

Climate Finance for Green Affordable Housing in Ulaanbaatar

Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project

ICLEI

GPSC Peer Exchange Session with Finance Experts

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Ulaanbaatar: 1.4 million population (Mongolia: 3 million) Ger areas: 840,000 population; 60% of the City; 30% of the country

Ger areas mainly result from rural migrations, driven by extreme climate events, increased temperatures, and reduced precipitation.

Settlements of low- and medium-income households served by poor infrastructure and socio-economic facilities:

- (i) inefficient individual stove to burn low quality coal, and low energy efficient shelters;
- (ii) open pit latrines which create severe soil pollution impacting residents health especially when temperature rises;

(iii) limited access to water supplied by water kiosks;

- (iv) absence of green buffer zone and drainage, and extensive muddy road system making ger areas highly prone to flood events in summer;
- (v) lack of public space; sport, cultural, education and health facilities, business opportunities....



Continue to grow (migration + natural growth) due to lack of sustainable strategy, infrastructure, and affordable alternative

Hight vulnerability to climate change, highly emitting, highly polluting











Roads, water and wastewater networks, heating system, drainage, bridges, power, telecommunication, street lighting





Bayankhoshuu Subcenter



BI = Business Incubator **KG** = Kindergarten **UP** = Urban Park **HT** = Heating Transfer Station **SC** = Sport Complex



Green Affordable housing core subproject **5** a a 1





Resettlement building

RESULTS ON AFFORDABLE HOUSING

The Challenge



- How to deliver affordable green housing, and integrate it in a resilient and livable urban environment?
- Why and how to raise Climate Finance for affordable housing?

- Hight and Medium real-estate market saturated

- 60% of households want to buy apartments with 8% mortgage loan at MNT1.2 million/m2 in average. Prefer to stay within their communities.



Justifications

- Use Country Climate Assessments. Most of the development and climate issues are closely interrelated. Work on the baselines and maximize green components
- Study and target which Climate Instrument or Fund is the most adapted, and make sure the proposal is in line with the fund's objectives and criteria
 - Impact Potential (Adaptation and Mitigation)
 - Paradigm Shift Potential
 - Sustainable Development Potential
 - Need for the recipient
 - Country ownership
 - Efficiency and effectiveness
- Find the right partner (ex: GCF Accredited entity) who will carry the project with you
- Build a strong story line. Climate to Development Story or Development to Climate Story? Why Climate finance is needed? What if there are no Climate finance support?
- **Go for scale.** Going climate finance requires a lot of work, no matter the size of the Project. Small projects or big projects requires almost the same amount of work. Climate funds want high impact, big, and transformative projects.





Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Project

Large scale demonstration project and complete solution, leveraging private sector investment, to deliver affordable and green housing stock, and establish policies, mechanisms, and standards for sustainable affordable housing and green urban development.



10,000 housing units (55% affordable, 15% social, and 30% market rate units) and redevelop **100 hectares** of *ger* areas into **ecodistricts** that are:

(i) mixed-use with ample public space and public facilities,

(ii) mixed-income with at least 65% of combined affordable and social housing units,

And

(iii) Resilient, resource efficient, and maximizing the use of renewable energy

Improve the regulatory and enforcement framework for climate responsive urban planning, green building, and affordable housing.





ECO-DISTRICT PRINCIPLES

Mixed land uses and functions (residential, commercial and recreation functions; ample public and green space; education, cultural and health facilities; minimize needs for transportation)

Social mix (urban areas that mixed different category of population having different income level) and vibrant/engaged communities

Green and resilient using implementable renewable energy and energy efficient

Attractive for communities: Quality of life, Social integration, and Affordable

Attractive for real estate developers: Reasonable Net Profit Value

In line with City master and local plans, and urban regulation

Green Features

Renewable Energy

- Passive Solar Design

- PV (Photo Voltaic) Panels

Energy Efficiency

- High efficiency isolation system based on Mongolian Norm and Regulation "Thermal Performance of Buildings"

