CEMAATERR

TERRITORIAL APPROACH TO ENERGY AND CLIMATE

Empowering local authorities to implement climate change & energy transition agenda

Arkhangai province's commitment towards an action plan for energy efficiency of the building sector

geres ACTING FOR CLIMATE SOLIDARITY

AFD

ARKHANGAI PROVINCE'S MAIN DATA

- -14°C is the average temperature during the cold season (October to April).
- Almost 70% of the province territory is situated within the continuous and periodic permafrost range.
- Soum development fund's budget covers up to 70% of public buildings' construction and retrofitting.

GERES NGO

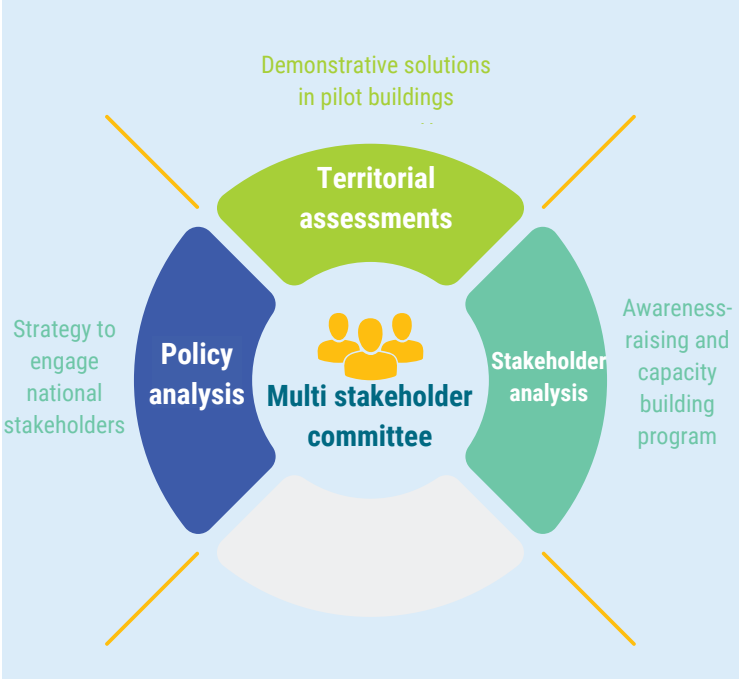
Set up in 1976, Geres is an international development NGO working in Europe, Africa and Asia to improve living conditions and fight against climate change and its impacts. The energy transition is a major lever in our activities. In the interests of ambitious societal change, we encourage the development and rollout of innovative, locally-based solutions, support territorial climate and energy policies, and mobilize all stakeholders around Climate Solidarity, urging them to take action and stand up for the most vulnerable.

Our operations include work on developing a value chain as it creates jobs and is often key to the sustainability of the solutions created. We also put great importance on ensuring that our stakeholders have a sense of ownership. Moreover, we focus on capacity-building activities to drive the dynamics of change, develop resilience strategies and open up the field of opportunity so that everyone can play a part in sustainable development.

CLIMATE-ENERGY: ADAPTATION AND MITIGATION MEASURES IN RURAL AREAS AND SECONDARY CITIES - CEMAATERR

CEMAATERR is a multi-country project that launched in November 2016 with the financial support of the French Development Agency. It involves 4 areas particularly vulnerable to climate change in Benin, Cambodia, Morocco and Mongolia. In Mongolia, the project is implemented in close collaboration with the Governor's Office of Arkhangai, Sustainable development NGO, the Construction Union of Arkhangai and future local/public journalists and in synergy with GIZ Mongolia's "Energy Efficient Building Refurbishment" project.

The second phase of the CEMAATERR project launched in 2019, targets the building sector and identifies the energy transition in the province as a priority. It aims at optimising energy efficiency in health, educational and social public buildings in order to improve comfort for users, and reduce carbon emissions and energy expenditure.



KEY ACHIEVEMENTS

Establishment of the multi-stakeholder committee

From the start of the project, the Governor of Arkhangai province formally set up a Steering Committee, led by the Deputy Governor and consisted of representatives from the Citizens' Representative Khural, the Governor's Office (Departments of Construction, infrastructure, planning and development, Environment, Education, Social Protection, Inspection and Finance), Energy Regulatory Committee and NGOs.

