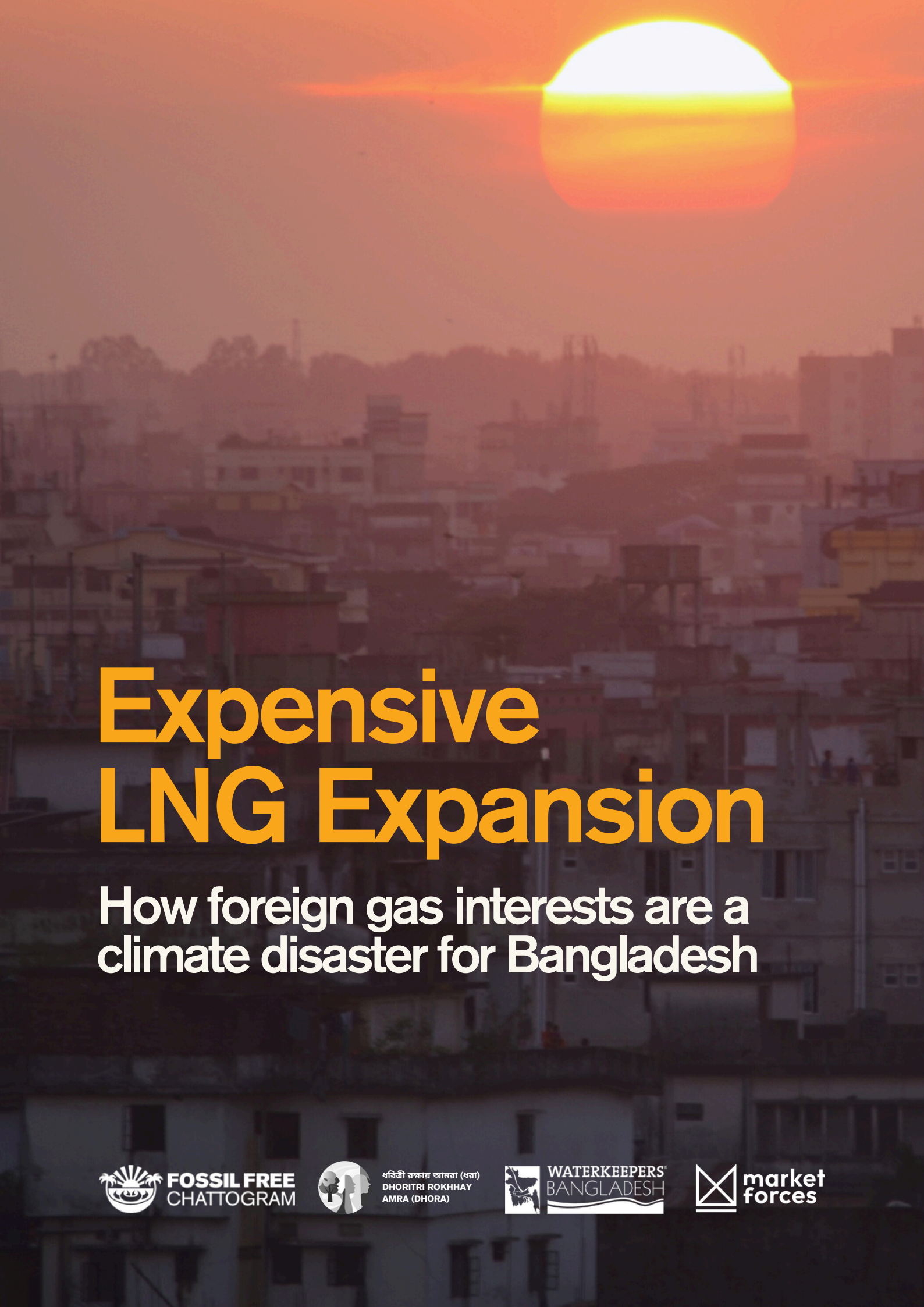


# Expensive LNG Expansion

## How foreign gas interests are a climate disaster for Bangladesh

FOSSIL FREE CHATTOGRAM

ধরিত্রী রক্ষায় আমরা (ধরা)
DHORITRI ROKHHAY AMRA (DHORA)

WATERKEEPERS BANGLADESH

market forces

# Contents

# Executive Summary

**Bangladesh is facing an energy crisis, having suffered repeated blackouts caused by an increasing over-reliance on expensive and polluting fossil gas imports.**

Rather than decreasing dependence on volatile international fossil fuel markets, and prioritising clean domestic renewable energy, **Bangladesh is being pushed by foreign interests to double down on liquefied natural gas (LNG).**

Market Forces' research reveals plans to build **41 new LNG power plants with a total capacity of 37.4 gigawatts** (GW) in Bangladesh. This is larger than the country's entire existing power fleet. To support these plans, there are **seven proposed new LNG import terminals.**

The LNG-heavy Integrated Energy and Power **Master Plan was written by Japanese government agency Japan International Cooperation Agency (JICA)** and energy think tank Institute of Energy Economics Japan (IEEJ). **Japanese companies are involved in over half of all planned LNG power projects in Bangladesh that have foreign involvement.** US companies also play a significant role.

The massive proposed LNG expansion would come at staggering financial, environmental, health and social costs to the Bangladesh community.

**Planned LNG projects would cost an estimated US$50 billion.** The LNG power plants are estimated to cost US$36 billion to build, and the LNG import facilities costing another US$14 billion.

By 2041, Bangladesh would face **the additional burden and cost of importing LNG that would reach $7–11 billion per year**, two to three times the cost of all fossil fuel imports today.

The proposed LNG power plants in Chattogram are projected to release **1.3 billion tonnes of carbon dioxide equivalent** (CO2-e) over their lifetimes, **six times Bangladesh's current annual emissions**. Much of the proposed infrastructure is planned in the lush Chattogram region, threatening to harm vulnerable natural environments and animals and disrupt the livelihoods of thousands of farmers, fisher folk and devastate the local tourism industry.

**$50bn**

**The total cost in USD for planned LNG projects in Bangladesh**

**1.3bn**

**The estimated lifetime CO2-e emissions (in tonnes) of proposed LNG power plants in Chattogram**

These gas developments and associated environmental pressures, threaten **at least 26 endangered species** which rely on the local forests, including the Asian elephant, Clouded Leopard and a scaly anteater known as the Chinese Pangolin.

There are mounting concerns over **human rights of women and local community members following violations in similar gas developments** backed by GE Vernova, including land grabbing and the destruction of the local environment on which the surrounding communities depend for their incomes.

New gas power plants would also spew **toxic emissions** worsening respiratory health, entrenching Bangladesh's status as the country with **the worst air quality in the world**.

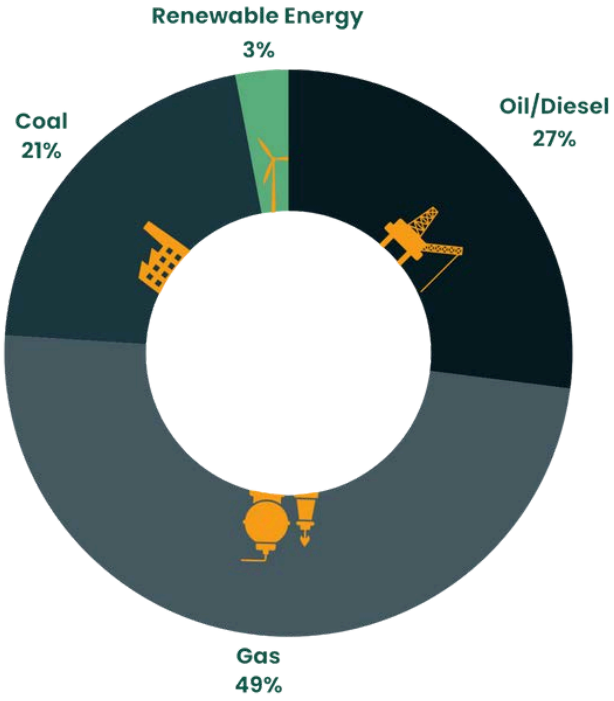
It does not have to be this way. The capital expenditure required to realise Bangladesh's LNG power plans **could instead fund 62 GW of new clean, renewable power**, enough to replace most of the country's existing gas power fleet, or replace its coal power capacity 4 times over. Contrary to prominent misleading narratives, Bangladesh has enormous renewable energy potential, with the **capacity to install up to 240 GW of solar power and 30 GW of onshore wind.**

Rather than implement an energy plan tailored to the interests of foreign entities, Bangladesh must pursue domestic renewable energy over expensive and polluting imported LNG. A renewable-powered future would avoid billions in annual fuel costs, protect livelihoods, improve health outcomes and ensure the energy security of Bangladesh.

