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Oil Issues of the Smallest Arabic Member of the OPEC

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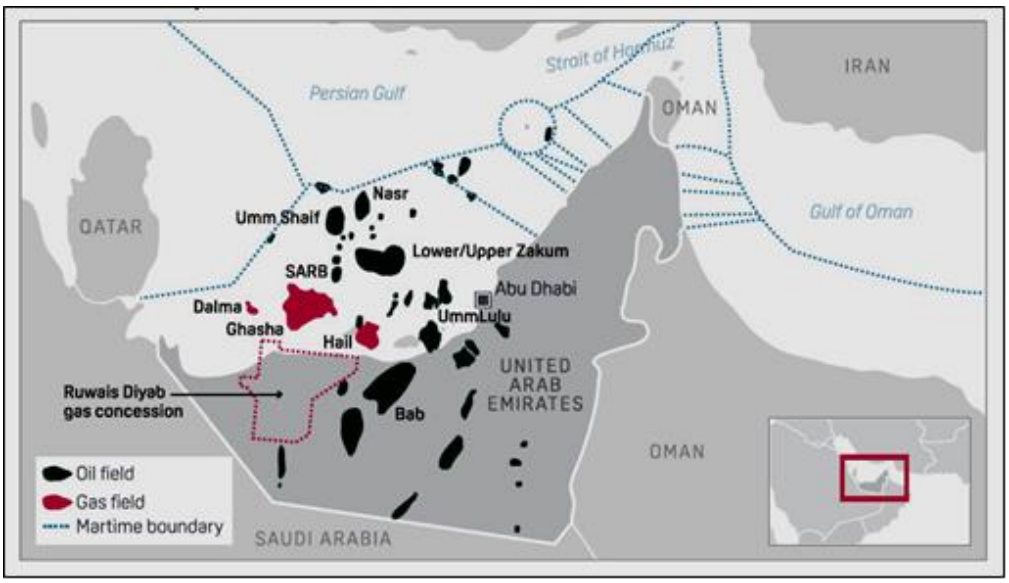
Abstract

The past, current status and future of the oil sector of the UAE are considered and analyzed. The author uses methods of comparative and systematic analyses, which are implemented for assessing the emirates' oil in the context of the world, the Middle East, and the Persian Gulf area. The article mainly concludes that the Covid-19 pandemia has seriously hit the UAE oil market (harder than the other sectors of the national economy), however, the pandemia has made inland oil demand (and petroleum imports) of the emirates lower but the domestic crude oil production will unlikely increase in the foreseeable future above 200 kb/d. Still, the federation fares quite well as the OPEC pledged crude oil production cuts are concerned.

Introduction

The United Arab Emirates (UAE) is the smallest Ara-bic member of the OPEC (territory of 83,6 thousand km^2 and permanent population of less than 9,771 thousand), divided into 7 emirates (Abu-Zaby/Abu Dhabi, 'Ajman, Dubayy/Dubai, Al-Fujayrah, Ra's-al- Khaymah, Ash-Shariqah/Sharjah, and Umm-al-Qaywayn), located on a southern coast of the Persian (ME) Gulf. Due to the revenues from oil sales and the limited population, the federation is the richest nation in terms of per-capita GDP (PPP) amongst the Arabic countries (in line with the World Bank data for 2019, – US$67,119.15 per capita or 3.8-fold more than the world's average. The high GDP stems from the fact that approxi-mately 30% of the country's GDP is directly based on its oil and gas output, contribu-ting to almost 13% of the value of its total exports. The UAE is essentially an imperative provider of oil to global energy markets, making around 10% of the overall global supply of crude oil reserves (Antwi-Boateng & Al Jaberi, 2022). In terms of oil exports (*see below*), the UAE accounts for nearly 30% of its gross domestic product becoming a mainstay in the economy.



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The federation is a member of the OPEC, which is well known, was established in September of 1960, since 1967-1971 (initially, in the form of only one emirate – the Emirate of Abu-Dhabi, as the federation itself, formerly known as the Trucial Sheikh-doms under control of the UK, was formed only at the end of 1971 while the Emirate of Ra's-al-Khaymah, joined the 6-member union not earlier than on 10 February 1972) (Bradshaw 2020). Abu Dhabi is the nation's capital, while Dubai, the most populous city, is an interna-tional hub. Each emirate is an absolute monarchy governed by a ruler, and together the rulers form the Federal Supreme Council. Accourding by Ploszka (2023) The members of the Federal Supreme Council elect a president (as of 14 May 2023, Sheikh Mohamed bin Zayed Al-Nahyan) and vice president (Sheikh Mohammed bin Rashid Al-Maktoum and Sheikh Mansour bin Zayed Al-Nahyan) from among their members. In practice, the ruler of Abu Dhabi serves as president while the ruler of Dubai is vice president and also prime minister. In 2013, the country had a population of 9.2 million, of which 1.4 million were Emirati citizens (privileged compared to foreigners) and 7.8 million were expatriates (Traifeh et al., 2021). As of 2023, the United Arab Emirates has an estimated population of roughly 10.2 million.

Reserves

As of the end of 2021, the United Arab Emirates (UAE) was estimated to hold the seventh-largest proven oil and natural gas reserves globally, equivalent to 97.8 billion barrels. As a member of the OPEC, the federation produces an average of 4 mln barrels of crude oil per day (*look below*), retaining 100 bln bbl of crude reserves (Salem et al., 2023).

