# Choked by Coal: The Carbon Catastrophe in Bangladesh



Photo credit: StevenK



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### Executive summary

Bangladesh has big plans to expand its power generation in the coming decades. One might expect the country's vulnerability to climate change impacts would mean power generation capacity is planned with low-carbon renewable energy - it is not. Bangladesh plans a massive increase of coal-fired power, the most greenhouse gas intensive form of fossil fuel electricity generation. This analysis explores these plans, the proponents behind the projects, necessary associated infrastructure and the potential impacts on community and climate.

- Bangladesh has at least 29 coal-fired power projects with a total capacity of 33,200 MW under construction and pre-construction. If all the proposed projects are built, the country's coal power capacity would increase by 63 times.
- It would cost Bangladesh an estimated US\$2 billion annually to import large volumes of coal to power the proposed coal plants. Unless exports increase significantly, this would add billions to a negative balance of trade, and lock in Bangladesh to costly coal imports for decades.
- Bangladesh has jumped to 6th place (from 12th) in the last three years in the global ranking of coal power capacity in 'active development', which includes coal plants in pre-construction and construction stages.
- All of Bangladesh's proposed coal projects are inconsistent with the Paris Agreement's climate goals
  of limiting global warming to well below 2°C. and to pursue efforts to limit global warming to 1.5°C. No
  room exists to build new coal power anywhere in the world.
- Annual emissions from the proposed coal plants would be 115 million tonnes of carbon dioxide (Mt CO<sub>2</sub>) by 2031, higher than the upper emissions estimate for the controversial Keystone XL oil pipeline (110 Mt CO<sub>2</sub>-e per year).
- 4,600 Mt CO<sub>2</sub> would be emitted through the operating lifetime of Bangladesh's proposed coal plants. This is 20% greater than the lifetime emissions from all of the currently operating coal plants in Japan.
- Foreign countries are investing heavily in Bangladesh's coal power expansion. Entities domiciled in China represent the majority of the proposed coal power capacity - 18,000 MW across 15 projects. UK- and Japan-based companies are involved in three proposed coal projects each, with coal power capacity totalling 4,700 MW and 3,600 MW respectively.
- China and Japan have concentrated their investments in the ports and planned 'power hubs' at Payra and Matarbari. There is a heavy concentration of China-backed coal power and coal import infrastructure projects proposed at Payra. Meanwhile, Japan-backed pipeline coal plants and related infrastructure projects are prominent at Matarbari.
- Only 10% of the proposed coal plants have progressed to the construction phase. One such project, the 1,320 MW Rampal power plant continues to face mass public protest demanding a halt to its development as it threatens the World Heritage listed Sundarbans mangrove forest.
- A clean, sustainable energy future is possible for Bangladesh. Renewable energy can replace planned coal power projects as a lower cost alternative for electricity generation.

# Background

Bangladesh is one of the fastest growing economies in the world with a forecast growth rate of eight per cent per year in the next two years.<sup>1</sup> The Government of Bangladesh (GoB), as a part of its goal to become a developed country by 2041, has committed to provide access to affordable and reliable electricity for all.<sup>2</sup> As of August 2019, Bangladesh's installed power capacity was 19,000 megawatts (MW), only 3% of which is coal-fired.<sup>3</sup> Ninety per cent of the country's population currently benefits from electricity coverage.<sup>4</sup>

#### **Coal expansion plans**

The GoB's 'Revisiting Power System Master Plan 2016' (PSMP) sets out a roadmap to meet energy demand growth to 2041.<sup>5</sup> By 2041, the PSMP has set a goal to achieve net generation capacity that is more than four times the capacity today.<sup>6</sup> The share of coal, the most greenhouse emissions-intensive fossil fuel, is also slated to increase to 32% of the electricity mix.<sup>7</sup>

Energy experts and high-level officials of the GoB's Ministry of power, energy and resources have cautioned the methodology used for future demand forecast does not consider cyclical fluctuations in demand. They also pointed out that one-third of the country's existing power capacity lies idle due to low demand.<sup>8</sup>

#### A global risk

Global Energy Monitor (GEM) currently ranks Bangladesh 6th globally with respect to the amount of coal power capacity in 'active development'. GEM defines coal plants in 'active development' as those in either the pre-construction and construction stages. Bangladesh moved up from 12th place between July 2016 and July 2019. The only countries currently pursuing new coal power capacity more aggressively are China, India, Indonesia, Turkey, and Vietnam.<sup>9</sup> According to End Coal – an advocacy group concerned about coal's harmful impact on human health, environment, and climate – if plans to build coal power plants around the world are realised it could lead to "a fate likened to planetary collapse".<sup>10</sup>

# Coal power in Bangladesh

#### Massive pipeline of coal-fired power projects

Market Forces has identified 10,200 MW of coal power capacity in Bangladesh's pipeline in addition to the Global Energy Monitor's capacity in 'active development' (23,000 MW). The additional capacity represents coal power plants that Market Forces considers at significant risk of being pursued in future.

