ASIAN INFRASTRUCTURE INVESTMENT BANK

PROJECT LEARNING REVIEW REPORT

BANGLADESH DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT

OCTOBER 2026

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ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
BERC	Bangladesh Energy Regulatory Commission
BREB	Bangladesh Rural Electrification Board
BTOR	Back-to-Office Report
CEIU	Complaints-resolution, Evaluation and Integrity Unit
DESCO	Dhaka Electric Supply Company Limited
DNCC	Dhaka North City Corporation
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ELA	Early Learning Assessment
ERD	Economic Relations Division of the Ministry of Finance
ESMP	Environmental and Social Management Plans
ESR	Environmental and Social Review
E&S	Environmental and Social
FAPAD	Foreign-Aided Project Audit Directorate
FIRR	Financial Internal Rate of Return
FY	Fiscal Year
GIS	Gas-Insulated Switchgear
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IMED	Implementation Monitoring and Evaluation Division
MDB	Multilateral Development Bank
MYRP	Multi-Year Rolling Programming
OHS	Occupational Health and Safety
PCN	Project Completion Note
PCR	Project Completion Report
PD	Project Document of AIIB
PIMR	Project Implementation and Monitoring Report
PLR	Project Learning Review
PMU	Project Management Unit
PBS	Pally Bidyut Samiti
PSC	Policy and Strategy Committee of the Board
PTL	Project Team Leader
RMF	Results and Monitoring Framework
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
VAT	Value Added Tax

ACKNOWLEDGEMENTS

This Project Learning Review (PLR) was conducted by the Independent Evaluation Function of the Complaints-Resolution, Evaluation, and Integrity Unit (CEIU) at the Asian Infrastructure Investment Bank (AIIB), with contributions from both staff and external consultants.

The review was conducted under the strategic leadership of Carmen Nonay, Managing Director of CEIU and Hwee Tin Kng, Acting Managing Director of CEIU up to July 14, 2026. The work was led by Eskender Zeleke, Head of the Independent Evaluation Function, with the core team comprising Emmanuel Awuni (Senior Evaluation Specialist), Ramachandra Jammi (Senior Consultant), and Mia Landeck (Evaluation Analyst). Operational support was provided by Yuting Wang (Administrative Assistant).

The PLR benefited from a rigorous internal review by Jan Willem van der Kaaij, Senior Advisor to CEIU, and an external peer review by Dr. Dejan Ostojic, a leading expert and sector leader in energy and infrastructure development.

The team extends its deep appreciation to AIIB management for their continued support of CEIU's learning and evaluation agenda. We are equally grateful to AIIB staff, and officials of the Economic Relations Division (ERD) of the Ministry of Finance, Ministry of Power, Energy and Mineral Resources, Bangladesh Rural Electrification Board (BREB), and Dhaka Electricity Supply Company (DESCO) for their time, perspectives, and engagement during the field mission. We would also like to thank the Board of Directors for their ongoing encouragement and guidance, which continues to strengthen the independent evaluation function and its contribution to institutional learning and accountability.

KEY PROJECT DATA

BANGLADESH: DISTRIBUTION SYSTEM UPGRADE AND EXPANSION

Project ID:	000003	**Investment no.:**	L0003A
Member:	Bangladesh	**Region:**	Southern Asia
Sector:	Energy	**Subsector:**	Electricity transmission and distribution
Financing Type:	Loan	**Cofinancier(s):**	None
Environmental and Social (E&S) category:	B	**Project Team Leader:**	Raqib Ahmed Chowdhury
Client:	Government of the People's Republic of Bangladesh	**Implementing agency:**	Dhaka Electric Supply Company Limited (DESCO) Bangladesh Rural Electrification Board (BREB)
AIIB Site Visits:	**September 2018; March 2019; August 2019; December 2019; December 2020; September 2021; August 2022**		

PROJECT OBJECTIVE

Project objective:	The project's objectives are to enhance distribution capacity and increase the number of rural and urban electricity consumers in Bangladesh. The project is designed to (i) provide 2.5 million new service connections in rural areas, (ii) upgrade distribution systems to reduce technical losses and enhance distribution efficiency, (iii) help remove system bottlenecks by expanding distribution capacity, and (iv) improve the quality and reliability of power supply.

KEY DATES

Approval:	June 24, 2016	**Signing:**	Nov. 11, 2016
Effective:	Feb. 06, 2017	**Restructured (if any):**	None
Original closing:	Dec. 31, 2019	**Revised closing (if any):**	Dec. 31, 2021

DISBURSEMENT DATA

Committed:	USD165 million	**Cancelled (if any):**	USD20.88 million
Disbursed:	USD144.12 million	**Undisbursed:**	None
Disbursement ratio:[1]	100%	**Last disbursement:**	USD4.95 million (June 30, 2021)

1 Disbursement ratio is defined as the volume (i.e., the dollar amount) of total disbursed amount as a percentage of the net committed volume, i.e., f = c / (a – b).

Executive Summary

PURPOSE AND PROCESS

This Project Learning Review (PLR) presents the findings of the independent evaluation conducted by the Complaints-resolution, Evaluation and Integrity Unit of the Asian Infrastructure Investment Bank (AIIB) on the Bangladesh Distribution System Upgrade and Expansion Project. The PLR assesses project performance and the work quality of AIIB and the Client, draws lessons, and provides actionable recommendations.

The assessment draws on a comprehensive review of project documentation, including appraisal instruments, 12 Project Implementation and Monitoring Reports (PIMRs), environmental and social records, project completion documentation from both executing agencies, Implementation Monitoring and Evaluation Division (IMED) inspection findings, and secondary sector data. A field mission to Dhaka from May 10-13, 2026, included consultations with the Ministry of Power, Energy and Mineral Resources, the Economic Relations Division of the Ministry of Finance, the Bangladesh Rural Electrification Board (BREB), the Dhaka Electric Supply Company Limited (DESCO), and Pally Bidyut Samiti (PBS) representatives. The mission also included field observation at the Bashundhara substation and selected low-voltage transformer and service-connection installations within the Gazipur PBS service area, as well as structured engagement with households and small enterprises benefiting from Component 1.

PROJECT SUMMARY

The Bangladesh Distribution System Upgrade and Expansion Project (P000003) was part of AIIB's first cohort of approved operations. It was AIIB's third-ever approved project and its inaugural energy sector investment. Approved in June 2016 as a standalone sovereign-backed loan of USD165 million to the People's Republic of Bangladesh, the project responded to a clearly diagnosed structural imbalance in the country's power sector. Generation capacity had increased approximately threefold between 2009 and 2015, rising from around 4,900 megawatt (MW) to 13,800 MW, while the distribution network had not kept pace. An estimated 13 million rural households remained unconnected despite lying within reach of existing medium-voltage infrastructure. In northern Dhaka, the two grid substations serving DESCO's rapidly growing territory held a combined transformer capacity of 125 mega volt-ampere (MVA), increasingly inadequate against the area's rapidly growing load demand. Additionally, an aging overhead 33 kilovolt (kV) network generated recurring faults, created safety risks such as high-rise construction reducing conductor clearances, and constrained economic activity across the area.

The project addressed both gaps through two components managed by separate executing agencies. Component 1, implemented by Bangladesh Rural Electrification Board (BREB) through 77 PBS cooperatives, financed the procurement and installation of 2.5 million rural service connections and 65,000 low-voltage transformers. Component 2, implemented by DESCO, financed the upgrade of the Bashundhara and Uttara substations from a combined 250 MVA to 480 MVA and the installation of 85 kilometers (km) of 33 kV underground cable across 28 routes in northern Dhaka. Total project cost at appraisal was USD262.29 million; actual expenditure at completion was USD206.67 million, with USD20.88 million in loan savings

cancelled at the borrower's request. The remaining variance of approximately USD34.74 million arose on counterpart-financed expenditure, principally lower customs duty and value-added tax obligations under Component 1 than the fully imported basis assumed at appraisal.

The two components followed different implementation trajectories. Component 1 was completed by June 2018, approximately 18 months ahead of the original closing date of December 2019. BREB organized procurement into standardized competitive packages that generated savings of approximately USD13.27 million, and the physical installation of 2.5 million connections and 65,000 transformers across 77 PBS areas was completed within approximately nine months of field mobilization.

Component 2 faced a more complex implementation environment. Underground cable installation required independent approval from multiple authorities in Dhaka, each operating with their own schedule and priorities. A road-cutting moratorium imposed by the Dhaka North City Corporation (DNCC) during Bangladesh's December 2018 general election cyclewas confirmed as the primary cause of implementation delay. COVID-19 disruptions from early 2020 added a secondary constraint, requiring a second extension of the loan closing date to December 2021. Despite the delay, all Component 2 physical targets were met. The AIIB loan allocation for Component 2 was USD66.11 million, of which USD7.61 million was cancelled following completion, with all physical targets delivered at a total cost below the appraisal base cost estimate of USD98.31 million (the USD98.31 million figure is the Component 2 base cost across all financing sources, of which the AIIB loan financed USD66.11 million; the two figures are therefore not directly comparable).

OVERALL PROJECT ASSESSMENT: SUCCESSFUL

The project is rated **Successful**.

The project delivered its full physical scope and achieved its core development objective. It connected 2.5 million rural households to the grid and modernized northern Dhaka's urban distribution network, within budget and, for the rural component, well ahead of schedule. Both executing agencies proved technically capable, and the assets remain in active, sound operating condition. The principal qualification is the two-year delay in the urban component, caused mainly by foreseeable urban-permitting constraints, which deferred reliability benefits to consumers during that period. A secondary qualification is that the results framework tracked physical outputs only, so some outcome-level benefits rest on proxy and comparator evidence rather than the project's own monitoring. Neither qualification alters the central conclusion: this was a well-conceived and well-executed operation that met its objective and delivered strong value for money.

The **Successful** rating reflects the weight of evidence across all four evaluation criteria and both work quality assessments. Relevance is rated Highly Relevant, Effectiveness Effective, Efficiency Efficient, and Sustainability Likely Sustainable. AIIB Work Quality and Client Work Quality are both rated Satisfactory.

Relevance:	Highly Relevant

- The project addressed a clearly diagnosed structural gap between Bangladesh's expanded generation base and its lagging distribution network, intervening simultaneously in rural last-mile connectivity and urban grid modernization.
- It aligned with Bangladesh's Seventh Five-Year Plan and the government's universal access commitment, with each component assigned to an operationally capable executing agency.
- AIIB's financing filled a segment of the distribution investment agenda not covered by parallel programs.

Effectiveness:	Effective

- All four Results Monitoring Framework (RMF) output targets were met in full.
- Component 1 delivered 2.5 million rural connections 18 months ahead of schedule.
- Component 2 upgraded substation capacity from 250 MVA to 480 MVA and installed 85 km of underground cable, helping reduce distribution losses over a period in which DESCO system losses fell from 8.37 percent to approximately 5.5 percent—a reduction that also reflects parallel network measures and is not attributable to Component 2 alone— alongside a broadly improving reliability trend, although the two-year delay deferred reliability benefits to northern Dhaka consumers during that period.
- The Effective rating is qualified by the output-focused design of the RMF. Welfare, income, and productive-use findings rely on proxy data and comparator evidence from a parallel World Bank project,[2] rather than this project's own monitored record.
- Gender-disaggregated data was not collected under Component 1, despite the Project Document projecting positive welfare outcomes for women.
- Carbon emission reduction figures in project documentation are indicative projections, not verified outcomes.

Efficiency:	Efficient

- The project delivered strong cost and economic efficiency across both components. Component 1 was completed 18 months early, with AIIB-financed expenditure of USD85.37 million against a loan allocation of USD98.39 million, leaving USD13.03 million unutilized.
- Across all funding sources, Component 1 expenditure was approximately USD120.3 million against an appraisal estimate of USD157.75 million, an underrun of about 24 percent.
- The BREB completion report estimates the EIRR at completion at 31.40 percent, against 17.90 percent at appraisal.
- Component 2 was delivered in full within the AIIB loan allocation, with AIIB expenditure of USD58.50 million and USD7.61 million cancelled at completion, against an appraisal base cost estimate of USD98.31 million.
- The DESCO completion report estimates the EIRR at completion at 18.87 percent, compared with 17.65 percent at appraisal.

2 World Bank, Bangladesh: Rural Electricity Transmission and Distribution Project (P129920), Investment Project Financing, implementing agencies: Bangladesh Rural Electrification Board (BREB) and Power Grid Company of Bangladesh (PGCB), covering 39 PBS areas in the Dhaka, Chittagong, and Sylhet divisions, closed June 2021.

- The Efficient rating is qualified by the two-year delay, which deferred reliability benefits to northern Dhaka consumers, and by demand remaining below appraisal projections due to upstream generation constraints.
- As a result, part of the economic return modeled at appraisal remains prospective rather than confirmed at this evaluation.

Sustainability:	**Likely Sustainable**

- Institutional capacity is strong across both agencies. BREB transformers installed in 2017 and 2018 are, according to BREB's operational assessment, performing at or beyond their 10-year procurement specification, although no independent condition assessment has been conducted.
- DESCO holds ISO 9001:2015 and ISO 45001:2018 certifications and has developed in-house capability in underground cable and gas-insulated switchgear maintenance.
- Bill collection rates across the PBS network consistently exceed 99 percent.
- DESCO's system losses of approximately 5.5 percent are the lowest of any distribution utility in Bangladesh.
- The underground cable infrastructure also carries inherent durability advantages in Bangladesh's climate context.
- One utilization-related qualification applies: generation availability, rather than distribution capacity, is currently the binding constraint on demand in DESCO's service area.
- That is, realized demand is held below its potential by periodic upstream supply shortfalls, not by any limitation of the distribution network.
- As a result, the upgraded assets are not yet being used to the level assumed at appraisal, but they have sufficient headroom to absorb projected load growth as upstream supply improves.

AIIB Work Quality:	**Satisfactory**

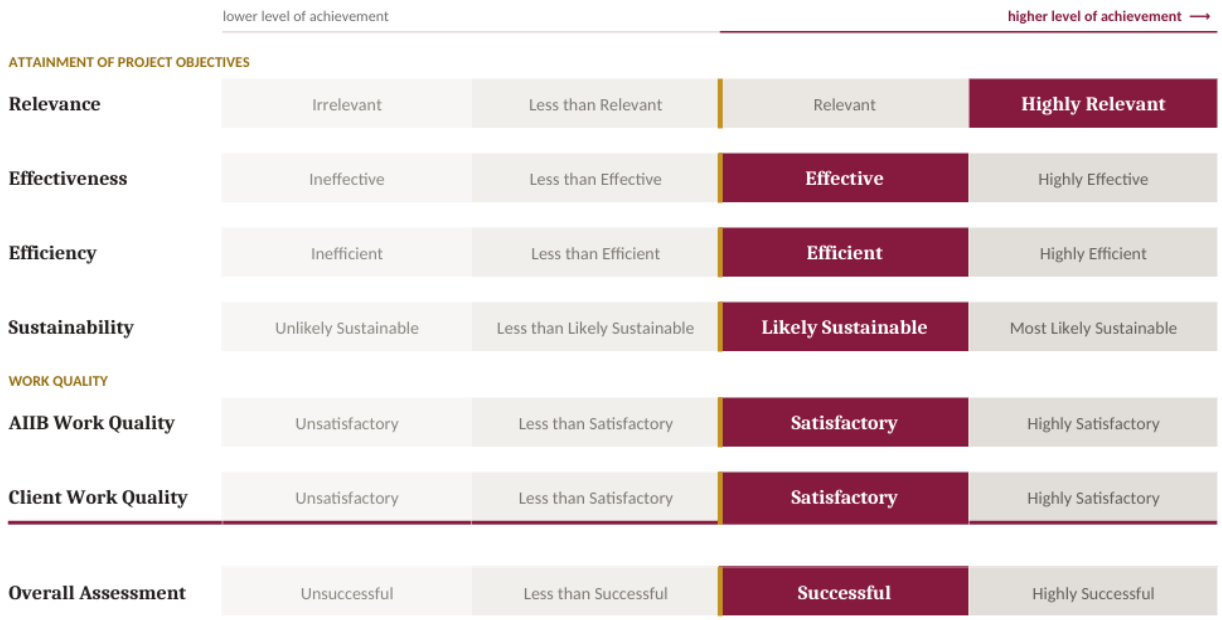
- Sector diagnosis and executing agency selection were well grounded. AIIB retained direct supervision throughout, maintained field presence, and processed adaptive management decisions responsively.
- Both agencies confirmed prompt engagement on technical queries and tender concurrences.
- Two quality-at-entry gaps qualify the rating: the RMF tracked physical outputs only, with no intermediate and outcome-level indicators; and Component 2 permitting risk was correctly identified at preparation but was not made a condition of construction readiness: the required road-cutting permits were not secured before works were allowed to mobilize.
- This was a works-level readiness gap specific to Component 2's civil works, not a loan-effectiveness condition applying to the operation as a whole.

Client Work Quality:	**Satisfactory**

- BREB delivered 2.5 million connections and 65,000 transformers ahead of schedule with strong procurement performance and no material irregularities.
- DESCO demonstrated strong technical capacity in managing complex substation and underground cable works, developing significant in-house capability during implementation.

- DESCO's inability to pre-negotiate framework road-cutting agreements with the Dhaka North City Corporation before mobilization was a foreseeable planning gap and the primary cause of the two-year delay.
- No unresolved grievances remained at closure under either component.
- However, neither executing agency could produce construction-phase GRM records during the PLR mission, so the qualitative functioning of the mechanisms could not be independently verified.

Figure 1: The Objectives of the Project



Note: The scale runs from the lowest level of achievement on the left to the highest on the right. The gold rule marks the point at which performance meets the expected level. The ratings describe the degree of achievement against each criterion. They are not risk flags, and the scale is not a ranking of first, second, or fourth place.

Source: AIIB CEIU (based on project documentation).

LESSONS

The following lessons are forward-looking. Each records what worked in this operation as well as where the preparation, supervision, and results measurement of comparable future operations can be strengthened. They should be read alongside the project's Successful rating rather than as qualifications of it.

Lesson 1: Development outcomes in the power sector depend on balance across the generation–transmission–distribution value chain.

Between 2009 and 2015 Bangladesh's generation capacity roughly tripled, yet 13 million rural households within reach of the network remained unconnected and northern Dhaka's grid had reached its limits. By financing last-mile connections and urban distribution modernization, the project relieved the constraint that mattered most at the time and turned generation that

was already available into electricity people could use. This worked because the diagnosis was grounded in documented engineering and economic analysis, and because each of the two problems received a solution matched to its scale—a low-cost connection program in rural areas and a capacity and reliability upgrade in Dhaka. It is a practice worth repeating wherever sector data allows the main constraint to be identified.

The lesson is that the impact of power-sector investment depends on balance across the value chain. At appraisal, operations should be explicit about which part of the chain the investment is intended to unblock, and about what needs to hold elsewhere for the benefits to appear. This is a diagnostic step, not a requirement to address every constraint within a single operation. Where several constraints bind at once, they are better addressed in sequence across operations, in line with the Member's own sector planning.

Lesson 2: Institutional, regulatory, and procurement readiness before mobilization preserves the value of strong implementation capacity.

The two components differed less in the capability of their agencies than in what each was asked to do. Component 1 was a supply-and-install program with settled designs, no land acquisition and no third-party approvals; once procurement cleared, 2.5 million connections and 65,000 transformers were installed across 77 PBS areas in about nine months. That speed came from standardized designs and aggregated procurement packages, and shows how readiness converts capable agencies into rapid delivery. Component 2 had to be designed first, built in live city roads, and cleared by at least five Dhaka authorities. Although the 2016 EIA identified this requirement, it was not carried into a readiness measure, and a DNCC road-cutting moratorium during the 2018 election, an event known at approval, contributed to a two-year delay.

The lesson is that identifying permitting risks is necessary but not sufficient, and that readiness extends beyond permits to designs and technical specifications, tender documents, contract packaging and contractor interest, land and access, coordination with other utilities, approvals, and the agency's own capacity. Readiness should be judged for each package of works, in proportion to the risks that package carries, and applied by authorizing work to start in stages. It is distinct from a condition on the loan itself and is not intended to hold back components that are otherwise ready: works such as those under Component 1 can proceed while works awaiting approvals are scheduled against their own timelines. Where a single operation combines components with substantially different requirements, preparation should weigh the benefits of combining them against the risk that they progress at different speeds.

