

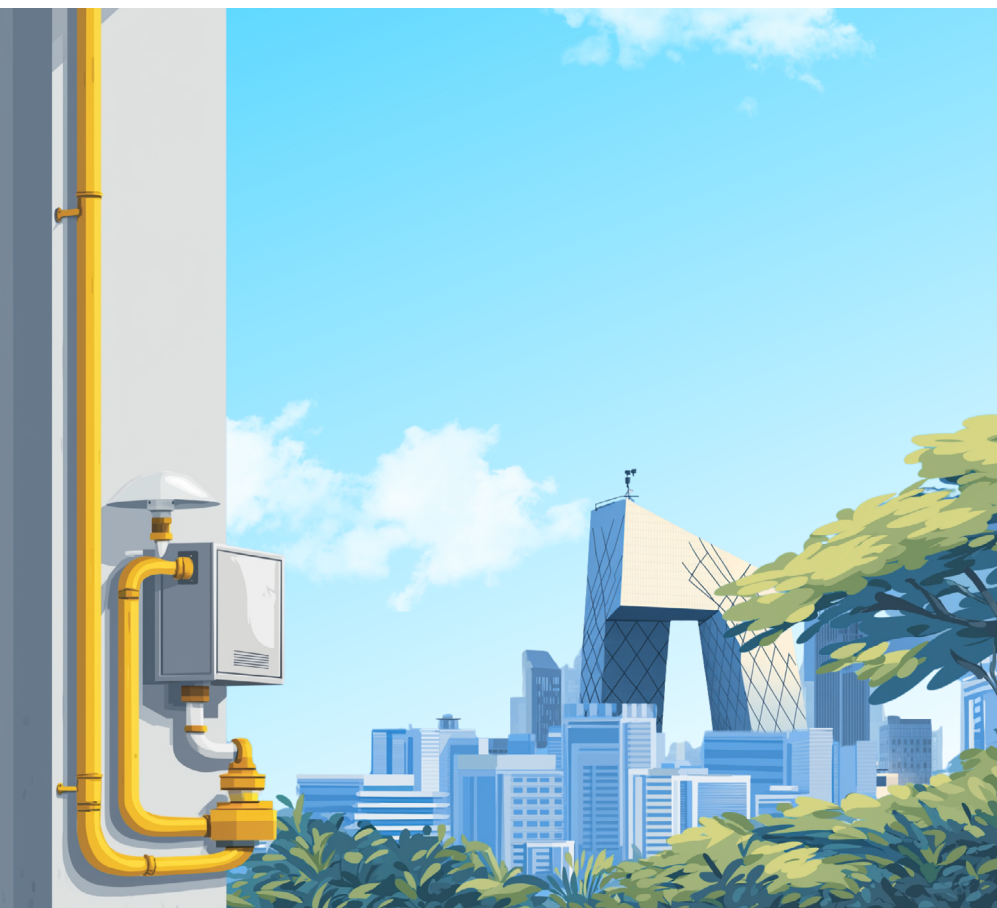


ASIAN INFRASTRUCTURE
INVESTMENT BANK

PROJECT LEARNING REVIEW REPORT SUMMARY

BEIJING AIR QUALITY IMPROVEMENT AND COAL REPLACEMENT PROJECT

DECEMBER 2025



Beijing Air Quality Improvement and Coal Replacement Project

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PROJECT LEARNING REVIEW PURPOSE AND METHODOLOGY

This project learning review (PLR) provides an independent assessment of the Asian Infrastructure Investment Bank's (AIIB) Beijing Air Quality Improvement and Coal Replacement Project ("the Project"). Conducted by the Complaints-resolution, Evaluation and Integrity Unit (CEIU),¹ the PLR serves to advance accountability and learning at AIIB. This PLR marks the Independent Evaluation Function's first evaluation of a nonsovereign-backed financing (NSBF) project in China and offers important institutional learning for AIIB's approach to state-owned enterprise (SOE) corporate lending financing and environmental infrastructure.

The PLR draws on comprehensive qualitative and quantitative evidence, including a review of documentation and data, interviews with AIIB staff, and site visits by the evaluation team in August 2025. The site visits included in-depth discussions with Beijing Gas Group (BGG/"the Client") and visits to 10 representative villages across three districts in Beijing: Chaoyang, Daxing, and Tongzhou. Guided by AIIB's Learning and Evaluation Policy,² the PLR assesses the project by applying OECD-DAC evaluation criteria (relevance, effectiveness, efficiency, sustainability) as well as AIIB and client work quality. The PLR presents lessons and recommendations for AIIB's continuous improvement.