# Bangladesh's fossil fuel over-expansion

## The current energy state of play

As of March 2024, Bangladesh's power generation capacity stood at 24.4 gigawatts (GW), almost all of which is from fossil-based energy sources: coal (21%), oil (27%) and gas (49%). Renewable energy such as solar, wind and hydroelectric power only comprise 3% of the mix. In addition, 2.7 GW of electricity is imported from neighbouring India.[1]




There are two operational gas import facilities (Floating Storage and Regasification Units, FSRUs) in Moheshkhali in Chattogram division and one dedicated coal import facility in each of the major energy hubs located in Payra in Barisal, and Moheshkhali in Cox's Bazar. Coal and fossil gas or liquified natural gas (LNG) imports for power generation have only begun in recent years, with the first LNG shipment arriving in 2019. Before this, Bangladesh was mostly dependent on its domestic gas production for power generation, a resource that is becoming limited in supply.[2,3,4]

## Overcapacity and blackouts

Recently, Bangladesh has also faced the unique problem of both overcapacity in power generation and sweeping blackouts, primarily due to overreliance on volatile and expensive LNG imports.

In April 2024, at the peak of summer heat that broke 75 year records, with temperatures as high as 43°C, the people of Bangladesh were left with a 2 GW electricity shortage, with power cuts for hours on end in some areas. This was not a problem of insufficient capacity, but rather an overreliance on imported LNG. Peak demand during the heat waves stood at 16.4 GW, compared to capacity of 27.1 GW, implying almost 40% overcapacity. A top official from Bangladesh's power ministry informed a newspaper that 4.8 GW of power was "out of generation only because of [a] gas shortage". These gas shortages mean that Bangladeshi people continue to experience sweeping power cuts despite abundant power capacity, especially in rural areas.[5,6,7,8,9,10]

## A plan full of costly miscalculations

Bangladesh aims to become an upper middle-income country by 2031, and has established Vision 2041, a national strategic plan to become a high-income country by 2041 and completely eradicate poverty and hunger. By extension, energy demand is expected to increase, evidenced by the Integrated Energy and Power Master Plan (Master Plan) published in November 2023.[11,12,13]

The Master Plan forecasts electricity supply will grow 4–5 times by 2050, ranging between 111 GW to 138 GW (486 to 674 terawatt hours) under varying economic growth scenarios. This plan, formulated by the Japanese government's aid agency, Japan International Cooperation Agency (JICA) and the energy think tank Institute of Energy Economics, Japan (IEEJ), has faced major criticism from energy experts and civil society nationally and internationally. Critics point to the Master Plan's overestimation of future energy demand and heavy reliance on coal and gas in the energy mix.[14,15,16,17]

Expensive and economically unproven technologies with patchy decarbonisation credentials like hydrogen and ammonia, as well as carbon capture and storage, are misleadingly bundled under "clean energy" in the Master Plan. By 2050, just 12–17% of Bangladesh's electricity would come from true clean energy in the form of wind and solar under the Master Plan's different economic growth scenarios. By contrast, a country like Vietnam has plans for over 50% hydro, solar and wind by 2050, and neighbouring India is already meeting its target of 40% of its power capacity from non-fossil fuels, thanks to drastic growth in solar and wind. The government of Bangladesh has seperately set targets to reach 30% renewable energy by 2030; 40% by 2041 and 100% by 2050 in the Mujib Climate Prosperity Plan.[18,19,20,21,22]

Energy experts warn if the Japan-backed Master Plan power supply projections are followed, Bangladesh's overcapacity gap will worsen. Bangladesh's end consumers ultimately suffer from the country's expensive build-out of unnecessary energy infrastructure and further reliance on imported, polluting fossil fuels like LNG.[23]

The Master Plan would block the fast adoption of renewable power needed to reduce costs, threatening Bangladesh's energy independence and climate goals. This plan serves a small number of large Japanese corporations prominent in global LNG trade, gas power and hydrogen-ammonia business, rather than benefiting the people of Bangladesh and its economy. Nowhere is this more evident than in the extensive pipeline of new LNG-to-power projects being promoted by overseas companies.[24,25]

# LNG invasion

**According to Market Forces data, there are 41 proposed new LNG power plants in Bangladesh, with a total capacity of 37.4 GW** (see Appendix 1). This is triple Bangladesh's current gas power capacity, and larger than the country's entire existing power fleet. These power projects would rely entirely on imported LNG given dwindling domestic gas supplies. Our analysis finds five additional LNG power plants totalling 7 GW were added in just the two years since December 2021.[26,27]

| Division | LNG Power Plants | Total Capacity (GW) |
|---|---|---|
| Barisal | 7 | 8.2 |
| Chattogram | 21 | 19.1 |
| Dhaka | 12 | 6.6 |
| Unclear location | 1 | 3.6 |
| Total | 41 | 37.4 |

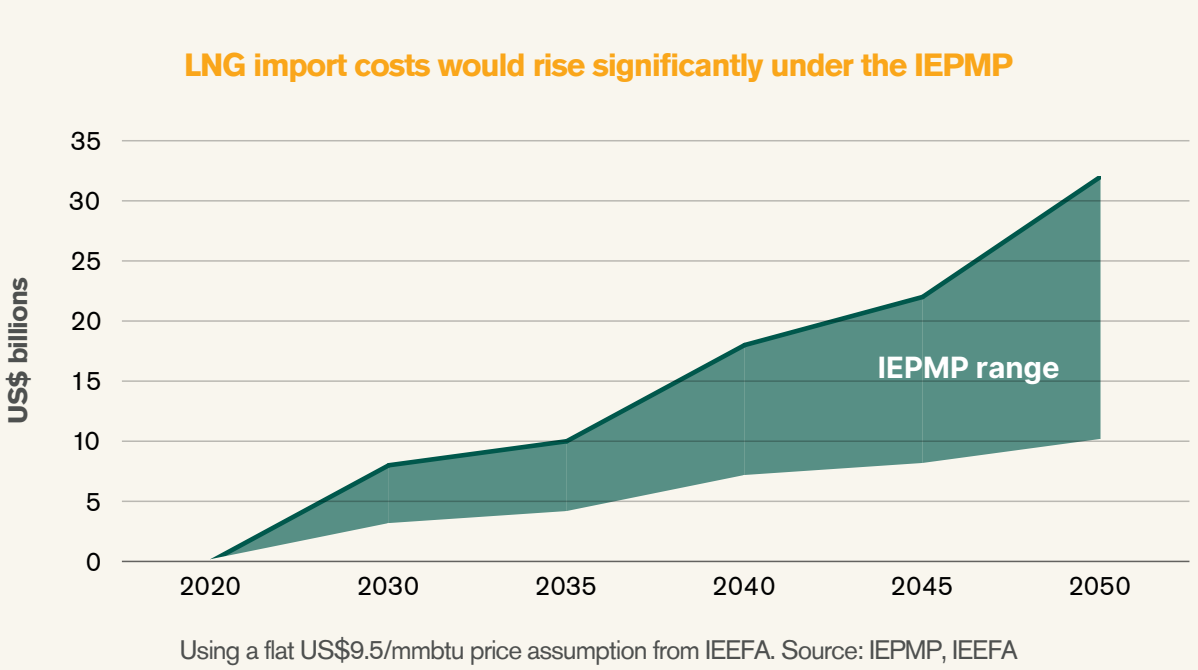
Bangladesh's gas-fired power capacity is 12 GW, making up half of the power mix in March 2024. Due to domestic gas shortages, roughly 20% of the country's gas needs are met by LNG imports – **a figure that the government says will skyrocket to 76% in 2040**. According to the Master Plan, the required LNG import capacity required in 2040 would be up to 30 million tonnes per annum (MTPA), 4 times higher than the current capacity (7.6 MTPA).[28,29,30,31]