Analysis by Market Forces finds that Bangladesh has at least 29 coal-fired power projects with a total capacity of 33,200 MW in the pipeline (pre-construction and under construction) as of July 2019.<sup>11</sup> **If all** 

**the pipeline projects were built, Bangladesh would increase its coal power capacity by 63 times.** At the moment, the only operational coal-fired plant is the 525 MW Barapukuria subcritical plant in Dinajpur district<sup>12</sup>.

Most of Bangladesh's 33,200 MW of proposed coal power projects are located in three 'power hubs' on the south coast of Bangladesh at Payra, Matarbari and Maheshkhali.

# Public opposition to coal power plants under construction

There is strong public opposition to the under-construction 1,320 MW Rampal power plant as it threatens the Sundarbans mangrove forests, a UNESCO world heritage site, home to the endangered Bengal tiger<sup>13</sup>. Communities in Bangladesh and overseas have demanded a stop to the plant. If built, pollution from the Rampal plant would have a devastating impact on the Sundarbans and the 500,000 people who rely on the forest for their livelihoods<sup>14</sup>.

Of the 29 proposed projects, only 10% have progressed to construction. It is widely reported that land acquisition and construction work for proposed coal projects at Rampal<sup>15</sup>, Barguna<sup>16</sup>, Patuakhali<sup>17</sup>, Matarbari, and Maheshkhali<sup>18</sup> are causing suffering for local communities. Displaced communities allege that corruption, malpractice and violations of human rights have occurred in relation to land acquisition and relocation processes for the proposed projects, and that they have not been fully compensated for the loss of their homes and farmlands<sup>15, 16, 17, 18</sup>.



Planned power transmission networks \*Protected areas of environmental and cultural significance have been collected from 'World Database on Protected Areas (WDPA)', which is a joint project between the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN), managed by UNEP World Conservation Monitoring Centre (UNEP-WCMC), UNEP-WCMC (2019). Protected Area Profile for Bangladesh from the World Database of Protected Areas, October 2019. Available at: www.protectedplanet.net



Graphics scaled to relative volumes



Phulbari Phase 1, 2000 MW

2 Phulbari Phase 2, 2000 MW

Grazaria (Orion) 700 MW

B Gazaria (RPCL) 350 MW

4 Gaibandha Ashuganj 1320 MW

Olighipara 1000 MW

Munshiganj 400 MW

Mirsarai 1320 MW

1320 MW

6 Mawa 660 MW

#### **PROPOSED COAL POWER PLANTS**

Patuakhali (Ashuganj) Phase 1, 1320 MW

1320 MW Patuakhali (Ashuganj) Phase 2, 1320 MW

4 Patuakhali (BCPCL) Phase 2 of Payra 1320 MW

1320 MW Patuakhali (RPCL/NORINCO) Phase 1, 1320 MW

1320 MW Patuakhali (RPCL/NORINCO) Phase 2, 1320 MW

#### PROPOSED COAL PORTS



- Matarbari Khoelia Phase 1, 700 MW
- 2 Matarbari Khoelia Phase 2, 700 MW
- 23 Matabari Phase 1, 1200 MW
- 2 Matabari Phase 2, 1200 MW
- <sup>29</sup> Maheshkhali (KEPCO) 1200 MW
- 20 Maheshkhali (Huadian) 1320 MW
- 🕺 Maheshkhali (BPDB/TNB) 1200 MW
- <sup>29</sup> Maheshkhali (PowerChina) 1200 MW
- 29 Banshkhali 1224 MW

Locations on this infographic are all approximate and for illustrative purposes only. ©2019 Market Forces. Report and Infographic design by Erin Laurence.