Lesson 3: Results frameworks that focus primarily on outputs may provide limited evidence on the achievement of development outcomes.

The project's results framework monitored four physical output indicators but did not include outcome-level indicators. The four indicators themselves were clear, straightforward to verify and reported consistently through the PIMR series, which gave supervision a dependable picture of physical delivery; that is a feature worth retaining. While the project was expected at appraisal

to benefit approximately 12.5 million people, monitoring ultimately focused on the achievement of about 2.5 million new electricity connections, and gender-disaggregated data were not systematically collected. As a result, the evidence available on broader outcomes, such as service reliability, welfare improvements, and productive use of electricity, remained limited. The project was approved in June 2016, when the Bank's results frameworks and monitoring practice were still being established, and AIIB's practice has developed considerably since.

The lesson is that output indicators provide an important foundation for tracking implementation progress but are most effective when complemented by a small number of outcome indicators that capture intended development results. The choice of indicators should reflect the nature of the intervention: connection-based access investments are generally well suited to outcome-level measurement, while transmission and primary distribution investments are often better captured by network-performance measures—system losses, how often and how long supply is interrupted, and the load the network carries—which reflect efficiency and reliability rather than physical output counts. Where welfare benefits for women are expected, how they will be measured should be settled at the outset and kept proportionate, drawing on sample surveys or existing national data rather than collection at every connection; population statistics alone establish who was reached, not how the benefits were shared.

Lesson 4: Regular supervision and adaptive management are critical enablers of delivery in complex multi-component operations.

AIIB supervised this project directly, without delegating to a co-financier, through multiple field visits from December 2016 onward, prompt technical and tender responses, and two closing-date extensions as conditions changed. Both agencies described AIIB's engagement as faster than other partners', and this sustained presence helped bring a demanding dual-component operation to full completion within budget. The model is worth repeating where the Bank has, or can resource, the in-house sector and country-level capability it requires.

The lesson is that in complex, multi-agency operations, consistent field presence, responsive engagement, and timely adaptation are central to delivery. Supervision effort need not be spread evenly, however. It is most effective concentrated earlier and more intensively where approvals are complex, the technology is new, or many outside parties are involved—as in Component 2's urban environment—and applied more lightly where an agency is repeating a method it has used many times, as in Component 1. This project offers a useful reference for resourcing direct supervision.

Lesson 5: Sustained development outcomes depend on the broader system in which financed assets operate, not only on the quality of the assets themselves.

The project financed infrastructure was generally well managed by capable institutions, with BREB maintaining collection rates above 99 percent and DESCO continuing to hold ISO certifications while reporting among the lowest system losses in the country. Both agencies had established operation and maintenance structures and revenue discipline before the project began, and DESCO's engineers built new in-house skills in cable and switchgear work during implementation;

the cooperative PBS model adds a community-level stake in keeping the network running. Underground cable, selected for capacity and safety reasons, has also proved a durable choice in a country exposed to floods and cyclones. However, part of the economic benefits envisaged at appraisal remain dependent on external factors, as generation availability rather than distribution capacity has increasingly become a constraint to meeting demand, and parts of the transformer stock are approaching the end of their expected service life without an independent condition assessment.

The lesson is that the sustainability of development outcomes depends not only on the performance of financed assets but also on broader sector conditions, including adequacy of power supply, the policy and regulatory environment, particularly tariffs and cost recovery, and the ongoing financial and technical capacity of utilities to operate, maintain, and renew infrastructure. Future operations should identify these key dependencies during appraisal and monitor those most material to the achievement and sustainability of intended outcomes throughout implementation.

RECOMMENDATIONS

Recommendation 1: AIIB should identify and monitor the conditions on which sustained outcomes depend in energy sector operations.

For future energy sector operations, AIIB Management should identify during preparation and appraisal the conditions on which sustained outcomes depend. Where utilization or sustainability risks are material such as upstream supply adequacy, utility financial health, cost recovery, or long-term asset maintenance preparation should assess them explicitly, and the few most material to the intended outcomes should be monitored during implementation and reported at completion. Where these risks lie beyond the project's own boundary, AIIB should engage government counterparts and development partners to help address them rather than widen the scope of the operation. This would help safeguard the benefits of individual investments over time.

The recommendation follows from the evidence in this evaluation: the distribution assets financed by the project perform as designed, but part of the economic return modeled at appraisal remains prospective because generation availability, not distribution capacity, is now the constraint on demand in DESCO's service area. The wider value-chain perspective that informs this recommendation is set out in Lesson 1; it is a diagnostic and sequencing lens applied to individual operations, not a prescription to resolve all sector constraints within a single project. Where the constraints identified are systemic and cut across multiple operations, they are more appropriately examined through thematic or sector-level evaluation than through the review of a single project.

Recommendation 2: AIIB should strengthen readiness assessments where delivery depends on permitting, complex procurement, design maturity, or stakeholder coordination. Both components showed that capable agencies deliver quickly once upstream constraints clear, but that preparation gaps absorb time.

Readiness should be assessed as a package covering designs and technical specifications, tender documents, contract packaging and contractor interest, land and access, coordination with other utilities, approvals, and the executing agency's own capacity, and confirmed in a manner proportionate to the risks each work package carries. Where delivery depends on approvals from authorities outside the executing agency's control and the timing of those approvals is uncertain as for urban works spanning multiple authorities in-principle approvals or framework agreements should be obtained before mobilization and reflected in covenants or dated action plans; for high-volume supply-and-install programs, readiness should confirm that designs and major-contract procurement are sufficiently advanced.

Readiness of this kind is confirmed at the level of the individual work or contract and applied by authorizing work to start in stages; it is not a loan-effectiveness condition and is not intended to hold back components that are otherwise ready to proceed. Supervision intensity should follow the same logic, concentrating earlier and more intensively where readiness and permitting risks are highest, and should be revisited as those risks evolve. Where an operation bundles components run by different agencies with very different requirements, preparation should weigh the benefits of bundling against the risk of divergent implementation tracks and provide for sequencing or separate treatment.

Recommendation 3: AIIB should ensure that results frameworks for energy access and distribution operations include intermediate and outcome indicators monitored during implementation, alongside physical outputs.

The indicators selected should be proportionate to the operation: connections made and how the electricity is used for investments that bring supply to new customers; system losses, interruption duration and frequency, and load served for investments that strengthen the network itself. Where gender-differentiated benefits are expected, how they will be measured should be specified from the outset and kept proportionate, drawing on sample surveys or existing national data rather than collection at every connection, and reported during implementation. This directly addresses the gap in this project, whose output-only RMF left limited evidence on reliability, welfare, and productive-use outcomes, and builds on how far AIIB's results practice has developed since 2016.

Management Response

Management welcomes the Project Learning Review (PLR) report for the People's Republic of Bangladesh: Distribution System Upgrade and Expansion Project (the Project), prepared by the Complaints-resolution, Evaluation and Integrity Unit (CEIU) in accordance with the Asian Infrastructure Investment Bank's (AIIB) Learning and Evaluation Policy (LEP). This Management Response is prepared in accordance with LEP para. 13(f).

The Project sought to enhance distribution capacity and increase the number of rural and urban electricity consumers in Bangladesh.

Management acknowledges that CEIU assessed the Project as **Successful**, noting strong performance across the evaluation criteria. Management concurs with CEIU's rating.

Management is pleased to share the following response to the recommendations included in the PLR:

Recommendation 1: In AIIB should identify and monitor the conditions on which sustained outcomes depend in energy sector operations.

Management agrees with the recommendation. Management has introduced the "Operational Sustainability" section in the Project Document template and provided related guidance for sovereign-backed financings, including aspects of operations and maintenance, revenue flows, and continuation after AIIB project financing ends.

Management will explicitly address operational sustainability risks as a separate risk category in the "Risks and Mitigants" section in the project document template and related guidance for sovereign-backed financings.

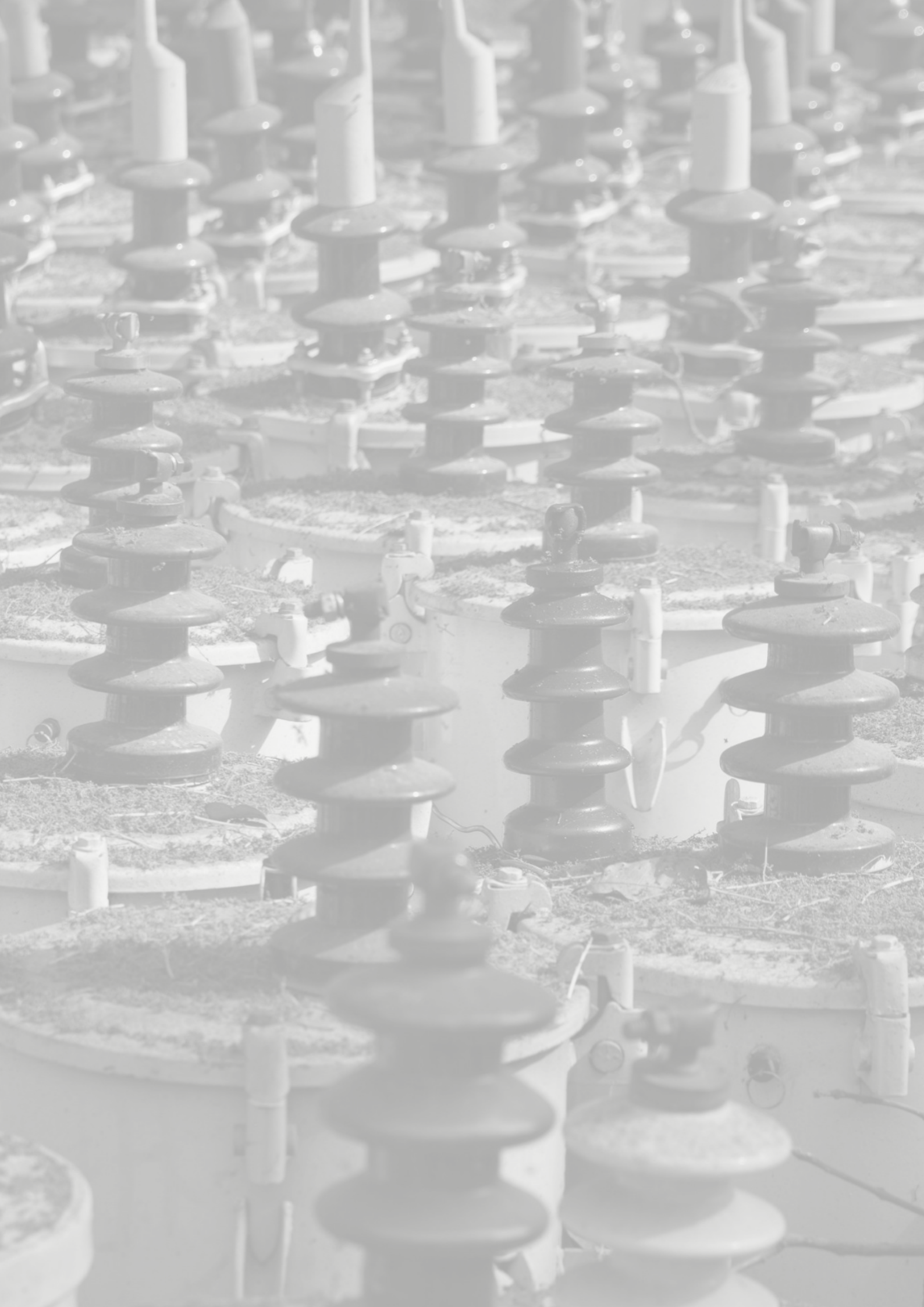
Recommendation 2: AIIB should strengthen readiness assessments where delivery depends on permitting, complex procurement, design maturity, or stakeholder coordination.

Management has introduced the "Implementation Readiness" section in the Project Document template and provided related guidance for sovereign-backed financings.

Management will evaluate the relevance, feasibility, and efficiency of assessing readiness at the component level and of further refining the assessment of readiness for different sovereign-backed financing modalities.

Recommendation 3: AIIB should ensure that results frameworks for energy access and distribution operations include intermediate and outcome indicators monitored during implementation, alongside physical outputs.

Management agrees with this recommendation. Management has strengthened guidance on the project Results Monitoring Framework through clarifying the roles and responsibilities of relevant departments, providing training, and enhancing staff capacity. It is now a requirement for the Results Monitoring Framework of each new project to include measurable outcome indicators aligned with the project development objectives.



Introduction

PROJECT DESCRIPTION

1. Guided by the Learning and Evaluation Policy of the Asian Infrastructure Investment Bank (AIIB, "the Bank"), the Complaints-resolution, Evaluation, and Integrity Unit (CEIU) conducts Project Learning Reviews (PLRs) for completed standalone projects. CEIU initiates a PLR after AIIB Management submits the Project Completion Note (PCN) to the Board. PLRs assess project performance and the work quality of AIIB and the Client, identify lessons, and provide actionable recommendations. After discussion in the Policy and Strategy Committee (PSC) of the Board, the full PLR reports for sovereign-backed financing projects are published on AIIB's website.

2. In line with CEIU's "independent and engaged" approach, PLRs are prepared by CEIU staff and expert consultants in collaboration with relevant operating departments. This approach enables candid reflection and promotes learning across the institution. While collaboration is essential, CEIU retains the final responsibility for the content and conclusions of the PLR.

3. The Bangladesh Distribution System Upgrade and Expansion Project holds a distinctive place in AIIB's institutional history as part of the Bank's first cohort of approved projects and its inaugural operation in the energy sector. Approved on June 24, 2016, this was a standalone sovereign-backed operation with no external co-financier. The project was designed to enhance distribution capacity and increase the number of rural and urban electricity consumers in Bangladesh. It addressed a structural imbalance in the country's power sector: while generation capacity had tripled between 2009 and 2015, rising from approximately 4,900 megawatt (MW) to 13,800 MW, investment in distribution infrastructure had not kept pace, leaving millions of rural households without last-mile connections and urban networks in northern Dhaka operating near or at capacity. The project intervened simultaneously at both ends of this gap.

4. To finance the project, AIIB provided a sovereign-backed loan of USD165 million to the People's Republic of Bangladesh. The remaining project cost was covered by the Government of Bangladesh (USD79.4 million) and the executing agencies from their own resources (approximately USD17.9 million). Total estimated project cost at appraisal was USD262.29 million; actual expenditure at completion was USD206.67 million, reflecting procurement savings and loan cancellations of USD20.88 million. The Ministry of Power, Energy and Mineral Resources provided sector oversight, with the Economic Relations Division (ERD) of the Ministry of Finance serving as the interface with AIIB.

5. The project's stated objective was "to enhance distribution capacity and increase the number of rural and urban electricity consumers in Bangladesh."[3] The project was structured into two distinct components managed by separate executing agencies. Component 1, implemented by the Bangladesh Rural Electrification Board (BREB) through 77 of its Pally Bidyut Samiti (PBS) cooperatives, aimed to provide approximately 2.5 million new last-mile service connections to

3 *Project Document* (June, 2016), para. 1, bit.ly/4iGrZ6h

rural households, entailing the procurement and installation of approximately 65,000 small low-voltage transformers and 2.5 million electricity meters.[4] Component 2, implemented by the Dhaka Electric Supply Company Limited (DESCO), targeted northern Dhaka's aging urban grid. Its scope included upgrading two grid substations, Bashundhara and Uttara, from a combined capacity of 250 MVA to 480 MVA and converting approximately 85 circuit-km of existing 33 kV overhead distribution lines to underground cables across 28 routes. Each component had its own Project Management Unit (PMU) under the respective executing agency, with AIIB maintaining supervision responsibilities directly.

PLR PURPOSE AND PROCESS

6. The purpose of this PLR is to assess the project's performance, extract lessons, and provide actionable recommendations for continuous improvement. The PLR serves both learning and accountability objectives, using the Organization for Economic Co-operation and Development's Development Assistance Committee criteria to ensure a structured, evidence-based assessment of results. The assessment applies four criteria: Relevance, Effectiveness, Efficiency, and Sustainability, consistent with the AIIB Learning and Evaluation Framework Guide: Evaluation Criteria[5] and the revised guidance for AIIB PCNs. Each criterion is rated on a four-point scale, which leads into the overall rating. Additionally, the PLR examines AIIB Work Quality and Client Work Quality.

7. This project was selected for a PLR based on its high institutional learning value for AIIB, as set out in the PLR Approach Paper. As part of the Bank's first cohort of approved projects and its inaugural energy sector operation, it provides a critical reference point for examining how early strategic choices, design decisions, and risk management approaches translated into implementation results. The project's dual-component structure, engaging BREB for rural connectivity and DESCO for urban grid modernization, offers a comparative lens for assessing design choices and operational performance across two executing agencies with distinct institutional profiles, operating in markedly different geographic and technical contexts. Unlike several early AIIB operations where supervision responsibilities were delegated to co-financiers, AIIB retained direct supervision of this project, making it a particularly valuable reference for evaluating the Bank's own oversight capabilities and institutional responsiveness during its formative years.

4 The headline beneficiary figure of 12.5 million rural people in the Project Document was not incorporated as a monitored indicator in the RMF; it was subsequently collapsed into the simpler output metric of 2.5 million connections in periodic reporting, without explanation.

5 *LEF Guide on Evaluation Criteria* (September, 2021) bit.ly/4kQrtIM

8. The PLR takes a mixed-methods approach, drawing on quantitative and qualitative data. The assessment draws on: desk reviews of project documentation, strategy and policy documents, and selected socioeconomic data; interviews with AIIB staff and government counterparts; and a field mission to Dhaka from May 10 to 13, 2026. The mission included in-depth discussions with the Ministry of Power, Energy and Mineral Resources, ERD, BREB, DESCO, and PBS representatives. It also included direct field observation at the Bashundhara substation and selected low-voltage transformer and service-drop installations under the Gazipur PBS, as well as structured engagement with households and small enterprises in the Gazipur area.

9. The draft PLR underwent a rigorous quality assurance process. This included internal review and editing within CEIU, as well as an external peer review by Dr. Dejan Ostojic, a leading expert and sector leader in energy and infrastructure development. Upon internal clearance, CEIU requested feedback from the Project Team, the Client, and AIIB Management before finalizing the report. CEIU retains final responsibility for the content and conclusions.

Project Design and Implementation

RATIONALE AND OBJECTIVES

10. Bangladesh's power sector faced a structural imbalance at the time of project appraisal that constrained economic growth and limited the welfare of millions of households. Installed generation capacity grew from approximately 4,900 MW in 2009 to around 13,800 MW by 2015, a roughly threefold increase driven by a deliberate government push to reduce acute supply shortfalls.[6] This expansion eased the most severe generation deficits of the early 2010s. It also brought into sharper focus a constraint that had been building for years: the distribution network had not kept pace with the volume of power now available for delivery. Distribution losses across the sector stood at approximately 13.5 percent in the BREB service area in 2015, well above the broadly accepted international efficiency benchmark of 8 percent, though substantially improved from a peak of 24 percent in 2002.[7] The government had committed to universal electricity access by 2021, a target embedded in successive national plans. Achieving it required improving generation on the one-hand and closing the last-mile gap between the existing medium-voltage network and the households and enterprises that could not yet access it.

11. Two distinct gaps defined the investment problem. In rural areas, approximately 13 million households were estimated to be living within reach of existing medium-voltage distribution lines but remained unconnected, unable to access electricity that had already been generated and transmitted to their areas.[8] The BREB cooperative network, which distributed roughly 40 percent of total national power supply through 77 PBS cooperatives, had the institutional reach and operational model to close that gap. It required financing for final-stage equipment: transformers, service drops, and meters. In northern Dhaka, the distribution network serving DESCO's service territory faced a different constraint. By mid-2015, the Bashundhara and Uttara grid substations had a combined capacity of 250 MVA serving a rapidly growing service area of over 700,000 consumers, with peak demand projected to more than double to approximately 1,964 MW by 2021.[9] An overhead 33 kV network designed for a smaller and less dense load was generating recurring faults, creating safety risks from reduced clearance levels as high-rise construction expanded, and limiting the economic activity the grid could support. These two gaps shared a common sectoral cause but required different interventions. Addressing them within a single operation, through two executing agencies with distinct mandates and technical profiles, was the central design logic of the project.

