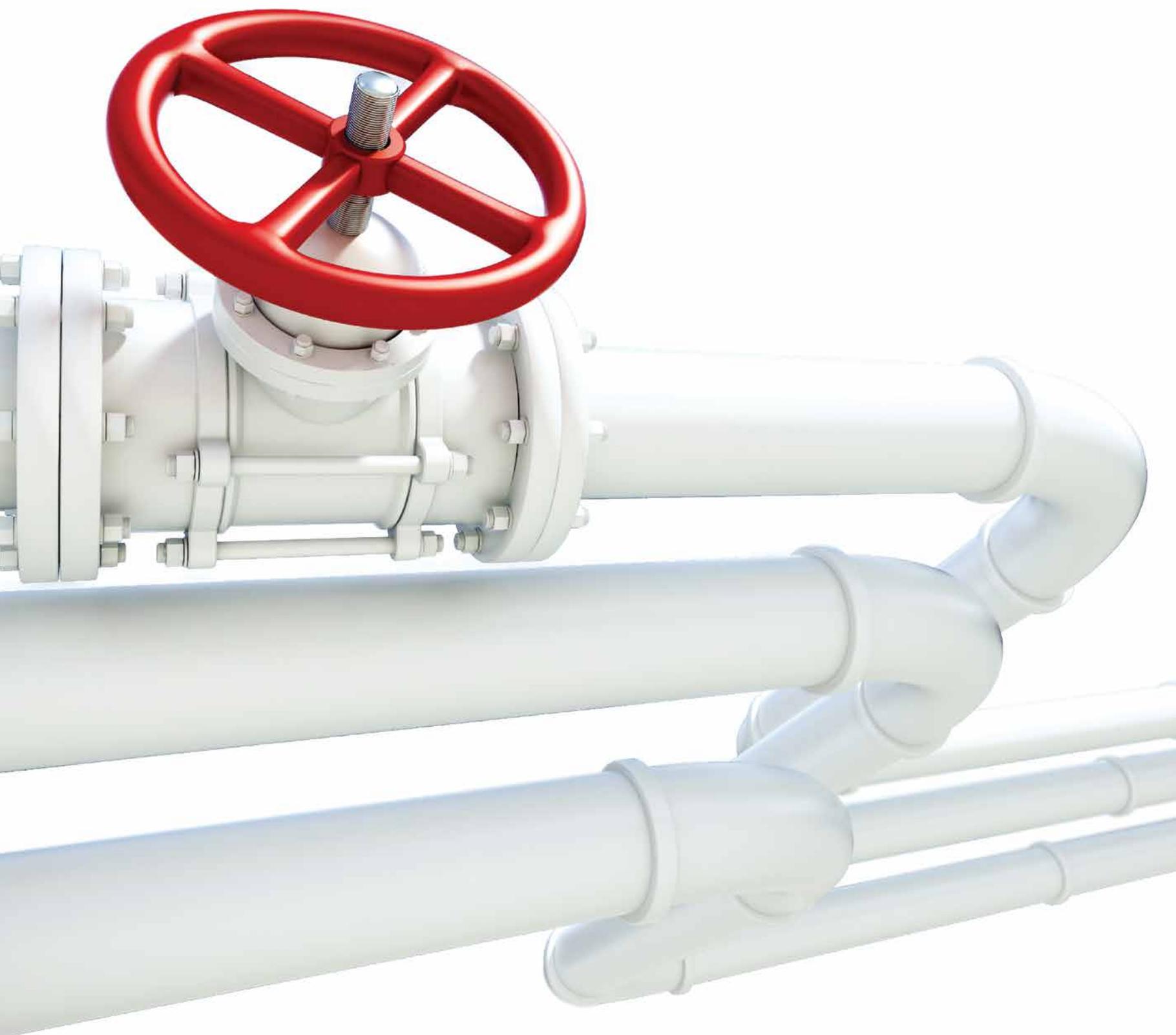


TRACING THE DOWNSTREAM ACTIVITIES DEVELOPMENT OVER FYS (2014/15-2018/19)

BY AMINA HUSSEIN, REHAM GAMAL, AND TASNEEM MADI



Downstream activities in the petroleum sector are essential for securing and meeting the domestic demand of natural gas. With this regard, the Egyptian Natural Gas Holding Company (EGAS) started natural gas connection activities in 1981. The activities target connecting natural gas to the consuming sectors, represented in industrial, commercial, and residential sectors, to replace butane with natural gas.

