled.

In the long run, it is difficult to make a forecast with the recent change of government. Mexico's oil production, exploration, and investment climate for the next few years depends on the new administration's policies in the energy sector.

Business opportunities for German companies

The opening of the upstream oil and gas market will provide opportunities to sell technology and services to private contractors and Pemex, or for joint ventures and partnerships between German companies and Pemex. The fatal state of Pemex is an opportunity for investment in the renewing of the six refineries. Furthermore, the government is planning the building of a new refinery in Dos Bocas in the state of Tabasco. Here, will be great possibilities for investment.

Even though, the new president elect is opposing the new energy reform, the firm contracts will not be reversed continuing to drive market growth. Large investments will be needed to comply with the award schedules for shallow water, onshore, deep water, heavy oil, and unconventional oil and gas projects. In the upstream oil and gas subsector, Pemex is no

longer the only player. The large and mid-sized private sector companies are invited to bid and will be requiring suppliers to register with them to sell their equipment and services.

In 2017, the German company Deutsche Erdöl AG (DEA) had a successful market entry in Mexico, with the award of one license as partner in Round 2.1, followed by the award of operatorship of the producing oil field Ogarrio in the same year and of three offshore licenses as operator in Bid Round 3.1 in 2018.

In December 2018 it was announced that DEA has signed an agreement to acquire Sierra Oil & Gas, a leading independent Mexican oil and gas company. DEA will add Sierra's acreage to its existing portfolio of operated production and exploration blocks, to become one of the country's largest acreage holders. The transaction is subject to obtaining government approvals, including from Mexico's National Hydrocarbons Commission (CNH) and the Federal Economic Competition Commission (COFECI), as well as satisfying other customary conditions. It is expected to close in the first half of 2019.

Those developments underline the importance of the Mexican market and will attract significant investments from DEA and its joint venture partners over the next five years and shows that despite the changes and the momentary uncertainty, companies continue to have trust in the Mexican energy market.

German companies should view Mexican energy reform as an opportunity to position themselves at an early stage with the help of their technological expertise and knowledge of the market. In the upstream sector, German companies are important operators, while in the mid- and downstream sectors they have the leading market competence as providers of technology, equipment, and services. There are great opportunities to capitalize on midstream infrastructure and downstream gasoline distribution opportunities.

Finally, there is great potential for project developers, operators, contractors, sub-contractors, or suppliers of equipment and/or technology especially since the installment of the Mexican energy reform.

Author: Julia Groß, Project Manager Trade & Investment, Energy & Environment | AHK Mexico.

Best Practice: Grannemann Lobeira

Sara Grannemann, CEO

Grannemann Lobeira:	Grannemann Lobeira S. de R.L. de C.V., known in the Mexican Oil and Gas market as GLOBE, was founded on November 12, 2009. Throughout the nine years since GLOBE began operations in the industrial and maritime sector in Mexico, it has participated in several projects of the Mexican petroleum industry, in the areas of exploration, exploitation, gas processing, pipeline transport and oil storage terminals. GLOBE works foremost in the certification and verification of technical safety of the upstream (marine platforms and pipelines), midstream (natural gas, petrochemical and petroleum pipelines, gas processing, petroleum storage terminals and liquefied natural gas), and downstream sectors (mechanical integrity, engineering and mechanical integrity of refineries), among others.
Products:	Certification of engineering, construction, operation and maintenance of onshore and offshore installations, mechanical integrity of pipelines and refineries, verification unit according to official Mexican standards (NOMs) regarding pipelines (natural gas, LPG, petroleum and petrochemical), oil storage terminals and liquefied natural gas storage terminals, electrical installations, risk analysis, ARP, HazOP, consequence analysis, LOPA (layers of protection), environmental impact assessment (EIS/MIA), environmental risk assessment (ERA), accident prevention program (APP), emergency response Plan (ERP), inspection and supervision of works, project management, owner's engineering, management of chance (MoC).
Business relations with Germany:	Up until now, GLOBE has not established business relations with Germany, but the enterprise is interested in collaborating with German Oil and Gas companies that have included Mexico in their expansion strategies, and German firms which have recently won tenders in the rounds of the National Hydrocarbons Commission (Comisión Nacional de Hidrocarburos, CNH) and the Secretariat of Energy (Secretario de Energía, SENER). GLOBE can support them with the compliance of international regulations and of national regulations (NMxs, NOMs). GLOBE represents via their maritime division, the German Shipyard Abeking and Rasmussen (A&R) promoting the construction of SWATH- type vessels for the use of personnel transport and surveillance, search and rescue on high seas. With the SWATHs GLOBE has already a lot of experience in Germany and other European countries but also in the US, where recently A&R built SWATH-type vessels already in service in the Gulf of Mexico from this year.
Challenges:	So far, the energy reform has represented great opportunities for several sectors of the country, including sectors directly and indirectly related to the oil industry. Up until now, Mexico has signed up to 70 contracts with new companies which have ventured into exploration and extraction of hydrocarbons in deep waters, shallow waters and onshore. The future years will represent a challenge for the new administration and for all those involved in the Gas and Oil sector. It is necessary to develop a work culture with professional business and operational specialties that were previously reserved for the state's productive enterprise, Pemex. It is important to install strict regulations in the sector because there are still gaps in the storage and private transport of fuels to the interior of the country. In Mexico, the storage capacity of gasoline and diesel is only three days, while in other countries it is between 70 and 90 days.
Outlook on the Mexican energy sector:	The general outlook is good, although a probable change in the priorities of the new administration in Mexico has to be taken in consideration. There are fundamental subjects that the new government should continue to address in the short and medium term such as the supply of petrochemicals (gasoline, diesel) and natural gas. New opportunities are in construction of new pipelines for transportation of natural gas and petrochemicals, petrochemical storage plants, as well as construction and maintenance refineries.



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Throughout the nine years since **Grannemann Lobeira, S de RL de CV, GLOBE**, started operations, has participated in many and relevant projects of the Mexican Oil and Gas Industry, in the areas of Certification and Verification of Technical and Environmental Safety of the Upstream (marine platforms and pipelines), Midstream

(natural gas, petrochemical and petroleum pipelines, gas processing, petroleum storage terminals and liquefied natural gas), and Downstream Sectors (mechanical integrity, Refineries) with the following services:

- Certification and Verification of FEED and Detailed Engineering
- Certification and Verification during the Construction, Maintenance and Operation Phases
- Certification of Materials and Components
- Risk Analysis, ARP, HazOP, Consequence Analysis, LOPA (Layers of Protection), Environmental Impact Assessment EIA/MIA), Environmental Risk Assessment (ERA); Accident Prevention Program (APP); Emergency Response Plan (ERP)
- Evaluation of the compliance with the Mexican and International Standards for:
 - Oil and Liquefied Gas Storage Terminals
 - Specifications of Petroliferous Quality

- Electrical installations
- Oil, Gas, Diesel and Petrochemical Pipelines
- Natural Gas and Liquefied Natural Gas
- Containers subject to pressure and boilers
- Mechanical Integrity of Refineries, Pipelines, Pipes, Tanks and Pressure Vessels
- RBI, RCM, RCA, Criticality Analysis and FMECA
- Conventional and non-conventional non-destructive tests
- Owner's engineer
- Inspection and supervision, project management
- Management of Change (MoC)

Nigeria

Nigeria Economic Overview

Nigeria is a lower middle-income, mixed economy and emerging market, with expanding manufacturing, financial, service, communications, technology and entertainment sectors. With a GDP of \$375bn in 2017 it is the largest African economy according to the World Bank. More than 190 million inhabitants account for the biggest population on the African continent and the seventh largest in the world. With a population growth rate of 2.7%, Nigeria is predicted to become the world's third largest population in 2050. However, its large population means that Nigeria remains a comparatively poor country in per-capita terms, with a lower GDP per capita than some of its sub-Saharan neighbours, including South Africa, Namibia and Angola.

Perhaps the single-biggest driver of Nigeria's economy has been its resource wealth in terms of crude oil and natural gas. With a fall in oil prices from more than \$100 per barrel in 2014 to roughly \$50 per barrel at the start of 2017, the past years have been difficult for Nigeria. The fall in revenues led to an economic slowdown, a ballooning of federal government debt, a rise in non-performing loans in the private sector and high inflation. In response to the consequential recession in 2016 the government launched the Economic Recovery and Growth Plan (ERGP) as of early 2017, identifying five priority areas: stabilizing the macroeconomic environment, achieving agricultural and food security, improving transport infrastructure, ensuring energy sufficiency and driving industrialization through the growth of small and medium-sized enterprises (SMEs). Eventually, in 2017 growth started to pick up.

Following a real GDP contraction of 1.6% in 2016 and a modest recovery in 2017 leading up to 0.8% p.a., the IMF forecasts that growth will reach 2.1% in 2018 and 2.3% in 2019. This period of modest economic performance, which began in 2015, is expected to continue until 2019, was preceded by more than a decade of high economic growth, with the country recording double-figure annual GDP growth rates three times in the period 2001 and 2014.

Inflation started to rise from 9.6% in January 2016 to its peak of 18.7% in 2017 and came down again to 11.1% in 2018. The IMF predicts 13.5% inflation in 2019. Due to poor economic performance combined with a population growth rate of 2.7%, unemployment has been rising steadily since 2014. The official unemployment rate increased from 13.4% in 2016 to

16.5% in 2017 and an estimated 17.3% in 2018. The long-term rate is projected to trend around 15% in 2019 and 2020. Youth unemployment averaged 21.7% from 2014 until 2017.

Trade recovered in 2017 with exports up to \$44.5bn, an increase of 35.2% compared to 2016, and imports worth \$28.9bn. Crude oil and petroleum gas account for more than 85% of exported goods. Refined products represent 22% of imported goods.

