



# Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 02-Jun-2022 | Report No: PIDC34344



## BASIC INFORMATION

### A. Basic Project Data

Country Bangladesh	Project ID P179009	Parent Project ID (if any)	Project Name Gas Sector Efficiency Improvement and Decarbonization Project (P179009)
Region SOUTH ASIA	Estimated Appraisal Date Nov 23, 2022	Estimated Board Date Apr 03, 2023	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) Peoples Republic of Bangladesh	Implementing Agency Bangladesh Energy Regulatory Commission (BERC), Pashchimanchal Gas Company Limited (PGCL), Petrobangla, Titas Gas T&D Company Limited	

### Proposed Development Objective(s)

To improve efficiency of gas distribution and end-use, and support decarbonization of the gas sector

## PROJECT FINANCING DATA (US\$, Millions)

### SUMMARY

<b>Total Project Cost</b>	300.00
<b>Total Financing</b>	300.00
<b>of which IBRD/IDA</b>	300.00
<b>Financing Gap</b>	0.00

### DETAILS

#### World Bank Group Financing

International Development Association (IDA)	300.00
IDA Credit	300.00



Environmental and Social Risk Classification

Moderate

Concept Review Decision

Track II-The review did authorize the preparation to continue

## B. Introduction and Context

### Country Context

- 1. Bangladesh has made rapid social and economic progress in recent decades and reached lower middle-income status in 2015.** Officially reported annual growth of gross domestic product (GDP) averaged close to 6 percent since 2000. Strong labor market gains contributed to a sharp decline in poverty, with the national poverty rate falling from 48.9 to 24.5 percent between 2000 and 2016, while extreme poverty declined from 34.3 to 13.0 percent. However, the pace of poverty reduction slowed in recent years even as growth accelerated, particularly in urban areas and in the west of the country. Similarly, the progress on shared prosperity slowed between 2010 and 2016 after a decade of improvements.
- 2. The COVID-19 pandemic caused major disruptions to economic activity in FY20 and FY21.** As a result of supply chain disruptions and exports contraction, real GDP growth decelerated to 3.5 percent in FY20. Early signs of a recovery emerged in the first half of FY21, after movement restrictions were progressively lifted. In July 2021, inflation remained benign, at 5.4percent. The pandemic has put the substantial poverty reduction gains of the past decade at risk, as poverty increased from 13.9 percent in FY19 to an estimated 18.1 percent in FY20. As growth strengthened in FY21, household surveys point to a gradual recovery in employment and earnings.
- 3. The economy is expected to continue to recover gradually as Bangladesh navigates the persistent effects of COVID-19 on domestic and export markets.** GDP growth is forecast to reach 6.4 percent in FY22, before accelerating to 6.9 percent in FY23 as exports and consumption continue to recover. The fiscal deficit is projected to remain above 5.5 percent of GDP over the medium term. Revenue mobilization will be supported by ongoing policy and administrative reforms to Value Added Tax (VAT) and income tax, while higher capital expenditure on infrastructure megaprojects is expected to increase public expenditure. Sustaining the fragile economic recovery and further reducing poverty will partly depend on mitigating economic scarring through well-targeted support to vulnerable households and businesses.
- 4. Bangladesh is extremely vulnerable to the effects of climate change.** The Global Climate Risk Index ranks Bangladesh as the world's seventh most affected country over the period 2000-2019. As a consequence of rising temperatures and related unpredictable rainfalls and flooding risk, it is estimated that a one-meter rise in sea levels would submerge 18 percent of arable land in coastal areas. Recent studies estimate that by 2050 Bangladesh could have 13.3 million internal climate migrants. Additional rural-urban migration would have significant consequences for air and water pollution and unsustainable consumption of natural resources.