Since starting the activity and until June 2019, over 10 million residential consumers, 2,531 industrial facilities and 20,617 commercial units were connected to natural gas. Thus, with the increasing reliance on natural gas, many natural gas grid projects have been implemented to link between the natural gas fields and facilities, bringing the grid's length to about 60,000 km in June 2019, as explained in EGAS Annual Reports (2014/15-2018/19).

Furthermore, in 1985, EGAS started the activity of converting vehicles into natural gas. Over the last five years, EGAS succeeded in expanding the use of natural gas as fuel for vehicles through the establishment of new gas fueling stations and conversion centers. From the start of the activity until June 2019, the number of Total converted vehicles reached 275,968, as explained in EGAS Annual Reports (2014/15-2018/19).

NATIONAL GRID DEVELOPMENT

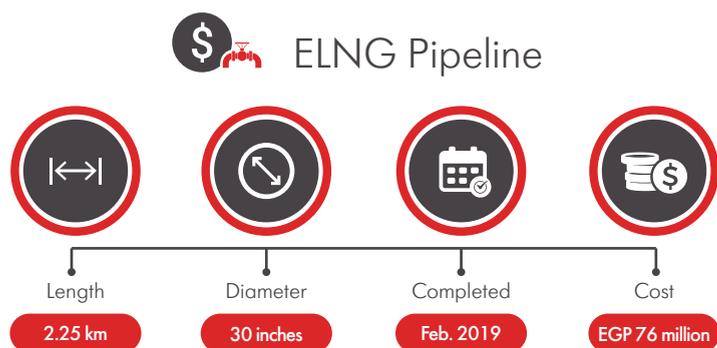
In light of the upgrading plan for the national gas grid and preserving assets complying with the standard maintenance procedures for gas pipeline projects, EGAS has been successfully working on a number of national gas grid pipeline projects since Fiscal Year (FY) 2014/15 and until FY 2018/19. Over the referred period, 31 natural gas pipelines were constructed with total costs of EGP 8.7 billion, EGAS Annual Reports (2014/15-2018/19).

In FY 2014/15, the petroleum sector succeeded in completing nine natural gas pipeline projects, representing the highest number of implemented projects over the referred period. The projects added length to the grid totaled 215 km with total costs of EGP 1.3 billion. By the end of the year, the natural gas national grid reached a total length of 40,000 km with a capacity of 7.6 trillion cubic feet (tcf) of transported natural gas, according to EGAS Annual Report 2014/15.

Over the period from FY 2015/16 to FY 2017/18, more than 15 natural gas pipeline projects were implemented with total costs of EGP 3.5 billion. Over this period, the natural gas national grid reached a total length extended from 44,000 km to 51,000 km, while the natural gas capacity increased from 7.7 tcf to 8.5 tcf, respectively.

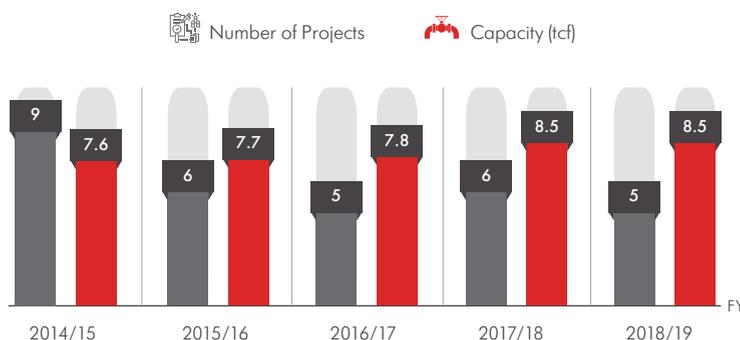
In FY 2017/18, the total imported quantities of natural gas supplied to the national gas grid were significantly reduced by 40% to reach 221 billion cubic feet (bcf). This was achieved through the discovery of new gas fields and increase in natural gas production by 29%. The increase in production led to saving hard currency for developing the national grid development projects, explained in EGAS Annual Reports (2015/16-2017/18).