Oil & Gas Industry

As Africa's largest oil producer, Nigeria is a key member of OPEC and the world's fourth-largest exporter of liquified gas (LNG). Nigeria's energy sector is notable for its early success in building local content in upstream activity. Policy moves over the past two decades have enabled young Nigerian companies to acquire and develop oil and gas blocks, build pipeline and distribution networks and, based on the current project pipeline, refineries and power plants. However, there is still room for improvement, particularly in terms of upstream disruptions and an outdated regulatory framework.



Source: The Guardian Nigeria (2018)

The oil & gas sector comprised 10% of Nigeria's GDP and provided 94% of export revenue in 2015. Proven reserves stood at 37.5bn barrels at the end of 2017 according to BP's "Statistical Review of World Energy 2018". Proven resources for natural gas were measured at 5.2trn cu metres at the end of 2017. Oil production is projected to rise from 1.6m barrels bpd in 2018 to 2.5m in 2020. Gas production was at 47.2bn cu metres in 2017, up 5.1% from 2016. According to the Federal Ministry of Petroleum Resources, onshore production costs are between \$8 and \$15 a barrel, shallow water costs range from \$14 to \$18, while deep water costs are between \$30 to

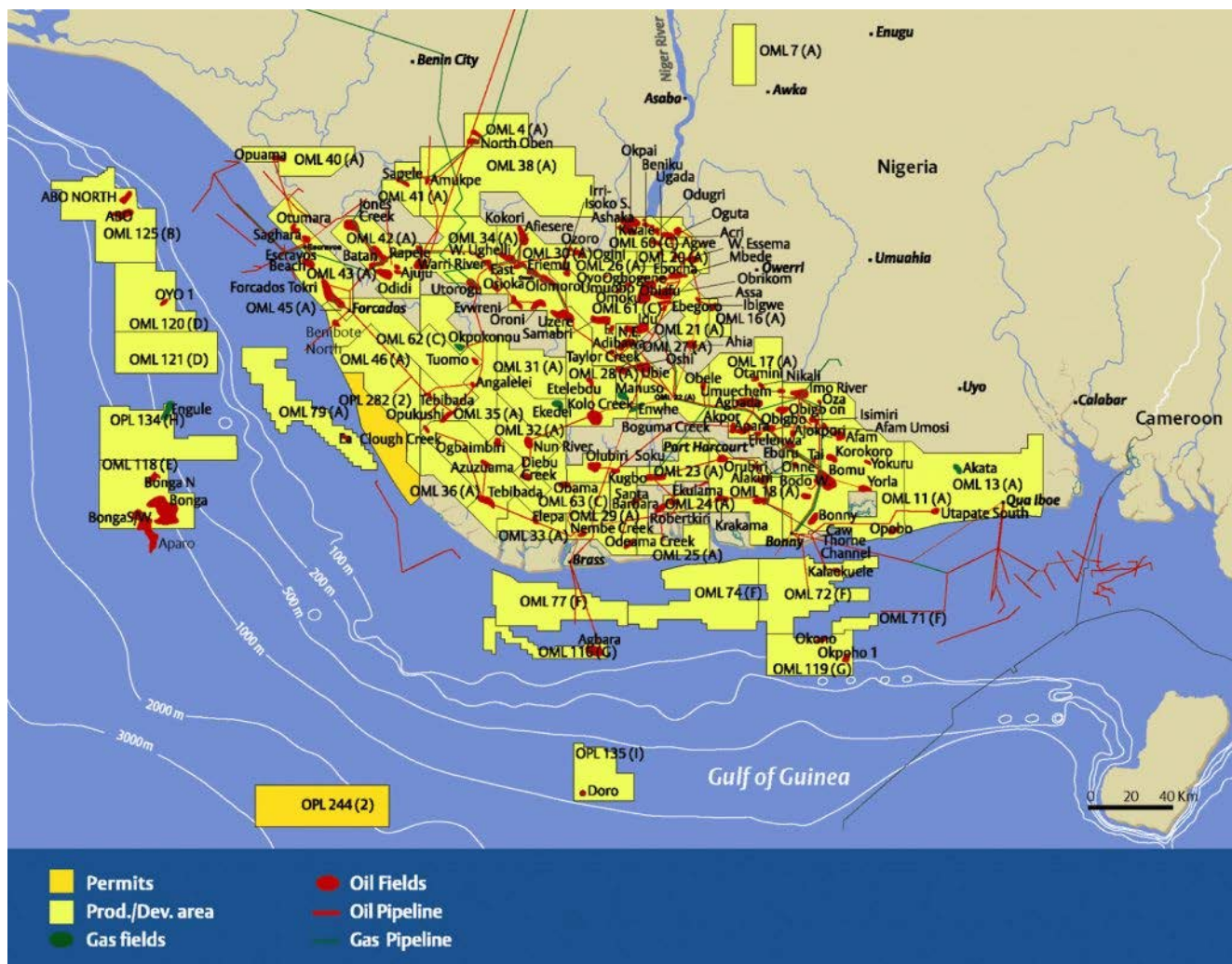
\$35. Investment in the oil and gas sector, the second largest recipient of FDI in Nigeria, saw \$720m in 2017, an increase of 23.2% compared to 2016. With roughly 445.000 bpd, Nigeria's refining capacity is low. Its average utilization rate of 20%, caused by poor maintenance, fire damage and transport bottlenecks, adds to it. Consequently, the government has prioritized refining capacity, envisioning Nigeria's conversion to a net exporter of refined petroleum products by 2020.

International oil companies (IOCs) hold the major fields in production, such as Shell's Bonga, Total's Akpo and Exxon's Erha and Usan, all located in the Niger delta region. State-owned oil companies are also present, such as Norway's Statoil and China National Offshore Oil Corporation. However, in most cases, onshore production comes from joint ventures between the Nigerian National Petroleum Company (NNPC), the national oil company, and private entities, whereas offshore production is governed by production sharing contracts (PSCs). As of 2015 about 34% of oil and gas was produced by joint ventures, 42% through PSCs and 23% through sole-risk arrangements.

The upstream trend is for the IOCs to move from onshore joint ventures to offshore PSCs, since the NNPC's National Petroleum Investment Management Services (NAPIMS), serving as joint venture partner to private companies, has been facing some challenges.

Nigeria has successfully boosted local content in the oilfield services sector. Although Nigerian firms have long been involved in downstream activities like fuel importing and sales, the sector witnessed the rise of domestic primary field operators particularly during the last 15 years has, which is somewhat unique for an African economy. A number of locally owned providers now operate in the country, providing ancillary support to IOCs and indigenous producers, such as Lagos Deep Offshore Logistics Base (LADOL), Nigerian Foundries, Oilserve and Elper.

The NNPC's arm for global sales is the Crude Oil Marketing Division, which operates a system in which commodity traders deliver the crude to foreign markets. That makes Nigeria the only major energy producer that sells to traders rather than



Source: Sweet Crude Reports (2018)

end-users. These contracts go to local companies as well as international players such as Trafigura and Vitol. The country's natural gas is primarily exported through Nigeria LNG which is a joint venture between NNPC, Shell, Total and ENI. It provides 7.2% of LNG in the world market.

Whereas most onshore pipelines are held by NNPC's Pipelines and Product Marketing Company, the gas pipelines are operated by NNPC's Nigerian Gas Company. Its network includes 1250 km of gas pipes with a capacity of more than 2.5m standard cu feet per day (scfd). The state can also concede operating rights. In the region, the West African Gas Pipeline is the sole one existing. It serves as a secondary route in the market, complementing Nigeria LNG. It runs 678 km west from Nigeria, providing gas to neighbouring countries such as Benin, Togo and Ghana. Capacity is 474 scfd, but due to technical and gas supply issues has rarely carried that amount. In addition, domestic gas sales are complicated by a long history of counterparty risks, since cashflow throughout the electricity value chain has been erratic and unreliable. Several legislative measures have been taken by government to mitigate that risk.

In the regulated market for gas most of the demand comes from power plants, and is directed through Nigerian Bulk Electricity Trading, a government entity. In order to de-risk the gas-to-power process, several public-sector guarantees have been proposed by international development agencies. One of the World Bank guarantees had been finalized in 2017. In the deregulated gas market, captive independent power producers (IPP's) have emerged as a growing client base. For private builders, the gas price is not regulated.

The sector has long needed legislative reform. After 17 years of consideration, the National Assembly passed the Petroleum Industry Governance Bill (PIGB) which intends to cover that requirement and has improved investor confidence subsequently. However, NNPC has traditionally dominated the up-, mid- and downstream sectors. Unfortunately, it is both serving as an operator and has some regulatory functions. An audit of NNPC found in 2015 that as much as \$16bn of oil revenues had been mishandled. Additional legislation therefore proposes to dismantle NNPC into several new agencies and parastatals to reduce inefficiency and improve regulatory oversight.

Disregarding the new legislation, there are other additions to the country's output underway. The US Department of Energy counts eight planned deepwater projects, to add 1.1m bpd of new production, while a number of indigenous-owned onshore blocks have the potential to contribute as well.

Opportunities for German companies

In Nigeria, the quality promise "Made in Germany" enjoys widely known recognition and appreciation. More than 85 German companies have been operating in the country, in many cases for several decades, employing more than 15,000 direct staff and generating more than \$1bn annually. Although Nigeria is considered a challenging market, experience has shown that long-term engagement pays off, leading to profit margins which are on average significantly higher than in other countries of the sub-Sahara region.

The economic recovery of the last two years and government's efforts to create a more investor-friendly business environment combined with the market potential and latest positive developments in the oil & gas sector, put Nigeria back into the spotlight of international investors and German companies in 2019 and 2020.