The PLR benefited from close engagement between the evaluation team and AIIB Management and received an official Management response covering all recommendations. CEIU presented the PLR report to the Policy and Strategy Committee (PSC) of AIIB's Board of Directors in December 2025. In accordance with AIIB's Policy on Public Information,³ the full report remains confidential.

PROJECT DESIGN AND IMPLEMENTATION

Approved in December 2017, the Project was AIIB's first corporate loan and first NSBF operation in China. The Project aimed to support Beijing Municipality's Clean Air Action Program⁴ by providing a USD250 million loan to BGG to expand natural-gas distribution networks and household connections in rural and peri-urban areas. The financing covered the construction of village-level low-pressure gas-distribution networks (4,883 km of pipelines) and the establishment of household connections with metering systems across 468 villages, connecting 214,000 households.

1 AIIB CEIU Webpage. bit.ly/4a1kl8B

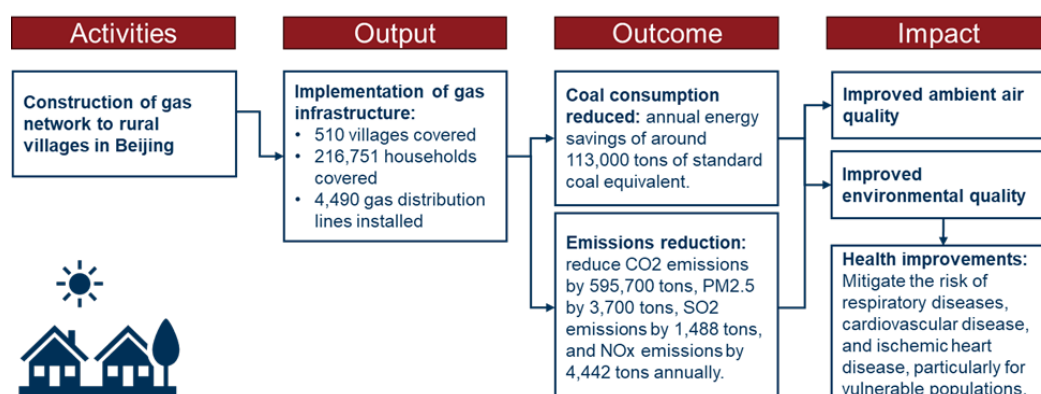
2 AIIB Learning and Evaluation Policy. (May 19, 2021). bit.ly/4q7wSGj

3 Policy on Public Information. (January, 2016). bit.ly/49MIF9b

4 Notice of the Beijing Municipal People's Government on Issuing the Beijing 2013-2017 Clean Air Action Plan. (September 11, 2013). bit.ly/3ZHMdGF

The Project targeted the displacement of approximately 650,000 tons of coal annually, with corresponding emissions reductions of CO₂, SO₂, NO_x, and PM_{2.5}. Implementation was faster than planned, with construction completed by December 2019, 18 months ahead of the original target of June 2021. The loan was fully disbursed and subsequently prepaid in December 2023.

The Objectives of the Project



Source: AIIB CEIU (based on project documentation).

PROJECT ASSESSMENT

The Project was rated as **Highly Successful**, reflecting strong performance across all evaluation criteria.

RELEVANCE – HIGHLY RELEVANT

The Project was well aligned with China's national air pollution control policies,⁵ Beijing Municipality's Clean Air Action Program,⁶ and AIIB's Energy Sector Strategy.⁷ Project design appropriately targeted household coal consumption, a major contributor to Beijing's winter air pollution. AIIB delivered both financial additionality through its inaugural NSBF structure and nonfinancial additionality through enhanced environmental and social standards. The Project also contributed significantly to AIIB's institutional learning in SOE corporate lending.