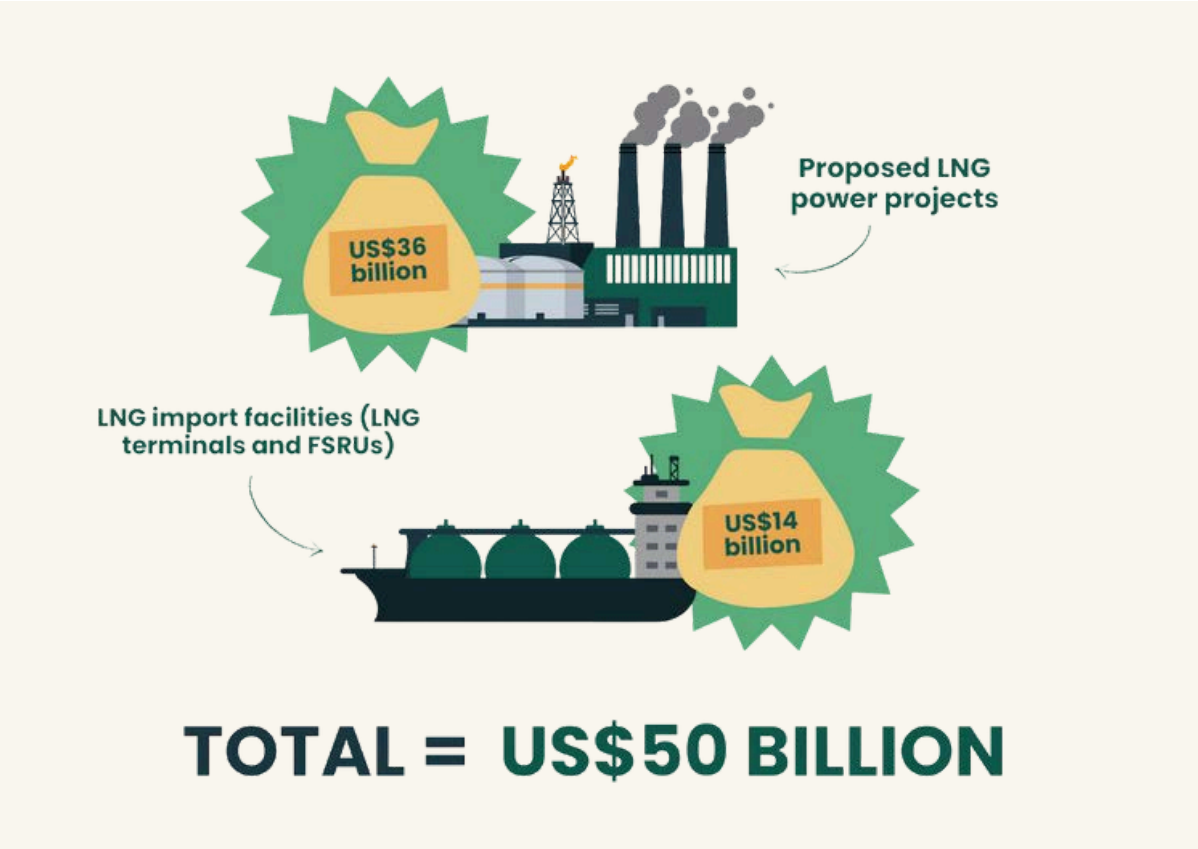
To support this projected LNG power boom, which is based on costly miscalculations, seven onshore LNG import terminals or FSRUs are proposed in Bangladesh. According to the Master Plan, three near-term LNG import facilities are planned by 2030: an FSRU in Payra, one in Moheshkhali and an onshore terminal in Matarbari in Chattogram division.

**76%**

**The Bangladesh Government estimates that by 2040, imported LNG will make up 76% of the gas demand in Bangladesh.**

The planned LNG projects would cost an estimated US$50 billion. We estimate the proposed LNG power projects would cost US$36 billion. Using independent research group Global Energy Monitor's LNG import terminal cost estimates, Bangladesh's proposed LNG import facilities would cost an additional estimated US$14 billion. This does not include the cost of importing LNG and re-gasifying it for power generation. The Institute of Energy Economics and Financial Analysis (IEEFA) estimates that Bangladesh only requires US$28–31 billion in investments to increase the share of renewables in installed capacity to 40% by 2041, significantly less than the total estimated investment for new LNG infrastructure.[32,33,34]




The proposed new LNG power plants and LNG import terminals would lock in Bangladesh to decades of dependency on imported LNG. Using IEEFA's LNG price assumption, we estimate LNG imports would cost some US$7–11 billion annually by 2041 if volumes were to increase in line with the Master Plan. Bangladesh is already struggling to ensure a stable gas supply for power generation, and is unable to afford expensive fossil fuel imports, including LNG, due to a US dollar shortage. Adding more LNG projects would only make the burden on Bangladesh's economy worse.[35,36,37,38]

# Chattogram: The epicentre of LNG expansion

The Chattogram division in coastal southeastern Bangladesh stands out with 50% of the country's proposed LNG power projects and much of its LNG import infrastructure despite accounting for just a quarter of Bangladesh's land area.

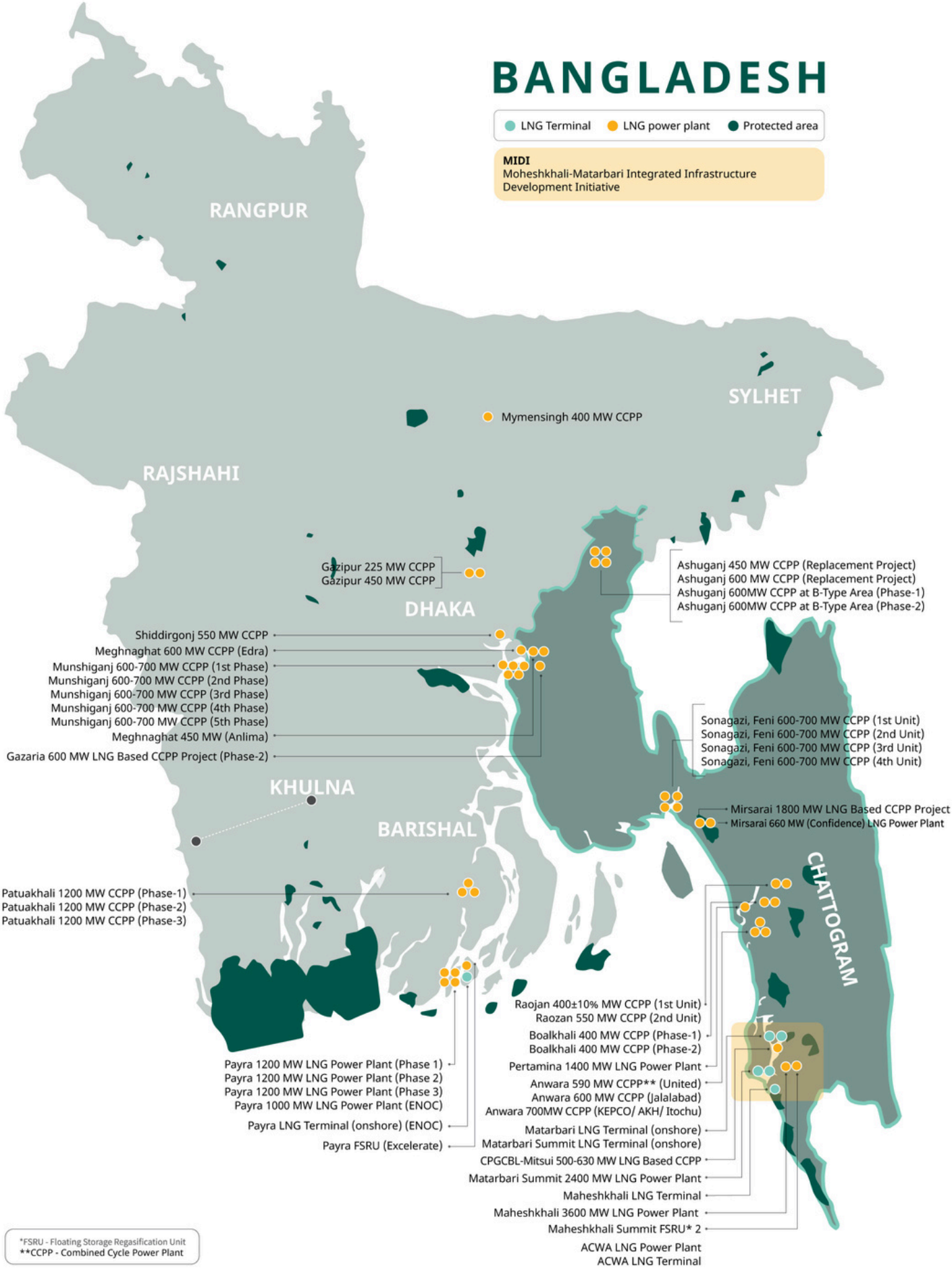
The heavy concentration of the LNG build-out in Chattogram is part of a mega project called the Moheshkhali-Matarbari Integrated Infrastructure Development Initiative (MIDI). This massive industrial plan was created in collaboration between the Bangladesh and Japanese governments, involving JICA, among others. It covers approximately 18,000 acres of coastal and riverfront lands in the region.[39,40,41]

## Who is behind the LNG expansion in Chattogram?

Roughly half of the known companies involved in proposed LNG power projects in Bangladesh are foreign, with companies playing various roles such as sponsors, lenders, and engineering, procurement and construction (EPC) contractors. Japanese companies dominate in Chattogram, making up 57% of all foreign company involvement, while US companies take up 14% (see Appendix 2 and 3). This highlights the interests of Japanese gas companies' direct involvement in the proposed pipeline of LNG power and import infrastructure projects in Bangladesh's energy and power Master Plan, written by Japan.

