**FINAL EVALUATION REPORT**

of the

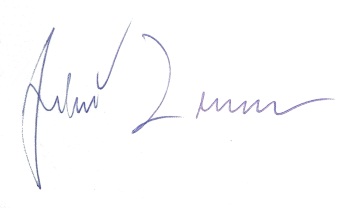
UNDP/GEF Medium Size Project

**Improving Energy Efficiency in Buildings, Kyrgyz Republic**

Project ID: 62794

PIMS: 3910

This Final Evaluation Report was prepared for UNDP Kyrgyzstan by:



Jiří Zeman, International Consultant

November 2013

**Table of content**

[Acknowledgements 5](#_Toc374685051)

[Abbreviations and acronyms 6](#_Toc374685052)

[1. Executive Summary 7](#_Toc374685053)

[1.1 Brief description of project 7](#_Toc374685054)

[1.2 Context and purpose of the evaluation 8](#_Toc374685055)

[1.3 Main conclusions, recommendations and lessons learned 8](#_Toc374685056)

[2. Introduction 11](#_Toc374685057)

[2.1 Project background 11](#_Toc374685058)

[2.2 Purpose of the evaluation 13](#_Toc374685059)

[2.3 Key issues addressed 14](#_Toc374685060)

[2.4 Scope and methodology of the evaluation 14](#_Toc374685061)

[2.5 Structure of the evaluation report 15](#_Toc374685062)

[3. The Project Description and Development Context 16](#_Toc374685063)

[3.1 Project start and its duration 16](#_Toc374685064)

[3.2 Problems that the project sought to address 16](#_Toc374685065)

[3.3 Immediate and development objectives of the project 17](#_Toc374685066)

[3.4 Main stakeholders 17](#_Toc374685067)

[3.5 Results expected 17](#_Toc374685068)

[3.6 Analysis of the situation with regard to outcomes, outputs and partnership strategy 18](#_Toc374685069)

[4. Findings 21](#_Toc374685070)

[4.1 Project design and formulation 21](#_Toc374685071)

[4.1.1 Project relevance and implementation approach 21](#_Toc374685072)

[4.1.1 Conceptualization/design 22](#_Toc374685073)

[4.1.2 Planned stakeholder participation 23](#_Toc374685074)

[4.1.3 Replication approach and sustainability strategy 23](#_Toc374685075)

[4.1.4 Linkages between the project and other interventions within the sector 24](#_Toc374685076)

[4.1.5 Design of Monitoring and Evaluation 24](#_Toc374685077)

[4.1.6 UNDP comparative advantage 25](#_Toc374685078)

[4.1.7 Replication approach and sustainability 25](#_Toc374685079)

[4.1.8 Cost-effectiveness 25](#_Toc374685080)

[4.2 Project Implementation 27](#_Toc374685081)

[4.2.1 Project implementation and adaptive management 27](#_Toc374685082)

[4.2.2 Partnerships arrangements 27](#_Toc374685083)

[4.2.3 Monitoring and evaluation 27](#_Toc374685084)

[4.2.4 Feedback from M&E activities used for adaptive management 28](#_Toc374685085)

[4.2.5 Financial planning and management 31](#_Toc374685086)

[4.2.6 Management by the UNDP Country Office 33](#_Toc374685087)

[4.2.7 Co-financing and in-kind contributions 34](#_Toc374685088)

[4.3 Results 37](#_Toc374685089)

[4.3.1 Overall results and attainment of objectives 37](#_Toc374685090)

[4.3.2 Relevance 37](#_Toc374685091)

[4.3.3 Effectiveness and efficiency 38](#_Toc374685092)

[4.3.4 Country ownership 38](#_Toc374685093)

[4.3.5 Mainstreaming 38](#_Toc374685094)

[4.3.6 Sustainability 38](#_Toc374685095)

[4.3.7 Project impact 39](#_Toc374685096)

[5. Conclusions, Recommendations and Lessons Learned 40](#_Toc374685097)

[5.1 Recommendations 41](#_Toc374685098)

[5.1 Lessons Learned 42](#_Toc374685099)

[6. Annexes 43](#_Toc374685100)

[Annex 1: Itinerary and list of persons interviewed 43](#_Toc374685101)

[Annex 2: List of key project short-term experts (SSA/IC) 43](#_Toc374685102)

[Annex 3: List of documents reviewed 44](#_Toc374685103)

[Annex 4: Summary of reviewed key project deliverables, reports and studies 45](#_Toc374685104)

[Annex 5: Final evaluation TOR 46](#_Toc374685105)

**Profile of the consultant:**

Mr. Jiří Zeman, has 20+ years of professional experience in energy efficiency, renewables, climate change and energy utilities primarily in Central and Eastern Europe and Central Asia. He has served as a Deputy Director of a leading energy efficiency consulting organization SEVEn, The Energy Efficiency Center in Prague, the Czech Republic, as a Solution Architect at a Utility Competence Center of Hewlett Packard for Central and Eastern Europe, Middle East and Africa, and since 2009 he works internationally as a freelance consultant. Mr. Zeman has developed, implemented and evaluated a number of energy efficiency and renewable energy projects (including UNDP/GEF sponsored ones) in Central and Eastern Europe and Central and South-East Asia, developed feasibility studies on district heating rehabilitation for international financial institutions, and delivered trainings on feasibility study development and business planning.

Contact details: Mr. Jiří Zeman

Murmanská 5

100 00 Praha 10

Czech Republic

Email: [jirkazeman@seznam.cz](mailto:jirkazeman@seznam.cz)

Tel: +420-776818363

# Acknowledgements

The author of the final evaluation would like to express his gratitude to all project stakeholders whom he met and interviewed during the project final evaluation mission in Kyrgyz Republic in November 2013 and who generously provided their views and opinions on project results and impacts.

The author would like to express his thanks specifically to Ms. Elena Rodina, Project Manager and Ms. Elena Pasportnikova, Administrative Finance Assistant, as well as to all other interviewed parties, who provided all requested information and valuable inputs for the project evaluation during the evaluation mission. The cooperation with the project team, all project partners and UNDP CO in Kyrgyzstan was effective, and the evaluator received all information requested.

# Abbreviations and acronyms

APR Annual Project Review

AWP Annual Work Plan

CEO Chief Executive Officer

CO Country Office

EE Energy Efficiency

EPB Energy Performance of Buildings

GEF Global Environment Facility

Gosstroy State Agency for Architecture and Construction under the government of the Kyrgyz Republic (SAAC)

IBD Integrated Building Design

IFC International Finance Corporation

MTE Mid-Term Evaluation

NGO Non-Government Organization

PDF Project Development Facility

PIMS Project Information Management System (UNDP GEF)

PIR Project Implementation Review

PIU Project Implementation Unit

SNiP Building Technical Standards and Rules – (SNiP = Stroitelnye Normy i Pravila)

ToR Terms of Reference

UNDP United Nations Development Programme

# Executive Summary

GEF Project ID: 62794

PIMS: 3910

Country: Kyrgyz Republic

Project Title: Improving Energy Efficiency in Buildings

GEF Agency: UNDP

Other Executing Partner: State Agency for Architecture and Construction under the Government of the Kyrgyz Republic

Table 1: Project Timeframe

|  |  |  |
| --- | --- | --- |
|  | Expected date | Actual date |
| CEO endorsement/approval |  |  |
| Agency approval date |  | December 12, 2008 |
| Implementation start |  | December 12, 2008 |
| Midterm evaluation completion |  | November 2011 |
| Project completion |  |  |
| Terminal evaluation completion | November 2013 | December 2013 |
| Project termination |  |  |

## Brief description of project

The four-year project (2009-2012) with a total UNDP/GEF budget of 950 000 USD has been designed with a project objective to reduce energy consumption and associated GHG emissions in Kyrgyzstan building sector and has defined five project outcomes:

1. Improved energy performance building codes
2. Improved enforcement levels of mandatory energy efficiency building codes
3. Pilot buildings with integrated building design approach constructed
4. Promoted best energy efficiency design and building practices in construction sector
5. Implemented monitoring of building energy consumption and GHG emissions

The investment costs for construction of two pilot schools have been designed to be provided as an in-kind contribution by municipalities in Osh and Bishkek; the budgeted in-kind contribution is 3.182 mil USD.

The focus of the project “Improving Energy Efficiency in Buildings” on strengthening energy efficiency building code, developing local capacities, building certification system, and monitoring of energy and GHG savings correctly addresses one of few if not the only one feasible low-cost energy efficiency strategy that could be implemented in a sustainable way even in such difficult conditions.

## Context and purpose of the evaluation

This Final Evaluation has been performed on a request of UNDP CO Kyrgyzstan as the GEF Implementing Agency as a part of a standard project monitoring and evaluation procedure of UNDP/GEF projects.

The Final Evaluation including on-site mission has been performed in November/December 2013.