Accordingly, FY 2018/19 witnessed the execution of five natural gas pipeline projects with relatively tremendous costs of EGP 3.9 billion compared to EGP 1.6 billion in FY 2017/18. The projects' pipeline length reached 292 km. The Egyptian LNG (ELNG) pipeline, one of the five pipelines, was established and extended from the national grid to feed Idku liquefaction plant with natural gas from the grid. During the year, Egypt succeeded to reach self-sufficiency and stopped importing Liquefied Natural Gas (LNG).



It is worth mentioning that the length of the natural gas national grid increased by 50% in FY 2018/19 compared to FY 2014/15 as it extended from 40,000 km up to 60,000 km. Meanwhile, the natural gas capacity rose by 12% from 7.6 tcf to 8.5 tcf, stated in EGAS Annual Report 2018/19.

National Gas Grid Development



NATURAL GAS CONNECTION

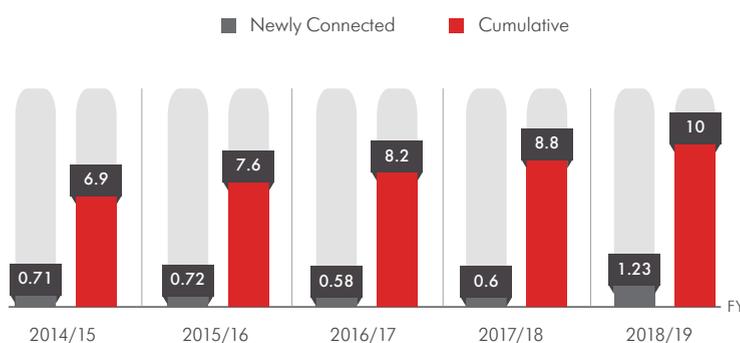
The residential sector along with the commercial sector consumes around 3% of the country's natural gas supply annually, according to EGAS annual reports. Over the period from FY 2014/15 to FY 2018/19, EGAS succeeded in connecting a total of 3.8 million residential units to the national gas grid. Annually the Ministry of Petroleum and Mineral Resources (MoP) connects an average of 0.77 million units to the grid, according to EGAS Annual Reports (2014/15-2018/19).

Over the referred period, the total number of residential units connected to the national gas grid increased by 45% to record 10 million units in FY 2018/19 compared to 6.9 million units in FY 2014/15, according to EGAS Annual Reports (2014/15-2018/19).

FY 2016/17 witnessed the lowest amount of connected residential units to natural gas with 0.58 million units. The relatively low level of connections in FY 2016/17 and the following year resulted in the increase in cost of connecting houses to the national grid. During the two years, EGAS has increased the cost of connecting residential units to natural gas from EGP 1,000 to EGP 1,800.

Following this decision, the government launched an initiative to deliver the natural gas to houses for EGP 30 per month over the course of six years; accordingly, FY 2018/19 witnessed a significant leap, achieving the highest residential connections since beginning of the activity at 1.23 million residential units, according to EGAS Annual Report 2018/19.

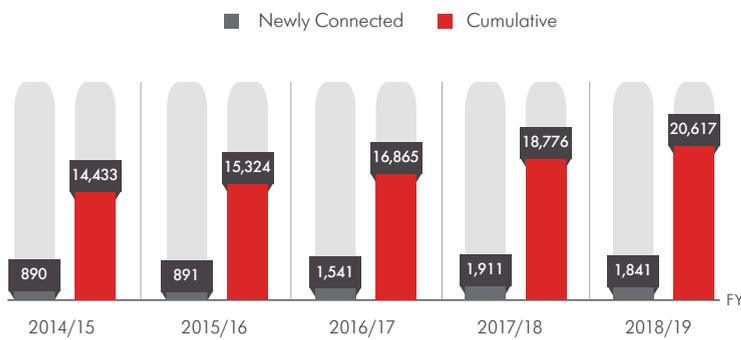
Residential Units Connected to Natural Gas (million)



As for the commercial units, EGAS was able to connect a total of 7,074 units over the period from FY 2014/15 to FY 2018/19. On average, the MoP connects 1,415 commercial units annually to the national gas grid, according to EGAS Annual Reports (2014/15-2018/19).

