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CHALLENGES OF LPG SUPPLY, DISTRIBUTION & PRICING IN GROWING MARKET: BANGLADESH CASE STUDY

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ABSTRACT

The prime energy scarcity is nowadays a mostly the debated issue in Bangladesh in the awaken of spreading energy and fuel crisis. Pipeline natural gas support only 6 % domestic consumption of total population by 16 % of total produced gas which is declined mode. The claim of natural gas is on the continuous increase to meet domestic needs in the city, suburban areas together with industrial, commercial, power generation and diverse usage against the scarcity of gas. The demand for natural gas is on the continuous increase to meet domestic needs in the urban, suburban areas alongside industrial, commercial, power generation and diverse usage against the scarcity of gas. In this situation, LPG becomes a popular alternative energy source to reduce the natural gas crisis along with providing clean fuel in rustic areas. LPG is using by about 81% in its total amount for domestic purposes. At present in 2018 LPG demand in Bangladesh is approximate 750,000 MT and in future 2025 it would be 250, 0000 MT with growth rate 25%, 17 %, 14%, 15 %, 8%, 20% and 17% respectively. Now a day 12 KG LPG cylinders price is BDT 1150-1200 because of the variety of market barriers, government VAT and higher transaction costs which is not affordable for the middle as well as a low-income family though Bangladesh government fixed the price every month. LPG could assume an increasingly significant job in giving cooking energy to low-middle pay family units in Bangladesh if an appropriate advertising structure and circulation plan are masterminded. The aim of this project is to find out the challenges of LPG supply, distribution, and pricing in the growing Bangladesh market and to make a well planned and details road map so that LPG companies of Bangladesh can serve 70% of the domestic cooking fuel through LPG by 2025.

Keywords: Natural Gas, Shortage, LPG market growth, Challenges, Bangladesh.

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INTRODUCTION

Liquified petroleum gas (LPG) initiated by Dr. Walter Snelling in 1912 is a non-exhaustible wellspring of energy like every non-renewable energy source which is removed from raw petroleum and flammable gas where the principal creation is three or four carbon particles. The typical parts of LPG therefore, are propane (C_3H_8) 30% and butane (C_4H_{10}) 70%. Little groupings of different hydrocarbons may likewise be available (EduGreen, 2019; Hahn E., 2019). Under slight pressure for LPG (propane) goes from 152 kPa (24 PSIG or 1.5 bar) at 0°C to 2482 kPa (360 PSIG or 24.8 bar) at 70°C (Hahn E. 2019). LPG turns into liquid form and can then be stored in tanks. LPG converted back to gas before being burned. Therefore, that LPG cylinder is typically filled to 80%, meaning 80% liquid and 20% vapor (EduGreen, 2019; Hahn E., 2019).

Bangladesh is an extremely fascinating and engaging business sector for LPG in light of the fact that it is a spotless and safe fuel that has a scope of properties nearest to oil. LPG not just use in households, there are huge prospects of LPG in Autogas. Subsequently, the future LPG market in Bangladesh is high, as the normal income level per family has been developing continually for quite a long time (Rahman M., 2017; Islam M.S, 2018; Power System Master Plan 2016; ADB TA 8839 BAN, 2016). Then again, the appeal of natural gas is on an unending increment to address local issues in the urban, rural regions close by powered, business, control age and differing utilization against the deficiency of gas. According to energy expert, the remain natural gas reserve will be kaput within 10 to 15 years which is shown in projected demand and supply in **figure 1** and **figure 2** (Energy Scenario Bangladesh: 2017-18 2019; Hydrocarbon Unit, 2021).) For example, in the year 2035, total demand (8000 MMSCFD) supply (5880 MMSCFD) gap nearly 2120 MMSCFSD. To meet the supply shortage, LPG is the best solution for household energy supply (Islam M.S 2018, Energy Scenario Bangladesh: 2017-18 2019; Power System Master Plan 2016; Hydrocarbon Unit, 2021).)

