

**AN EXCEPTIONAL ENERGY CASE STUDY**  
**LPG to be Used for Ceramic Brick Production in Bangladesh**

Photo credit: Larry C. Price/Pulitzer Center on Crisis Reporting

**A new era in the LPG industry is going to be launched in Bangladesh. For the first time in Bangladesh LPG will be used to manufacture ceramic bricks.**

**WLPGA member Bashundhara LP Gas Limited (BLPGL), the Bangladesh LPG market leader and one of the pioneers of the LPG industry in Bangladesh, has taken on a new challenge to supply LPG to the brick making industry in order to produce ceramic bricks in a new, efficient, and environmentally friendly way by using LPG to displace coal.**



**WORLD LPG ASSOCIATION**

182 avenue Charles de Gaulle  
92200 Neuilly-sur-Seine - France  
[www.wlpga.org](http://www.wlpga.org)



# 1. The LPG Market in Bangladesh

Bangladesh sits to the north of the Bay of Bengal and has borders with India and Myanmar. It has a population of 167 million with nearly 40% of the population living in the urban areas. The country is prone to flooding.

Bangladesh has natural gas reserves, but these are dwindling, causing the government to take action five years ago.

The LPG industry is almost thirty years old but until recently demand had been flat at around 50,000 metric tonnes (MT)/year.

The last few years has witnessed a dramatic increase in LPG demand following a change of government policy supporting LPG use at the expense of natural gas.

LPG is now preferred to natural gas in the residential and transport sectors. As a result, today the country's LPG demand is around 1 million MT/year. Although the residential sector dominates LPG demand - where it displaces traditional dirty fuels such as wood, coal, charcoal and rice husks, as a cooking fuel - there has also been some successful transitioning away from these traditional fuels in some of the country's industrial activities. One example of this is in the ceramic brick manufacturing sector where coal is used extensively, creating widespread pollution in the urban areas.

This case study examines one example where coal has been displaced by LPG creating major environmental and health benefits.

The shallow water draft, in and around Bangladesh, makes it challenging for vessels. LPG suppliers

www.cia.gov



struggle to bring supplies into the country economically. Innovative solutions include flat bottom barges and sub-sea pipelines.

Despite the challenges Bangladesh is now the fastest growing LPG market in the world (Ref: WLPGA Statistical Review of Global LPG 2020).

The per capita consumption of LPG in the residential sector is still below 5kg/year suggesting significant opportunities remain to expand the residential sector further.

It is predicted that Bangladesh may see LPG demand reach 2.5 million MT in 2025 and perhaps 3 million MT by 2030.

## 2. The Challenge



BLPGL bulk storage photo courtesy Bashundhara LP Gas Ltd.

CO2 emissions of 15.67 million MT.

The industry accounts for approximately 1% of the country's Gross Domestic Product (GDP), and generates employment for over one million people.

Bangladesh is one of the world's most densely populated countries and it is growing fast. At the current growth rate, Bangladesh will require approximate four million new houses annually and that will lead to increased demand for construction materials, especially bricks for buildings.

Bangladesh is the fourth largest brick producer in the world, and fired ceramic bricks are one of the most important construction materials in Bangladesh.

In 2019, the country had more than 7,200 coal-fired brick kilns, producing about 32.4 billion bricks annually, compared to 23 billion bricks in 2017. The Bangladesh brick industry consumes 5.68 million MT/year of coal annually, generating

### 3. The Project

There are serious pollution issues arising from the current brick making industry. Dust from the brick-making sites spreads to nearby towns and villages, affecting the lungs of young and old and generating health problems the country is ill-equipped to handle.



Photograph courtesy of Larry C. Price/Pulitzer Center on Crisis Reporting

About half of Bangladesh’s bricks are fired with coal, making them the single largest source of greenhouse gas emissions (GHG) in the country. Several million tons of GHG’s are emitted annually. There are over five hundred brick producing sites powered by inefficient coal fired kilns that have little or zero pollution control. Despite this, Bangladesh favours coal fired technology for brick making because of the low price of coal. The coal firing system is the oldest technology in the world, and different types of coal fired systems are available in Bangladesh. A large proportion of the industry uses open bed coal fired systems which emit high levels of carbon and sulfur into the environment. The coal fired technology operates on the reduction firing process which means insufficient oxygen is available creating incomplete combustion and results in high levels of soot emissions.

The coal-based brick industry requires crushing the coal during the first step of the process. During crushing a lot of particles and flying dust are created. This is harmful to the workers’ health and the environment. The reduction firing process generates carbon monoxide which is poisonous.

The Bangladeshi government operates eleven continuous air monitoring stations throughout the country and the Department of Environment monitors and reports findings daily for six common pollutants, including particulate matter (PM2.5 and PM10), Nitrous Oxide (NOX), Sulfur Dioxide (SO2), Carbon Monoxide (CO), and Ozone (O3).

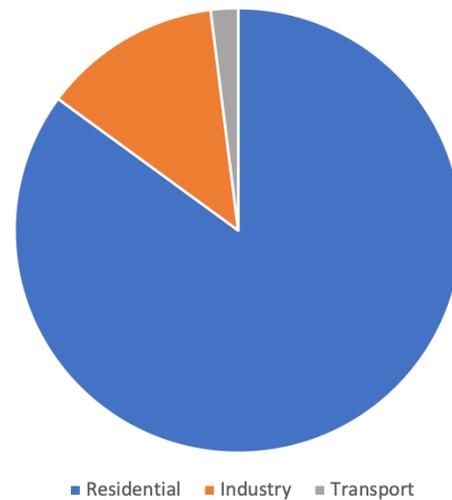
Almost half of the readings report on, or above, unhealthy levels and while road transport is a major contributor to air pollution, the impact of brick kilns cannot be underestimated. Some experts believe that a shift to greener kilns could reduce the industry’s carbon emissions by half.