The whole Nigerian oil & gas supply chain offers ample opportunities for business engagement of German partners. The project pipeline in the fields of onshore and offshore projects, gas pipelines, refining capacity, on-grid and off-grid energy solutions, chemicals and petrochemicals as well as logistics and sector-specific services offer great opportunities for German technology and service providers. The significant presence of other German companies helps to build a strong partner network and develop promising business opportunities.

The Key to success is local presence. By establishing a Nigerian presence, German partners visibly demonstrate their long-term commitment to the market and create a competitive advantage for future developments.

Author: Dr. Marc Lucassen, Delegate | AHK Nigeria.

Norway

Present Situation

Following the rapid decline in the price of oil in 2014, the Norwegian offshore market entered a transition phase in order to remain competitive. In the wake of severe cost cutting measures in some instances along the entire value-added chain, the industry has started to grow again in 2018 and will continue to do so throughout 2019-2021. Investments on the Norwegian continental shelf (NCS) increased from € 12.8 billion in 2017 to around € 15.9 billion in 2018. In 2019, investments are estimated to increase by an additional 12.7 % to € 17.9 billion.

Large oil and gas reserves still in production promise a high level of activity on the NCS over the coming 50 years. A major part of the future of the NCS lies in the north of the country, in the Barents Sea, where the largest existing oil and gas resources are presumed to be. In recent years, the Norwegian Ministry of Oil and Energy has released other areas in the Barents Sea for exploration; interest in these areas by Norwegian and foreign operators is significant.

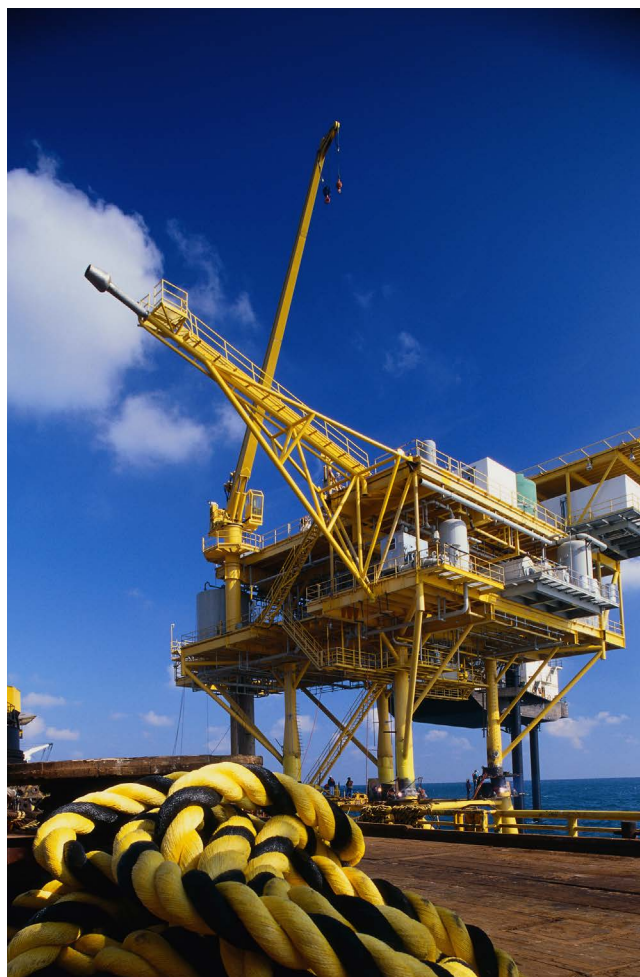
One of the world's largest oil fields, Johan Sverdrup, is currently being brought on stream in the North Sea. The decision to develop was a major factor in dampening the decline in investment in the wake of the oil price decline in 2014. Johan Sverdrup is the fifth largest discovery on the Norwegian continental shelf and is expected to account for about a quarter of all Norwegian oil production in ten years' time. Development projects of this kind are of immense importance to Norwegian value creation and have a high impact on employment, as well as the development of technology and of the supply industry.

At the end of the year 2017 and in early 2018, 85 fields were in production, of which 66 were in the North Sea, 17 in the Norwegian Sea and two in the Barents Sea. In 2017, 236.1 million Bm³ of oil equivalent (OE) were produced. This corresponds to an increase of 1.4% compared to the previous year (2016: 230.6 million Bm³ OE) and a reduction of 10.6% compared to the record year 2004 (264.2 Bm³ OE).

Currently, development of 75 discoveries is under discussion. Most of these are relatively small and are linked as «satellite fields» to existing fields, so that the infrastructure is used efficiently. Independent development projects are planned for the largest discoveries, while at the same time a new infrastructure is created by linking several small discoveries.

A series of new discoveries are currently in a development phase. Over the next ten years, production on the Norwegian shelf is expected to remain relatively stable and may increase slightly, as new fields commence production. Furthermore, the industry has introduced a number of efficiency measures, especially in regard to drilling wells and upgrading to increase the recovery rate of older fields.

Over the past years, cost reductions across the Norwegian continental shelf have led to a 30-50% reduction in the break-even price. For many projects, the current break-even price is at \$30-40 per barrel. This continues to make the NCS an attractive location for investment.



Source: Eyeidea

Economic Structure

The oil and gas industry is the largest industry in the country and also a strong driver of the economy as a whole. The oil and gas sector accounts for 17% of Norwegian GDP, as well as



Source: Fotolia

21% of total state revenue. To manage this revenue so that it benefits future generations in the long term, the government has set up a state pension fund. Oil and gas resources have also created a cluster of companies in Norway specializing in goods and services for that sector, including advanced technology, transportation, seismic surveys, engineering, testing and analysis, and safety and maintenance. Norway has thus developed its own proficient supplier industry for this sector.

In 2017, the number of workers employed by operator and supplier companies was at around 110,000. However, a total of just over 170,000 people (2017) work in companies that are directly or indirectly linked to the oil and gas industry. This is equivalent to 6.1% of all employees in Norway.

Export of Oil & Gas

Norway is the third largest net exporter of natural gas worldwide and the eleventh largest exporter of crude oil. Oil, gas and condensate account for approximately 50% of all Norwegian commodities export. In 2017, this amounted to € 45.1 billion. The export of crude oil alone had a product value of approximately € 21.5 billion and amounted to 70 million Bm³ OE, which is roughly equivalent to 25% of Norwegian commodities exports that year. Gas exports during this period amounted to 120 billion Bm³, the highest ever. It was valued at € 20.4 billion, with gas accounting for 24% of the country's total exports.

Since 2010, more gas than crude oil has been produced on the Norwegian shelf. Almost all Norwegian gas was sold on the European market. A well developed and effective infrastructure, as well as good transport distances, ensure Norwegian gas is competitive. The majority of exports go to Germany, the United Kingdom, Belgium and France, where Norwegian gas accounts for 20% to 40% of total consumption.

Businesses active in the industry

There are 43 exploration, production and infrastructure companies on the Norwegian continental shelf. In terms of production volume, Equinor is the largest company. With a share of 67%, the Norwegian state is the largest shareholder of Equinor. Other major companies on the Norwegian continental shelf are ExxonMobil, Total, Shell, ConocoPhillips and ENI. The German operator Wintershall DEA is also active on the Norwegian shelf.

The supply industry is Norway's second largest industry in terms of turnover, after oil and gas. The turnover of the Norwegian supplier industry in 2016 amounted to approximately € 38.6 billion. Of these, 35% were in international markets. The supplier segment currently consists of more than 1,100 companies along the entire value chain – from seismics, engineering and equipment for offshore platforms, such as nuts, valves and hoses for the shipyards, to advanced offshore supply and service vessels, as well as subsea technologies.

At the same time, suppliers have entered a period of consolidation, characterized by acquisitions and mergers, and increased collaboration to develop technologies that can meet the needs of operators. After the cost-cutting measures in recent years, the focus is once again on growth and investment, despite ongoing pressure on costs and efficiency in production.

Planned investment projects and potential

Large remaining oil resources promise a high level of activity on the continental shelf over the next 50 years. *Although here too, about 715,000 km² have not yet been released for exploration activities. The majority of that area is located in the Barents Sea and in the northeastern part of the European North Sea. The amount of undiscovered resources is estimated at 4 billion Bm³ OE in total.* It is also assumed that most future gas resources are located in the Barents Sea. Based on these positive estimates and forecasts for the northern areas, in 2016 the Norwegian government signaled a willingness to consider investigating completely new exploration areas in the Barents Sea for the first time in over 20 years. In 2017, a record number of exploration areas were released. In 2018, 75 new production licenses were granted in the 24th licensing round. This is an all-time high for one single licensing round. At present, nine new production fields are under development on the Norwegian continental shelf.

The most important project for the future is the development of one of the largest deposits on the NCS, the Johan Sverdrup

field of around 200 square kilometers. Participating licensees are Equinor, Lundin Norway, Petoro, AkerBP and Total. The field holds reserves of between 1.9 and 3.0 billion barrels of oil equivalent and has an estimated lifecycle of 50 years. The field will be developed in two phases. The first development phase with investments totaling approximately € 8.8 billion has already begun, and production can commence in November 2019. The development plan of Phase 2 was delivered in November 2018, with production to commence in 2022. The investment level for Phase 2 is estimated at € 4.2 billion.

Market entry potential for German companies

Companies in EU member states play a fundamental role in the Norwegian oil and gas industry. Products and services are either delivered directly by the manufacturing plant from the country of origin or by a Norwegian subsidiary. A range of manufacturers of component parts or equipment also work with commercial agencies or agencies that represent manufacturers for Norwegian system suppliers or other clients, and that are responsible for quality assurance and documentation. In some cases, the foreign producer operates their own organization with their own service organization in Norway.