## Main conclusions, recommendations and lessons learned

To be revised/updated

**Other key recommendations:**

* Disseminate locally developed financial management tool/spreadsheet to other UNDP/GEF projects in other countries
* Revise LogFrame and improve quality of LogFrame designs also in other projects in other countries – typically avoid using targets that are not specific enough and targets that are not measurable (clearly distinguish between SMART LogFrame targets and estimated replication potential that covers post-project expected activities)
* Develop effective administration system for building certification (building energy passports and energy labels), including appropriate organizational set-up.
* Develop specific methodology for the monitoring system and implement the monitoring in pilot schools
* Strengthen information dissemination and international/regional cooperation – make the project website a comprehensive source of information on energy efficiency in buildings in Kyrgyzstan, organize additional local and regional workshops/roundtables for sharing already developed local hands-on experience with development of the new EE code and primary legislation, application of the code, and design and construction of EE buildings
* In future projects do not rely on uncertain commitments of third-parties to finance construction of energy efficiency buildings only. Use more legally binding commitments or develop alternative solutions and risk mitigation strategies in Project Document already.

**Main lessons learned:**

* Even in a difficult and unstable economic and political situation and in case of low energy prices, a low-cost energy efficiency strategy can be implemented with sustainable long-term impact. The focus on energy efficiency and Integrated Building Design in newly constructed buildings is probably the only effective and feasible strategy that can be implemented in a sustainable way with limited incremental costs in such challenging conditions.
* The secret of low-cost energy efficiency strategy in constructing new buildings is to develop smart design, and not just to mechanically implement advanced energy efficiency code, such as design of wall insulation as thick as required. Success of IBD approach is based on effective communication and involvement of different advanced expertise of leading architects, building engineers and heating/HVAC engineers from the very early stages of building concept design.
* The project, although initiated and developed with substantial international support, has been able to properly address real local needs and to develop strong country ownership. A critical factor was direct involvement of Gosstroy, a key local authority responsible for building construction, which serves as a Project Implementing Partner.
* Excellent results of adaptive management have been achieved and alternative investors have been attracted to finance construction of two pilot buildings when two local municipalities failed to fulfill their co-financing commitment. The lesson learned is that even in difficult economic and political situation, there always is a chance to find a solution.
* Critical success factor is a strong leadership of project management that combines good managerial skills and good knowledge of local conditions, supported by international experts who provided up-to-date international expertise, both from Russia and CIS region, and from western countries.
* International experts need to have both an advanced up-to-date international expertise and to have a “feeling” for and to understand in detail local conditions and technical knowledge of local professionals in order to be able to properly address their actual needs.
* An important lesson learned worth to replicate across all UNDP/GEF projects in other countries is the use of a simple, locally developed financial management tool/spreadsheet for effective daily financial management and control.

The overall rating of the project is

Rating of individual project evaluation benchmarks is summarized in Table 2.

Table 2: Summary Rating of the Project Implementation

|  |  |
| --- | --- |
|  | **Rating** |
| **Project Formulation** |  |
| Project relevance (HS) and implementation approach in ProDoc (due to expired co-financing commitment for the Kokshetau pilot project at the time of project signature) |  |
| Logical Framework |  |
| Lessons from other projects incorporated |  |
| Planned stakeholder participation |  |
| Replication approach and sustainability strategy |  |
| UNDP comparative advantage |  |
| Linkages between project and other interventions |  |
| Management arrangements |  |
| **Project Implementation** |  |
| Project implementation and adaptive management |  |
| Partnerships arrangements |  |
| Monitoring and evaluation |  |
| Feedback from M&E used for adaptive management |  |
| Financial planning and management |  |
| Management by the UNDP office |  |
| **Project Results** |  |
| Overall results and attainment of objectives |  |
| Relevance |  |
| Effectiveness and efficiency |  |
| Country ownership |  |
| Sustainability |  |
| Project impact |  |
|  |  |
| **Overall Project Rating** |  |

**Rating scales:**

HS – Highly Satisfactory, S – Satisfactory, MS – Moderately Satisfactory, MU – Moderately Unsatisfactory, U – Unsatisfactory, HU – Highly Unsatisfactory

Relevance: R – Relevant, NR – Not Relevant

Sustainability: L – Likely, ML - Moderately Likely, MU - Moderately Unlikely, U – Unlikely

Impact: S – Significant, M – Minimal, N - Negligible

**Summary of key recommendations:**

**Main lessons learned:**

# Introduction

## Project background

The Kyrgyz Republic is a poor, mountainous country with a dominant agricultural sector (27% of GDP, source: [www.gfmag.com](http://www.gfmag.com)), but it is rich in water and several mineral resources, including gold. Electricity is produced locally from hydro power, up to some 10% of produced electricity is seasonally exported; natural gas, oil and majority of coal is imported. Electricity supply faces frequent outages and is planned to be rationed (ie. interrupted) in the winter period.

According to the World Bank, Kyrgyz Republic with its GDP per capita in 2010 of 860 USD ranks among the poorest countries in the Central Asia.

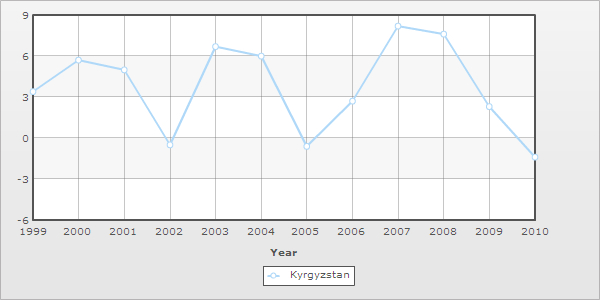
Table 1: GDP per capita in 2010

|  |  |
| --- | --- |
| Country | GDP per capita [USD] |
| Russia | 10 440 |
| Kazakhstan | 8 764 |
| Turkmenistan | 4 180 |
| Uzbekistan | 1 384 |
| Kyrgyz Republic | 860 |
| Tajikistan | 820 |

Source: The World Bank, http://data.worldbank.org

The country is one of the most open and tourist friendly countries in the region, with relatively well developed democratic and civil society institutions, but it heavily suffers from political instability, occasional violent political uprising and riots, and a widespread corruption. Periods of relatively high economic growth are disrupted by years with negative real economic growth caused by world economic crisis, local political instability and violent protests in 2005 and 2010.

Table 2: GDP – real growth rate [%]



Source: Index Mundi, www.indexmundi.com

In mid 2011, average monthly salary has reached 8 185 KGS (180 USD). End-use energy prices regulated by the government are low and do not reflect full costs, but basically only the variable operating costs. Energy infrastructure is obsolete and needs investment for modernization. But the utility revenues cannot generate required capital due to low regulated end-use energy prices. Electricity is priced extremely low at 0.7 KGS/kWh (1.5 US cent/kWh) for households and 1.5 KGS/kWh for others (3.3 US cent/kWh) thanks to the fact that operating costs of hydro power are negligible. Electricity is thus the most popular choice of energy for heating in new facilities. It is clear that this textbook example of capital misallocation is not sustainable, and in long term it is a costly policy. However, the governmental decision to increase energy prices in 2010 is reported to be one of the igniter of violent protests in April 2010, which lead to presidential impeachment and withdrawal and subsequent governmental decision to decrease energy prices again to original low levels.

Energy security, supply-side as well as demand-side energy efficiency have been the country’s policy priorities as stated in the “National Energy Program of the Kyrgyz Republic for 2008-2010 and Development Strategy of the Fuel and Energy Complex till 2025” approved by the parliament in April 2008, before the project implementation started. However, the energy efficiency was just declared as a policy priority, but has not been transformed yet to any viable instrument nor implemented in that time.

The UNDP/GEF project Improving Energy Efficiency in Buildings correctly addresses one of the country urgent actual needs and policy priority formulated at the beginning of the project. This UNDP/GEF project is one of few first activities covering end-use energy efficiency in the country, and probably the first one with a practical sustainable impact, combining development of new energy efficiency building code and demonstrating its impacts by construction of first pilot buildings. It addresses a critical and important problem and is fully in-line with the declared country’s energy security and energy efficiency priority. However, it is just one and the very first step towards more energy efficient economy. And much more needs to be done, including painful but urgently needed reforms as well as energy price increase to reflect full costs in order to attract investment to make the energy utility industry more efficient and sustainable in a long term.

UNDP has a long track of energy efficiency in buildings projects implemented in Central and Eastern Europe and in the CIS region. The Improving Energy Efficiency in Buildings project in Kyrgyz Republic is the earliest one under implementation in Central Asia. Similar projects are being implemented also in Kazakhstan, Uzbekistan, Armenia, and other energy efficiency in buildings project in Turkmenistan has been just approved by GEF CEO in October 2011.

**Project justification and its aims**

The Kyrgyz building stock has been constructed during the Soviet period without any regard to energy efficiency. Energy use per square meter is significantly higher than in EU countries with similar climate conditions (heating degree days). Energy efficient reconstruction of existing building stock requires investment which is scarce, and no economic motivation exists due to low energy prices and unmetered district heating with no controls. A unique opportunity thus lies in the development of new buildings – energy efficient building design is not costly and thus it represents an affordable market niche also for specific situation in Kyrgyzstan.

The project aims at reducing energy consumption and associated GHG emissions in new buildings in Kyrgyzstan by 30-40% compared to the existing building stock by:

(1) adopting and enforcing mandatory building energy performance codes, standards and labels (the Energy Passport) in line with internationally recognized best-practices;

(2) improving enforcement levels of mandatory energy efficiency building codes

(3) demonstrating feasibility and viability of an integrated building design approach for energy efficiency by construction of pilot public buildings;

(3) strengthening capacity of building and construction professionals to implement new building regulation and promotion of best practices; and

(4) establishing a system to monitor energy consumption and CO2 emissions in Kyrgyzstan building sector.

