

A GUIDE TO **THE NILE DELTA'S** OIL AND GAS RESOURCES

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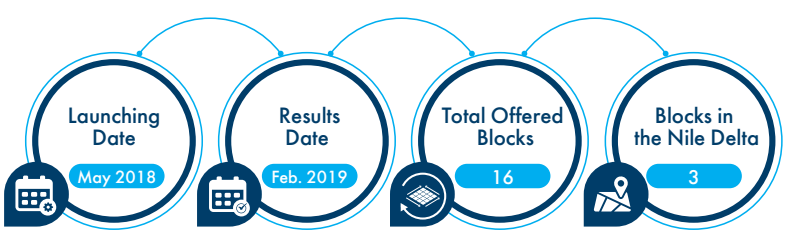
The Nile Delta is one of the oldest petroleum production areas. The region witnessed the first natural gas discovery in 1967, the Abu Madi field. Since then and until the end of Fiscal Year (FY) 2018/19, the region has achieved 173 discoveries in addition to drilling 387 wells with success rate of 45%. In FY 2018/19, the region's petroleum production recorded about 89.5 million barrels (mmbbl), representing 16% of Egypt's total petroleum production, according to the Egyptian Natural Gas Holding Company's (EGAS) and the Egyptian General Petroleum Corporation's (EGPC) data.

The Nile Delta went through notable changes and updates during FYs 2017/18 and 2018/19 covering different aspects, such as bid rounds, agreements, and production rates.

Bid Rounds

In 2018, the EGAS launched an international bid round, which offered 16 blocks; three of which were onshore blocks that are located in the Nile Delta, according to the EGAS Annual Report 2017/18.

EGAS INTERNATIONAL BID ROUND IN 2018



The bid round results were announced in February 2019, on the sidelines of the Egypt Petroleum Show (EGYPS 2019). Five blocks were awarded to major companies; two of which are located in the Nile Delta. The two blocks were awarded to Wintershall Dea, International Egyptian Oil Company (IEOC) and BP. In fact, the signature bonus of the two blocks totaled $16 million. In addition, the total financial commitments recorded $71 million to drill 12 exploratory wells, according to the MoP's official website.

EGPC AND EGAS 2018 BID ROUNDS' RESULTS FOR THE NILE DELTA

Company	Blocks	Signature Bonus ($ million)	Minimum Financial Commitment ($ million)	Exploratory Wells	Area (km²)
Wintershall Dea	East Damanhur Onshore-Block (10)	11	43	8	1,418
IEOC/ BP	West Sherbean Onshore-Block (11)	5	28	4	1,535

Active Agreements

Since the late 1960s, many International Oil Companies (IOCs) have signed agreements to exploit different concessions in the Nile Delta. Until June 2019, the region reached five active agreements to develop five concessions by Dana Gas, Eni, the EGPC, IPR, SDX, BP and Edison. Dana Gas only has interests in two active blocks; one in the Nile Delta (Block 3) and the other in the Eastern Nile Delta (Block 6), representing the most dynamic operating company in the region, according to the EGAS and Dana Gas's website.

The IOCs are granted the rights to carry out different types of activities depending on the type of agreement signed. However, the region's current active agreements concentrate on development activities.

Drilling Activities

The average number of drilling rigs in the Nile Delta fields in FY 2017/18 reached three rigs, contributing 2.8% of Egypt's total drilling rigs. On the other hand, in FY 2018/19, an average of two drilling rigs was recorded in the region, contributing 1.7% of total drilling rigs, according to the EGPC data.