Given the current challenges in the oil and gas industry, suppliers should be ready to adapt and break new ground in solving tasks to generate orders. Forms of cooperation between customers and suppliers are changing at present. In the past, small- and medium-sized suppliers have frequently concluded maintenance and modification contracts for EPC contractors. Since 2015, Equinor has been buying directly from product specialists on a larger scale. Suppliers should, therefore, join forces to deliver larger, integrated co-op packages and make themselves more attractive to operators. The combination of low oil prices and high costs has led to an increased focus on standardization measures in recent years. Tailor-made solutions are no longer optimal for operators; 'one size fits all' solutions that keep costs down and simplify processes, are in high demand instead.

In the coming years, more than 80 fields will be operating on the Norwegian continental shelf. To be able to operate in a manner that is efficient, both in terms of costs and resources, topics of particular strategic importance are energy-efficient, eco-friendly and sustainable technologies, exploration and increased production, cost-effective drilling and intervention, and future technologies in production, processing and transportation. The industry is clearly following the trend towards automation and digitization. The potential for new and cost-efficient labor and production methods by implementing

Industry 4.0 concepts is vast, and the industry has launched several ambitious digitization projects. Developmental advances in artificial intelligence technologies and robotics provide a range of opportunities for companies developing niche products for use on the ocean floor.

Challenges and trends

Exploration and production on the Norwegian shelf is becoming increasingly demanding due to the geographical location of the untapped resources. Furthermore, a need for saving on costs still exists in a market characterized by an abundance of fossil fuel at volatile prices and a focus on the reduction of greenhouse gas emissions to make the industry more climate friendly. This depends on the widespread introduction of new and innovative technologies. Industrialization and standardization processes in particular bring with them a high potential for improvement. The industry is underdeveloped in this respect compared to other industries. Further cost-cutting and efficiency-enhancing options are found in the use of new, innovative technologies, especially with the assistance of digitization and automation.

In addition, there is a growing interest in the exploitation of deep-sea resources that are estimated to exist also in Norwegian territory. A strategy formulated by the Norwegian government regarding this clarifies that there are still technological challenges to overcome in terms of exploration, extraction and production or processing before primary resource recovery on the seabed becomes profitable. There continues to be a need for further development of extraction and processing technologies, as well as for environmental impact analyses and safety preparations in order for any development of this sector to be done on a sustainable basis.

The industry continues to focus on increasing efficiency to keep the break-even price as low as possible. Standardization and industrialization through digitization are also high on the agenda. After several years of restructuring and cost reduction, operators and suppliers can only continue to reduce costs by using new technologies. Without the digitization of processes such as exploration, production, logistics and maintenance, the industry is unlikely to remain competitive. Various operators have therefore launched ambitious digitization projects.

Authors: Rita Hareid, Head of Market Entry & Business Development; Tor Kristian Haldorsen, Project Team Member | AHK Norway.



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In order to achieve these goals we focus on: The cluster represents world-class expertise within:

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- Stimulate technology development
- Create new entrepreneurs and grow businesses
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Russia

Economic Overview

Russia has overcome the economic turmoil that was caused by a combination of low oil and gas prices, as well as by the sanctions imposed by Western countries, and had a GDP growth of 1.8% in 2018. Forecasts by various domestic and foreign institutions suggest that for 2019 Russia's growth rate will level around 1.5%. Although this figure remains well below the global GDP forecast for 2019, the Russian economy is much healthier and diverse than ever before. This is mainly due to the Kremlin's successful efforts to reduce the dependency on the oil and gas sector. The inflation rate continues to drop considerably. For the first half of 2018 it fell to 2.3%, which is the lowest percentage since the collapse of the Soviet Union.

Since 2014, Russia repaid over 200B Euro of debt from state-owned enterprises. As a result, the debt ratio of companies and banks reduced to 30% of GDP. What is more, the Russian Federation continues to rebuild its foreign currency reserves. It is estimated that these reserves will amount to 470 billion USD by the end of 2018. Although public debt has been rising steadily over the last years, the figures for the Russian Federation are currently estimated at 13% in relation to GDP. This still makes the Russian Federation the country with the 6th lowest public debt and the 5th highest foreign exchange reserves. Because of these combined efforts, the Russian Economy is crisis-resistant in comparison to other emerging economies such as Brazil and Turkey. In conclusion, the financial sector of the Russian economy especially is, despite being in the 5th year of Western sanction, very healthy.

While these figures look promising, Russia still encounters many structural obstacles. Russia continues to struggle with the development of a robust and diverse supply industry, and is therefore, still dependent on exports of intermediate products. Moreover, the governmental influence and monopolies in the transport and energy industries are hindering competition and innovation in Russia's biggest industries. These obstacles are also supported by cases of corruption, nepotism and excessive bureaucracy that restrain potential economic growth.

Western Sanctions and new Opportunities

It is important to note that the western sanctions do not forbid cooperation.

The goals of these measures are to limit access to capital markets for certain Russian state-owned financial institutions, to place embargoes on the provision of arms and dual use

goods for military end use and end users, and to restrict access to certain sensitive technologies – particularly in the oil sector – to persons, entities, or bodies in Russia or for use in Russia. These restrictions are specified in the appendix No. 2 to the Council Regulation (EU) No. 833/2014 and are renewed every 6 months by a special decision of Europe's foreign ministers.

The financial restrictions aim at the biggest state-owned financial institutions such as Sberbank and VTB, majority state-owned oil & gas companies such as Rosneft, Gazprom and Transneft, and the arms & defense industry with companies such as OPK Oboronprom and the United Aircraft Corporation (OAK). These companies and institutions are imposed with restrictions or bans on buying and selling their shares and on expenditure related services. Moreover, financial services such as loans with a credit period over 30 days are restricted. However, all these restrictions are only applied to European financial institutions and banks under European financial supervision. Nevertheless, the sanctions on Russia's financial institutions have caused the danger of a credit crunch for Russian companies. As a result, the availability of loans has declined significantly, and the interest rates surged respectively.

The restrictions on dual-use goods are specified in the appendix to the Council Regulation (EC) No. 428/2009 and ban the import and provision of goods and technologies that are – or can be intended – for military use to any entity or body in Russia, or for use on Russian territory. These restrictions are often causing problems for manufacturing industries for civilian use and hindering possible growth.

In the oil & gas sector, the import of western technological equipment is not permitted when these goods are used for offshore oil exploration and production under 150 meters, for use in areas north of the polar circle or for oil production from clay or shale formations by means of slick water hydrofracking. However, the regulations do not forbid the exploration and production of oil from deposits underneath these formations. Certain services regarding financing projects, drilling, drill hole examination and complementary services, as well as the import of floating platforms are forbidden or restricted. These regulations do not affect contracts concluded prior to September 1, 2014 for goods, and prior to September 12, 2014 for services, respectively.

The western sanctions have caused an enormous shift in demand and enabled new opportunities for investments.

'Localization' has become a key solution for foreign companies in various industries, including the location of facilities for intermediate goods in key industries to overcome import barriers imposed by the sanctions. The focus of these endeavors lies on sectors such as the energy, automobile, oil & gas, chemical, agricultural and ship building industries. To encourage this trend, the Russian government started to reduce the import-ratio for public projects. It also provided incentives for domestic production by giving access to public tenders and to large state-owned shipyards in order to improve the knowledge- and technology transfer. Consequently, many foreign companies continue to move parts of their production to Russia, and are thus completing the value chain, helping Russia to further diversify its economy.

Oil and Gas Industry in Russia

The Oil and Gas Industry in Russia directly accounts for around 9% of GDP production (without accounting for various support and related industries) and is thus by far the biggest industry of the economy. According to Russtat, the oil production in Russia for 2017 remained on the same level as the previous year. In numbers, the industry produced 546.8 million tons of crude oil. Consequently, the output of Russia's refineries also remains equal to the previous year and produced 284.87 million tons. On the other hand, the gas production rose by 7.9% in 2017 due to an increase in domestic demand and sales to Europe and reached 690.5 billion cubic meters. The available figures for 2018 show an increase of up to 6% for Russian gas, which is mainly driven by increasing demand from China.

Since the revenue of this sector accounts for 40% of total public revenue, Russia's economy is still heavily dependent on this industry, and consequently, also on the oil price and foreign exchange rates. Therefore, it is not surprising that the Russian government plays a significant role in the oil and gas sector. Numerous companies are state controlled or heavily influenced by the government. Even the two biggest companies in the industry, Gazprom and Rosneft, are heavily intertwined and influenced by the government. This also holds true for other important companies in the industry, such as Lukoil, Surgutneftgas, Tatneft, Slawneft and Russneft.

In the oil and gas industry two long-term trends can be demarcated. The production volume of energy resources is going down in Norway, the United Kingdom and the Netherlands. These countries accounted for around one third of Europe's total energy production in the last decades. On the other hand, Asian countries such as China and India are stepping up their gas output and are expected to enhance the

output of liquefied natural gas (LNG) soon. In order to counter the influence of Asian countries on the oil and gas market, and to secure Russians' future position, the Russian Federation initiated large-scale infrastructural projects such as Turk Stream and Nord Stream 2. The benefits of these enormous pipeline projects are evident – in comparison to LNG, gas from pipelines is much more cost-efficient and can therefore be offered at competitive prices. LNG Gas, on the other hand, is the fastest way to trade gas, and is sold & exported to the highest bidder- which is currently Asia.

