FINAL EVALUATION

of the

UNDP/GEF Medium Size Project

Improving Energy Efficiency in Buildings, Kyrgyz Republic

Project ID: 62794

PIMS: 3910

Pilot project – first energy efficient school in Kyrgyzstan, School No. 52 in Osh

This Final Evaluation Report was prepared for UNDP Kyrgyzstan by:

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Profile of the evaluator

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.

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Abbreviations and acronyms

APR	Annual Project Review
AWP	Annual Work Plan
CEO	Chief Executive Officer
CO	Country Office
EE	Energy Efficiency
EPBD	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/СНиП = Строительные нормы и правила)
TIKA	Turkish Cooperation and Coordination Agency (Turkish Development Agency)
ToR	Terms of Reference
UNDP	United Nations Development Programme

1. Executive summary

Table 1: Overview of the project identification

Project title	Improving Energy Efficiency in Buildings
GEF Project ID	62794
UNDP Project ID	3910
Country	Kyrgyz Republic
Region	Central Asia
Focal Area	Climate Change
Operational Program	
GEF agency	UNDP
Executing Agency	State Agency for Architecture and Construction under the Government of the Kyrgyz Republic (Gosstroy)
Other Partners Involved	- State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic, - National Agency on Local Self-Governance, - Bishkek and Osh Municipalities

Table 2: Key project milestones

	Originally expected date	Actual/revised date
CEO endorsement/approval		August 2008
Agency approval date		December 5, 2008
Implementation start		December 5, 2008
Midterm evaluation completion		November 2011
Final evaluation completion		January 2014
Project completion	December 2012	June 30, 2014
Project termination		June 30, 2014

Table 3: Overview of budgeted and actual financial sources provided [in USD]

	Budgeted in Project Document	Actual
GEF financing	900 000	900 000
UNDP own financing cash	50 000	50 000
UNDP own financing in-kind	82 000	82 000
Government cash		45 000
Government in-kind	3 100 000	100 000
Other (TIKA grant, WHO)		6 965 000
Total co-financing	3 232 000	7 242 000
Total project costs (incl. GEF)	4 132 000	8 142 000

As of end of 2013, in total 877 131 USD has been spent out of total GEF budget of 900 000 USD.

1.1 Brief description of project

The project was designed with an aim to decrease high energy intensity of the building stock in Kyrgyzstan that is several times higher than in EU countries. Existing buildings were in obsolete conditions and in need for reconstruction; newly built buildings did not comply even with minimum energy efficiency requirements, typically no building insulation was used.

Kyrgyzstan ranks among two poorest countries in Europe and CIS region, but it has relatively open political system (it is the first parliamentary democracy in the Central Asia), and it has well developed civic society sector compared to other countries in the region. Kyrgyzstan faces a challenge to sufficiently enforce rule of law due to high corruption. Thus, also compliance with building regulations is in general very low.

The project was designed with an objective to reduce energy consumption and associated GHG emissions in Kyrgyzstan building sector by 30-40% and structured into five project components with following outcomes:

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

The budget of the GEF contribution of 0.9 million USD was not intended to be spent for investment costs of pilot projects. The investment costs for construction of two pilot schools were planned to be provided as a co-financing contribution by municipalities in Osh and Bishkek (in total 3.182 mil USD). Due to financial crisis municipalities in Osh and Bishkek were not in a position to finance construction of new pilot schools. However, the project managed to attract alternative investor (TIKA, Turkish Cooperation and Coordination Agency) that provided 6.9 mil USD for construction of new energy efficient pilot school in Osh. In addition to the pilot school in Osh a gymnasium of a school in Ak-Kashat under construction has been redesigned and constructed in more energy efficient way.

The project was originally designed as a four-year project (December 2008 – December 2012) and it was extended twice with no cost increase for GEF by end of 2013 and finally by end of June 2014. The total project duration is thus 5.5 years.

1.2 Evaluation rating

Table 4: Overview of project achievements rating

Project achievements are described in detail in Chapter 4.3.1 Overall results and attainment of objectives on page 35.

Indicator	Target	Achievements	Rating
1: Average thermal energy consumption in new/renovated residential/public buildings	1: Thermal energy consumption for new code-compliant buildings reduced to an average of 100 kWh/m² (by about 30%)	82 kWh/m^2	**HS**
2: New building lifecycle CO2 emission	2a: Direct lifecycle CO_2savings from constructed two pilot buildings 1 140 tCO_2 savings	1 620 tCO_2	**HS**
	2b: Indirect lifecycle CO_2 savings from replication of energy efficient buildings by the end of the project of 22 800 tCO_2	13 392 tCO_2	**MU***
Outcome 1:	***Improved energy performance codes***		

3: Adoption of mandatory energy efficient building code and its regular updates implemented	3: New performance-based EE code adopted in 2010 and updated at least once in 10 years	SNiP 23-01:2009 adopted in 2009	**HS**
4: Level of minimum mandatory thermal requirements for buildings	4: 10-20% decrease to 80 kWh/m² (or lower for larger multifamily buildings)	64, 66, 70, 73, 78, 96 kWh/m²	**HS**
5: Capacity of national authorities to design and regularly update advanced building codes	5: Calculation methodology to determine building energy consumption agreed, software obtained and staff trained in its application	Methodology in SP 23-01:2009, SP: 23-101:2009, SW purchased, staff trained	**HS**
Outcome 2: Improved enforcement of mandatory energy efficiency building codes			
6: Level of enforcement of new standards	6a: Compliance levels of building *designs* radically improved up to 80%	92%	**HS**
	6b: Compliance levels of *constructed* buildings radically improved up to 80%	60% - estimate	**MU**
7: Capacity to assess building energy performance in line with new standards	7a: Laboratories equipped by end of year 1	Four infra-red cameras	**HS**
	7b: 20 staff from Gosstroy and university trained to undertake energy performance assessment by end of year 1	26 + 12 experts trained	**HS**
8: Enforcement capacity for EE building code: trained staff, rules and procedures for building certification	8a: Procedures for mandatory building certification system adopted and tested by year 2	Energy passport of designed buildings according to SNiP	**S**
	8b: 150 Building Inspectors trained in their application by end of year 3	170 experts trained	**HS**
	8c: Building certification works by year 3	Implemented	**S**
Outcome 3: Pilot projects utilizing an integrated design approach			
9: Energy- and cost-saving and social impact of integrated building design (IBD) in comparison with similar buildings	9a: No or maximum 10% increase in construction cost of new pilot buildings	3.8% increase of investment and 40% energy reduction	**HS**
10: Scale of replication of energy efficiency building design in public sector in large cities	10: All new public buildings in two largest Kyrgyz cities (Osh and Bishkek) comply with the new energy efficiency code SNiP by the end of the project	All designs of public buildings comply with new code	**HS***
Outcome 4: Promotion of best energy design and building practices in construction sector			
11: New curricula on energy efficient building design for universities	11: Curricula developed, registered with Ministry of Education and introduced in Kyrgyz University for Construction, Transport and Architecture	Curricula applied in three universities	**HS**
12: Number of trained building engineers and architects	12: At least 100 industry professionals receive training in application of new codes	230+ experts trained	**HS**
13: Indicator deleted based on MTE recommendation			
Outcome 5: Monitoring of building energy consumption and GHG emissions			
14: Implementation of monitoring of building energy consumption and GHG emissions	14: Monitoring system, including institutional framework, trained staff and technical tools and methodology, including system for energy data collection and calculation of energy use for space heating developed in accordance with the Law on Energy Performance in Buildings, is in place by the end of the project, and implemented for project pilot buildings and other buildings built according to the new energy efficiency code by mid 2012 at least	Methodology developed and tested for pilot buildings, monitoring system not adopted.	**MU**

Rating: HS (Highly Satisfactory) – S (Satisfactory) – MS (Moderately Satisfactory) – MU (Moderately Unsatisfactory) – U (Unsatisfactory) – HU (Highly Unsatisfactory)

*Note: Achievement of target 2b refers to GHG emission savings (in absolute values) from all buildings constructed according to the new building code. Achievement is lower than target primarily due to the fact that actual construction rate was lower than estimated. The target 10 (relative value) refers only to very few actually designed and constructed public buildings in Osh and Bishkek.

Table 5: Final Evaluation Rating

	Rating					
	HS	S	MS	MU	U	HU
1. Monitoring and Evaluation						
M&E design at entry		**S**				
M&E plan implementation		**S**				
Overall quality of M&E		**S**				
2. IA & EA Execution						
Quality of UNDP Implementation	**HS**					
Quality of Gosstroy Implementation		**S**				
Overall quality of Implementation/Execution		**S**				
3. Assessment of Outcomes						
Relevance		**R**				
Effectiveness		**S**				
Efficiency		**S**				
Overall Project Outcome Assessment		**S**				
4. Sustainability						
Financial Resources	**HS**					
Socio-political		**S**				
Institutional Framework and Governance			**MS**			
Environmental	**HS**					

HS – Highly Satisfactory, S – Satisfactory, MS – Moderately Satisfactory, MU – Moderately Unsatisfactory, U – Unsatisfactory, HU – Highly Unsatisfactory
Relevance: R – Relevant, NR – Not Relevant

	L	ML	MU	U
Overall likelihood of sustainability	**L**			

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

	S	M	N
Impact	**S**		

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

1.3 Main conclusions, recommendations and lessons learned

The overall rating of the project is satisfactory.

The project delivered most of planned results, although not all of them.

New building code SNiP KR 23-01:2009 with relatively strict energy efficiency requirements has been developed and adopted, construction professionals and building inspectors trained in building code compliance, compliance rate with building code increased, in total four energy efficiency pilot projects were constructed and reconstructed with a total investment of 7 mil USD provided by external investors. First energy efficient school in the country was designed and constructed in Osh (School No: 52 that hosts 970 pupils) with energy consumption for space heating of 40 kWh/m^2, sport hall in school in Ak-Kashat village was constructed, and two small rural medical centers were reconstructed in energy efficient standard according to the new building code. All pilot buildings demonstrated significant energy savings of about 40% with investment cost increase of about 4%. Project results and experience and new building code was

widely promoted across the country, three university and college curricula on energy efficiency in building construction were developed and adopted. Methodology and procedures for energy consumption and GHG emissions monitoring was developed, applied in pilot buildings and submitted to relevant ministry for decision.

The monitoring system of existing buildings based on compulsory energy audits has not been approved and adopted yet. Compliance rate of constructed buildings have significantly increased to estimated 60%, but has not reached yet the planned but very demanding target of 80%. Direct project CO_2 emission savings reached 1 620 tCO_2 and met the planned target. Conservative estimate of indirect project CO_2 emission savings of 13 392 tCO_2 has not reached the planned target of 22 800 tCO_2 primarily due to lower number of constructed buildings subject to the new building code.

All three targets that were not fully reached are very ambitious and it was not realistic to achieve some of them as stated already in the MTE (80% compliance rate), especially when taking into account the limited budget of the project and limited institutional capacities compared to similar projects in the region. The GEF project budget of 0.9 mil USD does not include investment component and it is several times smaller than GEF budgets of similar energy efficiency in buildings projects in other countries in the Central Asia (ranging from 2.5 to 4.5 mil USD).

Target indirect project GHG emission reductions were calculated in the ProDoc with an assumption that replication factor will be 20, in other words, that 10 new schools in Osh and additional 10 new schools in Bishkek will be constructed within 2010-2012 in energy efficient standard. In reality, the pilot school in Osh, the first school in Kyrgyzstan designed and constructed according to the new SNiP, was constructed only in autumn 2012, and only one smaller school was constructed in Osh suburb in 2013. The actual construction rate in Kyrgyzstan was significantly smaller than planned due to combination of political crisis in 2010 and financial crisis and subsequent public budget cuts. Another important factor is that the indirect emission reduction calculation in ProDoc, as well as the SNiP code itself, does not include any transitional period after the new building code was adopted and entered into force in 2010. First experience from the pilot project could have been fully collected and disseminated in 2013, three years after the new building code came into force, and first buildings that incorporate experience from the project pilot school could have been designed in 2013 and constructed in 2014 at the earliest. Thus, in fact the full replication of buildings constructed according to the energy efficient standard of the new building code and utilizing experience gained during this GEF project can be expected to fully materialize starting in 2014. Lower actual indirect emission reductions than planned thus illustrate primarily lower construction rate, and reflect actual transitional period needed for full dissemination of experience in design and construction of buildings according to the new energy efficient building code.

Energy consumption (and GHG emissions) monitoring system of existing buildings is rather new concept also in EU countries which have several decades long experience with energy efficiency building codes and building insulation materials, and where energy consumption is metered, including district heating. Full scale implementation of energy monitoring system requires advanced market, and it is also rather costly measure. For example, in Croatia implementation of energy monitoring system in public buildings had a budget of 20+ mil USD. This suggests that full implementation of the energy monitoring system in Kyrgyzstan is not realistic to achieve within this project (whole project budget of less than 1 mil USD) and neither rational at this stage of development (there are practically no building level district heat metering installed yet).

Except for planned results, the project delivered a number of other achievements that supported project goal. For example university and college construction studies were supported by a new locally developed textbook on energy efficiency in buildings and a Russian translation of a book on design of passive houses authored by Dr. Wolfgang Feist of Passivhaus Institute, Germany, the project co-organized several international events on energy efficiency in buildings, how-to guide for house owners was developed and distributed in

Kyrgyz and Russian languages, technical catalogues for building designers with typical energy efficiency solutions in construction was developed and distributed.