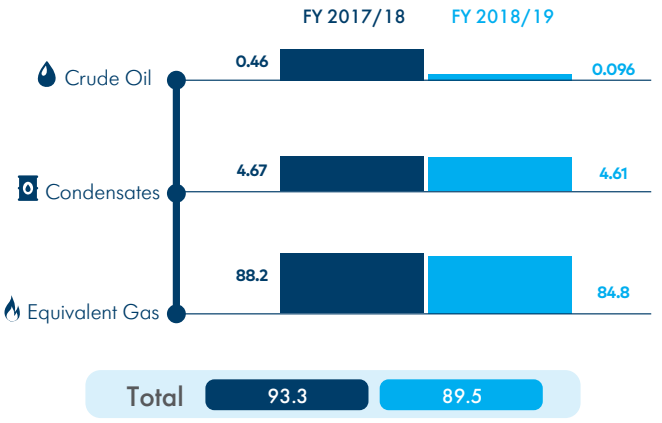
In FY 2017/18, the Nile Delta witnessed two natural gas discoveries out of a total 16. The discoveries added reserves of 53.28 billion cubic feet (bcf) of natural gas. Consequently, the region witnessed no discoveries in FY 2018/19, according to the EGAS annual reports 2017/18 & 2018/19.

THE NILE DELTA'S RIG COUNT

Average Number of Rigs in the Nile Delta
FYs (2017/18 & 2018/19)
2

The Nile Delta Share in Total Rig Count
2.24%

THE NILE DELTA'S PETROLEUM PRODUCTION (mmboe)(YoY)





2 DISCOVERIES IN THE NILE DELTA IN FY 2017/18



The Nile Delta's Petroleum Production

In FY 2017/18, condensates production contributed 5% of the Nile Delta's petroleum production, as opposed to nearly 5.2% in FY 2018/19. Moreover, crude oil production contributed 0.11%of the region's petroleum production, in FY 2018/19, in comparison to 0.5% in FY 2017/18. The equivalent gas share in the region's production increased from 94.5% in FY 2017/18 to 94.7% in FY 2018/19, according to the EGPC and the EGAS data.

Main Operators

1. DANA GAS

Dana Gas is an Emirati company, which mainly focuses its operations in the natural gas field. The company has been an active player in Egypt since 2007, through its subsidiary Dana Gas Egypt. Since then, Dana Gas operations have grown rapidly, making it the country's fifth largest natural gas producer. The company's activities in Egypt have been focusing on developing and providing natural gas, condensates, and Liquefied Petroleum Gas (LPG).

Dana Gas's focal point of operations is located in the Nile Delta region. The company's operations in the Nile Delta started when it purchased two onshore concessions that were operated by Centurion Corporation.

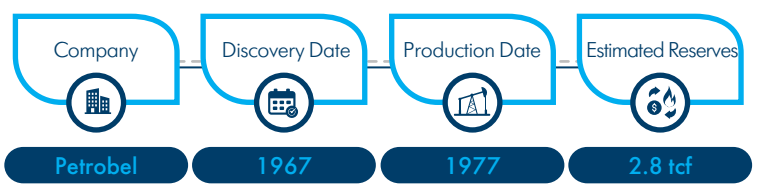
Currently, Dana Gas is operating in four onshore concessions with 100% working interest including: El Manzala, West El Manzala, West El Qantara and North El Salhiya. However, the North El Salhiya was relinquished in 2018. The concessions include 15 development leases producing natural gas and condensates from 15 fields. The four concessions cover an area of 796 km², and hold reserves estimated at more than 89 million barrels of oil equivalent (mmboe), according to Dana Gas's website.

Moreover, in 2014, Dana Gas was awarded a 100% working interest in Block 6 North El Arish offshore Concession, covering 3,039 km², in addition to 50% non-operated interest in Block 3 El Matariya onshore Concession, covering 1,525 km², as stated on the company's website.

2. ENI

The Italian Eni has been operating in Egypt since 1954 through its subsidiary, IEOC. Remarkably, Eni through its Joint Venture (JV), Petrobel, discovered Egypt's earliest natural gas field, Abu Madi field, according to Hamdy El Banby's book entitled "The Egyptian Crude Oil: Past Experience and Future Insights".