Current Pipeline Projects

Turk Stream

In May 2017, Gazprom started the construction of a gas pipeline under the Black Sea, laying pipes from the Russian shore of the Black Sea to Turkey. TurkStream will start on the Russian coast near the town of Anapa and run over 900 km through the Black Sea to the Thrace region of Turkey, creating a reliable source of energy. Additionally, a feeder line to Greece is planned. This line will bring gas to South and South-East Europe and will consist of two lines with an annual capacity of 15.75 billion cubic meters each. Although the Russian Federation is already Turkey's largest gas provider, the pipeline reduces the dependence on transit countries such as Ukraine, Bulgaria and Moldova, thus cutting costs and improving reliability. Moreover, this project further manifests Russia's dominance in the European gas market. However, Turkey is also benefiting, as the pipeline allows the country to further develop into a regional oil and gas hub for the Caucasus region, Central Asia, the Middle East as well as the Eastern Mediterranean area. As a result, the pipeline will not only provide a reliable oil and gas grid for the region, but it will also improve Turkey's geo-strategic importance. According to Gazprom, the undersea part of the pipeline is nearly finished.

Nord Stream 2

The North Stream 2 project is planned to complement already existing pipelines from Russia to Europe. The background to this project is that existing pipelines already run at full capacity and cannot fully satisfy market demand. In fact, in 2018 the North Stream pipeline has been running 7% above designed capacity. The resulting import gap is estimated to amount to 120 billion cubic meters in the next 20 years and will be closed through the additional pipelines of the North Stream 2 project. What is more, the modern and highly efficient pipeline will also contribute to furthering energy reliability in Europe by establishing a direct connection to vast, already tapped gas reserves in Russia's north. In terms of energy reliability, the North Stream 2 project can also be an improvement, as it reduces transit-related risk and costs. The privately funded

project is estimated to give an economic boost to various European industries, as over 200 companies from over 17 countries are involved in the realization of the project. The biggest beneficiaries are steel construction, mechanical engineering, construction, pipe installing, logistic, as well as environmental survey and monitoring related industries.

The investment volume of the project is estimated to be around 8 billion Euro. With 4 billion Euro already bound, even persisting political tensions between the Russian Federation and the European Union are unlikely to have an impact on the feasibility and completion of the project. The sanctions imposed by the US could become a considerable obstacle to the completion of the project. In that case Gazprom will attract own funds to complete the project.

The work on the inbound infrastructure in Germany is also in progress. After Brandenburg and Saxony, also Mecklenburg-Western Pomerania approved the construction of the Eugal-Pipeline. The 480 km long pipeline will connect to Nord Stream 2 and transport Russian gas into the European gas transmission system.

Power of Siberia

The Power of Siberia Pipeline is planned to be over 4,000 kilometers long and will connect the gas fields Kovyktinskoye and Tschajadinskoye in the eastern part of Siberia with Blagoveshensk in the Amur region. The investments for this project amounts to over 55 billion USD and are divided between Gazprom and the China National Petroleum Corporation (CNPC), who agreed to collaborate on this project for the next 30 years. According to Gazprom the pipeline is already 95.5% completed and will be in operation soon.

The Amur region forms a gas hub, from which the unprocessed gas is directly transferred to Khabarovsk near the Amur River at the border of China, or to China's Changling region. Additionally, Gazprom is building a gas processing plant for purification and the extraction of helium in Blagoveshensk. A large-scale gas chemicals facility is planned for the near future to further process the gas to polyethylene.

Other Projects and Investments

The investments in the Oil and Gas industry in Russia are currently focused on quality improvement and the development of further processing stages in order to extend the value chain – both – up and downstream. Therefore, the focus is on liquefying gas to LNG and to improve the fuel quality to Euro-5 and Euro-6 norm. In order to achieve this the modernization of worn-out refineries is a key component, since 20% of Russia's machineries can be considered as nearly worn-out. Russia's

plants are already around 14 years in use. Investments in new plants and modernization are necessary.

Chances for German Supplier

German companies enjoy an excellent reputation in the Russian market and the label 'Made in Germany' stands for reliability and quality. Regardless of the current political tensions, the history of cooperation and doing business between the Russian Federation and Germany is a story of success. In fact, the German-Russian economic relations continue to ease up. In the first half of 2018 the exchange of goods between the two countries had risen by 24% compared to the previous year and currently amount to 39 billion USD.

Apart from large foreign companies such as Winterstall, Linde, Bayer, and BASF, many German small and medium sized enterprises (SMEs) are actively shaping the local value-chain. For example, Bentec, KCA Deutag, Maximator, Bauer Kompressoren, Endress + Hauser, Fienemann Torpede, and so on, are main contributors to the success of the energy industry.

For SME newcomers, there are several market entry strategies that can be used to enter the Russian market, since there is no one-size-fits-all solution. First, exporting through a Russian distribution network is a good opportunity to gather first experiences on the market and build relationships with local partners for further cooperation. Due to the excellent reputation of German companies in Russia, franchising, licensing also brings good opportunities for entering the market.

Partnerships, Joint Ventures and Greenfield investments, such as wholly-owned subsidiaries and local production plants, allow to make use of favorable local production and legal conditions. In this context, it is important to note, that the new policy of the Russian Trade and Industry Ministry is giving incentives for joint ventures and greenfield investments through individually negotiated special investment contracts with foreign companies. This does not only consider local-value-added, but also metrics such as technology transfer.

As all market entry strategies bear a certain degree of risk, finding the right local partners, experts and staff is key to minimizing risk and increasing the chance of success. In this regard, the Russian-German Chamber of Commerce, with its experience and excellent network, can actively assist you in the search of local partners, experts and staff, maximizing the success of your endeavor.

Authors: Anton Wochmanin, Project Manager; Vladimir Nikitenko, Head of North-West Branch Office | AHK Russia.

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Saudi Arabia

Doing Business with the Leader of the Pack: Opportunities for German Companies in Saudi Arabia

Overview

Despite the recent rollercoaster ride of global oil prices, Saudi Arabia has remained in the pole position among the OPEC members. Equipped with comfortable foreign exchange reserves of 493.8 billion USD in mid-2018, the Kingdom of Saudi Arabia has been able to weather the ups and downs of its main source of income. Despite an ambitious diversification agenda, the Oil & Gas sector is and will continue to be the main economic pillar of the Kingdom. According to OPEC, Saudi Arabia's proven crude oil reserves amounted to some 266 billion barrels in late 2017, which places the country only after Venezuela. It currently is the second largest producer of crude oil (more than 10.4 mi. bpd out of 12.5 mi. capacity, MEED) and possesses the fifth biggest gas reserves (300 tr. cubic feet, MEED). About 70-90 % of its oil production is exported, with the rest being consumed domestically. This local consumption is subject to high seasonal fluctuations, with a peak in summer as the population turns to air conditioning to escape the searing heat.

At the same time, the oil and gas sector accounts for approximately 70 % of export earnings. Although the Saudi Vision 2030 reforms, launched in April 2016, aim at diversifying the economy, oil and its related downstream industry will continue to play a dominant role in the Kingdom's economy for the foreseeable future. Hence, the economic outlook of Saudi Arabia is still solid and stable, according to the assessment of most internationally acclaimed rating agencies.

Current Projects

The investment volumes along the Oil & Gas value chain in Saudi Arabia are massive. During the World Petroleum Congress 2017, Amin Nasser, the CEO of government-owned oil giant Aramco, announced that the Kingdom will invest 300 billion USD over the next decade in the Oil & Gas sector. At a more recent conference in Dubai, Amin reported that more than 100 billion USD are to be invested in new refining and chemicals projects over the next decade. This investment is viewed as an attempt to balance its business between upstream and downstream operations. "Our ultimate target is to reach 8-10 million barrels a day of refining capacity and create a better

balance between our upstream and downstream segments", Nasser said during the November 2018 conference. Between 2030 and 2050, chemicals could even reach 50 % of the crude oil demand, outstripping the demand from the transport sector.

Saudi Aramco and Saudi Basic Industries Corp. (SABIC) also announced the bidding process for the 'crude oil to chemicals' project - also known as COTC - which has an overall value of 20 billion USD. The project is located in Yanbu and will be a fully integrated facility to process crude oil into chemicals. The plant is expected to be commissioned by 2024. While the investment in the petrochemical processing sector will continue over the coming decades, the focus is expected to shift. For instance, renewable energies like solar and wind will play a much bigger role, in accordance with the international commitments of the Kingdom. Herein Saudi Aramco will invest and play an active role.

Regarding the gas industry, Aramco is planning to increase its diversification efforts. In 2016 Aramco awarded contracts for the Fadhili gas project (with a capacity of 2.5 billion cf/d). This project's overall value alone is 13 billion USD. The project will be finished by 2019 and will process gas from onshore and offshore fields. New gas processing facilities are currently being built to replace the use of crude oil for power generation. This is complemented by Aramco's Hawiya gas plant which is expected to be completed by 2021. The plant would add another 1 billion cf/d of gas.

Saudi Aramco is also further expanding its international operations. The plan is to build a 60 million ton refinery complex with the Indian Oil Corporation in Maharashtra Province on India's west coast. By 2040 the demand for oil in India will almost double to 10 million b/d, while the demand for gas will triple over the same period. Saudi Aramco also opened an office in India to market its products and engineering services. In June 2018, Abu Dhabi National Oil Company (Adnoc) took over 50 % of Aramco's shares in the mentioned Ratnagiri refinery and petrochemicals complex.

CEO Amin Nasser also confirmed that Aramco is continuing talks with Russia's Novatek to take a major stake in the new Arctic LNG (liquefied natural gas) 2 project. As well as investing in Russia's LNG project, the talks with Novatek cover

a petrochemicals joint venture with Aramco at Jubail, in Saudi Arabia's oil-rich Eastern Province.