Payra Phase 1, 1320 MW

19 Pekua Phase 1, 1200 MW

2 Pekua Phase 2, 1200 MW

Sena Kalyan Sangstha 1200 KW

1 Barisal 700 MW

# Barapukuria Case Study

# Bangladesh's only operational coal plant is toxic and inefficient, raising concerns about larger coal plants under construction.

The 525 MW Barapukuria subcritical coal power plant is a mine-mouth plant in Dinajpur district in northern Bangladesh.

#### Toxic impact:

- On water Testing found that the coal ash pond had significantly contaminated well water and irrigation water with toxic heavy metals<sup>19</sup>. Lead levels were 35-395 times higher than the WHO drinking water standards while chromium was 8,025-18,675 times higher.
- On land Coal ash pond overflows onto cropland, contaminating food production areas<sup>20</sup>.

#### Not Operating at Full Capacity:

- In 2018, Barakuria was shut down due to lack of coal after more than 140,000 tonnes of coal was
  reported to have "disappeared", causing power outages in northern Bangladesh<sup>21</sup>. The missing coal was
  allegedly sold illegally by officials at the Barapukuria mine<sup>22</sup>.
- To address coal supply shortages, attempts were made to import 800,000 additional tonnes of coal but failed due to the high costs resulting in an ongoing coal shortage<sup>23</sup>.
- Plant load factors for units 1 and 2 plummeted by 22 percentage points, going from 66% in FY 2017 to only 44% in FY 2018. The plant load factor for newly built unit 3 achieved 48% in FY 2018<sup>24</sup>.

## Inability to fully operate Barapukuria without toxic impacts causes concern for larger coal plants:

- At 525 MW, Barapukuria is much smaller than the 1320 MW Payra, 1200 MW Matabari and 1320 MW Rampal coal plants currently under construction.
- The Rampal coal plant is being constructed with inferior pollution control technology that would lead to the early death of 6,000 people<sup>25</sup>.
- The Bangladesh Power Development Board (BPDB), the same public sector parent company which owns Barapukuria plant is identified as the co-sponsor of eight other proposed coal-fired power plants with 10,000 MW of total capacity.

### Coal Infrastructure

#### Ports and coal imports

Twenty-five of the 29 proposed coal projects plan to use imported coal for power generation, while the remaining mine mouth plants intend to use domestic coal. Deep sea ports planned at Payra (in Patuakhali district) and Matarbari (in Cox's Bazar district) would be required to import coal from Australia, India, Indonesia, and South Africa.

Twenty (20) million metric tonnes of coal is planned to be imported through Payra every year once all the pipeline coal plants are commissioned (the year by which this will occur is unspecified)<sup>26</sup>. The proposed Matarbari port's coal terminal plans to import up to 41 million tonnes of coal by 204<sup>27</sup>. The ports therefore play a pivotal role in the massive build out of pipeline coal power plants. These plans represent a 4000% increase in Bangladesh's current imports of just 1.5 mtpa of thermal coal<sup>28</sup>.

At September 2019 prices, the estimated cost of importing 61 mtpa of thermal coal as Bangladesh plans to do by 2041, would be US\$2 billion annually<sup>29</sup>. During fiscal years 2018 and 2019, the country experienced the largest trade deficits in its history - US\$18 billion and US\$16 billion respectively. The pipeline plants would lock Bangladesh into a huge volume of coal imports for decades. Unless exports increase significantly, billions worth of coal purchased from abroad would add on to trade deficits. Experts warn that if this trend continues, it would be challenging to manage the negative balance of trade<sup>30</sup>.

#### Transmission and distribution of power

The GoB has taken various initiatives to improve nationwide transmission and distribution networks. The US\$532 million Southwest Transmission Grid Expansion Project is to develop new transmission lines and power grids to transmit power from the Payra power hub located in Patuakhali district to Bangladesh's southwestern regions and greater Dhaka. The project is planned to be financed through a US\$350 million Asian Development Bank (ADB) loan, US\$7 million grant from Japan, US\$0.50 million grant from the Republic of Korea and the rest is to be financed by GoB<sup>31</sup>.

Another such project, the US\$177 million Chittagong Power System Expansion is to be financed through a US\$120 million loan from Beijing-based Asian Infrastructure Investment Bank (AIIB). The project would transmit power generated from power plants in Matarbari<sup>32</sup>.

Given that both of these transmission and distribution projects rely heavily on proposed coal power plants being successfully built and operated at Payra and Matarbari, they would share in the stranded asset risks borne by the coal plants.

