

# A Carbon Catastrophe in the Making

The dirty energy plans in  
Chattogram, Bangladesh



Salt farmers working near the Matarbari coal-fired power project construction site in Cox's Bazar District, Bangladesh.  
Photo Credit: Market Forces



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# Executive Summary

Known throughout Bangladesh for its beautiful beaches and mountainous terrains with deep tropical forests, the Chattogram division of Bangladesh is now at risk of being the location of one of the world's largest carbon catastrophes. Plans by companies predominantly from Japan and the United States to more than double fossil fuel power in Bangladesh overwhelmingly focus on the Chattogram division, the location of two-thirds of the proposed new fossil fuel capacity in Bangladesh.

20 gigawatts (GW) of new coal and gas power capacity is proposed in the Chattogram division this decade, enough to double the current power capacity of Bangladesh. This massive buildout spells disaster for the local ecology and waterways, communities and livelihoods, health and the climate.

The climate impacts of the proposed Chattogram power buildout would be immense, adding 1.38 billion tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e) to the atmosphere throughout the plants' operational lifetime. This is equivalent to more than five years of Bangladesh's national emissions. This buildout is being proposed despite the International Energy Agency (IEA) stating that we need to stop adding fossil fuel supply if we are to achieve the goal of net-zero emissions globally by 2050, warning that much of the proposed and even existing liquefied natural gas (LNG) infrastructure risks becoming stranded.

Arguably the most damaging proposal is Matarbari 2, a 1,200 megawatt (MW) coal power station proposed to be built and funded by Japanese companies, contradicting Japan's commitment to end coal financing made through the G7 in 2021. The Matarbari 1 project has already resulted in damage to local waterways while people have been displaced and lost their livelihoods as a result of construction. If built, health impacts related to air pollution from Matarbari 1 and 2 projects' operational years would cause an estimated 6,700 premature deaths.

New coal and gas power in Bangladesh would also exacerbate a massive sovereign risk issue. The government of Bangladesh already paid US\$1.6 billion in 2021 to companies for unused power capacity, while the Bangladesh Power Development Board (BPDB) is calling for tariff increases to offset the crippling costs of buying power from independent power projects.

By 2030, Bangladesh's annual LNG import cost would be an estimated US\$8.4 billion. With a further LNG-to-power project

Plans by companies predominantly from Japan and the United States to massively expand fossil fuels in Bangladesh overwhelmingly focus on the Chattogram division, the location of two-thirds of the proposed new fossil fuel capacity in Bangladesh.

construction cost of US\$960 million per GW on average, Bangladesh's economy would be exposed to the volatile prices of imported fuels and force the Bangladeshi public to bear financial risks that should be held by foreign private companies. Companies like Mitsubishi Corporation (Mitsubishi), JERA, and General Electric (GE) are holding Bangladesh as financial hostages so they can profit from the buildout of more polluting power.

Bangladesh has the potential to meet its new energy needs with renewable sources like wind and solar. Moreover, these sources do not require expensive and environmentally destructive fuel imports.

Wealthy nations like Japan and the United States should stop treating Bangladesh as one of the last dumping grounds for polluting power, and instead support Bangladesh to meet its new power needs with the clean, cheap and climate-friendly technologies the rest of the world is able to enjoy.

The Matarbari 1 project has already resulted in damage to local waterways while people have been displaced and lost their livelihoods as a result of construction.



*This fishing community village is a stone's throw away from the under construction Matarbari 1 coal power project.  
Photo Credit: Market Forces*

# Fossil fuel pipeline in Bangladesh

## Bangladesh energy state of play

As of November 2021, Bangladesh's power production capacity was 22 GW, with coal, oil and gas making up 93% of the country's energy mix, the remaining coming from imported or renewable energy sources.<sup>1</sup> Renewable sources of power make up less than 2% of the country's energy capacity.<sup>2</sup>

Currently, the only two LNG import terminals in Bangladesh are Floating Storage and Regasification Units (FSRUs) with 3.8 million metric tonnes per annum (mtpa) capacity each, based in Maheshkhali in Chattogram division. Bangladesh started importing LNG in 2018.<sup>3</sup>

## Trending away from dirty coal

Bangladesh has typically relied on domestic gas for electricity. However, dwindling domestic supplies resulted in Bangladesh increasing fuel imports. For the last few years, Bangladesh was looking to coal to meet its energy needs.

In 2019, Bangladesh's intention was to build 29 coal power projects, increasing the coal capacity from 525 megawatts (MW) to 33,200 MW.<sup>4</sup> However, in the face of rising global pressures to tackle climate change, in June 2021 the government of Bangladesh cancelled ten proposed coal power projects.<sup>5</sup> It appears overall that only three are close to coming online. While this clear shift away from coal is a crucial step to decarbonising Bangladesh's energy future, a planned switch from coal to imported LNG-based power has been reported.<sup>6</sup>

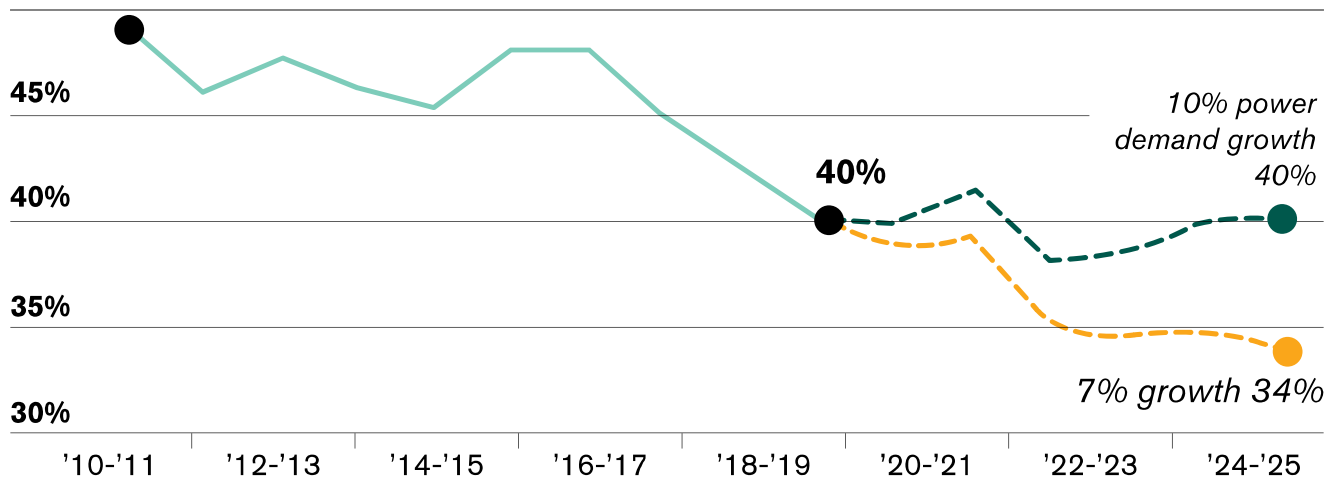
## Major overcapacity issues

There is already a major overcapacity issue in Bangladesh. In 2020-2021, about 60 percent of installed

## Power System Utilisation in Bangladesh

Future scenarios predict continued underutilisation

### 50% system utilisation



Source: Bangladesh Power Development Board, IEEFA

IEEFA

capacity was not used.<sup>7</sup> According to the Institute for Energy Economics and Financial Analysis (IEEFA), the gap between power production capacity and actual demand has gradually increased over the last few years.<sup>8</sup>

IEEFA predicts that as more capacity is added over the next five years, capacity utilisation will drop below 40%.