## Spreading Japan's LNG dependence

As Japan faces long-term LNG oversupply, the Japanese government policies support offloading this additional capacity onto emerging Asian markets. Unsurprisingly, Japanese companies are cultivating demand for LNG in countries like Bangladesh. For example JERA, a 50-50 joint venture of TEPCO and Chubu Electric Power, is one of the largest thermal power producers in the world and is heavily involved in LNG projects in Chattogram and the rest of Bangladesh.[42,43]


BANGLADESH
LNG Terminal
LNG power plant
Protected area
MIDI
Moheshkhali-Matarbari Integrated Infrastructure Development Initiative
RANGPUR
SYLHET
Mymensingh 400 MW CCPP
RAJSHAHI
Gazipur 225 MW CCPP
Gazipur 450 MW CCPP
DHAKA
Ashuganj 450 MW CCPP (Replacement Project)
Ashuganj 600 MW CCPP (Replacement Project)
Ashuganj 600MW CCPP at B-Type Area (Phase-1)
Ashuganj 600MW CCPP at B-Type Area (Phase-2)
Shiddirgonj 550 MW CCPP
Meghnaghat 600 MW CCPP (Edra)
Munshiganj 600-700 MW CCPP (1st Phase)
Munshiganj 600-700 MW CCPP (2nd Phase)
Munshiganj 600-700 MW CCPP (3rd Phase)
Munshiganj 600-700 MW CCPP (4th Phase)
Munshiganj 600-700 MW CCPP (5th Phase)
Meghnaghat 450 MW (Anlima)
Gazaria 600 MW LNG Based CCPP Project (Phase-2)
Sonagazi, Feni 600-700 MW CCPP (1st Unit)
Sonagazi, Feni 600-700 MW CCPP (2nd Unit)
Sonagazi, Feni 600-700 MW CCPP (3rd Unit)
Sonagazi, Feni 600-700 MW CCPP (4th Unit)
KHULNA
Mirsarai 1800 MW LNG Based CCPP Project
Mirsarai 660 MW (Confidence) LNG Power Plant
BARISHAL
CHATTOGRAM
Patuakhali 1200 MW CCPP (Phase-1)
Patuakhali 1200 MW CCPP (Phase-2)
Patuakhali 1200 MW CCPP (Phase-3)
Raojan 400±10% MW CCPP (1st Unit)
Raozan 550 MW CCPP (2nd Unit)
Boalkhali 400 MW CCPP (Phase-1)
Boalkhali 400 MW CCPP (Phase-2)
Pertamina 1400 MW LNG Power Plant
Anwara 590 MW CCPP** (United)
Anwara 600 MW CCPP (Jalalabad)
Anwara 700MW CCPP (KEPCO/ AKH/ Itochu)
Payra 1200 MW LNG Power Plant (Phase 1)
Payra 1200 MW LNG Power Plant (Phase 2)
Payra 1200 MW LNG Power Plant (Phase 3)
Payra 1000 MW LNG Power Plant (ENOC)
Payra LNG Terminal (onshore) (ENOC)
Payra FSRU (Excelerate)
Matarbari LNG Terminal (onshore)
Matarbari Summit LNG Terminal (onshore)
CPGCBL-Mitsui 500-630 MW LNG Based CCPP
Matarbari Summit 2400 MW LNG Power Plant
Maheshkhali LNG Terminal
Maheshkhali 3600 MW LNG Power Plant
Maheshkhali Summit FSRU* 2
ACWA LNG Power Plant
ACWA LNG Terminal
*FSRU - Floating Storage Regasification Unit
**CCPP - Combined Cycle Power Plant

In addition to proposed power projects, multiple Japanese companies are bidding to become the owners of Bangladesh's first onshore LNG terminal in Matarbari, Chattogram. The bidders list includes Mitsui & Co., Mitsubishi Corporation, JERA, Sumitomo Corporation and Chugoku Electric Power, among others. "Fossil fuel dinosaur" JERA, through its ownership stake in Summit Power International, Bangladesh's largest private gas power company, is also involved in the proposed second Moheshkhali FSRU and is planning a further multi-billion dollar LNG overexpansion in Bangladesh.[44,45,46,47,48]

Japan is the largest LNG importer in the world. Japan's addiction to gas and LNG is evident through the many large Japanese corporations involved in the LNG trade, gas turbine manufacturing, gas power production, and promotion of unproven and expensive technologies like hydrogen, ammonia, and carbon capture and storage.[49,50]

Japan's megabanks, Mitsubishi UFJ Financial Group (MUFG), Sumitomo Mitsui Financial Group (SMBC), and Mizuho Financial Group are among the world's top financiers of the coal and gas industries. These banks provided US$8.9 billion in finance to companies expanding the coal industry in 2023 alone, and a staggering US$24.2 billion to LNG expanders. SMBC is involved as a financial advisor for the 1.4 GW Pertamina LNG power plant, and other Japanese financial institutions are involved as financial advisors and prospective lenders.[51]

Arguably the worst offender of all is the Japanese government-backed JICA, which not only has been writing Bangladesh's power plans but also provided multi-billion dollar funding for emission-heavy projects like the Matarbari 1 coal power plant, misleadingly labelled as "climate finance". This finance has helped attract private lenders to new fossil fuel projects, accelerating the amount of capital flowing into dirty energy. This is a clear example of the conflict of interest that is at the heart of Japan's involvement in Bangladesh's energy system development.[52,53,54]

**Potential lenders for LNG projects in Bangladesh**


## GE Vernova's greenwashing spin

GE Vernova stands out as the only US-based company involved in the proposed LNG power projects in Chattogram. It is involved in one-third of all proposed projects in Chattogram, totalling 6.7 GW. Having spun off from General Electric in April 2024, GE Vernova, which in Latin means "new green," attempts to portray a green image, claiming a commitment to clean energy while its strategy in fact hinges on large-scale spending on new LNG projects and hydrogen blend turbines.[55,56]

| Project name | Size (MW) | Sponsors | Other GEV involvement |
|---|---|---|---|
| Maheshkhali LNG Power Plant | 3,600 | GEV, Bangladesh Power Development Board (BPDB) | |
| Matarbari Summit LNG Power Plant | 2,400 | GEV, Summit Group | GEV is the turbine supplier |
| Mirsharai 660 MW power project | 660 | GEV, Unique Hotel & Resorts, Strategic Finance Limited, Nebras Power | GEV is the EPC contractor and gas turbine supplier |

**List of LNG Power Plants with GE Vernova (GEV) involvement in Chattogram**[57]

## Hydrogen power: An expensive delusion

The Master Plan assumes Bangladesh will produce a substantial amount of electricity from burning hydrogen, increasing to around 15% of the power mix by 2050. That might not sound significant, but the IEA's Net Zero by 2050 scenario – designed as a cost-effective and energy secure pathway to limiting global warming to 1.5°C – assumes that just 1.5% of the world's power comes from hydrogen and ammonia in 2050 "as a result of continuing high costs". In the IEA's business-as-usual scenario, that figure is just 0.2%.[58,59]

Relying on hydrogen to the extent that JICA proposes in the Master Plan would be incredibly expensive. Based on Bloomberg NEF's price forecasts for the fuel, which assume a sharp decline over the next three decades, **hydrogen procurement costs for Bangladesh would run up to US$19 billion per year in 2050. That is nearly six times the annual cost of importing fossil fuels today, and enough money to install 35 GW of solar each year.**[60,61,62]

Just like with coal and LNG, Japan has a strong vested interest in deploying hydrogen and ammonia power at scale. The government is pouring subsidies into the technology, while major Japanese corporations such as JERA have made it a pillar of their decarbonisation strategies. Hydrogen is not a solution for Bangladesh's energy transition; rather it is yet another expensive fuel option, still unproven to operate at scale.[63,64]