According to the Project Document, the total project budget is 4 132 mil USD, of which 0.9 mil USD will be funded by GEF contribution, 0.05 mil USD by UNDP regular funding, and 3 182 mil USD will be in-kind contribution, which includes local investment costs for two pilot buildings to be provided by municipalities in Osh and Bishkek.

This medium-sized project is implemented by UNDP CO in Kyrgyzstan, Implementing Partner is Gosstroy – State Agency for Architecture and Construction.

The Project Document has been signed on December 5, 2008 and is scheduled to last for four years until December 2012.

On September 16, 2008, after the project has been approved by GEF, but before the Project Document has been signed, a meeting of the Local Appraisal Committee took place in Bishkek. Representatives of UNDP CO, governmental ministries and state authorities, national parliament, international organizations, private sector, and NGOs discussed the project goal and agreed to recommend endorsement of the Project Document. Letters of Intent confirming local co-financing have been presented, including 0.1 mil USD contribution from Gosstroy - State Agency for Architecture and Construction, and 1.5 mil USD from the Osh City Administration, and additional 1.5 mil USD from the Bishkek City Administration for the investment costs of the construction of the pilot building.

On November 11, 2008, the project Inception Workshop took place. The Project Document and planned project activities have been discussed again in detail with project partners.

On December 5, 2008 the project has officially started by signature of the Project Document and in early 2009 the project implementation has been launched.

## Purpose of the evaluation

This terminal evaluation has been performed on a request of the UNDP Kyrgyzstan as a standard mandatory requirement of all UNDP projects. The terminal evaluation mission took place in Kyrgyzstan in November 2013.

The objective of this evaluation is to assess the achievement of project’s objective, the affecting factors, the broader project impact and the contribution to the general goal/strategy, and the project partnership strategy. It also provides the basis for learning and accountability for managers and stakeholders and for providing important lessons learned which can be applied to the design of future UNDP projects which aim to remove barriers to energy-efficiency.

According to the GEF and UNDP/GEF Monitoring & Evaluation Policies, the 2009 Handbook on Planning, Monitoring and Evaluating for Development Results, the terminal evaluation has four objectives:

1. Monitor and evaluate results and impacts;

Analyze and evaluate effectiveness of the results and impacts that the project has been able to achieve against the objectives, targets and indicators stated in the project document;

1. Provide a basis for decision making on necessary amendments and improvements;

Assess effectiveness of the work and processes undertaken by the project as well as the performance of all the partners involved in the project implementation;

1. Promote accountability for resource use;

Provide feedback and recommendations for subsequent decision making and necessary steps that need to be taken by the national stakeholders in order to ensure sustainability of the project’s outcomes/results; and

1. Document, provide feedback on, and disseminate lessons learned.

Reflect on effectiveness of the available resource use; and document and provide feedback on lessons learned and best practices generated by the project during its implementation.

## Key issues addressed

The following key issues have been addressed in the final evaluation:

*Relevance* of the project with national development priorities, and its appropriateness,

*Effectiveness* of the development project and partnership strategies,

*Contribution* and worth of the project to national development priorities

*Key drivers and success factors* enabling successful, sustained and scaled-up development initiatives, alternative options and comparative advantages of UNDP

*Efficiency* – cost-effectiveness of funds spent to reach project objectives and results

*Risk factors* and risk management strategies

*Sustainability* - level of national ownership and measures to enhance national capacity for sustainability of results

*Impact* of the project implemented on human development

A specific attention has been paid, in addition to the project implementation itself, to the evaluation of recommendations of the mid-term evaluation, to the role of UNDP, and the use of Logical Framework matrix, definition of project indicators and targets.

## Scope and methodology of the evaluation

The methodology used for the project final evaluation is based on the UNDP/GEF Monitoring & Evaluation Policies and includes following key parts:

1. Project documents review prior to the evaluation mission
2. Evaluation mission and on-site visits, interviews with project management, UNDP CO, project partners and stakeholders, as well as with independent experts.
3. Drafting the evaluation report and ad-hoc clarification of collected information/collection of additional information
4. Circulation of the draft evaluation report for comments
5. Finalizing the report, incorporation of comments

## Structure of the evaluation report

This final evaluation report follows the structure specified in the Terms of Reference (see Annex 5: Final evaluation TOR) and according to the 2012 “Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects”.

# The Project Description and Development Context

## Project start and its duration

The four-year Project officially started with the signature of the Project Document by representatives of the government and UNDP on December 5, 2008, and is scheduled to last till December 2012.

An Inception Report has been prepared in June 2009 with a support of international consultant Mark Chao, after the project implementation has progressed already, and several project activities have started already. During the inception period, international expert Yurij A. Matrosov delivered a series of seminars focused on development of energy efficiency building code (SNiP), a detailed road map for new SNiP development has been prepared, including first estimates of new energy efficiency requirements, recommendations for development of new energy efficiency standard and its enforcement strategies, certification and labeling of buildings as well as monitoring of energy consumption have been formulated. The Inception Report also highlighted a risk of not providing co-financing for pilot projects due to budget cuts. The original LogFrame from the Project Document has been revised. The wording of several targets and indicators has been improved and clarified, and the target to decrease thermal energy consumption for new code-compliant buildings has been made stricter, based on recent data and experience from Russia and Kazakhstan. The revised LogFrame and changes made to the original matrix are shown in Annex 1.

The mid-term evaluation mission took place on October 17 through 26, 2011, in the fourth quarter of the third year of planned four year project implementation period.

After submitting the MTE report, there remain effectively one full year until scheduled termination of the project.

## Problems that the project sought to address

Until the beginning of this project, the country did not pay any systematic attention to improving poor end-use energy efficiency. Only few and limited activities have been implemented by the beginning of this project, namely the Energy Efficiency Program sponsored by the Norwegian government which supported establishment of a small revolving Energy Efficiency Fund, introduced energy audits, and implemented few energy efficiency and heat metering pilot projects.

Purchase prices of imported gas have increased significantly during the project design period, and energy affordability of both households and municipalities became a hot political topic.

Due to hard economic situation in rural areas, people have been moving into large urban centers in search for job. Major economic activities are concentrated in the largest cities of Bishkek and Osh and new buildings, residential, commercial and public buildings have started to be built in these cities. Mortgage loans became available on the local market which attracted development in residential sector. However, new buildings, and especially residential buildings, often did not comply even with the low energy efficiency building standard of that time, and even not with seismic standards.

The project addresses these problems and opportunity by development of the up-to-date new energy efficiency code, designing and building pilot schools according to the new energy efficiency code, training Gosstroy experts and professionals in principals of IBD and compliance control with the new building code, and by the development of the monitoring system.

## Immediate and development objectives of the project

The project objective is to reduce energy consumption and associated GHG emissions in Kyrgyz building sector.

The target has been enumerated to reduce GHG emissions by 267 000 tCO2eq. This amount is a total lifecycle emission reductions from all new energy efficient buildings built in compliance with the new energy efficiency building code until 2023 – ie. it includes a decade after the project will be terminated. The 267 000 tCO2eq emission savings have been calculated as top-down indirect GHG emission savings according to the methodology described in the GEF Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects (GEF, 2008). The direct and indirect emission reduction target for the project implementation period has been calculated to be 1 140 tCO2 direct lifecycle emission reductions from two pilot public buildings built with support from the project, and additional indirect 22 800 tCO2 lifecycle emission reductions from other buildings being built according to the new energy efficiency code until the project termination at the end of 2012 - bottom-up approach.

The Project Document defines a general expected outcome: “Sustainable development principles integrated into poverty reduction policies and programs”, and a UNDAF outcome: “Poor and vulnerable groups have increased and more equitable access to quality basic social services and benefits in a strengthened pro-poor policy environment”.

## Main stakeholders

The project management – the Project Implementation Unit – consists of four staff hired by UNDP for the period of project implementation. The office of the Project Implementation Unit has been provided for the project free of charge by Gosstroy in its premises. In 2011, the Project Implementation Unit consists of the Project Manager, Ms. Elena M. Rodina, Chief Engineer Mr. Genadiy F. Kasiev, Administrative Finance Assistant Ms. Elena Pasportnikova, and the driver of the project car, Mr. Sergey A. Izotov.

Project Implementing Partner is Gosstroy, the State Agency for Architecture and Construction under the Government of the Kyrgyz Republic, a governmental body with authority to approve and endorse building codes, former ministry for construction.

Other project partners include State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic, National Agency on Local Self-Governance, Bishkek and Osh municipalities, Kyrgyz Research and Design Institute for Seismic Resistant Construction, local universities, building design institutions, Ministry of Energy, and local NGOs.