As of January 2022, as many as 23 power plants were idle due to low electricity demand.<sup>9</sup>

### Future plans “not fit for purpose”

In seeking to achieve long term economic growth, the government of Bangladesh has set out an energy production plan aiming for a total capacity of 72 to 82 GW by 2041.<sup>10</sup> However, energy experts have described this plan as “not fit for purpose,”<sup>11</sup> criticising its heavy reliance on fossil fuels and overprojection of electricity demand.<sup>12</sup>

This comes as no surprise given Japan’s government agency Japan International Cooperation Agency (JICA) has been assigned to prepare Bangladesh’s next energy and power master plan.<sup>13</sup> Many of the world’s biggest corporate proponents of LNG are Japanese companies and it appears JICA’s control over Bangladesh’s energy strategy will serve mainly the interests of these companies. Energy experts are advocating for JICA to make this new plan a low or zero emissions roadmap with no further expansion of coal and LNG and calling for it “be designed in Bangladesh’s best interests, not Japan’s”.<sup>14</sup>

## LNG power explosion

The LNG power buildout in the Chattogram will cost close to US\$18 billion, six times more than the country’s 2022 budget to tackle climate change.

In 2020, 69% of Bangladesh’s electricity was provided by gas power. While most was being met by domestic gas, LNG imports began in September 2018 and are expected to rise.<sup>15</sup>

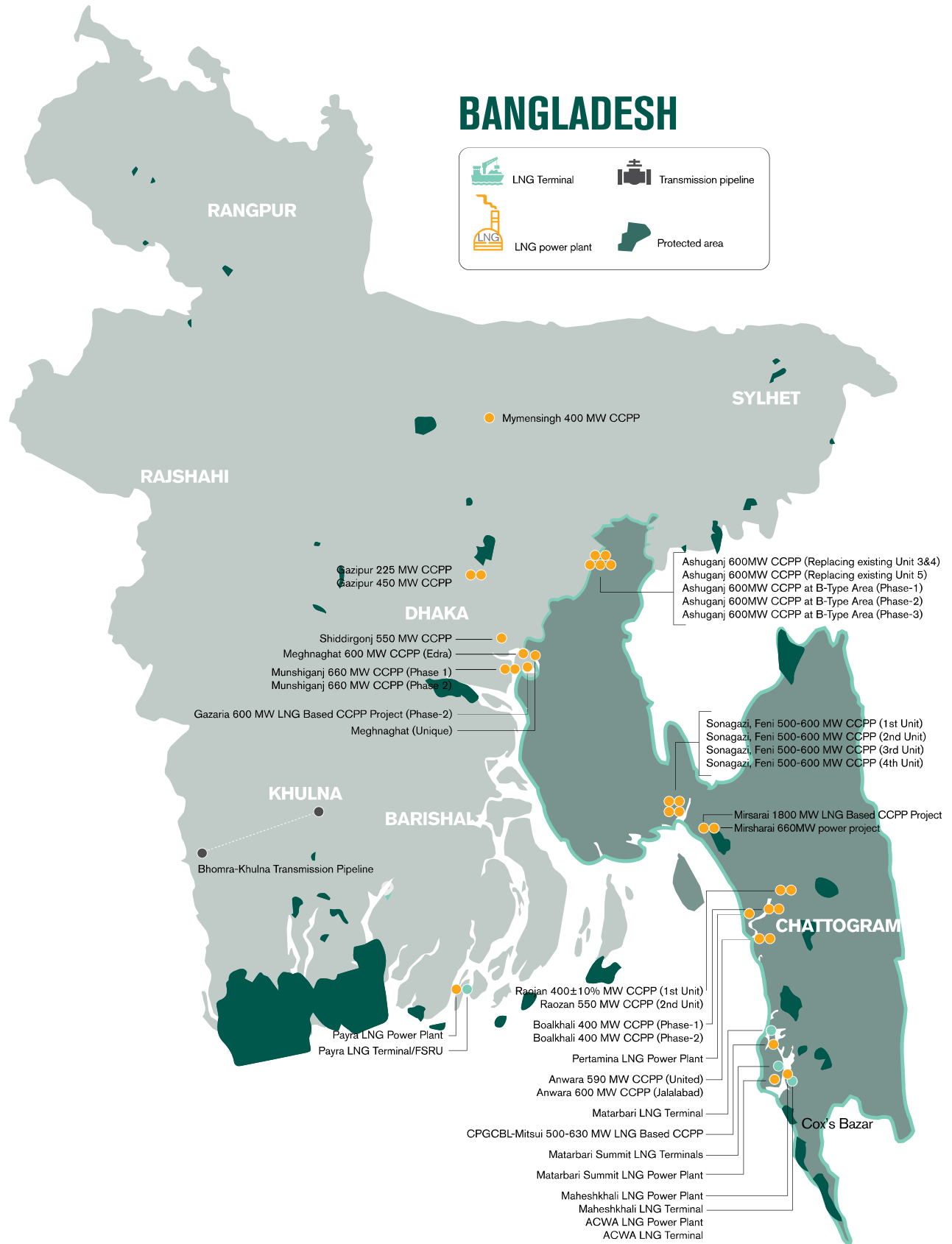
As of December 2021, there are 32 LNG to power projects with the capacity of 30.6 GW and 6 LNG import terminals/FSRUs proposed in Bangladesh. According to Wood Mackenzie’s LNG outlook, Bangladesh’s LNG demand is expected to grow to 21.2 Mtpa by 2030, increasing current LNG import volumes five-fold.<sup>16</sup>

District	Number	Capacity (GW)
Chattogram	21	18.7
Barisal	1	3.6
Dhaka	8	4.3
Mymensingh	1	0.4
Unclear	1	3.6

Of the 30.6 GW of LNG to power projects, almost two-thirds are planned in the Chattogram region.

At least four of the six terminals or FSRUs are planned for the Chattogram region.

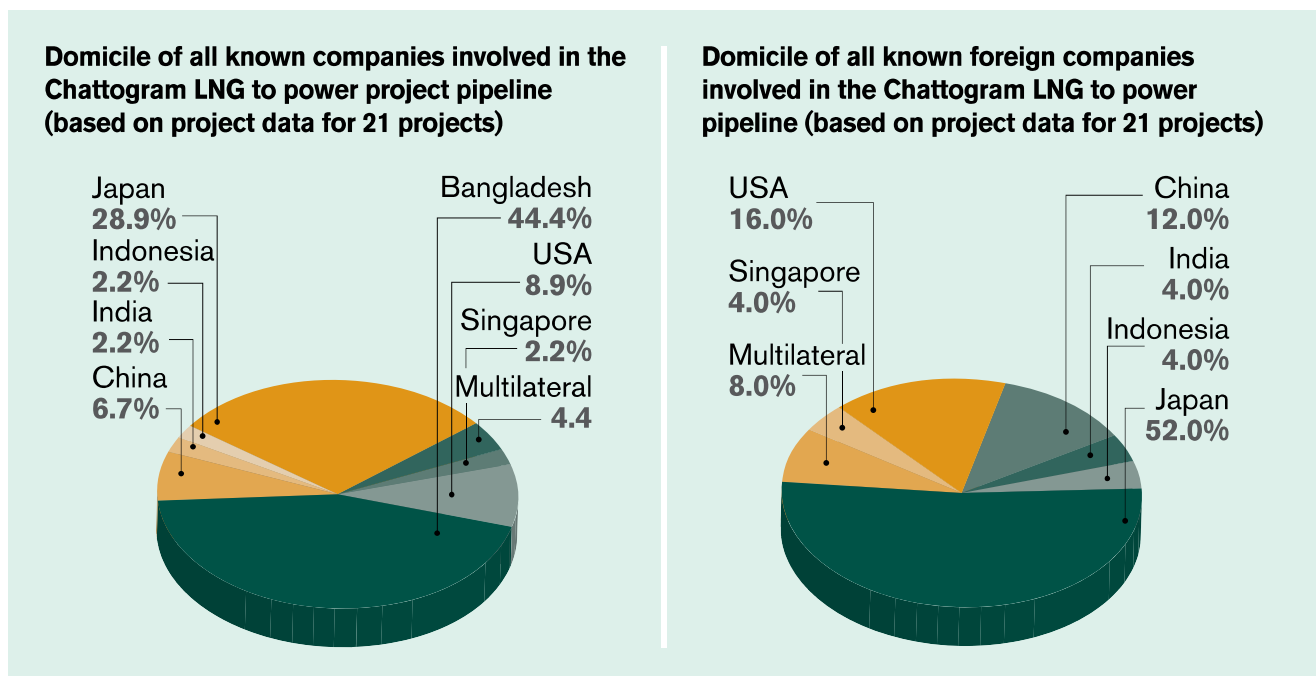
For projects with known costs, 15 GW of LNG-based power projects total US\$14.6 billion, averaging US\$960 million per GW. Based on that average calculation, the LNG to power buildout in the Chattogram division will cost close to US\$18 billion, six times more than the country’s 2022 budget to tackle climate change.<sup>17</sup>