# Climate Change

#### **Global warming impact on Bangladesh**

The Asian Development Bank ranks Bangladesh seventh in the world of countries most affected by climate change<sup>33</sup>. This is because of its geography and socio-economic factors. Bangladesh is a coastal, low-lying river delta country highly impacted by flooding, cyclones and storm surges. It is ranked number 1 in the world by the UNDP for its vulnerability to tropical cyclones. Severe cyclones make landfall in Bangladesh every three years on average. Under a scenario where global temperature rises by 2.4°C, the number of highest intensity cyclones (category 4 and 5) will increase by about 130%<sup>34</sup> By 2050, with a projected half metre rise in sea level, 11% of Bangladesh's land mass may be lost, affecting about 15 million people in it's coastal areas<sup>35</sup>.



Heavy flooding from monsoon rain and tide from river in Dohar, Bangladesh on August 5, 2016.

#### Proposed plants would bust climate targets

Despite being among the world's most vulnerable countries to climate change impacts, one of the largest 'carbon bombs' may yet be released in Bangladesh. If all of Bangladesh's pipeline coal-fired power is built, these plants would emit approximately 115 million tonnes of carbon dioxide (Mt  $CO_2$ ) annually by 2031<sup>36</sup>. For perspective, the proposed coal plants would produce more carbon dioxide than upper estimate emissions for the highly controversial Keystone XL oil pipeline between Canada and the USA (110 Mt  $CO_2$ -e per year)<sup>37</sup>.

Annual  $CO_2$  emissions from the coal plants would also be 219% greater than the 36 Mt  $CO_2$ -e per annum that Bangladesh conditionally intends to mitigate relative to 'business as usual' by 2030 in its power, transport and industry sectors, as stated in its Intended Nationally Determined Contribution (INDC) to the Paris Agreement<sup>38</sup>. Adding the 29 proposed coal plants to the Bangladesh's power fleet would render other emissions mitigation efforts meaningless.

4,600 Mt  $CO_2$  would be emitted over the operating lifetime of the projects, 20% greater than the lifetime emissions from all of the currently operating coal plants in Japan<sup>39</sup>.

No new coal fired power plants can be built if we are to reach the Paris Agreement's climate goals of limiting global warming to 1.5°C or even 2°C<sup>40,41</sup>. Despite the GoB's objective to "[manage] coal fired power stations in a carbon-neutral way,"<sup>42</sup> none of Bangladesh's pipeline coal power projects are consistent with a 1.5°C target<sup>43</sup>.

"[Bangladesh's] current plans to develop domestic coal production, importing LNG to meet domestic gas demands and expansion of coal-fired power (projected to reach a share of 35% by 2041) are not in line with the need to decarbonise the energy system and phase out coal for power generation by 2040, as a Paris Agreement-compatible pathway for South Asia shows".

- Climate Analytics, May 201944

# Who's backing these coal projects?

#### Foreign ownership

Most pipeline coal-fired power plants in Bangladesh are co-sponsored through public-private partnerships (PPP) or government-to-government (G2G) initiatives between local and foreign companies<sup>45</sup>. Entities domiciled in China are involved in 15 projects with coal power capacity of 18,000 MW in total. UK and Japan-based companies are involved in three pipeline coal projects each, with capacity totalling 4,700 MW and 3,600 MW respectively.

Of the 29 proposed coal power plants analysed, detailed information on ownership split between local and foreign entities is available for 17 plants with a combined capacity of 20,500 MW. Figure 1 shows the proportion of pipeline coal projects broken down by sponsors' country of incorporation. Entities domiciled in Bangladesh are sponsors or co-sponsors of 42% of coal plant capacity with known ownership information, with the remainder owned by foreign-domiciled entities.

Among foreign entities where ownership split is known, Chinese companies and state-owned enterprises represent the lion's share (30%), whilst companies from the United Kingdom have the second largest share (15%), followed by India, Japan, Malaysia and Singapore (3% each).



*Fig 1: Ownership of 20,500 MW combined capacity of proposed coal projects in Bangladesh, by entities' country of incorporation* 

#### Engineering, procurement and construction

The engineering, procurement and construction (EPC) contractors were identified across 15 out of 29 proposed projects in Bangladesh. The majority of EPC contracts to develop proposed coal plants are with Chinese state-owned companies and their subsidiaries.