## Results expected

The project is structured into 5 components, for each of them the expected results are defined as follows:

1. Improved energy performance codes

*New building energy efficiency technical standard compatible with best international practices for new construction and reconstruction of buildings as well as energy passport with calculated annual consumption of energy for space heating and minimal standards for energy efficiency performance will be developed, approved and implemented.*

1. Improved enforcement levels of mandatory energy efficiency building codes

*The compliance rate with existing building codes has been estimated at the beginning of the project to be extremely low at only 10% maximum. The very ambitious goal of the project is to increase the compliance rate to 80% during the project implementation period – in a country which suffers from widespread corruption in practically all economy sectors and all levels of governmental administration. This component includes training of Gosstroy building inspectors and creating of building certification – system of energy passports.*

1. Pilot projects utilizing and integrated building design approach

*Two pilot schools in Osh and Bishkek are planned to be designed according to new strict energy efficiency code and should comply with energy efficiency class B. The project budget is planned to support building design only, full investment costs are to be provided by local investors – municipalities. Energy efficiency building design should be replicated in all public buildings in large cities.*

1. Promotion of best energy design and building practices in construction sector

*The promotion includes training of professionals and Gosstroy licensing experts, development of new curricula on design of energy efficient buildings for university students, and information dissemination to professional and general public.*

1. Monitoring of building energy consumption and GHG emissions

*Regular revisions of the building code should be put in place. Monitoring system should be developed for new buildings to assess actual energy consumption and related GHG emissions and compliance with designed energy efficiency requirements. However, district heating, which is common energy source for space heating in buildings in larger cities, is obsolete and typically is not metered at the building level at all. District heating is priced per floor area only.*

## Analysis of the situation with regard to outcomes, outputs and partnership strategy

The project design has properly identified country’s needs and opportunities and has defined focus of the project on improving energy efficiency in buildings. Concentration of the project on implementing new state-of-the art energy efficiency building code, training professionals, design and construction of two pilot buildings financed by local investors, and information dissemination is a low-cost strategy with long-term impact, developing hands-on sustainable experience among local professionals.

This project is the first major activity focused on improving energy efficiency in buildings in Kyrgyzstan – alongside with the previous Norwegian project that introduced energy audit methodology. Much more actions are needed in order to improve the energy efficiency, including key policy reforms, increase of energy prices to reflect full costs – removal of energy price subsidies, upgrading the obsolete and inefficient district heating system, installation of heat controls and meters at the building level, energy efficient reconstruction of existing buildings and much more. The project focuses only on one market segment – newly constructed/reconstructed buildings, which has relatively small share compared to the existing building stock. But it is the best chosen strategy which could be successfully replicated in the future in the country even if needed policy and economic reforms in energy and district heating would not be fully implemented.

Two planned project outcomes, namely ***outcome 2 and 5, as specified by their targets, are very challenging*** and it will be very difficult to fully achieve these targets in the current situation in Kyrgyzstan.

Specifically, *Outcome 2 - Improved enforcement of mandatory energy efficiency building codes* has a target to dramatically increase the compliance rate from the estimated baseline of less than 10% to 80%. There are basically two main reasons of such a low baseline compliance rate. First, the original soviet building code has been updated in 1998, however it assumed the required energy efficiency of wall structures to be met basically by construction of thicker walls only, which in extreme cases was even not technically feasible. Second, and more important, widespread corruption is still a common phenomenon in Kyrgyz business and public administration culture. It can be improved, but it is not realistic to expect that a single energy efficiency project might that significantly improve the situation. Also it should be noted, that there are no measured statistical data on the compliance rate of constructed buildings, but only estimates. The compliance target might be realistic mainly for large commercial/public buildings that are designed by reputable local building design institutions, constructed by large construction companies, and financed by the government or large investors. But the target seems to be unrealistic especially for small residential buildings, built by small local companies or even by individual private investors themselves. It is worth to mention that the compliance of building designs significantly differs from the compliance of actual building constructions with the energy efficiency code. The target compliance rate applied for building design itself is realistic. The target compliance rate for construction of large buildings is realistic as well. The most problematic are small residential buildings where the compliance rate is assumed to be minimal, and the target compliance rate of 80% is unrealistic.

The issue of low compliance with energy efficiency code concerns the quality of the construction, changes made to the design during construction, and quality and reliability of construction supervision especially in case of small residential buildings. At the design stage, no significant problems are observed, and new building designs are reported to be in principle fully in line with requirements of energy efficiency code.

Following examples illustrate the scope of the corruption problem in the country: cases of whole suburb residential projects have been reported to be constructed illegally with no land-use permits, no roads, and no utilities available, not to speak about compliance with building and seismic codes. But after the buildings have been built, the government has decided to legalize them and to invest into construction of electricity and utility networks and roads, despite their tight budgets.

The *Outcome 5 – Monitoring of energy consumption of buildings* would be an extremely complex and costly task if applied to all buildings, including the existing ones. Similar project, implementation of Energy Management System in public buildings, has been implemented in Croatia (country of similar size with population of 4.4 million inhabitants) with UNDP/GEF support. The project was unique in its scope, covering practically all, but “only” public buildings. The total project costs are 21.5 mil USD provided by the Croatian government, with GEF funding of 4.39 mil USD. The total implementation period has been planned for 8 years (the UNDP/GEF project lasted 6 years).

But even if such monitoring system in Kyrgyzstan would cover only new buildings, it would be impossible to collect data on actual energy consumption in buildings that are supplied by district heating, because district heating is not metered at the building level in Kyrgyzstan so far. Only about a dozen of building/secondary substation level district heat meters have been installed in Bishkek till now. And district heating is a common source of energy especially in large cities, some 30% of all existing building stock in the whole country is supplied by the district heating, in Bishkek and Osh the share is even higher.

Without installation of building level metering of district heating it is impossible to implement functional monitoring system for all new buildings. But the district heating utilities sell heat for regulated prices that are significantly lower than full costs, and thus they face critical shortage of funds for necessary investment into infrastructure modernization, including installation of meters and controls.

Even in case of buildings which use metered electricity and gas for space heating it is not that straightforward to separate energy used for space heating from other energy consumption used by other appliances, if no secondary submeters are installed.

The monitoring system to be proposed and implemented should also reflect the real situation in the country – including widespread corruption. Any robust monitoring system ideally designed and implemented could be bypassed if the input data on energy consumption, potentially fully metered one day, would be incorrectly reported and falsified. Recommendations for the monitoring system are described in Chapter 6.2.

**Partnership Strategy**

The main project partner – Implementing Partner – is Gosstroy, The State Agency for Architecture and Construction under the Government of the Kyrgyz Republic. Gosstroy is a key governmental agency, former Ministry of Construction, which has strong responsibilities and authorities in the construction industry. The responsibilities of Gosstroy include:

1. Development of policy in the area of urban development in the KR
2. Development of regulatory and legal acts in the area of design and construction
3. Implementation of progressive standards, technologies, materials, equipment
4. Design expertise
5. Standardization and price formation
6. Drafting/development of urban development plans and documentation
7. Licensing of construction specialists
8. Certification of construction products
9. Supervision over norms/standards application and project/construction implementation

All relevant governmental agencies and ministries have been involved in discussions during project preparation, including representatives of the national parliament, ministries, universities, local professionals and experts from the construction and building sector, and local NGOs. Selected institutions and organizations take an active part also during project implementation.

The partnership strategy included all main governmental and non-governmental organizations in the country.

Contacts have been also established also with other international donors and their projects in the country that could potentially utilize project results and assist in the future with their replication.

# Findings

## Project design and formulation

The project idea was initiated by GEF and UNDP in early 2006.

The project scoping study, Project Identification Form, CEO Endorsement Request and Project Document were developed in 2006-2008 under a contract with Austrian KWI Management Consultants and ACE Group and it was financed by the Austrian Trust Fund.

During the project scoping study the consultant worked closely with local partners in Kyrgyzstan, including State Environmental Protection Agency, district heating utilities in Bishkek, State Agency for Architecture and Construction, Kyrgyz-Russian Slavic University, Bishkek City Administration, Ministry of Industry, Trade and Tourism, National Standardization and Metrology Research Institute, State Energy and Gas Inspectorate, National Antimonopoly Policy Agency, and the Demonstration Zone Bishkek on Energy and Water Efficiency.

The original proposal included five components:

1. Stricter standards for new buildings and improved enforcement of energy performance code
2. Pilot project of building with improved energy performance
3. Rehabilitation of district heating networks
4. District heat plant optimization and refurbishment
5. Installation of apartment level heat and hot water meters

The district heating components were removed from the original proposal due to high costs and lack of local co-financing and no local political support for policy and tariff reforms.

The Project Identification Form has been submitted to GEF in July 2007, the final revised version in December 2007. PIF has been approved in January 2008.

The Request for GEF CEO Endorsement/Approval has been submitted in June 2008, and re-submitted in July 2008.

After the GEF CEO endorsement in August 2008, the Project Document has been signed and the project implementation officially started on December 5, 2008.

### Project relevance and implementation approach

As discussed above, Kyrgyzstan is a poor country, which suffers from political instability and occasional violent political protests, as well as from a widespread corruption. Energy infrastructure is obsolete, district heating has no meters, nor controls, energy is heavily underpriced, practically no activities in end-use energy efficiency have been implemented prior to this project, except for some limited international projects. Increase of electricity prices (together with a corruption on a top governmental level) is believed to be one of the factors that lead to violent political protests in April 2010 that resulted in withdrawal of the president, subsequent ethnic conflicts, and later on electricity tariffs have been decreased again to original low levels.