## Who is behind the Chattogram division buildout?

This section is based on Market Forces' analysis of known information regarding pending projects in Bangladesh.<sup>18</sup> Typically, large-scale power projects in Bangladesh are partnerships between Bangladesh and foreign companies. Therefore, it would be expected that roughly half of the projects would have a Bangladesh company involved, although it may be the foreign company that is the driving force.

Many of the companies involved in the buildout of fossil fuels in Chattogram are domiciled in Japan. Matarbari 1 coal power plant is being built by Sumitomo Corporation (Sumitomo), which has since ruled out involvement in Matarbari 2. Similarly, the companies involved in the LNG power pipeline, from an analysis based on 21 projects, are overwhelmingly Japanese.



According to Oil Change International, “While framed as helping countries with energy transition, Japan’s push to expand LNG is largely motivated by corporate interests.”<sup>19</sup> As noted in the list of companies below, there are a significant number of Japanese companies involved in multiple roles, including sponsor, engineering procurement and construction contractor (EPC) building projects, or lender. This fact makes it a clear conflict of interest for Japan to be developing the energy and power master plan for Bangladesh.



# Japan Inc.'s fossil fuel problem

Both the Japanese government and corporations have continued to finance the expansion of fossil fuels, despite this contradicting the climate goals of the Paris Agreement.<sup>20</sup> As stated by Fatih Birol, the IEA's executive director in 2021: "If governments are serious about the climate crisis, there can be no new investments in oil, gas and coal, from now – from this year."<sup>21</sup>

## Public finance

According to Oil Change International, Japan is one of the largest providers of public finance for fossil fuels in the world, providing at least US\$4.5 billion for fossil fuels annually from 2018 to 2020.<sup>22</sup>

In June 2021, the Japanese government revised its Infrastructure Systems Export Strategy 2025 to "end new direct international government support for unabated coal-fired power generation."<sup>23</sup> However, it appears that JICA may be considering financing the Matarbari 2 coal-fired power project in contradiction to this commitment. A whistleblower complaint was brought against JICA to the US Securities and Exchange Commission alleging JICA was misleading bondholders by advising that JICA's bonds were not going to be used in coal power, when in fact the proceeds would be used to fund Matarbari 1 and, if approved, Matarbari 2.<sup>24</sup>

## Corporate support

Companies like Mitsubishi, JERA and Marubeni are doubling down on their support of fossil fuel expansion in Chattogram, despite making commitments to net-zero CO<sub>2</sub> emissions by 2050.<sup>25</sup> The IEA's Net Zero by 2050 Scenario<sup>26</sup> published in May 2021 makes clear that achieving this goal means "no new natural gas fields are needed," and "also not needed are many of the liquefied natural gas (LNG) liquefaction facilities currently under construction or at the planning stage."<sup>27</sup>

Nevertheless, Mitsubishi and JERA (through an equity stake in Summit LNG) are acting as sponsors of the proposed Matarbari Summit LNG Power Plant and the Matarbari Summit LNG Terminals. They are also bidding to be the sponsor of the Matarbari LNG Terminal.

## Japanese companies sponsoring Chattogram LNG power plants

Company	Project Name	Equity stake	Capacity (MW)	Relative capacity owned (MW)
JERA (22% equity shareholder of Summit)	Matarbari Summit LNG Power Plant	22% (of Summit's 55% joint venture share)	2400	290
Kyushu Electric	Anwara 590 MW CCPP (United)	20%	590	118
Marubeni	Pertamina LNG Power Plant	50%	1400	700
Mitsubishi Corporation	Matarbari Summit LNG Power Plant	25%	2400	600
Mitsui & Co	CPGCBL-Mitsui 500-630 MW LNG Based CCPP	50%	630	315
Sojitz	Anwara 590 MW CCPP (United)	20%	590	118

## Chattogram LNG import infrastructure projects and corporate involvement

LNG infrastructure project	Role	Company
Maheshkhali LNG Terminal	Sponsor	GE
Matarbari LNG Terminal	Bidder	Chugoko Electric
		Japan Investment Corporation
		JERA
		Kogas
		Marubeni
		Mitsubishi Corporation
		Mitsui & Co
		Osaka Gas
		Petronet LNG
		Poly-GCL Petroleum
		Posco
		Samsung
		Shell
		Sumitomo Corporation
		Summit
		Total
	Feasibility Study	Tokyo Gas
Matarbari Summit LNG Terminals (2)	Prospective Lender	ADB
		IFC
		JBIC
	Shareholder in Summit	JERA
	Sponsor	GE
		Mitsubishi Corporation
		Summit

## General Electric: keeping the US in the game

US involvement in this pipeline of LNG to power projects is driven largely by GE, a sponsor or EPC for at least three proposed LNG to power projects in Chattogram. GE is also involved as a sponsor or a bidder in all four proposed LNG terminals. Despite setting a goal to become carbon neutral in its facilities and operations by 2030, GE includes polluting technologies like gas power as a part of its energy transformation strategy.<sup>28</sup>

## Case study: Matarbari

Coal Power Generation Company Bangladesh (CPGCBL) and Sumitomo Corporation (Sumitomo) are building a 1,200 MW coal-fired power plant, Matarbari 1, on Matarbari Island in Cox's Bazar, the southeastern coast of Bangladesh.<sup>29</sup>

The government of Bangladesh has requested JICA finance a further 1,200 MW coal power plant proposal, Matarbari 2.<sup>30</sup> On February 28, 2022, after significant civil society pressure, Sumitomo Corporation updated its climate change policy and confirmed it would end its involvement in Matarbari 2.<sup>31</sup>

In March 2022, news reports revealed that the Environmental Impact Assessment (EIA) of Matarbari 2 fails to adequately address major environmental and health impact concerns. According to environmental and air pollution experts, JICA's EIA report of Matarbari 2 "has furnished misleading information, used flawed air quality modelling and intentionally omitted facts to avoid addressing major crises likely to be caused by the project."<sup>32</sup>