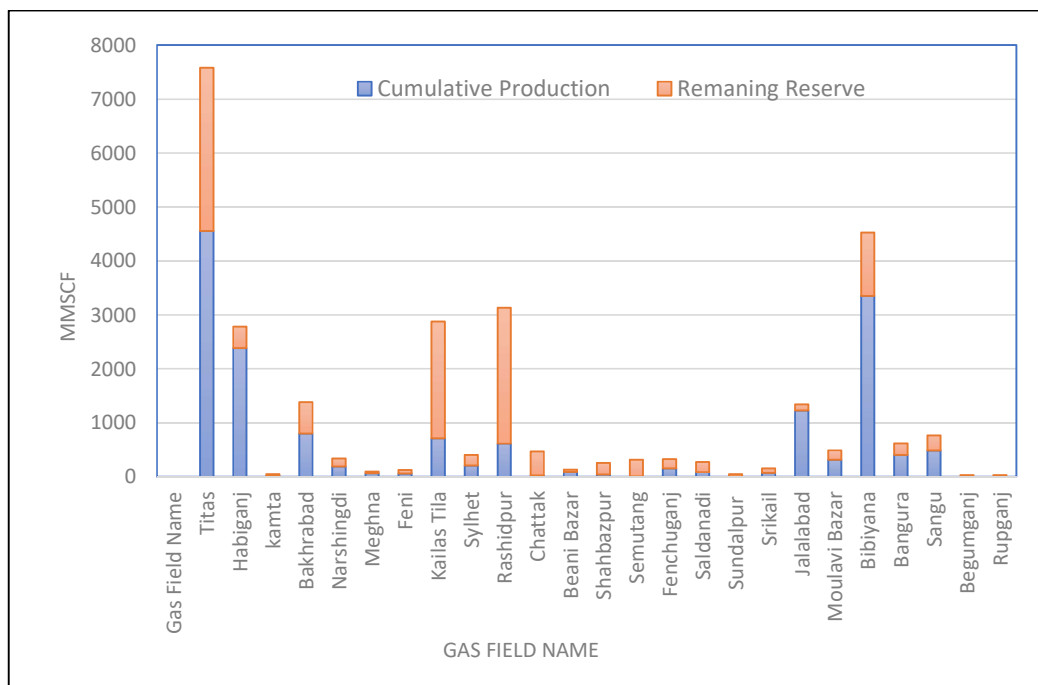


Figure 1: Produced vs remaining gas reserve for all fields in Bangladesh (Power System Master Plan 2016, Energy Scenario Bangladesh: 2017-18 2019; Hydrocarbon Unit., 2021).

The principal purpose of the LPG sector is to attain household fuel demand and transportation. The aim of the paper is to find out the challenges of LPG supply, distribution & pricing in the growing Bangladesh market and its Ultimate Solutions by taking with local stockholder, businessman, market visit and analyzing the energy situations in Bangladesh.