Efficient land use planning

- Compact design
- Shape and building orientation

Energy Performance Monitoring System (green and smart)





ECO-DISTRICT / BLOC DEVELOPMENT

Integrated planning and development process, and complete solution at the neighborhood level to build up citywide sustainability and green development

> **Combination** of public policy, catalytic investments from local government and utilities, private sector and communities participation

Bridge the gap between green policy objectives and practical investments

Appropriate scale for step by step implementation and to enhance neighborhood urban and environmental solutions



Block













ECO-DISTRICT DESIGN PARAMETERS

- Housing units should comprise **15% social housing**, **55% affordable housing**, and **30% market rate** housing.
- **30% of land use is public space** (including 15% of open space and green areas)
- the ratio of m² of public amenities/facilities, commercial facilities, and entertainment areas per person correspond to average international standard, respectively 1.2 m²/persons, 1.5 m²/persons, and 0.5 m²/persons.
- The average density of an eco-district should be about **300 p/ha** and housing building should comprise townhouses or low-rise building of a maximum of five to six floors.
- Each building should reach an energy efficiency performance guaranteeing an **energy consumption of 150 kilowatt hours per m² per year,** housing units should be equipped with indoor air filtration system, passive design, sensor in building, heating regulation system.
- Universal design will be apply and the building and structures should be earthquake resistant.
- Building and facilities should have **18% of their footprint covered with solar panels**.
- At least **10% of the eco-district surface should be covered with greenhouses** for urban farming (on the ground or on building or facilities rooftop).

Institutional and Financial Scheme



ADB



Implementation Steps and Criteria



Subprojects identification:

- Eco-district should be located in ger areas
- Close to main trunk Infrastructure
- Demand based

Eco-district development:

- 100% landowner willing to participate (voluntary resettlement)
- Financially feasible
- In line with master plan





Financing Plan

Source	Amount (USD million)	Share of Total (%)
Asian Development Bank	80.0	14.0
Green Climate Fund		
GCF (grant)	50.0	8.8
GCF (concessional loan)	95.0	16.7
Subtotal	145.0	25.5
HLT Fund (grant)	3.0	0.5
Commercial banks/DBM	111.4	19.6
Developers	131.8	23.1
Beneficiaries	63.9	11.2
Municipality of Ulaanbaatar	35.0	6.1
Total	570.1	100.0





KEY MECHANISMS

- **Designed Based PPPP (Public Private People Partnership)** to insure the overall cohesion of the eco-district and its energy efficient land use and physical plan, the affordable housing delivery, the right technical specifications for building performance, and the adequate procurement packaging and method for PPPP implementation.
- Financial intermediary (financed by the Green Climate Fund) to promote a financial and institutional integrated mechanism, with revolving mechanism, to leverage private sector resources (Total cost: \$570.1 million, including EDAF leveraging and private financing commercial banks, developers and beneficiaries, that is \$307.1 million).
- **Green Building facility** (financed by the Green Climate Fund): performance-based grants to qualified private developers for climate change mitigation and adaptation features such as passive housing design, extra isolation system, and heating regulation system to bring down the energy consumption for heating from 395 kWh/m2 per year to 150 kWh/m2 per year, for a total reduction of 230 million kWh thermal energy input.





- **Renewable energy** in buildings, 71,000 m2 of 11MW solar PV on housing building's rooftops, that will generate 15.6 GWh per year

- Smart renewable energy and building performance control and monitoring system (financed by HLT fund) will establish an energy performance monitoring system, install and provide initial O&M for solar PV, pilot small scale grid lithium-ion battery storage plant, and pilot private sector management contract for solar panels operation and maintenance.