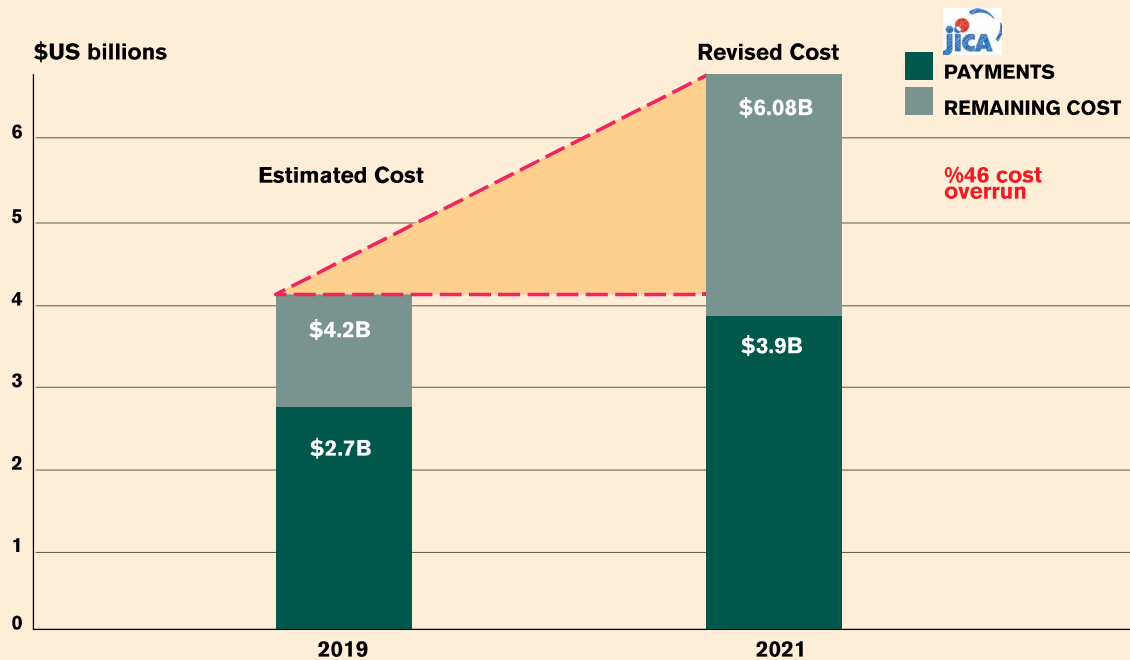
A detailed technical evaluation by Mark Chernaik, Staff Scientist of Environmental Law Alliance Worldwide (ELAW), has found the Matarbari 2 EIA:<sup>33</sup>

- Fails to provide adequate justification for the project in light of power overcapacity issues in Bangladesh,
- contradicts the Bangladesh government's findings on renewable energy alternatives,
- does not apply international best practice to manage coal ash or follow Japan's own ambient air quality standards, and
- fails to disclose detailed information on the true impact on the environment, climate and communities.

**Matarbari 1 has created significant losses for project affected communities,** including flooding from construction, and the filling of the Kohelia River.<sup>34</sup> As a result of the construction, more than 2,000 fisherfolk who used to rely on the river lost their livelihoods, and trade from the region has been disrupted as boats cannot navigate the river any longer.<sup>35</sup> Locals report pollution from the project's development has damaged adjacent shrimp farms and the river water has become turbid after mixing with silt from the project work.<sup>36</sup> The Deputy Director of the Department of Environment (DoE), which approved the Environmental Impact Assessment in 2014, noted that the encroachment of Kohelia River was not mentioned by project proponents, and that "DoE would not have issued any clearance" if it was.<sup>37</sup>

As of June 2021, according to testimonials of local community members, salt farmers and fishermen have lost their jobs due to the construction of Matarbari coal power project and are yet to receive compensation.<sup>38</sup>

## COST OVERRUN FOR MATARBARI 1



Source: Market Forces, JIGlobal, The Financial Express

### Cost overruns

JICA is currently funding the construction of Matarbari 1, having paid 300.5 billion yen (US\$2.7 billion approx.) in five loan tranches for the project to July 2019.<sup>39</sup> While these funds have already been disbursed, it was reported in November 2021 that JICA signed a follow-on loan agreement of an additional 143 billion yen (US\$1.2 billion) for Matarbari 1.<sup>40</sup> Earlier in 2021, the project's implementation agency announced a cost overrun of Taka 164.05 billion (US\$1.9 billion), roughly 46% of the original cost.<sup>41</sup>

### Local and international opposition

The Matarbari coal power project has been challenged by local community members demanding compensation for the filling of the Kohelia river.<sup>42</sup>



Protest in Tokyo in 2021: In June, activists in Japan protested outside of Sumitomo's Annual General Meeting in Tokyo holding images of community members affected by Matarbari 1. Photo credit: ©Taishi Takahashi



Action outside the Embassy of Japan in the Philippines. Photo Credit: Asian Peoples' Movement on Debt and Development (APMDD)

In October 2021, activists from around the world joined to protest Japan's continued coal power finance, highlighting the government's role in financing the Matarbari 1 coal project and considering Matarbari 2. More recently, a global petition was launched by Fridays for Future seeking that Matarbari be stopped.<sup>43</sup>



An activist in Tokyo, Japan holds up a full page ad published in the New York Times calling on Japan to stop funding coal. Photo credit: Friends of the Earth Japan



Pikachu Action in Bangladesh. Photo Credit: Bangladesh Working Group on External Debt (BWGED) and YouthNet for Climate Justice, Bangladesh

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# Chattogram's beaches and biodiversity at risk



*Tourists enjoying sunset at Cox's Bazar Sea Beach. Photo Credit: Market Forces*

Chattogram, formerly known as Chittagong, is a major coastal region in southeastern Bangladesh. Chattogram city is the second largest urban area after the capital Dhaka, and hosts the main seaport of Bangladesh. Despite Chattogram Port being one of South Asia's most important trading routes through the Bay of Bengal and one of the busiest ports in the world,<sup>44</sup> the region is also home to long sandy beaches and reportedly Bangladesh's last rainforest,<sup>45</sup> making it a favourite tourist destination and ecologically important place for the people of Bangladesh.

Cox's Bazar is one of the world's longest natural beaches and a favourite tourist destination for the people of Bangladesh.<sup>46</sup> Stretching across 100 kilometres, the blue waters, golden sandy beaches, and tropical weather of Cox's Bazar attracts 10,000,000 tourists every year.<sup>47</sup> The coastal plains offer tourists a respite away from the busy cities.<sup>48</sup> Himchari National Park is a lush rainforest with waterfalls, home to hundreds of species of animals, birds and plants.<sup>49</sup>

Parbotto Chattogram or the Chittagong Hill Tracts (CHT) span more than 13,000 square kilometres and is a group of three districts within Chattogram division.<sup>50</sup> CHT is distinct in its ethnic, cultural, and environmental diversity to the rest of Bangladesh. The hill tracts are beautiful mountainous terrains with deep tropical forests, waterfalls and freshwater bodies.<sup>51</sup> The hill tracts are also home to the majority of Bangladesh's ethnic and indigenous peoples who have a unique history and culture.<sup>52</sup>

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*Himchari National Park. Photo Credit: Market Forces*



*Conservation scientists and researchers working with Indigenous parabiologists to protect threatened species using traditional ecological knowledge in Parbotto Chattogram. Photo Credit: Creative Conservation Alliance*



Covering around 10% of the entire country's land mass, CHT's lush, green tropical forests make up a biodiversity hotspot.<sup>53</sup> Although there is no definitive figure of the number of plants and animals in CHT forests, conservationists identify at least 26 globally threatened species that live in the hill tracts including the great Asian Elephant, Clouded Leopard and Chinese pangolin, among others.<sup>54</sup> CHT forests are increasingly threatened by deforestation, degradation of forest resources and poor land management practices. The construction of the 230 MW hydro power station and dam at Kaptai in the 1960s affected 54,000 acres of forest and agricultural areas and displaced over 100,000 local and indigenous peoples, resulting in forced migration to neighbouring India.<sup>55</sup>

The Chattogram division is at an increased risk of losing its charm and beauty due to unplanned urbanisation and rapid development of projects without due consideration of nature and biodiverse ecosystems.<sup>56</sup>

CHT forests  
are increasingly  
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practices.