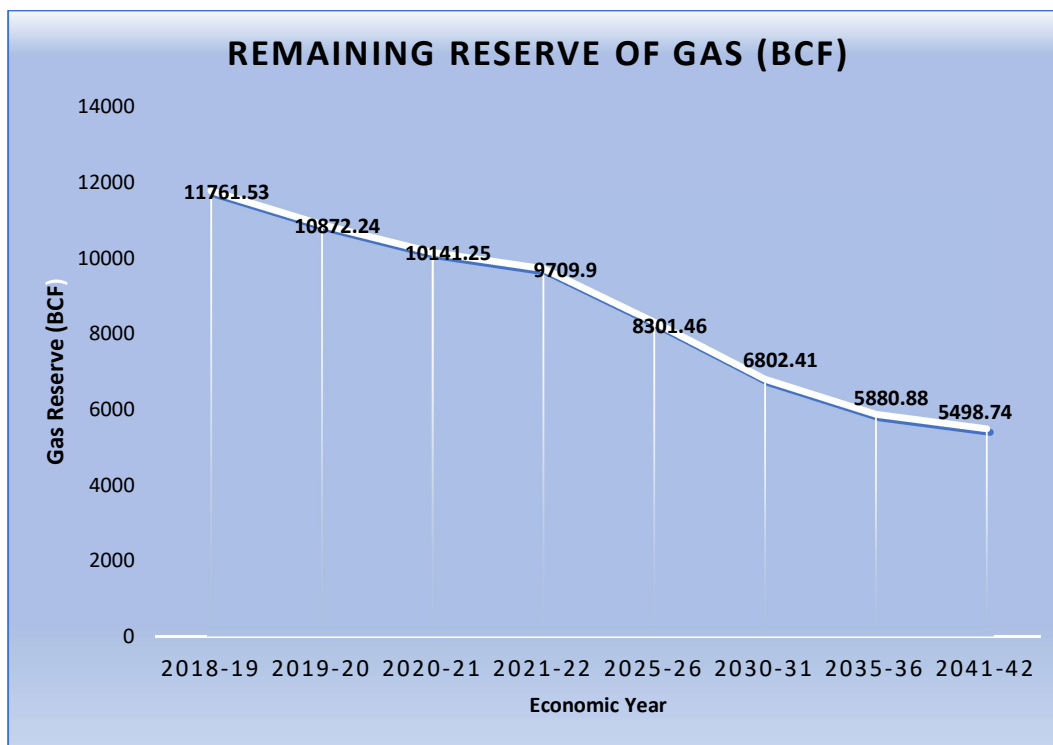


Figure 2: Projection of Gas production in Bangladesh (Energy Scenario Bangladesh: 2017-18 2019; HydrocarbonUnit. (2021).

Why LPG Is the Best Option for Domestic Purpose in Bangladesh?

About 160 million+ inhabitants, Bangladesh needs a very accurate and comprehensive plan to supply primary fuel for cooking. Pipelined natural gas support 6 % domestic consumption of total population by 16 % of total produced gas which is declined mode (Islam M.S 2018, Islam M.S 2018, Energy Scenario Bangladesh: 2017-18 2019;)

As per the Bangladesh government plan, around 2.3 million NG residential clients and 0.18 million CNG autos to be changed over in LPG/different options by 2025. On the other hand, LPG (Propane 2572 Btu/ft³ · Butane 3225 Btu/ft³) has higher calorific value than petrol, wood, kerosene and produce less CO₂, ultra-fine particulates, NO_x than petrol or diesel engine (TinleyTech, Chowdhury I. 2018, Engineering ToolBox). It not only is good for the engine but also for the environment as it is free of lead and contains very low sulfur and other heavy metals. In adding to the fact that LPG is economy than petrol and diesel when relating the cost per mile for fuel.

Present LPG market situation in Bangladesh

Bangladesh's LPG demand is just 2% of absolute oil demand, and under 0.01% out of the all-out energy request (Chowdhury I., 2016; Habib, W. B., & Molla, M. A.-M., 2019).) which can be expanded by the inaccessibility of new NG associations at household, expanding the cost of kerosene and diminishing openness of firewood.

However, LPG request is expected to develop provocatively as a substitute for household cooking fuel and transportation fuel (as Autogas). The rising interest for LPG is an outcome of exhausting gas stores in the country (Habib, W. B., & Molla, M. A.-M., 2019).

About 81% of total LPG in Bangladesh is used for the domestic purpose, 14% is used for the Industrial purpose, 1% is used for the large industry, 1% as transport called LPG as Autogas and 3% is used for other purposes (Shown in **figure 3**) where Bashundhara and Omera's market share nearly 44% flowed by Jamuna - 17%, BM - 11%, Laugfs - 7%, TotalGaz -5%, others 16%. (Rahman M., 2017; Islam M.S, 2018; Islam M.S, 2018; Chowdhury I., 2016; Habib, W. B., & Molla, M. A.-M., 2019)