### Sectoral and Institutional Context

- 5. The upstream energy sector weighs heavily on Green House Gas (GHG) emissions in Bangladesh.** The majority of the country's carbon dioxide (CO<sub>2</sub>) emissions stems from the oil and natural gas sector. In 2020, in Bangladesh, methane (CH<sub>4</sub> or natural gas) emissions from venting and leakages in oil and gas operations were estimated at 408 Kilotons, roughly equivalent to 11.5 million tons of CO<sub>2</sub>, stemming mainly from the upstream and midstream links of the oil and gas value chain. Reducing emissions from oil and gas operations presents a low-hanging fruit opportunity for



decarbonization of the energy supply chain, since the pathways and technologies for abatement are both clear and cost-effective. This is particularly true in the gas sector, where it is possible to avoid more than 70percent of methane emissions with existing technology and where around 45percent can be avoided at no net cost.

**6. Conscious of both its increasing GHG emissions level and its increasing exposure to climate risks, the Government of Bangladesh (GoB) committed to achieving an ambitious climate change agenda.** The GoB revised its Nationally Determined Contributions (NDCs) in August 2021, calling for 6.73 percent unconditional and 15.12 percent conditional reductions in GHG emissions by 2030, primarily from actions taken in the energy sector. Bangladesh's revised NDCs indicate actions such as improving energy efficiency in the industrial sector and reducing fugitive methane emissions, which includes leakages from gas transmission and distribution pipeline networks. These actions are expected to contribute more to achieving Bangladesh's NDCs than all actions in the Transport, Agriculture and Commercial sectors combined. The GoB's climate strategy also targets reduction of downstream gas and electricity use by households, as current use levels represent the fourth largest source of GHG emissions in the country. Such a strategy would also benefit the economic and fiscal position of Bangladesh, as enhancing gas demand efficiency would reduce the need for Liquefied Natural Gas (LNG) imports, relieving the country's energy import dependence.

**7. However, addressing gas sector GHG emissions will be challenging, in particular without adapted monitoring systems and pricing strategies.** First, in Bangladesh, gas network monitoring capabilities are weak. Gas use in Bangladesh has never been metered for residential consumption. Residential consumers pay a monthly gas bill amounting to 975 Taka (BGT) for each double burner, irrespective of the gas volume consumed. As a result, there is very little incentive for efficient use of this resource and potential over-billing of the most vulnerable groups. For industrial consumers that benefit from preferential rates, suspected unauthorized connections after the meter add to pilferage at advantageous rates for other purposes. Second, in Bangladesh, monitoring is lacking as the Supervisory Control and Data Acquisition (SCADA) system is limited only to the transmission network, hampering a comprehensive and efficient supervision of gas leakages at critical points on the distribution system. Third, gas pricing strategies are not optimal. As prices in Bangladesh are among the lowest in the South Asia region, despite a 2019 price hike. Power producers pay significantly less for gas in Bangladesh than in any other country in South and South-East Asia, leading to massive inefficiencies and distortions.

**8. To contribute to national decarbonization efforts and energy security, there is an opportunity to implement measures that strengthen demand-side energy efficiency.** Reducing emissions from oil and gas operations presents a low-hanging fruit opportunity for decarbonization of the energy supply chain, since the pathways and technologies for abatement are both clear and cost-effective. This is particularly true in the gas sector, where it is possible to avoid more than 70percent of methane emissions with existing technology and where around 45percent can be avoided at no net cost. Until all gas consumption in the country is properly metered, it will be difficult, if not impossible, to determine, much less control, how and where gas losses and leakages are occurring in the system. In 2020, the GoB adopted a program to begin this process at the residential level. Thus far, progress has been positive but needs to be accelerated, with at least 2 million meters needed over the next 2-3 years.

**9. Bangladesh's relevant institutions are keen to answer these challenges, with the support of the World Bank.** The gas sector is regulated by the Bangladesh Energy Regulatory Commission (BERC). Domestic natural gas exploration, production, transmission and distribution are mainly managed by public companies owned by Petrobangla, a state-owned company under the authority of the Energy and Mineral Resources Division (EMRD) of the Ministry of Power, Energy and Mineral Resources (MPEMR). Petrobangla is the main public company in the gas sector in Bangladesh, owning twelve companies throughout the entire oil and gas value chain – exploration and production, transmission, distribution, Condensed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) and mining. Under the authority of Petrobangla, the transmission network is managed by the Gas Transmission Company Limited (GTCL) while the distribution network is



managed by six other companies. Amongst these companies, Titas Gas Transmission and Distribution Company Limited (Titas) is the largest gas transmission and distribution company in Bangladesh, with a total length of pipeline of 13,196.85 km including 58.18 km built during the FY 2019-20.