*One of the last of the Asian Elephants in Bangladesh. Photo Credit: Creative Conservation Alliance*

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# Issues related to fossil fuel buildout

## Financial cost of coal and LNG

Both coal and LNG are imported fuels and, as such, there is a substantial and volatile cost to using these fuels in electricity generation. According to the World Bank, natural gas and coal prices reached record levels in October 2021. The Australian thermal coal price was three times higher in October 2021 than January 2021.<sup>57</sup> The LNG market can also be expensive and volatile,<sup>58</sup> with Bangladesh already feeling the pinch, buying two LNG cargoes at record prices in October 2021.<sup>59</sup>

By 2030 it would cost Bangladesh an estimated US\$8.4 billion every year to import LNG at the 2030 price forecasted by the IEA.<sup>60</sup> Depending on costly imported LNG could significantly hurt Bangladesh's growing trade deficit<sup>61</sup> and threaten energy security.<sup>62</sup>

A report from Centre for Policy Dialogue finds “current price estimates for [LNG imports in] the fiscal year 2021-22 make LNG 24 times more expensive than [Bangladesh's] national production by national companies”.<sup>63</sup>

Disruptions in global LNG trade can cause gas shortages, even when long-term supply contracts have been signed. For example, as of December 2021, Qatar and Oman, two contracted long-term LNG suppliers to Bangladesh, have planned to reduce their 2022 LNG deliveries.<sup>64</sup>

Domestic issues related to supply can also arise. One of Bangladesh's two LNG importing facilities was forced to stop LNG imports in December 2021 due to a damaged mooring line.<sup>65</sup>

This cost is compounded by the fact that Bangladesh provides “capacity payments,” a monetary penalty paid to private power plant owners for unused capacity due to low electricity demand.<sup>66</sup> For example, the newly constructed Payra coal power plant had not operated at full capacity for months due to low demand and delay in transmission infrastructure being built.<sup>67</sup> For sitting idle, the owners received roughly US\$116 million (Taka 10 billion) for seven months from the start of its commercial operation to June 2021.<sup>68</sup>

In 2021 the Bangladesh Power Development Board (BPDB) paid US\$1.6 billion (approx.) in capacity payments, a 48% increase from the previous year.<sup>69</sup> This burden is expected to increase as more plants are built. One third of the energy ministry's budget has been allocated to capacity payments for idle power plants in the 2020-2021 financial year.<sup>70</sup> Even though Bangladesh has scrapped some coal-fired power plants, the expectation is still that Bangladesh will produce a surplus of 17 GW of electricity by 2030.<sup>71</sup>

These rising costs from imported fuels may be passed on to consumers in the form of tariff increases. According to a February 2022 report by the Institute for Energy Economics and Financial Analysis, in January 2022, the BPDB proposed a bulk power tariff increase of up to 64% to cover a Taka 325 billion (US\$3.8 billion) shortfall.<sup>72</sup> Given the pipeline of projects, this proposed tariff increase is unlikely to be the last, and expected to become an added burden to everyday consumers of electricity.<sup>73</sup>

## Damage to climate

In order to meet the climate goals of the Paris Agreement, there is no room for new carbon emitting power projects.<sup>74</sup> This means the proposed fossil fuel buildout in Chattogram could end our chances of meeting the Paris climate goals.

The total lifecycle carbon emissions from Chattogram's proposed coal and LNG power projects' lifetime operations is estimated at 1.38 billion tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e). This is equivalent to more than five years of Bangladesh's annual greenhouse gas emissions.<sup>75</sup>

Moreover, “the production, processing, and transport of gas release large amounts of methane, a GHG that has a much greater and more immediate climate impact”<sup>76</sup>, which are not included in the figure above.

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Intentional methane releases or leaks reduce any climate benefits from replacing coal with LNG. According to the Natural Resources Defense Council, “Emissions from burning gas to generate electricity are more than 50 percent higher than global sustainable development targets for the electricity sector, demonstrating that gas-fired power production is neither a strategic nor an effective approach to combat climate change and hold global warming at or below 1.5°C.”<sup>77</sup>

Bangladesh is a climate vulnerable country, bearing some of the worst impacts of climate change. According to NGO Germanwatch, from 2000 to 2019, “Bangladesh suffered economic losses worth US\$3.72 billion and witnessed 185 extreme weather events due to climate change.”<sup>78</sup> According to the Environmental Justice Foundation, up to 50% of those now living in Bangladesh’s urban slums may be there because they were forced to flee their rural homes as a result of riverbank flooding.<sup>79</sup>

In a scenario where global warming is limited to 2°C by 2050, 42 million people living on coastal Bangladesh (almost 18% of the projected 2050 population<sup>80</sup>) would be at risk of flooding at least once a year, and the entirety of Matarbari Island is projected to be inundated by coastal flooding.<sup>81</sup> It is ironic that the impacts of climate change, exacerbated by the additional fossil fuel power buildout, would be catastrophic to Chattogram’s physical LNG or coal power assets, threatening Bangladesh’s energy security,<sup>82</sup> as storms, flooding and high winds damage infrastructure.



*The devastating aftermath of cyclone Yaas in coastal Bangladesh in May 2021. Photo Credit: Market Forces*

## Health impacts of fossil fuels

Bangladesh is ranked as the world’s most polluted country by both IQAir<sup>83</sup> and Air Quality Life Index (AQLI),<sup>84</sup> two leading global air quality information platforms. According to a study published in the journal of the National Academy of Sciences, every year Bangladesh experiences 73,000 avoidable deaths related to health impacts from air pollution from burning fossil fuels.<sup>85</sup>

Several studies examining the health impacts of proposed coal-based power projects have shown alarming risks. If built, the Matarbari (1 and 2) projects alone have been estimated to cause 6,700 premature deaths “due to increased risk of stroke, heart disease, lung cancer and respiratory diseases,



*Commuters shielding their face from heavy dust and air pollution in Dhaka, Bangladesh.*

including lower respiratory infections in children” during the plants’ operational years.<sup>86</sup> The air pollution from the projects would also increase asthma, cancer, preterm births and other chronic respiratory diseases.<sup>87</sup> Studies by the Centre for Research on Energy and Clean Air (CREA) demonstrate emissions from proposed coal fossil fuel power projects in the Chattogram region would significantly worsen air quality, increasing the risk of death and illness from acute and chronic diseases.<sup>88</sup>

LNG, although touted by the fossil fuel industry as a “cleaner fuel” than coal, has similar health impacts. According to a report by Physicians for Social Responsibility (PSR), LNG terminals lead to poorer air quality and are located in areas that fail to meet air quality standards. They state: “these extra air pollutants (methane as well as nitrogen oxides, volatile organic compounds, ozone and particulate matter) exacerbate the health risks that already face heavily burdened communities”.<sup>89</sup> This is a particular concern for Chattogram, where residents live with the annual average particulate pollution level exceeding both the World Health Organization (WHO) guideline and Bangladesh’s own national standard.<sup>90</sup>

Peer reviewed scientific studies show burning gas in combined cycle power plants results in toxic gases and particulate matter which cause premature deaths and other health impacts like chronic bronchitis, cardiovascular disease, asthma and other health impacts.<sup>91</sup>

The coal and LNG build out in Chattogram would not only exacerbate the risks of climate change on already vulnerable coastal populations, but also deadly air-pollution related health impacts in the densely populated vicinities of the power plants.