EFFECTIVENESS – HIGHLY EFFECTIVE

The Project successfully connected 214,000 households across 468 villages, achieving 98.7% of planned household coverage. Annual coal displacement reached 642,000 tons, closely matching appraisal projections of 650,000 tons. Emissions reductions were substantial: 588,000 tons CO₂, 3,653 tons PM_{2.5}, 1,469 tons SO₂, and 4,388 tons NO_x annually. The Project contributed

⁵ Notice of the State Council on Issuing the Air Pollution Prevention and Control Action Plan. (September 10, 2013). bit.ly/4k3R4XS

⁶ Notice of the Beijing Municipal People's Government on Issuing the Beijing 2013-2017 Clean Air Action Plan. (September 11, 2013). bit.ly/3ZHMAGF

⁷ AIIB Energy Sector Strategy: Sustainable Energy for Tomorrow. (November 22, 2022). bit.ly/4riJpaP

measurably to Beijing's air-quality improvements. Private capital mobilization of USD252.8 million was achieved through BGG's contribution. Gaps in the consistency and specificity of the Results Monitoring Framework (RMF) limited the ability to assess outcomes, identify risks early, and support effective reporting.

EFFICIENCY – EFFICIENT

Implementation progressed ahead of schedule, with construction completed 18 months earlier than planned, in December 2019. The Project was delivered within budget and without cost overruns, reflecting strong project management and procurement efficiency. BGG demonstrated strong institutional efficiency and leveraged economies of scale in procurement and implementation. AIIB's lean corporate loan structure ensured efficient use of resources with reduced transaction costs while maintaining adequate oversight. Limited financial and economic analysis at completion constrained comprehensive efficiency assessment.

SUSTAINABILITY – MOST LIKELY SUSTAINABLE

BGG's strong financial position ensures long-term asset-maintenance capacity. Environmental benefits are permanent and policy-backed through Beijing's coal ban enforcement. High household satisfaction and social acceptance support the continued use of natural gas. Institutional arrangements between BGG and Beijing Municipality provide a durable framework for service delivery. Furthermore, the constructed infrastructure is future-proofed to support China's long-term energy transition by enabling the integration of nonfossil energy sources, such as solar, wind, and green hydrogen, and aligning with the national dual-carbon goals of peaking emissions before 2030 and achieving carbon neutrality by 2060.⁸

AIIB WORK QUALITY – SATISFACTORY

AIIB demonstrated strong work quality at entry, with appropriate project design and risk assessment. Supervision was responsive and adaptive, effectively providing support to manage external shocks, including gas supply shortages and COVID-19 disruptions during the repayment period. Strategic portfolio management linked downstream distribution investments with upstream supply infrastructure. The Bank successfully pioneered its NSBF model while maintaining environmental and social standards.

CLIENT WORK QUALITY – HIGHLY SATISFACTORY

BGG demonstrated exceptional institutional capacity and project-management capabilities. Implementation proceeded efficiently with strong coordination across multiple districts and contractors. Environmental and social safeguards were implemented satisfactorily with effective grievance mechanisms. BGG maintained strong responsiveness to AIIB supervision and reporting requirements, and financial management was exemplary.

8 Full text: *Carbon Peaking and Carbon Neutrality China's Plans and Solutions*. (November 8, 2025). [bit.ly/49Z5ELF](https://www.aiib.org/en/projects/49Z5ELF)

LESSONS LEARNED

Lesson 1: Financing Modality

Sovereign-backed financing (SBF) and NSBF have distinct operational characteristics. The financing modality is determined by the presence of direct recourse to a member. However, since the Project could have potentially been financed through SBF, institutional learning on the criteria and requirements to access either SBF or NSBF financing could benefit future operations. This Project demonstrated the effectiveness of NSBF through a corporate loan to BGG, which enabled rapid implementation of timebound air-quality targets. The 15-year USD-denominated structure, with project-finance features such as debt service coverage ratio monitoring, helped BGG benchmark costs for future access to international markets. Institutional learning from this pioneering deal has since informed AIIB's broader corporate financing approach for systemically important infrastructure companies and regulated utilities. For robust SOEs in strategic sectors, corporate financing can combine delivery efficiency with market-based discipline and enhanced access to global capital.

Lesson 2: System-wide Energy Infrastructure Planning

Clean energy transitions require integrated planning across the complete energy value chain, including production, transmission, distribution, and end-use consumption. The 2017-18 natural-gas shortage highlighted this: national gas consumption experienced an 18.9% rise in 2017 due to strong demand from industry and winter heating.⁹ As a result, more than 426,000 households across northern China were affected by heating and gas shortages.¹⁰ This demonstrated how downstream household conversions could fail if upstream supply capacity is insufficient. The experience informed AIIB's subsequent USD500 million sovereign loan for the Beijing-Tianjin-Hebei LNG terminal,¹¹ approved in 2019, which expanded liquefied natural gas import and storage capacity. Future energy-transition projects would benefit from including system adequacy assessments prior to project approval, identification of complementary infrastructure gaps, coordination with other development partners, and contingency planning for supply shocks.