The Committee met on a quarterly basis and participated in field visits at different stages of the project, such as the baseline study, validation of technical solutions, monitoring and evaluation of pilots, capacity-building and awareness-raising activities.

It also played a decisive role at all steps, ensuring an inclusive multi-stakeholder collaboration between public institutions and civil society and encouraging commitment and ownership for the stakeholders. It paves the way for sustainable collaboration and management schemes dedicated to climate and energy transition in the province.

Territorial Assessments

This analysis and additional complementary data collection helped improve the knowledge of decision-makers, informing their territorial planning exercises and prioritising public investment plans.

A **territorial assessment study** covering energy consumption, construction structure and GHG emissions of the **241** public buildings of the province, was conducted. Following a literature and administrative statistical review, 6 soums representing the diversity of climatic and heating conditions, were selected for the detailed analysis. Research organisation, BEEC LLC implemented field measurements on 62 buildings and provided the **Energy Performance Certificate** with recommendations to improve energy efficiency of the 57 public buildings labelled in D and E categories.

- Even though thermal regulations are theoretically respected, many of the buildings remain energy consuming and do not provide sufficient comfort to their users. Public buildings of the province emit **39 000 tons of CO2** per year, considering GHG emissions from the centralised heating system in Erdenebulgan soum (51,4% of the emissions) and consumption of water heating boilers in the other soums.

- Energy consumption for heating represents up to **80% of the operational budget** of the buildings. Introducing energy efficiency measures is a key leverage to improve comfort and reduce energy cost, on top of reducing the carbon footprint.

A **survey on housing conditions and energy resources and practice**s in Tsetserleg was conducted with the support of Technical and vocational education and training (TVET) students through gender-sensitive interviews of **172 households** combined with on-site measurements.

- Neither men nor women have sufficient knowledge of energy-saving and energy efficiency practices, especially about foundation insulation and the performance of insulation materials.

- They are not aware of their energy consumption level and do not monitor it.

- Women are not satisfied with the thermal comfort at home and vulnerable family members get sick very often due to the cold air during the winter season.

- Respondents expressed their interest in increasing their knowledge about qualified energy sources and energy efficient practices to increase the warmth duration.

A **"climate proofing"** analysis was conducted using GIZ methodology helped the project team to put in perspective the foreseen technical options with long-term climate change scenarios.

Stakeholder mapping and analysis

The roles and responsibilities of each participating stakeholder were analysed, as well as the constraints and limitations to fully fulfilling their role. The Government of Arkhangai shared the preliminary analysis made by Geres in order to collect the inputs of each organization, which helped improve the analysis and fine-tune the capacity-building plan.

- Local public entities face numerous challenges to monitor and follow-up with building-related issues, due to government structure, legal framework and lack of human resources. Technical provincial services are unable to travel frequently in the field and there is no dedicated position at the Soum level. Weak collaboration among stakeholders, especially with civil society, prevents them from participating actively in research and innovation, encouraging citizens' awareness-raising efforts and providing technical guidance to the decision-making processes.

Awareness-raising and capacity-building program

With the support and guidance of Geres, the SDG NGO and journalists implemented a series of awareness activities to spread good practices in tackling climate change in every soum of the province, reaching 95,000 inhabitants. Under the campaign, **14 articles** were published in local media and social media channels, a Photo competition in 11 soums involving **500 students** and an Eco-office competition involving 8 public offices were organized, a talk show about energy efficient good practices was released on local TV, and **45 ambassador households** in Tsetserleg were deeply involved in the project. Additionally, **16 households** were selected to implement simple and low-cost energy efficient solutions such as roof insulation (10), light bulb change (15) and door and windows insulation (15).

Demonstrative solutions in pilot buildings

- Technical and behavioural solutions to optimise energy uses were implemented in **3 pilot public buildings** that have been selected together with public institutions in order to test and demonstrate their relevance and feasibility and to document the conditions for their dissemination in buildings with similar features.
- Blueprint for renovation was developed considering the users' needs and expectations.
- Construction companies established in the Province, selected through a competitive procurement process, benefited from continuous onsite technical guidance of Geres and BEEC LLC about energy efficient solutions.