The project was implemented in a difficult period of financial crisis, political crisis and violent riots in 2010 in Kyrgyzstan, the second poorest country in the CIS region. Despite these negative factors, fully outside of project control, the project managed to deliver results and make a significant and sustainable impact on energy efficiency in buildings on Kyrgzystan.

Except for quantitative project achievements described above, the main contribution of the project is that it served as genuine catalyst of energy efficiency in Kyrgyzstan. The project managed to change the attitude of local professionals and decision makers towards energy efficiency and their way of thinking and understanding energy efficiency from a declaratory theoretical buzzword to a real business opportunity that increases value of energy efficient buildings compared to energy intensive buildings with poor or no insulation.

Recommendations:

I. External financing of pilot projects investment costs by a third party, ie. outside of the UNDP/GEF project budget, is the most cost-effective arrangement from the GEF perspective. However, it is also a very risky arrangement, as experienced by this project. In case the investor fails to fulfill the financing commitment, the project is exposed to a serious risk that pilot projects will not be constructed. Letter of Intent to provide financing is not a legally binding commitment. Ideally, in the project development phase, before Project Document signature, legally binding financing commitment should be submitted, or alternative financing solutions and financing risk mitigation strategies should be prepared in the Project Document already (for example Letters of Intent signed with more potential investors).

II. Effective energy consumption and GHG emission monitoring system requires energy metering ideally at the building level. Without metering, energy consumption for space heating can be calculated and estimated only, which is rather costly and prone to over- or underestimation, and thus it can be effectively used in individual cases only. Before implementation of a country-wide energy consumption monitoring system, energy meters should be in place, including building level district heating meters. Or in other words, the national monitoring system should apply only to buildings with metered energy consumption for space heating. Otherwise the monitoring costs and administrative burden might easily exceed benefits from "accurate calculation of inaccurate inputs".

III. Implementation of a full scale national energy consumption and GHG emission monitoring system is a very ambitious and rather costly task. It requires sufficient budget and time, sufficiently developed local experience with energy efficiency, and a sufficient potential - and a financing capacity - to invest into energy efficiency improvements of existing buildings and technologies. Otherwise, energy and GHG monitoring system would remain just an expensive administrative exercise. Implementation of energy and GHG monitoring system might be a subject of a separate future full-size project - after experience with energy efficiency reconstruction of buildings will be more widespread and capacity to finance energy efficiency reconstruction of existing buildings and technologies strengthened.

Lessons learned:

I. Energy efficiency building code that sets up mandatory minimum energy efficiency requirements is an affordable and effective policy tool that can be implemented effectively even in a case of a poor country with underpriced energy - especially for newly constructed buildings, although actual GHG emission savings in absolute values in short term will not be in this case as high as in more developed countries with higher rate of construction. 40% energy and GHG emission reduction in new buildings with only 4% incremental costs, as demonstrated in pilot buildings, is a potential that would otherwise remain untapped.

II. Even in case of heavily underpriced energy where energy savings themselves do not pay for investment costs into improved energy efficiency in buildings, energy efficiency does have economic sense for investors. Improved energy efficiency performance of housing and insulated buildings increase comfort of living and increase market price of the real estate and thus generate real economic return for investors who sell buildings with improved energy efficiency.

III. In countries with high share of poor individually owned housing and a tradition of do-it-yourself approach it is more difficult to enforce newly introduced energy efficiency building code in this market segment. It is more appropriate to target mandatory energy efficiency building code first to larger buildings, institutional investors – companies (legal persons) and public buildings, or to have more demanding energy efficiency requirements for these types of buildings.

IV. In a country that faces problems with low law enforcement and a widespread corruption one cannot expect that any administrative measure will fully eliminate non-compliance with a new building code. Equally important is increased demand for energy efficient housing and buildings based on hands-on experience from living in well insulated buildings and spread of word and information and experience dissemination. Generating such demand is not a one-time activity but rather a long-term process. A single five-year project cannot fully eliminate non-compliance problems but can effectively initiate the process of gradual compliance increase.

V. This project – that did not have any investment component in its GEF budget – can serve as the best example of being a catalyst of energy efficiency in buildings. The project was proactively managed by its Project Manager, it openly and effectively cooperated and did not compete with other relevant projects in the country. The project actively sought cooperation with other international donors and supported them by incorporating energy efficiency component and by providing locally developed expertise for their investment projects.

VI. This project was the first one of several GEF energy efficiency in buildings projects implemented in the region – in Armenia, Uzbekistan, Kazakhstan, and Turkmenistan. The UNDP RTA facilitated cooperation and information and experience sharing among these projects. A joint website was created and includes project updates from each country. All individual projects benefited especially from sharing experience in energy efficiency building code development. This regional experience and know-how sharing can serve as a good example worth for replication in other countries and regions as well.

VII. This project can serve as the best example in effective and quick start. Typically UNDP/GEF projects suffer from delayed and slow start, caused often by lengthy hiring of the project manager and staffing of the project team initiated with delays after ProDoc signature. In this case the project started full effective implementation immediately after official signature of Project Document without any transitional period. The inception report was actually organized already few weeks before the official launch of the project and signature of the ProDoc, after GEF CEO approval of the

project. The process of hiring Project Manager was initiated by UNDP CO immediately after GEF approval of the Project Document and the Project Manager was hired on November 24, 2008, few weeks before actual official signature of the Project Document on December 5, 2008.

VIII. The project management and administration benefited from using locally developed simple financial spreadsheet that tracks financial data (budget and actual expenditures) not only in Atlas structure, but also in project activities structure. Atlas structure is not suitable for effective daily project financial management because it does not show details for individual project activities. Few projects in few countries do use similar locally developed financial spreadsheet, however in most cases project management depends fully on reporting in Atlas structure only, and have to make ad hoc financial reports according to project structure “by hand” if needed. It would be worth to offer all UNDP/GEF projects a simple financial spreadsheet that links individual budget lines and expenditures to Atlas budget lines as well as to actual project activities.

2. Introduction

2.1 Purpose of the evaluation

This final evaluation was performed on a request of UNDP CO Kyrgyzstan (the GEF Implementing Agency) as a standard mandatory requirement of all UNDP/GEF projects. The final evaluation mission took place in Kyrgyzstan, in Osh and Bishkek, on November 11-17, 2013, the Final Evaluation report was submitted in February 2014.

The objective of this evaluation is to assess achievements of project’s objectives, affecting factors, broader project impact and a contribution to the general goal/strategy, and a project partnership strategy. It also provides a basis for learning and accountability for managers and stakeholders and for providing 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 final evaluation has four objectives:

i. 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;

ii. 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;

iii. 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

iv. 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.

2.2 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:

I. Project documents review prior to the evaluation mission
II. Evaluation mission and on-site visits, interviews with project management, UNDP CO, project partners, representatives of the implementing partner, government, steering committee, other relevant stakeholders and independent experts
III. Drafting the evaluation report and ad-hoc clarification of collected information/collection of additional information

IV. Circulation of the draft evaluation report for comments
V. Finalizing the report, incorporation of comments

2.3 Evaluation criteria

The following key evaluation criteria have been used in the final evaluation according to the UNDP/GEF Terminal Evaluation Guide:

- *Relevance*
  The extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time, and the extent to which the project is in line with the GEF Operational Programs or the strategic priorities under which the project was funded.
- *Effectiveness*
  The extent to which an objective has been achieved or how likely it is to be achieved.
- *Efficiency*
  Cost-effectiveness of funds spent to reach project objectives and results and the extent to which results have been delivered with the least costly resources possible.
- *Results*
  The positive and negative, foreseen and unforeseen changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short to medium-term outcomes, and longer term impact including global environmental benefits, replication effects and other local effects.
- *Sustainability*
  The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion (includes environmental, financial and social sustainability).

2.4 Structure of the evaluation report

This final evaluation report follows the structure specified in the “Project-Level Evaluation, Guidance for Conducting Terminal Evaluations of UNDP-Supported GEF-Financed Projects”, UNDP 2012.

3. Project description and development context

3.1 Project development context

Kyrgyz Republic has, in regional comparison, relatively well developed parliamentary democracy and civil society institutions, but during the project implementation period, it heavily suffered from political instability, occasional violent political protests and riots, widespread corruption and selective law enforcement.

According to the World Bank, the Kyrgyz Republic with its GDP per capita in 2012 of 1 160 USD ranks among two poorest countries in the region of Central Asia and CIS.

Period of high economic growth (GDP) of up to 9% in 2007-2008 was followed by years with zero or negative real economic growth (-1%) caused by world economic crisis, local political instability and violent protests in 2010, with a singular peak growth of 6% in 2011.

Table 6: Per Capita Gross Domestic Product (GDP) and Gross National Income (GNI) in Purchasing Power Parity (PPP) in 2012

Country	GDP per capita [current USD]	GNI per capita in PPP [current international USD]
Russia	14 037	22 720
Kazakhstan	12 116	11 780
Turkmenistan	6 798	9 070
Uzbekistan	1 717	3 670
Kyrgyzstan	1 160	2 230
Tajikistan	871	2 180

Source: The World Bank, www.worldbank.org, as of January 2014

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 interruptions. End-use energy prices regulated by the government are low and do not reflect full costs. Electricity is priced extremely low at 0.7 KGS/kWh (1.4 US cent/kWh) for households and 1.5 KGS/kWh for others (3 US cent/kWh). The governmental decision to increase energy prices in 2010 has been 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 are 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, energy efficiency was just declared as a policy priority, but was not transformed to any viable action plan. Thus, the UNDP/GEF project "Improving Energy Efficiency in Buildings" properly addressed one of the country's urgent needs and policy priority.

The Kyrgyz building stock has been constructed during the Soviet period without any regard to energy efficiency. Energy use for space heating per square meter is reported in the ProDoc to be up to several times higher than in EU countries with similar climate conditions and comparable number of 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 without any heat controls. A unique opportunity in demonstrating benefits of energy efficiency thus lies in the design and

construction of new buildings – energy efficient building design is not costly and thus it represents an affordable market niche also for specific situation in Kyrgyzstan.

This UNDP/GEF project was designed with the aim to improve end-use energy efficiency in buildings, practically as the first country-wide energy efficiency initiative with a sustainable impact, combining development of new energy efficiency building code, training of local professionals and demonstrating effects of new building code by construction of first pilot buildings according to higher energy efficiency standard. The project addresses a critical and important problem and is fully in-line with the declared country's energy security and energy efficiency priority.

3.2 Project start and its duration

The project was officially launched on December 5, 2008 by signing the Project Document by representatives of the State Agency for Architecture and Construction under the Government of the Kyrgyz Republic (Gosstroy) and UNDP. The project was originally scheduled to last for four years till December 2012. The project was extended twice with no cost in order to have sufficient time after construction of pilot schools for proper monitoring of real energy performance of pilot buildings and dissemination of real hands-on experience among stakeholders in the country. In 2012 the project was extended by one year till the end of 2013, and in 2013 by another half a year till June 30, 2014. The originally planned 4-year project has been extended in total to last 5.5 years.

On September 16, 2008, after the project has been approved by GEF, 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.

3.3 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 an urgent political topic.

Mortgage loans became available which attracted development in residential sector. However, new buildings, and especially smaller residential buildings, often did not comply even with the low energy efficiency building standard of that time.

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

3.4 Immediate and development objectives of the project

The project has been developed with expected project outcome "Sustainable development principles integrated into poverty reduction policies and programs" and within an 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".

The project objective is to reduce energy consumption and associated GHG emissions in Kyrgyzstan building sector by 30-40%.

The project target has been enumerated to reduce GHG emissions by 267 000 tCO_{2eq}. This amount included both total project- and post-project lifecycle emission reductions from all new energy efficient buildings built in compliance with the new energy efficiency building code until 2023 – ie. 10 years after planned project termination.

Project direct and indirect emission reduction targets have been calculated to be 1 140 tCO_{2eq} direct lifecycle emission reductions from two pilot public buildings built with support from the project, and additional indirect 22 800 tCO_{2eq} lifecycle emission reductions from other buildings being built according to the new energy efficiency code until the project termination.

3.5 Baseline indicators

The project logical framework matrix specified indicators and targets for each project outcome and for project objective.

In addition to targets, a baseline was specified for each indicator, as well as means of verification and important assumptions.

The logical framework specified in the Project Document was revised by the Inception Report and MTE report.

The main change in the project LogFrame was a revision of target of project indicator 2: new building life cycle CO_2 emissions. Originally, the target was 267 000 tCO_2 emission reductions; however, this number combined total project- and post-project emission reductions and thus could not be verified even at the end of project. The MTE thus recommended replacing this target with two new targets:

Target 2a: Direct lifecycle CO_2 savings from constructed pilot buildings of 1 140 tCO_2, and

Target 2b: Indirect lifecycle CO_2 savings from replication of energy efficient buildings by the end of the project of 22 800 tCO_2.

These targets have been calculated and specified originally in the project document.

3.6 Expected results

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.

