ASIA CLEAN ENERGY FORUM 2024
Accelerating the Clean Energy Transition and
Ensuring Energy Security and Affordability
Time for Urgent Action Now
3-7 JUNE 2024

ADB’s Engagement on Energy Efficiency and Green Buildings across Asia and the Pacific

Session 2.2: Energy Efficiency in Buildings

04 June 2024  |  4:00 - 5:30 PM (GMT+8)
ASIA CLEAN ENERGY FORUM 2024

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Ramola Naik Singru

Principal Urban Development Specialist
Asian Development Bank

Featured Speaker
ADB Engagement in Energy Efficiency in Buildings

1. Policy and Strategy
   • Regulatory Frameworks
   • Policy Reform
   • Institutional Strengthening
   • Green Building Standards and Certification
   • Knowledge Sharing and Capacity Building

2. Technical Assistance
   • Energy Audits
   • Project preparation
   • Masterplanning – Green City Action Plans
   • Design and Innovation

3. Financing
   • Sovereign Loans and grants for Projects
   • Program lending – Policy Based Lending, Results Based Lending
   • Nonsovereign Lending
   • Bonds - Green, Sustainability linked, Social
Examples of ADB’s Sovereign Projects

Philippines Energy Efficiency Project ($31.2 million loan and $1.5 million grant)
- Retrofitted 40 government buildings in Manila and 150 government buildings nationwide resulting in 11 GWh of energy savings per year with 4.6-year investment payback and PHP 112 million annual cost savings.
- Expansion of the Department of Energy’s appliance-testing laboratory to test performance of e.g. televisions, washing machines and refrigerators / freezers

Mongolia Ulaanbaatar Green Affordable Housing ($80 million loan and $3 million grant from ADB; $95 million loan from Green Climate Fund and $50 million grant)
- Leverage private sector investment to deliver 10,000 affordable green housing units and redevelop 100 hectares of ger areas into eco-districts

Bhutan Green and Resilient Affordable Housing Sector Project ($24 million loan and $6 million grant)
- Build 1,000 climate and disaster-resilient, energy efficient and affordable housing units
- Strengthen housing design, construction and management capacity, review building code and regulations, conduct training and awareness, strengthen the housing management information system, provide project implementation support.

Uzbekistan Mortgage Market Sector Development Program ($150 million loan)
- Boosting the funding available to commercial lenders in the country to continue providing affordable home loans
- Next phase - Help expand green renovation loans based on a Green Housing toolkit.
Examples of ADB’s Non-sovereign Projects

Maldives Safe and Affordable Housing ($4.5 million in equity + $7.5 million loan package)

Georgia M Square Affordable Housing ($10 million loan)
- Two residential complexes to be completed with the aim to deliver affordability, energy efficiency, accessibility and safety. Conducted Energy audits to inform designs

India Affordable Green Housing ($58 million loan and $10 million grant)
- Support IIFL Home Finance Limited’s green housing portfolio, specifically towards incentivizing developers to adopt green certification standards in building affordable housing

India Low-Cost Affordable Housing Finance ($150 million loan)
- 7-year senior loan of up to $200 million to PNB Housing Finance Limited, a Housing Finance Company, to fund affordable housing in India.

Social and Green Bonds for Green Housing in Thailand ($244 million loan)
- The Government Housing Bank of Thailand issued its first sustainability bonds in accordance with the International Capital Market Association’s Sustainability Bond Guidelines and the ASEAN Sustainability Bond standards.

India Cygnus Affordable Hospitals Project ($18.4 million loan)

Lhoopa Promoting Green Affordable Housing Project in the Philippines ($20 million loan)
INDIA: Inclusive, Resilient and Sustainable Housing for Urban Poor Sector Project in Tamilnadu

Public Health Resilience through Design

- Achieve required numbers
- Introduce a vision that guides the masterplan
- Incorporate landscape concept design
- Introduce well designed social amenities
- Introduce well designed social amenities
- Provide dedicated spaces for washing and water chores

Responsible Urbanism for a Sustainable Future

- Achieve required numbers
- Introduce a vision that guides the masterplan
- Incorporate landscape concept design
- Introduce well designed social amenities
- Provide dedicated spaces for washing and water chores
- Use of wind, heat and daylight simulation/ energy modelling to enhance health and wellness outcomes
- Use of additional modelling including Solar PV calculations, Runoff analysis, Site water calculations, Waste management, Numerical envelope flow model, Energy thermal simulations