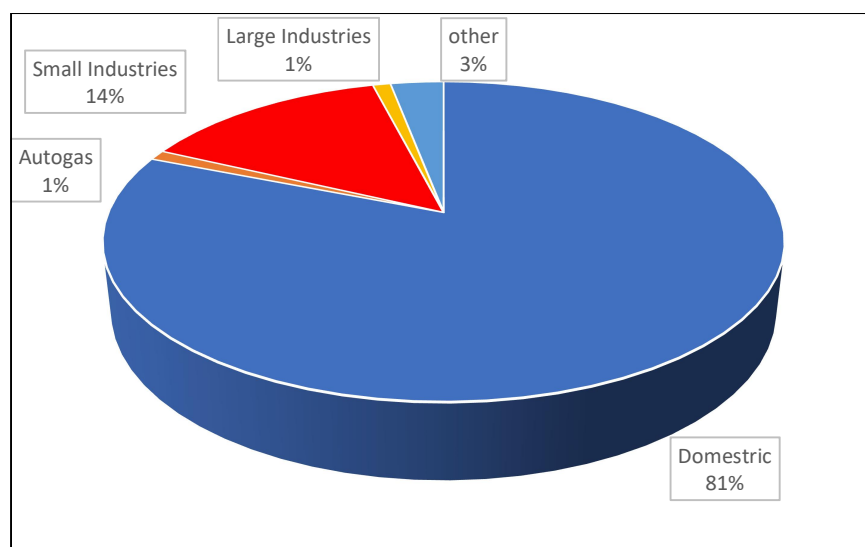


Figure 3: Sector wise LPG uses in Bangladesh (Islam M.S, 2018; Rahman M. A., 2018; Chowdhury I., 2018)

The LPG market increasing (2016-50 %, 2017 -51 % and 2018 -31%) dramatically last five years and predicted that will increase 2,700,000 MT in 2025 from 131,916 MT in 2015. The LPG market and its forecast up to 2025 with year-by-year growing percentages given in **figure 4** (Rahman, M. A., 2018; Mahmud F.,2019).

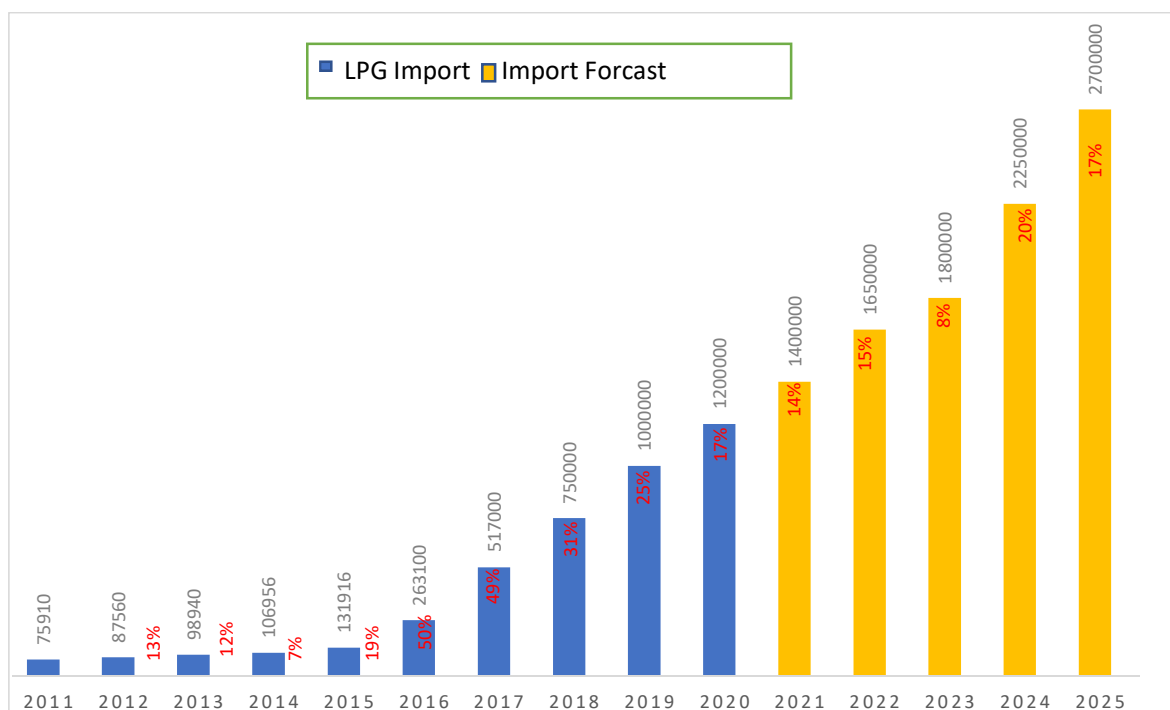


Figure 4: The LPG market and its forecast up to 2025 (Islam M.S 2018, Jahangir S. 2018, Bangladesh LPG Import Forecast 2018-2025, Mahmud, F. 2019.)

This graph clearly indicates that if 2.30 million natural gas users and 0.18 million CNG users converted to LPG, the market will be higher than the forecast.