2. 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 10% only. The very ambitious goal of the project is to increase the compliance rate to 80%. This component includes training of Gosstroy building inspectors and creating of building certification – system of energy passports.
3. Pilot projects utilizing and integrated building design approach
   One pilot school in Osh and a school sport hall in Ak-Kashat (originally planned two pilot schools in Osh and Bishkek), were planned to be designed according to new strict energy efficiency code and should comply with energy efficiency class B. The project budget has been planned to support building design only, full investment costs were expected to be provided by investors. Energy efficiency building design should be replicated in all public buildings in large cities.
4. 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.
5. 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.

4. Findings

4.1 Project design and formulation

The project idea was initiated by UNDP/GEF 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 final proposal focused on building level energy efficiency and contained five components:

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

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

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

The total project development period lasted three years (2006-2008) from the specification of initial project idea till the signature of ProDoc.

4.1.1 Project relevance and implementation approach

This project is focused on development of new stricter energy efficiency code for construction of new buildings and reconstruction of existing buildings, demonstration of energy efficiency design according to the new code by construction of new energy efficient pilot buildings, dissemination of best practices and monitoring of results achieved.

The focus of the project on newly built buildings through development of energy efficiency expertise in the country, and development and implementation of a new energy efficiency building code, addresses relatively small market segment compared to the whole building stock, but it is probably the best affordable low-cost energy efficiency strategy that can be implemented and replicated even in situation when the country lacks any economic motivation and sufficient capital for large-scale investment into energy efficiency reconstruction of the existing building stock.

The project is fully in line with the Country Development Strategy 2008-2010, that formulated goals to decrease energy intensity by 13% in 2011, and specifically to ensure sustainable development in housing sector through improvement of energy efficiency in newly constructed buildings.

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 CO_2 emissions reductions calculation according to the GEF Manual for Calculating GHG Benefits of GEF Projects and it was supported with statistical data analysis.

4.1.2 LogFrame 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”.

The Mid-Term Evaluation found some of the project LogFrame indicators and targets not to be specific enough and/or not measurable, because they included period after project termination. Some of the targets were estimated to be unrealistic, such as radical improvement of the compliance rate with the new energy efficiency code from 10% up to 80%.

4.1.3 Assumptions and risks

The project document defined in the project logical framework matrix specific assumptions for each project indicator and target.

In addition to LogFrame targets assumptions, three project risks have been identified, rated, and a risk mitigation strategy was defined in ProDoc:

Overview of risks specified in ProDoc:

1. Energy efficiency building code enforcement levels will not improve sufficiently – risk rated medium

2. Cooperation between national organizations will not be optimal – risk rated low

3. Energy efficiency building designs will not be adopted and replicated in other municipalities

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

The Inception Report highlighted additional risk of not providing co-financing for investment in pilot projects due to economic crisis.

The MTE report discussed in detail described risks, highlighted additional risks and proposed mitigation strategies. MTE assessed that the assumption to increase building code compliance rate from 10% to 80% is not realistic, and suggested that project efforts should focus primarily on large buildings financed from public budgets, and multi-apartment buildings.

Due to the fact that there are practically no district heat meters installed, MTE also recommended to focus energy monitoring system only on buildings with metered energy consumption (gas, electricity).

4.1.4 **Planned stakeholder participation**

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

The project is implemented under the NEX (National Execution) modality. The main project partner, the implementing partner, is Gosstroy, the State Agency for Architecture and Construction under the Government of the Kyrgyz Republic. Inviting Gosstroy to be an Implementing Partner was a crucial decision that supported local ownership of the project.

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:

- Development of policy in the area of urban development in the KR
- Development of regulatory and legal acts in the area of design and construction
- Implementation of progressive standards, technologies, materials, equipment
- Design expertise
- Standardization and price formation
- Drafting/development of urban development plans and documentation
- Licensing of construction specialists
- Certification of construction products
- Supervision over norms/standards application and project/construction implementation

Other project partners specified in the ProDoc 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.

During the project design phase 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 (NGO)
15. Biom (NGO)
16. Sustainable Nature Management (NGO)
17. Public Fund Inon

4.1.5 **Linkages between the project and other interventions within the sector**

At the project design phase (and also during project implementation phase), the project team contacted and facilitated discussion with all relevant stakeholders and activities in the country.

Before the project launch, during the project design period, UNDP contacted KfW (German development bank) to discuss potential cooperation within a Village Investment Project (VIP-KfW) implemented by the

Kyrgyzstan Community Development and Investment Agency (ARIS) which provides grant and loan financing for local communities to improve economic and social infrastructure, including construction of new energy efficient public buildings (schools, kindergartens and hospitals).

The project design incorporated also experience from the Energy Efficiency Program implemented by the Municipality of Bishkek with the support of the Norwegian Government. The program performed energy audits in selected public buildings, trained auditors and municipal managers, established a small municipal revolving fund for energy efficiency projects, and supported few buildings to be retrofitted.

The project was designed to advance implementation of the law on “Energy Saving” (1998) and the National Strategy for Energy Efficiency. The project is also fully consistent and builds on recommendations from the Initial National Communication to UNFCCC.

4.1.6 **UNDP comparative advantage**

UNDP Kyrgyzstan has the administrative capacity to implement energy efficiency in buildings project and it is a neutral implementing agency.

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 was the first building energy efficiency UNDP/GEF project implemented in the Central Asia. Similar UNDP/GEF projects are under implementation also in Kazakhstan, Uzbekistan, Turkmenistan, Armenia and in other countries.

UNDP has demonstrated international experience in energy efficiency in buildings. UNDP has collected and developed practical experience in energy efficiency by implementing building energy efficiency projects internationally, already before the launch of this project in 2008. UNDP also benefitted from synergy of portfolio of similar building energy efficiency projects in environmental governance focus area, and namely of those that are being implemented regionally in Uzbekistan, Kazakhstan, Armenia and Turkmenistan and globally.

UNDP has also a proven record of effective cooperation with international energy efficiency experts both in project development as well as in project implementation phases.

4.1.7 **Replication approach and sustainability**

The project has been designed to create a framework consisting of legislation, new energy efficiency code, locally developed capacity and know-how to design and construct new energy efficient buildings. This framework is designed to be fully employed and used for replication - construction of new energy efficient buildings - especially after project termination, and thus to secure sustainability and replicability of project results.

Pilot energy efficient buildings were planned to serve primarily for development and distribution of local hands-on experience with energy efficient building design and construction. The actual construction of pilot projects is not an ultimate goal of the project itself. Primarily it should serve for gaining practical experience that can be further disseminated. Key project impact in terms of amount of CO_2 savings is planned to be achieved after project termination – when new buildings in the country will be constructed according to the new energy efficiency code.

4.2 Project Implementation

4.2.1 **Project implementation and adaptive management**

The project did not experience during project implementation any need to make significant changes to the project design in terms of project activities, nor to project outcomes/outputs: new building code has been developed and adopted, experts and professionals trained, pilot buildings designed and constructed, energy consumption and CO2 emissions in pilot buildings monitored, although a system of monitoring of energy consumption and GHG emissions has not been established.

After the inception report and MTE, the project has updated specification of several targets in the LogFrame as suggested, however the content of project outcomes have remained unchanged.

However, as described below in Chapter: 4.2.4, the project did implement critically important and successful adaptive management – first and foremost it attracted alternative investors for construction of pilot buildings, after municipalities in Osh and Bishkek failed to finance construction of pilot schools.

4.2.2 **Partnerships arrangements**

The project served as a facilitator of energy efficiency activities in building sector, and worked formally and informally with practically all relevant local stakeholders involved and/or interested in construction and energy efficiency in buildings.

The key local project partner, implementing partner, is Gosstroy, the State Agency for Architecture and Construction under the Government of the Kyrgyz Republic. 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. State Agency for Architecture and Construction under the Government of the Kyrgyz Republic
2. Ministry of Industry, Energy and Fuel Resources
3. Ministry of Education and Science
4. Parliament 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, Ak Kashat
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
16. Local media, national TV and local radio station
17. Center for Energy Efficiency and Renewable Energy
18. BIOM NGO

The project has cooperated with other new energy efficiency projects and activities in the country primarily in information and experience dissemination, and delivered presentations at seminars, roundtables and workshops organized among others by: KyrSEFF (EBRD financial facility managed locally by Unison Civic Environmental Foundation), Inogate (EU funded Sustainable Energy Programme for Central Asia: Renewable Energy Sources - Energy Efficiency managed by GIZ) and others.

A critical project partner was TIKA – the Turkish development agency that provided financing for the construction of the pilot energy efficiency school in Osh. The project teamed up also with the World Health Organisation in financing energy efficiency reconstruction of two rural medical centers.

4.2.3 **Monitoring and evaluation**

The Project Document specified Monitoring and Evaluation Plan that identified responsible parties for M&E activities, allocated indicative budget, and specified time frame for each M&E activity. According to the M&E plan, key parties responsible for performing project monitoring and evaluation included Project Manager, UNDP Country Office, UNDP-GEF Regional Coordination Unit, Governmental counterparts and External consultants.

The project is subject to standard UNDP monitoring and evaluation procedures. Crucial tools used for monitoring and evaluation include the LogFrame, Inception Report, Mid-Term (and Final) Evaluation, and standard UNDP and GEF project progress reports – Annual Project Reviews (APR) and Project Implementation Reviews (PIR).

Project implementation has been regularly reviewed by the Project/Advisory Board. Annual Work Plans, Annual Progress Reviews, Quarterly Reports, and Project Implementation Reviews have been regularly developed and submitted for approval to the Project Board.

The project was not subject to external financial audit, because the mid-size project budget is lower than 1 mil USD.

The project Inception Workshop took place on November 11, 2008, few weeks before actual project signature and official launch of the project.

An Inception Report has been finalized in June 2009 with a support of international consultant Mark Chao, after the project implementation has progressed already, and several project activities have been under implementation already. The Inception Report highlighted a risk of not providing co-financing for pilot projects due to public budget cuts. The original LogFrame from the Project Document has been reviewed and moderately updated. 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 mid-term evaluation mission was postponed to 2011 mainly for security reasons due to political instability in 2010 and took place on October 17 through 26, 2011. The MTE report was delivered in November 2011, three years after project launch. MTE rating of the project was satisfactory.

The Board of Directors was set up in May 2009 to oversee implementation of the project. The Board of Directors, renamed in 2009 to the Advisory Board, consists of 11 members:

The Advisory Board is chaired by Mr. Narbayev, Director of Gosstroy, and co-chaired by 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.

Meetings of the Board of Directors/Advisory Board were held once or twice a year: on October 27, 2009; December 16, 2010; July 7, 2011; December 14, 2011; July 10, 2012, and on July 7, 2013.

Monitoring and Evaluation has been designed and implemented according to the UNDP/GEF standards.

4.2.4 Feedback from M&E activities used for adaptive management

The project used feedback from M&E activities and updated LogFrame according to recommendations of the Inception Report and Mid-Term Evaluation.

The Project Manager managed the project in a flexible way and adjusted individual project activities to specific changing local conditions, needs and opportunities in order to meet project outcomes in the most effective way. The project teamed up with other new ongoing activities and for example disseminated project experience, results and lessons learned among relevant stakeholders at practically all relevant events organized by third parties in the country.

The major challenge the project faced was withdrawal of investors which committed to provide financing for construction of pilot schools in energy efficient standard. Due to financial crisis and subsequent public budget cuts, both Osh and Bishkek municipalities were not in a position to meet their financial commitments they provided during project development phase and resigned from the project as investors. Since the project budget was not designed to finance investment costs of pilot schools, the project was in a serious risk that construction of pilot schools could not have been demonstrated.

The Project Manager was extremely effective in attracting alternative investors that financed construction of pilot schools.

Finally TIKA, the Turkish development agency, agreed to finance full investment costs and to provide 6.9 mil USD for construction of the pilot school in Osh. The project managed also to make an agreement with the government and to finance incremental costs of 0.045 mil USD in Ak-Kashat where a new school was already under construction and the investment budget was already approved. The project found an opportunity and agreed with the municipality to redesign a gymnasium that was not yet constructed to an energy efficient standard, and to have it constructed according to the new building code.

In addition to the planned construction of two new pilot buildings (school and gymnasium), the project also managed to team up with the World Health Organisation as an investor and to reconstruct two rural medical centers according to the new energy efficiency standard. The WHO provided 0.014 mil USD for reconstruction of two rural medical centers.

4.2.5 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 as well. The administration of the project finance is well organized and effective.

In addition to Atlas system, the project uses a specific locally developed spreadsheet for bookkeeping of all individual project expenditures that allows linking the Atlas budget line code with specific project activity. The PIU 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 not only structured according to Atlas activity level). This gives the project management possibility to effectively control project costs in required detail on a daily basis. This is not a typical case for most UNDP/GEF projects implemented in other countries, where the only information available is provided in an Atlas structure – without linkage to specific project activity.

The original planned budget as of the project document is shown in Table 7.

Table 7: Project Budget as of Project Document [USD]

Year	2009	2010	2011	2012	Total	
Outcome 1	21 875	19 875	14 625	23 625	**80 000**	8%
Outcome 2	61 250	72 050	40 750	35 750	**209 800**	22%
Outcome 3	134 500	180 500	88 000	47 000	**450 000**	47%
Outcome 4	10 150	11 150	11 150	17 550	**50 000**	5%
Outcome 5	7 500	13 500	25 500	23 500	**70 000**	7%
Management	23 300	22 300	22 300	22 300	**90 200**	9%
Total	**258 575**	**319 375**	**202 325**	**169 725**	**950 000**	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/Project Board in the form of an Annual Work Plan. These annual budgets as shown in AWPs are summarized in the Table 8.