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6 *Project Document* (June, 2016), para. 3, bit.ly/4iGrZ6h: installed capacity grew from approximately 4,900 MW to 13,800 MW between 2009 and 2015; World Bank, Bangladesh Power Sector Assistance: A Review, October 2016, Figure 2.1, confirms the generation capacity trajectory.

7 *Project Document* (June, 2016), para. 13, bit.ly/4iGrZ6h: distribution losses at approximately 13.5 percent in 2015; World Bank, Bangladesh Power Sector Review, 2016, para. 19: distribution losses fell from 24 percent in 2002 to less than 11 percent in 2016 sector-wide; BREB losses at approximately 11.2 percent and DESCO at 8.03 percent at time of the review.

8 *Environmental and Social Review* (April, 2016), para. 7, bit.ly/4i8nWQ7: approximately 13 million rural households without electricity access; rural electrification rate approximately 40 percent at time of preparation.

9 P*roject Document* (June, 2016), para. 11-12, bit.ly/4iGrZ6h: DESCO serving over 700,000 consumers by June 2015 with peak demand of 845 MW; load demand projected to 1,964 MW by 2021; IEE, DESCO/DUET, 2016, para. 34: installed capacity nationally projected to grow to 25 GW by 2030 against a 7 GW base.

12. The project's stated objective was to enhance distribution capacity and increase the number of rural and urban electricity consumers in Bangladesh. Four output targets were established in the Results Monitoring Framework (RMF): 2.5 million new rural service connections; installation of 65,000 small low-voltage transformers; upgrade of the Bashundhara and Uttara substations from a combined 250 MVA to 480 MVA; and installation of 85 km of 33 kV underground cable across 28 routes in northern Dhaka. Beyond these output targets, the Project Document projected broader expected outcomes: electricity access for an estimated 12.5 million rural people through the connections delivered under Component 1; annual energy savings of approximately 21.9 million kilowatt-hour (kWh) from reduced technical losses under Component 2; and associated carbon emission reductions of approximately 16,400 tons per year. These projected outcomes were not incorporated as monitored indicators in the RMF, a design-stage choice with implications for learning and evaluability, which is discussed in the assessment chapters below.

13. The project was strategically well placed. It supported the government's universal access commitment. It also aligned with the priorities that AIIB's Energy Sector Strategy, approved one year after project approval in 2017, would subsequently formalize around expanding access, improving efficiency, and supporting sustainable economic development.[10] As AIIB's inaugural energy sector operation and its first sovereign project in Bangladesh, it also carried institutional significance beyond the investment itself. It helped establish operational precedents and build working relationships with government counterparts that subsequent operations could draw on.

DESIGN

14. The dual-component structure was a deliberate design choice. Each component was assigned to the executing agency whose institutional mandate, operational experience, and technical capacity best matched the nature of the works and the expected outputs. BREB had operated rural electrification through the PBS cooperative model since 1978. It held ISO 9001:2008 quality-management certification, obtained in 2013 (this standard was later superseded by ISO 9001:2015 in September 2015, before project approval). It also held system losses on a sustained downward trajectory—approximately 13.5 percent in the BREB service area in 2015, against 24 percent in 2002—and bill-collection rates consistently above 99 percent.[11] Its approach to last-mile connections proved scalable, and required no civil works, land acquisition, or grid infrastructure upgrades. Transformers were mounted on existing distribution poles, and service drops of typically 20 to 30 meters ran directly to consumer premises. DESCO, established in 1996 as a corporatized distribution entity, demonstrated technical competence in operating urban distribution infrastructure, reporting system losses of 8.37 percent in 2015, the lowest

10 *Project Completion Note* (June, 2023), para. 10, bit.ly/4iGFCT8: project aligned with AIIB's Energy Sector Strategy in promoting rural electricity access and improving urban supply reliability.

11 *Project Document* (June, 2016), para. 8, bit.ly/4iGrZ6h: BREB established in 1978, operating through 77 PBS cooperatives; *Environmental and Social Review* (April, 2016), para. 4, bit.ly/4i8nWQ7: BREB holds ISO 9001:2008 certification, the applicable standard in 2013 when certification was obtained.

distribution utility in the country.[12] Assigning each agency to its matching component reduced implementation risk and avoided the coordination complexity that could have arisen from a single-agency model spanning two technically distinct contexts.

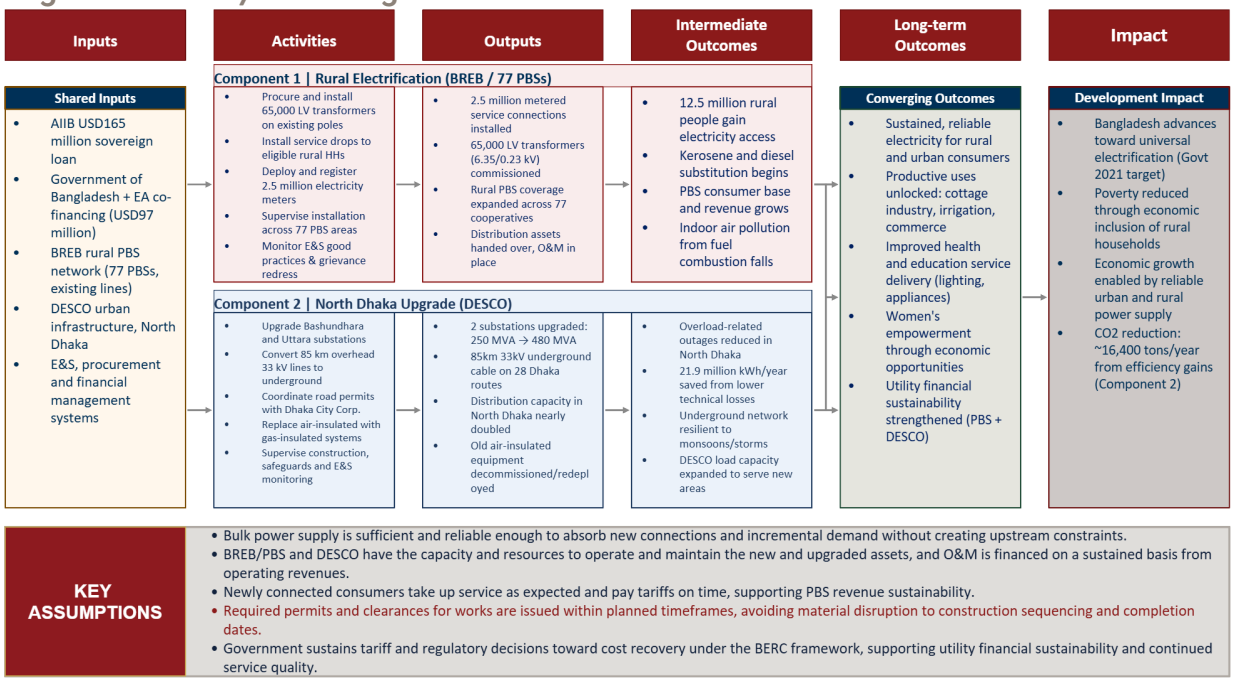
15. Component 2 was technically more demanding. Upgrading the Bashundhara and Uttara substations required replacing existing 50/75 MVA transformers with larger 80/120 MVA units (each pair of figures is the transformer's rating without and with forced-air cooling) and installing gas-insulated switchgear, which is better suited to the spatial constraints of existing substation footprints in dense urban settings than the air-insulated configuration being replaced. The underground cabling scope involved open-cut trenching along 28 road routes to install 33 kV cable, followed by backfilling and full road reinstatement. This required coordination across multiple municipal and technical authorities, each with independent jurisdiction over different road segments, traffic management during works, and technical supervision of a specialist contractor. The Environmental Impact Assessment (EIA) for the underground cable component, prepared by the Dhaka University of Engineering and Technology, identified the need for this multi-authority coordination at the preparation stage.[13] The extent to which this risk was mitigated before works commenced is discussed under Implementation.

16. The project's theory of change is reconstructed for this PLR, as no formal theory of change was prepared at appraisal. The reconstructed logic follows a straightforward results chain. AIIB financing and counterpart contributions enabled the procurement and installation of transformers, meters, cables, and substation equipment. These activities produced the four RMF output targets. The outputs were expected to generate intermediate outcomes: rural households gaining metered electricity access; substation load constraints in northern Dhaka being relieved; underground cable infrastructure replacing fault-prone overhead lines; and system losses being reduced. Over the medium term, reliable electricity access was expected to support productive use, improve service delivery in health and education, and contribute to continued economic development in DESCO's rapidly urbanizing service territory. The ultimate impact was a contribution to Bangladesh's universal electrification goals and, through more reliable and expanded access, to economic growth, inclusion, and poverty reduction. A central assumption underpinning this chain was the availability of sufficient bulk power upstream. This assumption had become more robust by 2016 given the generation expansion but remained linked to how available generation is scheduled across power plants (dispatch) and to transmission adequacy.

12 P*roject Document* (June, 2016), para. 10-11, bit.ly/4iGrZ6h: DESCO established 1996; system loss of 8.37 percent in 2015, lowest of any distribution entity in the country; 705,234 consumers by June 2015.

13 EIA Report, DESCO/DUET, 2016, Chapter 9: public consultation outputs identify road restoration and coordination with other utility agencies as key concerns raised by stakeholders, consistent with the multi-authority coordination challenge that emerged during implementation.

Figure 2: Theory of Change



Source: AIIB CEIU (based on project documentation).

17. A design-stage gap, also observed in other PLRs of projects approved during AIIB's startup phase relates to the Results Monitoring Framework, and provides an important institutional learning point. The framework tracked four physical output indicators and did not include intermediate and outcome level metrics for system reliability, welfare change, or productive use of electricity. The headline projected outcome of electricity access for 12.5 million rural people was documented in the Project Document but was not incorporated as a monitored indicator. This limited the project's ability to generate evidence on outcome-level change. Chapter 3 examines this issue as part of the effectiveness assessment.

IMPLEMENTATION

18. The two components followed markedly different implementation trajectories. Component 1 was delivered rapidly and efficiently. Component 2 took longer, mainly due to the coordination requirements of Dhaka's urban regulatory environment, with further disruption later caused by the COVID-19 pandemic. The divergence reflected the nature of each component's scope more than any difference in the relative efficiency of the two agencies. Component 1 was a supply-and-install program procured against mature specifications, with no design phase, no land acquisition and no third-party permitting. Component 2 carried a design phase, civil works in live urban road corridors, and approvals from multiple independent authorities. Table 1 presents the key milestones for each component.

19. Component 1 achieved its output targets approximately 18 months ahead of the original project closing date. BREB organized procurement into four standardized goods categories, tendering each as a separate lot group under International Open Competitive Tender. This approach attracted strong international competition and generated loan savings of approximately USD13.27 million against appraisal estimates. Equipment transportation to

all 77 PBS warehouses was contracted through 20 separate carrying contracts, separating logistics from supply and enabling parallel delivery across the national network. The installation of 2.5 million connections and 65,000 transformers across 77 PBS areas was completed within approximately nine months of field mobilization. This reflected the operational capacity of the decentralized PBS model and the technically straightforward nature of the works. All four RMF targets under Component 1 were met in full by June 2018. The AIIB-financed portion was delivered at USD85.37 million against a loan allocation of USD98.39 million. Total expenditure across all funding sources was approximately USD120.3 million against a total appraisal estimate of USD157.75 million.

Table 1: Implementation Milestones by Component

Milestone	Component 1 (BREB)	Component 2 (DESCO)
Loan effectiveness	Q1 2017	Q1 2017
Physical works commenced	2017	2018
Original loan closing date	Q4 2019	Q4 2019
First extension	n/a	Q4 2020
Second extension	n/a	Q4 2021
All targets met (as recorded by PIMRs)	Q2 2018	Q3 2021
Months ahead/behind original schedule	18 months ahead	24 months behind

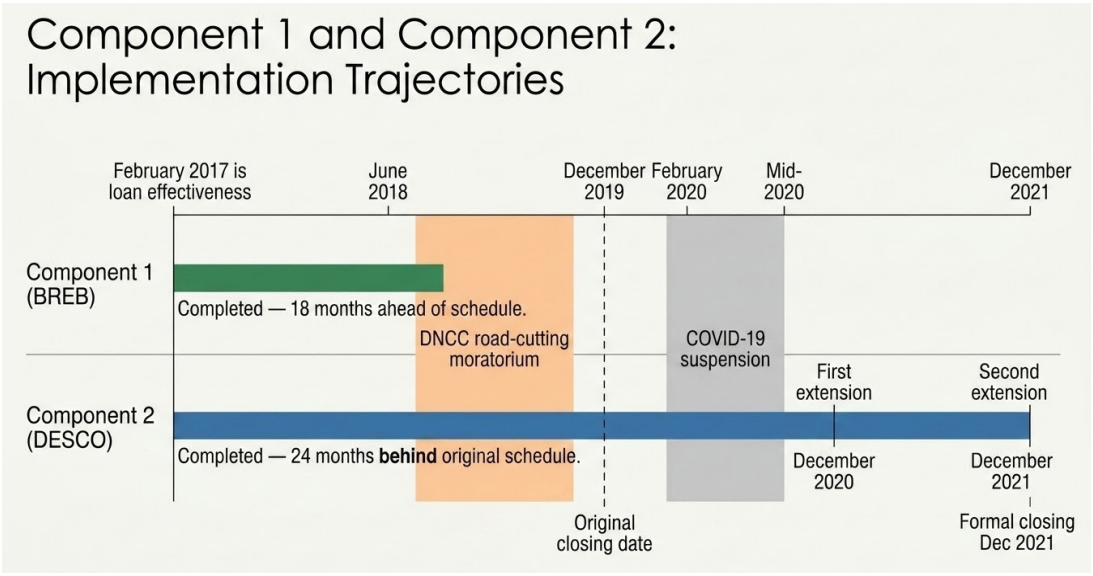
Note: "n/a" indicates that the extensions did not affect implementation under BREB, as its physical targets had already been achieved by the second quarter of 2018. It does not mean that BREB was formally excluded from the project extensions. Completion dates are reported by calendar quarter in Tables 1 and 2 to maintain a consistent level of precision across the two components.

Source: *Project Completion Note* (June, 2023), bit.ly/4iGFCT8; Project Implementation Monitoring Reports 7-12.

20. Component 2 encountered a more complex implementation environment than initially anticipated. Underground cable installation along public road corridors in Dhaka required independent approval from multiple authorities, including the Dhaka North City Corporation for city roads; the Roads and Highways Department for arterial routes; Bangladesh Railways for crossings near rail infrastructure; RAJUK for routes along the Purbachal corridor; the Bangladesh Small and Cottage Industries Corporation for relevant segments; and Gazipur City Corporation for routes within its jurisdiction.[14] Each authority operated independently with its own schedules and priorities. The evaluation also learned that where a road had recently been built or repaired under another agency's program, it could not be excavated during its defect-liability period. These access restrictions were a known feature of Dhaka's road network but were not reflected in the project's implementation schedule. By end-of-2018, only 8 km of underground cable had been installed against an initial target of approximately 70 km for that year. The substation upgrades were less dependent on road-cutting permissions and therefore proceeded more smoothly. Both substations were upgraded to the target 480 MVA combined capacity by December 2020.

14 DESCO Compliance Report on IMED Recommendations (translated)June 2022 confirms that road excavation permissions were suspended by DNCC for two years, and that approvals from Roads and Highways Department, Bangladesh Railway, Gazipur City Corporation, and Bangladesh Small and Cottage Industries Corporation were also delayed.

Figure 3: Implementation milestones across the two components



Source: *Project Completion Note* (June, 2023), bit.ly/4iGFCT8; Project Implementation Monitoring Reports.

21. The COVID-19 pandemic added a further disruption from early 2020. Construction was suspended from February 2020 following the onset of the COVID-19 pandemic in Bangladesh. Works resumed in the third quarter of 2020, but the interruption required a second extension of the loan closing date, to December 2021. The full 85 km underground cable target was met by the third quarter of 2021. The DESCO Project Completion Report (PCR) and the subsequent IMED inspection report both indicate that the main cause of the two-year delay was the difficulty of securing road-cutting permissions from the relevant authorities, with COVID-19 as a later and secondary factor.[15] Despite the delays, all physical targets were delivered in full within the AIIB loan allocation of USD66.11 million, against an appraisal base cost estimate of USD98.31 million.

22. Procurement performance across both components was a project-wide strength. All procurement was completed without material irregularities. Total loan cancellations of USD20.88 million at project close reflected procurement savings from competitive tendering in both components and not reduction in physical scope. The final disbursement ratio against the net committed amount (the original loan minus cancellations) was 100 percent, confirming full use of the retained loan envelope. Savings on this scale reflected deliberate procurement choices rather than favorable market conditions alone. Standardization and aggregation of repetitive goods into a small number of large lots generated economies of scale and attracted stronger international competition; separating logistics from supply across 20 carrying contracts lowered transaction costs and enabled parallel delivery to 77 warehouses; and both executing agencies applied established institutional oversight to tender evaluation and award. Contract administration was sustained through to completion: no material contract-management difficulties were reported under either component in the PIMR series or in the completion reports available to this evaluation.

15 DESCO Project Completion Report (PCR of 33kV UG Cable Project), 2021: confirms implementation period of July 2016 to June 2021 with two DPP revisions. IMED Inspection Report, 2022, and DESCO Compliance Response, June 2022, both confirm multi-authority permitting as the primary delay cause, COVID-19 as secondary.

23. Financial management was broadly satisfactory throughout the project. Both Project Management Units (PMUs) submitted financial management reports on schedule. AIIB-financed expenditure was found to be acceptable in successive reviews. Minor internal control matters were identified during supervision, including non-compliance with national VAT regulations in contractor payment deductions. These were assessed by the external auditors, and confirmed in AIIB's fiduciary review, as not material to AIIB-financed expenditures and did not qualify audit opinions, which remained unqualified throughout. External audit submissions were consistently late against contractual deadlines. Under Component 1, the single audit report covering the implementation period was submitted eleven months after the due date. Under Component 2, four audit reports were submitted late—by eleven months for FY2018, six months for FY2019, and eight months each for FY2020 and FY2021—an average of approximately eight months. The pattern is attributable in part to the capacity of the Foreign-Aided Project Audit Directorate (FAPAD), and earlier and more structured coordination with the auditor would have mitigated it. This recurring fiduciary management issue was noted throughout the PIMR series.

ENVIRONMENTAL AND SOCIAL SAFEGUARDS

24. The project was classified as Category B under AIIB's Environmental and Social Policy (2016) (the intermediate level of AIIB's three-category A/B/C system, indicating impacts expected to be limited, largely site-specific, and reversible). This classification reflected the judgment that adverse impacts would be site-specific, largely reversible, and manageable through standard mitigation measures. This was a reasonable assessment given the technical profiles of both components.