# New LNG makes no financial sense for the economy or the consumer

## Disproportionate economic burden on Bangladesh

The Bangladesh government pays capacity charges to power plant owners for the rights to purchase power, even when the plant is sitting idle and not supplying to the grid. These payments totalled Taka 171.56 billion (~US$1.5 billion) in the fiscal year 2023. Bangladesh's FSRUs for LNG imports also impose capacity charges, with the government required to pay US$454,000 per day even if the FSRUs are out of operation. Energy experts call this the "wrong model" and not fit for purpose for Bangladesh and say vested interest groups have used inflated demand projections to extract higher capacity payments. Summit Group, 22% owned by Japan's JERA, for instance, received US$1.09 billion in capacity charges between 2010 and 2020.[65,66,67,68,69,70]

Vested-interest groups have used inflated demand projections **to extract higher capacity payments.**

With an estimated US$36 billion price tag for proposed LNG power projects alone, the costs of building and paying capacity charges on new LNG projects could add billions to the borrowing bill for Bangladesh's economy. The fiscal year 2024 alone saw a year-on-year increase in foreign debt servicing by 49%, owing to sky-rocketing interest payments, which crossed the US$1 billion mark for the first time, according to the Bangladesh government's Economic Relations Division (ERD). This increase is partly owing to rising debt for power projects like the Matarbari 1 coal power plant, and the Rooppur nuclear power plant, among other infrastructure projects. In a sign that debt sustainability is already becoming a risk, the US and Japan have recently probed Bangladesh's ability to pay outstanding debts. The last thing Bangladesh needs is more debt to fund new infrastructure that would lock the country into expensive, volatile and polluting LNG imports.[71,72,73]

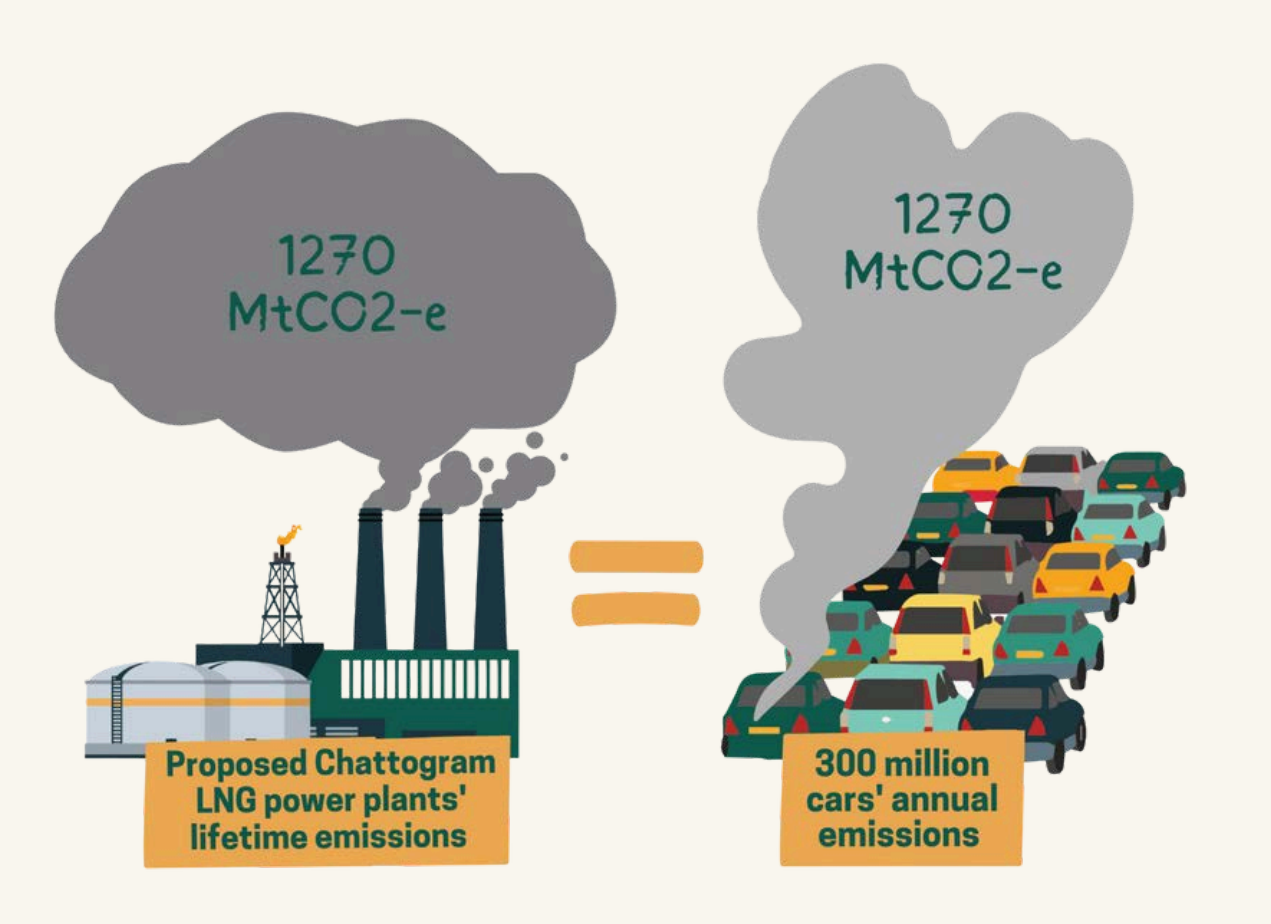
## End users bear the brunt

In March 2024, electricity prices were increased by 8.5% because of rising fuel costs. This follows two 5% retail electricity price hikes 2023. The Consumers Association of Bangladesh (CAB) has argued that the flawed policies in the power sector have created opportunities for certain companies to exploit the situation. This is opposite to global trends, with the IEA noting prices in many countries, including in Asia, declined in 2023 compared to 2022.[74,75,76,77]

# LNG encroachment: Social and environmental risks

## Damage to our shared climate

If built, the proposed LNG power projects in Bangladesh would add approximately 2,500 million tonnes of carbon dioxide equivalent (MtCO2-e) to the atmosphere over the plants' operational lives. This estimate assumes new power plants are more efficient than the current fleet; using the current average emissions intensity would increase our estimate by another 900 million tonnes. Emissions from Chattogram's proposed LNG plants' lifetime emissions, 1270 MtCO2-e, are equivalent to six years of Bangladesh's national emissions, or the same as 300 million cars' annual emissions (See Appendix 3).




Bangladesh is ranked seventh in the world for physical climate risk exposure. This risk is already being felt: over the last two decades, nearly 200 catastrophic heatwaves, droughts, floods, and tropical cyclones have hit the country, claiming thousands of lives and damaging property and livelihoods. 2024 has been a year of extreme heat for Bangladesh, with record-breaking temperatures reaching 43°C, forcing school shutdowns that impacted 33 million students.[78,79,80,81]

In 2023, deadly cyclone Mocha made landfall in Bangladesh and Myanmar, claiming 145 lives and causing extensive damage affecting millions. Bangladesh's only source of fossil gas imports, its floating LNG terminals (FSRUs), were closed due to cyclone Mocha,

causing sweeping power cuts across the country. This happened again in May 2024 when Cyclone Remal made landfall and damaged an FSRU, causing an acute gas shortage across the country. It is estimated the FSRU will take more than a month to repair, while the country reels from the damage of the cyclone itself. Bangladesh's Meteorological Department, attributed the intensity of cyclone Remal, that killed at least 65, to climate change.[82,83,84,85]

Chattogram itself, where the majority of new LNG projects are proposed to be built, is no stranger to extreme weather events. Flooding in 2023 impacted millions in the region. Even if global warming is limited to 2°C, by 2050, the coastal areas of Chattogram are projected to be inundated every year.[86,87,88]

These extreme weather events highlight the risk of building costly new import-based LNG power projects in Bangladesh. These projects could face lower utilisation rates, early phase-outs, and cancellations due to worsening climate change impacts and policy and market shifts to address them.

## Harm to communities and livelihoods

The construction of fossil fuel projects in Bangladesh has had a devastating, and sometimes deadly impact on local communities. The foreign-backed 1,320 MW Banshkhali coal power plant (also known as S. Alam Chattogram coal power plant) is linked to the death of at least 12 workers and local community members, some as young as seventeen, shot dead by the police while protesting for their due wages in 2021. In Phulbari, three young lives were taken in 2006 during protests against UK-listed GCM Resources' proposed coal mine.[89,90]

An October 2023 joint report by international NGOs reveals the construction of the 584 megawatt (MW) Unique Meghnaghat LNG power plant, backed by GE Vernova (then General Electric), "resulted in several human rights violations, including land grabbing and the destruction of the local environment on which the surrounding communities depend for livelihoods". The adverse impact disproportionately burdened women in the area, particularly causing economic insecurity, damage to property, health issues and food insecurity.[91]

More than one million families rely on traditional livelihoods like tourism, fishing and dry fish, salt production, betel leaf cultivation and agriculture in the Cox's Bazar region in Chattogram. A 2023 study by Waterkeepers Bangladesh found that these critical industries, connected to the lifeline and livelihoods of the people in this area, are at threat of highly polluting carbon-intensive projects such as coal and gas power plants, oil refineries, LNG terminals, pipelines and storage facilities.[92]

The coastal islands of Matarbari and Maheshkhali demonstrate the harm to the local community through displacement and hardships due to the construction of fossil fuel projects. Now, the people of Matarbari and its surrounding areas are contending with the additional threat of new LNG projects. The proposed projects' proponents made no known effort to fully quantify the loss of lives and livelihoods due to the displacement of families from their homes and farmlands.[93] Any further construction of fossil-based projects, including the proposed LNG power projects and import terminals, would harm communities.