Table 8: Annual Project Budgets as of AWPs [USD]

Year	2009	2010	2011	2012	2013
Outcome 1	78 850	62 718	51 168	40 000	14 000
Outcome 2	43 050	79 432	88 400	88 000	12 100
Outcome 3	43 000	166 687	78 000	52 000	40 664
Outcome 4	28 200	66 681	62 098	54 010	26 100
Outcome 5	1 000	4 992	39 520	40 000	39 000
Management	17 550	27 209	24 336	22 242	3 549
UNDP fee ISS	8 591	134	122	112	
Total	**220 241**	**407 853**	**343 644**	**296 252**	**135 413**

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

The Table 9 shows annual project expenditures by project outcomes for each year of project implementation period as reported in Combined Delivery Reports.

Table 9: Annual expenditures by project outcomes and years (CDR) [USD] as of end of 2013

	2009	2010	2011	2012	2013	Total	% of total
Outcome 1	71 860	23 289	25 605	23 514	10 305	**154 573**	18 %
Outcome 2	30 827	36 674	49 760	60 401	10 234	**187 896**	21 %
Outcome 3	16 665	154 272	37 121	16 370	29 916	**254 344**	29 %
Outcome 4	24 890	65 582	11 312	8 720	20 420	**130 924**	15 %
Outcome 5	400	4 000	27 233	2 402	15 492	**49 527**	6 %
Mngment	10 764	9 048	15 630	12 602	5 712	**53 755**	6 %
UNDP direct	10 847	11 795	12 290	11 180	0	**46 112**	5 %
Total	**166 251**	**304 661**	**178 952**	**135 189**	**92 079**	**877 131**	100%
% of total budget	18 %	32 %	19 %	14 %	10 %	92%	

The financial planning and management is well organized. Annual budgets at the beginning of the year have been typically higher compared to actual spending of that year. Annual budgets have been also regularly revised and updated during the year.

As of end of 2013, the total project spending is 877 131 USD, ie. 92% of total budget of 950 000 USD. The remaining funds of 72 869 USD are budgeted and planned to be spent by the end of project in June 2014.

4.2.6 Co-financing and in-kind contributions

The project budget as of Project Document includes 0.9 mil USD GEF grant, 0.05 mil USD cash contribution from UNDP and 3.182 mil USD "in-kind" contribution. The budgeted "in-kind" contribution included 3 mil USD cash co-financing planned to be provided by Osh and Bishkek municipalities for construction of two schools – 1.5 mil USD that each of both municipalities planned to finance and construct even without a project. Letters of Intent confirming local co-financing have been submitted to the project and signed by the Osh City Administration, the Bishkek City Administration, and Gosstroy - State Agency for Architecture and Construction. 0.1 mil USD was planned to be provided in-kind by the government and its agencies, namely by Gosstroy. This in-kind contribution was used mainly to cover office space costs provided for free to PIU by Gosstroy, and capacity of Gosstroy key staff participating in the project – members of the project Advisory Board and other Gosstroy experts providing their expertise and services. In addition to cash co-financing, UNDP provided also 0.082 mil USD in-kind support.

Due to financial crisis and public budget cuts, both cities failed to fulfill their financial commitment to provide financing of 3 mil USD for construction of new pilot schools. The project was very fortunate that it attracted interest of TIKA, the Turkish International Cooperation and Development Administration, which provided 100% funding as a grant for the construction of a new pilot school in Osh - 6.9 mil USD in total.

Instead of a new school in Bishkek, a redesigned gymnasium of a school under construction in Ak-Kashat has been constructed in energy efficient standard with an incremental investment costs of 0.045 mil USD provided by the government.

The project has demonstrated energy efficiency in reconstruction of two additional rural medical centers in Al-Tchaluu and Konush. The UNDP/GEF project has financed technical design (1 000 USD) and has teamed up with World Health Organization (WHO) that provided 0.014 mil USD cash co-financing for actual energy efficiency reconstruction of both medical centers. The whole building was insulated and windows and door were replaced with more energy efficient ones. Energy consumption decreased by 40%.

Actual grants provided by other sources of 6.965 mil USD (see table on the next page) include contribution from TIKA in the amount of 6.9 mil USD, 0.014 mil USD contribution from WHO, and 0.051 mil USD combined contribution from the UN Economic and Social Commission for Asia Pacific (UN ESCAP) and the UN Economic Commission for Europe UNECE for a joint organization of the Third International Forum on Energy for Sustainable Development held in Kyrgyzstan in September 2012.

Table 10: Financial Planning Co-financing

Co financing (Type/Source)	UNDP own Financing (mill US$)		Government (mill US$)		Other Sources (mill US$)		Total Financing (mill US$)		Total Disbursement (mill US$)	
	Planned	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**
– Grants	0.050	0.050		0.045		6.965	0.050	7.060	0.050	7.060
– Credits										
– Equity										
– In-kind	0.082	0.082	3.100	0.100			3.182	0.182	3.182	0.182
– Non-Grant Instruments										
– Other										
Total	**0.132**	**0.132**	**3.100**	**0.145**		**6.965**	**3.232**	**7.242**	**3.232**	**7.242**

4.2.1 **Management by the UNDP Country Office and implementing partner**

The project is implemented in a very active way by the Project Implementation Unit, a small but very effective team of two professionals, a Project Manager Ms. Elena M. Rodina and a Chief Engineer Mr. Genadiy F. Kasiev, supported by an Administrative Finance Assistant Ms. Elena Pasportnikova and a driver Mr. Sergey A. Izotov. In September 2013 the Chief Engineer already resigned from the project. Project staff was hired by UNDP and office space is provided free of charge by Gosstroy.

For implementation of specific tasks within project components, such as development of the new energy efficiency code SNiP, development of pilot buildings design, local subcontractors and short-term local experts have been hired. 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.

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

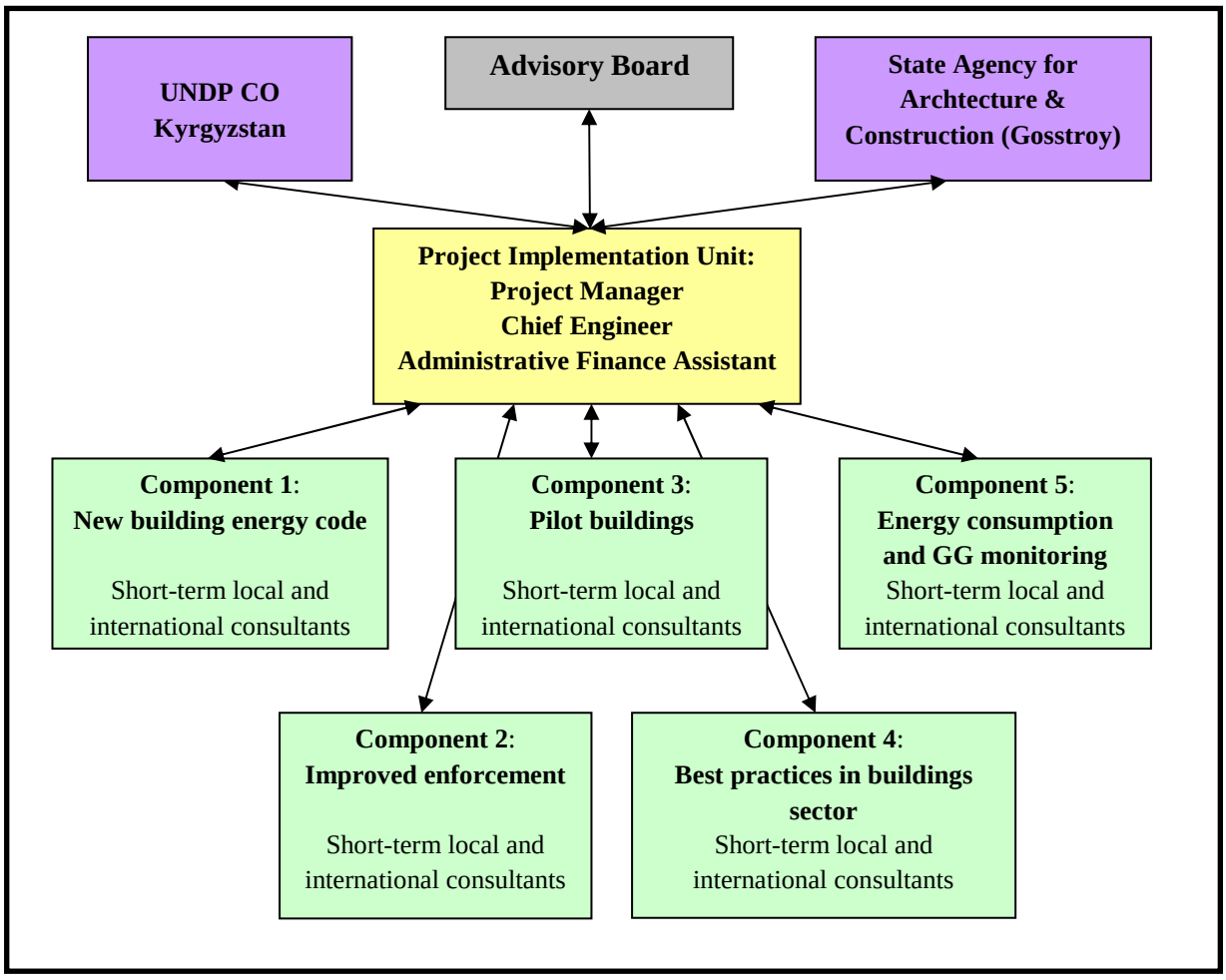
A special role in project implementation has Gosstroy – the State Agency for Architecture and Construction under the Government of the Kyrgyz Republic. Gosstroy, formerly Ministry for Construction, has strong authority and wide responsibility among others in developing and implementing energy efficiency codes, licensing of construction specialists, and supervision of building constructions. Gosstroy thus have two roles: first, it serves as an official project implementing partner and supports PIU by providing project office free of charge, and also provides time capacity of its staff if needed. However, Gosstroy is not directly involved in a daily project operational management. And second, Gosstroy, as a key local governmental authority with lots of relevant responsibilities, is a key beneficiary of project results, including trainings in energy efficiency, enforcement of new building code, strengthened construction supervision, etc.

The PIU received effective support from the UNDP Country Office. The UNDP country office assists PIU in project implementation but it is not (and does not need to be) involved in a project operational management on a daily basis. The UNDP CO manages also the Atlas accounting system and provides the PIU with regular official reports from the Atlas financial system that includes also spending expensed directly by UNDP CO. Except for administrative support, UNDP CO provides also overall project supervision and strategic support if needed.

UNDP RCU/RTA, Ms. Marina Olshanskaya, coordinates similar energy efficiency in buildings projects in other countries in the region (Armenia, Kazakhstan, Uzbekistan, Turkmenistan), and supports information and best practice exchange among these projects and coordinates external expert advice.

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

Chart 1: Project Management Scheme



The project is managed according to the management structure originally designed in the project document.

4.3 Results

4.3.1 Overall results and attainment of objectives

Project objective:
Reduce energy consumption and associated GHG emissions in Kyrgyz building sector

Indicator 1: Average thermal energy consumption in new/renovated residential/public buildings
Target 1: Thermal energy consumption for new code-compliant buildings reduced to an average of 100 kWh/m² (by about 30%)
Achievement: All new buildings' designs that are subject to building expertise are checked for their compliance with thermal conductivity coefficient stated in the newly developed building code SNiP KR 23-01:2009. Actual buildings designed in 2011-2013 have area of 400 m^2 to 2 000 m^2 with maximum energy consumption of 82 kWh/m^2.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 2: New building lifecycle CO_2 emission
Target 2a: Direct lifecycle CO_2 savings from constructed two pilot buildings 1 140 tCO_2 savings
Achievement: Direct lifecycle CO_2 savings from constructed pilot school in Osh are 1 620 tCO_2.
Rating: The target has been achieved. Highly Satisfactory.

Target 2b: Indirect lifecycle CO_2 savings from replication of energy efficient buildings by the end of the project of 22 800 tCO_2
Achievement: Indirect lifecycle CO_2 savings from newly constructed 252 708 m^2 buildings in 2012 and 2013 subject to new building code, assuming 55% combined compliance rate of design and actual construction, are 13 392 tCO_2.
Rating: The target has not been achieved. Moderately Unsatisfactory.
Note: The target has not been achieved primarily because of combination of two factors: actual construction volumes are significantly lower than estimated in the ProDoc baseline calculation before financial crisis, and second: the target did take into account transitional period between new building code adoption and its full application, a period needed for dissemination of experience from pilot project. Indirect project CO_2 emission reductions are expected to increase according to future construction volumes.

