

TRACKING PETROLEUM PRODUCTS TRANSPORTATION:

A COMPARATIVE ANALYSIS (2016/17 - 2017/18)

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Transporting petroleum products represents a major pillar in the oil and gas industry, locally and globally. It plays a vital role in upstream and downstream activities. Railway tanks, pipelines, marine vessels, tankers, trucks are used to transport hydrocarbon products, including oil, compressed and liquefied gas, fuels, and other chemicals from refineries and distribution points to the end consumers.

In oil importing countries, transportation secures the link connecting importing locations and consumption points. Meanwhile, Egypt depends on a variety of tools and channels to transport petroleum products on both domestic and international levels.

Transportation services help strengthen the performance of the petroleum sector and its contribution on the Egyptian economy growth. This indicates the importance of tracking the changes in Egypt's petroleum transportation performance. In the following lines, we will monitor the developments that took place between fiscal year (FY) 2017/18 and FY 2016/17.

MAIN TRANSPORTATION CHANNELS

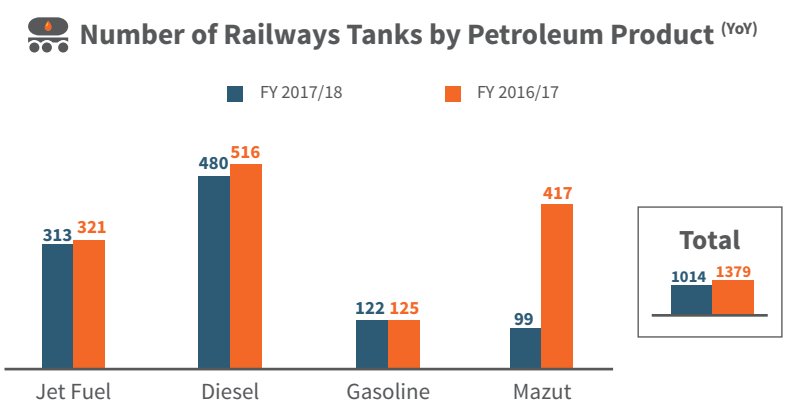
In Egypt, there are four main routes to transport petroleum products which are railways, pipelines, trucks, and maritime transport.

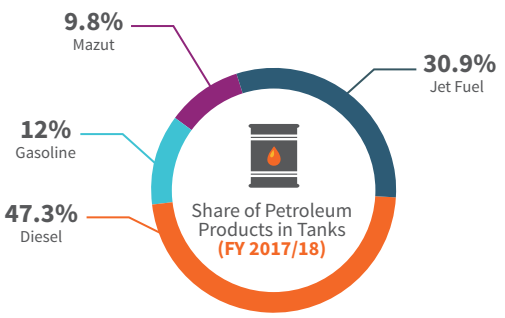
1. RAILWAY TANKERS

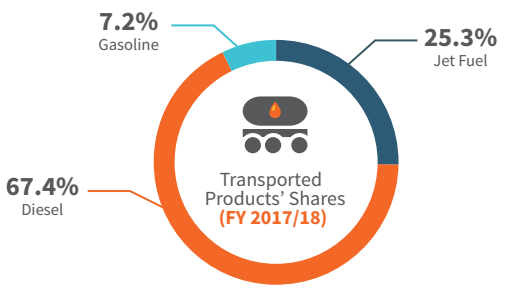
Railway tankers are a special means of transportation, transporting petroleum products through a various numbers of lines that cover most governorates through railway stations. The Egyptian railways are used to transport mainly four different petroleum products, namely; gasoline, mazut, diesel, and jet fuel

In FY 2017/18, the total number of active railway tankers reached 1,014, registering a decline of 26% compared to FY 2016/17, when the number of tankers stood at 1,379.

Diesel had the highest share of the total number of railways tankers in FY 2017/18, which accounted for 47.3% of the total number of tankers compared to 37.4% in the previous year.