Highlights - Sample Sub-Projects

Reddyarpatti, Tirunelveli
17.15 Acres; 1600 Units

Responsible Urbanism for a Sustainable Future

- Achieve required numbers
- Introduce a vision that guides the masterplan
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Vallam, Thanjavur
7.77 Acres; 969 Units

Redesigning a TNUHDB Layout

- Achieve required numbers with basic and minimal improvements to the site layout and block/unit plans

Kalanivashal, Kankinadu
11.08 Acres; 900 Units

NEST Concept (NURTURE, ENGAGE, STIMULATE, THRIVE)

- Achieve required numbers
- Introduce a vision that guides the masterplan
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Pallipalayam, Namakkal
3.82 Acres; 503 Units

- Achieve required numbers
- Introduce a vision that guides the masterplan
- Incorporate landscape concept design
- Introduce well designed social amenities
- Provide dedicated spaces for washing and water chores

Odukam, Dindugul
11.05 Acres; 1209 Units

A Green Certified Sustainable Community

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Project prototype: [RE]Build Communities

[Re]Instate Connection With Nature
[Re]Lay Healthy Lifestyle Practices
[Re]Unite Communities
[Re]Boot Sense of Ownership
[Re]Deem Natural Resources

Points Achieved at Concept Masterplan Stage: 59 (3 Star)
Points to be Achieved Pre and Post Construction: 18 (4 Star)
Points to be Achieved through Use of Fixtures and Appliances: 11

= 88/100 5 Star GRIHA Rating


https://www.grihaindia.org/griha-ah
Project prototype: [RE]Build Communities

Sustainable site solutions including, preservation of existing trees, enhanced green cover, use of water and waste management techniques, etc.

Optimizes thermal comfort by placing building blocks and open spaces in a manner that maximizes wind flow while minimizing heat gain.

Creates distinct neighborhoods while also carving a variety of programmed open spaces to provide active and passive recreation opportunities for all age groups.

Focus on site features - views to hills, temples on site etc.

Project 1: Modelling and Simulation Approach

- **Computational Fluid Dynamics**
  Understand and optimize wind patterns to increase the overall wind pressure across the site and thereby, improve outdoor thermal comfort.

- **Irradiation Analysis**
  Compute the relationship between building and solar geometry in conjunction with the solar irradiation for every hour (across the year).

- **Run-Off Analysis**
  Understand the lay of the land and study water flow patterns in the event of extreme rainfall and flooding.

- **Site Water Calculation**
  Predict and analyze the site water demand for potable and non-potable end uses at the site and building levels.

- **Solar PV Calculation**
  Estimate the peak installed capacity and energy production for PV energy systems for a given area factoring in constraints at the terrace level and solar PV azimuth and inclination angle.

- **Waste Management Calculation**
  Predict and analyze the site waste generation.

MOBILIZING CAPITAL MARKETS FOR A CLIMATE-RESPONSIVE AND INCLUSIVE SOUTHEAST ASIA

Catalyzing Sustainable Bond Issuances In Southeast Asia

The ASEAN Catalytic Green Finance Facility's (ACGF) Green, Social, Sustainable and Other Labeled (GSS+) Bonds Initiative provides advisory support to sovereign, municipality, and state-owned-enterprise issuers while ASEAN+3 Asian Bond Markets Initiative (ABMI) focuses on supporting corporate issuers to catalyze signature GSS+ bond issuances and creates enabling environments for growth.

Key Activity Pillars

**Signature GSS+ Bond Issuances:** We provide hands-on support to potential issuers.

**Enabling Ecosystem:** Sustainable finance enabled through the development of a bond taxonomy, sustainability disclosure requirements, and the promotion of local verifiers.

**Talent Pool Development:** We offer capacity building and knowledge support on green and sustainable finance.

**In-House Experts:** A core team of ADB in-house experts provides on-the-ground support to ensure successful sustainable bond issuance.

We Support

- Sovereigns
- Municipalities
- Financial institutions
- Nonfinancial corporates
- State-owned enterprises

Bond Types

- Green bonds
- Social bonds
- Sustainability bonds
- Sustainability-linked bonds
- Blue bonds
- Other labeled bonds

Source:
TRANSACTIONS

- First ever **green bond** will be issued in Cambodia
- Aligned with the ASEAN green bond standards
- Approximately $1.3 million in local currency equivalent
- Finance EDGE-certified green office building in Phnom Penh

- First **green bond** by Thailand's real estate and retail industry developer
- THB 1 billion ($30 million), 3 years maturity
- Support investments in green projects and achieve the company’s ‘Journey to Net Zero’ plan by 2050.