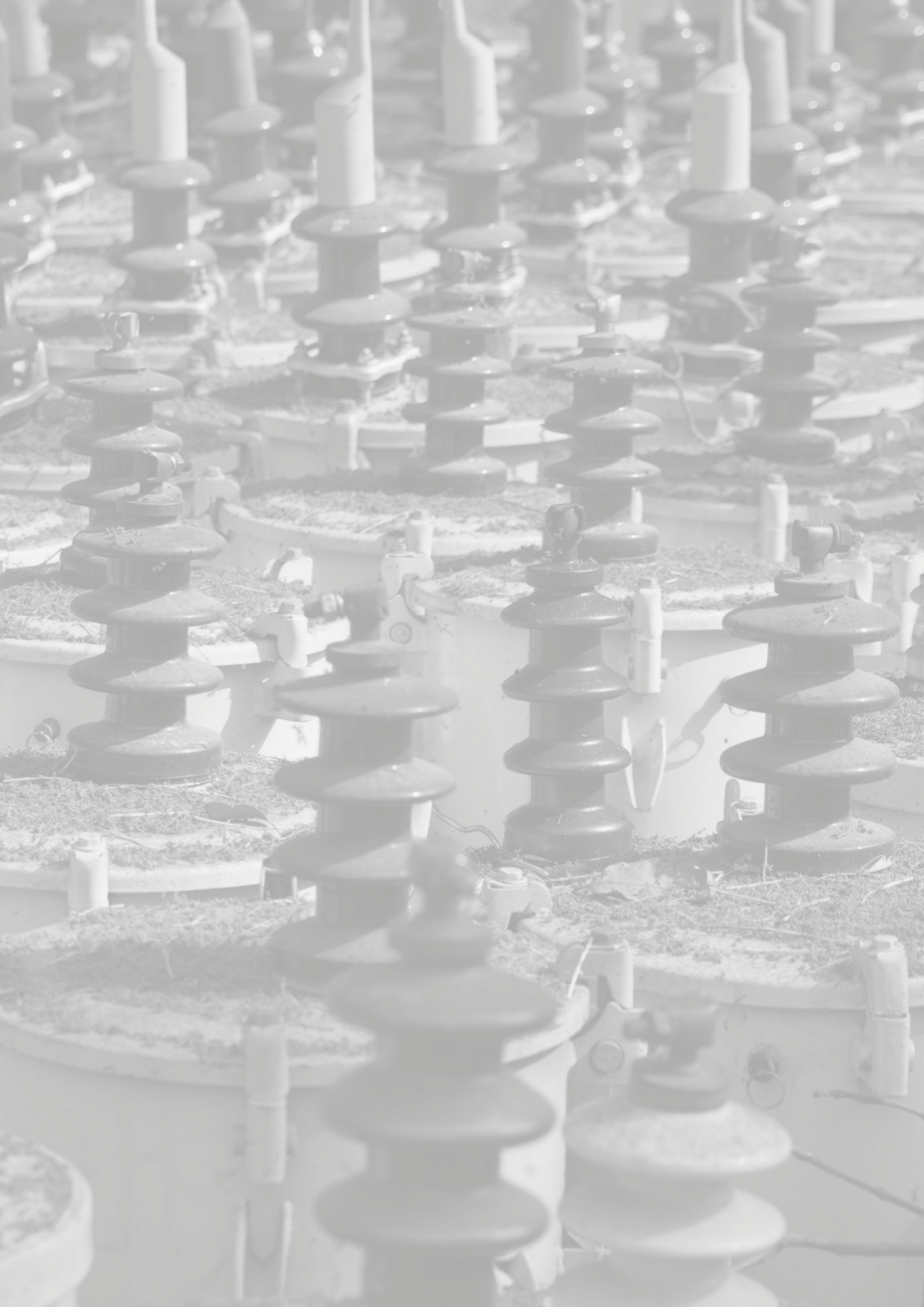
25. The safeguard instruments differed between components. For Component 1, a focused Environmental and Social Review (ESR) was prepared at appraisal. As the works involved mounting small transformers on existing poles and running short service drops to consumer premises, no land acquisition, involuntary resettlement, or civil earthworks were required. Connection uptake was voluntary, initiated by consumer application. The principal safeguard requirements were occupational health and safety (OHS) good practices during installation: use of personal protective equipment, temporary barricades around work areas, and safe disposal of any replaced equipment. For Component 2, the primary instruments were an Initial Environmental Examination (IEE) and a site-specific Environmental and Social Management Plan (ESMP). Given the open-cut trenching along public roads in a dense urban environment, the main impacts were construction-phase and temporary in nature: noise, dust, traffic disruption, and occupational safety risks. The ESMP translated these into concrete contractor obligations. An independent environmental and social monitoring consultant was engaged by DESCO for the duration of the works, producing periodic monitoring reports submitted by DESCO to AIIB for compliance review.[16] Ambient air quality monitoring at the Uttara and Bashundhara sites confirmed that all measured parameters remained within national standards set by the Department of Environment across the monitoring

16 Environmental and Social Management Plan, DESCO, 2016; Environmental Health Safety and Social Monitoring Report, EGIS/HYOSUNG, January-June 2020: documents monitoring of air quality, noise, water, OHS, and contractor compliance.

period. For the parameters monitored (principally particulate matter, noise, and gaseous pollutants), the national Department of Environment standards applied are broadly consistent with, though for some parameters less stringent than, the World Health Organization Air Quality Guidelines and the World Bank Group Environmental, Health and Safety Guidelines that AIIB's Environmental and Social Policy references as international good practice. No exceedance of the applicable national limits was recorded during construction.

26. Environmental and social performance was satisfactory across both components throughout implementation. No fatalities or serious injuries were recorded under either component, a meaningful result given the scale of rural field operations across 77 PBS areas and the civil works intensity of underground trenching across a dense urban network. The PCN confirms this record across all monitoring periods. Both components maintained functioning Grievance Redress Mechanisms, calibrated to their different operational contexts: BREB through its existing consumer-facing infrastructure at PBS service centers, and DESCO through a project-level mechanism with nominated contractor contact points and complaint facilities at construction sites. No unresolved grievances remained at project closure under either component. Both mechanisms were consistent with AIIB's Environmental and Social Policy (2016), which reflects international good practice on grievance redress under International Financial Corporation Performance Standard 1 and World Bank ESS10. The PLR's assessment of how well the GRMs functioned in practice is, however, constrained by the available evidence. It rests principally on the case counts and closure status reported by the executing agencies; neither agency could produce the underlying construction-phase grievance logs during the PLR mission. The evaluation could therefore confirm that no grievances were recorded as outstanding, but could not independently verify how complaints were received, triaged, and resolved. This is treated as an accountability and record-keeping gap rather than evidence of GRM failure, and it informs the work-quality assessment in Chapter 4.

27. One monitoring-related issue concerns gender-disaggregated data under Component 1. Such data was not collected at connection or PBS level to track how electricity access was used within newly connected households. The Project Document projected positive welfare outcomes for women, including reduced indoor air pollution, reduced time spent on manual tasks, and expanded opportunity for cottage industry activity. Without systematic monitoring data, these outcomes cannot be verified from the project record. Chapter 3 addresses this as a results framework design observation.



Project Assessment

RELEVANCE

Relevance At Time Of Appraisal

28. 28. The investment addressed a structural constraint that was well documented and directly linked to the government's development objectives. Bangladesh's electricity access rate stood at approximately 40 percent of the rural population in 2015, despite a substantial increase in national generation capacity from approximately 4,900 MW in 2009 to 13,800 MW by mid-2015. Generation and access had not moved in tandem. The investment gap was in the final-stage connections needed to bring available power from the existing medium-voltage network to unserved households. An estimated 13 million rural households were within reach of existing distribution infrastructure but remained unconnected, limiting their ability to access electricity already generated and transmitted to their areas. This last-mile gap was a key constraint, rather than generation capacity. The project responded to that constraint. More broadly, a structural gap between an expanded generation base and a lagging distribution network diminishes the development impact of investment made in any single segment in isolation: it raises technical and commercial losses, heightens safety risks, and reduces the reliability of supply, while slowing on-grid electrification and pushing consumers toward costly self-supply such as stand-alone back-up generation. Relieving that gap was therefore central to converting Bangladesh's generation gains into usable, reliable access.

29. The sectoral case was reinforced by a second and distinct problem in northern Dhaka. DESCO's distribution territory had grown rapidly. By June 2015, the two grid substations serving Dhaka's northern residential and commercial areas operated at a combined capacity of 250 MVA against peak demand of 845 MW, with projections indicating demand would reach approximately 1,964 MW by 2021. The existing 33 kV overhead network carried load above its design parameters, contributing to recurring faults, safety concerns as building heights reduced clearance margins, and capacity constraints in an area that included commercial concentrations, hospitals, diplomatic facilities, and emerging new townships. Both problems were grounded in documented engineering and economic analysis. Addressing them in a single operation was operationally coherent.

30. The project was closely aligned with the government's stated national priorities. Bangladesh's Seventh Five-Year Plan (FY2016-FY2020) set specific targets for electricity access expansion and system loss reduction as part of the broader commitment to achieve universal electricity access by 2021. Distribution losses, which had fallen from 24 percent in 2002 to approximately 13.5 percent in the BREB service area by 2015, remained above the sector's own efficiency benchmarks and above the performance of the country's best-performing urban utilities. Investment in last-mile connections and urban distribution reliability was therefore consistent with stated government priorities. The Project Document reflects a government request for AIIB financing, and the project design was rooted in BREB's feasibility work and DESCO's existing load forecasting studies.

31. AIIB's involvement was additional and complementary. Other development partners were active in the sector at the time, but their focus was on different segments of the investment chain: ADB on transmission and primary distribution infrastructure, the World Bank on rural transmission and medium-voltage strengthening, and the Japan International Cooperation Agency (JICA) on substation construction in other distribution areas. The project filled a gap in last-mile service connections and urban distribution reliability that was not being addressed through parallel programs. For AIIB, as a newly established multilateral development bank (MDB) making its third-ever approved investment and its inaugural standalone energy sector project, the operation was also strategically well placed. It demonstrated AIIB's ability to support sovereign infrastructure lending in a core sector of its mandate.

32. One qualification applies to the appraisal-stage design of the RMF. The four RMF indicators tracked physical outputs only: connections installed, transformers commissioned, substation capacity, and cable length. No outcome-level indicators were included for service reliability, household welfare, system losses in the project area, or gender-disaggregated access. The Project Document identified projected outcomes, including electricity access for approximately 12.5 million rural people and annual energy savings of 21.9 million kWh, but these were not incorporated as monitored indicators. This did not affect the strategic relevance of the investment, but it limited the evaluation's ability to trace the output-to-outcome results chain using project data alone and points to an opportunity for stronger results monitoring in similar future operations.

Design Relevance

33. The project's design responded logically and proportionately to the two problems it identified. The low-voltage transformer-and-service-drop model selected for Component 1 was technically appropriate for the specific gap being addressed: rural households within reach of an existing medium-voltage grid but lacking the final-stage equipment to connect. No civil works, land acquisition, or grid upgrades were required. BREB's feasibility work confirmed that installation could proceed using existing distribution poles across all 77 PBS areas. The choice was a least-cost technically feasible solution for the specific bottleneck. A more capital-intensive approach, such as new primary distribution lines, would not have been necessary or appropriate for most target connections.

34. The assignment of each component to its natural executing agency was a sound design choice. BREB had operated the PBS cooperative model continuously since 1978, held international quality management certification, and held system losses on a sustained downward trajectory and bill collection rates above 99 percent at appraisal. DESCO had demonstrated technical and financial competence in urban distribution, reporting the lowest system losses of any distribution utility in the country. The dual-agency design matched implementation responsibilities to institutional mandates and avoided the inefficiencies that could have arisen from assigning both components to a single entity without operational experience in the other's territory.

35. The design was coherent, though it rested on one important assumption. The assumption was that sufficient bulk power would be available upstream to flow through the new connections and upgraded substation infrastructure. By 2016, the generation expansion of the preceding years had substantially strengthened this assumption, but dispatch arrangements, fuel availability, and transmission adequacy remained variables outside the project's direct control. The assumption was reasonable at appraisal and broadly shared by development partners working in the sector. It is noted here as a contextual design assumption rather than a design weakness.

36. The urban component under Component 2 carried a preparation-stage coordination risk that was identified but could have been more fully addressed before implementation. The 2016 environmental impact assessment for the underground cable works identified road restoration and coordination among multiple utility service departments as a key stakeholder concern. The IEE also noted that underground cable routes would require coordination with relevant municipal and technical authorities. This correctly identified the issue, but the project proceeded without securing in-principle permissions from the relevant road authorities before loan signing, a practice that ADB now requires before a project proceeds to loan committee, as noted in the DESCO compliance response to the IMED inspection report.[17] The subsequent coordination challenges in Dhaka were therefore foreseeable and provide a useful point of reference for strengthening preparation of similar urban infrastructure works.

Relevance at time of Evaluation

37. The challenges this project addressed remain central to Bangladesh's development agenda in 2026. Bangladesh declared near-universal electricity coverage by 2021, with household electrification reaching approximately 96 percent of the population.[18] This achievement reflects a major investment program of which this project was one part. However, coverage and quality are distinct dimensions of access. The World Bank's Electricity Distribution Modernization Program, approved in November 2021 at USD500 million, documented that electricity supply for more than 90 percent of Bangladeshi households corresponded to Tier 3 or below on the Multi-Tier Framework for Electricity Access, reflecting continued issues with reliability, quality, and duration of supply despite high headline coverage.[19] Unreliable power supply also remained a constraint on medium-size enterprise expansion in export sectors. The investment logic that underpinned this project, that new connections and upgraded urban distribution infrastructure are necessary conditions for inclusive economic development, remains relevant.

17 DESCO Compliance Report on IMED Recommendations, June 2022: DESCO noted that ADB now requires in-principle approval from relevant city authorities before a project proceeds to the loan committee.

18 World Bank, Electricity Distribution Modernization Program PAD, November 2021, para. 13: BREB successfully delivered access to more than 90 million people in the preceding decade, placing the government on the cusp of universal electrification targets expected by 2021.

19 World Bank, Electricity Distribution Modernization Program PAD, November 2021, para. 6: electricity supply for more than 90 percent of households corresponded to Tier 3 or below under ESMAP's Multi-Tier Framework. Bangladesh ranked 101 out of 137 economies in the Global Competitiveness Report 2017-18 on quality of electricity supply.

38. The sector's investment trajectory since project completion confirms the continued strategic importance of the agenda. The same World Bank Electricity Distribution Modernization Program explicitly built on the BREB rural electrification experience and cited system losses reduced from 18 percent in 2009 to 9 percent by 2021 as evidence of the institutional foundation in place.[20] BREB's subsequent national investment plans, including proposals submitted to the Planning Commission for a further modernization program covering four divisions, reflect the same operational model supported by the project. For DESCO, the underground cabling model piloted under Component 2 has become the default design for new distribution works in Dhaka, with the project's 28-route conversion representing the largest underground distribution project completed in Bangladesh to date and a technical reference for subsequent works.

39. AIIB's continued Bangladesh program is consistent with the relevance finding. The project was AIIB's first sovereign energy investment in Bangladesh. It helped establish working relationships with BREB, DESCO, and the Ministry of Power, Energy and Mineral Resources that subsequent AIIB operations in Bangladesh have drawn on. At the time of this evaluation, AIIB's Bangladesh program has expanded to include climate-focused policy-based financing (CPBF) and additional infrastructure investments, reflecting the strategic importance of the relationship initiated through this project.

40. Overall, the PLR rates the project's relevance as "Highly Relevant." The project addressed a critical imbalance in Bangladesh's electricity sector, where generation capacity had expanded rapidly without corresponding distribution network development. Its design, combining rural last-mile connectivity and urban grid modernization, was well aligned with sector needs and supported the Government's goal of universal electricity access by 2021, as well as key national strategies. The choice of BREB and DESCO as executing agencies was appropriate, given their strong performance and established capacity in rural and urban contexts. The project also held strategic importance as AIIB's first sovereign energy operation in Bangladesh, helping build institutional relationships and operational experience. While urban permitting delays affected implementation, these challenges point to readiness gaps rather than weaknesses in the project's relevance.

EFFECTIVENESS

41. The effectiveness assessment draws on the project's supervision and monitoring record, AIIB's PCN, project completion documentation from both executing agencies (BREB and DESCO), field observations during the PLR mission to Dhaka in May 2026, and secondary data on Bangladesh's rural electrification trajectory. As set out in Chapter 2, the project's results framework tracked only the four physical output indicators. It did not include intermediate or outcome-level indicators for system reliability, household welfare, productive use of electricity,

20 World Bank, Electricity Distribution Modernization Program PAD, November 2021, para. 13: BREB reduced system losses from 18 percent in 2009 to 9 percent by 2021. The PAD explicitly builds on the rural electrification model and notes the World Bank's Rural Electricity Transmission and Distribution Project, which ran in parallel with the AIIB project, as the institutional predecessor.

or gender-differentiated access. Outcome-level findings presented below are therefore derived from technical data provided by the executing agencies, project completion documentation, beneficiary engagement during field visits, and externally published evidence on comparable rural electrification programs in Bangladesh. One monitoring record observation warrants upfront acknowledgment: PIMR 12 corrected the project objective indicator value from 12.5 million to 2.5 million, with the remark that the parameter had been "updated with correct figures" but without documented rationale for the original discrepancy. The PCN subsequently re-labelled the indicator as service connections installed. The PLR treats 2.5 million connections as the verified physical output and the 12.5 million beneficiaries estimate as a plausible projected benefit that is directionally consistent with the project's design logic but not independently confirmed through systematic monitoring. Where outcomes were also influenced by parallel programs, broader national investments, and macroeconomic trends, this assessment uses "contributed to" formulations to reflect the project's role without overstating attribution. Consistent with established MDB evaluation practice, the assessment applies a contribution-analysis logic: it triangulates utility performance data, field observations, stakeholder interviews, sector trends, and project documentation to form a reasoned judgement on the project's likely contribution to outcomes, while remaining explicit that attribution to the project alone is not claimed.

42. The project met all four output targets defined in the RMF, as set out in Table 2. Component 1, implemented by BREB, delivered 2.5 million rural service connections and 65,000 low-voltage transformers across 77 PBS areas by June 2018, approximately 18 months ahead of the original project closing date of December 2019. Component 2, implemented by DESCO, upgraded the combined capacity of the Bashundhara and Uttara substations from 250 MVA to 480 MVA by December 2020 and completed the installation of 85 km of 33 kV underground cable across 28 routes in northern Dhaka by the third quarter of 2021, within the extended loan closing date. Physical delivery was confirmed in both AIIB and Client project completion documentation and corroborated through field verification during the PLR mission. The full appraised scope was delivered by both executing agencies. The effectiveness assessment therefore starts from strong physical delivery and then considers the extent to which these outputs supported the stated development objective of enhancing distribution capacity and increasing the number of rural and urban electricity consumers.

Table 2: RMF Output Targets at Approval vs. Actual at Completion

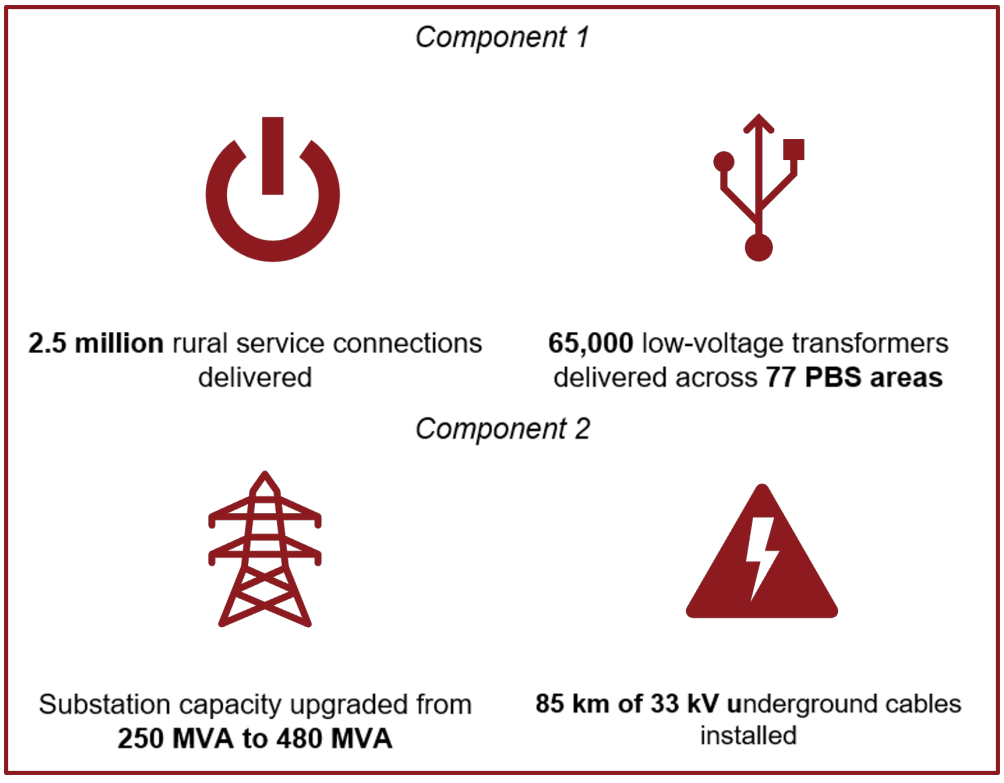
Indicator	Baseline (2016)	Target at Approval	Actual at Completion	Target Met On
New rural service connections (millions)	0	2.5	2.5	Q2 2018
Small low-voltage transformers installed (units, 000s)	0	65	65	Q2 2018
Grid substation capacity, Bashundhara and Uttara (MVA)	250	480	480	Q4 2020
Length of 33 kV underground cable installed (km)	0	85	85	Q3 2021

Source: *Project Completion Note* (June, 2023), bit.ly/4iGFCT8; Project Implementation Monitoring Reports 7-12.