### 4. The Technology

Advantages of LPG Firing Technology:

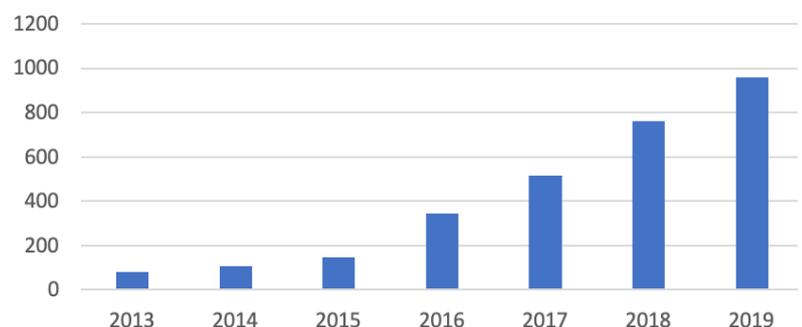
- Homogeneous heat distribution across the furnace and efficient heat across each brick
- The air ratio is higher than with other fuels and the air circulation area is larger to create uniform burning
- Good flame control and heat density that can be adjusted according to heat demand
- Waste hot air can be collected and reused in the dryer
- Brick crushing strength and colour consistent across oven layers
- Easy to maintain the firing curve
- Automatic controlling system
- Cleaner environment (lower PM and GHG emissions)
- Improved air quality

Bangladesh LPG Demand by Segment



Bangladesh - LPG Demand ('000's MT)

(Source: WLPGA 2020 Statistical Review of Global LPG)



# Bashundhara LP Gas Limited (BLPGL) and the Ceramic Brick Case Study

For any ceramics industry, fuel is a key product and the biggest challenge is to have an uninterrupted supply of energy to these industries. BLPGL has invested in many diversified sectors to create new opportunities for the industry and with BLPGL's pioneering outlook, and significant logistics capacity, they have taken on the challenge to extend their business support to Makrail Ceramics Ltd. (MCL) who were searching for a clean fuel for their factories.

In early 2021, BLPGL and MCL signed an exclusive fifteen-year agreement whereby BLPGL will provide LPG fuel support and full technical assistance related to LPG to MCL.

MCL have agreed to produce up to 120,000 ceramic bricks daily using LPG. They produce various types of bricks such as ceramics bricks for household construction, and solid and hollow bricks, and cladding (facing tiles, roof tiles, pavers and specialty applications).

Before this agreement, MCL produced ceramic bricks with coal, but after understanding the effects of burning coal on the environment, together with an unreliable supply of coal, they decided to move away from coal and started searching for a clean fuel for their production.

BLPGL has since become a part of this journey with the aim to achieve the UN's Sustainable Development (SDG) Goal 11 by 2030 (# below).

BLPGL recognises the potential for LPG in this market sector, and has taken the challenge and invested in a complete LPG solution at the MCL premises. BLPGL are installing a bulk LPG storage facility at each MCL factory and will supply the LPG through a fleet of bulk LPG road tankers.

BLPGL LPG terminal photo courtesy Bashundhara LP Gas Ltd.



## # United Nations Sustainable Development Goals (UN SDG's) Brick Case Study

The UN Sustainable Development Goals (SDG's) are a collection of seventeen interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set in 2015 by the United Nations General Assembly and are intended to be achieved by the year 2030.

The SDGs cover social and economic development issues including poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy,

urbanisation, environment and social justice. WLPGA recognises the role that LPG can play in helping achieve many of the goals and the WLPGA LPG Contribution to the SDGs project was launched in 2019 as a way to map the contribution that LPG makes in achieving the SDGs. SDG 11 relates to Sustainable Cities and Communities and pledges to make cities and human settlements inclusive, safe, resilient and sustainable.



## 5. Looking to the Future



Photo courtesy Bashundhara LP Gas Ltd

Engr. Jakaria Jalal, Head of Sales, BLPGL, believes that this project is just the beginning and the company will always be ready to create new opportunities for the industry. He also believes that this action is just another footprint from BLPGL to create a better environment for the population of Bangladesh and that BLPGL will work continuously for further improvements.

In addition, Mr Syed Sadaf Zafar, Managing Director of MCL said that large industries are damaging the environment every day, and that we should all be seeking an exceptional green solution.

## 6. Acknowledgements

- Argus Media
- Bashundhara LP Gas Limited
- Makrail Ceramics Limited

### Bashundhara LP Gas Limited (BLPGL)

In 1999, Bashundhara LP Gas Limited, launched what was then the first private LPG importing, cylinder filling and marketing company in Bangladesh. The company has a state-of-the-art LPG plant in Mongla Port Industrial Area. Being a subsidiary of country's business conglomerate Bashundhara Group, the company embarked on a journey to meet the growing demand for clean cooking gas and provide consumers the opportunity to switch away from dirty traditional fuels such as wood and charcoal. It has since grown to be the market leader of LPG in the country.