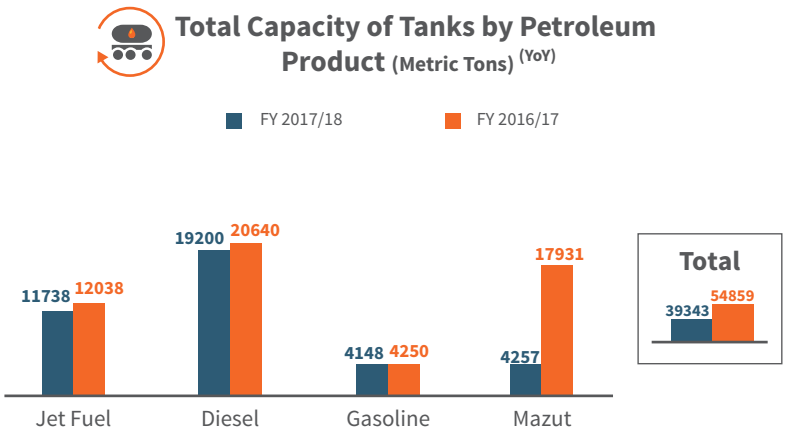


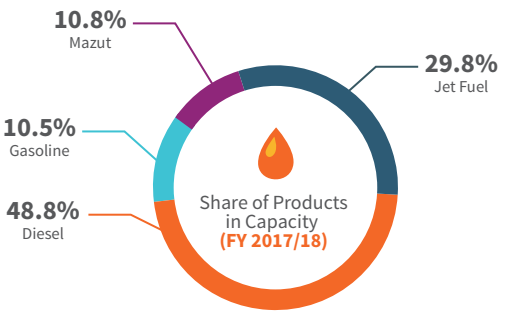




Additionally, in FY 2017/18, the capacity of these tankers declined by 28% to record 39,343 metric tons, compared to a total 54,859 metric tons in FY 2016/17.

Diesel also had the highest share in the tankers capacity in FY 2017/18, as it represented approximately 49% of the total capacity.

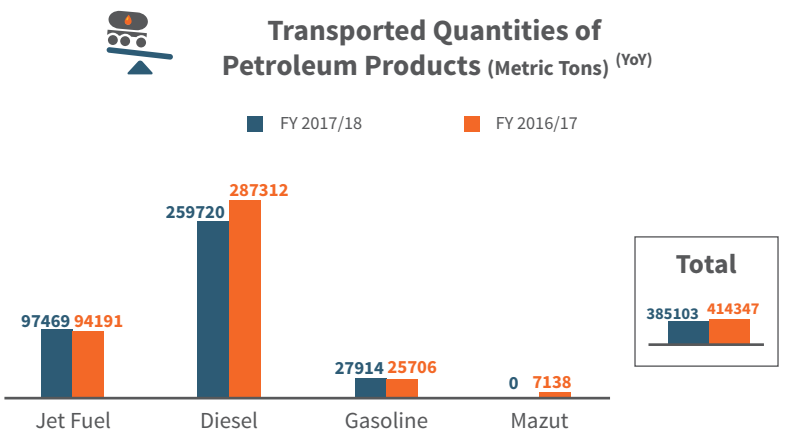




The Egyptian railways transported a total of 38,510 MT of petroleum products in FY 2017/18, which was 7% less than the quantity transported in FY 2016/17.

Thus, diesel was the product with the highest quantity transported, amounting to 259,720 metric tons, which represented 67.4% of the total transported quantity.

It is worth noting that railway tankers did not transport any quantities of mazut during FY 2017/18, versus 7,138 MT in FY 2016/17.



2. PETROLEUM PIPELINES

The general rationale for transporting crude oil, natural gas, and petroleum products is to flow these products through pipelines. The pipelines transfer petroleum products from wells to refineries or gas plants, and then to terminals, and eventually to the end consumers. Pipelines are considered the best transportation in some cases, as they could be the most efficient option from an economic perspective, especially if transportation is over long distances.

Aboveground, underwater and underground pipelines are three types of pipelines that vary in size from several centimeters to more than a meter in diameter. Generally, there are four types of pipelines including flow lines, gathering and feeder lines, crude trunk pipelines and petroleum product pipelines.

In Egypt, there are three types of petroleum pipelines. First, there are the main pipelines that mostly have large diameters. Main transmission pipelines are usually underground or undersea and are used to transfer crude oil or natural gas through high-pressure techniques. These pipeline networks include several compressing stations in gas lines or pump stations for crude and multi product pipelines.