The largest EPC contractors incorporated in China exposed to Bangladesh's proposed cal power expansion are:

- Power Construction Corporation of China or PowerChina (6,000 MW)
- China Energy Engineering Corporation or EnergyChina (4,000 MW)
- First Northeast Electric Power Engineering Company (2,600 MW)
- China National Machinery Import and Export Corp (2,600 MW)
- China Huadian (1,320 MW)

Other major EPC contractors or technology and technical support providers are:

- Japanese companies Toshiba (1,200 MW) and Sumitomo (1,200 MW)
- US-based General Electric (1,360 MW)
- German company Siemens AG (1,320 MW) and
- South Korea's Doosan Group (660 MW).

PowerChina is the single largest EPC contractor, with involvement in four pipeline coal projects in Bangladesh.

#### Finance

Market Forces aggregated data relating to the 29 proposed coal projects (33,200 MW) made available via financial databases, company disclosures and other sources. Of these, the project cost was identified for 18 out of 29 pipeline plants, amounting to approximately US\$40 billion in total.

Financial information regarding the pipeline coal projects is not widely available as, for many plants, planned commissioning is some time away and therefore financing has likely not progressed significantly. The debt providers for only four projects (5,160 MW) were identified, showing that foreign export credit agencies play a huge role. See Appendix A for details on lending.

Regarding the four projects with lenders identified, it's evident that the domicile of the financier is always shared with the owners or EPC contractors. For instance, projects with Chinese owners or EPCs are financed by Exim Bank of China (CHEXIM) while the project with Japan-based sponsorship or EPC contracts is financed by the Japan International Cooperation Agency (JICA). Considering this trend, which is consistent with findings in other countries<sup>46</sup>, many pipeline coal projects would seek to attract debt from financial counterparts with a record of providing significant debt to the coal power sector. There are several Chinese, Japanese and UK-based commerical banks with such a record<sup>47</sup>. See 'Commercial banks to watch for finance in Bangladesh'.

# Commercial banks to watch for coal finance in Bangladesh<sup>47</sup>



# China & Japan: Pledged to Paris, or pledged to coal?

The GoB is encouraging of foreign companies to invest in the power sector. The 'Speedy Supply of Power and Energy Law' enacted in 2010 allows the government to directly award contracts to build power plants without a competitive bidding process<sup>48</sup> China and Japan, both signatories of the Paris Agreement, have taken advantage of this opportunity and are seeking to construct massive coal power hubs at Payra and Matarbari.

Although China-backed pipeline coal projects are located across Bangladesh, there is a heavy concentration at and near the Payra power hub in Patuakhali district. Two Chinese companies have signed a memorandum of understanding (MoU) to develop the Payra deep sea port's main and supporting infrastructure<sup>49</sup>. In addition, multiple pipeline coal projects at and near the Payra power hub are being co-sponsored by companies domiciled in China. The coal power projects' EPC contractors and financiers are also China-based.

Meanwhile, Japan-backed coal plant and related projects are most prominent at Matarbari power hub in Cox's Bazar district. According to IJGlobal, the Japan International Cooperation Agency (JICA) has loaned US\$24 million for the Matarbari port development and is considering lending an additional US\$486 million<sup>50</sup>. Meanwhile, the port's cargo and primary fuel terminal is jointly owned by Japan's JERA (owned by Tokyo Electric Power Company and Chubu Electric Power). Two power plants at the Matarbari power hub with 2,400 MW capacity are co-sponsored by Japan's Sumitomo Corporation. Japan's ODA agency JICA has provided loans for the first phase of one of the two plants.

# A clean, sustainable energy future is possible

There is a clear imperative for Bangladesh to adopt an energy future compatible with the Paris Agreement's target of limiting global warming to well below 2°C and to pursue efforts to limit global warming to 1.5°C. This requires a complete phase out of coal-fired power generation by 2040 globally and a rapid uptake of renewable energy<sup>51</sup>.

A clean and sustainable energy future is possible for Bangladesh. Only 10% of the proposed coal plants have progressed to the construction phase, while the remaining projects have merely been announced or are in preliminary, pre-construction stages. Potential for up to 53 gigawatts (GW) of solar power capacity exists in Bangladesh, which could replace planned coal power projects as a lower cost alternative for electricity generation<sup>52</sup>.