Privatization of State Oil Companies

The privatization of Saudi Aramco - at least in part - has gained much attention in financial markets worldwide. Saudi Aramco is the biggest oil company in the world and manages Saudi Arabia's oil and gas reserves. It has an estimated value of 1–2 trillion USD; however, a thorough due diligence is still to be conducted. Riyadh was planning an initial public offering (IPO) of 5%. Recent Government statements in November 2018 indicate that this IPO will not take place before 2021. Currently, a merger of Aramco with the downstream giant SABIC (Saudi Arabian Basic Industries Corporation), the fourth largest chemical company in the world, seems being more opportune and realistic. 30% of SABIC is listed on the Saudi stock exchange Tadawul, while the remaining 70% of the shares are owned by the Saudi Arabian Government, according to SABIC figures.

The privatization of (shares of) government-owned petrochemical assets underlines Saudi Arabia's commitment to reform its economic model. With the above-mentioned plans, the Kingdom aims at raising money that will be reinvested by the state-owned Public Investment Fund, PiF. Yet the key assets will remain under Government control, even after the completion of the mentioned IPO.

German Business Opportunities

The launch of the ambitious reform agenda Vision 2030 in mid-2016 kicked off an unprecedented reform drive in the Kingdom of Saudi Arabia. Once implemented, the Vision will shape a country that is different from the 'old style' Saudi Arabia in terms of economic, social and cultural development. German industry is perfectly positioned to contribute to the far-reaching changes, especially when it comes to diversifying Saudi Arabia's industry and adding value to locally sourced raw materials like oil & gas. The brand "Made in Germany" enjoys an outstanding reputation in Saudi Arabia. Large companies like thyssenkrupp, BASF, LINDE, Evonik and many more are already successfully operating in the Kingdom, in addition to numerous medium-sized and often family-owned firms like S.A. Talke, V-LINE, Schmidt Logistics, just to name a few.

As a prime example, BASF, the world's leading chemical company, has been operating in the Kingdom since 1984 in the oil-rich Eastern Province, more precisely in Al Khobar. BASF offers a vast range of oil field solutions (drilling, cementing, stimulation, production and enhanced oil recovery), as well

as solutions for gas treatment (natural gas, synthetic gas and biogas). "The continuously rising demand for energy and resources requires us to develop energy solutions that are more sustainable and address the need for energy efficiency and conservation," underlines the Managing Director of BASF Saudi Arabia LLC, Basim Tawfeeq. With its expertise and knowledge in chemistry for oilfields, refineries, mining, water, wind and solar energy, BASF is committed to serving its Saudi customers. It aims at playing an active part in achieving Saudi Vision 2030. Just across the bridge connecting Saudi Arabia with the smaller Kingdom of Bahrain, BASF operates another manufacturing plant: BASF Plastic Additives Middle East (PAME), a state-of-the-art production facility for customer-specific antioxidant blends (CSB).

Besides the German global giants, German small- and medium-sized enterprises (SMEs), which are highly specialized in their respective markets, encounter tremendous opportunities in the Kingdom. This is also true for service providers, such as logistics firms. In view of the progressing 'Saudiization' of the labor market, German excellence in education and training is highly requested. The German-Saudi joint venture S.A. Talke for example was honored for its talent development strategy by the Human Resource Development Fund (HRDF). S.A. Talke renders high quality logistics services to the chemical and petrochemical industry in Saudi Arabia. It developed a 'cooperative training program' (COOP), which includes special trainings for core workers, leadership training and safety training, among others - all meeting clients' demand for qualified local employees.

The Saudi Arabian Oil & Gas industry is a significant purchaser of international products and services. SABIC alone accounts for an annual volume of over 4.5 billion USD. Many German manufacturers of machinery products – pipes, valves, fittings, measurement technology, etc. – are serving local clients, often from their regional hub in Dubai or Abu Dhabi. A growing number of German suppliers to the local Oil & Gas industry is currently reconsidering its strategic business outreach. Encouraged by the recent push towards localization, see below, small- and medium-sized suppliers of (spare) parts especially are increasingly requested by the large industrial buyers to join hands with local technology partners, if not to manufacture partially in the Kingdom of Saudi Arabia.

Legal framework

Activities in the region require a long-term and dedicated commitment. A local representation is almost always beneficial and even a necessity in most cases. With the IKTV Program ('In Kingdom Total Value Add') Aramco for instance has set a

threshold for international suppliers to 'localize' supplies up to a certain degree within a defined number of years. 'Localized' suppliers gain a competitive advantage compared to those serving the market from abroad. Aramco itself announced it will spend around 400 billion USD over the next 10 years to achieve the localization goals of its IKTVA program. SABIC launched a similar program called NUSANED to identify specific segments of the product value chains that are particularly attractive for local production.

In fact, Saudi rules and regulations are generally supportive to international investors. Besides being able to find a local partner for the distribution of their products, German companies can form a joint venture with a local company to invest in the Kingdom. This often adds a competitive edge compared to a wholly foreign owned entity, which in most cases is also possible. Typically, local companies serve as financial and administrative partners, while the international companies operate mainly as technology suppliers. It is also possible to act locally as a consortium, offering a full-service solution.

From a Saudi Arabian perspective, a European, and especially German, capital investment in the Kingdom is in principle desirable particularly in manufacturing and high-tech services. The Saudi Arabian General Investment Authority (SAGIA) acts as a service provider and 'problem solver' - truly a one-stop shop.

Authors: Oliver Oehms, Delegate; Quentin Blommaert, DEInternational Consultant | AHK Saudi-Arabien.



An Aerial View of Industries in Jubail Industrial City | Source: GESALO



King Fahd Industrial City | Source: GESALO

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United Arab Emirates

Overview of the UAE Oil and Gas Market

The energy sector plays an important role in the diversification plans of the UAE. The aim is to capture more domestic value from hydrocarbons by expanding the petrochemical sector, using the potential of renewable energy and investing into the upstream, as well as developing a role in deploying new energy technologies.

At the end of 2017, The Abu Dhabi National Oil Company (ADNOC) announced a \$109bn expenditure plan to expand its upstream and downstream capacity within the next five years, and it was approved by the Supreme Petroleum Council (SPC). The plan sees a split of 60% (\$65.4 billion) going into upstream projects, including the exploitation of unconventional gas resources; whereas 40% (\$43.6 billion) is dedicated to expanding ADNOC's downstream refining and petrochemical capacity.

With 97,800 million barrels of proven reserves, the United Arab Emirates has the sixth largest oil reserves in the world. The UAE's production of 2,966.5 million bpd amounts to 8.1% of the total OPEC production and should increase to 3.5 million bpd in 2020. Currently, the oil sector holds 30% of the country's GDP, aiming for a further diversification to become more independent from its oil and gas reserves. The UAE consists of seven Emirates which are independently regulating their oil reserves within their borders. The Emirate of Abu Dhabi holds 95% of the UAE's oil reserves with a volume of about 2850 billion m³, both offshore and onshore. In Abu Dhabi, the oil and gas market is regulated by the Supreme Petroleum Council (SPC), chaired by His Highness Sheikh Khalifa Bin Zayed Al-Nahyan, President of the UAE and ruler of Abu Dhabi. The SPC sets all petroleum-related objectives and policies, as well as oversees the industry.

The main player in the UAE's oil and gas sector is the Abu Dhabi National Oil Company (ADNOC), one of the largest oil companies in the world. It is a government owned corporation that was founded in 1971 and currently employs over 65,000 people. Its headquarters are located in Abu Dhabi.

Recently, ADNOC made significant changes to improve the company's efficiency and dynamic, starting with unifying ADNOC's subsidiary brands in October 2017 to make ADNOC Group more productive. The company continued by introducing a procurement program with centralized registration and pre-qualification. By digitalizing their distribution application

process, ADNOC is adapting to the digital age. Every request to ADNOC is now going through their e-Registration platform. Companies can find detailed information, as well as instructions on their website.

An important milestone to contribute to the UAE's economic vision and to stimulate local economic growth was taken by ADNOC in January 2018 by introducing the In-Country Value (ICV) program in order to increase the localization. ICV is an important milestone. It represents a change in the oil and gas industry as ADNOC's entire distribution chain is asked to make a local contribution. Companies applying to an ADNOC related tender are now requested to provide their ICV score. Higher scores increase the success of winning a tender.

With the UAE having the seventh largest gas reserves in the world, the gas market is also playing an important role, with the UAE intending to become more self-sufficient. The proven reserves of natural gas amounted 6,091 billion cubic meters in 2017, with a production of 54,085.7 million cubic meters. In order to meet the high demand of gas in the UAE, the Dolphin pipeline supplies up to 2 billion cubic feet of gas from Qatar to the UAE and Oman per day. To become independent of this import, the UAE intends to increase their own gas production.

One of the projects in gas development was completed (Phase 1) in August 2018. A fourth gas dehydration unit and dry gas compression aftercoolers, as well as 231km of pipelines, have already been built on Das Island, which boosted ADNOC's offshore gas processing capacity by 400 million ft³/day to 1.4 billion ft³/day. ADNOC awarded an \$860m Engineering, Procurement and Construction (EPC) deal for Phase 2 of the Integrated Gas Development Expansion (IGD-E) project, including the construction and commission of new gas facilities on Das Island.

The installed pipelines deliver the recovered gas from Das Island to the Taweelah Gas Compression Plant. The ADNOC gas plant was inaugurated in November 2018 and ensures uninterrupted gas supply to Abu Dhabi's industries, as well as the Northern Emirates. Main contractor for the plant was Siemens, who received the order in 2016. The plant is composed of three compression trains, with a processing capacity of 225 mmscfd each.