Component 1: Rural Electrification (BREB)

43. Component 1 delivered rural household electrification at a scale that made a significant contribution to Bangladesh's national electrification drive during its most intensive phase. Between 2016 and 2018, 2.5 million households gained metered electricity access across all 77 PBS areas, extending the grid to communities that had been within reach of existing medium-voltage infrastructure but remained unconnected. The AIIB PCN estimates that approximately 12.5 million people benefited from these connections, applying a household multiplier consistent with national demographic data.[21] As noted in the methodological framing, this figure is presented as a projected order-of-magnitude estimate rather than a verified outcome. The PLR mission's field visit to an AIIB-financed site within the Gazipur PBS confirmed that installations of low-voltage transformers and service line drops were completed to specification and remain in sound operating condition. Of 590 connections in the village visited, 235 were AIIB-financed, providing selective but concrete post-completion corroboration of the PCN's physical claims.

Figure 4: Project Outcomes by Component



Source: AIIB CEIU (based on project documentation).

21 The Bangladesh Bureau of Statistics Population and Housing Census 2011 records a national average household size of 4.44, placing the BREB estimate at the upper end of the plausible range. This figure is treated as a projected order-of-magnitude estimate, not a verified beneficiary count.

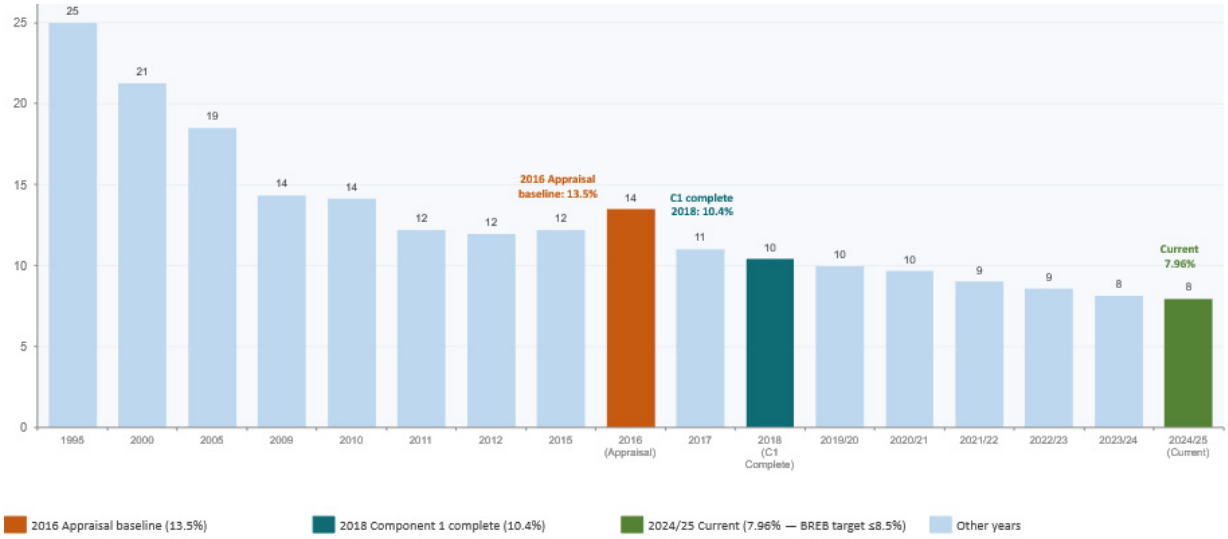
44. The strongest available evidence on welfare outcomes associated with rural electrification at this scale comes from the World Bank's impact evaluation of the Bangladesh Rural Electricity Transmission and Distribution Project (P129920),[22] a parallel program operating across overlapping geographic areas during the same period. That evaluation, which used a comparison group design, found that electrified households earned annual incomes of BDT201,497 compared with BDT135,470 for non-electrified households, and that kerosene use among electrified groups fell from 54 percent to 15 percent. These findings are methodologically stronger than agency-produced comparisons and are directionally consistent with the outcomes this project was designed to support. They are presented here as comparator evidence, not as a measure of this project's causal impact. The BREB project completion report also presents indicative comparisons, showing connected households reporting annual incomes of BDT92,963 against BDT56,524 for non-electrified households, alongside estimates of BDT16 million per month in kerosene savings and BDT46 million per season in diesel displacement from irrigation. These figures are useful as illustrative evidence, but they carry methodological limitations: they are self-reported, not based on a formal comparison group, and were produced by the implementing agency. The reported income differential may also reflect pre-existing differences between connected and non-connected areas, since wealthier households and more commercially active locations are often connected earlier. No formal socioeconomic impact assessment was commissioned for this project. The BREB PCR figures are therefore treated as indicative of the plausible scale of benefits, not as evidence of the project's causal contribution to income change.

45. System loss performance across the BREB network provides a further observable proxy for the project's contribution to distribution efficiency. BREB's network-wide system losses followed a sustained downward trajectory over the project period: from approximately 13.5 percent in the BREB service area at appraisal in 2015, losses had declined to approximately 9 percent by 2021, as documented in the World Bank's Electricity Distribution Modernization Program appraisal.[23] The installation of 65,000 standardized low-voltage transformers replacing older, higher-loss equipment across 77 PBS areas is directionally consistent with this trend. Attribution is partial, as BREB network improvement reflected multiple programs and management initiatives over the same period. The investment can therefore be understood as contributing to the observed system-level efficiency gains, with a clear technical mechanism through replacement of aging distribution equipment with modern, lower-loss assets.

22 World Bank. 2022. Bangladesh: Rural Electricity Transmission and Distribution Project, Implementation Completion and Results Report (P129920). Washington DC: World Bank Group. Annex 7: Supporting Information on Impact Analysis.

23 World Bank. 2021. Bangladesh: Electricity Distribution Modernization Program, Project Appraisal Document (P176570). Washington DC: World Bank Group, para. 13.

Figure 5: BREB Network System Loss Trajectory (1995 – 2025)



Source: BREB mission presentation (May 2024); AIIB PLR mission notes; Project Documents.

Component 2: Urban Distribution (DESCO)

46. Component 2 addressed documented network stress in one of Bangladesh's most densely urbanized corridors. The combined capacity of the Bashundhara and Uttara grid substations was expanded from 250 MVA to 480 MVA, replacing existing 50/75 MVA transformers with larger 80/120 MVA units and installing gas-insulated switchgear, a more space-efficient configuration suited to the footprint constraints of existing urban substations. Beyond the raw capacity addition, the upgrade moved multiple distribution areas from single-source to dual-source supply configuration, so that if one transformer trips, supply continuity is maintained without consumer interruption. In practical terms, each location can now carry its load even with one transformer out of service. This resilience improvement is a qualitative change in network performance that the MVA headline figure alone does not fully convey. Both substations were upgraded to the combined 480 MVA target by December 2020 and remain in service. Project documentation confirms that the upgrades improved overall system reliability and expanded the network's capacity to serve new areas of northern Dhaka approaching the limits of the prior configuration.

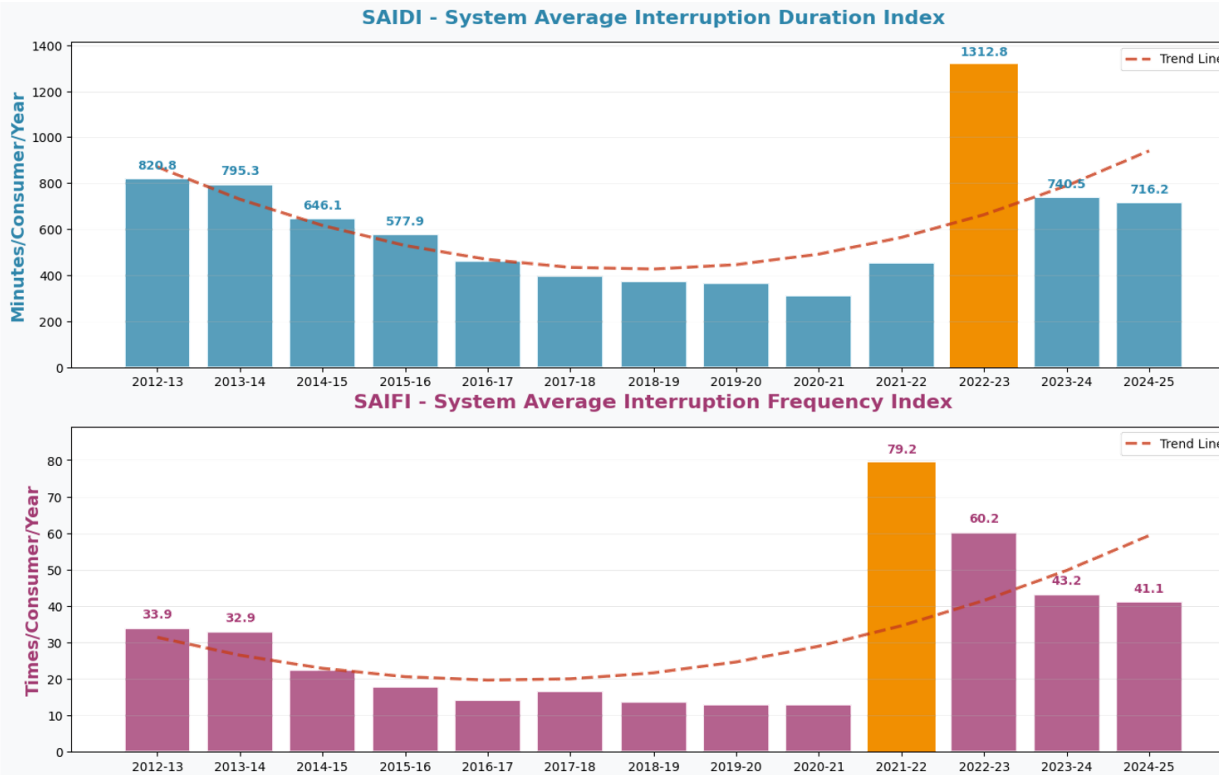
47. Reliability trends in the DESCO service area are captured through SAIDI and SAIFI[24] indices, measuring respectively the average duration and frequency of outages per consumer per year. DESCO's performance data available to the PLR mission in May 2026 showed a broadly improving trend across both indicators over the project period and since. An important methodological note governs how this data should be read: prior to SCADA-based measurement, reliability indices were calculated manually, which may have undercounted faults not formally logged. When automated SCADA measurement was introduced from 2022 onwards, the recorded indices appeared to increase before resuming a declining trend, reflecting improved measurement accuracy rather than necessarily indicating a deterioration in actual service quality.

24 SAIDI (System Average Interruption Duration Index) measures the average total duration of outages experienced per consumer per year, expressed in hours or minutes. SAIFI (System Average Interruption Frequency Index) measures the average number of outage events experienced per consumer per year.o

The installation of 85 km of underground cable across 28 routes contributed to this trajectory by replacing overhead infrastructure exposed to weather-related faults, particularly during the monsoon season, with underground cable that eliminates that exposure. Attribution is partial, as DESCO appropriately acknowledged that other concurrent investments also contributed, and that qualification is maintained here.

48. System loss performance provides a tangible and independently observable indicator of the component's contribution to distribution efficiency. DESCO's system losses declined from 8.37 percent before the project to 6.33 percent at project completion in 2020/2021 and stand at approximately 5.5 percent at the time of this evaluation, the lowest system loss of any distribution utility in Bangladesh as confirmed in DESCO's operational records. This system-wide movement reflects reductions in both technical and commercial (non-technical) losses, achieved through several measures implemented in parallel, of which the Component 2 works are one; the full reduction should therefore not be attributed to the AIIB-financed investment alone. The Component 2 works act principally on technical losses. The technical mechanism is well established: replacing high-resistance overhead infrastructure with lower-loss underground cable across a heavily loaded urban network reduces technical losses measurably. DESCO acknowledged partial attribution of this improvement to the AIIB-financed investment alongside other concurrent network improvements, and that qualification is also maintained here. DESCO's operational assessment indicates that the 5.5 percent figure approaches the technical floor for a system of this type and geography, and that further significant reductions would require additional major capital investment.

Figure 6: Trends in SAIDI and SAIFI (Reliability indicators) 2012-13 to 2024-25



Source: DESCO, Dhaka, Bangladesh.

Box: Field Observation on Productive Use and Service Experience in Gazipur

Source: AIIB.

During the PLR mission in May 2026, the evaluation team conducted structured field observations at selected sites within the Gazipur PBS service area, one of the 77 PBS cooperatives across which AIIB-financed connections were delivered under Component 1. Sites included a tea shop, bakery, multi-family residential unit, and a poultry farm. The purpose was to validate and contextualize BREB PCR's socioeconomic narrative at the level of individual consumers, not to generate a representative sample.

Across the limited sites visited, a consistent account emerged: electricity access was experienced as a meaningful improvement in service quality and reliability relative to the pre-connection period, and in several cases appeared to enable behavioral changes reflecting greater confidence in supply continuity. These observations come from a small, purposively selected sample and are not statistically representative; they are offered as illustrative anecdotes consistent with the broader outcome narrative. The six-family residential unit reported sufficient reliability to adopt induction stoves, a behaviorally significant shift given that households typically invest in electricity-dependent appliances only when supply is perceived as dependable. The poultry farm also expanded its operations on the basis of reliable power access, citing temperature-controlled environments as the enabling factor. The tea shop and bakery reported improved service quality since the project period, with electricity supporting extended trading hours and refrigeration capacity. The combined electricity bill for the six-family unit was approximately USD30 per month, a level all consumers visited considered reasonable.

Consumers described outages of variable frequency that in some cases constrained customer-facing activity. Project documentation and operational data indicate that these outages are attributable to generation-side constraints upstream of the distribution network, a system-level condition that the project was not designed to address. This distinction is important for interpreting effectiveness: the project delivered and has maintained functional distribution infrastructure, while the service quality limitations reported by consumers originate above the level of what it financed. These observations are illustrative and site-specific and are presented to provide a ground-level reference point for the outcome narrative and to show how field observations can usefully complement a monitoring record focused on output-level data.

49. One outcome that extends beyond the immediate physical works is the role of the AIIB-financed infrastructure as a foundation for subsequent network modernization. The underground cable network and upgraded substation configuration have created the technical base on which DESCO is progressively layering distribution automation, and this digitalization is in turn strengthening the network's readiness for smart-grid investment. This sequencing reflects sound utility planning practice: physical reinforcement of the network followed by digitalization of infrastructure capable of supporting it. The underground cabling model has also become the default design approach for new distribution works in Dhaka, with the 28-route conversion representing the largest underground distribution project completed in Bangladesh to date. These downstream developments were not planned outputs of the project, but they are observable and concrete and reflect institutional confidence in the technical model that the AIIB-financed investment helped establish.

Environmental, Social, and Gender Dimensions

50. Environmental and social (E&S) performance was satisfactory across both components throughout implementation. No fatalities or serious injuries were recorded under either component, a meaningful result given the geographic scale of Component 1's field operations across 77 PBS areas and the civil works intensity of Component 2's open-cut trenching across 28 road routes in a dense urban setting. Environmental monitoring reports for the DESCO component confirm that measured air quality and noise parameters remained within national standards set by the Department of Environment across the monitoring period. Both components maintained functioning Grievance Redress Mechanisms (GRMs) appropriate to their operational contexts, and both closed with no unresolved grievances. As discussed under "Environmental and Social Safeguards," the qualitative functioning of these mechanisms could not be independently verified because construction-phase grievance records were not made available during the PLR mission. The project's Category B classification and the absence of land acquisition, involuntary resettlement, or material environmental incidents across the implementation period indicate that E&S risks were appropriately managed.

51. The project design identified positive welfare outcomes for women from rural electrification under Component 1. These welfare outcomes included reductions in indoor air pollution from kerosene displacement, reduced time on manual household tasks, and expanded opportunity for cottage industry activity. These outcomes are plausible and directionally consistent with the international literature on gender-differentiated impacts of rural electrification. Gender-disaggregated data was not collected at PBS or connection level, which means these outcomes cannot be verified from the project record. This is a results framework design gap: the absence of gender-disaggregated monitoring limits what can be concluded about distributional effects within households and points to an opportunity for stronger monitoring design in future operations of similar scale and reach.

52. The DESCO PCR projected annual carbon emission reductions of approximately 16,400 tons of carbon dioxide equivalent per year, derived from an estimated 21.9 million kWh in annual energy savings from reduced technical losses under Component 2.

The directional logic of this projection is credible given the scale of loss reduction delivered through the underground cable works. No emissions baseline was established at project preparation, however, and no reduction has been formally measured against a baseline. This figure is therefore presented as an indicative projection grounded in the projected energy savings, not as a verified outcome. The same qualification applies to emissions reduction claims associated with kerosene displacement under Component 1. These observations point to the value of stronger results framework design in future operations where climate co-benefits are expected to be demonstrated.

53. Overall, the PLR rates the project's effectiveness as "Effective." The rating rests on a complete physical delivery record. All four RMF output targets were met in full, and field verification during the PLR mission confirmed that Component 1 installations remain in sound physical and operating condition at the selected sites visited within the Gazipur PBS. Component 2 delivered a qualitative improvement in network resilience beyond the headline MVA addition, with multiple distribution areas moving to dual-source supply. Two qualifications temper the rating. First, the RMF tracked physical outputs only, so outcome-level findings rest on proxy data, external comparators and field observation rather than on the project's own monitored record. Second, Component 2 was delivered two years behind the original schedule, deferring reliability benefits to consumers in northern Dhaka over that period. Neither qualification displaces the central finding that the project achieved its stated development objective.

EFFICIENCY

54. The efficiency assessment examines four dimensions across both components: procurement performance and cost out-turn, implementation timeliness, disbursement performance, and economic returns. The two components followed different efficiency trajectories, and the assessment considers both together. A methodological note on the economic analysis warrants upfront transparency: the Project Document records appraisal EIRRs of 64.1 percent for Component 1 and 18.5 percent for Component 2, reflecting the analysis conducted at Board approval. The BREB and DESCO project completion reports present different appraisal figures of 17.90 percent and 17.65 percent respectively, derived using the same methodology applied to their completion estimates. To ensure a consistent basis for comparison between appraisal and completion performance, this assessment uses the executing agency completion report figures throughout, while acknowledging that the Project Document figures reflect a different calculation approach and are not directly comparable.

55. Total project expenditure at completion was USD206.67 million against an appraisal estimate of USD262.29 million, a reduction of approximately USD55.62 million or 21 percent, as recorded in the AIIB PCN. Loan cancellations of USD20.88 million reflected procurement savings across both components: USD13.27 million in Component 1 and USD7.61 million in Component 2, confirmed in the AIIB PCN and the PIMR series. The remaining variance of approximately USD34.74 million between the appraisal estimate and actual expenditure arose on the counterpart-financed portion, principally a 46.8 percent underrun in Government of Bangladesh-funded expenditure under Component 1 following lower customs-duty and value-added tax obligations than the fully-imported basis assumed at appraisal (see paragraph 56). The

USD55.62 million total variance is therefore fully accounted for: USD20.88 million in cancelled loan proceeds and approximately USD34.74 million in counterpart savings. All four RMF output targets were met in full. The savings therefore reflect procurement efficiency and favorable market conditions rather than any reduction in physical scope. The final disbursement ratio against the net committed amount was 100 percent, confirming full utilization of the retained loan envelope. The savings, including the approximately USD13.27 million realized under the strongly performing and early-completing Component 1, were cancelled at the borrower's request at project close rather than reallocated through a project restructuring to expand scope. No restructuring was processed during implementation. For future operations, the proactive reallocation of savings from over-performing components, where additional development impact is available within the project period and the executing agency has absorptive capacity, can be considered as a means of maximizing the value of an operation, balanced against the time and transaction costs of a restructuring.

