Notes on Mainstreaming Energy Efficiency in the Asian Infrastructure Investment Bank (AIIB)

Energy Foundation China
Energy Efficiency Investment and Assessment Committee of China Energy Research Society
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Foreword

Notes on Mainstreaming Energy Efficiency in the Asian Infrastructure Investment Bank (AIIB) aims to provide policy makers with both strategic plans and practical approaches to mainstream energy efficiency (EE) within AIIB operations. The suggested actions are aimed at helping the bank to develop and implement a long-term, flexible, and comprehensive EE policy framework. This strategic framework will enable the bank to consistently assess, monitor, and report the green benefits of each project. It will also help inform shareholders, partners and developers of AIIB-funded projects and guide the communication and cooperation between the parties.

Infrastructure plays an irreplaceable role in promoting regional economic development. Statistics suggest that developing countries require $1.5 trillion in infrastructure financing annually. In the context of unbalanced global growth, as well as the risks and uncertainty of an economic downturn, it is important to increase financing and develop innovative financial tools for infrastructure investment.

Global infrastructure development has made obvious progress, especially in terms of its social and economic benefits. However, it has failed to address several key issues, especially those of energy conservation and environmental protection. This is despite the fact that most infrastructure projects can actually well support the transition to a green economy. In order to balance economic growth and environmental protection, it is important to enhance financial capacity and the investment environment for sound infrastructure development. To this end, a variety of policy incentives should be put in place in order to establish a standard assessment system where a project’s environmental and energy benefits are evaluated on the same level of importance as its economic benefits by investors.

This paper focuses on the concept of “mainstreaming” energy efficiency as a way for the AIIB to reach its green growth objectives for the Asian region. As a multilateral development bank (MDB) promoting regional and global development, AIIB provides financial support for energy-intensive infrastructure projects including transportation, energy, telecommunications, agriculture and urban development. Mainstreaming EE within AIIB will offer new opportunities for the design, construction, management and operation of each infrastructure project throughout its lifecycle. It will increase the productivity of infrastructure projects and establish standards for sustainable infrastructure development for the coming decades.
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**Vision**

The Paris Agreement, adopted in December 2015, demonstrates a global aspiration for green, low-carbon, and sustainable development, and a commitment to setting aside disputes to address climate change through coordinated global actions. Moreover, the Paris Agreement highlights the central role of financial cooperation mechanisms in global climate action and establishes a new agenda for international cooperation on climate finance.

The call for greater financial cooperation is also echoed in an increasing number of other global venues. The agenda for the 2016 G20 Summit, hosted by China, included Green Finance for the first time and, at their September Summit, Leaders endorsed the G20 Energy Efficiency Leading Programme (EELP), indicating that energy efficiency, including energy conservation, is a long-term priority G20 countries. Many countries have also begun to accelerate the development of local green finance. However, more will be needed. According to the *Adaptation Gap Report 2016* published by United Nations Environment Programme (UNEP) in May 2016, the financing gap for developing economies to address climate change will reach 280 to 500 billion USD by 2050.

Integrating climate into the global financial governance framework will be crucial to providing the capital flows necessary to achieve local and global climate objectives. As the newest actor focusing exclusively on infrastructure, much of which is energy-intensive, one of the most practical ways AIIB can do this is by elevating the role of energy efficiency in Bank operations and lending.

Energy efficiency is one of the most effective instruments available to project planners and policymakers to moderate energy demand, reduce production costs, lower carbon dioxide emissions and expand the reach and security of regional energy supply. To this end, AIIB should adopt a long-term, comprehensive, and flexible energy strategy that avoids investments in inefficient and unsustainable technologies aims to improve EE in the long through broader capacity building and project development assistance. The bank must recognize its unique role in scaling-up green finance and lead the global transition to sustainable infrastructure development.
**Recommendations**

- Develop a clear strategic policy framework that promotes the integration of EE across bank operations

- Encourage and strengthen knowledge sharing of EE financing best practices and financial risks

- Improve assessment methods of green finance

- Expand capacity building and project development assistance in order to build a pipeline of investment-ready energy efficiency projects
Energy Efficiency Mainstreaming Roadmap

Energy efficiency mainstreaming within AIIB can proceed under the following three-phase roadmap: 1) top-level design, 2) implementation strategy, and 3) operational practice. At the strategic level, the roadmap meets the standards of long-term thinking, comprehensiveness, and flexibility. At the technical level, the roadmap provides time for systematic analysis of the objectives, approaches, conditions, and safeguards for the AIIB to achieve green growth in the future through a cohesive integration of EE objectives into its operations.