Another major project in the gas industry is the Ghasha Concession, one of the most important centers for oil and

gas production in the world. At the end of 2018, the German based Wintershall signed a concession agreement to develop the deposits of natural resources. With a ten percent stake, Wintershall will be working alongside ADNOC and the Italian company ENI to extract gas from the concession area. The project aims towards the UAE's self-sufficiency in the gas industry. It is expected to produce 40 million cubic meters of natural gas per day, as well as 120,000 barrels of oil and high value condensate per day. The reservoirs also hold a large quantity of condensate.

A milestone in the development of the UAE petrochemical industry started in 2002 with the foundation of the ADNOC daughter Borouge, a joint venture between ADNOC and the Austrian based provider for Polyolefins, base chemicals and fertilizers, Borealis. A pillar outside of the general oil and gas market has been created with the joint venture. Today, Borouge and Borealis have a combined annual production capacity of approximately 8 million tonnes of polyethylene and polypropylene. In September 2018, Borouge signed an EPC (Engineering, Procurement and Construction) contract for its fifth polypropylene plant in Ruwais with a capacity of 480,000 t/y. The plant is scheduled to be on stream in the third quarter of 2021. It will enhance the company's polypropylene capacity by 25% to 2.24 million t/y.

Currently, Al Ruwais is the 4th largest refinery in the world and the construction of Borouge 4 and PP5 should make it the largest integrated polyolefin complex in the world. It will increase ADNOC's polyolefin capacity from 4.5 million tons per year to more than 10 million tons.

In November 2018, ADNOC's CEO stated that the oil and gas industry will play a significant role in the economic growth for the 4th Industrial Age. Artificial Intelligence, Big Data and Blockchain are all shaping Oil and Gas 4.0, enhancing efficiency and productivity and maximizing the overall performance. Therefore, ADNOC is working on integrating these new technologies throughout their entire value chain, marking a new era and a "new age of opportunity" at ADNOC, starting with the recent announcement that the company will increase its oil capacity to 4 million b/d by 2020 and 5 million b/d by 2030. Furthermore they are looking for innovative technologies. One example is Carbon Capture. In 2016, ADNOC and Masdar initiated the worldwide first commercial Carbon Capture project with a storage capacity of 800.00t CO₂/year at a steel production facility in Al Reyadah. The captured CO₂ is then transported to ADNOC's largest onshore field where it is stored and also enhances the field's capacity. Carbon Capture Storage (CCS) technology will play a more important role in the UAE in the upcoming years.

Besides the mentioned German companies above, there are numerous German companies with excellent reputations present in the UAE market. A prominent example is Linde, who formed a joint venture with ADNOC in 2007 called ADNOC Industrial Gas, formerly known as Elixier. Others examples include Bilfinger, Bauer Kompressoren, Maximator, Seepex GmbH etc.

For a successful market entry, regular visits to the region and a supportive strong local partner or presence in the market are the prerequisites.

The German Emirati Joint Council for Industry and Commerce is offering services to support German companies in entering the market and as well as find local partner.

Author: *Dr. Dalia Samra-Rohte, Deputy CEO, Managing Director Abu Dhabi Office | AHK United Arab Emirates.*

United States

Economic overview

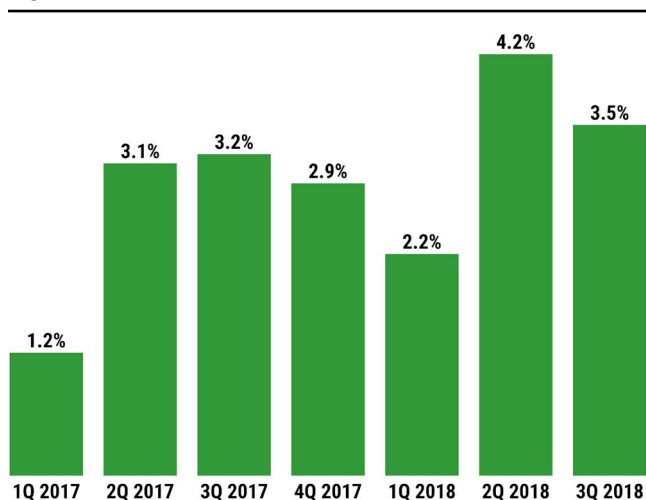
According to key economic indicators, the U.S. economic outlook is healthy. The GDP growth rate is expected to remain between 2 and 3 %. Unemployment is projected to continue at the natural rate. Inflation and deflation are also at healthy levels.

Despite facing challenges both domestically and on a global level, the U.S. economy is still the largest and arguably most important in the world. It represents about 24,3% of total global output and features a highly developed and technologically advanced services sector, which accounts for about 78% of its output. The industrial sector comes in second with about 20% followed by agriculture with about 1% of GDP. Services-oriented companies in areas such as technology, financial services, healthcare and retail dominate the U.S. economy. Large U.S. corporations also play a major role on the global stage, with more than a fifth of companies on the Fortune Global 500.

After the slowdown in growth of the American economy in 2016, mainly due to lower exports and investments, improvement was recorded in 2017 and also in 2018. In particular, the increase in consumer spending as well as the supporting environment of the financial markets and the trend reversals in the real estate market helped improve the budgetary balance and strengthen the overall economy.

In fact, the GDP increased 4.2% in the second quarter and 3.5% in the third quarter of 2018, the Bureau of Economic

Fig. 1



Source: US Department of Commerce

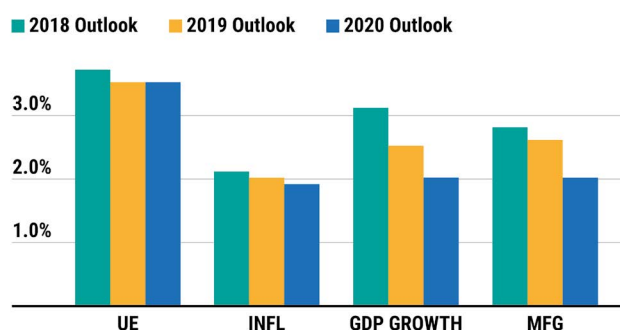
Analysis reported (Fig. 1). This was the highest increase since the third quarter of 2014. Major growth accelerators were elevated spending in both public and private sectors, as well as business investments. Information, real estate, rental and leasing, and professional, scientific and technical services contributed significantly to the increase in US economic growth in the second quarter of 2018.

After this acceleration in 2018, economists predict slower GDP growth for 2019. According to most recent forecasts, growth will decline to 2.5% in 2019 and 2.0% in 2020 as a result of Trump's trade war with China. An escalation could result in tariffs on all goods traded between the world's largest economies.

U.S. manufacturing is projected to increase faster than the general economy. Nevertheless, growth in production is projected to slow down to 2.6% in 2019 and 2% in 2020.

According to the latest projections, the unemployment rate will drop to 3.5% in 2019 and 2020. This is a notable improvement from the rates of 4.7% in 2016, 4.3% in 2017, and 4.1% in 2018.

Fig. 2



Source: The Federal Reserve

Oil & Gas industry

Oil production in the U.S. reached record levels in 2018. Despite the temporary slowdown caused by some natural disasters, the outlook remains very positive in upcoming years.

A similar situation can be observed for the country's gas production. Here, the boom is mainly due to the increased focus on shale gas.

In terms of technology, the country has been a pioneer and innovator in oil drilling and refining, which has encouraged the

development and settlement of energy-related industries for decades. Numerous companies are engaged in the domestic oil and gas processing industries, enabling them to meet the petroleum industry's needs and maintain advantages against international competitors. Due to technical innovations over the past decade, U.S. production has increased the extraction of shale oil and gas, thereby decreasing the country's dependence on imports. In July 2018 the U.S. government reported record exports of 2.1 million barrels of crude oil per day.

The new administration has reconfirmed its commitment to offshore development and expansion and is on a mission to unlock a new wave of heavy investment for oil and gas production in the United States.

Compared with the sometimes tumultuous price instability during 2015 and 2016, the U.S. oil and gas industry appears to have settled into a more stable pattern in 2017 and 2018, as shown by the average monthly retail prices below.

Crude oil production is at an all-time high. In August 2018, U.S. crude oil production reached 11.3 million barrels per day, a slight increase from 10.9 million barrels per day in July. Economists forecast that U.S. crude oil production will continue to grow and even exceed Russian and Saudi Arabian crude oil production. In 2019, US crude oil production will average 12.1 million barrels per day according to recent statistics published by the EIA. This upward trend was made possible by astronomical production levels in several states. Texas topped the list with the highest record level at 4.6 million barrel per day, followed by North Dakota at 1.3 million barrel per day. New Mexico, Oklahoma, Colorado and West Virginia also hit record highs. The Gulf of Mexico states also hit a record high of 1.9 million barrels per day.

A similar trend can be observed in the U.S. dry natural gas production. Despite relatively low storage levels, strong growth is expected for natural gas production. By 2019 the natural gas production will rise to an average of 89.6 billion cubic feet per day.