This project is focused on development of state-of-the-art new energy efficiency code for construction of new buildings and reconstruction of existing buildings and implementation of IBD principles in building design, and construction of two pilot buildings in compliance with the new code. The IBD approach is a no-cost strategy combining expertise of architects, construction and HVAC engineers from the very early stages of development building design concept. As an illustration, the following simple IBD principle has been implemented in the design of the pilot school in Osh: the whole school with classroom and sport and other facilities is integrated in a single compact building with minimum external walls, rather than to have built traditionally several buildings for classrooms, gymnasium and dining room which would have much worse external walls area to total building volume ratio, and the investment costs would be in fact even higher. The optimized building design saves energy as well as investment costs, and the saved funds can thus be used for additional improved energy insulation.

The focus of the project on developing IBD expertise in the country, implementing of a new energy efficiency code for buildings, and construction of two pilot schools addresses relatively a small market segment of the whole building stock, but it is perhaps the only low-cost/no-cost energy efficiency strategy that can be implemented and replicated even in situation when the country lacks any economic motivation and sufficient capital for investment into energy efficiency reconstruction of the existing building stock.

The project is also fully in line with the Country Development Strategy 2008-2010.

### Conceptualization/design

The Project Document was in general well prepared, with detailed and specific information on the baseline situation in the building industry; it provided a detailed methodology on CO2 emissions reductions calculation according to the GEF Manual for Calculating GHG Benefits of GEF Projects and it was supported with statistical data analysis.

The Inception Report did not propose any significant changes to the original project design; it specified in more detail individual activities within each of the project component, and provided minor mainly wording revisions and upgrade of the project LogFrame. The main revision in the LogFrame concerns strengthening of the target 1: Thermal energy consumption for new code-compliant buildings reduced to an average of 100 kWh/m² (by about 30%), instead of original “110 kWh/m² (by 20%)”. The Inception Report also highlighted a risk of dependence of the project construction of pilot buildings on governmental funding in the period of world economic crisis and subsequent “uncertain availability of government co-funding for construction of new schools”, and it changed the original target to revise new EE code “by 2015” from the original wording “each 3 years”.

As discussed in detail in the following chapter, some of the project LogFrame indicators and targets are not specific enough and/or not measurable, because they include period after project termination. Some of the targets are unrealistic, such as radical improvement of the compliance rate with the new energy efficiency code from 10% up to 80%.

### Planned stakeholder participation

During the project design phase national ministries, governmental agencies, municipalities, universities, local NGOs, energy utility, and foreign agencies for international cooperation have been contacted, and involved in discussions on project focus.

State Environmental Protection Agency, district heating utilities in Bishkek, State Agency for Architecture and Construction, Kyrgyz-Russian Slavic University, Bishkek City Administration, Ministry of Industry, Trade and Tourism, National Standardization and Metrology Research Institute, State Energy and Gas Inspectorate, National Antimonopoly Policy Agency, and Demonstration Zone Bishkek on Energy and Water Efficiency took an active role in the early scoping phase of the project development.

A Local Project Appraisal Committee has been established, which provided comments and suggestions to project design. The LPAC Committee consisted of the following members:

1. Ministry of Finance
2. Ministry of Education and Science
3. Ministry of Industry, Energy and Fuel Resources
4. State Agency for Architecture and Construction under the Government of the Kyrgyz Republic
5. National Agency on Local Self-Government
6. State Inspectorate on Energy and Gas
7. Bishkek Municipality
8. Osh Municipality
9. Kyrgyz Housing Communities Union
10. ARIS – Community Development and Investment Agency of the Kyrgyz Republic
11. GTZ/GIZ – German Society for International Cooperation
12. JICA - Japan International Cooperation Agency
13. SeverElectro – Power Distribution Utility
14. CAMP Alatoo
15. Biom
16. Sustainable Nature Management
17. Public Fund Inon

The key local project partner during the design phase was Gosstroy, which provided valuable inputs for the project design, knowledge of local situation and specification of needs, and data and statistics on building construction in the country. Gosstroy has a specific role on the Kyrgyz building construction market. It is a governmental agency, former ministry for construction, with significant licensing and certification powers and responsibilities. Inviting Gosstroy to be an Implementing Partner was a crucial decision that supported local ownership of the project. The project benefitted also from good human and professional relations with Gosstroy: Genadiy Kasiev, the project Chief Engineer, is for example a former head of the Construction Department at Gosstroy.

### Replication approach and sustainability strategy

### Linkages between the project and other interventions within the sector

The main and key activity covering energy efficiency in buildings in addition to the UNDP/GEF project was an EBRD initiative developing a Law on Energy Performance in Building that created an umbrella primary legislation to the Energy Efficiency in Buildings Code – SNiP developed and implemented by the UNDP/GEF project.

The UNDP/GEF project has drafted provisions on energy efficiency in buildings for updates of existing Law on Energy Efficiency, the draft update of the law has been discussed in the parliament, however this legislative process has been interrupted and not finalized. In 2009-2010 the EBRD has funded a project called Enhancing Regulatory Framework for Energy Efficiency in Built Environment that was focused on transposition of the EU directive on Energy Performance of Buildings into national legislation in Kyrgyzstan. A new Law on Energy Performance of Buildings and two bylaws Regulation on Energy Certification of Buildings and Regulation on Regular Inspection of Boilers and Heating Systems were developed, submitted for governmental review and approved by the parliament in mid 2011. The Law will come into force six months after its publication, ie. on February 5, 2012. This Law was prepared parallel to the UNDP/GEF project sponsored development of the energy efficiency code – SNiP, and creates its umbrella primary legislation. It specifies that in principle all buildings, except for residential buildings smaller than 150 m2 of floor area, are subject to compulsory minimum energy efficiency requirements, building certification (energy passport), and compulsory display of energy label; the minimum energy requirement of buildings must be reviewed at least once in 10 years. Buildings that will not comply with the minimum energy efficiency standard will not be granted approval for utilization.

Three other activities and interventions within the sector are described below:

CAMP Alatoo is a local NGO working with rural communities in remote mountainous regions. One of their projects is focused on providing microfinance loans for rural families. The UNDP/GEF project has teamed up with CAMP Alatoo and developed a series of manuals on energy efficiency – Catalogues – that were distributed to families that were potential borrowers of microfinance loans to improve energy efficiency in their homes.

ARIS is a Community Development and Investment Agency of the Kyrgyz Republic which implements project financed by German Development Bank KfW to construct and reconstruct public buildings with improved energy efficiency. The focus of the project is on small facilities, kindergartens and schools for ca 25-50 pupils. The construction is planned for the period of 2012-2013. ARIS has been involved also in discussions during UNDP/GEF project design phase. During the evaluation mission the evaluation team and the Project Manager visited ARIS and discussed potential future cooperation and utilization of UNDP/GEF project experience in designing and constructing energy efficiency schools.

The UNDP/GEF project organized also a joint training with ESIB on building certification in Bishkek and Naryn. ESIB is an Energy Saving Initiative in the Building Sector in Eastern Europe and Central Asia within the INOGATE program that supports energy policy cooperation between EU and Eastern Europe (Belarus, Ukraine, Moldova), Turkey, Caucasus, and Central Asia.

### Design of Monitoring and Evaluation

The Project Document includes a design of the Monitoring and Evaluation plan that specifies type of monitoring and evaluation activity, identifies responsible parties, allocates indicative budget, and specifies time frame. A detailed description of Monitoring and Evaluation Plan components is provided in the Section G of the Request for CEO Approval/Endorsement.

The LogFrame is designed to serve as a basis for project progress monitoring and evaluation.

Key responsible parties for performing project monitoring and evaluation include:

* Project Manager
* UNDP Country Office
* Governmental counterparts
* UNDP-GEF Regional Coordination Unit
* External consultants

### UNDP comparative advantage

### Replication approach and sustainability

The project concept is based on replication of results achieved during project implementation. The project results are in principle designed to create an environment, soft “infrastructure” consisting of legislation, state-of-the-art energy efficiency code, and local capacity and know-how to design, construct and monitor new energy efficient buildings; and this “infrastructure” is designed to be fully employed in a sustainable way especially after project termination. The two pilot schools to be designed and constructed during project implementation serve basically as a demonstration, but the actual impact of the project in terms of amount of CO2 savings is planned to be achieved after the project terminates – when newly constructed buildings in the country in the future will fully deploy IBD principles and comply with the new energy efficiency code.

Replication approach is rated *Highly Satisfactory*.

### Cost-effectiveness

The project with GEF/UNDP budget of 0.95 mil USD is designed to deliver new energy efficiency building code, higher compliance rate with the mandatory code, promotion of best practices, monitoring of building energy performance and GHG emission reductions, and design and actual construction of pilot energy efficiency buildings according to the new energy efficiency building code. The investment costs of two new buildings to be constructed with support from the project have been designed to be provided by local investors – municipalities of Bishkek and Osh. This in-kind contribution was estimated to be 3 mil USD. The financing of the building construction investment costs out of the UNDP/GEF budget is definitely a very cost-effective strategy; however, it is in the same time very risky strategy as well.

The Project Document has enumerated CO2 abatement costs to be 15 USD/tCO2, based on the total project budget of 4 mil USD (including in-kind co-financing), and estimated indirect project GHG emission savings of 267 000 tCO2 (lifecycle emission savings from buildings built in 2009-2023, ie. up to 10 years after the project termination, with conservative assumptions on compliance rate with the new EE code). Of the total budget, 3 mil USD have been budgeted to be in-kind local financing for construction of the two pilot schools that would cover 100% of total investment costs.