**"There were many types of work [before the coal project came] like shrimp business, farming, boating, salt cultivation, fishing. Now we have no more work."**
Humaira, displaced by Japan-funded Matarbari 1 coal power plant

A massive new coal power plant Matarbari 1, backed by Japan, looms over hundreds of families displaced by its construction. As of May 2023, many local families still report they have not been fully compensated for their lost homes and livelihoods. Jannatul Naim Jhuma's family used to have three houses where the coal power plant now sits. One belonged to her father and two to her brothers. When construction started, they were forced to leave their homes and relocate to concrete houses right beside the facility, with the coal plant belching black smoke overhead.

Despite the ongoing impacts of the Matarbari 1, a group of women displaced by the coal power plant are striving to rebuild their lives, developing ways of securing an income and providing for their families. They learned embroidery and stitching to share their stories of loss and resilience.

**“They did not pay a single penny of compensation.”**
Jannatul Naim Jhuma

**“Only landowners will be compensated. Us [fisherfolk] workers will get nothing.”**
Ismail Pasha, crab farmer in Chattogram

**“I worry future generations will have no way to survive when the coal power plant and the LNG terminals start operating. The future is dark.”**
Abdus Salam Kakali, journalist and environmental activist

## Threats to biodiversity and tourism

Chattogram is known for its natural beauty and biodiversity, with rolling hills, majestic waterfalls and beaches. The jewel in Chattogram's crown is Cox's Bazar - the world's longest natural beach and one of Bangladesh's most popular tourist destinations. Cox's Bazar's sandy beaches attracted some 200,000 tourists in a single day during the peak holiday season in April 2024. Nearby are the Saint Martin's and Sonadia Islands, all three identified as 'Ecologically Critical Areas'. St Martin's is the only island with large coral reefs in Bangladesh. Sonida Island is a biodiversity hotspot and habitat for several threatened species like marine turtles, shore birds and marine mammals.[94,95,96,97,98]

The Parbotto Chattogram or the Chattogram Hill Tracts (CHT), covered by the largest portion of forests in Bangladesh, is home to at least 26 globally threatened species including the Asian elephant, clouded leopard and Chinese pangolin, among others. CHT is inhabited by eleven "adibashi" or indigenous tribes with unique cultures and connections to nature and land.[100,101]

Chattogram's nature and hill tracts communities are under threat from industrialisation and massive deforestation due to construction and infrastructure development.[102,103,104] The proposed LNG projects in Chattogram are close to these significant biodiversity havens, threatening harm to the local environment and its residents.

## Air pollution and human health

Bangladesh is the world's most polluted country according to both IQAir and Air Quality Life Index (AQLI), two leading global air quality monitoring platforms. An estimated 174,000 Bangladeshi lives were lost to air pollution in 2019, with 34% of outdoor particle pollution (PM2.5) coming from fossil fuels like coal, oil and gas. Residents of Chattogram are expected to live 7.4 years less than someone living in a country meeting internationally accepted standards, such as Australia or Sweden.[105,106,107,108]

If built, the proposed LNG terminals would enable the burning of methane gas in new gas power plants. Gas-fired power generation results in toxic gases and particulate matter, which cause premature deaths and other health impacts, including respiratory illnesses and asthma. A study on the USA's proposed gas-fired projects found health impacts are felt nationally, beyond local communities, with severe impacts on population-dense areas. The study also found that clean energy alternatives would reduce energy costs while saving billions in community health burdens. Bangladesh's planned LNG build-out would lock in deadly air pollution and related health impacts for decades.[109,110,111]

"Locals are suffering from various diseases such as allergies, respiratory problems, sneezing, etcetera. **We don't want a power plant, we want a healthy life.**"

– Salma, who lives near GE Vernova co-owned Meghnaghat LNG power plant [112]

## Matarbari 1: Destroying community and environment

The construction of the Matarbari 1 coal plant shows what local communities can expect if Bangladesh's LNG power boom materialises. Matarbari 1 is one of the most expensive coal power plants in Asia, costing US$6 billion (Taka 51,800 crore), and has left a lasting mark on the local community and environment. The project is jointly developed by the state-owned Coal Power Generation Company Bangladesh Limited along with a group of Japanese companies.[113,114,115]

Matarbari 1's construction filled up and narrowed the Kohelia River, resulting in more than 2,000 fishermen losing their livelihoods. Local shrimp farms and the river water were also polluted. The filling in of the Kohelia River also resulted in legal action.[116,117,118]

Thousands of people are expected to develop fatal health conditions – such as heart disease and lung cancer – among other respiratory illnesses due to the nearly operating Matarbari 1 coal project's emissions, according to a study by the Finland-based Centre for Research on Energy and Clean Air (CREA).[119]

In January 2024, significant corruption allegations emerged around exorbitant prices paid for items purchased for Matarbari 1. For example, an abnormally high price of US$250,000 was paid for a shipment of 19 small tools, ranging from 5 to 18,500 times higher than the value recorded in Bangladesh's export-import database.[120]

In February 2024, "a journalist was tortured by a former army officer for publishing news of irregularities and corruption" linked to Matarbari 1. The former army officer was a Sumitomo Corporation-employed security official who, according to local newspapers, took the journalist in custody, physically and verbally abused him, and threatened to kill him and dispose of his body. This incident brought together Matarbari residents and journalists who protested and called on the staff member to be dismissed immediately. The coal plant authorities reportedly dismissed the security officer. The consequences and actions taken by the Sumitomo Corporation or JICA are not known and neither has publicly taken responsibility or formally responded to the corruption allegations.[121]

The scale of the Matarbari coal project's devastation has been limited by a major victory for the Bangladesh and global community, and the climate, in 2022 when the second phase of the project, Matarbari 2 was cancelled.[122]

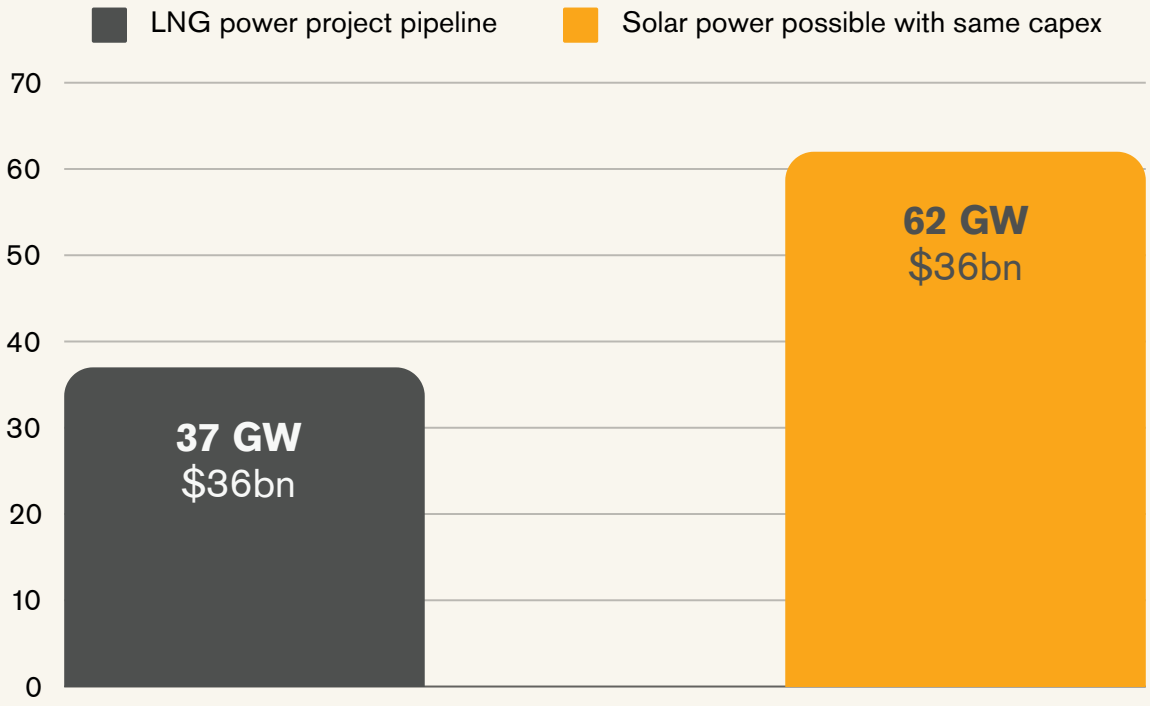
Sadly, the people of Matarbari are still contending with the further expansion of fossil fuels.