Phase 1: Top-Level

During the first phase, AIIB should develop top-level objectives and strategies for mainstreaming EE within the AIIB. This includes securing internal thought leadership and capacity by establishing an energy efficiency promotion committee to coordinate and support cooperation. It also includes external coordination. In order to strengthen the importance of EE in global green finance, the committee should encourage AIIB to work with other international and financial organizations to explore the feasibility of collaborative EE financing options.

Phase 2: Strategic Level

During the second phase, AIIB should establish strategic goals and develop short-, medium- and long-term implementation plans for the growth of the global green economy through international finance institutions broadly and AIIB’s expertise in infrastructure investment and finance specifically. AIIB should strengthen cooperation on EE with other multilateral and bilateral development organizations. Countries at different stages of economic development, natural resource endowments, and population densities should be encouraged to coordinate with each other on the promotion of EE as a tool to address energy security.

Phase 3: Operational Level

At the operational level, EE considerations should permeate various levels of project development, implementation and assessment. In contrast to the traditional finance model, AIIB must not only aim for economic profit, but also place high importance on the improvement of EE, energy productivity, energy security, and broader environmental benefits when measuring the success of a financial project. To facilitate its own transition toward greater integration of EE, AIIB should learn from the experiences of other MDBs in terms of the development, investment, and governance of EE projects. AIIB needs to both cooperate with other MDBs on topics including co-finance, knowledge sharing, and capacity building in order to help member countries develop high-quality, high-yield, low energy consumption, and low-cost infrastructure projects.
Figure 1: AIIB EE mainstreaming roadmap
Approaches

Mainstreaming energy efficiency within bank operations means integrating energy efficiency into banks’ regular lending practices and creating a value-added service or product for projects. For example, an airport construction (or building or transportation) project applies for a loan from a bank. The bank would then assess the project in terms of not only financial risk, but also energy saving potential. Unlike the current prevailing EE credit business model, EE will be integrated into regular loans in the new model at AIIB. This means EE finance and regular loans are unified and EE credit no longer exists as an independent entity. The biggest advantage of this new model is that it can make the best use of the potential for energy saving and integrate green finance into AIIB’s vision, strategy, credit culture, policy and institutions, management, product and service innovation, as well as capacity building.

I. Main Objectives

• To support Asian green infrastructure projects where energy saving and environmental protection are highlighted
• To ensure that project implementation increases energy efficiency and reduces greenhouse gas emissions through the use of EE technology, equipment, and products
• To encourage private capital in green investment and promote economic growth
• To set an example of global sustainable development through Asian infrastructure construction

II. Principles and Bottom Lines

1. Investment Principles

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<thead>
<tr>
<th>Investment Principles</th>
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<tr>
<td>A. Financing rate must be attractive to the borrowers: it has better competitive finance price as compared with the market products</td>
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<tr>
<td>B. Repayment source must certainly have the safeguard: the cost of energy saving as one of the source of repayment</td>
</tr>
<tr>
<td>C. Long-term financing period: the maximum loan term is 25 years</td>
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<td>D. The variability of operation style: available on- and off-balance sheet finance mode, repayment schedule should adapt the special requirement of project cycle</td>
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Figure 2: Green infrastructure project investment and financing principles
2. Double Bottom Lines

AIIB is a commercial bank independent from the government, so all investments need to hold a double bottom line: financial bottom line and green (energy efficiency) bottom line. AIIB investment projects must be green and profitable at the same time.

III. Business Scope

As a multinational financial institution, AIIB aims to promote Asia’s economic development and improve the regional infrastructure network. It is also expected to play an important role in job creation and poverty alleviation in the region.

1. Public Facilities

Public facilities include roads, railways, airports, ports, bridges, communications, urban water supply and drainage system, gas, power and other infrastructure projects.