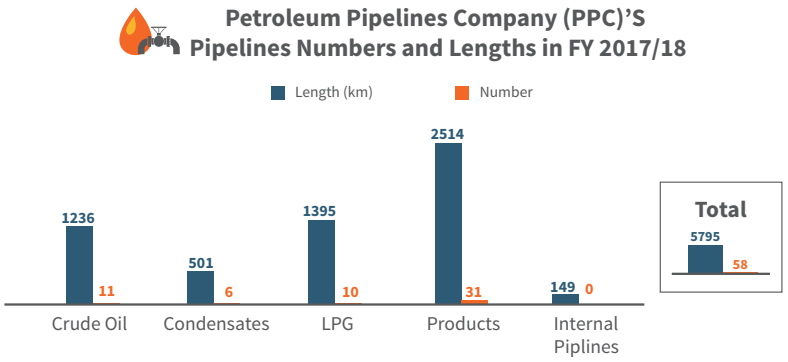
The second type is gathering pipelines. Smaller, interconnected, and form complex networks that bring crude oil or natural gas from several nearby wells to a treatment or processing facility. In this category, lines are usually short and with small diameters. Subsea pipelines used to collect products from deep-water production platforms are considered gathering pipelines.

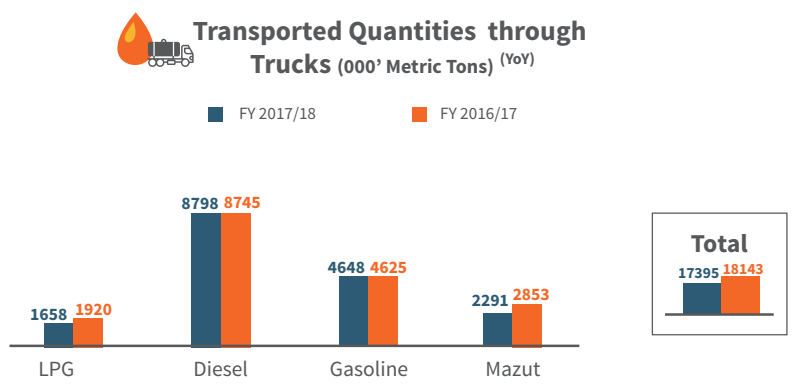
Finally, the third type is distribution pipelines, which are composed of several interconnected pipelines with small diameters. Distribution networks are mainly used to move the products to the final consumer. This type of pipelines includes feeder lines, as in the natural gas grid that distributes to homes and businesses downstream, in addition to pipelines at terminals to distribute products to tankers and storage facilities.

The Arab Petroleum Pipelines Company's (SUMED) pipeline is the main pipeline in Egypt as it is one of the most important developments in the field of pipeline transportation. The SUMED line is a global center for crude oil storage and marketing, where crude is transferred from oil producing countries to consuming markets through the shortest way and lowest expenses. It is 320 kilometers (km) long, with a 42-inch (106.68 centimeters) in diameter, and a capacity of 117 million metric tons per year (mmt/y).

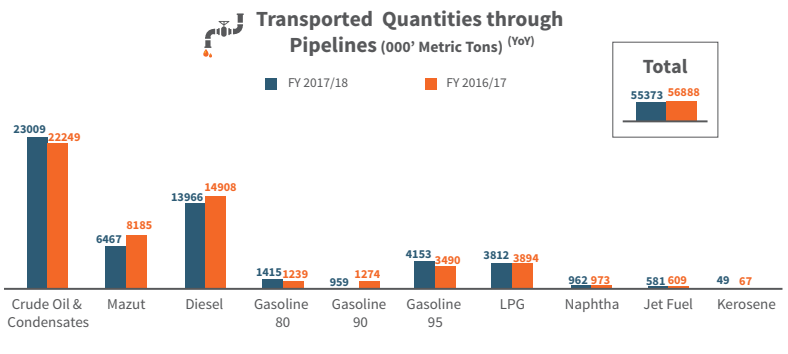
Although the number of pipelines remained constant at 58, the total length increased by 4% to reach 5,795 km in FY 2017/18 compared to 5,590 km in FY 2016/17. This increase was due to the 117 km extension in the lengths of liquefied petroleum gas (LPG) pipelines and an extension of 88 km in the products pipeline.