Outcome 1: ***Improved energy performance codes***
Indicator 3: Adoption of mandatory energy efficient building code and its regular updates implemented
Target 3: New performance-based EE code adopted in 2010 and updated by at least once in 10 years
Achievement: The new energy efficiency code SNiP 23-01:2009 was approved in 2009 and came into force on January 1, 2010. The building code was updated in 2013, and the number of energy efficiency classes was increased to seven (harmonization with European standard). The building code is planned to be revised regularly.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 4: Level of minimum mandatory thermal requirements for buildings
Target 4: 10-20% decrease to 80 kWh/m² (or lower for larger multifamily buildings)

Achievement: Minimum energy performance required by SNiP KR 23-01:2009 depends on the type, size and shape of a building and the location (climate zone). The bigger and more compact the building, the stricter the requirements are: 96 kWh/m² (2 stories, 250 m²), 78 kWh/m² (4-5 stories), 73 kWh/m² (6-7 stories), 70 kWh/m² (8-9 stories), 66 kWh/m² (10-11 stories), and 64 kWh/m² (12 stories and higher) – in Bishkek. In Osh, the other dominant population center of the country, requirements are about 18 percent more demanding (maximum allowed energy demand lower by 18%) than in Bishkek because of warmer climate.

Rating: The target has been achieved. Highly Satisfactory.

Indicator 5: Capacity of national authorities to design and regularly update advanced building codes

Target 5: Calculation methodology to determine building energy consumption agreed, software obtained and staff trained in its application

Achievement: The methodology to determine building energy consumption has been agreed and is described in detail in the energy efficiency building code SP 23-01:2009 and Rules for Design and Construction SP: 23-101:2009 approved in 2009, more than 170 experts trained in a series of seminars on development of EE building code for Gosstroy experts and other professionals. Software was purchased and transferred to construction expertise department of Gosstroy, construction universities and research institutes.

Rating: The target has been achieved. Highly Satisfactory.

Outcome 2: ***Improved enforcement of mandatory energy efficiency building codes***

Indicator 6: Level of enforcement of new standards (% of new buildings)

Target 6a: Compliance levels of building *designs* radically improved up to 80% - in buildings subject to regulations of the Law on Energy Performance of Buildings (Закон об энергетической эффективности зданий) - article 5.3

Achievement: Between July 2011 till June 2012 in total 330 public and residential buildings designs were submitted and checked for compliance with new building code; 76% of submitted building designs complied with the new building code. In 2013, according to Gosstroy, the compliance rate increased to 92%.

Note: Article 5.3 of the new Law on Energy Performance of Buildings specifies buildings to which the Law is applicable, ie. practically all buildings except for residential buildings smaller than 150 m^2.

Rating: The target has been met. Highly Satisfactory.

Target 6b: Compliance levels of *constructed* buildings radically improved up to 80% - in buildings subject to regulations of the Law on Energy Performance of Buildings (Закон об энергетической эффективности зданий) - article 5.3

Achievement: Based on field review of randomly selected buildings under construction in Bishkek, estimated compliance rate is about 60%.

Rating: The target has not been met. Moderately Unsatisfactory.

Note: The target is very ambitious as stated in the MTE already. The baseline was estimated to be 10% maximum. Estimated achievement of 60% refers to buildings subject to Law on Energy Performance of Buildings, ie. buildings bigger than 150 m^2.

Indicator 7: Capacity to assess building energy performance in line with new standards
Target 7a: Laboratories equipped by end of year 1
Achievement: Laboratories have been equipped with four infra-red cameras in 2010.
Rating: The target has been met. Highly Satisfactory.

Target 7b: 20 staff from Gosstroy and university trained to undertake energy performance assessment by end of year 1
Achievement: 26 professionals trained in energy performance assessment, energy savings and energy efficiency in buildings in year 2010. 12 experts have been trained in building energy performance analysis with infra-red camera. 30 typical building types and pilot buildings have been analyzed with infra-red camera and results published.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 8: Enforcement capacity for energy efficient building code: trained staff, rules and procedures for building certification
Target 8a: Procedures for mandatory building certification system adopted and tested by year 2
Achievement: Energy passport of newly designed buildings and methodology for its development and calculation have been developed in 2009 and published in the SNiP code. According to SNiP, each new building design must include calculation of energy performance and energy efficiency class – energy passport.
Rating: The target has been achieved. Satisfactory.

Target 8b: 150 Building Inspectors trained in their application by end of year 3
Achievement: 170 specialists of National Building Certification Center and teachers of higher education institutions with construction and architecture specialties were trained on SNiP KR 23-01:2009 application methodology.
Rating: The target has been achieved. Highly Satisfactory.

Target 8c: Building certification works by year 3
Achievement: The system of energy passports is in place since 2009 . Energy passports are compulsorily developed as an integral part of building design by design organizations.
Rating: The target has been achieved. Satisfactory.

Outcome 3: Pilot projects utilizing an integrated design approach

Indicator 9: Energy- and cost-saving and social impact of integrated building design (IBD) in comparison with similar buildings
Target 9a: No or maximum 10% increase in construction cost of new pilot buildings
Achievement: First pilot school No: 52 for 970 pupils in Osh was constructed in energy efficient standard – class B with investment costs of 6.9 mil USD, sport hall in school in Ak-Kashat was constructed in energy efficiency standard (investment costs 0.045 mil USD), two additional rural medical centers were reconstructed to meet energy efficiency requirements (investment costs 0.014 mil USD). Energy efficiency incremental investment costs are 3.8%, energy consumption in pilot buildings was reduced by 40% compared to standard buildings.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 10: Scale of replication of energy efficiency building design in *public* sector in large cities
Target 10: All new *public* buildings in two largest Kyrgyz cities (Osh and Bishkek) comply with the new energy efficiency code SNiP by the end of the project
Achievement: All *designs* of new *public* buildings comply, according to Gosstroy, with the new building code SNiP KR 23-01:2009.
Rating: The target has been achieved. Highly Satisfactory.

Outcome 4: Promotion of best energy design and building practices in construction sector

Indicator 11: New curricula on energy efficient building design for universities
Target 11: Curricula developed, registered with Ministry of Education and introduced in Kyrgyz University for Construction, Transport and Architecture
Achievement: Three syllabuses/curricula on energy efficiency in buildings for university classes in construction and architecture were developed and implemented in the Kyrgyz-Russian Slavic University and in the Kyrgyz University for Construction, Transport and Architecture and in the Bishkek Construction College.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 12: Number of trained building engineers and architects
Target 12: At least 100 industry professionals receive training in application of new codes
Achievement: In total more than 230 professionals, building developers, designers, other construction experts, and academicians have been trained during number of training courses over the whole project implementation period.
Rating: The target has been achieved. Highly Satisfactory.

Indicator 13: Development of new products in conformity with new standards
Target 13: Larger availability of efficient materials and services

This indicator and target are not directly relevant to project objectives and outcomes and has been removed based on MTE recommendation.

Outcome 5: Monitoring of building energy consumption and GHG emissions

Indicator 14: Implementation of monitoring of building energy consumption and GHG emissions
Target 14: Monitoring system, including institutional framework, trained staff and technical tools and methodology, including system for energy data collection and calculation of energy use for space heating developed in accordance with the Law on Energy Performance in Buildings, is in place by the end of the project, and implemented for project pilot buildings and other buildings built according to the new energy efficiency code by mid 2012 at least
Achievement: Methodology for calculation and monitoring of actual energy consumption and GHG emissions of constructed buildings has been developed, tested in pilot projects and submitted to governmental agencies (Gosstroy and relevant ministries) for approval. However, no central agency responsible for monitoring has been appointed, and the monitoring system has not been adopted yet.

Rating: The target has not been reached. Moderately Unsatisfactory.

Note: As explained in the summary, the target is rather ambitious for relatively small project with budget of less than 1 mil USD and this stage of market development (practically no district heat meters in place yet).

Table 11: Overview of project achievements rating

Indicator	Target	Achievements	Rating
1: Average thermal energy consumption in new/renovated residential/public buildings	1: Thermal energy consumption for new code-compliant buildings reduced to an average of 100 kWh/m² (by about 30%)	82 kWh/m^2	**HS**
2: New building lifecycle CO2 emission	2a: Direct lifecycle CO_2savings from constructed two pilot buildings 1 140 tCO_2 savings	1 620 tCO_2	**HS**
	2b: Indirect lifecycle CO_2 savings from replication of energy efficient buildings by the end of the project of 22 800 tCO_2	13 392 tCO_2	**MU***
Outcome 1: Improved energy performance codes			
3: Adoption of mandatory energy efficient building code and its regular updates implemented	3: New performance-based EE code adopted in 2010 and updated at least once in 10 years	SNiP 23-01:2009 adopted in 2009	**HS**
4: Level of minimum mandatory thermal requirements for buildings	4: 10-20% decrease to 80 kWh/m² (or lower for larger multifamily buildings)	64, 66, 70, 73, 78, 96 kWh/m²	**HS**
5: Capacity of national authorities to design and regularly update advanced building codes	5: Calculation methodology to determine building energy consumption agreed, software obtained and staff trained in its application	Methodology in SP 23-01:2009, SP: 23-101:2009, SW purchased, staff trained	**HS**
Outcome 2: Improved enforcement of mandatory energy efficiency building codes			
6: Level of enforcement of new standards	6a: Compliance levels of building *designs* radically improved up to 80%	92%	**HS**
	6b: Compliance levels of *constructed* buildings radically improved up to 80%	60% - estimate	**MU**
7: Capacity to assess building energy performance in line with new standards	7a: Laboratories equipped by end of year 1	Four infra-red cameras	**HS**
	7b: 20 staff from Gosstroy and university trained to undertake energy performance assessment by end of year 1	26 + 12 experts trained	**HS**
8: Enforcement capacity for EE building code: trained staff, rules and procedures for building certification	8a: Procedures for mandatory building certification system adopted and tested by year 2	Energy passport of designed buildings according to SNiP	**S**
	8b: 150 Building Inspectors trained in their application by end of year 3	170 experts trained	**HS**
	8c: Building certification works by year 3	Implemented	**S**
Outcome 3: Pilot projects utilizing an integrated design approach			
9: Energy- and cost-saving and social impact of integrated building design (IBD) in comparison with similar buildings	9a: No or maximum 10% increase in construction cost of new pilot buildings	3.8% increase of investment and 40% energy reduction	**HS**
10: Scale of replication of energy efficiency building design in public sector in large	10: All new public buildings in two largest Kyrgyz cities (Osh and Bishkek) comply with the new energy efficiency code SNiP by the end of the project	All designs of public buildings comply with new	**HS***

cities		code	
Outcome 4: ***Promotion of best energy design and building practices in construction sector***			
11: New curricula on energy efficient building design for universities	11: Curricula developed, registered with Ministry of Education and introduced in Kyrgyz University for Construction, Transport and Architecture	Curricula applied in three universities	**HS**
12: Number of trained building engineers and architects	12: At least 100 industry professionals receive training in application of new codes	230+ experts trained	**HS**
13: Indicator deleted based on MTE recommendation			
Outcome 5: ***Monitoring of building energy consumption and GHG emissions***			
14: Implementation of monitoring of building energy consumption and GHG emissions	14: Monitoring system, including institutional framework, trained staff and technical tools and methodology, including system for energy data collection and calculation of energy use for space heating developed in accordance with the Law on Energy Performance in Buildings, is in place by the end of the project, and implemented for project pilot buildings and other buildings built according to the new energy efficiency code by mid 2012 at least	Methodology developed and tested for pilot buildings, monitoring system not adopted.	**MU**

Rating: HS (Highly Satisfactory) – S (Satisfactory) – MS (Moderately Satisfactory) – MU (Moderately Unsatisfactory) – U (Unsatisfactory) – HU (Highly Unsatisfactory)

*Note: Achievement of target 2b refers to GHG emission savings (in absolute values) from all buildings constructed according to the new building code. Achievement is lower than target primarily due to the fact that actual construction rate was lower than estimated. The target 10 (relative value) refers only to very few actually designed and constructed public buildings in Osh and Bishkek.

Picture 1: First energy efficient pilot school in Kyrgyzstan, School No. 52 in Osh

Other project achievements

In addition to achievements described above and in the project LogFrame matrix, the project has developed following additional deliverables:

- Three technical 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
- 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 and Ministry of Energy and Industry
- Three curricula on Design, Regulations, and Construction of energy efficient buildings have been developed for voluntary training of design and building construction professionals
- "How to do yourself your house warm" practical guide for home owners prepared, 3 000 hard copies published and disseminated in Kyrgyz (2 000 copies) and Russian (1 000 copies) language.
- Energy efficiency information leaflets and publications have been developed and circulated, media coverage included dozens articles on energy efficiency
- The project set up and operated international website on energy efficiency beeca.net, later on operation of the website passed on to another UNDP/GEF energy efficiency project in Uzbekistan, website collects and shares information on similar energy efficiency in buildings projects in countries in the Central Asia and Armenia. In early phase of project implementation information shared also via another international website caresd.net.
- One film and one short video on energy efficiency in buildings has been produced and broadcasted on national TV
- Conference on energy and energy efficiency held in Bishkek in September 2011 and organized by the Ministry of Energy was co-financed and project results presented
- 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 the first reading it was decided to be replaced with the Law on Energy Performance in Buildings developed with the support from EBRD.
- Textbook on energy efficiency in buildings for university and college students was prepared and published and 250 hard copies disseminated to universities and colleges
- 40 copies of the book authored by Prof. Dr. Wolfgang Feist of Passivhaus Institute "Basic Principles of Passive House Design" translated into Russian were provided to construction universities and colleges
- Conference on energy and energy efficiency held in Bishkek in September 2011 organized by the Ministry of Energy was co-financed and project results presented
- Third International Forum on Energy for Sustainable Development was organized in Kyrgyzstan in 2012 and sponsored jointly by UN ESCAP, UN ECE and the project
- Additional two rural medical centers were reconstructed in energy efficient standard (40% savings), with investment provided by WHO

- The project supported experts who drafted chapter “Development of Construction Industry” for the Program of the Government of the Kyrgyz Republic on Implementation of the Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017
- Radio broadcasts on do-it-yourself energy efficiency improvements in family houses in Susamirsk region
- Regional trainings organized with a local NGO for professionals, municipal managers and administrators, and interested house owners

Summary of project results and achievements

This project served as a real catalyst of energy efficiency improvements in buildings in Kyrgyzstan.