# A clean, domestic renewable energy solution

Bangladesh's power Master Plan paints a grim picture of a country with few options besides a deepened fossil fuel addiction. This isn't surprising given the significant influence exerted by the Japanese government and Japanese companies, which are notoriously reluctant to move away from coal and gas.[123] But there is, in fact, a cleaner, cheaper alternative - one focused on renewable energy.

We estimate that if the US$36 billion capex required to realise Bangladesh's LNG power pipeline was redirected to utility-scale solar power instead, **it would be enough to fund 62 GW of new clean, renewable power – enough to replace most of the country's existing gas power fleet, or replace its coal power capacity 4 times over.**[124] This is before considering the billions of dollars in annual savings from avoided fuel import costs.

## Cost of LNG pipeline could fund nearly twice as much solar power




*LNG power project pipeline is a Market Forces estimate. Solar power figure uses BNEF 2030 capex cost assumption.*

This would only capture a small portion of Bangladesh's potential renewable prize. The US-based National Renewable Energy Lab (NREL) has found the country has **the potential for up to 240 GW of solar power and over 30 GW of onshore wind power capacity**, although challenges remain around large-scale implementation.[125,126]

The government of Bangladesh has already set targets to achieve some of this, with goals to reach 30% renewable energy by 2030; 40% by 2041 and 100% by 2050. This supports the 1.5°C goal of the Paris Agreement, which is crucial for the protection of Bangladesh's environment and coastlines. At the same time, it is clear that other powerful foreign interests are pulling in the opposite direction.[127]

In a stark contrast, JICA's forecasts in the Master Plan project wind and solar to make up a mere 12-17% of Bangladesh's power generation in 2050. Similarly, JICA assumes just 9.5 GW of solar energy will be installed by 2041, less than a third of the Bangladesh government's own 30 GW forecast. JICA's projections are partly driven by an inexplicable assumption that solar cost reductions will suddenly slow, projecting declines of only 2.1% per year over the next 30 years - far slower than Bloomberg NEF's (BNEF) forecast of 6%, and well below the 13% a year observed globally over the last decade. By overestimating the costs of renewables, JICA is artificially tilting its analysis in favour of fossil gas, whereas other models result in a much more upbeat outlook for clean energy in Bangladesh.[128,129]

The Japanese and US governments have yet to step up their renewables financing at the scale needed to meet the country's targets, even though their countries play host to companies with the technical and financial capacity to transform Bangladesh's energy system. For instance, GE Vernova is one of the world's top wind turbine manufacturers. [130]

In a positive sign, 2.1 GW of large-scale solar projects were approved in 2023, along with some notable new wind power projects in Chattogram. China and Singapore are in active discussion with the Bangladesh government to invest in and strengthen the renewable energy sector in a massive shift away from their previous coal investments. [131,132,133,134,135]

In the context of a rapidly changing climate and an LNG-dependent energy system in crisis, Bangladesh is facing some stark choices. The people of Bangladesh deserve a path of renewables. The technical potential that leads to a clean and domestically powered renewable energy system exists. If the country's big energy players pull in the same direction there is an opportunity to realise that outcome much faster, laying the foundation for decades of prosperity.

# Gallery: Resistance and resilience

## Bangladesh's proposed coal, gas, and LNG projects face fierce opposition globally.


*Bangladeshi artists and activists march to GE offices in Boston, USA, to deliver their original artwork. The ten original artworks were displayed at an exhibition near GE Vernova's Boston headquarters, highlighting the dangers of the company's LNG plans in Bangladesh.*

*GE refused to accept the artwork or discuss the community's concerns. Security at the GE office in Boston turned the artists and activists away at the door.*



*Demonstrations by 'Don't Gas Asia', a coalition of civil society organisations that aims to contribute to the rapid, equitable and just transition out of fossil fuels like coal, gas and LNG towards 100% renewable energy systems that serve the people. The rallies called on companies like JERA and Japan's mega-banks to stop funding new LNG. Photo Credit: (1) Waterkeepers Bangladesh and Asian Peoples' Movement on Debt and Development (APMDD), (2) APMDD and Philippine Movement for Climate Justice*



*Climate activists call on G7 leaders and Japan's Prime Minister Kishida to end fossil fuels in developing countries during the 2023 G7 Summit in Hiroshima, Japan. Photo Credit: (1) Nonie Reyes, (2) FOE Japan, OCI, 350 Japan*


*Activists call on Japan's biggest power company, JERA to say goodbye to outdated fossil fuels. Photo credit: Waterkeepers Bangladesh*


*Activists dress as dinosaurs outside JERA headquarters in Tokyo, Japan. A full-page newspaper advertisement by groups in Bangladesh, Japan and elsewhere in the world read, "No more Jurassic JERA".*

# Methodology

This report examined the LNG projects (LNG power, terminals and Floating Storage Regasification Units (FSRUs) proposed to be built in Bangladesh as of November 2023. Market Forces identified proposed projects that have not reached financial close and have material prospects of being commissioned. Projects considered include 41 LNG-based power projects (21 projects in the Chattogram region) with 37.4 GW capacity and LNG import infrastructure.

Project data, including details on companies involved and potential financiers was compiled using Bangladesh Power Division's Integrated Energy and Power Master Plan released in 2023, official government documents, publicly available resources, company websites, peer-reviewed academic journals, news and research reports and subscription based financial databases by IJGlobal and LSEG Workspace (formerly Thomson Reuters Eikon).

# Disclaimer

The project list compiled by Market Forces is not an exhaustive list of all gas and LNG projects in Bangladesh. Projects powered by domestic gas sources are excluded. Market Forces has made every effort to ensure the analysis and information provided in the report are sound, but cannot guarantee the accuracy or correctness of any of the data collected from external sources.

Market Forces is an environmental advocacy project that focuses on financial institutions, and not a financial adviser. This material is provided for general information purposes only and is not to be taken as financial advice.