CHALLENGES OF LPG SUPPLY, DISTRIBUTION & PRICING IN BANGLADESH

Challenges of LPG Supply in Bangladesh Market

In 2017, the World LPG Association's annual report mentioned: Bangladesh one of the fastest-growing markets of the World. Within five years, the number of import terminals reached 18 (eighteen) from 6 (six). With initial pioneer investor Bashundhara, Jamuna Spacotech, TOTAL and LAUGFS, Omera, BPC, few other local big names added to the importers' list, in addition to the old players' reinvestment. More than 55 private LPG companies in total in Bangladesh, which are directly or indirectly, involved in the LPG business. At present condition more, than 50 LPG companies get a license from the Government for business in Bangladesh and from those companies five or six will come to operation in next 10 to 12 month and about 20 LPG companies are now in the operation field in Bangladesh (BEE R.E, 2012; Islam M.S, 2018; Islam M.S ,2018; Makeen Energy Published, 2017; Mahmud, F., 2019).

Private sector import LPG (more than 95% of the country LPG demand) from Singapore, Malaysia, Saudi Arabia, Abu Dubai, and Kuwait by Saudi Aramco (the state-owned oil company of Saudi Arabia) monthly contract price. The buyer has to pay Aramco Contract Price during their order for bulk LPG from the global market and need to add the freight per ton charge (for shipment to Bangladesh) which reached in Bangladesh after 2-4 months later (Islam M.S 2018; ADB TA 8839 BAN 2016; Mahmud, F., 2019).). Almost the total amount of LPG demand in our country is met by the imported LPG from abroad by Bulk LPG Cargo Ship the supply chain of LPG given in **figure 5**.

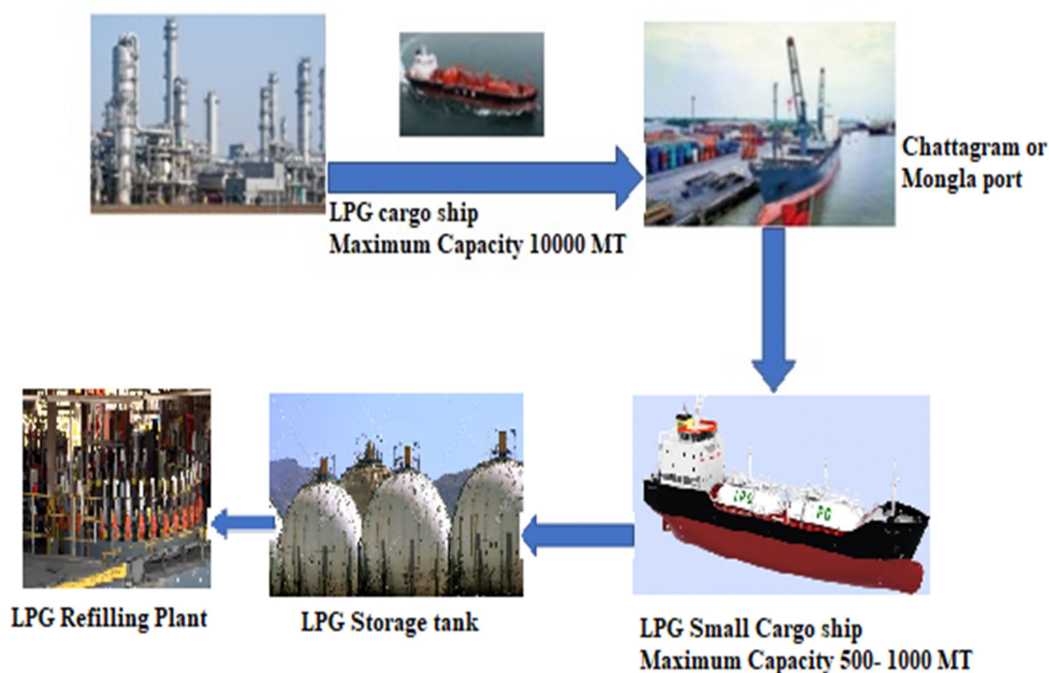


Figure 5: LPG supply procedure in Bangladesh

As LPG imported by LPG cargo ship, so seaport is also an important factor for LPG import. Other hand government policy and Saudi Aramco contract prices are big challenges for LPG supply in Bangladesh which are shown in **figure 6**.