As a result of the expansion in connecting different areas to the natural gas grid, FY 2017/18 witnessed the highest number of commercial units connected to the national gas grid with 1,911 units. The total number of commercial units connected to the national grid increased by 43% from 14,433 units in FY 2014/15 to 20,617 units in FY 2018/19, according to EGAS Annual Reports (2014/15-2018/19).

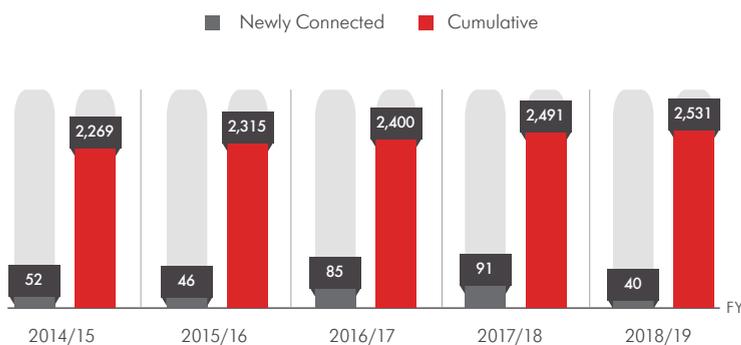
Commercial Units Connected to Natural Gas



The energy-intensive industries represent a relatively significant portion of Egypt's domestic natural gas supply with 22.5% in FY 2018/19, as mentioned in EGAS Annual Report 2018/2019. These industries include light industries like textiles and food, as well as heavy industries like steel and cement. According to EGAS, iron and steel manufacturers used 73.5 bcf (15%) of natural gas in FY 2018/19.

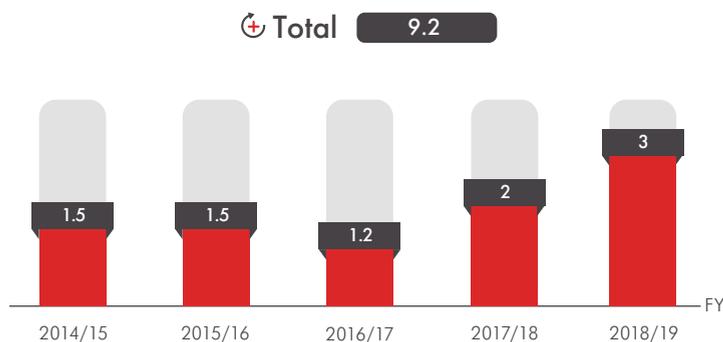
Over the period from FY 2014/15 to FY 2018/19, EGAS connected a total of 314 industrial facilities to natural gas, with an average of 63 units per annum. The growth rate of the total industrial facilities connected to natural gas, over the whole period, recorded at 12%, as the number increased from 2,269 units in FY 2014/15 to 2,531 in FY 2018/19, according to EGAS Annual Reports (2014/15-2018/19).

Industrial Facilities Connected to Natural Gas



The Local Distribution Company (LDC) plays a vital role in downstream activities through pumping investments to implement natural gas connection projects. Over the period from FY 2014/15 to FY 2018/19, the total investments spent by the LDCs on the natural gas connection projects amounted to EGP 9.2 billion. As a result of the increasing activity in connecting various units to natural gas, the investments implemented by the LDCs doubled in FY 2018/19 to reach EGP 3 billion compared to EGP 1.5 billion in FY 2014/15, according to EGAS Annual Reports (2014/15-2018/19).