## **Displacement and loss of livelihoods**

Construction of coal power projects have already destroyed homes, relocated families and impacted traditional livelihoods. Here are some stories of the people whose lives and livelihoods have been harmed by coal and LNG projects in Chattogram.



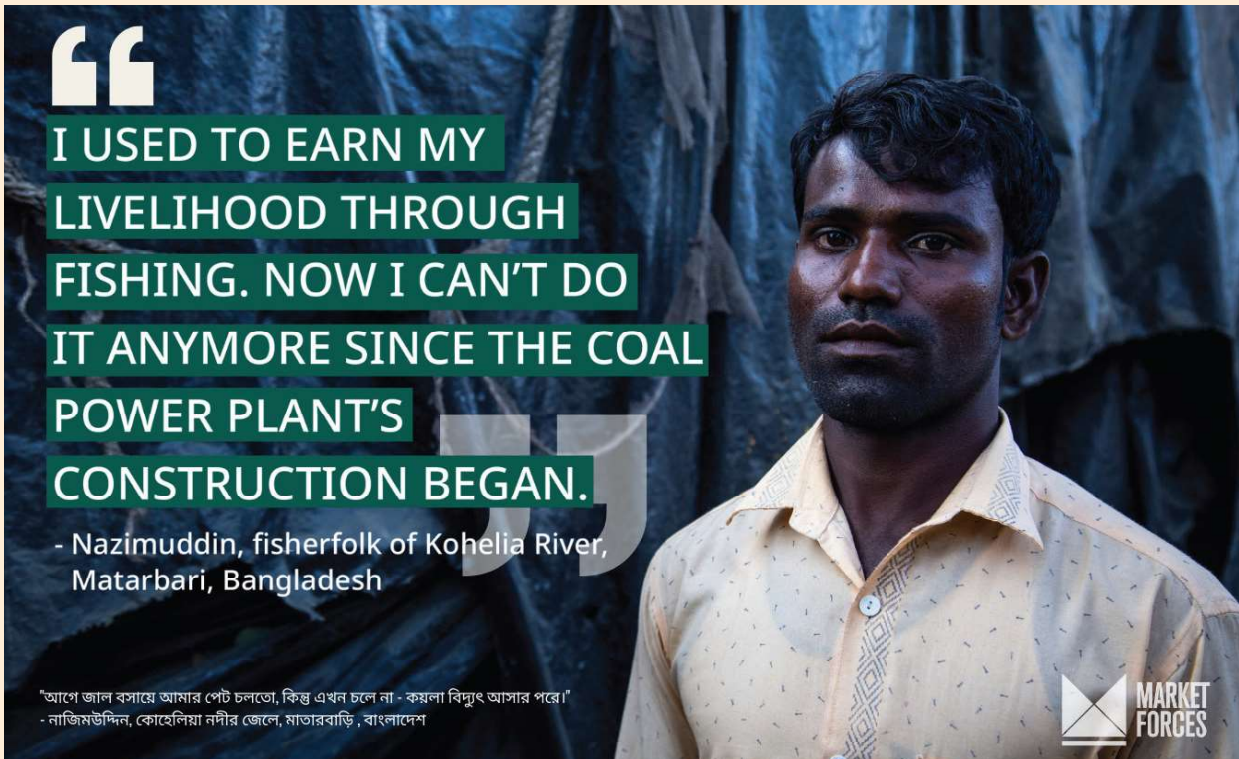
**“MY HOUSE HAS COLLAPSED DUE TO SAND REMOVAL FOR THE CONSTRUCTION OF THE MATARBARI COAL POWER PROJECT.”**

- Saleha Begum, Matarbari, Bangladesh

MARKET FORCES

“আগে অনেক বড় চর ছিল, আমার বাড়ি অনেক দূরে ছিল, মাতারবাড়ি কয়লা বিদ্যুৎ প্রকল্পের কারণে বালু তুলে নেওয়ায় ঘরবাড়ি ভেঙ্গে গেছে।”  
সালেহা বেগম, সাইরারডেইল, মাতারবাড়ি, বাংলাদেশ

Saleha Begum is a resident of Matarbari, Cox's Bazar. Saleha and her family lost their home to the sea two years ago from erosion. According to Saleha's testimony, the embankment eroded after sand was removed for the construction of the Matarbari 1 coal power project and port.



**“I USED TO EARN MY LIVELIHOOD THROUGH FISHING. NOW I CAN'T DO IT ANYMORE SINCE THE COAL POWER PLANT'S CONSTRUCTION BEGAN.”**

- Nazimuddin, fisherfolk of Kohelia River, Matarbari, Bangladesh

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“আগে জাল বসায় আমার পেট চলতো, কিন্তু এখন চলে না - কয়লা বিদ্যুৎ আসার পরে।”  
- নাজিমউদ্দিন, কোহেলিয়া নদীর জেলে, মাতারবাড়ি, বাংলাদেশ

Nazimuddin has fished at the Kohelia River in Matarbari, Cox's Bazar to support his family for the last ten years. Many fisherfolk like Nazimuddin have lost their livelihoods because of the filling up of the Kohelia River to build a road for the Matarbari coal power project.

“

I'VE LEARNED THAT  
AFTER THE COAL  
POWER PLANT IS  
BUILT, IT WILL EMIT  
TOXIC GASES AND  
HARM OUR SALT AND  
BETEL LEAF FARMS.

”

- Mohammad Mizan, Saltworker,  
Maheshkhali, Bangladesh

“কয়লা বিদ্যুৎ হচ্ছে - এখানে নাকি বিষাক্ত ধুমা বাহির  
হবে। আমাদের লবণের চাষ হবে না, পান খেতি হবে না।”  
- মোহাম্মদ মিজান, লবণ চাষী, মহেশখালী, বাংলাদেশ



Mizan is a third generation salt and betel leaf farmer in Maheshkhali. He is concerned that pollution from the Matarbari coal power project will destroy the salt and sweet betel leaf farms that Maheshkhali is famously known for around Bangladesh. Mizan worries he will soon be unemployed.

## What needs to happen?

The current overreliance on fossil fuels and massive proposed LNG buildout poses significant threats to the health, livelihoods and financial sustainability of Bangladeshis. Bangladesh can instead meet its energy needs with renewable sources. The country has potential for 30 GW of solar energy by 2041, according to the government of Bangladesh's Sustainable and Renewable Energy Development Authority (SREDA).<sup>92</sup> SREDA has also set a target of 5 GW of onshore and offshore wind power by 2030.<sup>93</sup> The sources would produce energy more cheaply, as they would not require costly fossil fuel imports.

Japan's involvement in the proposed fossil fuel buildout is particularly suspicious as the new energy and power master plan due in 2022 is funded and prepared by Japan. Although Japan claims that it is seeking a "transformation to a low or zero carbon energy system",<sup>94</sup> it has also stated its intention to continue financing LNG projects overseas,<sup>95</sup> and has not ruled out funding the Matarbari 2 coal power project.

If US-based GE or Japan-based Mitsubishi Corporation, JERA, and Marubeni are able to deliver their polluting fossil fuel plans in Bangladesh, the transition to renewable clean energy will be stifled. GE, Mitsubishi and JERA should be supplying Bangladesh with climate-friendly renewable technologies to ensure that Bangladeshis can enjoy a safe, healthy future.