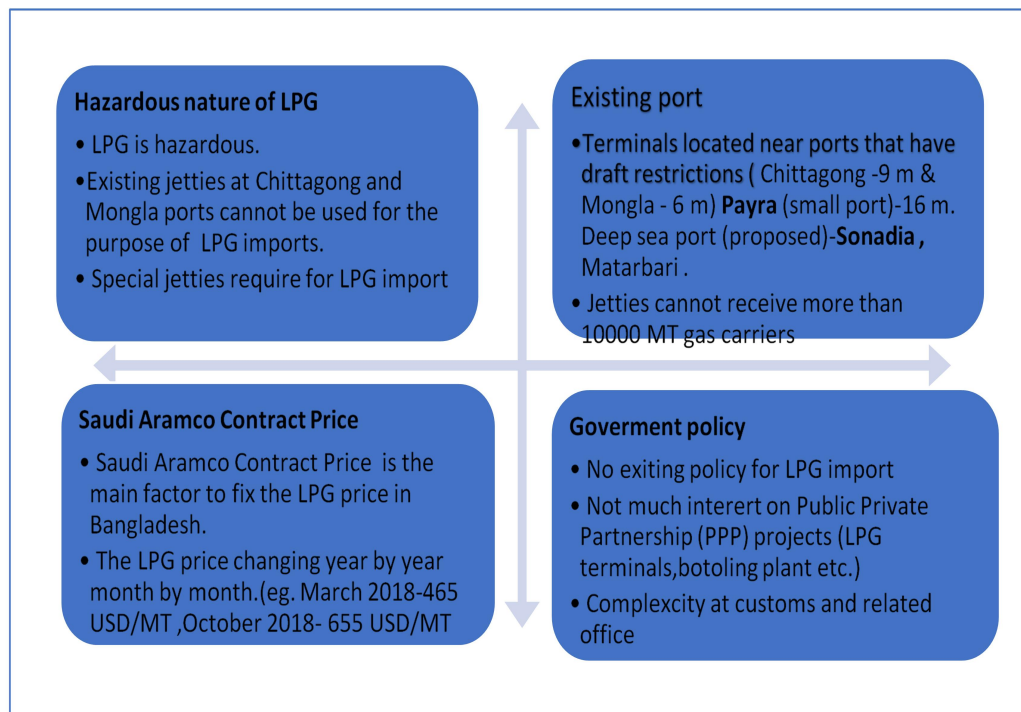


Figure 6: LPG Supply Challenges in Bangladesh (BEE R.E , 2012; Islam M.S, 2018; ADB TA 8839 BAN 2016)

Challenges of LPG Distribution in Bangladesh Market

LPG business is entirely different than FMCG business or any sustenance and drinks like a one-time business. This business is all about a close relationship with the client, merchants, retailers, and transporters. The dispersion procedure of LPG in Bangladesh appeared in figure 7. To do a good business by following all this criterion some challenges have come forward:

1) Managing cylinder supply chain

Managing cylinder supply network is the most down to earth challenge in LPG business, which is a considerable amount overwhelming in weight and cost too is the way to fortify the organization to do the business easily.

2) Growing up the safety culture among the distributors and retailers

Growing up the safety culture among the distributors and retailers is also a big challenge to grow the business in a sustainable manner.

3) Lacking awareness

Lacking consciousness of doing good faith business among wholesalers and companies is also a challenge in recent days.

4) Malpractices by ill-motivated executive

Malpractices by the ill-motivated executive, traditional bureaucratic delays from different Government bodies.

5) Infrastructure

The existing infrastructure at Bangladesh ports for LPG is inadequate to meet present demand. The Draft problem of the river, the large ship can't enter those rivers from the deep sea. Therefore, the distribution cost is increased. Due to inadequate import facilities on the coast, inland movement is required and the costs are substantial. In Bangladesh, there is more than 18 LPG terminal in 2018 and it will be reached to 30 in 2025 . Almost more than 15 satellite filling stations are established by various LPG Company (where Bashundhara LP Gas and Omera Petroleum contain 3 LPG satellites each of them) to distribute and maintain the LPG cylinder chain all over the country. Rangpur Division (districts like Rangpur, Dinajpur & Thakurgaon) and Sylhet Division (districts like Mowlabubazar, Hobigonj, Sunamganj) have lower penetration in LPG coverage as compared to other divisions through the river. LPG transportation via road costly than transport by the river with small LPG vessels (Chowdhury I. 2016; Energy Scenario Bangladesh: 2017-18 2019; ADB TA 8839 BAN 2016).