LDCs' Investments on Natural Gas Connections (EGP billion)

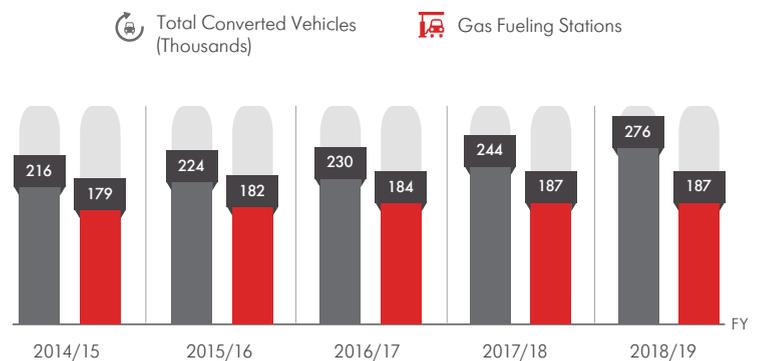


VEHICLES CONVERSION INTO NATURAL GAS

After 1985, the MoP has launched two affiliated companies, namely Car Gas and the Egyptian International Gas Technology (GASTEC). These companies are responsible for establishing Compressed Natural Gas (CNG) fueling stations and converting vehicles to run on natural gas. As a result, the private sector companies were allowed to contribute in the Natural Gas Vehicles (NGV) activity such as the entrance of Shell/Gas Express, Master Gas, Arabia Gas and Total Egypt. At the end of March 2017, Egypt was ranked as one of the pioneering countries in the NGV field, where the total amount of gas sales reached 217.9 billion cubic feet (bcf), according to GASTEC's website.

Over the period from FY 2014/15 to FY 2018/19, converting vehicles into natural gas activity has achieved unprecedented results, where a total of 71,912 new vehicles were converted into natural gas through 72 conversion centers and 187 gas fueling stations. On an annual basis, residential and CNG consumption represented about 5% of total natural gas consumption, stated in EGAS Annual Reports (2014/15-2018/19).

Vehicles Conversion into Natural Gas



In the framework of completing the activity's expansion programs, in FY 2014/15, 11,500 vehicles were converted through 71 conversion centers and 179 gas fueling stations. Hence, the total number of converted vehicles reached 216,000 vehicles this year. Since then, the conversion of vehicles has been following an increasing trend, explained in EGAS Annual Reports (2014/15-2018/19).

Over the period from FY 2015/16 to FY 2017/18, more than 20,000 vehicles were converted through establishing nine new gas fueling stations. Within this period, FY 2017/18 witnessed a rebound where the newly converted vehicles increased by more than 100% to reach 13,732 vehicles, due to the establishment of four new gas fueling stations and one new conversion center. Gas fueling stations reached 187 stations, while conversion centers reached 71 centers in FY 2017/18. In FY 2018/19, the number of newly converted vehicles jumped by 135% reaching 32,280 due to the establishment of a new gas fueling station and a conversion center. Thus, conversion centers reached 72 centers, during FY 2018/19. It is worth noting that the total number of converted vehicles into natural gas increased by 28% in FY 2018/19, in comparison to FY 2014/15. Accordingly, the converted vehicles totaled 267,000, according to EGAS Annual Reports (2015/16-2017/18).

Over the referred period, the downstream activities witnessed remarkable progress. This came in line with the digitalization plan which the petroleum sector started implementing in 2014. The plan adopted a digital transformation strategy to improve the sector's efficiency. In light of this strategy, downstream activities have been monitored and controlled by EGAS through a collective database. Accordingly, EGAS was able to achieve its targets and expansion plans as part of modernizing the sector.

Complying with the strategy, in FY 2019/20, over 40,000 cars were converted into natural gas where the gas fueling stations reached 206 and three car convention centers were constructed bringing them to 74 centers. The MoP targets 147,000 cars to be converted in the next three years with investments of EGP 1.2 billion, according to a ministerial press release reported on July 19, 2020.

Moreover, by offering more incentives, the government has reached unprecedented numbers in delivering natural gas to different consumers. Natural gas was widely delivered to 1.070 million residential units, as stated in a ministerial press release reported on July 5, 2020.