Cox's Bazar Beach. Photo Credit: Market Forces

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## Methodology

This report examined the LNG projects (LNG to power, terminals and Floating Storage Regasification Units (FSRUs) proposed to be built in Bangladesh as of December 2021.

Market Forces identified proposed projects that have not reached financial close or have material prospects of being commissioned. Projects considered include the Matarbari coal-fired power projects, 32 LNG-based power projects (21 projects in the Chattogram region) with 30.6 GW capacity and LNG import infrastructure. Project data, including details on companies involved and potential financiers was compiled using Bangladesh Power Division's Revisiting Power System Master Plan (PSMP) released in 2018, official government documents, publicly available resources, company websites, peer-reviewed academic journals, news and research reports and subscription based financial databases by IJGlobal and Thomson Reuters.

## Disclaimer

The projects 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.

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# Appendices

## Appendix A: List of proposed LNG power projects in Chattogram and rest of Bangladesh

Name	Capacity (MW)	Completion Year	Sponsor
<b>Chattogram</b>			
Anwara CCPP* (United)	590	2026	Kyushu Electric, Sojitz and United Enterprises
Anwara 600 MW CCPP (Jalalabad)	600	-	Jalalabad Electric Power Company
Ashuganj 600 MW CCPP (Replacing existing Unit 3&4)	600	Past 2030	Ashuganj Power Station Company Ltd (APSCL)
Ashuganj 600 MW CCPP (Replacing existing Unit 5)	600	Past 2030	Ashuganj Power Station Company Ltd (APSCL)
Ashuganj 600 MW CCPP at B-Type Area (Phase-1)	600	2030	Ashuganj Power Station Company Ltd (APSCL)
Ashuganj 600 MW CCPP at B-Type Area (Phase-2)	600	2030	Ashuganj Power Station Company Ltd (APSCL)
Ashuganj 600 MW CCPP at B-Type Area (Phase-3)	600	Past 2030	Ashuganj Power Station Company Ltd (APSCL)
Boalkhali 400 MW CCPP (Phase-1)	400	2026	Rural Power Company Limited (RPCL)
Boalkhali 400 MW CCPP (Phase-2)	400	2030	Rural Power Company Limited (RPCL)
CPGCBL-Mitsui 500-630 MW LNG Based CCPP	630	2028	Coal Power Generation Company Bangladesh Limited (CPGCBL) Mitsui & Co
Maheshkhali LNG Power Plant	3600	2025	Bangladesh Power Development Board (BPDB) General Electric Company (GE)
Matarbari Summit LNG Power Plant	2400	2023	General Electric Company (GE) Mitsubishi Corporation Summit
Mirsarai 1800 MW LNG Based CCPP Project	1800	2024	Rural Power Company Limited (RPCL)
Mirsharai 660 MW power project	660	-	Confidence Group General Electric Company (GE)
Pertamina LNG Power Plant	1400	-	Marubeni Pertamina
Raojan 400±10% MW CCPP (1st Unit)	438	2024	Bangladesh Power Development Board (BPDB)
Raozan 550 MW CCPP (2nd Unit)	550	2031	Bangladesh Power Development Board (BPDB)
Sonagazi, Feni 500-600 MW CCPP (1st Unit)	550	2028	Electricity Generation Company of Bangladesh (EGCB)
Sonagazi, Feni 500-600 MW CCPP (2nd Unit)	550	2032	Electricity Generation Company of Bangladesh (EGCB)
Sonagazi, Feni 500-600 MW CCPP (3rd Unit)	550	2034	Electricity Generation Company of Bangladesh (EGCB)
Sonagazi, Feni 500-600 MW CCPP (4th Unit)	550	2036	Electricity Generation Company of Bangladesh (EGCB)

Name	Capacity (MW)	Completion Year	Sponsor
<b>Rest of Bangladesh</b>			
Gazaria 600 MW LNG Based CCPP Project (Phase-2)	600	2027	Rural Power Company Limited (RPCL)
Gazipur 225 MW CCPP	225	2023	Rural Power Company Limited (RPCL)
Gazipur 450 MW CCPP	450	2024	Rural Power Company Limited (RPCL)
Meghnaghat (Unique)	584	2022	General Electric Company (GE) Nebras Power Strategic Finance Unique Hotel & Resorts
Meghnaghat 600 MW CCPP (Edra)	600	-	Edra Power Holdings Sdn Bhd Winnievision Power Ltd
Munshiganj 660 MW CCPP (Phase 1)	660	2030	Electricity Generation Company of Bangladesh (EGCB)
Munshiganj 660 MW CCPP (Phase 2)	660	2031	Electricity Generation Company of Bangladesh (EGCB)
Shiddirgonj 550 MW CCPP	550	2025	Bangladesh Power Development Board (BPDB)
Mymensingh 400 MW CCPP	400	2026	B-R Powergen
ACWA LNG Power Plant	3600	2024	ACWA
Payra LNG Power Plant	3600	2024	North-West Power Generation Company Ltd Siemens

\*CCPP = Combined Cycle Power Plant

## Appendix B: Foreign companies listed by role and number of projects in the Chattogram division (not including bidding)

Country	Company	Role	Number of projects
China	China Energy Engineering Group Northwest Construction & Investment Co Ltd (EnergyChina/ CEEC)	Engineering, Procurement and Construction (EPC)	1
	Powerchina International Group Ltd (PowerChina)	EPC	1
	SEPCO III	EPC	1
India	Bharat Heavy Electricals Limited (BHEL)	EPC	1
Indonesia	Pertamina	Sponsor	1
Japan	Environmental Resources Management (ERM)	ESIA	1
	JBIC	Lender (Prospective)	1
	JERA	Shareholder of Summit	1
	Kyushu Electric	Sponsor	1
	Marubeni	Feasibility Study	2
	Marubeni	Sponsor	1

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Country	Company	Role	Number of projects
	Ministry of Economy, Trade and Industry (METI)	Feasibility Study	2
	Mitsubishi Corporation	Sponsor	1
	Mitsui & Co	Sponsor	1
	SMBC Group	Adviser	1
	Sojitz	Sponsor	1
	TEPSCO	ESIA	1
Multilateral	ADB	Lender (Prospective)	1
	IFC	Lender (Prospective)	1
Singapore	Summit	Sponsor	1
USA	General Electric Company (GE)	EPC	1
	General Electric Company (GE)	Sponsor	3

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Lifetime CO<sub>2</sub> estimates of the Matarbari 2 coal power project is based on the Global Energy Monitor's (GEM) Global Coal Plant Tracker (GCPT) January 2022 dataset (not publicly available).

Bangladesh's annual greenhouse gas emissions for 2018 was 257 million tonnes CO<sub>2</sub> equivalent, according to the Emissions Database for Global Atmospheric Research (EDGAR).