According to the governments, oil reserves in the United Arab Emirates, are currently about 107 billion barrels, almost as big as Kuwait's claimed reserves. Accourding by Imsirovic (2022) Of the emirates, Abu Dhabi has most of the oil with 92 bln bbl while Dubai has 4 bln bbl and Sharjah has 1.5 bln bbl.

Production

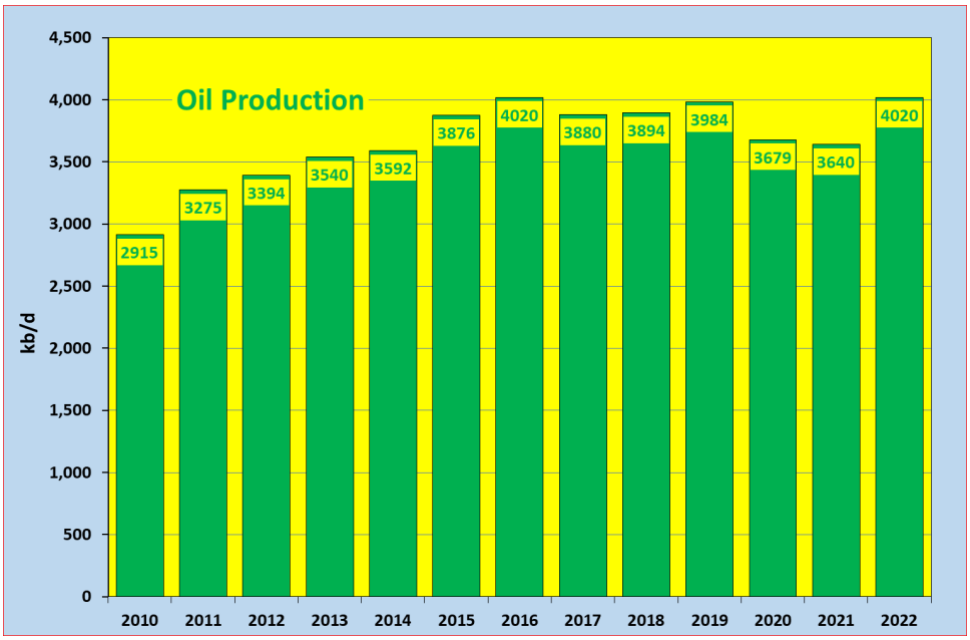

Figure 1. Crude Oil (including lease NGLs) Production in the UAE in 2010-2022 (according to BP), in kb/d

Source: Drawn by the author

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The first commercial oil was discovered in the UAE in 1958 (that is before the federation joined the OPEC – onshore in the Bab-2 well (Abu-Dhabi) and offshore at Umm Shaif (also Abu-Dhabi). The UAE is one of the world's major oil producers (Shoup, 2021; Jones et al., 2023). In line with the BP data, the UAE's annual oil (crude oil + lease NGLs) production grew from over 2,900 kb/d in 2010 up to 4,020 kb/d in 2019, before it declined down to 3,640 kb/d in 2021 – mostly as a result of the pledged cuts and under the impact of the coronavirus pandemia – and returned back to around 4,020 kb/d in 2022 (*Fig. 1*).

Figure 2. Monthly Crude Oil Production in the UAE in 2022-2023 (according to the OPEC), in kb/d

Source: https://tradingeconomics.com

In the period of August 2014 throughout November 2018 the world oil prices, represented by the benchmark Brent blend, have dropped from over US$100 per barrel down to less than US$65/b. Then, in early December of 2018, after eventful two days, the Organization of the Petroleum Exporting Countries and 13 allied producers, a group known as OPEC+, pleasantly surprised the market by agreeing to cut output by 1.2 mln b/d to support the prices. As for the UAE, the federation's total pledged voluntary oil-production cut initially was 542 kb/d or more than 17.1% of its referenced output.

Since December 2017 some non-OPEC oil-producing countries adjusted their respective oil production, voluntarily or through managed decline, in the support of the supply restrictions agreed by the OPEC and its allies in the effort to anchor plumme-ting oil market prices (Al Awaidy et al., 2021). Furthermore, in early August of 2020, the Gulf Cooperation Council's (GCC) 6 members, including Bahrain, Oman, and the 4 OPEC countries) of-ficially voiced their constructive position by approving a provisional additional cut in output of 600,000 b/d imposed by OPEC and its allies in their fight against the pan-demia.

Dubai oil, which is the most known worldwide, is a crude oil extracted from the Fateh offshore field owned by Dubai Petroleum (the oldest of the five oilfields found in the emirate – all of them offshore). The field was named Fateh Rashid bin Saeed Al-Maktoum. The Fateh was discovered in 1966 and it has been operational since 1969. The field consists of 47 offshore platforms with 31 satellite wellhead installations, 16 cent-ral complex platforms and 75 subsea pipelines.

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Dubai crude is used as a price benchmark or oil marker because it is one of only a few Persian Gulf crude oils available immediately. Dubai Crude is generally used for pricing Persian Gulf crude oil exports to Asia. The Dubai benchmark is also known as *Fateh*, how it is called in the UAE. Forward trade of Dubai oil (DO) is limited to one or two months (Imsirovic, 2022).