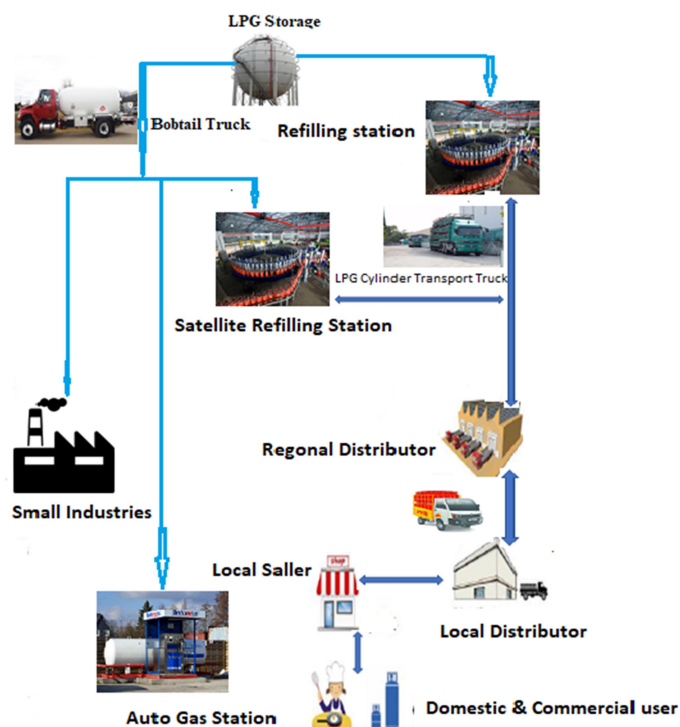


Figure 7: LPG distribution process in Bangladesh

The BRTA laws to carry LPG cylinder, executive distribution channel, higher premium cost, consumer behaviors are the big challenge for growing LPG market in Bangladesh

Challenges of LPG Pricing in Bangladesh Market

LPG can play a vital and useful role to provide a secure primary energy mix. The price of the LPG cylinder at customer ends mainly depends on government import policies, LPG station licensing process, transportation, relevant infrastructure, hidden cost, etc. which are shown in figure 8. The main challenges of LPG pricing in Bangladesh are pricing strategy, regulations, necessary supply chain development, future needs, technical and technological efficiency, assessment of futuristic demand growth and scopes for use in industry and transport communication sector, domestic users' and safety guidance, etc.