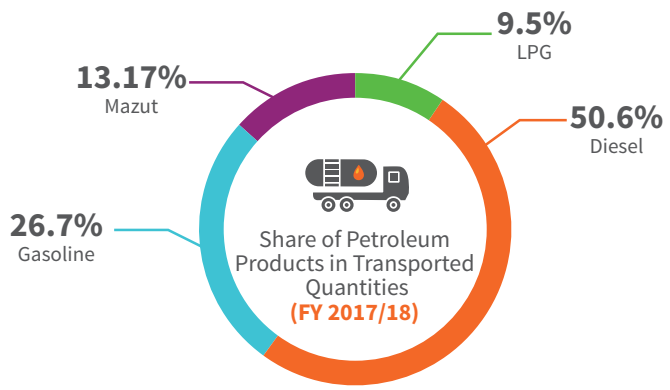
According to the Central Agency for Public Mobilization and Statistics (CAPMAS) figures, product pipelines came on top, with a total of 31 lines and 2,514 km length.

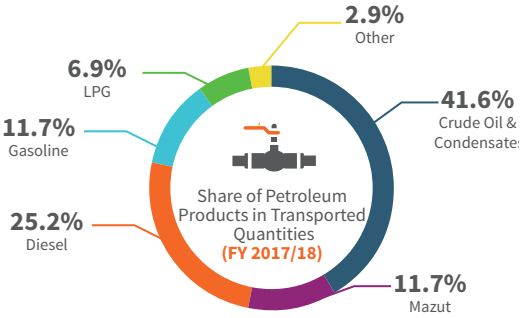




Despite the increase in the lengths of pipeline networks in FY 2017/18, transporting petroleum products fell by 3% on a yearly basis to record 55,373 metric tons in FY 2017/18. Crude oil and condensates represented around 42% of the transfered quantities in FY 2017/18 with 23,009 MT leading the total quantity of petroleum product transports.







3. TRUCKS

In the Egyptian market, trucks remain the main means of petroleum transportation that are used for transferring gasoline, diesel, mazut, and liquefied petroleum gas (LPG).

The total quantities transferred by trucks declined in FY 2017/18 by 4.12%, recording around 17,395 MT down from 18,143 MT in FY 2016/17. According to CAPMAS's figures, diesel accounted for 50.6% of the transported quantities by trucks in FY2017/18.

Gasoline, mazut and LPG followed diesel in the share of total quantities transported by trucks. In FY 2017/18, 4,648 metric tons of gasoline were transferred by trucks, which represented 26.7%. LPG had the least transported amount at 1,658 MT, accounting for 9.5% of the total quantities transported by trucks.

It is worth noting that diesel and gasoline quantities transported by trucks between FY 2016/17 and FY 2017/18 remained almost unchanged with slight differences. For instance, the diesel quantities that were transported increased by 0.006%, while the gasoline quantities rose by 0.005% in FY 2017/18. Diesel transportation reached 50.6% in FY 2017/18 compared to 48.2% in FY 2016/17.

Mazut and LPG were the products transported the least, as transported mazut quantities fell by 19.6% in FY 2017/18 and the LPG quantities shrank by 13.6% in comparison to FY 2016/17. Accordingly, LPG was the product with the smallest share at 9.5% in FY 2017/18.

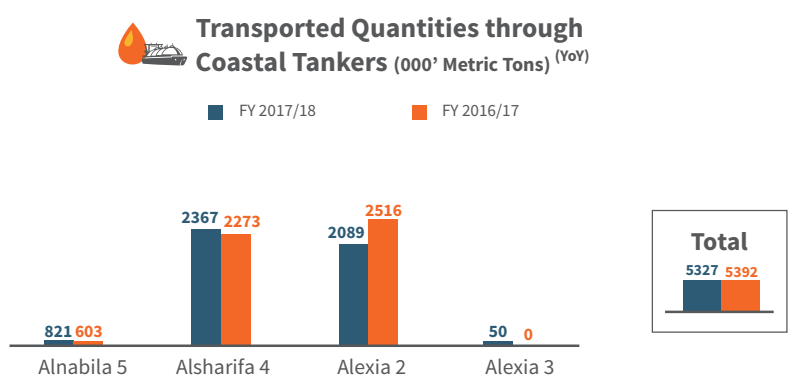
4. WATER TRANSPORT UNIT

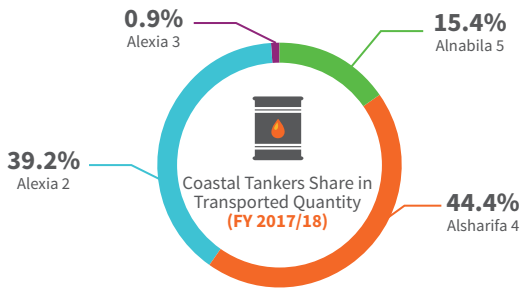
Egypt had four running coastal tankers in FY 2017/18. Namely, Alnabila 5, Alsharifa 4, Alexia 2 and Alexia 3. Those tankers were capable of transporting 5,327 MT in FY 2017/18. CAPMAS's figures show that Alsharifa 4 transported 2,367 MT, which is the largest amount transported by these tankers, representing 44.4% of the total quantities transported by coastal tankers.