- The first **sustainability-linked bond** issued under the ASEAN Sustainability-linked Bond Standards. The bond also aligned with SLB Guidelines
- Industrial estate developer in Thailand
- THB 1 billion ($30 million), 3 and 5 year maturity
- 3 times over subscription from from local institutional and HNW investors
- 2 KPIs including Scope 1 and Scope 2 GHG Emission Intensity Reduction and decrease in raw water consumption
**Lesson Learned**

**Green building certification**
- Understanding requirements
- Green building certification process takes time

**Project selection (green bond)**
- For real estate sector, not only green buildings can be green projects, but also renewable energy, energy efficiency, waste management, etc.
- Use of proceeds can be used for renovation of existing buildings

**KPIs selection (sustainability-linked bond)**
- KPIs should be material and relevant to the business and ambitious enough
- GHG emissions reduction is priority for many investors

**Monitoring of impact indicators/ KPIs**
- Utilizing existing monitoring systems

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<tr>
<td>Specific</td>
<td>Measurable</td>
<td>Achievable</td>
<td>Relevant</td>
<td>Time-bound</td>
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One ADB Task Force on Energy Efficiency in Buildings

Taskforce commenced in October 2023:

• To build on ongoing work and provide additional support to develop projects

• Cross task force members to bring multi-sector expertise

• Ensure all buildings financed by ADB comply with energy efficient and/or green building standards

• Provide a platform for sharing of knowledge and country experiences based on past and new projects as well as based on global trends

• Understand challenges faced by staff and provide guidance
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EXAMPLE OF IMPACT INDICATORS

<table>
<thead>
<tr>
<th>Eligible Categories</th>
<th>Potential Impact Indicators</th>
<th>SDGs address</th>
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<tbody>
<tr>
<td>Green buildings</td>
<td>• Green certifications obtained</td>
<td>SDG 7, SDG 11</td>
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<tr>
<td></td>
<td>• % of total portfolio</td>
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<td></td>
<td>• % reduction in energy usage and GHG emissions intensity in (kgCO2e/m2)</td>
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<td></td>
<td>• Annual GHG emissions reduced/avoided (tCO2e)</td>
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<tr>
<td>Energy efficiency</td>
<td>• % annual energy reduced/avoided in MWh</td>
<td>SDG 7, SDG 11, SDG 13</td>
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<tr>
<td></td>
<td>• Annual GHG emissions reduced/avoided (tCO2e)</td>
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<tr>
<td>Sustainable water</td>
<td>• Annual recycle water (m3)</td>
<td>SDG 6</td>
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<tr>
<td>&amp; wastewater</td>
<td>• % reduction in water usage intensity in m3/m2</td>
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<tr>
<td>management</td>
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<tr>
<td>Pollution prevention &amp; control</td>
<td>• Amount of waste reduced, reused, recycled and/or diverted from landfill (tons)</td>
<td>SDG 12</td>
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<tr>
<td></td>
<td>• CO2 avoided/reduced through waste management (tCO2e)</td>
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<td></td>
<td>• Amount of waste that is separated and/or collected and treated (including composting) (tons and %)</td>
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<td></td>
<td>• % Diversion rate (from landfill)</td>
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<td></td>
<td>• CO2 avoided/reduced through pollution prevention &amp; control and/or circular concept (tCO2e)</td>
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<tr>
<td>Environmentally sustainable management &amp; circular economy</td>
<td>• Area under Biological diversity assessment</td>
<td>SDG 13</td>
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<tr>
<td></td>
<td>• Amount of planting trees under forestation program</td>
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<tr>
<td>Clean transportation</td>
<td>• Numbers of EV charging stations provided</td>
<td>SDG 11</td>
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<tr>
<td></td>
<td>• Numbers of public transportation hub</td>
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<tr>
<td>Circular Economy</td>
<td>• Amount of waste reduced, reused, recycled and/or diverted from landfill (tons) under Journey to Zero program</td>
<td>SDG 12</td>
</tr>
<tr>
<td></td>
<td>• CO2 avoided/reduced through waste management (tCO2e)</td>
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