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# Appendices

## Appendix 1

### List of proposed LNG power projects in Chattogram and the rest of Bangladesh*

| Project name | Capacity (MW) | Completion scheduled | Sponsor | Division |
|---|---|---|---|---|
| Anwara 590 MW CCPP | 590 | 2027 | United Enterprises | Chattogram |
| Anwara 600 MW CCPP | 600 | 2026 | Jalalabad Electric Power Company | Chattogram |
| Anwara 700MW CCPP | 700 | N/A | KEPCO, AKH PP Project, Itochu | Chattogram |
| Ashuganj 450 MW CCPP (Replacement Project) | 450 | 2028 | Ashuganj Power Station Company Ltd (APSCL) | Chattogram |
| Ashuganj 600 MW CCPP (Replacement Project) | 600 | 2031 | Ashuganj Power Station Company Ltd (APSCL) | Chattogram |
| Ashuganj 600MW CCPP at B-Type Area (Phase 1) | 600 | 2037 | Ashuganj Power Station Company Ltd (APSCL) | Chattogram |
| Ashuganj 600MW CCPP at B-Type Area (Phase 2) | 600 | 2041 | Ashuganj Power Station Company Ltd (APSCL) | Chattogram |
| Boalkhali 400 MW CCPP (Phase 1) | 400 | 2038 | Rural Power Company Limited (RPCL) | Chattogram |
| Boalkhali 400 MW CCPP (Phase 2) | 400 | 2041 | Rural Power Company Limited (RPCL) | Chattogram |
| CPGCBL-Mitsui 500-630 MW LNG Based CCPP | 630 | 2028 | Coal Power Generation Company Bangladesh Limited (CPGCBL), Mitsui & Co | Chattogram |
| Maheshkhali LNG Power Plant | 3600 | 2027 | GE, Bangladesh Power Development Board (BPDB) | Chattogram |
| Matarbari Summit LNG Power Plant | 2400 | 2023 | Summit, GE | Chattogram |
| Mirsarai 1800 MW LNG Based CCPP Project | 1800 | 2024 | Rural Power Company Limited (RPCL) | Chattogram |
| Mirsarai 660 MW LNG Power Plant | 660 | 2027 | Confidence Group, GE | Chattogram |
| Pertamina LNG Power Plant | 1400 | 2026 | Pertamina | Chattogram |
| Raojan 400±10% MW CCPP (Unit 1) | 438 | 2025 | Bangladesh Power Development Board (BPDB) | Chattogram |
| Raozan 550 MW CCPP (Unit 2) | 550 | 2031 | Bangladesh Power Development Board (BPDB) | Chattogram |
| Sonagazi, Feni 600-700 MW CCPP (Unit 1) | 660 | 2028 | Electricity Generation Company of Bangladesh (EGCB) | Chattogram |
| Sonagazi, Feni 600-700 MW CCPP (Unit 2) | 660 | 2032 | Electricity Generation Company of Bangladesh (EGCB) | Chattogram |
| Sonagazi, Feni 600-700 MW CCPP (Unit 3) | 660 | 2034 | Electricity Generation Company of Bangladesh (EGCB) | Chattogram |
| Sonagazi, Feni 600-700 MW CCPP (Unit 4) | 660 | 2036 | Electricity Generation Company of Bangladesh (EGCB) | Chattogram |
| Patuakhali 1200 MW CCPP (Phase 1) | 1200 | 2029 | Ashuganj Power Station Company Ltd (APSCL) | Barisal |
| Patuakhali 1200 MW CCPP (Phase 2) | 1200 | 2034 | Ashuganj Power Station Company Ltd (APSCL) | Barisal |
| Patuakhali 1200 MW CCPP (Phase 3) | 1200 | 2041 | Ashuganj Power Station Company Ltd (APSCL) | Barisal |
| Payra LNG Power Plant | 1000 | N/A | Emirates National Oil Company (ENOC) | Barisal |
| Payra LNG Power Plant (Phase 1) | 1200 | 2027 | North-West Power Generation Company Ltd | Barisal |
| Payra LNG Power Plant (Phase 2) | 1200 | 2030 | North-West Power Generation Company Ltd | Barisal |
| Payra LNG Power Plant (Phase 3) | 1200 | 2033 | North-West Power Generation Company Ltd | Barisal |
| Gazaria 600 MW LNG Based CCPP Project (Phase 2) | 600 | 2033 | Rural Power Company Limited (RPCL) | Dhaka |
| Gazipur 225 MW CCPP | 225 | 2032 | Rural Power Company Limited (RPCL) | Dhaka |
| Gazipur 450 MW CCPP | 450 | 2031 | Rural Power Company Limited (RPCL) | Dhaka |
| Meghnaghat 450 MW | 450 | 2026 | Anlima Textile Ltd, GE | Dhaka |
| Meghnaghat 600 MW CCPP | 600 | N/A | Edra Power Holdings Sdn Bhd, Winnievision Power Ltd | Dhaka |
| Munshiganj 600-700 MW CCPP (Phase 1) | 660 | 2030 | Electricity Generation Company of Bangladesh (EGCB) | Dhaka |
| Munshiganj 600-700 MW CCPP (Phase 2) | 660 | 2032 | Electricity Generation Company of Bangladesh (EGCB) | Dhaka |
| Munshiganj 600-700 MW CCPP (Phase 3) | 660 | 2034 | Electricity Generation Company of Bangladesh (EGCB) | Dhaka |
| Munshiganj 600-700 MW CCPP (Phase 4) | 660 | 2036 | Electricity Generation Company of Bangladesh (EGCB) | Dhaka |
| Munshiganj 600-700 MW CCPP (Phase 5) | 660 | 2038 | Electricity Generation Company of Bangladesh (EGCB) | Dhaka |
| Shiddirgonj 550 MW CCPP | 550 | 2027 | Bangladesh Power Development Board (BPDB) | Dhaka |
| Mymensingh 400 MW CCPP | 400 | 2026 | B-R Powergen | Dhaka |
| ACWA LNG Power Plant | 3600 | 2024 | ACWA | Unknown |

### List of proposed LNG import infrastructure in Chattogram and the rest of Bangladesh*

| Project name | Capacity (mmcfd) | Completion scheduled | Sponsor | Division |
|---|---|---|---|---|
| Maheshkhali LNG Terminal | | N/A | Bangladesh Power Development Board (BPDB) | Chattogram |
| Maheshkhali Summit FSRU 2 | 800 | 2026 | Summit | Chattogram |
| Matarbari LNG Terminal (onshore) | 1000 | 2028 | Rupantarita Prakritik Gas Company (RPCGL) | Chattogram |
| Matarbari Summit LNG Terminal (onshore) | 1500 | 2023 | Mitsubishi Corporation, Summit | Chattogram |
| Payra FSRU (Excelerate) | 1000 | N/A | Excelerate Energy | Barisal |
| Payra LNG Terminal (onshore) (ENOC) | 1000 | N/A | Emirates National Oil Company (ENOC) | Barisal |
| ACWA LNG Terminal | 1000 | 2024 | ACWA, Saudi Aramco | Unknown |

**This list is based on Market Forces' analysis of available information regarding proposed LNG projects that have not reached financial close as of December 2023.*

## Appendix 2

### List of foreign companies involved in proposed LNG power plants in Chattogram

| Project name | Foreign company | Company domicile | Role |
|---|---|---|---|
| Anwara 600 MW CCPP (Jalalabad) | EnergyChina/ CEEC | China | EPC |
| | PowerChina International Group Ltd | China | EPC |
| Anwara 700MW CCPP (KEPCO/ AKH/ Itochu) | AKH PP Project | Unknown | Sponsor |
| | Itochu | Japan | Sponsor |
| | KEPCO | Korea | Sponsor |
| CPGCBL-Mitsui 500-630 MW LNG CCPP | Mitsui & Co | Japan | Sponsor |
| | MUFG | Japan | Adviser (Financial) |
| Maheshkhali LNG Power Plant | GE | USA | Sponsor |
| Matarbari Summit LNG Power Plant | ADB | Multilateral | Lender (Prospective) |
| | GE | USA | EPC |
| | | | Sponsor |
| | IFC | Multilateral | Lender (Prospective) |
| | JBIC | Japan | Lender (Prospective) |
| | JERA | Japan | Shareholder of Summit |
| | Summit | Singapore | Sponsor |
| Mirsarai 660 MW (Confidence) LNG Power Plant | GE | USA | Sponsor |
| Pertamina LNG Power Plant | Pertamina | Indonesia | Sponsor |
| | SMBC Group | Japan | Adviser (Financial) |

**List of foreign companies involved in proposed LNG import terminals in Chattogram**

| Project name | Foreign Company | Company domicile | Role |
|---|---|---|---|
| Maheshkhali Summit FSRU 2 | JERA | Japan | Shareholder of Summit |
| | Summit | Singapore | Sponsor |
| Matarbari LNG Terminal (onshore) | Chugoku Electric | Japan | Bidder |
| | ExxonMobil | USA | Bidder |
| | JERA | Japan | Bidder |
| | Kyushu Electric | Japan | Bidder |
| | Mitsubishi Corporation | Japan | Bidder |
| | Mitsui & Co | Japan | Bidder |
| | Petronet LNG | India | Bidder |
| | Qatar Petroleum | Qatar | Bidder |
| | Sumitomo Corporation | Japan | Bidder |
| | Summit | Singapore | Bidder |
| | Tokyo Gas | Japan | Feasibility Study, EIA, Bidder selection |
| | Total | France | Bidder |
| Matarbari Summit LNG Terminal (onshore) | ADB | Multilateral | Lender (Prospective) |
| | IFC | Multilateral | Lender (Prospective) |
| | JBIC | Japan | Lender (Prospective) |
| | JERA | Japan | Shareholder of Summit |
| | Mitsubishi Corporation | Japan | Sponsor |
| | Summit | Singapore | Sponsor |

# Appendix 3

**Emissions calculation**

The proposed LNG projects are assumed to have a 51.9% average capacity factor across a 30-year economic lifetime. Emissions estimates are based on median lifecycle emissions from combined cycle gas power of 490 gCO2-e/kWh, according to IPCC 2014, p1335, citing Schlömer S., T. Bruckner, L. Fulton, E. Hertwich, A. McKinnon, D. Perczyk, J. Roy, R. Schaeffer, R. Sims, P. Smith, and R. Wiser. (2014). Annex III: Technology-specific cost and performance parameters. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-iii.pdf#page=7

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In 2020, Bangladesh emitted 224.35 MtCO2-e.
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EPA emissions calculator
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

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