However, the actual energy efficiency incremental costs would be only a small fraction of total investment costs. If incremental costs are assumed to be 15% of investment costs, the CO2 abatement costs are 5.9 USD/tCO2.

The UNDP/GEF contribution of 0.95 mil USD to the project budget means that for UNDP/GEF the GHG abatement costs are estimated to be 3.6 USD/tCO2.

As the Project Document illustrates, the IPCC Working Group III in their review of climate change mitigation potential in residential buildings suggests that about 32% of the projected global baseline emissions in the residential sector can be avoided cost-effectively through no or low cost best-practice measures cheaper than 20 US$/t CO2.

## Project Implementation

### Project implementation and adaptive management

### Partnerships arrangements

During the project implementation the project has continued its cooperation with local partners that have been involved also in the project design phase.

The key local project partner is Gosstroy. Other local partners include national ministries, other governmental agencies, municipalities, universities, building design companies and local NGOs.

Local stakeholders involved actively during project implementation include:

1. Ministry of Industry, Energy and Fuel Resources
2. Ministry of Education and Science
3. Parliament of the Kyrgyz Republic
4. State Agency for Architecture and Construction under the Government of the Kyrgyz Republic
5. Kyrgyz Research and Design Institute of Seismic Construction
6. State Environmental Protection Agency
7. National Agency on Local Self-Government
8. Bishkek Municipality
9. Osh Municipality
10. Kyrgyz-Russian Slavic University
11. Kyrgyz University for Construction, Transport and Architecture
12. Garant Proekt company
13. Kyrgyzgiprostroy
14. CAMP Alatoo NGO
15. ARIS – Community Development and Investment Agency of the Kyrgyz Republic

### Monitoring and evaluation

The project is subject to standard UNDP monitoring and evaluation procedures. Project planned activities and achievements are regularly reported and approved by the Advisory Board; Annual Work Plans, Annual Progress Reports, Quarterly Reports, and Project Implementation Reports are regularly developed and submitted for approval.

The project has not yet been subject of the external audit.

The Mid-Term Evaluation of the project took place in the 34th month of project duration in October 2011, of the total planned 48 month implementation period. This is 10 month after the exact half of the implementation period.

Board of Directors has been set up in May 2009 to oversee implementation of the project. The Board of Directors, renamed in 2009 to an Advisory Board, consisted of 11 members:

The Advisory Board is chaired by Mr. Narbayev, Director of Gosstroy, the Deputy Chairman of the Board is Mr. Pradeep Sharma, Deputy Country Representative, UNDP. Nine Board members represent Gosstroy, Kyrgyz Research and Design Institute for Seismic Resistant Construction, State Agency for Environmental Protection and Forestry, State Inspectorate for Energy and Gas of the Ministry of Energy and Fuel Resources, NGO “Sustainable Development”, and the Kyrgyz State University of Construction, Transportation and Architecture.

The Board of Directors/Advisory Board held a meeting in October 2009, December 2010, and in July 2011. The meeting of the Advisory Board planned for spring 2010 has been cancelled due to the unstable political situation in the country in that time. Next meeting is planned for late 2011, so that the Advisory Board would meet twice a year as originally planned.

The project receives support from the UNDP Country Office. The UNDP CO manages the Atlas system and provides the PIU with regular official reports from the Atlas financial system that includes spending expensed directly by UNDP CO, however the Atlas system does not provide budget lines per project activities, but by project outcomes only.

### Feedback from M&E activities used for adaptive management

The Project Document has identified three risks and has proposed for each risk a mitigation strategy:

* Energy efficiency code enforcement levels will not improve sufficiently
* Cooperation between national organizations will not be optimal
* Integrated Building Design will not be replicated in other cities

The risk mitigation strategy included focus on large urban centers and involvement of Gosstroy and State Agency for local Government Affairs.

At the beginning of the project implementation, the Inception Report has identified additional major risk of negative impact of global economic crisis on potential unavailability of local co-financing for construction of pilot buildings and has proposed mitigation strategies.

The MTE has identified additional risks in the project design. The summary of all project risks is described below together with mitigation strategies. In those cases, where project risks did materialize already, the Project Implementation Unit has adopted effective adaptive management and has implemented adequate measures to mitigate these risks.

The project as it was designed contains following major risks that might potentially influence project results and targets specified in the Project Document LogFrame:

*Major project risks and risk mitigation strategies:*

1. Approval and implementation of the new energy efficiency code is a legislative action of the government and is out of direct control of the project.

The project has established very good partnership with Gosstroy, key local governmental agency with responsibilities in this field, and it has authority to implement technical codes - SNiP. Gosstroy was appointed to be an Implementing Partner of the project and thus it feels a strong ownership of the project and responsibilities for achievement of planned project results. Gosstroy has approved and implemented the developed energy efficiency code in 2009.

1. Construction of two pilot schools depends on investment financing provided by local investors – municipalities. This is a very cost-effective strategy for the project, which thus does not need to include investment costs into its budget. However, the achievement of this important project result fully depends on availability of investment funds from a third-party. The project has no direct control on availability and actual provision of these funds.

The project has signed a Letter of Intent with two local municipalities in Bishkek and Osh, which declared their interest and intention to finance investment costs of two new energy efficiency schools to be developed and constructed within the project. Each of the municipality made a commitment to provide 1.5 million USD for investment costs. However, due to external impacts of world economic crisis, local political instability, decrease of GDP and subsequent public budget cuts, none of the municipality was in a position to fulfill its commitment to finance new school so far. The Project Implementation Unit has lead intensive negotiations with other potential partners – investors, and was very lucky to find alternative solution.

Instead of the Osh municipality, the Turkish International Cooperation and Development Administration TIKA has decided to fully finance the construction of the pilot school building in Osh, and to provide 100% financing for the investment costs of 6.9 million USD. The contract has been signed and actual construction started in September 2011.

In case of the planned school in Bishkek, the school has been designed, but the municipality was not able to allocate the necessary investment funds. As an alternative solution the project agreed with the city to focus on additional school already under construction in Ak-Kashat nearby Bishkek. This school was designed to comply with the old code. The project redesigned its one stand-alone building (sport hall/gymnasium) according to the new energy efficiency code. The new energy efficiency design has been developed and the construction of the gymnasium started in September 2011 as well. The investment is provided by the Bishkek municipality from funds approved before budget cuts already. The negotiations with municipality on funding of the planned new school continue, but the result is unclear.

Dependence of the project on third-party investment is critically risky in all similar projects in other countries as well. The risk might be mitigated by signature of more binding, ideally legally binding contract on co-financing. However, since the period between project design phase and construction period might easily exceed an election period, any legally binding commitment is rather hypothetical. Focus on other than municipal investors only might be an option.

1. Target 6 to radically improve energy efficiency code compliance from 10% to 80% is unrealistic and it is more than highly probably that such a target cannot be achieved in the specific situation of Kyrgyzstan over the period of project implementation. More realistic is such target for a segment of new large public buildings financed from the state/public budgets and/or by international donors. And potentially to a certain level also for other large buildings in commercial sector.

Compliance with codes and other technical standards in small residential buildings is heavily influenced by the prevailing business culture and widespread corruption in all levels of state administration and economy. It is clearly out of the scope of the four year energy efficiency project itself to radically improve the situation in this market segment. More complex policy and economic reforms are needed, and more time is needed for step by step improvement.

Project activities designed to support Outcome 2 – Improved enforcement of mandatory energy efficiency building code and the relevant targets, ie. state building inspectors trained, laboratory equipped with energy auditing equipment, professionals trained, and development and implementation of building certification system will definitely help to improve the compliance rate, however the compliance target should be designed more realistically within the specific local conditions.

Should the target be realistically achievable, it should focus on large public and commercial buildings only, including perhaps large multi-storey apartment buildings developed by recognized investors.

The new Law on Energy Performance of Buildings developed with support from EBRD introduced the mandatory minimum energy efficiency requirements and building certification for all buildings except for small residential buildings with area smaller than 150 m2. For this market segment the target is more realistic, although still very challenging.

1. Any energy consumption monitoring system needs to have available data on actual energy consumption. This is not the case of district heating in Kyrgyzstan. Practically no end-use heat meters are installed in the district heating schemes, except for some 10 heat meters installed in the district heat distribution system in Bishkek. End-use electricity and gas meters are, with exception of some regions, installed.

The monitoring system can thus be developed and implemented only for those buildings which have energy consumption metered.

1. Target 2 to reduce CO2 emissions by 267 000 tCO2 is not measurable during project implementation period because it is based on estimated number of newly constructed buildings according to the new code in the period between 2013 till 2023, 10 years after planed project termination. If only direct and indirect emission reductions that will materialize during project period would be taken into account, the target would be significantly lower: direct 1 140 tCO2 lifecycle savings from two pilot buildings and 22 800 tCO2 indirect lifecycle emission reductions from other 20 buildings/schools estimated to be built by the end of the project.

The LogFrame targets in the project document should clearly distinguish targets achievable by the end of project implementation from credible estimates on replication potential and future, project ex-post emission savings. The Project Document did provide transparent and detailed calculation of both types of CO2 emission savings, however the project LogFrame target, should it be measurable, cannot include emission savings from buildings expected to be built after project termination.