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# Executive Summary in Bengali

## বাংলা সারসংক্ষেপ

বাংলাদেশের আটটি বিভাগের মধ্যে চট্টগ্রামের অবস্থান দেশটির দক্ষিণ পূর্বাঞ্চলে। এই বিভাগের কক্সবাজারেই অবস্থিত বিশ্বের সবচেয়ে বড় সমুদ্র সৈকত। সমুদ্র সৈকত ছাড়াও নয়নাভিরাম পাহাড়ি অরণ্যে সমৃদ্ধ চট্টগ্রাম বিভাগ। তবে বর্তমানে অঞ্চলটি বিশ্বের অন্যতম বড় কার্বন নিঃসরণক্ষেত্র হওয়ার ঝুঁকিতে রয়েছে। কারণ, চট্টগ্রামকে কেন্দ্র করে জাপান ও যুক্তরাষ্ট্রের কয়েকটি কোম্পানি বাংলাদেশে জীবাশ্ম জ্বালানির ব্যবহার বৃদ্ধির পরিকল্পনা করছে। তাদের পরিকল্পনা বাস্তবায়িত হলে দেশের মোট জীবাশ্ম জ্বালানির দুই তৃতীয়াংশই পুড়বে এই চট্টগ্রামে।

চলতি দশকে চট্টগ্রামে কয়লা ও গ্যাসভিত্তিক মোট ২০ গিগাওয়াট বিদ্যুৎ উৎপাদন প্রকল্পের প্রস্তাবনা পেশ করা হয়েছে, যা দেশের বর্তমান বিদ্যুৎ সক্ষমতার প্রায় দ্বিগুণ। এসব প্রকল্প নৈসর্গিক চট্টগ্রামের প্রাণ-প্রকৃতির ওপর যেমন বিরূপ প্রভাব ফেলবে, তেমনি স্থানীয় জনসাধারণের জীবন-জীবিকা ও স্বাস্থ্যের জন্যও ডেকে আনবে ভয়াবহ বিপর্যয়।

জলবায়ুর ওপরও চট্টগ্রামের প্রস্তাবিত বিদ্যুৎকেন্দ্রগুলোর প্রভাব হবে ভয়ঙ্কর। বাস্তবায়িত হলে প্রকল্পগুলো থেকে প্রায় ১.৩৮ বিলিয়ন টন কার্বন ডাইঅক্সাইড সমপরিমাণ গ্রিনহাউস গ্যাস নিঃসরিত হবে। প্রকল্পগুলোর ধ্বংসাত্মক প্রভাব এতোটাই ব্যাপক হবে যে, তা বাংলাদেশের পাঁচ বছরেরও বেশি জাতীয় নির্গমনের সমান। আন্তর্জাতিক জ্বালানি সংস্থার (আইইএ) ঘোষণা অনুযায়ী, ২০৫০ সালের মধ্যে বৈশ্বিকভাবে নতুন কার্বন নিঃসরণের হার শূন্যে নামিয়ে আনতে চাইলে জীবাশ্ম জ্বালানির ব্যবহার ও সরবরাহ একেবারে বন্ধ করে দিতে হবে। আইইএর এমন সতর্কবার্তা সত্ত্বেও চট্টগ্রামের বিদ্যুৎকেন্দ্রগুলো নির্মাণের নতুন পরিকল্পনা নিচ্ছে। সংস্থাটির মতে, প্রস্তাবিত বিদ্যুৎকেন্দ্রগুলো তো বটেই – এমন কি ইতোমধ্যেই চালু হওয়া গ্যাস (এলএনজি) বিদ্যুৎকেন্দ্রগুলোর ক্ষতিকর প্রভাব হবে দীর্ঘমেয়াদী।

প্রস্তাবিত প্রকল্পগুলোর মধ্যে তর্কসাপেক্ষে সবচেয়ে বেশি ক্ষতিকর হলো ১,২০০ মেগাওয়াট উৎপাদন ক্ষমতা সম্পন্ন মাতারবাড়ি-২ বিদ্যুৎকেন্দ্রটি। এ প্রকল্পে সবচেয়ে বেশি অর্থায়ন করছে জাপানি কোম্পানিগুলো। অথচ ২০২১ সালে জাপান জি-সেভেন সম্মেলনে কয়লাভিত্তিক প্রকল্পে অর্থায়ন না করার অঙ্গীকার করেছিল। অর্থাৎ, মাতারবাড়ি-২ প্রকল্পে অর্থায়ন করার মধ্য দিয়ে দেশটি নিজেদের অঙ্গীকার সরাসরি ভঙ্গ করছে। মাতারবাড়ি-১ বিদ্যুৎকেন্দ্রটি ইতোমধ্যেই স্থানীয় জলাশয়ের ব্যাপক ক্ষতিসাধন করেছে। বিদ্যুৎকেন্দ্রের স্থাপনা নির্মাণের জন্য সাধারণ মানুষকে তাদের বসতবাড়ি থেকে উচ্ছেদ করা হয়েছে। সেইসাথে তারা তাদের জীবন-জীবিকা হারিয়েছে। নির্মিত হলে মাতারবাড়ির দুটি বিদ্যুৎকেন্দ্রের দূষণ প্রায় ৬,৭০০ জন মানুষের অকাল মৃত্যু ডেকে আনবে বলে আশঙ্কা করা হচ্ছে।

প্রস্তাবিত কয়লা ও গ্যাস বিদ্যুৎকেন্দ্রগুলোর কারণে বাংলাদেশের সার্বভৌমত্বও নানাদিক থেকে হুমকির মুখে পড়বে। শুধু ২০২১ সালেই কোনো ব্যবহার না করে বিদ্যুৎ উৎপাদন, বিদ্যুৎকেন্দ্রের রক্ষণাবেক্ষণ ও অন্যান্য কাজের জন্য বাংলাদেশ সরকার বিভিন্ন কোম্পানিকে ১.৬ বিলিয়ন মার্কিন ডলার পরিশোধ করেছে। বেসরকারি প্রকল্প থেকে বিদ্যুৎ কেনার মতো অপ্রয়োজনীয় খাতের চাহিদা মেটাতে বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ড (বিপিডিবি) শুল্ক বৃদ্ধির সুপারিশ করেছে।

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২০৩০ সাল নাগাদ তরলীকৃত প্রাকৃতিক গ্যাস (এলএনজি) আমদানি করতেই বাংলাদেশের বার্ষিক খরচ বেড়ে দাঁড়াবে প্রায় ৮.৪ বিলিয়ন মার্কিন ডলার। এলএনজি থেকে প্রতি গিগাওয়াট বিদ্যুৎ উৎপাদনে বিদ্যুৎ কেন্দ্র নির্মাণের খরচ হবে গড়ে ৯৬০ মিলিয়ন মার্কিন ডলার। ফলে, দেশের অর্থনীতি বেশি দামে আমদানি করা জ্বালানির ওপর নির্ভরশীল হয়ে পড়বে। তাছাড়া আপাতদৃষ্টিতে বিদেশী কোম্পানিগুলো এসব খরচ বহন করলেও পরিশেষে দেশের সাধারণ মানুষকেই এই ঋণ পরিশোধ করতে হবে। মিংসুবিশি কর্পোরেশন, জেরা, ও জেনারেল ইলেক্ট্রিকের মতো কোম্পানিগুলো নিজেদের স্বার্থে দূষিত বিদ্যুৎ প্রকল্পের ফাঁদে ফেলে বাংলাদেশকে অর্থনৈতিকভাবে জিম্মি করে রেখেছে।

বায়ু ও সৌর বিদ্যুতের মতো নবায়নযোগ্য উৎস থেকে বিদ্যুৎ উৎপাদন করতে ব্যয়বহুল ও পরিবেশ ধ্বংসকারী জ্বালানির প্রয়োজন হয় না। বাংলাদেশ এসব উৎস কাজে লাগিয়ে নিজের বিদ্যুৎ চাহিদা পূরণ করতে পারে।

জাপান ও মার্কিন যুক্তরাষ্ট্রের মতো ধনী দেশগুলোর উচিত বাংলাদেশকে পরিবেশ দূষণকারী প্রযুক্তি গছিয়ে না দিয়ে সাশ্রয়ী, পরিচ্ছন্ন ও পরিবেশ-বান্ধব প্রযুক্তির মাধ্যমে দেশটির প্রয়োজনীয় বিদ্যুতের চাহিদা পূরণে সহায়তা করা।



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