Component 1: Rural Electrification (BREB)

56. BREB structured Component 1 procurement into four standardized goods categories, tendering each as a separate lot under International Open Competitive Tender. This approach attracted strong international competition and generated procurement savings of approximately USD13.27 million against appraisal estimates, as documented in the BREB PCR. Equipment transportation to all 77 PBS warehouses was managed through 20 separate carrying contracts, separating logistics from supply and enabling parallel delivery across the national network. The installation of 2.5 million connections and 65,000 transformers across 77 PBS areas was completed by June 2018, approximately 18 months before the original project closing date of December 2019. The AIIB-financed portion was delivered at USD85.37 million against a loan allocation of USD98.39 million, generating savings of USD13.27 million as confirmed in the BREB completion report and the AIIB PCN. Combined Government of Bangladesh and AIIB expenditure at completion totaled approximately BDT94,306 lakh, equivalent to approximately USD120.3 million at the appraisal exchange rate, against the appraisal total estimate of USD157.75 million for all funding sources, representing an overall underrun of approximately 24 percent. This reflected competitive procurement savings on the AIIB-financed portion and a 46.8 percent underrun in the government of Bangladesh-funded components, largely attributable to lower customs-duty and VAT obligations (Bangladesh applies a standard VAT rate of 15 percent, together with customs duties on imported equipment) once a larger share of equipment was sourced locally than the fully-imported basis assumed at appraisal. This pace and scale of delivery reflected the operational strength of the decentralized PBS model and the technically straightforward nature of the works.

57. The economic return on Component 1 improved substantially between appraisal and completion. The EIRR at appraisal, as reported in the BREB completion report, was 17.90 percent. At completion, the BREB completion report estimates the EIRR at 31.40 percent, well above the 12 percent economic opportunity cost of capital threshold. The primary driver of this improvement was the acceleration of benefits: early delivery meant that approximately 2.5 million households gained electricity access 18 months ahead of schedule, advancing the income, energy

substitution, and productive use benefits that underpin the economic case. Cost savings below appraisal estimates further strengthened the return. Taken together, lower-than-anticipated investment costs and the earlier realization of benefits from accelerated implementation provide strong evidence of value for money and effective execution under Component 1. These figures carry the methodology qualification noted in the opening paragraph. A post-completion recalculation using independently verified consumption and welfare data was not conducted, which limits the precision with which the economic return can be independently confirmed.

Component 2: Urban Distribution (DESCO)

58. Component 2 faced a more complex implementation environment than anticipated at appraisal. As detailed under "Implementation," underground cable installation required independent approvals from at least five authorities, and a road-cutting moratorium imposed by the Dhaka North City Corporation during the period surrounding Bangladesh's December 2018 general election was the documented primary cause of delay. COVID-19 disruptions added a secondary constraint from early 2020. By end-of-2018, only 8 km of underground cable had been installed, as recorded in PIMR 8. The full 85 km target was achieved by the third quarter of 2021, approximately two years beyond the original schedule.

59. Despite the delay, Component 2 was delivered without cost overrun and without reduction in physical scope. The AIIB loan disbursement for Component 2 was USD58.50 million, following the cancellation of USD7.61 million from the original allocation of USD66.11 million. Total Component 2 expenditure across all funding sources was below the appraisal base cost estimate of USD98.31 million, with savings attributed to competitive procurement and scope optimization as documented in the DESCO PCR. The DESCO completion report estimates the EIRR at completion at 18.87 percent against an appraisal figure of 17.65 percent, both substantially above the 12 percent threshold. The implementation delay would ordinarily be expected to reduce the economic return relative to appraisal by deferring the realization of reliability benefits. The completion EIRR nonetheless exceeds the appraisal figure reflecting the combined effect of cost savings below appraisal estimates and the scale of network capacity and resilience improvements delivered. These figures carry the same methodology qualification noted at the outset.

Financial Management

60. Financial management was broadly satisfactory across both components throughout implementation. Both Project Management Units (PMUs) submitted financial management reports on schedule, and AIIB-financed expenditures were found acceptable in successive reviews, as documented across PIMR 7 through PIMR 12. Two recurring gaps in the fiduciary record are noted. First, audited financial statements were consistently submitted late. The single Component 1 report covering the implementation period arrived eleven months after the due date, and the four Component 2 reports were submitted between six and eleven months late, averaging approximately eight months. The pattern is attributable in part to the capacity of the Foreign-Aided Project Audit Directorate (FAPAD) and was flagged consistently in the PIMR series; earlier

and more structured coordination with FAPAD would have mitigated it. The PLR does not assign a separate rating to financial management, which is assessed here as one element of efficiency and of work quality. Second, auditors identified non-compliance with national VAT regulations in contractor payment deductions under both components, noted in the BREB and DESCO audit records. This concerned the executing agencies' withholding of VAT on domestic contractor payments under national tax rules, not the use of AIIB loan proceeds. Both issues were assessed by the external auditors, and confirmed in AIIB's fiduciary review, as not material to AIIB-financed expenditures, and audit opinions remained unqualified throughout.

61. Overall, the PLR rates the Project's efficiency as "Efficient." Component 1 delivered strong procurement and schedule performance, completing all targets 18 months early and approximately USD49.6 million below total appraisal cost, with an economic return at completion substantially above the appraisal estimate as recorded in the BREB completion report. Component 2 delivered the full physical scope under budget despite a two-year delay caused primarily by Dhaka's multi-authority permitting environment, and its economic return at completion likewise exceeded the appraisal estimate as recorded in the DESCO completion report. The Efficient rating reflects the strong overall value for money delivered by both components, while recognizing that the material implementation delay in Component 2 deferred reliability benefits to urban consumers in northern Dhaka for approximately two years beyond the original schedule. Taken together, the two components present a project that delivered strong value for money, with useful operational lessons for the preparation of future urban infrastructure operations involving complex permitting environments.

SUSTAINABILITY

62. Sustainability is assessed across three dimensions: physical asset condition and institutional capacity for asset management, financial performance of the assets created, and environmental durability. Physical asset condition and institutional capacity for asset management are assessed together for each executing agency, as asset condition and maintenance capacity are closely linked in this project context. The assessment draws on the AIIB PCN, the BREB and DESCO PCRs, DESCO's annual operational data, Bureau Veritas certification records, and the PLR mission in May 2026. The assessment is bound by the scope of what the project financed and what can be demonstrated about the capacity of the responsible institutions to sustain those specific assets and their benefits.

Physical asset condition and Institutional Capacity

63. BREB's institutional foundation for managing Component 1 assets is well established and documented. BREB obtained ISO 9001 quality management certification in 2013 following a reform action plan that strengthened management structures and delegated greater operational authority to PBS cooperatives, as recorded in the AIIB Environmental and Social Review prepared at appraisal.[25] An Additional Chief Engineer-level function oversees operations,

25 *Environmental and Social Review* (April, 2016), para. 5, bit.ly/4i8nWQ7

maintenance, and distribution across the PBS network, as confirmed during the PLR mission. The 65,000 low-voltage transformers installed under the project are standard equipment within the PBS network's established operation and maintenance routines. No independent technical condition assessment of the AIIB-financed transformer stock has been conducted. BREB officials reported during the PLR mission that units installed in 2017 and 2018 are performing at or beyond their 10-year procurement specification; this claim rests on the implementing agency's own operational assessment and cannot be independently verified by this evaluation. The assessment is noted as directionally plausible given the absence of reported failures at scale, but the transformer stock is now approaching the end of its specified design life and warrants a formal condition survey in the near term. The cooperative PBS model reinforces these formal arrangements: PBS members are co-owners with a direct community-level stake in asset condition and network performance, creating local incentives for maintenance and service continuity. BREB has also deployed approximately 700,000 smart prepaid meters across pilot PBS areas, covering around 20 percent of consumers, with rollout timed to coincide with end-of-life replacement of conventional meters. This reflects an active modernization trajectory within the same institutional framework that delivered the AIIB-financed connections.

64. DESCO's institutional capacity for managing Component 2 assets rests on certified management systems and dedicated operational structures. DESCO holds ISO 9001:2015 and ISO 45001:2018 certifications issued by Bureau Veritas in February 2024, covering operations and maintenance across substations, switching stations, distribution networks, and testing and repair facilities across all project-area units.[26] Similar to BREB, a Chief Engineer-level structure leads underground cable and substation operations, supported by a dedicated division for monitoring cable-related incidents. During implementation, DESCO engineers developed direct hands-on capability in gas-insulated switchgear operation, 33 kV underground cable installation, high-voltage testing, and fault location, expanding in-house technical capacity in areas that were new at project entry. This skills transfer strengthens DESCO's ability to maintain the more technically demanding assets created by the project. DESCO is progressively layering distribution automation and SCADA capability onto the project-financed underground cable and substation infrastructure, with SCADA-based measurement fully operational from 2022. This sequencing, physical reinforcement followed by digitalization, reflects sound utility planning practice and indicates that the project-financed assets are serving as the technical foundation for continued network modernization rather than standing as a static endpoint.

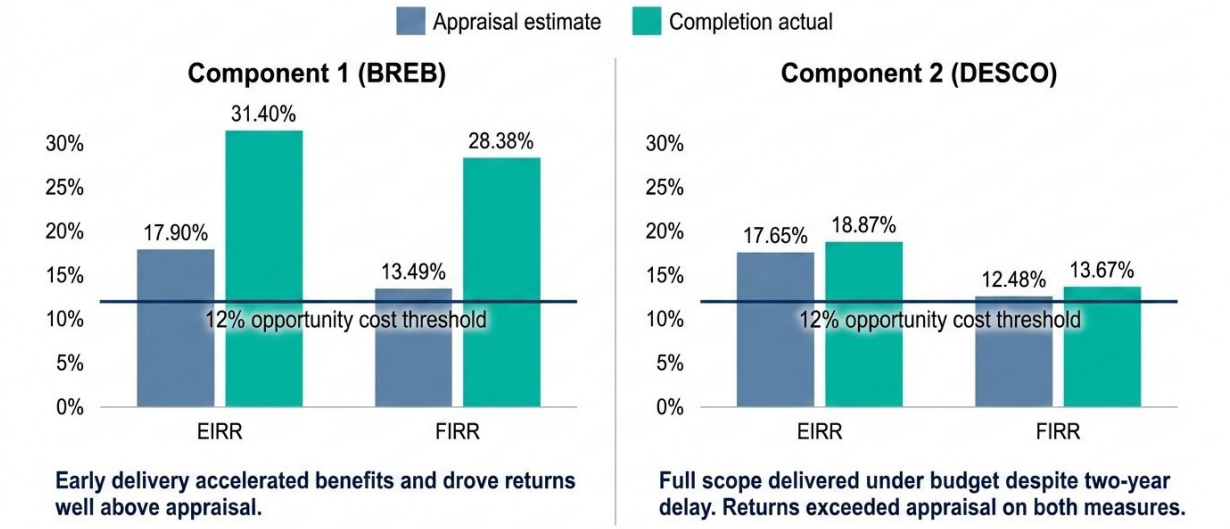
Financial Performance

65. The financial performance of Component 1 assets is supported by strong and stable revenue indicators. Bill collection rates across the PBS network have consistently exceeded 99 percent, as documented in the BREB completion report and corroborated by the PLR mission observations at the Gazipur PBS. The BREB reported that there were no voluntary disconnections, indicating a sustained consumer uptake and willingness to pay for the connections installed.

26 Bureau Veritas. 2024. ISO 9001:2015 and ISO 45001:2018 Certification, Dhaka Electric Supply Company Limited. Certificate No. IND.24.2540/IM/U, issued 28 February 2024.

The AIIB PCN confirms that all 2.5 million connections remain active across all 77 PBS areas and the mission confirmed a sample through beneficiaries visited. The BREB completion report records a post-completion Financial Internal Rate of Return (FIRR) of 28.38 percent against an appraisal estimate of 13.49 percent, both above the weighted average cost of capital threshold and confirming financial viability, with the completion figure substantially exceeding the appraisal estimate.[27]

66. Component 2's financial sustainability is supported by a measurable improvement in network efficiency. DESCO's system losses declined from 8.37 percent at project appraisal to approximately 5.5 percent at the time of this evaluation, as recorded in DESCO's annual operational data. In practical terms, a greater share of every unit of electricity purchased now reaches paying consumers rather than being lost within the distribution network, directly strengthening the revenue position of the upgraded system. The DESCO completion report records a post-completion FIRR of 13.67 percent against an appraisal figure of 12.48 percent, reflecting the combined effect of cost savings and the scale of capacity and efficiency improvements delivered, subject to the methodology qualification discussed under "Efficiency." Beyond high collection rates and improved network efficiency, the longer-term financial sustainability of the assets depends on the overall financial viability of the responsible utilities, including the extent to which distribution tariffs remain cost-reflective. Tariff-setting in Bangladesh rests with the Bangladesh Energy Regulatory Commission (BERC), and adequate maintenance and timely renewal of the project-financed equipment will ultimately depend on revenue generated by rate-payers and any associated public support being sufficient to cover efficient operating and capital-renewal costs. No tariff-adequacy or cost-recovery concern was evident at the time of this evaluation; the cost-recovery and tariff framework is identified here as a factor to monitor rather than a current threat to the assets.



Source: BREB and DESCO completion reports.

27 These figures should be read alongside the methodology qualification noted in the "Efficiency" section, given differences between appraisal figures in the Project Document and those used in the completion reports. DESCO Project Completion Report, 2021: Installation, Up-gradation, and Conversion of Existing 33 KV. Overhead Lines into Underground Cables in DESCO Area. Post-completion FIRR of 13.67 percent against an appraisal estimate of 12.48 percent, as recorded in the DESCO completion report financial annexures.

67. The most significant forward-looking sustainability risk lies at the sector level, rather than within the project-financed assets themselves. DESCO's installed distribution capacity at the 33 kV level stands at approximately 2,920 MVA in transformer-rated capacity, relative to maximum recorded demand of 1,520 MW, as recorded in DESCO documentation available to this evaluation. Transformer capacity is rated in MVA and demand measured in MW; at the power factors typical of urban distribution networks, 2,920 MVA corresponds to roughly 2,600 to 2,770 MW of deliverable real power, so substantial headroom exists on either measure. This demand level is approximately 440 MW below the 1,964 MW projection for 2021 used in the Project Document's appraisal analysis. DESCO confirmed during the PLR mission that generation availability, rather than distribution capacity, is currently the binding constraint on demand in its service area, particularly during peak summer months. The shortfall relative to appraisal projections therefore reflects upstream supply constraints rather than weak consumer growth or underperformance of the distribution assets. This distinction is important for interpreting the economic return. The appraisal EIRR was based on a demand trajectory that has not yet been fully realized in measured terms, not because the distribution infrastructure is underperforming, but because the power available to flow through it has been constrained. The economic benefits modeled at appraisal are therefore expected to materialize progressively as upstream supply improves. This qualification does not alter the Efficiency rating, which is supported by cost performance, procurement savings, full physical completion, and the completion EIRRs reported by both executing agencies. It does mean, however, that part of the economic return assumed at appraisal remains prospective rather than fully confirmed at evaluation. The infrastructure operates without stress and retains sufficient headroom to absorb the load growth projected at appraisal once generation supply permits.

Environmental Durability

68. The environmental sustainability of Component 1 rests on the scale and durability of the fuel substitution enabled by the connections delivered. The replacement of kerosene for household lighting and diesel for irrigation and small enterprise use across 2.5 million newly connected households is expected to reduce annual carbon emissions and indoor air pollution at scale, as projected in the BREB completion report. As noted under "Effectiveness," no emissions baseline was established at project preparation, and the associated reduction figures have not been verified against a measured baseline; they are presented as indicative projections consistent with the technical logic of the intervention. The project's Category B classification and the absence of land acquisition, involuntary resettlement, or adverse environmental incidents across the full implementation period, documented in the AIIB PCN, indicate that no material environmental liabilities were created that would threaten sustained asset use. The E&S compliance record, including the absence of fatalities or serious injuries under either component, is also assessed in the same subsection.

69. The environmental durability of Component 2 is strengthened by the inherent characteristics of the infrastructure installed. Underground cable is less susceptible to fault damage from cyclones and flooding than the overhead lines it replaced, reduces safety hazards from live overhead conductors in a densely populated urban environment, and requires less emergency intervention following extreme weather events. These characteristics are increasingly relevant as Bangladesh's exposure to climate-related events intensifies. Framed in climate terms, these underground cable investments function as climate-adaptation and resilience measures: by reducing exposure to weather-related disruption, they enhance the robustness of urban electricity infrastructure and align the operation with AIIB's climate priorities.

70. Overall, the PLR rates the project's sustainability as "Likely Sustainable." This rating is due to the strong institutional capacity and solid operational performance across both components. BREB and DESCO demonstrate robust technical and managerial capability, supported by internationally recognized certifications and strengthened in-house expertise developed during implementation. Operational indicators remain strong at the time of the evaluation, with consistently high bill collection rates, low system losses, and all connections remaining active, supporting the financial viability of the investments. Technical design features, including durable transformer performance and resilient underground infrastructure, further enhance long-term reliability and reduce maintenance needs. Financial returns at completion exceeded appraisal estimates in both components, reinforcing sustainability. One utilization qualification applies: generation availability, rather than distribution capacity, is currently the binding constraint on demand in DESCO's service area, so the upgraded assets are not yet used to the level assumed at appraisal, although they retain sufficient headroom to absorb projected load growth as upstream supply improves. Environmental benefits are positive, with reduced reliance on fossil fuels in rural areas and improved resilience to climate-related risks in urban networks.

Work Quality Assessment

AIIB WORK QUALITY

71. AIIB Work Quality is assessed across three dimensions: quality at entry, supervision and adaptive management, and environmental and social oversight. This was AIIB's third-ever approved project, its first standalone energy sector operation, and its first sovereign project in Bangladesh, approved in June 2016 when the Bank's operational systems and supervision frameworks were still being established. A further distinguishing feature is that AIIB retained direct supervision responsibility throughout, without delegating oversight to a co-financier, making it a meaningful early test of the Bank's own oversight capacity. The assessment recognizes this institutional context while remaining grounded in what the project record documents.

Quality at Entry

72. The project preparation process produced a coherent and analytically sound investment. The sector diagnosis was well grounded: the structural gap between Bangladesh's rapidly expanded generation base and its lagging distribution network was clearly documented, and the case for a dual-component intervention addressing both rural last-mile connectivity and urban grid modernization was well articulated and appropriate. The assignment of BREB and DESCO as executing agencies was well calibrated to their respective institutional mandates and track records. The financial and economic analysis at appraisal established a positive investment viability case. The Project Document records EIRRs of 64.1 percent for Component 1 and 18.5 percent for Component 2. As noted in the "Efficiency" section, the executing agencies' completion reports recalculate the same appraisal-year figures at 17.90 percent and 17.65 percent respectively, reflecting different modelling assumptions. Both sets of appraisal figures were above the 12 percent threshold. The large gap for Component 1 (64.1 percent in the Project Document versus 17.90 percent in the completion report) most plausibly reflects a different economic model at appraisal, in which the Project Document valued the full stream of consumer and productive-use benefits from 2.5 million new connections against a low incremental connection cost, while the completion report applied the more conservative benefit assumptions and standard methodology used for the completion estimate. The underlying appraisal workings were not available to this evaluation, so the difference cannot be reconciled line by line; this evaluation therefore relies on the completion-report figures throughout to keep appraisal and completion on a consistent basis. Loan effectiveness was reached within eight months of Board approval, a creditable result given the complexity of establishing subsidiary loan agreements with two executing agencies through the Government of Bangladesh's ERD.

73. The design of the RMF provides a useful learning point at entry and it is treated as an early-stage gap for a newly established MDB establishing its systems. The RMF tracked four physical output indicators and did not include intermediate outcome indicators, for example system reliability, household welfare, productive use of electricity, or gender-differentiated access. The headline projected benefit of approximately 12.5 million rural people gaining electricity access was recorded in the Project Document but was not incorporated as a monitored indicator. PIMR 12 corrected the indicator value from 12.5 million to 2.5 million without documented explanation of the original discrepancy, and the PCN subsequently re-labelled the indicator as service

connections installed. The absence of a requirement to re-estimate the EIRR at completion using actual monitoring data means that the economic returns projected at appraisal cannot be verified from the project's own monitored record. This is a design-stage observation consistent with the Bank's early portfolio context. AIIB's approach to project design, results frameworks and results monitoring has continued to develop since 2016, and the observation is recorded to reinforce that trajectory rather than to apply present-day standards retrospectively.