Dubai/Fateh crude is a medium sour oil. It has a gravity of 31° API (specific gravity of 0.871 g/cm^3) and a sulfur content of 2 weight %.

Companies

At present (2022), there are well over 20 foreign and local oil- and oil-related companies, including such world-famous names like Royal Dutch Shell, Amoco, ENI, OMV, Weatherford, CNOOC, and Vitol operating in upstream and downstream sectors of the UAE. It is noteworthy that the UAE have not just 1 but 3 national petroleum compa-nies, partly duplicating but actually never competing with each other – Emirates National Oil Co. (ENOC), Abu-Dhabi National Oil Co. (ADNOC), and Sharjah National Oil Corporation (SNOC). *Emirates National Oil Company* Limited (ENOC) L.L.C. is a leading integrated global oil and gas player operating across the energy sector value chain. A wholly owned company of the Government of Dubai, ENOC was initially established in 1993.

The ENOC Group comprises more than 30 related subsidiaries involved in refining, lubricant blending, storage, aviation and retail. Servicing thousands of customers across 60 markets, we employ a workforce of over 9,000 employees and are deploying our world-class customer service, latest innovations and technologies and best practices towards the UAE's social and economic development (Luthra & Monteith, 2023). ENOC recognizes the importance of exploration and production (E&P) in their value chain, and acquired Dragon Oil, operating in upstream sector of Turkmenistan and many other countries, in 2015.

Besides, drawing on the growth of the UAE as a strategic hub for global trade and as part of plans aimed at meeting the fast-growing demand for bulk liquid terminalling, ENOC established *Horizon Terminals* Limited (HTL) in 2003. Operating from the UAE as a holding company, Horizon has consolidated the company's existing terminalling investments and is expanding the business globally. Since its incorporation, HTL has expanded from its terminals and storages in the UAE and Saudi Arabia as of 2003, to cover Singapore, Djibouti and Morocco. HTL has also strengthened its presence within the UAE through further investments in Dubai and Fujairah (Koshaimah & Zou, 2023).

Also, ENOC manages and operates 154 ENOC and EPPCO service stations in the (UAE) , reaching an estimated 90 million transactions each year. Providing fuel and non-fuel services to consumers, ENOC plans to increase its UAE footprint to 191 ser-vice stations, from now and leading up to 2022 (*see below*).

The segment's first GCC service station opened in Saudi in 2013. ENOC cur-rently (2022) has twenty service stations in Saudi Arabia, with plans to build 45 more by 2024. ENOC delivers quality fuels such as Special ULG 95, Super ULG 98, and E-plus 91 in the motor gasoline category, and Diesel Gas Oil 10PPM. Company fleet vehicles supply white oils (such as gasoline, diesel, kerosene and Jet A1), while contracted vehi-cles take care of black product deliveries such as of Fuel Oil 180 cst and Asphalt 60/70 (Jacobson, 2023).

Founded in 1971 and headquartered in the city of Abu-Dhabi, *Abu Dhabi National Oil Company* (shortly ADNOC), with access to the country's oil and gas reserves, considered the fourth largest in the world.

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ADNOC is one of the largest companies in the world with large oil reserves (137 bln bbl as of June 2007), and in recent years they have continued to use seismic analysis methods in their exploration activities in order to increase proven reserves. Oil production capacities have been expanded and oil production rates at existing oil fields have been improved. The company currently operates two refineries: Ruwais and Umm al-Nar. ADNOC consists of eleven subsidiaries, each of which deals with all aspects of processes in the oil industry.

To achieve the goal of turning ADNOC into a world-class environmental company, attention to health, safety and the environment has increased and includes greater protection of the population and the country as a whole, on land and at sea, from industrial pollution. Key achievements include a drastic reduction in gas flaring, and the ultimate goal is to eliminate it completely. continues to develop its largest asset – the Upper Zakum field, which is also the world's second-largest offshore oil field and the fourth-largest oil field in the world – as well as the historic Murban Bab oil field, around 84 km north-west of Abu-Dhabi, where the first oil was produced in the UAE in 1960.

ADNOC is now a UAE-based refiner with a global reach. Every year, it supplies more than 40 mln tons of high-quality refined products to markets around the world. The company has been operating in Abu-Dhabi for more than 40 years, playing a crucial role in serving both the ADNOC Group and the United Arab Emirates. Our facilities are jointly able to refine nearly a million barrels of crude oil and condensates per day. ADNOC operates the world's fourth-largest single-site refinery in the town of Al-Ruwais in Abu-Dhabi's Al-Dhafra region. It is equipped with state-of-the-art ma-chinery and managed by a highly experienced international workforce. Its unique location allows to rapidly meet the clients' needs across Asia, Africa, Europe, and the Middle East. Domestically, the company operates a pipeline network spanning 1,600 km to ensure that local customers are supplied on demand.

Every month, more than 20 mln visits are paid to ADNOC's network of over 360 service stations in Abu-Dhabi and the Northern emirates (Ignatiev, 2020). By the way, on October 20th of 2022 ADNOC announced that a new world record for the longest oil and gas well has been set at its Upper Zakum Concession.

Stretching 50,000 feet, the well is around 800 feet longer than the previous world record set in 2017 and supports ADNOC's efforts to expand production capacity of its lower carbon oil and gas resources to help meet the world's growing demand for energy. ADNOC Drilling drilled the oil and gas well from Umm Al Anbar, one of ADNOC Offshore's artificial islands.