Gulf coast significance

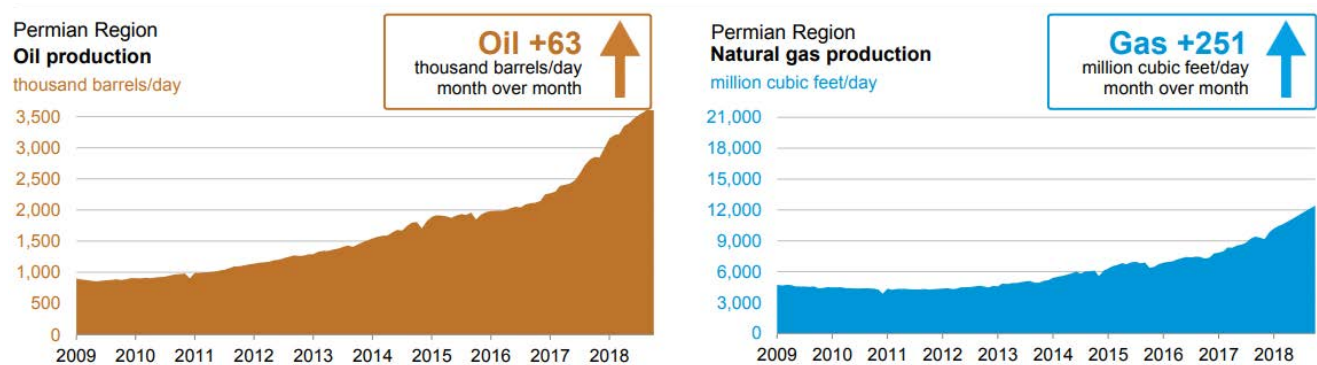
The area along the Gulf of Mexico, both onshore and offshore, is one of the most important regions for energy resources and infrastructure. The Gulf of Mexico offshore oil production accounts for 17% of total U.S. crude oil production, and federal offshore natural gas production in the Gulf accounts for 5% of total U.S. dry production. Over 45% of total U.S. petroleum refining capacity is located along the Gulf coast, as well as 51% of total U.S. natural gas processing plant capacity.

The U.S. government pursues the expansion of the offshore sector as a high priority. The focus of new field exploitation focuses especially on the Gulf Coast where the country's oil and gas industry finds its main cluster. In March 2018, the Bureau of Ocean Energy Management (BOEM) held a lease sale for more than 14,000 Federal Gulf of Mexico blocks, which includes areas off the coasts of Mississippi, Alabama, and Florida. In fact, most of the blocks did not receive any bids. Although the results of this auction will not affect GOM production within the Short-Term Energy Outlook forecast horizon (through 019), the level of interest for leases may have longer-term implications for GOM crude oil production.

In addition to the huge offshore potential, the shale industry has seen tremendous growth in 2017 and 2018 as well - with two of the most important regions located in Texas, along the Gulf coast, namely the Permian Basin and Eagle Ford.

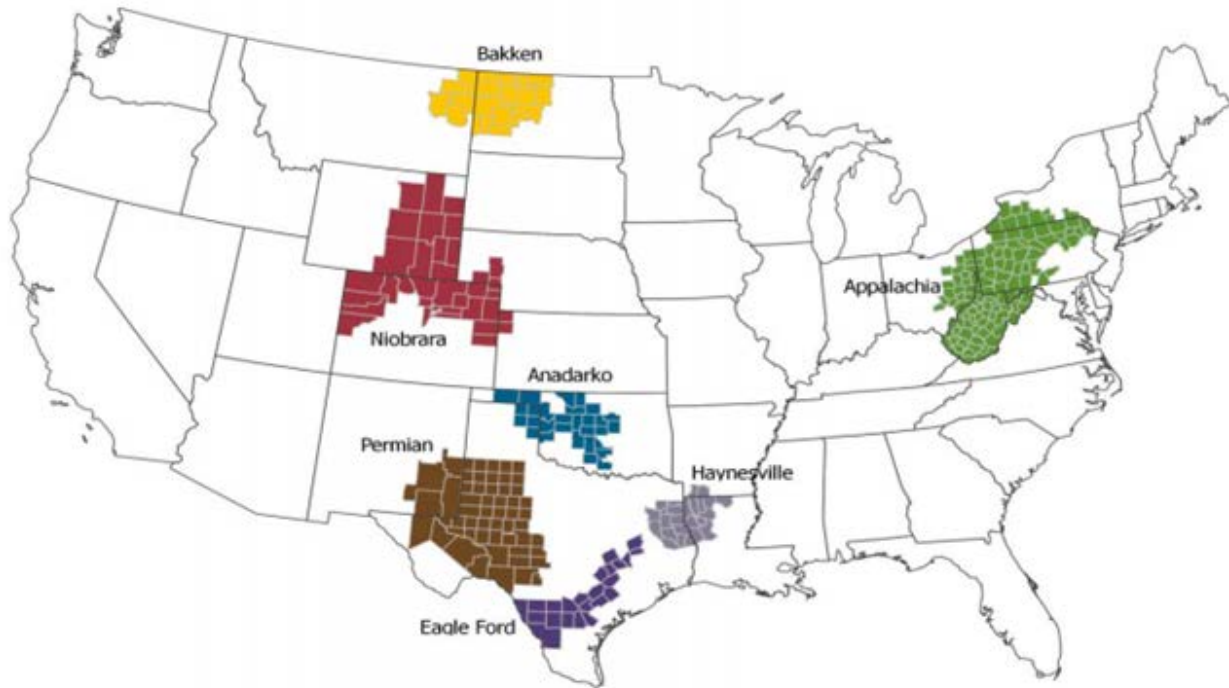
The Permian Basin is one of the top oil fields in the country and will be soon the second largest oil field in the world behind Saudi Arabia's Ghawar field. The Permian region is located in western Texas and eastern New Mexico, and accounts for about 63% of total Texas crude oil production and 95% of total New Mexico crude oil production. From January 2018 to August 2018, Texas crude oil production increased by 683,000 b/d (15%) and New Mexico production increased by 182,000 b/d (25%).

Fig. 3



Source: U.S. Energy Information Administration | Drilling Productivity Report

Fig. 4



Source: U.S. Energy Information Administration | Drilling Productivity Report

According to the U.S. Energy Information Administration (EIA), the seven formations detailed on the above map fueled a 60% increase in the Permian's output since 2007. That increase pushed it past the Gulf of Mexico as America's leading oil production basin in 2013. Currently, the Permian accounts for about a quarter of the country's oil production.

The illustration (Fig. 5) by the EIA shows the accumulation of crude oil pipelines as well as natural gas inter/intrastate pipelines. The state of Texas contains the most extensive network of intrastate gas pipelines. While other states have seen a boom in recent years, Texas is still the epicenter of the U.S. oil industry.

Fig. 5



Source: U.S. Energy Information Administration: U.S. Energy Mapping System

Crude oil production, March 2018 (in barrels)

1. Texas 129.2 million
2. North Dakota 35.7 million
3. New Mexico 19.4 million
4. Oklahoma 16.8 million
4. Alaska 15.9 million

A large part of it has to do with hydraulic fracturing, or fracking, and horizontal drilling techniques that operators in states such as North Dakota, Texas and New Mexico have increasingly employed in the past decade or so.

The construction of pipelines has also underpinned industry revenue growth over the past years since new pipeline construction relies heavily on valves and related parts. Ongoing maintenance and repair of existing piping systems has further supported revenue. This is particularly true for the private sector where maintaining existing systems has become the primary focus.

Opportunities for German companies

The U.S. oil and gas industry has been struggling with the heavy fluctuation in oil prices for a while. This has forced many companies to set a new focus on efficiency, reducing overcapacities and applying stricter criteria when choosing exploration areas. This development has led to negative

consequences such as a high number of lay-offs or holds on investment projects. On the other hand, it boosts advantages for all oil consuming industries, such as the chemical and petrochemical sectors. Furthermore, the paradigm shift among oil producers delivers opportunities for supplier companies capable of meeting the new needs of companies struggling with low oil prices. Project decisions tend to be made increasingly based on long-term benefits rather than the quick rise of plain oil production. There is a shift in focus from quantity to quality, in which operational excellence, efficiency and lean production receive more emphasis. These changes provide opportunities for German companies with high-quality, specialized solutions that offer positive returns in the long run. Products and services that promise improvements in operational costs receive more attention and consideration. The stamp "made in Germany" enjoys a good reputation in the U.S. and is positively associated with reliability, competitiveness and quality.

The changing business landscape will also see new business models and collaborations emerge. One of the recent trends is that the procurement process is moving online and becoming more centralized, which in turn also offers smaller companies a chance to receive exposure.

New construction projects also offer great opportunities for German companies entering the market. A recent example is the planned 700-mile natural gas pipeline in Texas. The pipeline will link natural gas liquids (NGL) reserves in the Permian and Eagle Ford to Gulf Coast refiners, petrochemical companies, and export markets. This provides producers with new options for takeaway and downstream players with an alternative source of feedstocks.

The first two phases of the NGL Pipeline are currently in operation. Phase one was completed in April 2018, and it extends from DLK Black River Midstream to Delaware Basin Midstream.

Phase two completion was announced in June 2018. Phase three is expected to be in service by the second half of 2019 and will run from Benedum to Corpus Christi.

The Oil and Gas industry is also very open to new technologies and digital innovation. This creates opportunities for companies offering digital solutions – especially when it comes to big data. Modern offshore drilling platforms have roughly 80,000 sensors, which are estimated to generate about 15 petabytes (15 million gigabytes) of data during an asset's lifetime. This field will continue to grow and create opportunities for new companies looking to enter the market.

Digitalization can bring various benefits, including dramatic cost-reduction, increased extraction from wells, and higher

efficiency, especially in the day-to-day operations. Today's drilling is primarily managed by computerized control centers. Additionally, drones are being used to monitor conditions and perform inspections. On-site technicians wear reality headsets with wireless connection to other experts offsite. Real-time data from wells will allow timely decisions on underperforming wells and other potentially high-cost issues. Detecting anomalies during drilling and operations will enable more effective decision making that can deliver cost savings.

It is important to note for German companies looking to enter the U.S. market that a local presence is not only vital, but is becoming a necessity. President Trump's policy of "Buy American, Hire American" is a message that has resonated with many people in the United States. By establishing a local U.S. presence, German companies can demonstrate their commitment to the market and put themselves in a favorable position for future development.

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