It was the first one and for a long period also the only project focusing on energy efficiency in buildings with a long term local presence in the country. Only thanks to this long-term local presence, with its office located in Bishkek, and most importantly staffed with local project manager and local experts, the project did not only deliver planned results, but it also effectively helped to change the attitude to energy efficiency at all levels, including parliament, government, relevant state agencies, as well professionals, academicians and university students. At the beginning of the project energy efficiency was declared as one of country priorities; however this priority was not translated into any specific activity or viable action plan. At the end of this project, energy efficiency is subject of regular business and commercial financing. For example KyrSEEF, a financial facility established by EBRD, provides financing specifically for energy efficiency improvements in housing and other private sectors and industries. Energy efficiency and insulation became a standard in new construction; professionals, experts and university students have been trained in energy efficiency, hands-on practical experience with implementing energy efficiency has been collected and disseminated.

The credit for this development goes not only but primarily to this UNDP/GEF project. The project team initiated and led a national discussion on energy efficiency in buildings and its environmental, energy and financial impact on the country, and supported this discussion by hands-on experience and results delivered by the project.

The project managed to deliver most of planned project achievements:

1. Building code was significantly revised and updated to include up-to-date energy efficiency requirements. New building code SNiP 23-01:2009 was adopted and implemented, and is mandatory for all newly constructed and reconstructed buildings. Building designers, professionals were trained in application of the new building code, and Gosstroy experts were trained in effective supervision.
2. Compliance rate of *building designs* with mandatory energy efficiency requirements introduced by the new code has increased and is quite high; according to Gosstroy it reaches 92% for buildings that are subject to Article 5.3 of the new Law on Energy Performance of Buildings, ie. practically all buildings except for residential buildings smaller than 150 m2. Compliance rate of *actual construction* is significantly smaller, however no hard-fact statistics are available. Based on a research of randomly selected buildings under construction, the compliance rate is estimated to be 60%. Building certification has been implemented in a form of energy passport, i.e. compulsory

addendum to building design that specifies calculated/designed energy consumption, compliance with minimum requirements, and energy efficiency class.

3. The project managed to have constructed two new pilot projects despite the problems with financing after both municipalities in Osh and Bishkek resigned from their commitment to finance pilot schools. The project managed to attract alternative investors – TIKA, the Turkish development agency for a school in Osh, and a small grant from the government for a sport gymnasium in Ak-Kashat. In addition to planned pilots, the project also had two additional buildings - rural medical centers - be reconstructed to an energy efficiency standard with investment costs provided by World Health Organisation. Although there were number of problems with quality of construction of pilot buildings – these pilot buildings and especially the school in Osh serve as a unique hands-on example in the country of energy efficient building in energy efficiency class "B".
4. The project has developed and implemented new curricula on energy efficient building design and construction. University and college students have been trained in energy efficiency since 2012. Practical experience, how-to-guides, technical catalogues in energy efficient building design and construction have been developed and disseminated to professionals as well as house owners, media campaign targeted at general public, including TV shots has been delivered.
5. Energy and GHG emissions monitoring has been developed and implemented for pilot buildings. Provisions for a system of energy consumption and GHG emissions monitoring based on compulsory energy audits have been developed (Draft Instructions on Energy Audit of Buildings for practicing inspectors of energy inspection, Provisions on Economic Incentives of Energy Conservation and Energy Efficiency in Buildings in the Kyrgyz Republic, Draft Provisions on Regulations and Procedures of Energy Audit and Energy Certification of Buildings, Draft Provisions on Energy Passport and its Implementation Procedures, Provisions on Building Energy Performance Certification and Energy Monitoring for School Buildings) and submitted to the Ministry of Energy and Industry and Gosstroy, however these drafts have not been approved yet and the national compulsory monitoring system is not implemented. As discussed earlier, implementation of full scale monitoring system is an ambitious task far beyond the time and financial resources available in this relatively small mid-size project. It is also more appropriate for a more advanced market with longer experience in operation of energy efficient buildings and installed metering also in district heating systems.

There have been lots of problems during project implementation and not all project achievements have met expected targets: compliance rate of constructed buildings with new energy efficient building code is still rather low (estimated to be at 60%), although it has increased significantly, general monitoring system is not in place, and the project did not reach the target of indirect lifecycle GHG emission reductions of 22 800 tCO_2 because of lower volume of new construction. Construction of pilot projects faced a number of problems mainly due to low quality of construction works, approval for using electricity for space heating in pilot school in Osh has been questioned and the school had to pay additional penalty. However, in the evaluator's opinion, the failure to meet these 3 out of 13 targets is not critical for overall success of the project.

Energy consumption for space heating in buildings supplied by district heating is typically not metered at all in Kyrgyzstan (with few examples). Establishing and operating energy consumption and GHG emission monitoring system in the situation when energy used is not metered would be too costly and not accurate enough. Even in case the monitoring system would be already fully implemented, its real impact would be rather limited, and the monitoring system might easily become - at this phase of development - just a formal exercise.

Compliance of constructed buildings with energy efficient building code is still rather low especially in the private sector (in international comparison), although it has increased significantly. Low compliance is a result of historical experience in the country and a widespread corruption. Non-compliance cannot be immediately and fully removed by administrative measure only. The evaluator estimates that in next few years the compliance rate will increase due to widespread positive experience of owners/users of new energy efficient buildings, and that the market price of buildings without insulation will be significantly lower compared to buildings constructed according to the new energy efficiency building code.

Indirect project GHG emission reductions depend primarily on two factors: number/size of buildings constructed during the period of project implementation and an actual compliance rate with new stricter energy efficiency building code. The scope of building construction was significantly lower than estimated due to financial crisis but it is expected to recover again with restored GDP growth. As explained above, the evaluator expects the compliance rate will further increase in the next few years. Thus also GHG emission reductions from newly built buildings are expected to continue to increase in the future.

Table 12: **Comparison of Kyrgyz, Turkmen, Kazakh, Uzbek and Czech minimum R-values adjusted for the same climate (3000 heating degree days)**

	Kyrgyzstan building code SNiP KR 23-01: 2009 R [m^2. K/ W]	**Turkmenistan** building code SNT 2.01.03-98 as of 2000 R [m^2. K/ W]	**Kazakhstan** building code SN RK 2.04-4-2011 R [m^2. K/ W]	**Uzbekistan** building code KMK 2.01.04-97* of 2011 R [m^2. K/ W]	**Czech** (EU harmonized) building code ČSN 73 0540-2: 2011 R [m^2. K/ W]
Roof	**3.7**	**3.7**	**3.7**	**1.6**/**3.2**/4.2	**4.17**/6.25/10
Wall	**2.45**	**2.45**	**2.45**	**0.94**/**2.2**/3.0	**3.3**/4-5/5.5-8.3
Window	**0.375**	**0.375**	**0.375**	**0.39**/**0.42**/0.53	**0.6**/0.83/1.25-1.7

Source: Kazakhstan code SN RK 2.04-4-2011, Czech code ČSN 73 0540-2:20011 (values refer to minimum/recommended/high energy efficiency standard), Uzbekistan code KMK 2.01.04-97 revised and adopted in 2011, Turkmenistan code SNT 2.01.03-98 adopted in 1998 with values applicable as of 2000, Kyrgyzstan code SNiP KR 23-01:2009, parameters of residential buildings, health and educational facilities for 3000 heating degree-days.*

Note: The higher R-value of the thermal resistance, the more energy efficient and better insulated the building structure is. Typical average annual heating degree days in Kyrgyzstan are 3 161, 4 575 in Kazakhstan, 3 569 in the Czech Republic, 2 251 in Uzbekistan, and 2 218 in Turkmenistan (source

http://chartsbin.com). The higher heating degree days, the colder and/or longer the winter season is. Kazakh, Turkmen and Kyrgyz values are calculated for 3000 heating degree days as an arithmetical average of required values for 2000 and 4000 degreedays. Values in the Czech code refer to minimum/recommended/high energy efficiency standard for regions with 3000 heating degree days. Compared to previous 2007 Czech code minimal mandatory requirements became stricter, and the strictest values for highest energy efficiency standard were slightly decreased. Values in Uzbek code illustrate three levels of required values for degreedays >3000, the highest values are voluntary.

Table 12 illustrates energy efficiency requirements (R-values) in Central Asia and in the Czech Republic adjusted to the same climate (3 000 heating degree days). Energy efficiency requirements in updated building codes in Kyrgyzstan, Kazakhstan and Uzbekistan, and in the original building code of 2000 in Turkmenistan are somewhat less demanding than in the 2011 Czech building code, as illustrated by required R-values of selected building structures. R-value requirements are some 10-37% less strict than requirements of the 2011 updated Czech building code. However, it should be noted that energy price in EU countries is significantly higher than in Kyrgyzstan. Price of electricity in EU countries varies among member countries, but in households is on average is up to 20 times higher than in Kyrgyzstan. Thus, relatively compared to local energy prices, energy efficiency requirements of the updated building code in Kyrgyzstan, as well in other countries in the region, are sufficiently demanding.

4.3.2 **Relevance**

The project is highly relevant with GEF and UNDP priorities as well as with specific country priorities and actual needs.

It is directly consistent with the GEF 4 strategic programming for climate change and its Strategic Objective 1 “To promote energy-efficient technologies and practices in appliances and buildings”, and namely the Strategic Programme 1” Promoting energy efficiency in residential and commercial buildings”.

The project is an integral part of the UNDP-led GEF Global Framework for Promoting Low Carbon Buildings with a primarily focus on two thematic approaches promoted by the Framework: a) Promotion and increased uptake of High Quality Building Codes and Standards – by introducing and enforcing mandatory energy efficient building codes; and b) Developing and Promoting of Energy Efficient Building Technologies, Building Materials and Construction Practices – by piloting integrated building design.

The project advanced implementation of the Law on Energy Savings and is closely aligned with national priorities in Kyrgyzstan, namely with the National Strategy for Energy Efficiency, national commitments under the Kyoto protocol and national communication to UNFCCC, namely with the development of integrated solutions for increasing energy efficiency, and improvement of construction standards and control systems to monitoring the application of these standards in buildings, and with the 2013-2017 National Strategy on Sustainable Development.

4.3.3 **Effectiveness of project implementation**

The project has reached its objective to reduce energy consumption and associated GHG emissions in Kyrgyz building sector. Although the project did not fully reach its target in terms of indirect GHG emission savings, compliance rate and monitoring as discussed above, it laid down the necessary framework: new stricter energy efficiency building code was developed, adopted and implemented, Gostroy building experts and inspectors were trained, as well as building designers and other construction professionals, the building code compliance rate increased significantly up to estimated 60%, energy efficient pilot buildings were designed and constructed with 40% energy savings and 4% incremental investment costs, hands-on experience from design and construction of energy efficient buildings was promoted and disseminated among professionals as well as general public and building owners, and monitoring was implemented for pilot projects.

4.3.4 **Efficiency - cost-effectiveness of project implementation**

The project with a GEF budget of 0.9 mil USD (and UNDP cash contribution of 0.05 mil USD) was designed to directly finance "soft" measures: development of new energy efficiency building code, strengthening compliance rate with the mandatory code, promotion of best practices, monitoring of building energy performance and GHG emission reductions, and design of pilot energy efficiency buildings according to the new energy efficiency building code.

"Hard" measures, the actual investment into construction of two newly constructed buildings (school in Osh and a sport hall/gymnasium) and a reconstruction of two rural medical centers, were designed to be (and actually were) financed by external investors, outside of the project budget. This actual external co-financing provided reached in total 7.01 mil USD. External financing of investment costs (for building re/construction) outside of the UNDP/GEF budget is definitely the most cost-effective strategy for GEF. However, it is in the same time rather risky strategy as well and especially in case of a country exposed to economic challenges, as proved in this project.

Lifetime project direct CO_2 emission savings are 1 620 t CO_2 and indirect savings are 13 392 tCO_2. Total combined lifetime direct and indirect CO_2 emission savings from energy efficient buildings built during project implementation period are 15 012 tCO_2. For GEF, that provided 0.9 mil USD for the project, this means abatement costs of 60 USD/tCO_2. Abatement costs, including post-project emission reductions, are with very conservative assumptions 12 USD/tCO_2, and more realistically can be assumed to be closer to 6 USD/tCO_2. In the first case (12 USD/tCO_2) the same relatively low construction rate and the same compliance rate with a building code is assumed over next 10 years as it was during the first two years after the building code came into force (total post-project emission reductions are estimated to be 77 240 tCO_2. The evaluator estimates that in fact both construction rate and compliance rate will rise. Assuming construction rate of new buildings constructed according to the new building code will be two times higher than in early years after the adoption of the building code and shortly after financial crises, the abatement costs will be 6 USD/tCO_2. Both abatement costs in the range of 6-12 USD/tCO_2 are lower than 20 USD/tCO_2 that can be assumed as a threshold of cost-effectiveness for GEF.