Abdulrahman Abdullah Al Seiari, ADNOC Drilling CEO, said: "This incredible achievement is in line with ADNOC Drilling's quest to deliver increased efficiency for our customers as we continue to create greater value for our shareholders. The delivery of this record-breaking well also demonstates our commitment to lower operational costs, while enabling ADNOC to reach its oil and gas production capacity targets" (Jones et al., 2023).

Sharjah National Oil Corporation (SNOC), established in 2010, is a relatively young organization but it carries within it more than 40 years of heritage and experience of the oil and gas business devolving from previous holders of the Sharjah concession. In 2019, SNOC initiated a globally recognized LNG import project, as well as the signing of a 30-year partneship deal with the Italy's ENI for 3 concessions to explore and de-velop onshore oil and gas fields in the emirate (Hordeski, 2020). As it was mentioned earlier, all the national oil companies (NOCs) actually dupblicate each other (as far as the state supervision is concerened) but do not compete with each other, differing by their emirate coverage and functions.

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Apart of the 3 NOCs, there are some other local oil-related companies in the UAE, the most important of which is the private *Dubai Petroleum Establishment* (DPE or simply DP), created by the emirate's decree in 2006 and which took over operations from ConocoPhillips, a western company that was granted concession to start oil exploration in Dubai back in 1963.

Automobiles and Car Fueling Stations

Since the national road sector constitutes the mainest consumer of oil products in the federation (*look below*), its deserves a separate coverage. The UAE has one of the most advanced road infrastructures in the world. The country's roads ranked number one in the world in the Global Competitiveness Report, issued by the Word Economic Forum for 2017-18 and the quality of the infrastructure is one of the most distinctive features that sets the UAE apart. Total length of roads in the emirates, including local roads, motorways, desert "lanes", and city streets is approximately 19,000 km (Abubakar & Dano, 2020) (*Fig. 3*). This includes the world-famous, the UAE's longest paved motorway – the more than 558.4-km Sheikh Zayed Road which was named after the first president of the emira-tes, runs from Abu Dhabi (starting from As-Silah) and stretches all the way to Ras al-Khaimah. It connects all the emirates, except Fujairah, and runs through the cities' most prominent locations, like Al-Majaz in Sharjah, Bur-Dubai in Dubai, and the Abu-Dhabi International Airport.

Figure 3. Main Motor Roads in the UAE

There are almost three million cars on UAE roads, a World Health Organization report has revealed. According to the Global Status Report on Road Safety, the total registered vehicles was almost 3.4 million, with cars and light vehicles accounting for the largest proportion of the figure (Gohlke & Zhou, 2021).

With average permanent inhabitants of a bit more than 9.44 million, in 2022 the emirates exploited almost 360 passenger cars per 1,000 people, which is less than population motorization in the USA, that "country on the wheels" (over 830 units per 1,000) but more than automobilization in Russia (around 310) and surely more than the world's average (less than 120 units per 1,000 persons) (Koli et al., 2021).

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The most popular passenger car in the UAE in 2023 were *Aston Martin Vantage* costing around AED 741,730 as a new auto, *Audi A3* (AED 103,110-114,640), and *Audi A4* (AED 209,900) (Merkin, 2023). And this is not too expensive («only» US$28-202 th.). But why? This is because rates of expatriation and repatriation are very high in the UAE and as a result, the rate of buying and selling cars is also high. Furthermore, when in the emirates, you only have to pay 5% of VAT [FYI: In the European Union, VAT for auto can go up to 27%, in India, it is 28%, and in Singapore taxes on high-end cars can go up to 320 percent!]. This significantly reduces the purchase cost of a car in the UAE (Anjam et al., 2020).

For all that, off-road SUVs (not rather fragile passenger cars not good for everywhere sands) are much more popular in the emirates. Bearing in mind terrain specifics, among luxury cars, SUVs had the highest share of sales in the United Arab Emirates in 2021 – at more than 60%. That year, luxury passenger cars of convenient type accounted for a mere 15% of passenger car sales in the UAE.

However, the Germany-based Statista forecasts show that convenient passenger car sales in the United Arab Emirates (UAE) are expected to surpass 520 thousand units by 2026. Around 209 thousand passenger cars were sold across the country in 2021, which was an increase compared to154 thousand units in the previous year (Baigireyeva et al., 2021).

There are mainly petrol stations in the UAE at present (643 car filling stations as of the end of 2022), offering mostly 95 and 98 gasolines, and the Enoc company installed during 2020 20 new mobile stations for fuel distribution in the Emirates of Dubai Ajman, Ras Al-Khaimah and Fujairah, including 12 stations in Dubai (Springer & Published, 2020). [FYI: A typical mobile station in the UAE meets the daily fuel needs of around 400 cars].

Along with petrol, Liquefied Petroleum Gas (LPG), diesel fuel as well as hydrogen are also available at the car-refuelling stations in the UAE. In nearly 300 locations across the UAE one can find now electric-car charging points for EVs.

In Dubai, for instance, a new plan earlier this year, endorsed by Dubai's Roads and Transport Authority (RTA), aims to make public transport emission-free by 2050. It will make Dubai the first City in the MENA region to map out a comprehensive emission-free plan for public transport and related infrastructure.