Construction of a 100 sq.m safe house in Tsetserleg soum - 2019-

Beneficiaries: 67 victims of domestic violence, 9 social workers and administrative staff

Solutions: Using volcanic rock and bioclimatism

Cost: 45,000 Euros

Retrofitting of a kindergarten in Undur-Ulaan soum - 2021-

Beneficiaries: 251 students (up to 6 years old), 31 educational and administrative staff

Solutions: Flat roof insulation, waterproof PVC, floor and hollow foundation insulation, replacement of entrance door, replacement of bulbs (LED), improvement of ventilation system, replacement of window seals and painting

Cost: 40,000 Euros, 30% covered by the Local Development Fund

Retrofitting of a hospital in Khashaat soum -2022-

Beneficiaries: 450 patients, 27 hospital and administrative staff

Solutions: Attic roof insulation, wall insulation, foundation insulation, replacement of windows, replacement of doors and bulbs (LED) & electrical appliances and rain water collector

Costs: 43,000 Euros, 70% covered by the Local Development Fund

Key technical solutions implemented include:

- Water-proof PVC membrane was used in a flat roof for the first time in the province, presenting a promising guarantee of up to 50 years.
- Insulating the hollow foundation and its column is an essential prerequisite to reduce the effects of permafrost.

Key challenges and results reached:

- Energy audits and quantitative and qualitative monitoring protocols involving the building users were conducted and they helped to assess the environmental and social impacts and advise the managers for future uses.
- In both renovated buildings, the energy passport increased from **"E" to "C"** category. Annual energy consumption decreased by **54%** in the kindergarten and by 49% in the hospital; while users prove improved comfort and well-being inside.
- In the kindergarten, the coldest class increased by **6 degrees (15 to 21 °C)**; and the average temperature of classes increased from 19 to 24 by 5 degrees. Reduced energy consumptions for heating in 2021 are equivalent to **70 tons of GHG.**
- The absence of a value chain of local green buildings has been a key challenge faced during the project implementation. Options for insulation materials are limited due to the absence of local insulation material production and the pandemic caused increased prices (up to 2 times) of imported materials. In addition, the province lacks professional engineers for the construction company.

TESTIMONY OF A USER

"Before it used to be so cold that we had to wear our coats indoors, but after the insulation, the kindergarten is a warm and comfortable learning and working environment for the children and staff."

Ts. Duurengerel
Teacher, Undur-Ulaan kindergarten

Policy Analysis

Analysis of key national development policies and programs underlines the absence of specific roles and objectives dedicated to rural local authorities in accomplishing the climate change, energy transition and sustainable development goals. Some national regulations and standards are not adapted to local specificities with limited power of local entities to modify them.

When mainstreamed into local strategies and action plans, climate change and energy issues are addressed on a sectoral basis, without a transversal approach, and that makes it lack specific goals and objectives adapted to the local context.

- Considering the potential of optimising energy efficiency in public buildings based on the pilot buildings results, government organizations can influence its development through urban strategy and public purchase. Therefore, the Government of Arkhangai expressed the will to develop a clear agenda to optimise energy usage for the building sector.

NATIONAL STAKEHOLDER ENGAGEMENT STRATEGY

Pilot initiatives attracted the interest of government organizations as it utilizes existing public funding meaningfully while maximising their social benefit. A significant amount **(30% to 70%) of the cost** for those demonstrative solutions was covered by the Local Development Fund and the similar Provincial Development Fund. Furthermore, those initiatives raised the interest of the Ministries of Construction and Urban Development and the Ministry of Environment as it could be potential best practices to be scaled-up and widely used.

However, existing arrangements of financial law limit public building managers to reallocate the amounts resulting from energy consumption savings (for example, allowing capital expenditures to be used for further retrofitting or to slide the remaining budget to another fiscal year). In addition, in buildings connected to central heating systems, the absence of a thermal counter does not allow for adaptation of the energy consumption to the specific needs of one building.

Those constraints do not provide sufficient incentives for local public contracting and managing entities to improve the energy efficiency of their public buildings or invest in renewal energies, even though current and expected climate trend seeing an increased duration of the shoulder seasons (both spring and autumn) is an additional opportunity to reduce heating needs and decrease energy consumption in buildings that have been thermally retrofitted. Through a collaboration with Woman Law Association legal experts, a meaningful and efficient national stakeholder engagement strategy is being developed

ARKHANGAI PROVINCE'S COMMITMENT TO OPTIMISE ENERGY USES IN PUBLIC BUILDINGS

Arkhangai Government developed a long-term vision and defined 5-yearly targets to disseminate energy efficiency practices and spread out renewable energy resources in the provincial public buildings.