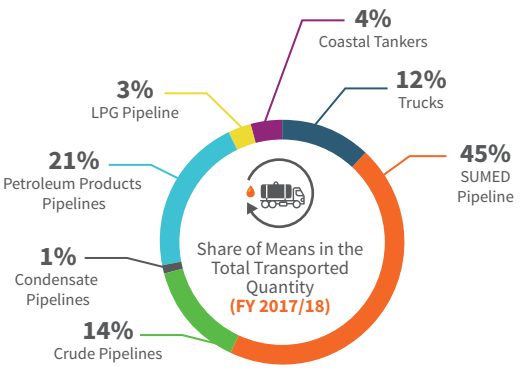
However, coastal tankers witnessed the smallest change in the percentage rate among other coastal tankers in two years, as it increased in FY 2017/18 by 4.13% more than FY 2016/17. Alexia 3 transported the fewest amount among other tankers, with only 50,000 MT; which represented 0.93% of the total quantities transported by coastal tankers. Alnabila 5's transports increased by 36.15% in FY 2017/18 in comparison to FY 2016/17. Moreover, Alexia 2 was the only tanker that witnessed a decrease of nearly 17% in FY 2017/18 in comparison to FY 2016/17. However, Alexia 2 was not used before as it was decommissioned.

On the other hand, Alsharifa 4 represented the tanker with the highest share in transporting oil among all other tankers in FY 2017/18.

These tankers differ in their characteristics. For instance, Al Nabila 5 has the highest maximum recorded-speed among other tankers, which is 13.4 Knot, while Alexia 3 has the biggest size (in length and breadth), (248m*43m). Furthermore, Alexia 2 is the smallest, slowest in speed, but enjoys the highest capacity. It is worth noting that all these tankers are Egyptian crude oil tankers except Al Nabila 5, which is an oil products tanker.







LEADING INDICATORS

The cost and quantities of the petroleum transportion means are two leading indicators to be considered for an efficient transportation process. The total petroleum transportation costs in Egypt increased by 3%, reaching EGP 19.9 billion in FY 2017/18, up from EGP 19.3 billion in FY 2016/17. As a result, the quantity of the petroleum products that were transported decreased by 7%, reaching 136,897 MT in FY 2017/18, down from 147,131 MTin FY 2016/17.

The SUMED pipeline, which is one of the successful joint Arab-Egyptian projects, has been expanding since 1970s. It transferred 58,417 MT in FY 2017/18, compared to 66,294 MT in FY 2016/17 at a cost of EGP 2.45 billion, down by 12%.

Nonetheless, the SUMED pipeline has represented the means of transportation that transferred the highest quantity of petroleum products in FY 2017/18 with a 45% share. On the other hand, the remaining 55% of petroleum products were transferred by various means including railways tankers, trucks, and coastal tankers, as well as crude, condensate, LPG, and petroleum pipeline.

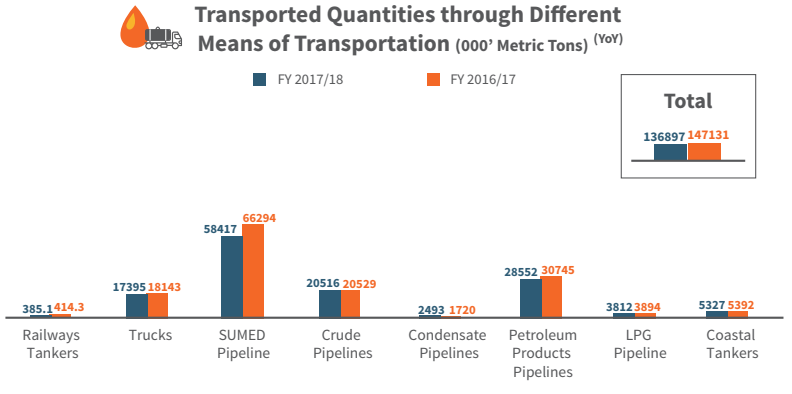
Railways tankers in Egypt have not been upgraded since 1960s. In 2014, the Ministry of Petroleum and Mineral Resources took an initiative to upgrade 100 tankers. A contract was signed between the Egyptian General Petroleum Corporation (EGPC) and the Egyptian National Railways (ENR) to increase the petroleum products quantities transferred to Upper Egypt from 1,000 tons per day (t/d) to 1,500 t/d. In addition, another contract was signed to purchase 250 tankers that would transfer petroleum products of some petroleum companies to different regions in Egypt, the Minister of Petroleum, Tarek El Molla, said in an interview with el Mogez Newspaper in April, 2014.