It will perform the following major functions:

- (i) integrate control and monitoring of renewable and conventional energy sources and ventilation systems;
- (ii) aggregation of data inputs from heat, electrical, hot and cold water metering, thermostats, and humidity sensors;
- (iii) consolidation and reporting of energy and water use data;
- (iv) fault and water leak detection and alarms with remote reporting; and
- (v) measuring, reporting, and verification system for eco-efficient construction techniques and materials, and renewable energy.

Voluntary Land Swapping Mechanism that will provide housing solution to all residents for in situs redevelopment and through which the ger area population can move up to more climate resilient, low carbon, modern apartment buildings.





- Sector and Policy reform: Green building standard (including eco-efficient materials, equipment, passive solar house design, renewable energy, and ventilation systems) and associated regulations, energy efficient construction material and techniques, energy systems, tariff, efficient supply chains for renewable energy systems and energy efficiency, and comprehensive urban planning that combine climate resilience, social cohesion, and economic opportunities.

 \rightarrow \$24 million technical assistance (including Detailed Design and PMO staff)

- Long term program with critical mass to remove market barrier, cost of material, increase domestic production, promote green finance, and insure linkages between constructor/developer/end-user and performant material/equipment producer

Highest scores from GCF Independent Technical Review Panel



Impact potential	 <u>Mitigation</u> Direct economic lifetime GHG emission reductions of 7.92 million tCO2e (200,000 tCO2e/year) Indirect economic lifetime GHG emission reductions of 39.59 million tCO2e (including direct emission reductions). <u>Adaptation</u> 100,000 direct beneficiaries benefitting from reduced climate change vulnerability. 900,000 indirect beneficiaries benefitting from reduced climate change vulnerability (including direct beneficiaries). Co-benefits 1.4 million people in UB benefitting from reduced air pollution, further estimated to grow to 2.7 million people <u>Transformational impact</u> Policies and regulations conducive to decentralized renewable energy, and energy efficiency in buildings in effect Efficient supply chains for renewable energy systems and energy efficient construction technics and material in effect Climate responsive urban planning, green banking policies, sector capacity, and implementation capacity developed
Paradigm shift potential	 Significant replication potential Possibilities for learning plus mechanisms for M&E and learning Support for enabling environment and policies & measures Policies and regulations for resilient and energy efficient urban development, decentralized renewable energy in effect Efficient supply chains for renewable energy systems and energy efficiency developed.
Sustainable development potential	 Significant social co-benefits – affordability mechanisms Economic co-benefits - jobs Significant environmental co-benefits – reduced air pollution benefitting 1.4 million people living in Ulaanbaatar.
Needs of the recipient	 Mongolian vulnerability Mongolia's tight macroeconomic conditions Needs of the target population Role of climate change in causing rural-urban migration and urban climate change vulnerability
Country ownership	 Mongolia's (Intended) Nationally Determined Contribution Mongolia's National Action Programme on Climate Change Mongolia's Second National Communication Affordable Housing Strategy (AHS) for Ulaanbaatar Ulaanbaatar City Master Plan
Efficiency and effectiveness	 GCF cost (mitigation funding) per tCO₂e of less than \$7. Number of direct and indirect beneficiaries from increased climate resilience, related to adaptation spending.



AHURP/GADIP - Synergies



GADIP (SELBE EAST) Main trunk infrastructures

- Main roads
- Networks
 - Water, Heating, Sewage
- Public amenities
- Kindergarten
- Business Incubator



AHURP Block development

- Affordable housing
 - Housing units
 - Shops / Offices
- Secondary Infrastructure
- Urban renewal

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- Basic urban services
- Local public amenities
- Parks/Public space











Langth Cross Section





PERSPECTIVE

2 billion urban dwellers in Asia, expected to reach 3.3 billion by 2050.

Urban centers need to provide housing for a large number of new residents every near. The ADB Institute estimates that **127,000 people are added to urban centers every day in Asia**.

563 million people in Asia leave in slum, that need to be changed into livable, resilient, and energy efficient urban areas.



THANK YOU