Bangladesh can achieve both sustainable development and its goal as a Climate Vulnerable Forum (CVF) country to "meet 100% domestic renewable energy production as rapidly as possible"<sup>53</sup>. The GoB has already taken steps towards this goal by setting a renewable energy target of 10% of total power generation by 2020<sup>54</sup>. A renewable energy pathway can strengthen Bangladesh's energy security while protecting the country from sovereign risks from the high cost of coal imports and volatile international markets.

The countries pushing proposed coal projects onto Bangladesh are pivotal to the global energy transformation. China and India are global leaders in large-scale solar power expansion<sup>55</sup> while Japan announced it will not sanction new large coal plants domestically<sup>56</sup>. These countries should apply the same principles for Bangladesh by proposing clean renewable technology for power generation.

At least 112 major financial institutions have announced coal exit, with the global financial sector increasingly shifting away from coal due to environmental, reputational and financial risks associated with climate change<sup>57</sup>. Banks, insurers and other financial institutions approached to support Bangladesh's proposed coal fleet can play a pivotal role by providing funds for renewable energy investments instead. JICA, which is financing the under-construction 1,200 MW Matarbari coal plant, has previously provided funds to promote renewable energy in Bangladesh<sup>58</sup>.

Coal plant developers should suspend plans to build coal power projects and utilize the capital to drive rapid deployment of renewable power. Some of the known sponsors and EPC contractors for proposed coal projects in Bangladesh already have the expertise and capability to drive an energy transformation. The US-based General Electric's renewables business, for instance, has installed more than 400 GW of renewable energy across the globe<sup>59</sup>. PowerChina has built more than 4 GW of renewable energy capacity and is growing as a renewables EPC company globally<sup>60</sup>. Meanwhile, Japan's Sumitomo is involved in building and operating 1.4 GW of renewables capacity worldwide and is seeking to raise additional funds to invest in overseas wind projects<sup>61</sup>.

This brief examined the coal-fired power pipeline in Bangladesh for projects that are either proposed or under construction as of October 2019.

Market Forces identified 29 'pipeline coal projects' that have either reached financial close or have material prospects of being commissioned. Coal power plants considered include those listed in the Government of Bangladesh's 'Revisiting Power Sector Master Plan 2016' (PSMP) and Global Energy Monitor's Global Coal Plant Tracker (GCPT, July 2019, full dataset not publicly available).

Additional data relating to coal infrastructure, sponsors, financiers and engineering, procurement and construction contractors (EPCs) was identified via investigation of publicly available company disclosures, official government documents, peer-reviewed academic journals, research reports, subscription-based financial databases provided by IJGlobal and Thomson Reuters and media reports.

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Appendix A

Who's financing the coal and infrastructure projects?

# Lending data on pipeline coal power plants (where information is available<sup>®</sup>)

Coal power project	Finance status <sup>63</sup>	Financial Institutions and Export credit agencies (ECAs)	US\$ million
1320 MW Banshkhali power station	Financial close	The Exim Bank of China (CHEXIM)	1,739
1320 MW Rampal power station	Financial close	Export-Import Bank of India	1,600
1200 MW Matarbari power station	Financial close	Japan International Cooperation Agency (JICA) ODA loans	1,481
	Financing	Japan International Cooperation Agency (JICA)	1,326
1,320 MW Payra power station	Financing	The Exim Bank of China (CHEXIM)	1,900