NGV (Natural Gas for Vehicles) is an alternative vehicle fuel that uses compressed natural gas (CNG) as a cleaner alternative transportation. CNG is currently used by taxis, government and personal cars in the UAE. There is an approved government decree to convert 25% of government entities vehicles to NGV.

With regard to Electric Vehicles (EVs), there are a number of challenges facing the spread of EVs globally, most notably the relatively high cost of owning an electric car, accessing charging stations, and the range of traffic on a single charge. However, these challenges have become engines for a faster spread of EVs on the streets.

The UAE has taken a number of bold decisions to confirm its accelerating pace in the transition towards EVs. In this context, the country has succeeded in converting 20% of its fleet of cars belonging to government agencies to electric vehicles, and aims to have 42,000 electric vehicles on its streets by 2030.

Having now only two hydrogen fueling stations across the entire UAE, Powertap Hydrogen Capital Corp., a California-based utility company, which entered in August 2021 into an exclusive ME distribution agreement with the company Viridian Hydrogen UAE, plans to deploy more than 100 hydrogen refueling stations across the Middle East and is perfectly

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positioned to help strategically develop a hydrogen highway utilizing many of the UAE's 643 car filling stations (Al Rashedi et al., 2020).

It is noteworthy that, despite the general underdevelopment of the Arab world, including the UAE, the expensive alternative car fuels (such as hydrogen or electricity) have good, proved prospects here (first of all, in the emirates) for at least one unusual reason – extremely wealthy sheikhs of the UAE like to shock the world with very expensively weird things like handy beasts of prey (which now cannot be *officially* a private property of common emiratis) being passengers in golden limousines.

Pipelines

The Emirates' oil pipelines are mainly those that bring produced crude oil to shore or to oil refineries (*see below*), with pipelines for NG surely dominating the picture. According to the World Bank, based mostly on the CIA's data, total length of hydrocarbon pipelines in the UAE amounts to 7,738 km, including 3,287 km of pipelines for crude oil, 533 km for gas condensate, 300 km for LPG, and 3,277 km for NG.

The longest of UAE's oil pipelines is Habshan–Fujairah pipeline, aka "Abu Dhabi Crude Oil Pipeline (ADCOP)". It starts from the Habshan onshore field in Abu-Dhabi and runs for 360 km to Fujairah's export terminal on a coast of the Gulf of Oman.

The pipeline was ordered by the International Petroleum Investment Company in order to increase the security of supply and reduce oil transportation through the Strait of Hormuz – initially to supply a refinery in Fujairah (*see below*) – and also the Fujairah export terminal. The conceptual design of the pipeline was completed in 2006 by an Arabic subsidiary of the Dutch Bilfinger Tebodin company, and the construc-tion-related (EPC) contract was awarded in 2007 to China Petroleum Engineering and Construction Corporation and China Petroleum Pipeline Bureau, both subsidiaries of the China National Petroleum Corporation (CNPC). Construction of the pipeline started on 19 March 2008 and was completed in March 2011. However, its commis-sioning was postponed several times and it became operational in June 2012. The pipeline was inaugurated on 15 July 2012 when it made its first delivery of Murban crude to one of Fujairah's refineries.

The 48-inch (1,219 mm) pipeline is 360 km (220 mi) long, of which 14 km (8.7 mi) is an offshore section. It passes east of the Abu-Dhabi city, through Sweihan and west of Al-Ain. The pipeline has a capacity of 1.5 mln b/d (~7.5 mln t/a) and it cost US$3.3 bln to build [20] (*Figs. 4* and *5*).

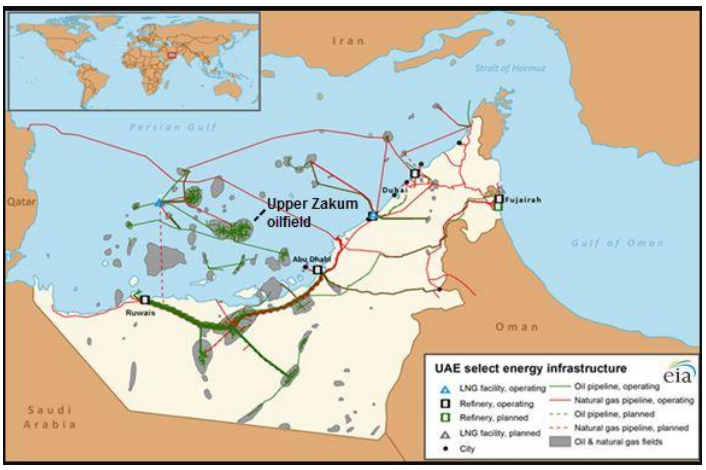

Figure 4. Oil and Gas Pipelines in the UAE (as of the start of 2021)

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Figure 5. Location of the Habshan-Fujairah pipeline

The UAE's all oil and gas pipelines are managed at present by the DUSUP (Dubai Supply Authority), which is based in As-Satwa (Dubai).

Unfortunately, there are no data on economic performance (economics) of the UAE's any pipelines but the Habshan-Fujairah pipeline's strategic location, allowing for oil by-passing the narrow and Iran-controlled Strait of Hormuz, is very important for the global effective oil supplies (not to mention the UAE's ones).

Refineries

At present, there are in the UAE 8 operating oil refineries with combined capacity of some 1.3 mln b/d (around 65 mln t/a) (*Table 1* and *Figs. 2* and *7*).