<table>
<thead>
<tr>
<th>Public Facilities</th>
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<tbody>
<tr>
<td>Highway</td>
<td>application of recycled materials, high efficiency construction equipment, electronic toll collection technology, etc.</td>
</tr>
<tr>
<td>Railway</td>
<td>application of recycled materials, efficient equipment, etc.</td>
</tr>
<tr>
<td>Airport</td>
<td>wall insulation technology, central air conditioning technology, heating and cooling technology, information technology, etc.</td>
</tr>
<tr>
<td>Port</td>
<td>on-shore power supply for vessels, etc.</td>
</tr>
<tr>
<td>Bridge</td>
<td>application of recycled materials, efficient equipment, etc.</td>
</tr>
<tr>
<td>Communication</td>
<td>construction and operation of green base station and computer room, application of high efficiency products, etc.</td>
</tr>
<tr>
<td>Water conservancy</td>
<td>use of renewable energy, high efficiency motor and drive equipment, smart water service, etc.</td>
</tr>
<tr>
<td>Urban water supply and drainage</td>
<td>high efficiency motor and drive equipment, energy efficient water pipeline, etc.</td>
</tr>
<tr>
<td>Gas supply</td>
<td>pressure power generation, accurate measurement, efficient gas stove.</td>
</tr>
<tr>
<td>Power supply</td>
<td>high efficiency transformer, energy efficient wire, harmonic filter, etc.</td>
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2. Social Utilities

Social utilities include education, technology, medical and health care, sports, and culture.

AIIB’s EE projects adopt energy efficient products, equipment, technology, and materials to improve energy efficiency in the design, construction and operation of infrastructure projects. Some examples include wall insulation technology, high efficiency heating and cooling, efficient lighting, energy efficient computer rooms, information technology, etc. They require all the equipment, technology, and materials to be highly energy efficient throughout the whole lifecycle of a project. Some examples of EE social utilities are listed above.

IV. Business Model

One of AIIB's objectives is to support green infrastructure projects in Asia. To achieve this objective, funding from AIIB alone is not enough. The private sector must be mobilized into green investment. Therefore, the business model of AIIB needs to leverage private investment into green projects. In order to promote the benefits of green investment, the business model should start with AIIB funding the green infrastructure projects and increase the profitability of green projects through demonstration effect, replicable experience, as well as innovative technology and financial tools. The high profitability allows reinvestment of financial capital and can attract new investment from other players to expand green finance projects. These processes will generate energy savings and economic benefits, and will contribute to job creation and the modernization of infrastructure. (Figure 3).

Figure 3: AIIB Business Operation Model
V. Implementation Strategy

The implementation strategy of mainstreaming EE within AIIB includes market research, demand analysis, financial design, product innovation, and risk control.

1. Research of market conditions

First, AIIB must have a comprehensive understanding of the financial needs and market conditions for EE investment. It needs a clear analysis of the potential and space for improving energy efficiency during the construction, operation, and procurement of infrastructure development. An understanding of all the available financing options is necessary at the early stage of market research. Based the knowledge of financial options, AIIB can collaborate with the private sector and encourage the participation of social capital in order to open the door to EE investment market.

2. Analysis of energy consumption and demand

Second, AIIB should conduct quantitative analysis of projects’ energy consumption and compare the advantages and disadvantages of different energy consumption equipment. This analysis can help AIIB adopt a series of EE technologies and improve procurement management.

3. Design of financing plans

Third, AIIB can collaborate with different types of social capital including foundations, social organizations, private investors, etc. On the one hand, the same project may need different EE financing plans in different areas. AIIB should prepare to work with different stakeholders to meet various needs. On the other hand, AIIB should also try to design replicable financial solutions to scale its approaches and meet the needs of other similar projects.

4. Innovation of financial products

Fourth, AIIB should not only focus on flexible and innovative financial products, but also leverage various types of social capital in EE investment through debt and equity finance. It is also important for AIIB to provide long-term and competitive market rates. With attention to demand, AIIB can also create financial products on or off the balance sheet as well as structural repayment plans.
5. Management of risks

Fifth, rigorous risk management is necessary throughout any EE investment. This is a systematic approach where each of the green infrastructure projects needs to go through a series of tools, including project screening standards, due diligence, details risk assessment models and process, monitoring mechanism, and green impact reports. For projects that are highly subject to policy changes, AIIB needs to not only focus on current policies, but also predict and assess the impact of potential policy changes in the future. AIIB should also develop an internal stress testing mechanism to manage, predict, share, and prevent potential risks both at the macro and micro levels in order to maintain certain investment returns.

VI. Loan/Investment Modes

Based on the development strategy of AIIB and experience of EE investment in other regions, AIIB can adopt the following modes for EE investment.