However, railway tankers have represented the means of transportation with the lowest quantity transferred of petroleum products. Tankers transferred only 385,100 MT in FY 2017/18 at a cost of EGP 50 million, down from 414,300 MT in FY 2016/17 at a cost of EGP 36 million, declining by 711%.

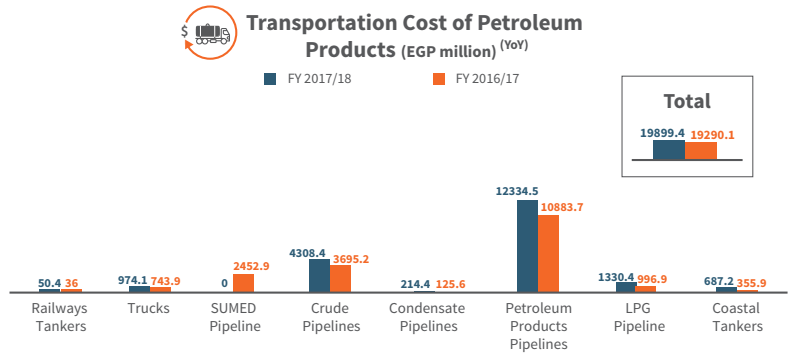
Additionally, the total quantities of crude oil, condensates, LPG, and other petroleum products that were transferred through pipelines declined by 3% to reach 55,373 MT in FY 2017/18 at a cost of EGP 18.2 billion, down from 56,888 MT at a cost of EGP 15.7 billion.

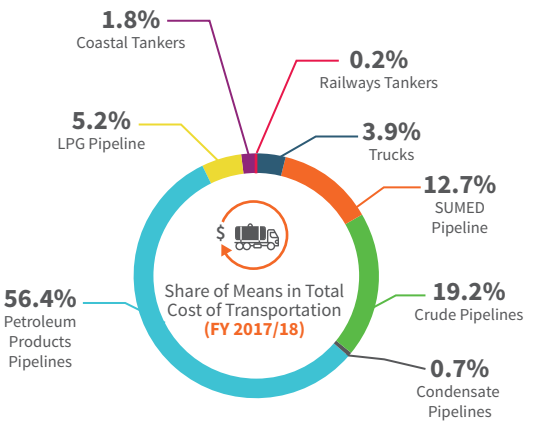
For the trucks, it is evident that the total quantities transferred by this means decreased by 4%, reaching 17,395 MT in FY 2017/18 at a cost of EGP 0.97 billion, down from 18,143 MT in FY 2016/17 at a cost of EGP 0.74 billion.

On the other hand, there are coastal tankers, which represent the containers that have been designed for carrying fuel to vessels offshore. The transferred crude oil and other petroleum products by coastal tankers slightly decreased from 5,392 MT in FY 2016/17 at a cost of EGP 0.4 billion, reaching 5,327 MT in FY 2017/18 at a cost of EGP 0.7 billion.



Costs have greatly affected the quantity of petroleum products that were transported. It is clear that when the total transportation cost increased by 3% year-on-year (YOY) in FY 2017/18, the quantity of transports decreased by 7%. However, over the past few years, the transportation and distribution system of petroleum products in Egypt has witnessed a significant leap nationwide. This progress has highly contributed to the market stability.





Additionally, new measurements have been implemented by the Ministry of Petroleum and Mineral Resources in 2018 to improve the efficiency of the transportation and distribution system of petroleum products. Consequently, the domestic needs of these products will be met. Security, safety, and environmental protection policies must be considered while transporting and uploading fuels to ensure the adequacy of any future plans, El Molla stated in an interview with Reuters in March 2019.