Table 1. Oil Refineries of the UAE (as of the mid-2022)

Name of refinery	Location (city, emirate)	Design capacity, kb/d	Year Started	Owner/Manager
Abu-Dhabi Refinery	Abu-Dhabi city, Abu-Dhabi	85	1972	Abu-Dhabi Oil Refining Co.
Fujairah VTTI Refinery	Near the port of Fujairah, Fujairah	82	…	Vitol Tank Terminal Co.
Fujairah Ecomar Refine-ry		20	2020	Ecomar Energy Solutions Co.
Uniper Fujairah Refine-ry		70	…	Uniper Energy Co.
Fujairah V/Brooge Re-finery		25	2020	Al-Brooge International Advisory and Brooge Energy Co.
Hamriya Sharjah Refine-ry	Sharjah, Hamriya Free Zone, Sharjah	75	…	Sharjah Oil Refining Co.
Al-Ruwais Refinery (1)	245 km west of Abu-Dhabi City, Abu-Dhabi	817	1981	Abu-Dhabi Oil Refining Co. (Takreer)
Jebel-Ali Refinery	Jebel-Ali, Dubai	120	1999	ENOC
Al-Nakheel Oil Refinery	Alsajaa, Sharjah	…		Al-Nakheel Oil Refine-ry (ANOR)
Total plants	**UAE**	**1,294**	**…**	**Various companies**

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(1) In fact, two plants

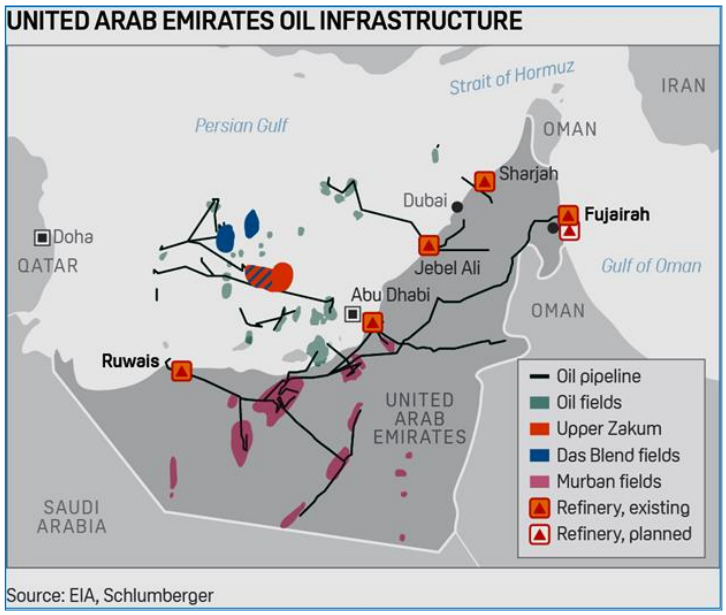

Figure 6. Oil Infrastructure of the UAE, Including Existing and Planned Refineries (as of end of 2021)

Source: compiled by the author

Actual refinery production, according to BP's estimates, has risen from 571 kb/d in 2010 up to a maximum of almost 1,120 kb/d (the capacity's utilization more than average 91%) in 2017 and then declined to a bit more than 870 kb/d in 2020. The steepest fall has occurred in 2021, when annual refinery throughput has decreased by over 16% – mainly due to the pandemia-caused drop in demand for oil products and Sharjah's only al-Nakheel oil refinery was even temporarily closed as actually unnecessary. Anyway, despite the negative impact of the global coronavirus pandemia, ave-rage refinery utilization in the UAE fluctuated in 2020-2022 in the range of 70-79% and amounted to 78.9% in 2022 (*Fig. 7*).

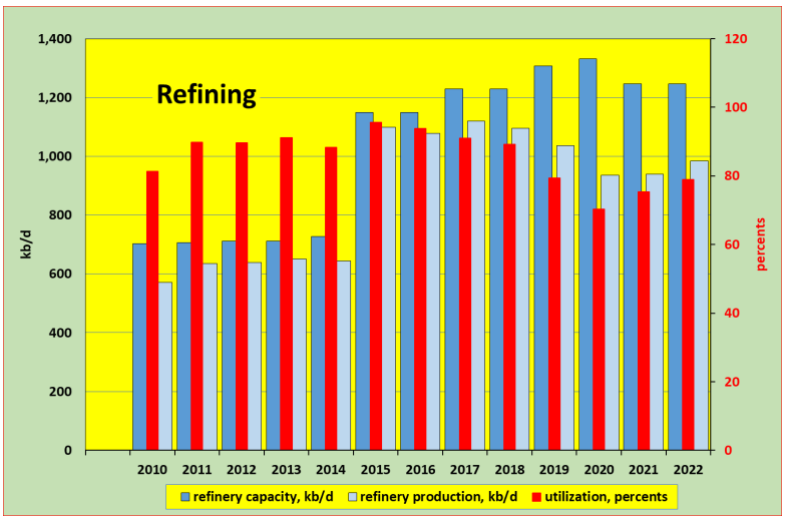

Figure 7. Combined Refinery Capacity, Actual Refinery Production and Average Refinery Utilization in the UAE in 2010-2022 (according to BP), in kb/d and %

Source: calculated and drawn by the author

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Since 2009 the UAE-based Brooge Petroleum and Gas Investment Company (BPGIC) plans to set up an oil refinery in the port of Fujairah to produce a bun-ker fuel with a capacity of 250,000 b/d. The facility will be the first in the Middle East and North Africa to comply with the new IMO 2020 regulations of the International Maritime Organization by capping sulfur content in shipping fuels. BPGIC's first 14 tanks, which can hold 400,000 cu m of middle distillates and fuel oil, became opera-tional in January 2018. In turn, the first phase of the refinery project is expected to be finished in the first quarter of 2020.