ABU MADI FIELD



Through its focused operations, Eni continued to achieve and put on production other significant natural gas discoveries in the Nile Delta. These discoveries include: the onshore East Delta and El Qar'a, as well as Darfeel, Barboni, Anshuga, Baltim East, Baltim North, and El Temsah.

In July 2014, Eni announced the discovery of Nooros field in the Great Nooros Area located in the Nile Delta. Nooros discovery was estimated to contain reserves of about 530 bcf of natural gas in addition to the associated condensates. The discoveries continued in 2016, as the company announced the discovery of Nooros East-1, which has natural gas reserves of 24.3 bcf, according to Eni's website.

In addition to natural gas Exploration and Production (E&P) activities, Eni has a 40% share in the Damietta Liquified Natural Gas (LNG) plant, which is constructed and operated by SEGAS. The facility is constructed to process natural gas coming from the Nile Delta fields. The facility also ships the natural gas to Europe in form of LNG, according to the company's report published in 2016, entitled " Eni in Egypt".

Main Fields

1. NOOROS AREA

Among the recent field developments are those in the Nooros Area, which include the Nooros and the Baltim Southwest fields.

» NOOROS

The Nooros field, a Nile Delta offshore field, was discovered in July 2015. The natural gas produced from the field's seven operational wells is transported to the Abu Madi treatment facility to be treated and then linked to the national grid.



The Nooros field commenced production in August 2015. By 2016, the average daily production of the field reached 900 million cubic feet per day (mmcf/d). In 2017, the level of production achieved the targeted production of 1 billion cubic feet per day (bcf/d) and it continued to increase in 2018 to reach 1.2 bcf/d due to the drilling of a new successful well, as stated in the MoP press release published in January 2019.

» BALTIM SOUTHWEST

The field was discovered in June 2016. The natural gas reserves of the field represent 30% of the natural gas reserves in the Great Nooros area, according to Eni.

The Baltim Southwest field is operated by Petrobel, while Eni and BP each hold a 50% stake. The field is located 12 km off the Mediterranean in the Baltim South development lease; specifically, 10 km from the Nooros field.

The Baltim South West field started production in September 2019, at an initial rate of 100 mmcf/d. After brining two wells on stream, the production from the field increased to 190 mmcf/d in November 2019, according to a statement by the cabinet.

The potential production is expected to reach a maximum of 500 mmcf/d of natural gas by Q2 2020, when a total of six wells are brought online, according to the MoP.

2. DISOUQ

The Disouq concession is located in Kafr El Sheikh, one of Egypt's natural gas rich areas in the Nile Delta region. In 2004, Wintershall Dea was awarded the Disouq concession with a 100% stake. The total area of the concession is 3,217 km^2, according to Wintershall Dea's website.

The development project of the concession consists of developing seven natural gas fields in order to produce around a total of 402 bcf of natural gas, according to the company's official website.

Wintershall Dea initiated production from the onshore concession in 2013, with an average daily production of 49 mmcf, which was delivered to the Egyptian National Gas Grid. The peak of the production was achieved in mid-2014, when an average daily rate of 140-158 mmcf was reached. This increase was mainly due to the central treatment plant that was added to production, as stated on the company's website.

As part of the development plan, Wintershall Dea was able to put six wells on production in 2019 with initial production rates of about 50 mcf/d, according to the MoP.

3. SOUTH DISOUQ

The South Disouq is located 65 km north of Cairo, in Kafr El Sheikh in the Nile Delta region. The concession has a total area of 828 km^2, according to SDX's website.



The exploration activities in the concession started by drilling the SD-1X exploratory well in 2017, when natural gas was discovered in the Messinian-aged Abu Madi formation, as stated in SDX's Energy Inc. 2018 Q2 Interim Report.

In 2018, the development lease application was approved by the relevant authorities. The development project for the concession targets producing about 50 mcf/d. Furthermore, SDX drilled four wells, including Ibn Yunus, SD-4X and SD-3X. The four wells were connected to the treatment facilities in the area of South Disouq and Ibn Yunis, through an early production unit with a capacity of 60 mcf/d. The treatment facilities are connected to the national grid through a 30-cm diameter pipeline with 10 km length, according to the MoP.