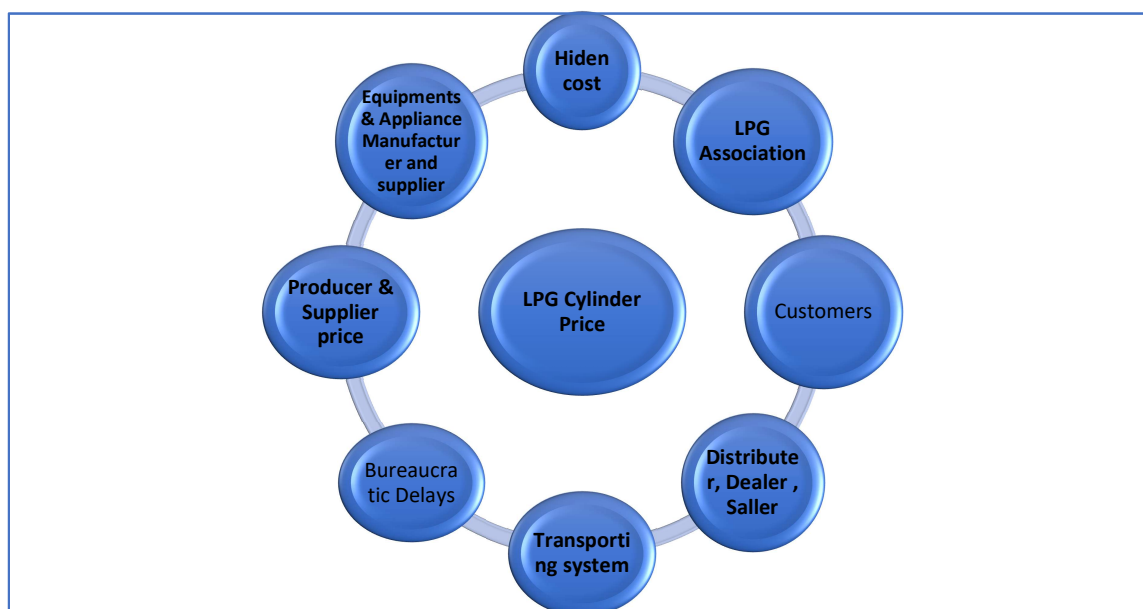


Figure 8: The LPG Cylinder Price Dependency in Bangladesh

The operator of Bangladesh purchases LPG from the international market either in spot or term contract. For the pricing of LPG, some challenges come forward are disused below.

The Saudi Aramco Contract Price

The Saudi Aramco Contract Price is the most important factor that determines the LPG prices in Bangladesh. It is also known as “CP Price”. The operators purchase LPG from the International market either in spot or term contract. Its formula is generally based on CP plus freight and premium. There are several factors that decide the freight and premium, but the CP always remains constant for a month. Saudi Aramco is responsible to declare monthly CP

for the International market. The importers have to pay for freight, premium and necessary duty & taxes to release the gas from the ship. After including all sorts of overheads the expands the gas is solid the market in the different pack sizes.

LPG price for customer = Saudi Aramco Contract Price + Premium cost + Cylinder refilling cost + Dealer profit + Distributor profit + Local seller profit

Vat on LPG Accessories

Vat on LPG accessories is also a big challenge for LPG pricing. LPG accessories like LPG cylinders, LPG valves, Regulators, hose pipe, clips, burners of different sizes. Unless these items get the benefit of VAT exemption, the penetration LPG shall always remain challenging

Aggressive marketing to capture market share

The operator wants to sell to their distributors & dealers at a lower rate with a very low margin to capture market share. Therefore, it is one of the practical challenges for LPG pricing

Different freight and premium for different companies

Some companies can bring cargo at a relatively lower price because of their storage advantage. So, these operators do not tend to increase the price right away and putting the other operators in pressure. So, it is also a big pricing challenge for LPG Company.

CONCLUSION AND RECOMMENDATION

Conclusion

Bangladesh LPG industry has a great prospect no doubt but we have to consider a few issues resolved as discussed above. Moreover, we should not overrate the industry in such a way so that investors are jeopardized in the end upon invested and get ruined their money. If all the challenges are be solved then the LPG industry of Bangladesh will take a sustainable position in the energy sector and they will be able to fulfill the target to serve 70% of the domestic cooking fuel will be served through LPG by 2025, with a reasonable price for the middle- and low-income people. In the invigorate of expanding energy emergency, the following suggestions can be pursued upgrade of LPG ubiquity. By following those recommendations, I think the LPG companies will be able to spear the LPG among the rural and sub the rural part of the country and they will be able to make LPG more popular than other traditional fuel sources (wood, animal waste, kerosene, etc.)

Recommendation

- Developing new higher capacity import terminals near deep-sea ports (Draft – 50 meter) to facilitate the handling of higher capacity carriers (50,000 -100,000 MT)
- High capacity bulk storage facilities (mother storage) near deep seaports need to construct.
- Dredging needed in the river to transport the LPG within major strategic locations of the country for efficient & cheaper way of LPG distribution.
- Proper national LPG policies for sourcing, tariff, retail distribution and market management imposed by GoB.
- To cut the distribution cost of LPG, LPG rectification may use in high rise building gas supply
- Government should take the necessary steps to reduce the monopoly business in the LPG sector.
- Increase the price of pipe gas (two-burner 2500 BDT and one burner -1500 BDT) and subsidize in LPG cylinder price (12 kg cylinder - maximum 800 BDT).

Highlights

- 16 % natural gas used by 6 % of total population
- LPG is the household alternative energy in absence of natural gas
- The Demand of LPG will increase 320 % within next 10 Years
- Government policy, Infrastructure, awareness, international price are the main Challenges to grow the LPG market.
- Government should take necessary steps to reduce the challenges to increase the market share of LPG market in Bangladesh

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