1. The risk of political and economic instability unfortunately fully materialized during project implementation. The violent political protests in April 2010 had significant impact on country’s political and economic situation. This kind of risk is undoubtedly out of project control, and the project can only react and try to find innovative adaptive management solutions.

As a result of political instability and economic decrease the project had to cancel several activities in 2010 - planned meeting of the Advisory Board in spring 2010, international conference planned for 2010, and most importantly local investors did not fulfill their commitment to provide financing for the construction of two new schools. The project faced a serious risk that one of key components of the project, demonstration of the energy efficiency building design, would not materialize in construction of pilot buildings. The Project Manager deployed very effective adaptive management and searched for alternative sources of financing. With a portion of good luck an agreement with TIKA, Turkish International Cooperation and Development Administration, was reached, and TIKA decided to fully finance the pilot school in Osh with investment of 6.9 mil USD. Instead of the new school planned to be built in Bishkek, the project find an alternative solution and redesigned a gymnasium of a school in Ak-Kashat already under construction with allocated funds for financing investment costs. The energy efficient gymnasium is under construction already as well. Negotiations with the city of Bishkek on construction of the designed energy efficient school continue, but no commitment on financing has been reached so far.

The project faced significant risks caused by project design, political instability in the country and economic crisis. The project management applied very successful adaptive management and found alternative investor for two pilot buildings. However, the school in Osh is under a construction already also thanks to fortunate interest of TIKA to allocate necessary funds for this project.

### Financial planning and management

Project implementation benefits from having a professional Administrative Finance Assistant in the PIU team who has previous experience from other UNDP/GEF projects. The administration of the project finance is well organized and effective.

This is the first time ever the evaluator has seen that the project management does not rely on the Atlas system only, which is not suitable for daily project financial management because of its impractical budget lines structure. In addition to Atlas system, the project uses a specific locally developed spreadsheet for bookkeeping of all individual project expenditures that allows identification of both Atlas budget line code as well as identification of specific project activity. The Project Manager has thus an easily accessible instant one-click access to up-to-date overview of actual project spending and actual delivery – expenditures spent vs. its budget – in required detail up to each project activity and does not need to rely only on periodically accessible reports from Atlas system, which provide detail only according to Atlas budget lines, but not for each individual project activity. This gives the project management possibility to effectively control project costs in required detail on a daily basis. This is not the typical case for other UNDP/GEF projects implemented in other countries.

This very helpful (and simple) spreadsheet for financial monitoring has been developed locally in UNDP Kyrgyzstan and has been utilized by the project since mid 2010. Thus the annual data on project spending in 2009 and 2010 is available only in the structure available in the Atlas reports and CDR reports.

The original planned budget as of the project document is shown in Table 3.

Table 3: Project Budget as of Project Document [USD]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2009** | **2010** | **2011** | **2012** | **Total** |  |
| **Outcome 1** |  |  |  |  |  | 8% |
| **Outcome 2** |  |  |  |  |  | 22% |
| **Outcome 3** |  |  |  |  |  | 47% |
| **Outcome 4** |  |  |  |  |  | 5% |
| **Outcome 5** |  |  |  |  |  | 7% |
| **Management** |  |  |  |  |  | 9% |
| **Total** |  |  |  |  |  | 100% |
|  | 27% | 34% | 21% | 18% | 100% |  |

Each year a new annual budget has been prepared for the next year and submitted for approval to the Steering Committee in the form of an Annual Work Plan. These annual budgets as shown in AWPs are summarized in the Table 4.

Table 4: Annual Project Budgets as of AWPs [USD]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Outcome 1 |  |  |  |  |  |  |  |
| Outcome 2 |  |  |  |  |  |  |  |
| Outcome 3 |  |  |  |  |  |  |  |
| PIU |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |

*Note: The total of annual budgets does not make the total project budget because the annual project budgets have been updated annually.*

The Table 5 shows annual project expenditures by project outcomes for each year of project implementation period as reported in Combined Delivery Reports.

Table 5: Annual expenditures by project outcomes and years (CDR) [USD]

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Till 22.4. 2013 | **Total** | % of total |
| 1 |  |  |  |  |  |  |  |  | 15% |
| 2 |  |  |  |  |  |  |  |  | 49% |
| 3 |  |  |  |  |  |  |  |  | 30% |
| EE Frm |  |  |  |  |  |  |  |  | 0.4% |
| PIU |  |  |  |  |  |  |  |  | 5.7% |
| **Total** |  |  |  |  |  |  |  |  | 100% |
| % | 7% | 13% | 14% | 23% | 15% | 19% | 8% | 100% |  |

### Management by the UNDP Country Office

The project implementation is executed by the UNDP Project Implementation Unit, which consists of a small team of two professionals – Project Manager and a Chief Engineer, supported by an Administrative Finance Assistant and a driver.

The PIU manages project implementation, including communication with governmental and municipal authorities.

For the actual work on project implementation, such as developing the new energy efficiency code SNiP, a number of short-term local experts have been hired for specific tasks. This arrangement helped the project to be implemented in a cost-effective way, but also to effectively disseminate the energy efficiency expertise across the local professional community.

Implementation of the project benefited from cooperation with both long-term and short-term international experts, including Yurij Matrosov, a Russian expert in building energy efficiency codes, and Mark Chao, a Russian speaking US expert in building energy efficiency. Canadian company Econoler provided one-week training for local experts in energy efficiency building development, and reviewed technical proposals, an international company Grontmij was hired for organization of Kyrgyz expert excursion to Denmark.

The Project Implementation Unit is responsible for overall project implementation. The Advisory Board oversees its execution of project implementation and approves Annual Work Plans and Annual Progress Reports.

UNDP CO administratively supports PIU and pays and expenses directly some of project costs and provides PIU with regular Atlas reports.

In addition to this project in Kyrgyzstan, UNDP RCU coordinates similar projects in other countries in the region (Armenia, Kazakhstan, Uzbekistan, Turkmenistan), supports information and best practice exchange among these projects and coordinates external expert advice.

The structure of the project management illustrates the following Chart 1: Project Management Scheme.

PIU coordinates works of all five project components. Most of the work in each of the project component is subcontracted to local short-term consultants with support from international consultants.

The project management and coordination is executed in a way as it was originally designed in the project document.

Chart 1: Project Management Scheme

**Component 1**:

**New building energy code**

Short-term local and international consultants

**Component 2**:

**Improved enforcement**

Short-term local and international consultants

**State Agency for Archtecture & Construction (Gosstroy)**

**Project Implementation Unit:**

**Project Manager**

**Chief Engineer**

**Administrative Finance Assistant**

**UNDP CO Kyrgyzstan**

**Advisory Board**

**Component 4**:

**Best practices in buildings sector**

Short-term local and international consultants

**Component 5**:

**Energy consumption and GG monitoring**

Short-term local and international consultants

**Component 3**:

**Pilot buildings**

Short-term local and international consultants

A key role in the project implementation has Gosstroy – State Agency for Architecture and Construction under the Government of the Kyrgyz Republic, which serves as a project implementing partner. Gosstroy, former Ministry for Construction, has authority and responsibility among others in developing and implementing energy efficiency codes, licensing of construction specialists, and supervision of building constructions.

Rating of the management and coordination is *Highly Satisfactory*.

### Co-financing and in-kind contributions

The project budget includes 0.95 mil USD cash contribution from GEF and UNDP and 3.182 mil USD in-kind contribution. The in-kind contribution consists of 3 mil USD cash co-financing planned to be provided by Osh and Bishkek municipalities for construction of two schools that the cities would invest without the project as well. The remaining amount of 0.182 mil USD was planned to be provided in-kind by the government and its agencies, namely by Gosstroy.

Gosstroy provides office for the PIU free of charge (an equivalent of ca 10 000 USD per three years of project duration), as well as capacity of their key staff participating in the project – members of the project Advisory Board and other Gosstroy experts providing their expertise services.

Due to unforeseen economic constrains, both cities failed to fulfill their financial commitment to provide financing of 3 mil USD for construction of new schools. The project was very fortunate that it attracted interest of TIKA, the Turkish International Cooperation and Development Administration, which provided 100% funds for the construction of the school in Osh, 6.9 mil USD in total. And instead of a new school in Bishkek, a redesigned gymnasium of a school under construction in Ak-Kashat has started to be constructed in 2011 with already approved budget of which 0.157 mil. USD for the gymnasium itself.