4.3.5 **Country ownership**

The project is fully and effectively owned by the country.

The project is in line with national priorities as outlined in the National Strategy for Energy Efficiency, and subsequent Law on Energy Savings. New building code SNiP KR 23-01:2009 and Rules for Design and Construction SP: 23-101:2009 were approved and fully implemented without any delays. Gosstroy, as an implementing partner, relevant ministries, key policy makers have been actively involved both in the project steering committee/advisory board and in policy dialogue initiated by the project. Other local stakeholders actively supported project implementation, including local universities and colleges, relevant ministries, local designers and construction professionals.

Rejection of both municipalities in Bishkek and Osh to provide co-financing for construction of pilot schools was caused by the financial crisis and general budget cuts – not by the lack of interest. In that time municipal investment into any new construction was significantly decreased.

4.3.6 **Mainstreaming**

The project is directly mainstreamed with other UNDP priorities, namely with improved governance, economic development and poverty alleviation.

The project is also directly aligned with and is an integral part of the UNDP-led GEF Global Framework for Promoting Low Carbon Buildings and specifically with its focus to promote and increase uptake of High Quality Building Codes and Standards – by introducing and enforcing mandatory energy efficient building codes and by piloting integrated building design/energy efficiency.

The project was not designed to address specifically gender issues. However, on a practical level the project demonstrated also gender equality. For example even the small four-member project team illustrated gender equality – it consisted of two female members (including project manager) and two male members.

4.3.7 **Prospects of sustainability**

The project was designed so that its results will be sustained even after project termination. Project budget was used for strengthening regulatory framework and development of new energy efficient building code, strengthening its enforcement by extensive trainings and promotion of best practices. The project budget did not finance one-off investment, but design of pilot projects financed by external investors. This approach ensured that the project results and achievements will be sustained in a long term without a need for additional grant financing.

Financial risk – is estimated to be low, because there will be no additional need for grant financing in order to sustain project results. Incremental costs for energy efficient buildings constructed according to the new building code in a C and B energy efficiency class are lower than 4% of standard investment costs, and thus fully affordable even in the context of Kyrgyzstan.

Socio-political risk – is estimated to be low. It does not seem to be possible or likely that once approved building code might be abolished, especially when benefits of energy efficient construction have been fully demonstrated, and are recognized by all relevant stakeholders and decision makers.

Institutional framework and governance risk – is estimated to be medium. Country that experiences high corruption has difficulties with full enforcement of any regulation. The same applies for energy efficiency building code. However, with growing number of new buildings constructed according to the new energy efficiency standard, improved quality of living in such buildings will become well-known and demand for low-quality, i.e high energy intensive buildings will decrease, because incremental costs are negligible. The more widespread practical experience with construction of energy efficient buildings will be, the more probable it is that energy efficiency will be a solid part of national policy priorities.

Environmental risk – is estimated to be low. The project has been designed to save energy used for space-heating and it does not generate any additional environmental risk.

It is highly likely and practically certain that the project will continue to generate energy savings from further new buildings constructed (and later on also reconstructed) in energy efficiency standard according to the new building code even after project termination.

4.3.8 **Project impact**

Project impact can be best illustrated by the changed attitude towards energy efficiency in Kyrgyzstan: at the beginning of the project in early 2009 “no one from the professional community believed that such project might be successful, because in Kyrgyzstan people are poor and energy is cheap”[1]. Five years later energy efficiency in buildings is fully demonstrated and integrated into new building construction, benefits and importance of energy efficiency is well understood by professionals and decision & policy makers – and especially in case when people are poor and energy prices are subsidized.

The project managed to change people’s thinking and perception of energy savings.

Nowadays, energy efficiency became a subject of commercial financing and a business of standard companies. Energy efficiency is no more understood only as a theoretical potential, but a practical measure that saves energy and energy bills but in the same time it also improves the quality of living in buildings and thus also increases building market price and hence generates also economic incentive.

This project impact – change of people’s views on energy efficiency – is irreversible and fully sustainable.

In quantitative terms, constructed pilot projects generate 1 620 tCO_2 of lifecycle direct emission reductions, and indirect emission reductions have been estimated with conservative assumptions to be 13 392 tCO_2, in total project emission reductions are 15 012 tCO_2. Post project GHG emission reductions are estimated to be 77 240 tCO_2 minimum – for buildings subject to Article 5.3 of the new Law on Energy Performance of Buildings that specifies buildings to which the Law is applicable, ie. practically all buildings except for residential buildings smaller than 150 m^2.

[1] Interview with Ms. Elena Rodina, Project Manager and other project stakeholders, Bishkek, November 2013

Indirect project and post-project emission reductions are lower than estimated in the Project Document, because the Project Document estimated compliance of small individual residential buildings with the building code as well. However, small residential buildings are not yet subject of this building code regulation at this time because the affordability and compliance rate would be very low.

5. Conclusions, Recommendations and Lessons Learned

The overall rating of the project is satisfactory.

The project delivered most of planned results, although not all of them.

New building code SNiP KR 23-01:2009 with relatively strict energy efficiency requirements has been developed and adopted, construction professionals and building inspectors trained in building code compliance, compliance rate with building code increased, in total four energy efficiency pilot projects were constructed and reconstructed with a total investment of 7 mil USD provided by external investors. First energy efficient school in the country was designed and constructed in Osh (School No: 52 that hosts 970 pupils) with energy consumption for space heating of 40 kWh/m^2, sport hall in school in Ak-Kashat village was constructed, and two small rural medical centers were reconstructed in energy efficient standard according to the new building code. All pilot buildings demonstrated significant energy savings of about 40% with investment cost increase of about 4%. Project results and experience and new building code was widely promoted across the country, three university and college curricula on energy efficiency in building construction were developed and adopted. Methodology and procedures for energy consumption and GHG emissions monitoring was developed, applied in pilot buildings and submitted to relevant ministry for decision.

The monitoring system of existing buildings based on compulsory energy audits has not been approved and adopted yet. Compliance rate of constructed buildings have significantly increased to estimated 60%, but has not reached yet the planned but very demanding target of 80%. Direct project CO_2 emission savings reached 1 620 tCO_2 and met the planned target. Conservative estimate of indirect project CO_2 emission savings of 13 392 tCO_2 has not reached the planned target of 22 800 tCO_2 primarily due to lower number of constructed buildings subject to the new building code.

All three targets that were not fully reached are very ambitious and it was not realistic to achieve some of them as stated already in the MTE (80% compliance rate), especially when taking into account the limited budget of the project and limited institutional capacities compared to similar projects in the region. The GEF project budget of 0.9 mil USD does not include investment component and it is several times smaller than GEF budgets of similar energy efficiency in buildings projects in other countries in the Central Asia (ranging from 2.5 to 4.5 mil USD).

Target indirect project GHG emission reductions were calculated in the ProDoc with an assumption that replication factor will be 20, in other words, that 10 new schools in Osh and additional 10 new schools in Bishkek will be constructed within 2010-2012 in energy efficient standard. In reality, the pilot school in Osh, the first school in Kyrgyzstan designed and constructed according to the new SNiP, was constructed only in autumn 2012, and only one smaller school was constructed in Osh suburb in 2013. The actual construction rate in Kyrgyzstan was significantly smaller than planned due to combination of political crisis in 2010 and financial crisis and subsequent public budget cuts. Another important factor is that the indirect emission reduction calculation in ProDoc, as well as the SNiP code itself, does not include any transitional period after the new building code was adopted and entered into force in 2010. First experience from the pilot project could have been fully collected and disseminated in 2013, three years after the new building code came into force, and first buildings that incorporate experience from the project pilot school could have been designed in 2013 and constructed in 2014 at the earliest. Thus, in fact the full replication of buildings constructed according to the energy efficient standard of the new building code and utilizing experience gained during this GEF

project can be expected to fully materialize starting in 2014. Lower actual indirect emission reductions than planned thus illustrate primarily lower construction rate, and reflect actual transitional period needed for full dissemination of experience in design and construction of buildings according to the new energy efficient building code.

Energy consumption (and GHG emissions) monitoring system of existing buildings is rather new concept also in EU countries which have several decades long experience with energy efficiency building codes and building insulation materials, and where energy consumption is metered, including district heating. Full scale implementation of energy monitoring system requires advanced market, and it is also rather costly measure. For example, in Croatia implementation of energy monitoring system in public buildings had a budget of 20+ mil USD. This suggests that full implementation of the energy monitoring system in Kyrgyzstan is not realistic to achieve within this project (whole project budget of less than 1 mil USD) and neither rational at this stage of development (there are practically no building level district heat metering installed yet).

Except for planned results, the project delivered a number of other achievements that supported project goal. For example university and college construction studies were supported by a new locally developed textbook on energy efficiency in buildings and a Russian translation of a book on design of passive houses authored by Dr. Wolfgang Feist of Passivhaus Institute, Germany, the project co-organized several international events on energy efficiency in buildings, how-to guide for house owners was developed and distributed in Kyrgyz and Russian languages, technical catalogues for building designers with typical energy efficiency solutions in construction was developed and distributed.

The project was implemented in a difficult period of financial crisis, political crisis and violent riots in 2010 in Kyrgyzstan, the second poorest country in the CIS region. Despite these negative factors, fully outside of project control, the project managed to deliver results and make a significant and sustainable impact on energy efficiency in buildings on Kyrgzystan.

Except for quantitative project achievements described above, the main contribution of the project is that it served as genuine catalyst of energy efficiency in Kyrgyzstan. The project managed to change the attitude of local professionals and decision makers towards energy efficiency and their way of thinking and understanding energy efficiency from a declaratory theoretical buzzword to a real business opportunity that increases value of energy efficient buildings compared to energy intensive buildings with poor or no insulation.

5.1 Recommendations

I. External financing of pilot projects investment costs by a third party, ie. outside of the UNDP/GEF project budget, is the most cost-effective arrangement from the GEF perspective. However, it is also a very risky arrangement, as experienced by this project. In case the investor fails to fulfill the financing commitment, the project is exposed to a serious risk that pilot projects will not be constructed. Letter of Intent to provide financing is not a legally binding commitment. Ideally, in the project development phase, before Project Document signature, legally binding financing commitment should be submitted, or alternative financing

solutions and financing risk mitigation strategies should be prepared in the Project Document already (for example Letters of Intent signed with more potential investors).

II. Effective energy consumption and GHG emission monitoring system requires energy metering ideally at the building level. Without metering, energy consumption for space heating can be calculated and estimated only, which is rather costly and prone to over- or underestimation, and thus it can be effectively used in individual cases only. Before implementation of a country-wide energy consumption monitoring system, energy meters should be in place, including building level district heating meters. Or in other words, the national monitoring system should apply only to buildings with metered energy consumption for space heating. Otherwise the monitoring costs and administrative burden might easily exceed benefits from "accurate calculation of inaccurate inputs".

III. Implementation of a full scale national energy consumption and GHG emission monitoring system is a very ambitious and rather costly task. It requires sufficient budget and time, sufficiently developed local experience with energy efficiency, and a sufficient potential - and a financing capacity - to invest into energy efficiency improvements of existing buildings and technologies. Otherwise, energy and GHG monitoring system would remain just an expensive administrative exercise. Implementation of energy and GHG monitoring system might be a subject of a separate future full-size project - after experience with energy efficiency reconstruction of buildings will be more widespread and capacity to finance energy efficiency reconstruction of existing buildings and technologies strengthened.

5.2 Lessons Learned

I. Energy efficiency building code that sets up mandatory minimum energy efficiency requirements is an affordable and effective policy tool that can be implemented effectively even in a case of a poor country with underpriced energy - especially for newly constructed buildings, although actual GHG emission savings in absolute values in short term will not be in this case as high as in more developed countries with higher rate of construction. 40% energy and GHG emission reduction in new buildings with only 4% incremental costs, as demonstrated in pilot buildings, is a potential that would otherwise remain untapped.

II. Even in case of heavily underpriced energy where energy savings themselves do not pay for investment costs into improved energy efficiency in buildings, energy efficiency does have economic sense for investors. Improved energy efficiency performance of housing and insulated buildings increase comfort of living and increase market price of the real estate and thus generate real economic return for investors who sell buildings with improved energy efficiency.

III. In countries with high share of poor individually owned housing and a tradition of do-it-yourself approach it is more difficult to enforce newly introduced energy efficiency building code in this market segment. It is more appropriate to target mandatory energy efficiency building code first to larger buildings, institutional investors – companies (legal persons) and public buildings, or to have more demanding energy efficiency requirements for these types of buildings.

IV. In a country that faces problems with low law enforcement and a widespread corruption one cannot expect that any administrative measure will fully eliminate non-compliance with a new building code. Equally important is increased demand for energy efficient housing and buildings based on hands-on experience from living in well insulated buildings and spread of word and information and experience dissemination. Generating such demand is not a one-time activity but rather a long-term process. A single five-year project cannot fully eliminate non-compliance problems but can effectively initiate the process of gradual compliance increase.