### List of proposed coal power projects in Bangladesh

Project	MW Capacity	Site area	Sponsor	Commission expected
Barisal power station	700	Barisal	ISO Tech Electrification Company	January 2022
Patuakhali power station (Ashuganj) Phase 1	1320	Barisal	Ashuganj Power Station Company Limited (APSCL) and Energy China	December 2024
Patuakhali power station (Ashuganj) Phase 2	1320	Barisal	Ashuganj Power Station Company Limited (APSCL)	December 2030
Patuakhali power station (Phase 2 of Payra Power Station)	1320	Barisal	Bangladesh-China Power Company Limited (BCPCL)	December 2023
Patuakhali power station (RPCL/NORINCO) Phase 1	1320	Barisal	Bangladesh Rural Power-Norinco International Power	December 2024
Patuakhali power station (RPCL/NORINCO) Phase 2	1320	Barisal	Rural Power Company Limited (RPCL) and NORINCO	December 2031
Payra power station (Phase 1)	1320	Barisal	Bangladesh-China Power Company Limited (BCPCL)	December 2019
Sena Kalyan Sangstha power station	1200	Barisal	Sena Kalyan Sangstha (SKS) and SDIC	Not known
Banshkhali power station	1224	Chittagong	SS Power I Ltd and SS Power II Ltd	December 2028
Mirsarai power station	1320	Chittagong	Zhejiang Jindun Holding Group Co. Ltd (ZJHG)	January 2023
Maheshkhali power station (BPDB/TNB)	1200	Cox's Bazar	BPDB and Tenaga Nasional Berhad (TNB)	December 2027
Maheshkhali power station (Huadian)	1320	Cox's Bazar	Huadian Chittagong	December 2027
Maheshkhali power station (KEPCO)	1200	Cox's Bazar	Bangladesh Power Development Board (BPDB) and KEPCO	December 2029
Maheshkhali power station (PowerChina)	1200	Cox's Bazar	Bangladesh Power Development Board (BPDB) and PowerChina	December 2027
Matabari power station (CPGCB-Simotomo) Phase 1	1200	Cox's Bazar	Coal Power Generation Company Bangladesh (CPGCBL) and Sumitomo	December 2026
Matabari power station (CPGCB-Simotomo) Phase 2	1200	Cox's Bazar	Coal Power Generation Company Bangladesh (CPGCBL) and Sumitomo	December 2028
Matarbari Kohelia power station Phase 1	700	Cox's Bazar	Kohelia Singapore Holding Private Limited (KPHSL)	December 2023
Matarbari Kohelia power station Phase 2	700	Cox's Bazar	Coal Power Generation Company Bangladesh (CPGCBL) and Sembcorp	December 2032
Pekua power station Phase 1	1200	Cox's Bazar	Electricity Generation Company of Bangladesh Limited (EGCB) JV	December 2025
Pekua power station Pwhase 2	1200	Cox's Bazar	Electricity Generation Company of Bangladesh Limited (EGCB) JV	December 2030
Gazaria power station (Orion)	700	Dhaka	Orion Power Unit-2 Dhaka Limited	December 2022
Gazaria power station (RPCL)	350	Dhaka	Rural Power Company Limited (RPCL)	December 2021
Mawa power station	660	Dhaka	Orion-Long King (OLK)	June 2022
Munshiganj power station	400	Dhaka	Electricity Generation Company of Bangladesh Limited (EGCB)	December 2026
Rampal power station (Maitree)	1320	Khulna	Bangladesh-India Friendship Power Company Pvt Ltd. (BIFPCL)	March 2021
Dighipara power station	1000	Rangpur	North-West Power Generation Company (NWPGCL)	December 2032
Gaibandha Ashuganj power station	1320	Rangpur	Ashuganj Power Station Company Limited (APSCL)	December 2031
Phulbari Coal Project (GCM-China Gezhouba)	2000	Dinajpur	GCM Resources and Energy China	Not known
Phulbari Coal Project (GCM-Sinohydro/ PowerChina)	2000	Dinajpur	GCM Resources and PowerChina	2024

# Endnotes

- Asian Development Bank, Gross Domestic Product growth (%/year) from the 'Asian Development Outlook 2019', Link: https://www.adb.org/countries/bangladesh/economy (accessed 15 September 2019).
- 2 Government of Bangladesh's Ministry of Power, Development & Mineral Resources, 'Revisiting Power Sector Master Plan 2016' (November 2018), p9,10.
- 3 Bangladesh Power Development Board (BPDB), 'BPDB Daily Generation Report' (31 August 2019).
- 4 Government of Bangladesh's Ministry of Finance, Bangladesh Economic Review 2018, 'Chapter 10: Power and Energy'. According to BPDB website, as of 31 August 2019, Bangladesh's installed power generation capacity was 19,057 MW while the maximum electricity generation for 2019 was 12,738 MW (on 5 August, 2019). The only coal power station contributing to Bangladesh's installed power generation capacity is the Barapukuria Power Station (525 MW). This makes coal's contribution to electricity mix 2.7%. (BPDB website accessed 16 September 2019).
- 5 Government of Bangladesh's Ministry of Power, Development & Mineral Resources, 'Revisiting Power Sector Master Plan 2016' (November 2018), p9,10.
- 6 Revisiting Power Sector Master Plan 2016' (November 2018) sets out a goal to achieve net power generation capacity of 94,000 MW under a high demand or 79,500 MW under a low demand scenario by 2041. p 39-42.
- 7 Ibid., 36-47 The World Bank, 'Understanding CO<sub>2</sub> emissions from the global energy sector' (February 2014).
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