Table 6: Financial Planning Co-financing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Co financing (Type/Source)** | **IA own  Financing (mill US$)** | | **Government (mill US$)** | | **Other Sources (2) (mill US$)** | | **Total Financing (mill US$)** | | **Total Disbursement (mill US$)** | |
| **Planned** | **Actual** | **Planned** | **Actual** | **Planned** | **Actual** | **Planned** | **Actual** | **Planned** | **Actual** |
| * Grants |  |  |  |  |  |  |  |  |  |  |
| * Credits |  |  |  |  |  |  |  |  |  |  |
| * Equity |  |  |  |  |  |  |  |  |  |  |
| * In-kind |  |  |  |  |  |  |  |  |  |  |
| * Non-Grant Instruments (1) |  |  |  |  |  |  |  |  |  |  |
| * Other |  |  |  |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |  |  |

## Results

### Overall results and attainment of objectives

**Other project achievements**

In addition to targets specified in the project LogFrame matrix, the project has developed following additional deliverables according to the updated annual work plans:

* An amendment to the Law on Energy Efficiency with provisions on end-use energy efficiency in buildings has been drafted and submitted to the parliament (after the first reading the parliament has been dissolved.)
* Energy efficiency information leaflets and publications have been developed and circulated, media coverage include 15 articles on energy efficiency
* International website on energy efficiency has been established, and information shared via caresd.net
* One film and one short video on energy efficiency in buildings has been produced and broadcasted on national TV
* Four GOST technical standards have been updated to comply with the new SNiP 23-1:2009
* Three draft provisions, Provisions on Energy Passport and its Implementation Procedures, Provisions on Building Energy Performance Certification and Energy Monitoring for School Buildings, and Provisions on Energy Audit of Buildings have been developed and submitted to Gosstroy.
* Three curricula on Design, Regulations, and Construction of energy efficient buildings have been developed for voluntary training of design and building construction professionals
* Conference on energy and energy efficiency held in Bishkek in September 2011 organized by the Ministry of Energy co-financed and project results presented
* Three Catalogues have been developed and distributed: Catalogue on Technical Solutions for Insulation of External Walls in Multifamily Residential Buildings, Catalogue on Technical Solutions for Insulation of External Walls in Single Family Houses, and Catalogue of Technical Solutions for Construction of Energy Efficient Stoves
* Presentations at the Side-Event at the 7th Ministerial Conference in Astana, September 2011 - Green Buildings
* Draft Law on Energy Efficiency developed and submitted to Parliament for approval. In first reading it was decided to be replaced with Law on Energy Performance in Buildings developed with support from EBRD.

### Relevance

Project relevance is rated ***Highly Relevant***.

|  |  |
| --- | --- |
| Relevant | Not Relevant |
| **R** |  |

### Effectiveness and efficiency

***Effectiveness of project implementation***

***Cost-effectiveness/efficiency of project implementation***

### Country ownership

Country ownership is rated ***Highly Satisfactory***.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Highly Satisfactory** | Satisfactory | Moderately Satisfactory | Moderately Unsatisfactory | Unsatisfactory | Highly Unsatisfactory |
| **HS** |  |  |  |  |  |

### Mainstreaming

### Sustainability

Foundations for sustainable project impact laid the adoption of the new energy code and the new Law on Energy Performance of Buildings. Critical factors for sustainability of project impacts are effective administration of the building certification system that will also include revisions of building designs during their construction, energy passports and energy labels that will be made public and thus subject to public control, implementation of effective building inspection, and implementation of effective monitoring system of actual energy consumption in buildings subject to the new energy efficiency code. All these activities are scheduled to be implemented and finalized by the project by the end of 2012.

The project as of October 2011 has good prospects to fully implement these remaining tasks; however the next year will be critical for securing the sustainability of project impacts in long term.

### Project impact

This UNDP/GEF Improving Energy Efficiency in Buildings project addresses only a small energy efficiency market niche and opportunities in Kyrgyzstan – new buildings. The country faces complex problems in the energy sector and most of the energy efficiency potential remains unaddressed so far. This includes energy pricing reform that would allow energy utilities to collect enough revenues for urgently needed reconstruction and modernization of its infrastructure. In district heating sector this means specifically installation of heat meters that would help to identify the most urgent energy inefficient segments of its infrastructure for modernization, and installation of heat controls both in the distribution network and on the building level to minimize energy losses. Energy efficient reconstruction of existing building stock is practically none existent due to scarce sources of financing and low capacity of building owners and utilities to accept and repay loans.

In this respect the focus of the project on development of an energy efficiency code for buildings and development of local capacity in Integrated Building Design is perhaps the best, if not the only one low-cost/no-cost energy efficiency strategy applicable in today’s Kyrgyzstan. A strategy that can be successfully implemented independently on other needed complex reforms.

Such strategy has a limited impact in short term, during project implementation, due to its focus on small share of new buildings on the whole market. However, its long term potential impact in terms of CO2 savings is substantial. This illustrates also the target 2 which was designed in the Project Document to cover a period of 10+ years after project termination – estimated indirect GHG savings of 267 000 tCO2.

The project evaluation has demonstrated that the project has already delivered substantial impact in terms of development and strengthening of local capacities to design energy efficient buildings, although the actual benefits in terms of CO2 savings from buildings built during project implementation are rather limited. However, this type of capacity building projects in principle cannot generate significant amount of GHG savings during project implementation only, including savings from pilot buildings. The main benefits can follow only in the future, after project termination.

The project has delivered already substantial results and impact: new energy efficient code has been developed, approved, and implemented, local professionals, including architects, designers and building inspectors, were trained, and design of three pilot school buildings have been prepared and a construction of one pilot school and one school gymnasium has started. In a parallel activity sponsored by EBRD a new Law on Energy Performance in Buildings has been developed, approved by the Parliament and will come into force in 2012.

The GEF/UNDP project activities in 2012 should focus primarily on support of full implementation of the administration of the certification system at Gosstroy, and on development and implementation of the monitoring system of actual energy consumption in new buildings. A transparent and published system on building performance control and building certification will increase also compliance rate with the new code even in the situation where corruption is widespread, and will make the project impact sustainable.

# Conclusions, Recommendations and Lessons Learned

The project design properly addresses the country needs and priorities and reflects the specific situation in Kyrgyzstan – lack of energy sector reforms due to political instability and poor economic performance. The GEF/UNDP project Improving Energy Efficiency in Buildings is a low-cost strategy with a potential to deliver sustainable impacts in long terms even if the government will not implement the needed energy sector reforms in a near future.

The Project Document is quite well developed; the relatively weakest part is LogFrame and specification of project indicators and targets. Some of them are not specific enough, not measurable, and some are not exactly relevant to project objectives and designed activities. The LogFrame needs improvement so that it could properly measure project achievements. However, the specification of the LogFrame has significant impact on proper evaluation of project results, but not directly on actual delivery of project results themselves.

The project faced significant risks, both external and internal. Unexpected critical external factor were the violent political protests in the spring 2010 which resulted in political instability and together with the world economic crisis lead to economic decrease and public budget cuts. This multiplied the key internal risk: the project fully relied on local public investors to provide financing for the construction of pilot buildings to be built in accordance with the new energy efficiency code. And unfortunately neither of both municipalities was in a position to fulfill its commitment to finance the construction costs of pilot schools in Osh and Bishkek.

The PIU deployed effective adaptive management and with a big portion of good luck it managed to secure alternative financing from TIKA, the Turkish International Cooperation and Development Administration, for the school in Osh, and to redesign a gymnasium of another school already under construction in Ak-Kashat, whose budget was already approved and financing provided.

The project target to dramatically increase compliance with the energy efficiency code from estimated 10% to 80% seems unrealistic. In a country with widespread corruption one cannot expect that just implementation of a certification system and training of state building inspectors will guarantee such an significant change, if the target is applicable for all buildings, including small residential where the compliance rate is believed to be the lowest one. The indicator and target might be redefined in accordance with the new Law on Energy Performance in Buildings which is not applicable for residential buildings smaller than 150 m2.

As discussed in detail in Chapter 4.3.1 Attainment of Outputs, Outcomes and Objectives, the main project objectives, outcomes and targets has been in principle reached proportionally to the status of project implementation. Some of the project activities have been delayed, but are expected to be fully achieved by the end of project implementation with one exception: monitoring of actual energy consumption of newly constructed pilot buildings will not cover the whole heating period by the planned termination of the project implementation. New energy efficiency code – SniP has been implemented, four GOST technical norms updated, two schools and one gymnasium has been designed according to the new code, a construction of one school in Osh and a gymnasium in AK-Kashat has been launched in September 2011, total of 162 professionals have been trained in new energy efficiency code compliance, two energy efficiency in buildings curricula developed and approved for two universities, three manuals – energy efficiency catalogues developed and disseminated, one film and a video were prepared and broadcasted, information leaflets disseminated, information on project results updates published in numerous newspaper articles.

## Recommendations

## Lessons Learned

# Annexes

# Annex 1: Itinerary and list of persons interviewed

# Annex 2: List of key project short-term experts (SSA/IC)

# Annex 3: List of documents reviewed

**General documentation**

* UNDP Programme and Operations Policies and Procedures
* UNDP Handbook for Monitoring and Evaluating for Results
* GEF Monitoring and Evaluation Policy
* GEF focal area strategic program objectives
* UNDP Development Assistance Framework
* UNDP Country Program Document
* UNDP Country Program Action Plan
* Project-Level Evaluation: Guidance for Conducting Terminal Evaluations of UNDP-Supported GEF-Financed Projects, UNDP 2012

**Project documentation**

* GEF approved Project Ddocument and Request for CEO Endorsement
* Inception Report
* Annual Work Plans
* Annual Project Reports
* Project Implementation Review
* CDR
* Quarterly Reports
* Project Outcome Board Meeting minutes
* Project Steering Committee Meeting minutes
* Updated risk log
* Mid-Term Evaluation Report,
* Financial Audit Reports
* Project internal financial records (financial spreadsheet)

**Project web sites:**

**Project deliverables – see Annex 4**

# Annex 4: Summary of reviewed key project deliverables, reports and studies

# Annex 5: Final evaluation TOR