In early 2009 the United Arab Emirates (UAE) government has backed out of an agreement with Pakistan to install a US$5-bln, 250,000 b/d refinery at Khalifa Point near Hub in Baluchistan, Pakistan. Media reports speculated that the country's reason for withdrawing its support was the Pakistani government's refusal to allow the UAE-owned International Petroleum Investment Co. (IPIC) to receive more shares in Pak-Arab Refinery Ltd. (PARCO), based in Mehmood Kot, the Multan Province of Pa-kistan. The UAE owns a 40% stake in PARCO, while Pakistan holds 60%. PARCO controls Pakistan's largest refinery, capable of refining 100,000 b/d of oil.

Consumption

Currently, the UAE has one of the most diversified economies of all the major oil-producing Arabian Gulf states. The economic diversification was carried out through implementation of several major projects in various sectors, including refinery and petrochemicals, tourism, banking, real estate, aviation and airports, re-export commerce, and telecommunications. For instance, Dubai, which is one of the key emirates in the country has become a central hub for regional trade and finance, accounting for about 70% of the emirates' non-oil trade at the end of the previous millennium. With high economic and population growth rates and a fairly low energy cost, the country's energy consumption has risen tremendously in the past decades, making it one of the highest energy consumers per capita in the world [26]. Still, in the Emirates, the patterns of which are quite typical to the Middle East, is dominated by NG, which accounted for 60% of total primary energy use in the UAE in 2020 (or some 70 BCMA, including imports from Qatar through the Dolphin under- water pipeline to feed UAE power and desalination plants) (Mania, 2020).

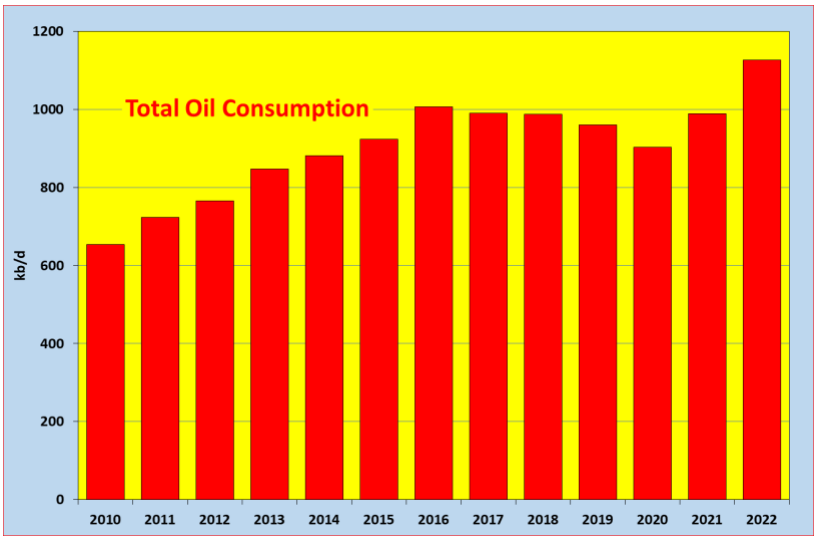

Figure 8. Oil Consumption in the UAE in 2010-2022 (according to BP), in kb/d

Source: drawn by the author

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As for the inland demand for oil products, in line with BP's estimates, oil con-sumption in the UAE rose in the period of 2011-2016 almost by 60% – from nearly 683 kb/d in 2010 up to almost 1,034 kb/d in 2016 and then has declined to less 17.7% has occurred in 2020 – mainly under the coronavirus pandemia (*Fig. 8*).

In 2019 (that is before the pandemic-caused drop of inland demand for oil products has occurred), the shares of gasoline and diesel fuel (gasoil) in total oil-product use in the United Arab Emirates was for the both product around 24% while the share of LPG, which is consumed mostly for cooking, approached 23%.

Oil Balance

Generally speaking, the Emirates's oil balance is quite typical to a major oil-exporting country – own production and exports dominate the petroleum picture while inland consumption does not play any significant role (*Fig. 9*). In 2020 petroleum self-sufficiency of the UAE was over 357% – not far away from almost 446% in 2010.