DEVELOPMENT PROJECTS IN THE NILE DELTA IN FY 2017/18

	Project	Operator	Initial Production Rate (mcf/d)	Cost ($ million)	Start Up
FY 2017/18	Nooros (Phase 1 Cont.)	Petrobel	30-245	-	Aug 2016
	Faraskour Compressor	WASCO/ Dana Gas	5	2	Sep 2017
FY 2018/19	Disouq Phase B	Disouco/ Wintershall Dea	100 (Planned)	30	Dec 2018
	Abu Madi-El Gamil Pipeline	PetroShorouk (Petrobel)	Filling ullage of El-Gamil & Abu Madi plants	300	May 2019

The ministry further added that the field was put on production in November 2019 with an initial production rate of about 45 mmcf/d. The total cost of the project reached about $49 million.

Infrastructure

CRUDE OIL INFRASTRUCTURE

The crude oil extracted from the fields of the Gulf of Suez is transported from Cairo to refineries in Tanta and Mostorod, then to Alexandria through two pipelines, Mostorod-Tanta pipeline and Tanta-Alexandria pipeline.

NATURAL GAS INFRASTRUCTURE

The Nile Delta has eight natural gas pipelines, four of which spread across the region while four exist within it; two pipelines of the latter mainly connect Abu Madi field with Talkha distribution station. The Abu Madi-Talkha pipelines either directly provide the consumers in Talkha with natural gas or further extend to feed electric stations with natural gas in Cairo through the Talkha-Tanta-Cairo pipeline.

CRUDE OIL INFRASTRUCTURE IN THE NILE DELTA

Pipeline	From	To	Length (Km)	Diameter (Inches)
Mostorod-Tanta	Mostorod Refinery	Alexandria	75	12
Tanta-Alexandria	Tanta	Alexandria	123	12

NATURAL GAS INFRASTRUCTURE IN THE NILE DELTA

Pipeline	From	To	Length (Km)	Diameter (Inches)
Abu Madi-Talkha I	Abu Madi	Talkha Distribution Station	35	12
Abu Madi-Talkha II	Abu Madi	Talkha Distribution Station	35	22
Abu Madi-Damietta	Abu Madi	Damietta	42	16
Damanhur-Tanta	Damanhur	Tanta	60	28
Talkha-Tanta-Cairo	Talkha Distribution Station	Cairo	125	28
Meadia-Damanhur	Abu Qir Development Area	Damanhur	50	20
Alexandria Network -Damanhur	Alexandria	Damanhur	45	24
Cairo Ring-Port Said Line	Cairo Ring	Port Said	130	16

For decades, the Nile Delta has been one of the most productive areas in Egypt. The region witnessed intense offering of international bids for oil and gas exploration activities, which received expected turnouts from IOCs such as Dana Gas, BP, SDX and others. Hence, these IOCs attained concession rights in a number of offshore blocks and have succeeded in making new discoveries.

For instance, in FY 2017/18, SDX and Dana Gas achieved two discoveries in the Nile Delta, Ibn Yunus-1 and East South Abu Elnaga-1, which contributed 30% of the total added reserves of natural gas in Egypt. Consequently, in FY 2017/18, the region's production of natural gas represented 25% the natural gas produced in Egypt, as explained by the EGAS. The discoveries led to achieving a great leap for the natural gas sector in Egypt as a whole, which had a clear reflection on the development path in Egypt.

FY 2018/19 also witnessed a tremendous change when Egypt achieved self-sufficiency in natural gas by September 2018. This was a result of high natural gas production rates from the Nile Delta and Mediterranean region which represented about 80% of the total natural gas produced in Egypt, as stated by the EGAS. With this regard, the MoP is exerting more efforts towards the development of the fields in the region.