Lesson 3: Outcome-level Results Measurement Enhancement

The Project achieved strong outputs, including 214,000 new household connections and the annual displacement of 642,000 tons of coal. However, the RMF used to measure environmental and health outcomes relied heavily on modeled estimates. Stronger evidence would improve attribution and institutional learning. AIIB has undertaken substantial work to strengthen results measurement frameworks since this Project's approval, including developing standardized indicators and updated guidance on project development objectives and RMFs, which are currently in the final stages of issuance. Future approaches should build on these institutional improvements.

9 Natural gas consumption surges in China. (December 18, 2017). bit.ly/4q7J4qd

10 Heating provided to 426,000 households with gas shortage. (December 28, 2017). bit.ly/3ZHMjtH

11 China: Beijing-Tianjin-Hebei Low Carbon Energy Transition and Air Quality Improvement Project. bit.ly/4t5AF9s

Lesson 4: Affordability as a Sustainability Prerequisite

The sustainability of fuel switching depends on affordability. For this Project, municipal subsidies for household connections and tariff support were essential to ensure universal adoption and prevent low-income households from reverting to coal. Infrastructure delivery alone, without such measures, may not sustain behavioral change. The experience with this Project underscores the importance of embedding affordability considerations through tariff structures, targeted subsidies, or safety nets into clean-energy projects.

RECOMMENDATIONS

The identified lessons lead to the following three recommendations for AIIB's Management to enhance AIIB's processes and approach for future projects.

- 1. Integrate System-wide Energy Planning into Sector Engagement and Pipeline Development**
- 2. Adopt a Consistent but Context-sensitive Monitoring Framework for Environmental and Energy Projects**
- 3. Strengthen Completion-stage Financial and Targeted Economic Analysis for NSBF Projects with Environmental and Social Co-benefits**

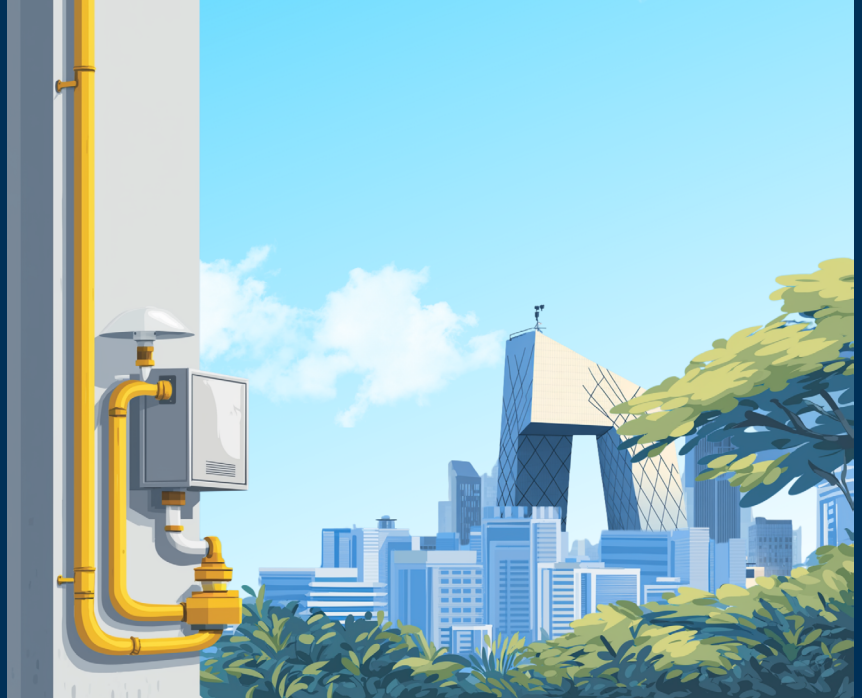


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The Independent Evaluation Function (IEF) of the Asian Infrastructure Investment Bank (AIIB) conducts Project Learning Reviews (PLRs) for selected closed projects, promoting accountability and learning at AIIB. This PLR summary note presents the key 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 CO₂, SO₂, NO_x, 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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