1. Traditional Loans

EE loans are included in AIIB’s infrastructure project loans, but need to be measured and assessed separately. Traditional loans include sovereign and non-sovereign loans, grants, and transfer loans.

- Sovereign loans: loans provided by national finance departments through designated banks
  - Loan period: the basic loan period is 15 to 20 years, but the longest grace period is up to 5 years\(^{[i]}\) based on the features of a project
  - Interest rate: the interest rate equals the 6-month Shanghai Interbank Offered Rate (SHIBOR) plus interest margin (the interest margin should be decided by the finance department of lending countries based on 6-month LIBOR \(^{[ii]}\)).

- Non-sovereign loans (no government guarantee):
  - Loan period: varies depending on specific projects.
  - Interest rate: varies depending on the risk factors of project owners

- Grants: grants can be used for policy research and technical assistance, and the amount should not exceed 3% \(^{[iii]}\) of the project loans.

2. Energy Efficiency Special Loans

AIIB can set up a special energy efficiency fund to encourage national and regional governments and the private sector to actively participate in national and local infrastructure projects. The fund would provide loans for energy efficiency components in infrastructure
projects, and invite a third party organization to audit the project. The interest rate of the EE special loans should be lower than the interest rate of traditional infrastructure loans and the load period matches the payback period of the investment. Similarly, an energy efficiency special loan can take the form of sovereign loans, or indirect loans in the form of other lending options. AIIB can also create a certain percentage of funds as grants for capacity building of EE programs in countries and regions that have infrastructure projects.

3. Open Finance

The EE components of AIIB’s infrastructure development can be supported by energy efficiency loans from the bank or by funds in other forms. In either case, AIIB needs to develop a risk sharing mechanism by establishing a fund to cover a certain percentage of the risks inherent in energy efficiency loans during infrastructure development. The fund can be solely financed by AIIB or co-financed with other international institutions. The mechanism would also require establishing specialized departments within the AIIB headquarters or working with project countries and regions to manage, assess and review EE finance.

4. Others

- Long-term concessional loans of official development assistance (ODA) with no restrictions on procurement
- A single project loan amount cannot exceed $50 million[^iv], the loan can be adjusted according to specific projects. Currently, the amount of loans should be no less than $1 billion every year[^v]. In the future, the number may be increased.
- Currency of loans: AIIB’s loans are generally in U.S. dollars. If the borrower has specific demands, the bank can provide loans in other currencies including the RMB. Project owners should consider the risk of exchange rate fluctuations.
- Depending on the borrower's preference, the interest rate of loans can be either floating or fixed.

VII. Business Procedures

The following diagram illustrates the main procedure of AIIB’s loan projects (Figure 4).
VIII. Risk Management

AIIB-led green development cannot succeed without a rigorous assessment and detailed risk management system. AIIB faces three major risks: investment risk, green risk, as well as operational risk during project implementation. Risk management at AIIB should adopt a top-down management approach and a bottom-up control process where risk preferences, department management policies, and business procedures are established based on the principles and objectives of the AIIB. The risk management, internal compliance and audit departments at AIIB should leverage tools such as Process Mapping, Root Cause Analysis,
Self-Assessment and Risk Register to strengthen credit and post-loan management. These departments should strengthen loan scrutiny, due diligence, and benefit assessment, and establish a credit quality control and early-warning system to reduce credit risks (Figure 5).

Figure 5: AIIB risk management procedure

1. Investment Risk Management

Investment risk management is key to sound project management. Project finance involves multiple stakeholders and the main risk factors are as follows:

- **Government**: for example, energy incentive policy as well as tax and trade regulations will have an impact on the risks and benefits of green investment.

- **Resources**: pricing and availability of related resources in green investment, such as resource tax, carbon price, and fluctuations of electricity rate.

- **Operational management and insurance**: such as operational cost, maintenance cost, and expiry of insurance contracts.

- **Technology**: such as the reliability, sustainability and competitiveness of green technologies.

- **Construction**: such as the risk of project completion and the credit risk of contractors.

- **Supply and procurement**: such as the price fluctuations of procurement contracts and credit risk of suppliers.
In order to address these risks, AIIB should follow a rigorous project approval process containing five phases from initial contact to post-investment management.

- **Preliminary information**: signing a confidentiality agreement, introduction meetings, and Q&A.