#### Relationship to CPF

**10. The proposed operation is aligned with the World Bank Group's (WBG) Bangladesh Country Partnership Framework (CPF) 2016-2020 (No. 103723-BD), discussed at the Board on April 5, 2016, which has been extended to FY2021 after the Program Learning Review.** It directly supports the CPF's transformational priority in energy and contributes to the achievement of foundational priorities – notably macroeconomic stability and strengthened institutions. The proposed operation contributes to the achievement of the CPF's Objective 1.1. Increased Power Generation Capacity and Access to Clean Energy, as part of the general focus on Growth and Competitiveness of the CPF. More specifically, under this objective, the proposed operation is directly in line with the CPF's ambition to "support Bangladesh's efforts to utilize limited gas resources efficiently". By reducing GHG emissions of the gas sector, the operation will also contribute to the decarbonization and climate change mitigation agenda of Bangladesh. The proposed operation is also fully aligned with the World Bank strategy to successfully achieve clean energy transition in the South Asia Region, particularly by supporting demand-side efficiency in the gas sector.

#### C. Proposed Development Objective(s)

**11. To improve efficiency of gas distribution and end-use, and support decarbonization of the gas sector**

##### Key Results (From PCN)

**12. The PDO-level results indicators are:**

- Total greenhouse gas emissions avoided as a result of the Project (kT of CO2 equivalent)
- Customers (residential and industrial) provided with an efficiently metered gas connection (Number)
- Decarbonization opportunities of the gas sector assessed and selected for implementation (Number)
- Improved institutional and regulatory capacity of the gas sector (Yes/No)

**13. The intermediate outcome indicators are:**

##### ***Total greenhouse gas emissions avoided as a result of the Project***

- Projected gas savings (amount of gas saved in million British Thermal Units)
- Annual CO2 emission reduction supported by the investments under the Project (metric tons per capita)
- Annual methane leakage reduction supported by the investments under the Project (kT of CO2 equivalent)

##### ***Increased monitoring capacity of the gas sector network***

- Number of pre-paid meters installed for residential consumers in the greater Dhaka area (Number)
- Number of smart meters installed for industrial consumers (Number)
- Number of distribution companies provided with SCADA systems (Number)

##### ***Improved institutional and regulatory capacity of the gas sector***

- Capacity building and training of implementing agencies staff on SCADA systems management (Number of staff trained)
- Decarbonization strategy and action plan developed and adopted by the Ministry of Power, Energy and Mineral



Resources (MPEMR) (Yes/No)

#### D. Concept Description

14. The proposed USD 300 million project contains two components and five sub-components.

#### **Component 1 (USD285 million) - Strengthening the gas sector monitoring and control capabilities downstream:**

15. **Sub-Component 1.1 (USD270 million) - Enhancing the efficiency of the gas distribution network and end-use through metering systems for residential and industrial consumers.** This sub-component will focus on installing and commissioning of metering solutions and chromatographs/analyzers tailored to each targeted consumer group as follows:

- *For residential consumers (USD260 million)*, up to 1,100,000 and 86,000 prepaid meters would be installed respectively by Titas in the greater Dhaka area and PGCL in its service territory.
- *For industrial consumers (USD10 million)*, a limited pilot for rolling out smart meters to a selected number of Titas' industrial customers is expected to be carried out to demonstrate viability of smart meters to better manage gas use by industrial customers and improve monitoring of gas use.