74. The identification and management of permitting risk for Component 2 at preparation was a quality-at-entry gap. The EIA prepared in 2016 identified road restoration and coordination with multiple utility service departments as key stakeholder concerns, and the Project Document acknowledged road-cutting in Dhaka's urban environment as a risk requiring forward-looking management. However, neither the Project Document nor the subsidiary loan agreement with DESCO included a condition requiring pre-negotiated framework agreements with the Dhaka North City Corporation (DNCC) before construction mobilization. The road-cutting moratorium imposed by the DNCC during Bangladesh's December 2018 general election, confirmed as the primary cause of delay in the DESCO completion report and the IMED inspection report, illustrates that the identified permitting risk was not sufficiently translated into readiness measures before mobilization. The DESCO completion report notes that ADB now requires in-principle approval from relevant city authorities before a project proceeds to loan committee, a practice that provides a useful reference point for future urban infrastructure operations.

Supervision and Adaptive Management

75. AIIB maintained a visible field presence and supervisory engagement across the project cycle. The BREB completion report documents AIIB field visits to project locations including Mymensingh, Dhaka, Narsinghdi, and Sylhet from December 2016 through April 2018, covering the period of Component 1 implementation. The formal PIMR series records further field visits in September 2018, March 2019, August 2019, and December 2019, with virtual portfolio review sessions in December 2020 and September 2021 during the COVID-19 period when in-person missions were constrained. Both executing agencies independently confirmed during the PLR mission that AIIB's engagement was responsive and accessible throughout implementation, citing prompt responses to technical queries and fast concurrence on tender documents, feedback also reflected in the AIIB PCN client feedback annex. When implementation challenges emerged, AIIB's adaptive management was timely: two loan closing date extensions were processed to accommodate DNCC permitting delays and COVID-19 disruptions, helping maintain implementation continuity through a difficult period. The supervision record reflects consistent engagement that the executing agencies assessed positively and that supported delivery of a technically complex dual-component operation to completion.

Environmental and Social Oversight

76. AIIB's E&S oversight is assessed as satisfactory and well documented. The project was correctly classified as Category B, and appropriate instruments were prepared at appraisal and applied throughout implementation: an Environmental and Social Review for Component 1 and

an Initial Environmental Examination with a site-specific Environmental and Social Management Plan for Component 2. The lighter Environmental and Social Review suited Component 1's low-impact profile, which involved no civil works, land acquisition, or resettlement; Component 2's open-cut urban trenching warranted the fuller Initial Environmental Examination and site-specific management plan. EGIS was engaged as an independent environmental and social monitoring consultant for the DESCO component, producing periodic monitoring reports covering air quality, noise, water quality, and occupational health and safety throughout the construction period. E&S compliance was rated as complied in all PIMRs from PIMR 7 through PIMR 12. As documented under "Effectiveness," no fatalities or serious injuries were recorded under either component, and both Grievance Redress Mechanisms (GRMs) closed with no unresolved cases.

Fiduciary and Operational Oversight

77. Fiduciary oversight was broadly satisfactory, with several process-level observations relevant for future operations. Audit submission delays of between six and eleven months were identified and flagged in the PIMR series, and non-compliance with national VAT regulations in contractor payment deductions was identified during supervision. Both were assessed as not material to AIIB-financed expenditures, and audit opinions remained unqualified throughout.

78. Overall, the PLR rates AIIB Work Quality as "Satisfactory." This reflects solid supervision and responsiveness during implementation, alongside some design and readiness gaps at entry. While the results framework captured output-level indicators, it lacked intermediate and outcome measures, limiting the ability to track development results such as reliability improvements and beneficiary impacts. Similarly, although permitting risks were identified at appraisal, these were not adequately translated into readiness measures, contributing to delays in the urban component. During implementation, however, AIIB maintained active supervisory engagement and responded flexibly to emerging issues, including processing extensions and providing timely technical support. Environmental and social oversight was consistently sound, with full compliance reported, no major incidents, and effective grievance resolution. Minor fiduciary issues, such as audit delays and VAT compliance, were identified and managed without affecting the integrity of project financing.

CLIENT WORK QUALITY

79. Client Work Quality is assessed separately for each executing agency across four dimensions: Project management and delivery, procurement performance, financial management, and environmental and social compliance.

Component 1: BREB

80. BREB's project management performance on Component 1 was a strong feature of the overall project record. The installation of 2.5 million service connections and 65,000 low-voltage transformers across 77 PBS areas was completed by June 2018, approximately 18 months ahead Bof the original closing date of December 2019. The core installation period was approximately

nine months, with the remaining time absorbed by procurement approval cycles. The PLR mission field verification at the Gazipur PBS confirmed that installations were completed to specification and remain in sound operating condition, providing post-completion corroboration of the BREB completion report's physical claims.

81. BREB's procurement approach was a particular strength. Equipment categories were tendered as four standardized lot groups under International Open Competitive Tender, attracting strong international competition and generating savings of approximately USD13.27 million against appraisal estimates. Local procurement accounted for approximately 40 percent of procurement value, reducing customs-duty and value-added tax obligations and contributing to a 46.80 percent underrun in Government of Bangladesh-funded components. Equipment transportation to all 77 PBS warehouses was managed through 20 separate carrying contracts, separating logistics from supply and enabling parallel delivery across the national network. No material procurement irregularities were identified across AIIB's fiduciary reviews.

82. Financial management was broadly satisfactory throughout Component 1 implementation. The audit for Component 1 was completed by January 2018 with no major findings, with three objections raised and reported as resolved. The audit report covering the full Component 1 implementation period was submitted eleven months past the Dec. 31, 2017 contractual deadline, a pattern attributable in part to the capacity constraints of the Foreign-Aided Project Audit Directorate. Auditors identified non-compliance with national VAT regulations in contractor payment deductions, assessed as not material to AIIB-financed expenditures, with audit opinions remaining unqualified throughout. One fiduciary and results-verification gap warrants note: the Project Document stipulated an independent technical audit of 2,500 connection records to verify physical completion. During the PLR mission, BREB confirmed that this independent technical verification was not conducted. Although the physical delivery of Component 1 is supported by the BREB completion report, AIIB records, and selective PLR field verification, the absence of the stipulated independent verification reduced the strength of the project's own completion evidence and should be treated as a documentation and verification gap for future high-volume connection programs.

83. E&S compliance under Component 1 was satisfactory throughout implementation. The E&S review's good-practice requirements for installation crews were implemented and maintained, and no fatalities or serious injuries were recorded across 2.5 million installation events. The ongoing consumer GRM, operated through PBS service centers, the national helpline 16899, and a web portal, closed with no unresolved grievances. One documentation gap is noted: when asked about the construction-phase GRM required under the loan agreement during the period of transformer and service-drop installation, BREB was unable to produce specific documentation. BREB's observation that Component 1 works involved low-impact service-drop installation at household level rather than civil earthworks is noted as context, but the loan condition required a formal mechanism, and its documentation should have been retained.

Component 2: DESCO

84. DESCO demonstrated strong technical and organizational capacity throughout Component 2. The procurement and installation of complex substation equipment, including gas-insulated switchgear and 80/120 MVA power transformers, and the installation of 85 km of 33 kV underground cable across 28 routes in a dense urban environment required coordinating civil contractors, electrical contractors, traffic management, and regulatory interfaces simultaneously. Both substations were upgraded to the combined 480 MVA target by December 2020, and the full underground cable scope was completed within the extended closing date of December 2021. During implementation, DESCO engineers developed direct hands-on capability in underground cable installation, high-voltage testing, jointing, horizontal directional drilling, and fault location, as reported by DESCO during the PLR mission. This represents a meaningful expansion of the utility's technical capacity in areas that were new at project entry.

85. The main weakness on DESCO's performance is the two-year delay in the underground cable component. The immediate cause was the road-cutting moratorium imposed by the Dhaka North City Corporation during the period surrounding Bangladesh's December 2018 general election. The permitting risk was foreseeable: the electoral calendar was known at project approval in 2016, and the DNCC's practice of restricting road-cutting during pre-election periods was an established feature of Dhaka's regulatory environment, as documented in the DESCO completion report and DESCO compliance response to the IMED inspection. DESCO did not, prior to construction mobilization, secure pre-negotiated framework agreements or advance permits with the relevant authorities that would have maintained construction continuity through the electoral period. This was a material planning gap and the main qualification on DESCO's otherwise strong technical delivery. Despite the delay, DESCO demonstrated the institutional capacity to recover ground and deliver the full scope within the extended timeline, with COVID-19 confirmed as a secondary and later factor.

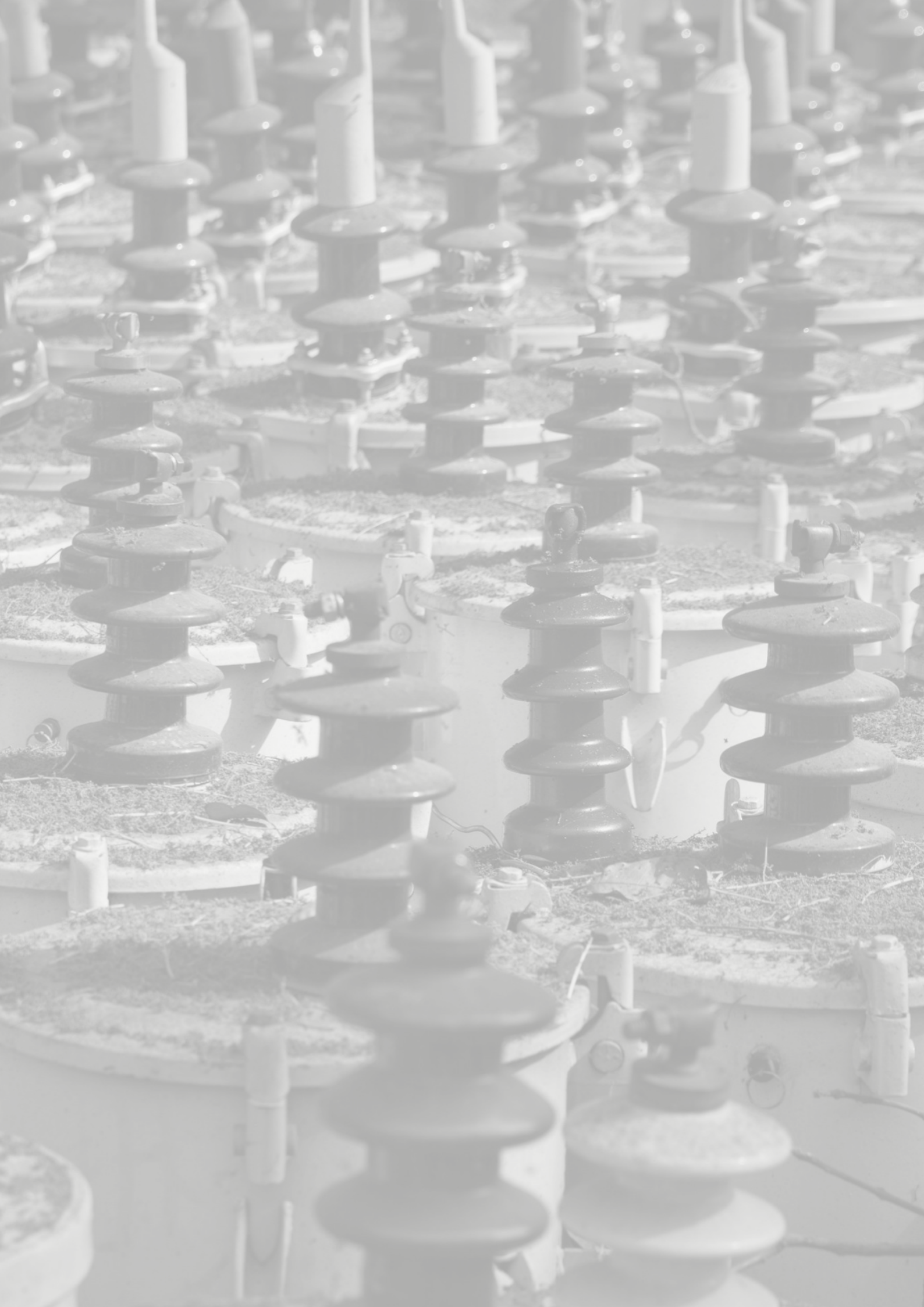
86. DESCO's procurement management was satisfactory throughout Component 2. The main contract for installation, upgrade, and conversion of 33 kV overhead lines into underground cables was tendered with bid invitation on Jan. 5, 2017, and contract signing on Dec. 10, 2017, as documented in the DESCO completion report. Competitive tendering and scope optimization resulted in loan cancellations of USD7.61 million from the AIIB allocation of USD66.11 million. Total Component 2 expenditure across all funding sources was below the appraisal base cost estimate of USD98.31 million. No material procurement irregularities were identified across AIIB's fiduciary reviews.

87. Financial management under Component 2 broadly mirrored the BREB pattern. Four audit reports were submitted between six and eleven months past deadline, averaging approximately eight months, and auditors identified the same VAT deduction non-compliance; both were assessed as not material to AIIB-financed expenditures, with audit opinions remaining unqualified throughout.

88. E&S compliance was satisfactory: EGIS was engaged as an independent monitoring consultant and produced periodic reports covering air quality, noise, water quality, and occupational health and safety throughout the construction period.[28] No fatalities or serious injuries occurred despite the intensity of open-cut trenching across 28 road routes. The construction-phase GRM for Component 2 was insufficiently documented: DESCO confirmed a system was in place but was unable to produce complaint records from the construction period during the PLR mission, a notable material gap given the visible community interface of urban road excavation works.

89. Overall, the PLR rates the Client Work Quality as "Satisfactory." The rating is assessed by strong implementation capacity alongside some planning and compliance shortcomings. BREB demonstrated efficient execution, delivering all planned connections and installations ahead of schedule, supported by sound procurement practices that generated cost savings without irregularities. DESCO also showed solid technical capability in delivering complex urban infrastructure and building in-house expertise in specialized areas. However, gaps in planning, particularly the failure to secure key urban permits in advance, contributed to significant delays in the urban component. While fiduciary management was generally adequate, with unqualified audit opinions throughout, delays in audit submissions and VAT compliance issues were noted, though not material. Additionally, incomplete technical audit evidence and limited GRM documentation point to areas for improvement in compliance and accountability.

28 EGIS Environmental Health Safety and Social Monitoring Report covering January to June 2020.



Conclusions

OVERALL ASSESSMENT

90. The Bangladesh Distribution System Upgrade and Expansion Project is rated Successful. Both components delivered their full appraised physical scope. Component 1 provided 2.5 million rural service connections and 65,000 low-voltage transformers across 77 PBS areas by June 2018, contributing materially to Bangladesh's national electrification drive during its most intensive phase. Component 2 upgraded combined substation capacity from 250 MVA to 480 MVA and installed 85 km of 33 kV underground cable across 28 routes in northern Dhaka, delivering a qualitative improvement in network reliability and resilience that continues to benefit an urbanizing service area of approximately 705,000 consumers at appraisal, a figure that has grown substantially since project completion. Total project expenditure at completion was USD206.67 million against an appraisal estimate of USD262.29 million, with savings reflecting procurement efficiency rather than scope reduction. BREB's delivery of 2.5 million connections and 65,000 transformers ahead of schedule and below budget stands out as a good-practice example of large-scale rural electrification, reflecting strong institutional capacity, a decentralized cooperative implementation model, and efficient competitive procurement.

91. The Successful rating reflects positive findings across Relevance, Effectiveness, and Sustainability, and Satisfactory ratings for both AIIB and Client Work Quality. Efficiency is rated Efficient, qualified by the two-year implementation delay in Component 2 caused primarily by Dhaka's multi-authority road-cutting permitting environment and, secondarily, by COVID-19 disruptions. That delay was material and had real consequences for northern Dhaka's consumers. It reflected a foreseeable preparation-stage and client planning gap rather than a failure to deliver the intended physical scope. A separate limitation, discussed in the effectiveness assessment, is that the results framework tracked outputs rather than pre-defined outcomes, which constrains the direct project-based evidence available on development results. On balance, the evidence supports the conclusion that the project achieved its core development objective and delivered strong value for money across the operation.

LESSONS

92. The PLR identifies five lessons with direct implications for the strategic framing, preparation, supervision, results measurement, and sustainability of future AIIB energy and urban infrastructure operations. The lessons address specific dimensions of project preparation, results design, and supervision where future practice can be strengthened. They are presented as forward-looking institutional learning and should be read alongside the "Successful" project rating, which reflects aggregate performance across the full project cycle. The lessons therefore do not alter the overall assessment; rather, they identify practical areas where the experience of this early operation can inform stronger preparation and implementation of comparable future projects. Each lesson also records the good practice that underpinned this performance—AIIB's direct supervision and sustained field presence, sound sector diagnosis and executing-agency selection, strong client procurement and technical delivery, and responsive adaptive management—so that what should be repeated and what should be strengthened are set out together rather than in separate sections.

93. Lesson 1: Development outcomes in the power sector depend on balance across the generation–transmission–distribution value chain. Between 2009 and 2015 Bangladesh's generation capacity roughly tripled, yet 13 million rural households within reach of the network remained unconnected and northern Dhaka's grid had reached its limits. By financing last-mile connections and urban distribution modernization, the project relieved the constraint that mattered most at the time and turned generation that was already available into electricity people could use. This worked because the diagnosis was grounded in documented engineering and economic analysis, and because each of the two problems received a solution matched to its scale—a low-cost connection program in rural areas and a capacity and reliability upgrade in Dhaka. It is a practice worth repeating wherever sector data allow the main constraint to be identified. The lesson is that the impact of power-sector investment depends on balance across the value chain. At appraisal, operations should be explicit about which part of the chain the investment is intended to unblock, and about what needs to hold elsewhere for the benefits to appear. This is a diagnostic step, not a requirement to address every constraint within a single operation. Where several constraints bind at once, they are better addressed in sequence across operations, in line with the Member's own sector planning.

94. Lesson 2: Institutional, regulatory, and procurement readiness before mobilization preserves the value of strong implementation capacity. The two components differed less in the capability of their agencies than in what each was asked to do. Component 1 was a supply-and-install program with settled designs, no land acquisition and no third-party approvals; once procurement cleared, 2.5 million connections and 65,000 transformers were installed across 77 PBS areas in about nine months. That speed came from standardized designs and aggregated procurement packages and shows how readiness converts capable agencies into rapid delivery. Component 2 had to be designed first, built in live city roads, and cleared by at least five Dhaka authorities. Although the 2016 EIA identified this requirement, it was not carried into a readiness measure, and a DNCC road-cutting moratorium during the 2018 election—an event known at approval—contributed to a two-year delay. The lesson is that identifying permitting risks is necessary but not sufficient, and that readiness extends beyond permits to designs and technical specifications, tender documents, contract packaging and contractor interest, land and access, coordination with other utilities, approvals, and the agency's own capacity. Readiness should be judged for each package of works, in proportion to the risks that package carries, and applied by authorizing work to start in stages. It is distinct from a condition on the loan itself and is not intended to hold back components that are otherwise ready: works such as those under Component 1 can proceed while works awaiting approvals are scheduled against their own timelines. Where a single operation combines components with substantially different requirements, preparation should weigh the benefits of combining them against the risk that they progress at different speeds.

95. Lesson 3: Results frameworks that focus primarily on outputs may provide limited evidence on the achievement of development outcomes. The project's results framework monitored four physical output indicators but did not include outcome-level indicators. The four indicators themselves were clear, straightforward to verify and reported consistently through the PIMR series, which gave supervision a dependable picture of physical delivery; that is a feature worth retaining. While the project was expected at appraisal to benefit approximately 12.5 million

people, monitoring ultimately focused on the achievement of about 2.5 million new electricity connections, and gender-disaggregated data were not systematically collected. As a result, the evidence available on broader outcomes, such as service reliability, welfare improvements, and productive use of electricity, remained limited. The project was approved in June 2016, when the Bank's results frameworks and monitoring practice were still being established, and AIIB's practice has developed considerably since. The lesson is that output indicators provide an important foundation for tracking implementation progress but are most effective when complemented by a small number of outcome indicators that capture intended development results. The choice of indicators should reflect the nature of the intervention: connection-based access investments are generally well suited to outcome-level measurement, while transmission and primary distribution investments are often better captured by network-performance measures—system losses, how often and how long supply is interrupted, and the load the network carries—which reflect efficiency and reliability rather than physical output counts. Where welfare benefits for women are expected, how they will be measured should be settled at the outset and kept proportionate, drawing on sample surveys or existing national data rather than collection at every connection; population statistics alone establish who was reached, not how the benefits were shared.