- **Due diligence and negotiation**: assessment of a project from technical, legal, energy saving, and profit aspects and completing a final agreement. This is the most important phrase. Each project must be approved through four stages: preliminary assessment, draft plan, modified plan, and the final plan.

  AIIB needs to carry out regular assessment and investment meetings to discuss all of the ongoing projects. The project manager or the energy efficiency department would have the opportunity to answer questions from auditing staff, executive team, and board members on project risk, laws, green aspects, and technologies to ensure that the project is in line with AIIB’s investment standards.

- **Investment decision making**

- **Agreement signing and transaction completion**

- **Projects transferred to investment department followed by tracking and monitoring of the projects**

Each project should follow AIIB’s established template, including project background, qualification inspection, green impact, economic feasibility, adherence to AIIB’s strategic plan, project safety, and exit mechanism. It is also necessary to include comments and recommendations from the risk, green impact, legal, and technology departments.

2. **Green Risk Management**

Green risk management should play an important role and have the veto power in project management. AIIB should ensure that every investment project meets at least one of the following EE-related goals.

- Save primary or secondary energy
- Promote energy recycling.
- Reduce greenhouse gas emissions.
- Contribute to optimizing design and adopting energy efficient equipment and systems.

In order to achieve these goals, AIIB needs to establish an energy efficiency department and develop green standards, as well as a rating system, according to the EE goals above and AIIB’s priority investment areas.

AIIB should develop the green standards based on data and evidence, investment principles and feedback from experts. The green standards to measure investment should be in line with sustainable development goals. If a project fails to pass the assessment of green investment or
energy efficiency department, it should not be approved no matter how high the financial return on investment is. During the pre-investment audit and post-investment management, each project will go through rigorous assessment and continuous monitoring processes. The project proposal must include the assessment results of EE goals and corresponding analysis of the results. It should also list green risks in terms of probability and impact, as well as related risk control and management measures.

3. Operational Risk Management

Operation risk management should support the long-term development strategy of a bank. AIIB should establish a risk and compliance committee composed of leaders of major operational departments. The committee should have regular meetings to discuss major decisions as well as recent risk events, and summarize the risk management results to report to the higher level audit and risk committee. The audit and risk committee needs to further report to the board. At the same time, in order to meet the stress test requirements, AIIB should develop stress test guidelines and frameworks, and implement them in a step-by-step manner. Each step requires careful data collection and analysis as well as feedback from third-party consulting organizations before any quantitative and qualitative results. Finally, based on the results, the operational risk management department needs to provide recommendations to the management team to address potential stress situations.

IX. Capacity Building

Mainstreaming EE will demand a higher level of technical expertise within AIIB. Unfortunately, the lack of technical expertise on EE is common among commercial banks. AIIB, therefore, needs to improve its overall capacity in various aspects including project identification, energy audit, loan assessment, and post-loan management.

1. EE team establishment

AIIB should establish a new EE department. Its mission, instead of directly developing independent EE loans, should be to support all other operational departments and identify energy saving opportunities from traditional loan projects. The EE department not only needs to have expertise in finance but also technical EE knowledge in order to support the bank’s project portfolio.

2. Institution development

The EE department should establish systems on credit rating, EE audits, EE evaluation and assessment statistics within AIIB. The department should also guide AIIB to engage in green finance and manage relevant risks under the sustainable business growth model.
3. Talent building

AIIB can cooperate with external experts and organizations providing technical services when necessary. AIIB should establish an expert database to help the bank with carry out EE audits, technology evaluations, internal capacity building, and technology development. The database could also be useful in identifying expertise in new technology development and industry and market trends.

4. Technical assistance

AIIB should establish an expert group to provide international technical assistance and advisory services for projects. Technical assistance such as technology advancement, knowledge exchange, and troubleshooting can help with project construction and implementation and promote energy efficiency and energy conservation aims during the full lifecycle of each green infrastructure project.

[i] The data is a reference value, based on the characteristics of the infrastructure project and experience of multilateral financial institutions.

[ii] The data is a reference value, referring to the location of the AIIB and common practice of multilateral financial institutions.

[iii] The data is a reference value, referring to experience of multilateral financial institutions.

[iv] The data is a reference value, and estimated according to the scale of project investment, the proportion of energy efficiency project accounted for the whole infrastructure project, and experience of international multilateral financial institutions.

[v] The data is a reference value.