16. **Sub-Component 1.2 (USD15 million) - Reducing gas leakages on the distribution network through reinforced monitoring and upgraded distribution infrastructure.** This sub-component will focus on effective reduction of gas leakages through:

- (i) Installing SCADA systems for Titas and PGCL. Under this activity, SCADA will be expanded from the transmission network to the distribution network, based on a mapping of gas network pipe records using Geographic Information System (GIS) methods to be developed under Component 2.
- (ii) Improving distribution network infrastructure: This activity will focus on upgrading the distribution network to address fugitive gas and network weaknesses leading to gas leakages. This could be achieved by installing pressure and monitoring devices/transducers in the distribution feeders/ring main units. An additional measure could be the use of welding instead of threading at the consumer riser level.

#### **Component 2 (USD 15 million) - Technical assistance for decarbonization opportunities along the entire oil and gas chain value:**

17. **Sub-component 2.1: Assessment of decarbonization opportunities along the entire oil and gas chain value:**

- a. Upstream, technical assistance would focus on developing a decarbonization strategy based on (i) fugitive emissions reduction techniques and (ii) routine and non-routine flaring reduction, (iii) identification of other opportunities, such as energy efficiency measures and the deployment of CCS, where applicable, upstream.
- b. Midstream, technical assistance would focus on a detailed assessment of decarbonization opportunities, including by (i) completing a study on repurposing of depleted gas fields for CCS, (ii) identifying opportunities of future use of existing gas networks for hydrogen transportation, (iii) testing innovative techniques and equipment to increase gas recovery and eliminate flaring.
- c. Downstream, technical assistance would focus on supporting the mapping of gas network pipe records using GIS methods. Such a map would be based on the existing data but would expand the coverage to the entire distribution network.



**18. Sub-component 2.2: Developing an enabling legal, contractual and regulatory environment to support continued measurement, monitoring, reporting and verification protocols for GHG abatement and mitigation and for private investment in identified decarbonization opportunities.**

Based on the activities described in subcomponent 2.1., this activity would focus on:

- (i) Identification of gaps in the legal, institutional, regulatory and contractual framework and recommendations to incrementally address them to enable the introduction and application of GHG emissions standards, carbon-intensity and decarbonization targets in upstream and midstream operations;
- (ii) Assessment of regulatory and contractual gaps that may hamper private capital mobilization for targeted decarbonization investments and development of a framework to enable private investments in the most efficient, commercially viable intervention options identified in 2.1 above

**19. Sub-Component 2.3. Bangladesh Energy Regulatory Commission (BERC)– Capacity building.** There exists a strong opportunity to accompany BERC in its institutional strengthening and capacity building, including in the following fields: capacity building program for BERC officials, implementation of Energy Auditing programs, digitization of commission activities (monitoring dispute settlement system / improving license management system), conduct targeted survey/studies, recruitment of national consultants, launching of an internship program for undergraduate/graduate students, participation in international events/seminars/symposium/experience sharing programs, energy efficiency awareness campaigns, implementation of a Performance Management System (PMS).

**20.** In addition to these three sub-components, technical assistance under the project might provide dedicated support to Titas and PGCL aiming at strengthening their climate resilience efforts. Such support could include: conducting climate vulnerability assessments of their respective distribution assets, emergency preparedness and response/business continuity planning, climate risk-based Operation and Maintenance planning).

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No
Summary of Screening of Environmental and Social Risks and Impacts	

**Based on the nature of proposed activities, it is expected that the E&S impacts will be localized and minor**, entailing primarily the generation of noise and dust associated with the installation of the meters, which will be addressed through adequate mitigation measures and related guidelines to be incorporated in the ESCoP. Minor OHS related risks related to the installation of meters can be expected. Adequate safety measures must be ensured to avoid accidents from gas leakage, if any. Community and worker health and safety (CHS and OHS) and SEA/SH risks (which is low) and the newness of the ESF to the IAs. The IAs will need guidance on mitigating Labor management, stakeholder engagement, gender, CHS, OHS and SEA/SH risks and issues. The risk of exclusion, however, is small as TGTDC usually applies an area/block/street based plan for coverage, covering households connected to the main feeder line, and there is normally a technical reason/explanation if someone is left out (e.g. connected to a different feeder line).



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**APPROVAL**

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