Policy goals

- Cost reduction for public institutions
- Reduce CO2 emmisions - natural mitigation engagement
- Increase energy autonomy
- Improve air quality and comfort for public building users

Short, middle, and long-term visions

By 2025
Promote energy efficiency solutions and renewable energy solutions for all type of buildings

By 2022
Improve awareness and knowledge of all stakeholders about energy and climate issues, test demonstrative solutions in pilot public buildings and houses, and assess conditions for the dissemination

By 2035
Disseminate energy efficiency solutions and promote renewable energy sources

Objectives until 2025 by type of public buildings

By 2025, 32 energy efficient buildings are constructed respecting label "C" at least; and 11 buildings are retroffited (out of 57, representing 19% of the existing provincial building stock), with a reduction in energy consumption and GHG emmissions estimated at 45% per building.

Administrative buildings
- 5 buildings constructed
- 3 buildings retrofitted
- 125 thousand Euros invested from Local development fund
- 2.5 million Euros invested from state budget

Cultural buildings
- 7 buildings constructed
- 5 buildings retrofitted
- 34 thousand Euros invested from Local development fund
- 9.5 million Euros invested from the Ministry of Culture

Health buildings
- 5 buildings constructed
- 1 building retrofitted
- 27 thousand Euros invested from Local development fund /Khashaat/
- 5.2 million Euros invested from the Ministry of Health

Education buildings
- 15 buildings constructed
- 2 buildings retrofitted
- 27 thousand Euros invested from Local development fund
- 9.7 million Euros invested from the Ministry of Education

RECOMMENDATIONS FOR PUBLIC INSTITUTIONS TO SCALE-UP ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS

Elected bodies:

- Set up clear objectives related to buildings into a comprehensive energy transition and climate change mitigation plan
- Set up a dedicated managing body including representatives from all participating Departments and external voluntary stakeholders – including civil society and private sector representatives- to share information and create synergies about energy and climate commitments
- Allocate sufficient budget within local funds for insulating the buildings and upgrading heating systems
- Set up clear monitoring mechanisms based on data collection considering user experience

Provincial Governor's Office:

- Include ambitious goals for energy efficiency in the Government action and investment plans
- Enhance the number of specialized employees in charge of checking the conditions of public buildings -including thermal regulations, indoor air quality and security - and provide them with adequate monitoring equipment (thermal cameras)
- Set up collaborative mechanisms using digital technologies that improve guidance of provincial Technical Department and Architect to soum decision-makers and building managers
- Raise awareness about energy efficiency solutions in Departments dedicated to managing public tenders, collecting data, planning & follow up the operational budget of public buildings, and concerned by the comfort of public buildings users
- Improve participation of soum's Governor's Offices, public building managers and end-users into decision making process

Soums' Governor Offices:

- Create a new dedicated position or improve existing job descriptions to better suit to supervise and monitor public buildings
- Develop the skills of public building managers and provide them with adequate measurement equipment

Public building managers:

- Develop their knowledge about existing solutions to optimize energy use and improve their capacities to identify the needs, participate in the renovation and construction process, and dedicate appropriate budget for maintenance and energy consumption

Central public institutions:

Specific suggestions for legislation have been developed and shared with concerned Ministries, including the Government, Ministry of Finance, Ministry of Economy and Development, Ministry of Environment and Tourism, Ministry of Construction and Urban Development, Ministry of Education and Science, Ministry of Health, Ministry of Energy, and Ministry of Finance.

- Define comprehensive reporting mechanisms related to climate change in line with local planning, and support local authorities in monitoring
- Set up regulatory and financial incentives to encourage local authorities' efforts in implementing thermal regulations
- Improve the autonomy of local authorities to modify blueprints and adapt regulations to the specificities of the local context
- Encourage sharing of information and synergies with external stakeholders, including civil society and private sector Improve transparency and information sharing process about public building construction and renovation into multi-year planning
- Solve the issue of labeling

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