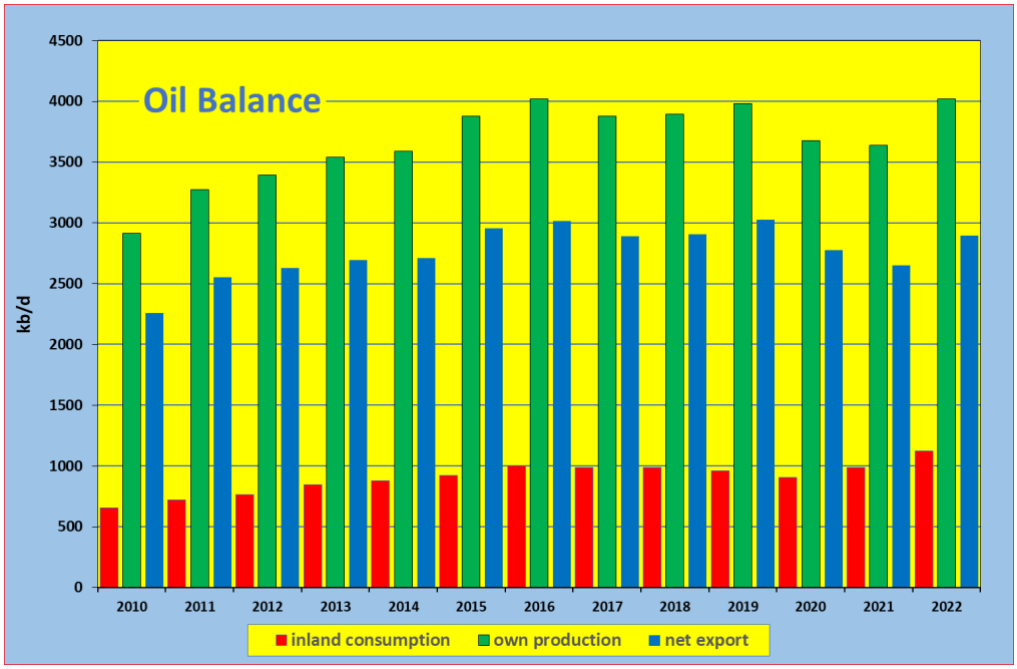

Figure 9. Oil Balance of the UAE in 2010-2022 (according to BP), in kb/d

Source: calculated and drawn by the author based on sources for the Figs.1 and 8

The Covid-19's Impacts and Prospects

The coronavirus pandemic has seri-ously hit the Emirati oil market. Annual use of oil products has dropped in 2020 by nearly 18%, while annual refinery throughput in the UAE has decreased by over 16% (*see above*).

Still, according to the Hyderabad-based Mordor Intelligence international consultancy, the UAE oil and gas market is expected to register a CAGR of more than 2% during the forecast period of 2022-2027. The low oil prices during the COVID-19 pandemic resulted in a cut down of the nation's 2021 budget by 5.3%, as compared to 2020. The nation has also cut down the oil production 2020 due to low crude prices and low demand for petroleum products. However, the market is expected to recover in 2022, owing to factors like increasing investment in the upstream sector coupled with supportive government policies. Moreover, in 2018, the country launched a mega project worth USD45 bln to increase its refining capacities in the existing

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refineries. The project is expected to increase the refining capacity of the country by 65%, up to 1.5 million barrels per day, by 2025. Therefore, increasing investment in the upstream, midstream, and downstream sectors is expected to drive the country's oil and gas mar-ket during the forecast period. However, the plans to diversify the power generation mix by introducing renewable energy sources are expected to hinder the growth of the market studied during the forecast period.

Foreign Trade

The UAE (Abu-Dhabi) started to export crude oil in 1962 – some 4 years after the first "black gold" field was discovered in the emirates in1958.

In 2021, United Arab Emirates exported US$58.5 Bln in crude petroleum, with it being the most exported product in the UAE (19.8% of the federation's value of merchandise exports). The main destination of crude petroleum exports from the UAE in that year were: Japan (32.7%), India (16%), and the PR of China (over 14%) (Baig et al., 2022).

Still, in 2021, the United Arab Emirates also imported US$1.41 bln in crude petroleum, being the 16th most imported product of the federation (less than 0.5% of its total import bills). The UAE imported the crude primarily from: Libya ($547 mln), the United States ($403M), Algeria ($75.7M), Norway ($67.1M), and Australia ($59.4M).

In addition, being unable to meet inland demand for oil products with domestic refineries (*see above*), the federation imported refined products – in 2021, for a value of US$16.7 bln, being the 3rd most imported item (or over 5.6% of value of its total goods imports) – primarily from Saudi Arabia (more than US$4.6 bln), India (nearly US$4.5 bln), and Bahrain (UUS$1.3).

Surely, the federation exports LNG and does it regularly since the state-owned Abu Dhabi National Oil Co. (ADNOC; *see above*) has undertook its first LNG export from Das Island in 1977.

In December of 2021, the company has announced its plans to double by 2026 LNG production from 6 to 12 MTPA. Prior to 2019, about 90% of Das Island LNG exports were delivered to Japan. In 2019, ADNOC diversified its supply portfolio, signing on several clients, including Vitol, TotalEnergies SE and other buyers in South Asia, Japan and China (Vopilovskiy , 2022).

However, regardless of a lot of traditional public noise, LNG are not the No.1 good ex-ported by the country. In 2020, the federation exported US$5.49 bln of chilled liquid gas (or less than 2.6% of its total export proceeds) – primarily to India ($2.28 bln, nearly 42%), and the PR of China ($1.36 bln, almost 25%).

Summa summarum, the Covid-19 pandemic has seriously hit the UAE oil market (harder than any other sectors of the national economy), however, the pandemic has made inland oil demand and petroleum imports of the kingdom *lower*, but the domestic crude oil production will unlikely increase in the foreseeable future above 200 kb/d. Still, the federation fares quite well as the OPEC pledged crude oil production cuts are concerned.

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