96. Lesson 4: Regular supervision and adaptive management are critical enablers of delivery in complex multi-component operations. AIIB supervised this project directly, without delegating to a co-financier, through multiple field visits from December 2016 onward, prompt technical and tender responses, and two closing-date extensions as conditions changed. Both agencies described AIIB's engagement as faster than other partners', and this sustained presence helped bring a demanding dual-component operation to full completion within budget. The model is worth repeating where the Bank has, or can resource, the in-house sector and country capability it requires. The lesson is that in complex, multi-agency operations, consistent field presence, responsive engagement, and timely adaptation are central to delivery. Supervision effort need not be spread evenly, however. It is most effective concentrated earlier and more intensively where approvals are complex, the technology is new, or many outside parties are involved—as in Component 2's urban environment—and applied more lightly where an agency is repeating a method it has used many times, as in Component 1. This project offers a useful reference for resourcing direct supervision.

97. Lesson 5: Sustained development outcomes depend on the broader system in which financed assets operate, not only on the quality of the assets themselves. The project financed infrastructure was generally well managed by capable institutions, with BREB maintaining collection rates above 99 percent and DESCO continuing to hold ISO certifications while reporting among the lowest system losses in the country. Both agencies had established operation and maintenance structures and revenue discipline before the project began, and DESCO's engineers built new in-house skills in cable and switchgear work during implementation; the cooperative PBS model adds a community-level stake in keeping the network running. Underground cable, selected for capacity and safety reasons, has also proved a durable choice in a country exposed to floods and cyclones. However, part of the economic benefits envisaged at appraisal remain dependent on external factors, as generation availability rather than distribution capacity has increasingly become a constraint to meeting demand, and parts of the transformer stock are approaching the

end of their expected service life without an independent condition assessment. The lesson is that the sustainability of development outcomes depends not only on the performance of financed assets but also on broader sector conditions, including adequacy of power supply, the policy and regulatory environment, particularly tariffs and cost recovery, and the ongoing financial and technical capacity of utilities to operate, maintain, and renew infrastructure. Future operations should identify these key dependencies during appraisal and monitor those most material to the achievement and sustainability of intended outcomes throughout implementation.

RECOMMENDATIONS

98. The PLR presents three recommendations to AIIB Management. They address the conditions on which sustained outcomes depend, project readiness, and results measurement—the areas where the evidence points to a specific gap requiring management action—while recognizing the project's Successful rating and the Satisfactory ratings for AIIB Work Quality and Client Work Quality. Practice that this operation demonstrated and that merits replication is recorded in the lessons above rather than restated as a recommendation.

99. Recommendation 1: AIIB should identify and monitor the conditions on which sustained outcomes depend in energy sector operations. For future energy sector operations, AIIB Management should identify during preparation and appraisal the conditions on which sustained outcomes depend. Where utilization or sustainability risks are material—such as upstream supply adequacy, utility financial health, cost recovery, or long-term asset maintenance—preparation should assess them explicitly, and the few most material to the intended outcomes should be monitored during implementation and reported at completion. Where these risks lie beyond the project's own boundary, AIIB should engage government counterparts and development partners to help address them rather than widen the scope of the operation. This would help safeguard the benefits of individual investments over time. The recommendation follows from the evidence in this evaluation: the distribution assets financed by the project perform as designed, but part of the economic return modeled at appraisal remains prospective because generation availability, not distribution capacity, is now the constraint on demand in DESCO's service area. The wider value-chain perspective that informs this recommendation is set out in Lesson 1; it is a diagnostic and sequencing lens applied to individual operations, not a prescription to resolve all sector constraints within a single project. Where the constraints identified are systemic and cut across multiple operations, they are more appropriately examined through thematic or sector-level evaluation than through the review of a single project.

100. Recommendation 2: AIIB should strengthen readiness assessments where delivery depends on permitting, complex procurement, design maturity, or stakeholder coordination. Both components showed that capable agencies deliver quickly once upstream constraints clear, but that preparation gaps absorb time. Readiness should be assessed as a package covering designs and technical specifications, tender documents, contract packaging and contractor interest, land and access, coordination with other utilities, approvals, and the executing agency's own capacity, and confirmed in a manner proportionate to the risks each works package carries. Where delivery depends on approvals from authorities outside the executing agency's control and

the timing of those approvals is uncertain—as for urban works spanning multiple authorities—in-principle approvals or framework agreements should be obtained before mobilization and reflected in covenants or dated action plans; for high-volume supply-and-install programs, readiness should confirm that designs and major-contract procurement are sufficiently advanced. Readiness of this kind is confirmed at the level of the individual works or contract and applied by authorizing work to start in stages; it is not a loan-effectiveness condition and is not intended to hold back components that are otherwise ready to proceed. Supervision intensity should follow the same logic, concentrating earlier and more intensively where readiness and permitting risks are highest, and should be revisited as those risks evolve. Where an operation bundles components run by different agencies with very different requirements, preparation should weigh the benefits of bundling against the risk of divergent implementation tracks and provide for sequencing or separate treatment.

101. Recommendation 3: AIIB should ensure that results frameworks for energy access and distribution operations include intermediate and outcome indicators monitored during implementation, alongside physical outputs. The indicators selected should be proportionate to the operation: connections made and how the electricity is used for investments that bring supply to new customers; system losses, interruption duration and frequency, and load served for investments that strengthen the network itself. Where gender-differentiated benefits are expected, how they will be measured should be specified from the outset and kept proportionate, drawing on sample surveys or existing national data rather than collection at every connection, and reported during implementation. This directly addresses the gap in this project, whose output-only RMF left limited evidence on reliability, welfare, and productive-use outcomes, and builds on how far AIIB's results practice has developed since 2016.

Appendices

A. PLR EVALUATION FRAMEWORK

Evaluation Criteria	Evaluation Questions	Data	Source of Information	Methods/ Analysis
Relevance	*Was the Project aligned with Bangladesh's energy sector needs and government strategy at appraisal?* *Did the two-component design reflect an appropriate diagnosis of the last-mile access and distribution gaps?* *Were design choices including the dual-implementer structure appropriate for the objective?* *Did the Project remain relevant throughout implementation?*	Government electrification target (2021) AIIB energy sector strategy Project design and results framework Sector statistics (2014–2021)	Project Document, PCN Bangladesh Power Sector Master Plan AIIB corporate and sector strategies Discussions with AIIB team, client project teams and government officials	Desk review Key informant interviews Analysis of project design documents
Effectiveness	*Were all four output indicators achieved as reported?* *Did output completion translate into intended intermediate outcomes?* *Did Component 1 produce differentiated outcomes for women? (Cross-cutting: gender)* *How should the PIMR 12 indicator correction affect the effectiveness assessment?* *Were there unintended effects, positive or negative?* *Did the Project comply with E&S safeguard requirements?*	Realized project outputs against targets Project monitoring framework implementation Gender-disaggregated connection data (if available); field interviews with female-headed households; secondary rural electrification literature PIMR 12 indicator correction (12.5M to 2.5M) E&S compliance records and GRM outcomes	PCN, PIMRs 7–12 Back to office reports (BTORs), environmental management reports Discussions with BREB, DESCO, and AIIB project team Field visit observations	Desk review Key informant interviews Analysis of project indicators Direct observation through field visit

A. PLR EVALUATION FRAMEWORK (CONTINUED)

Evaluation Criteria	Evaluation Questions	Data	Source of Information	Methods/ Analysis
Efficiency	*Was Component 1 delivered on time and within budget?* *Were the Component 2 delays foreseeable and adequately managed?* *Were the loan savings a function of procurement efficiency or scope reduction?* *Was the appraisal EIRR methodology robust?*	Loan disbursement and fund utilization Procurement and implementation timelines EIRR and cost-benefit analysis Loan savings and cancellation data	Project documents, Loan Agreement PIMRs, BTORs Discussions with BREB, DESCO, and AIIB procurement staff (if previous team members are still available)	Desk review Key informant interviews Cost-benefit analysis. For Component 1, reconstruction will draw on PBS electricity consumption records and kerosene substitution rates; for Component 2, outage-hours data from DESCO will be required. Where primary data cannot be obtained, the PLR will apply cost-per-connection benchmarking for Component 1 and cost-per-MVA with reliability improvement analysis for Component 2.
Sustainability	*Are installed connections in active use with sustained tariff payment?* *Are BREB PBS cooperatives and DESCO financially viable and maintaining assets?* *Is the expanded network being maintained and fully utilized?* *What institutional or regulatory risks threaten sustained benefit delivery?*	Operation and maintenance funding and asset maintenance records PBS and DESCO financial viability indicators. Assessment of PBS financial sustainability will use a purposive sample of PBS areas rather than aggregate BREB data. Tariff and cost recovery framework (BERC) Network utilization data	DESCO institutional reports BERC tariff orders and BREB annual reports. Bangladesh Energy Regulatory Commission data PCN Discussions with implementing agencies and field visit observations	Desk review Key informant interviews Financial sustainability analysis Direct observation through field visit

A. PLR EVALUATION FRAMEWORK (CONTINUED)

Evaluation Criteria	Evaluation Questions	Data	Source of Information	Methods/ Analysis
AIIB Work Quality	*Was the project design adequate, including the results framework?* *Was Component 2 permitting risk adequately identified at preparation?* *Was supervision timely and adaptive management exercised effectively during delays?* *Were E&S requirements monitored appropriately throughout implementation?*	Quality of project design and preparation Risk identification and management Supervision frequency and responsiveness E&S monitoring and GRM records	Project Document, ELA, Board minutes BTORs, PIMRs, supervision records Discussions with project team PCN	Desk review Key informant interviews Analysis of supervision quality and responsiveness
Client Work Quality	*Did BREB and DESCO demonstrate adequate project management capacity?* *Were procurement and financial management processes satisfactory?* *Did implementing agencies engage constructively with E&S and GRM requirements?* *Was the independent verification audit for Component 1 connections conducted as specified?*	Implementation of management quality Procurement and financial management performance E&S engagement and GRM operation Independent verification audit records	PIMRs, BTORs, audit reports PCN Discussions with BREB, DESCO project units and AIIB team	Desk review Key informant interviews Assessment of procurement and financial management records

Source: AIIB CEIU.

B. EVALUATION CRITERIA RATING SCALE

Evaluation Criteria	Rating Scale
Relevance	*Highly Relevant / Relevant / Less than Relevant / Irrelevant*
Effectiveness	*Highly Effective / Effective / Less than Effective / Ineffective*
Efficiency	*Highly Efficient / Efficient / Less than Efficient / Inefficient*
Sustainability	*Most Likely Sustainable / Likely Sustainable / Less than Likely Sustainable / Unlikely Sustainable*
Overall Assessment	*Highly Successful / Successful / Less than Successful / Unsuccessful*
AIIB Work Quality	*Highly Satisfactory / Satisfactory / Less than Satisfactory / Unsatisfactory*
Client Work Quality	*Highly Satisfactory / Satisfactory / Less than Satisfactory / Unsatisfactory*

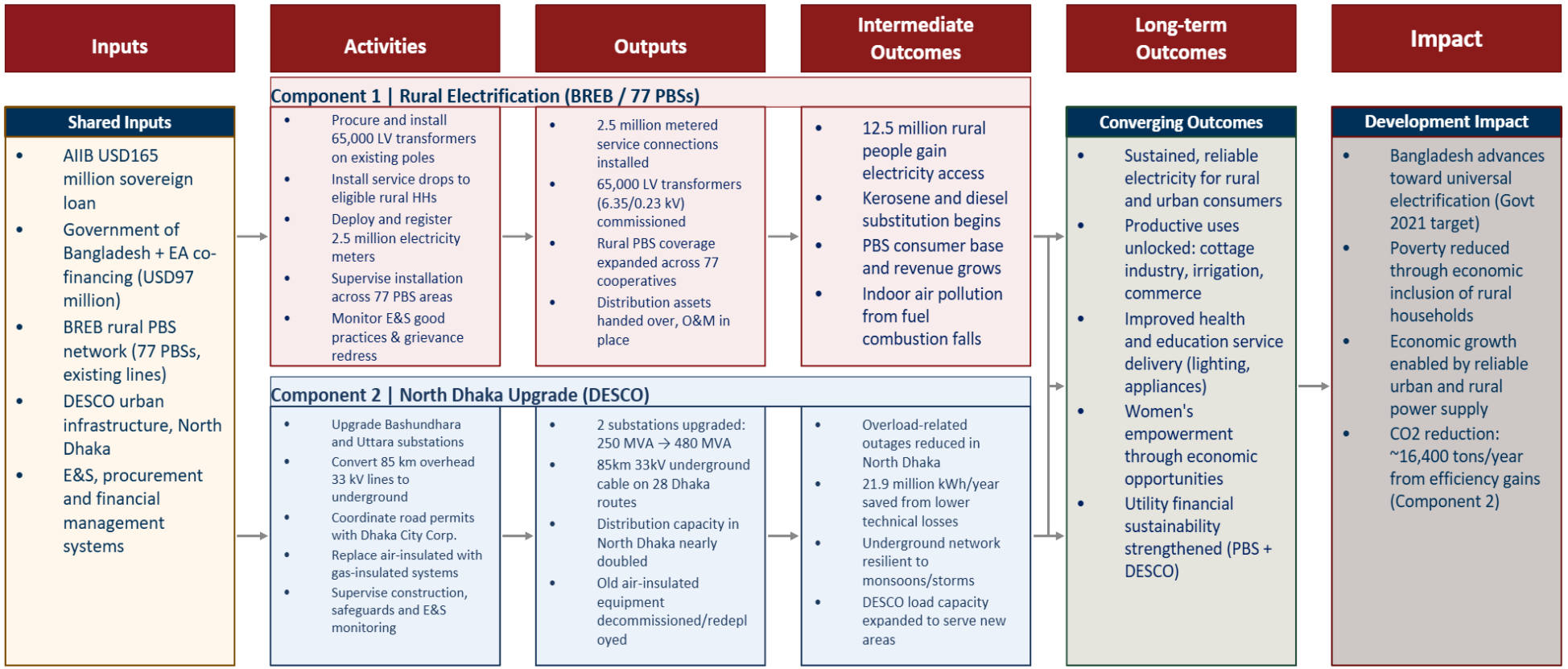
Source: AIIB CEIU.

C. RESULT AND MONITORING FRAMEWORK AND ACTUAL ACHIEVEMENTS

Project Objective Indicator	Indicator Level	Unit of Measure	Baseline (2016)	Cumulative Target Values										End Target (2022)		Frequency	Responsibility
				2017		2018		2019		2020		2021					
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Number of service connections installed	Project	Million	0	0.8	0.8	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	Annual	BREB
Number of small low-voltage transformers installed	Project	'000	0	20	20	52	65	65	65	65	65	65	65	65	65	Annual	BREB
Upgrade of two grid substations from 250 MVA to 480 MVA	Project	MVA	250	250	250	250	250	480	480	480	480	480	480	480	480	Annual	DESCO
Length of 33 kV underground cable installed	Project	Kilometers (km)	0	25	0	70	0	85	37	85	59	85	85	85	85	Annual	DESCO

Source: *Project Completion Note* (June, 2023), bit.ly/4iGFCT8

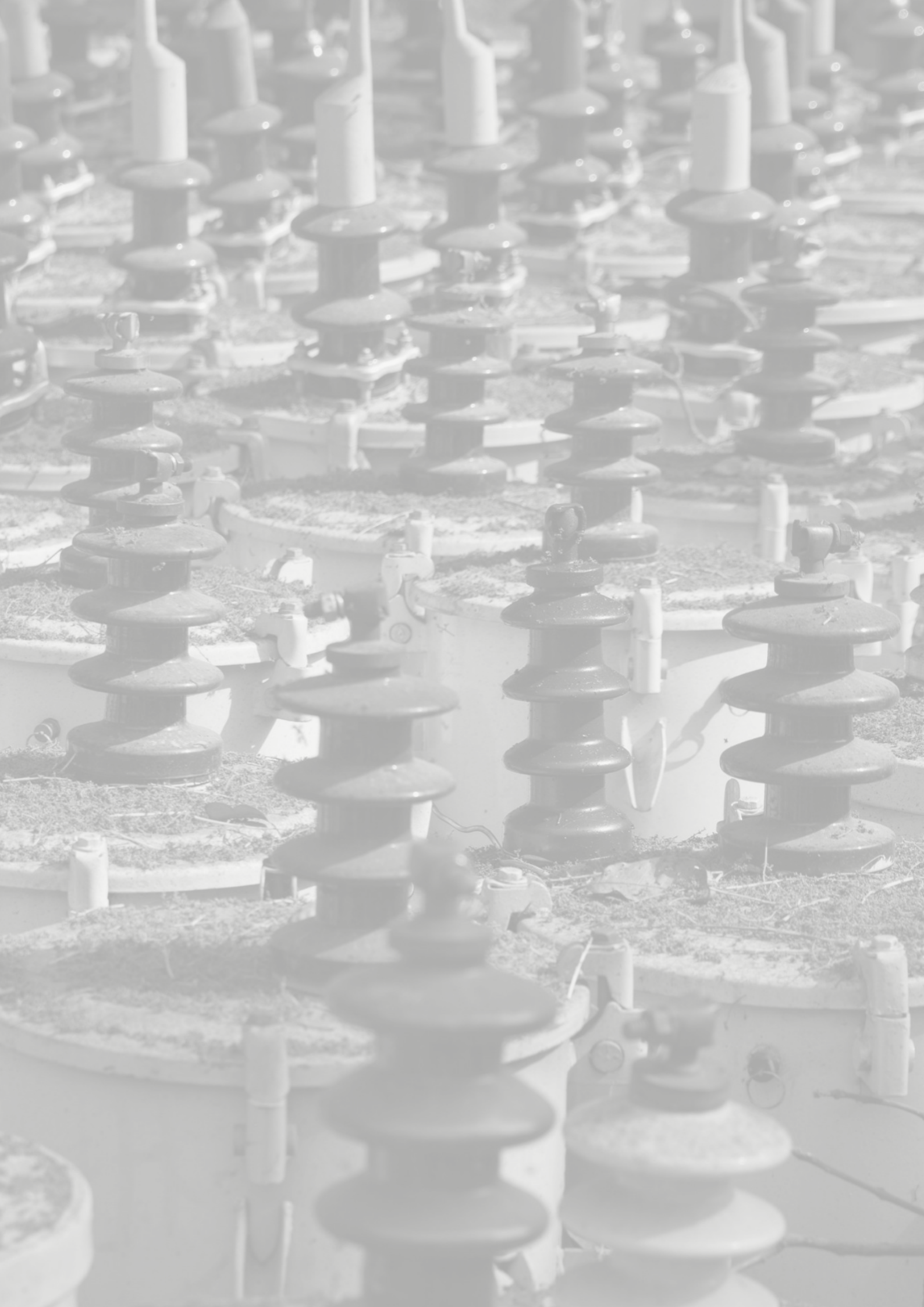
D. PROJECT THEORY OF CHANGE



KEY ASSUMPTIONS

- Bulk power supply is sufficient and reliable enough to absorb new connections and incremental demand without creating upstream constraints.
- BREB/PBS and DESCO have the capacity and resources to operate and maintain the new and upgraded assets, and O&M is financed on a sustained basis from operating revenues.
- Newly connected consumers take up service as expected and pay tariffs on time, supporting PBS revenue sustainability.
- Required permits and clearances for works are issued within planned timeframes, avoiding material disruption to construction sequencing and completion dates.
- Government sustains tariff and regulatory decisions toward cost recovery under the BERC framework, supporting utility financial sustainability and continued service quality.

Source: AIIB CEIU (based on project documentation).



The Independent Evaluation Function (IEF) of the Asian Infrastructure Investment Bank (AIIB) conducts Project Learning Reviews (PLRs) for selected closed projects, promoting accountability and learning at AIIB. This PLR presents the key findings of the independent evaluation on the Beijing Air Quality Improvement and Coal Replacement project in China. Approved in December 2017, this project provided USD250 million for Beijing Gas Group to improve air quality and reduce air pollution, including emissions of CO_2, SO_2, NOx, and particulate matters, through replacing coal with natural gas for heating and cooking in the selected rural villages in Beijing. The PLR identifies lessons learned and presents recommendations for improvements in AIIB's processes and projects. The full report remains confidential for internal use.

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