V. This project – that did not have any investment component in its GEF budget – can serve as the best example of being a catalyst of energy efficiency in buildings. The project was proactively managed by its Project Manager, it openly and effectively cooperated and did not compete with other relevant projects in the country. The project actively sought cooperation with other international donors and supported them by incorporating energy efficiency component and by providing locally developed expertise for their investment projects.

VI. This project was the first one of several GEF energy efficiency in buildings projects implemented in the region – in Armenia, Uzbekistan, Kazakhstan, and Turkmenistan. The UNDP RTA facilitated cooperation and information and experience sharing among these projects. A joint website was created and includes project updates from each country. All individual projects benefited especially from sharing experience in energy efficiency building code development. This regional experience and know-how sharing can serve as a good example worth for replication in other countries and regions as well.

VII. This project can serve as the best example in effective and quick start. Typically UNDP/GEF projects suffer from delayed and slow start, caused often by lengthy hiring of the project manager and staffing of the project team initiated with delays after ProDoc signature. In this case the project started full effective implementation immediately after official signature of Project Document without any transitional period. The inception report was actually organized already few weeks before the official launch of the project and signature of the ProDoc, after GEF CEO approval of the project. The process of hiring Project Manager was initiated by UNDP CO immediately after GEF approval of the Project Document and the Project Manager was hired on November 24, 2008, few weeks before actual official signature of the Project Document on December 5, 2008.

VIII. The project management and administration benefited from using locally developed simple financial spreadsheet that tracks financial data (budget and actual expenditures) not only in Atlas structure, but also in project activities structure. Atlas structure is not suitable for effective daily project financial management because it does not show details for individual project activities. Few projects in few countries do use similar locally developed financial spreadsheet, however in most cases project management depends fully on reporting in Atlas structure only, and have to make ad hoc financial reports according to project structure "by hand" if needed. It would be worth to offer all UNDP/GEF projects a simple financial spreadsheet that links individual budget lines and expenditures to Atlas budget lines as well as to actual project activities.

6. Annexes

Annex 1: Evaluation mission itinerary

Sunday, November 10, 2013

International travel from Prague, Czech Republic to Osh, Kyrgyz Republic

Monday, November 11, 2013

Arrival to Osh
Workshop on intermediate results of the UNDP/GEF project "Improving Energy Efficiency in Buildings" hosted in pilot school in Osh
Meetings with the representatives of the government, Osh district and Osh municipality, school director and other workshop participants
Site visit of the pilot school No. 52

Tuesday, November 12, 2013

Meeting with Gosstroy representatives in Osh
Travel to Bishkek
Meeting with the Project Manager

Wednesday, November 13, 2013

Meeting with the project team, Project Manager and Administrative Finance Assistant

Thursday, November 14, 2013

Meeting with the Project Manager
Meeting with Gosstroy representative
Meeting with Ministry of Energy and Industry

Friday, November 15, 2013

Meeting and roundtable discussion with representatives of Gosstroy, UNISON, SamrAla-Too, KyrSEFF and INOGATE
Meeting at UNDP, wrap up and debriefing with UNDP CO Deputy Resident Representative

Saturday, November 16, 2013

Final discussion with the Project manager

Sunday, November 17, 2013

Departure from Bishkek, international travel Bishkek – Prague

Annex 2: List of persons interviewed

- Project team

  Ms. Elena Rodina, Project Manager
  Ms. Elena Pasportnikova, Administrative Finance Assistant

- UNDP Country Office

  Mr. Pradeep Sharma, Deputy Resident Representative
  Mr. Daniyar Ibragimov, Program Analyst, Environment for Sustainable Development and Disaster Risk Management Unit
  Mr. Erkin Kasybekov, Senior Advisor to the Resident Representative
  Mr. Vladimir Grebnev, Programme Coordinator, Environment Protection for Sustainable Development in Kyrgyzstan

- State Agency on Architecture and Construction and Housing and Utilities (Gosstroy)

  Mr. Shuhrat M. Sabirov, Deputy Director
  Ms. Chynara Janykeeva, Head of Department, Municipal Infrastructure and Housing
  Mr. Joldosh Abdraev, Director, Republic Center for Certification and Standardization in Construction

- Government of the Kyrgyz Republic, Office of the Government

  Mr. Kalanbay Baktygulov, Deputy Chief of Staff

- Ministry of Energy and Industry of the Kyrgyz Republic

  Mr. Raimbek Mamirov, Deputy Minister
  Ms. Gulsara Rasymova, Head of Department of Energy Efficiency and Ecology, Kyrgyz Research and Scientific Center of Energy

- Osh District

  Mr. Akhmatjan Makhammadov, Deputy Governor

- City of Osh

  Mr. Ismail Radzhapov, Deputy Mayor

- School No. 52, Osh

  Ms. S. A. Amanova, Director

- UNISON civic foundation

Ms. Nurzat Abdyrasulova, Director, Manager of KyrSEFF - Kyrgyz Sustainable Energy Financing Facility
Mr. Samat Sukenaliev, Project Engineer, KyrSEFF - Kyrgyz Sustainable Energy Financing Facility

- INOGATE Programme, Sustainable Energy Programme for Central Asia Renewable Energy Sources and Energy Efficiency

  Mr. Paul Moulin, Team Leader
  Ms. Ilze Purina, Key Expert, Energy Efficiency and Energy Policy
  Mr. Paata Janelidze, Key Expert, Renewable Energy Sources

- Camp Ala-Too civic foundation

  Mr. Ulan Amanturov, program coordinator

- State Agency on Environmental Protection and Forestry

  Ms. Baglan Salikmambetova, Head of International Relations Department, GEF Operational Focal Point
  Ms. Jiparkul Bekkulova , Head of Strategy and Policy Department

- BIOM Ecological Movement
  Mr. Vladimir Korotenko, Chairman of the Board
  Ms. Natalia Bogatova, Head of Energy Efficiency and Renewable Energy Department

- Kyrgyz Research and Design Institute of Seismic Construction

  Mr. Seitbek Imanbekov, Director

- Kyrgyz Russian Slavic University

  Mr. Boris Abramov, Head of Education and Methodology Department

- Kyrgyz State University of Construction, Transportation and Architecture

  Mr. Tashbolot Satkinaliev, Vice-Rector

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 Guidelines for Conducting Terminal Evaluations
- 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

- Project Document and Request for CEO Endorsement
- Inception Report
- Annual Work Plans
- Annual Project Reviews
- Project Implementation Review reports
- GEF Operational Quarterly Reports
- Combined Delivery Reports
- Project Board/Steering Committee Meeting minutes
- Mid-Term Evaluation Report
- Management response to MTE
- Revised project Logical Framework matrix
- Project internal financial records

Project web sites:

undp.kg, beeca.net

Main documentation produced by the project

- Additions and amendments to the Law of the KR On Energy Conservation;
- Section on Energy Conservation in Buildings, Urban Planning Code of the KR ;
- Building energy code SNiP KR 23-01:2009 "Thermal Engineering (Thermal Performance of Buildings)"
- Guidance Manual/Regulations SP 23-101:2009 "Design of Thermal Performance of Buildings";
- Catalog of Engineering Solutions. Heat insulation of enclosing parts in residential buildings;
- Design documentation on pilot energy efficient school buildings in Osh with a capacity of 850 occupants;
- Design documentation on pilot energy efficient school buildings in Bishkek with a capacity of 450 occupants;
- State Energy Efficiency and Energy Conservation Policy in Design, Construction and Upkeep of Buildings and Facilities in the Kyrgyz Republic

- Three (3) Curricula/Training Programmes on Energy Efficiency and Thermal Performance of Buildings for the following specialties:
    - design;
    - construction/installation works;
    - regulatory area;
- Two Energy Saving/Conservation and Energy Efficiency in Buildings Special Course Syllabus - one for Construction and another for Architecture Specialties in Higher Education including typical special course curricula:
    - passive buildings and low-energy buildings for construction specialties;
    - passive building design for architecture specialties;
- Video film and video clip on energy efficiency in residential buildings ;
- Draft Provision on Rules and Procedures of Energy Passport Formation and Introduction;
- Draft Provision on Building Energy Performance Certification Procedures and Provisions;
- Draft Provision on Energy Monitoring and Energy Audit of Buildings;
- Reports on the delivered seminars/workshops
- Report on study tour on energy efficiency in buildings issues of government employees and project staff to Denmark
- Manual/booklet “How to make yourself your home warm”

Other relevant documentation

- Country Development Strategy for years 2009-2011.
- National Energy Programme for years 2008-2010 and Fuel and Energy Complex Development Strategy of the KR for the period till 2025
- Law of the Kyrgyz Republic on Energy Conservation
- National Strategy on Sustainable Development of the Kyrgyz Republic for 2013-2017
- Program of transition of the Kyrgyz Republic to a sustainable development in 2013-2017
- Plan of the Government for implementation of the program of transition of the Kyrgyz Republic to a sustainable development (2013-2017)

Annex 4: Terminal evaluation TOR

TERMS OF REFERENCE

For International Consultant for Terminal Evaluation

Title of program	UNDP/GEF project Improving Energy Efficiency in Buildings
Name of position	International Consultant for Terminal Evaluation
Place of work	Bishkek, Kyrgyzstan
Type of contract	Individual contract
Type of procurement	Direct Contracting (Roster)
Duration	25 days (September-November 2013)

BACKROUND

Almost all the Kyrgyz housing stock has been constructed during Soviet period some 35-60 years ago without any regard to energy efficiency. These buildings are now in obsolete condition and do not provide for minimum hygienic and comfort living conditions. Energy use per square meter is almost 3-5 times as those in EU and varies between 320 and 690 kWh/m2 per year. The project aims at reducing energy consumption and associated GHG emissions in Kyrgyzstan building sector by 30-40% as compared to the current level by:

(1) adopting and enforcing mandatory building energy performance codes, standards and labels (the Energy Pass) in line with internationally recognized best-practices;
(2) demonstrating feasibility and viability of an integrated design approach for energy efficiency in public buildings;
(3) building capacity of building and construction professionals to implement new building regulation; and
(4) establishing a system to monitor energy consumption and CO_2 emissions in Kyrgyzstan building sector.

The Government of the Kyrgyz Republic and UNDP and GEF implement "Improving Energy Efficiency in Buildings" project.

Main project outcomes achieved by the end of 2013:

Building energy code SNiP KR 23-01:2009 "Thermal Engineering (Thermal Performance of Buildings)" and Guidance manual SP 23-101:2009 "Design of Thermal Performance of Buildings" are put into force on 1 January 2010, and included as mandatory into the List of the Government of the Kyrgyz Republic. 500 copies each of the SNiP and Guidance manual are published and distributed to Gosstroy of the KR, libraries of KGUSTA (Kyrgyz State University of Construction, Transport, and Architecture), KRSU (Kyrgyz Russian Slavic University)/ construction college, and also given to chief architects and heads of the state architecture and construction control/surveillance in 44 rayons of the Kyrgyz Republic and Bishkek and Osh cities.

Aiming at improving energy efficient building codes a catalog of technical energy-efficiency measures entitled "Insulation of Residential Building Envelopes" was developed, published (500 each), and distributed among all the stakeholders.

Energy efficient school building in Osh with a capacity of 850 occupants, and the school gymnasium in Ak-Kashat village are designed and built in 2012. Energy consumption monitoring that was carried out in 2012-2013 heating period showed that both projects allow 50% energy saving compared to the similar buildings.

Energy reconstruction (building envelop thermal insulation is performed, energy efficient windows and doors are installed) of 2 first aid posts/feldsher and obstetric centers (FAPs) in Alchalu and Konush villages, Chui province, Kyrgyz Republic. Energy consumption monitoring will be performed during 2013-2014 heating period.

Thermal imaging equipment (4 thermal imagers) is purchased for the national energy performance laboratory.

Energy saving and energy efficiency goals were incorporated into Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017 with the project support.

International Forum: Energy for Sustainable Development was held in Kyrgyzstan in 2012 (152 participants from 28 countries).

Over 150 Gosstroy experts, over 50 experts of the State Environment and Technical Security Inspection, and over 60 architects and engineers, university professors, businesses were trained during 10training seminars.
Energy performance courses were introduced in construction universities and colleges, and 3 curricula for construction experts' upgrade were introduced.
In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of "Improving Energy Efficiency in Buildings" Project (PIMS #3910).

OBJECTIVE

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects, in the GEF Monitoring and Evaluation policy: http://www.thegef.org/gef/sites/thegef.org/files/documents/ME_Policy_2010.pdf and guidelines for conducting evaluations: www.thegef.org/gef/node/1905; as well as the UNDP Monitoring and Evaluation Policy: http://web.undp.org/evaluation/policy.htm.
The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

SCOPE OF WORK

The project aims at reducing energy consumption and associated GHG emissions in Kyrgyzstan building sector by 30-40% as compared to the current level by:

(1) adopting and enforcing mandatory building energy performance codes, standards and labels (the Energy Pass) in line with internationally recognized best-practices;
(2) demonstrating feasibility and viability of an integrated design approach for energy efficiency in public buildings;
(3) building capacity of building and construction professionals to implement new building regulation; and
(4) establishing a system to monitor energy consumption and CO_2 emissions in Kyrgyzstan building sector.

The project is designed to produce five outcomes:
Outcome 1 Improved energy performance building codes

- Support the State Architecture and Construction Agency (Gosstroy) in the development of new mandatory energy performance-based building energy code (SNiP[1]) compatible with international best practices, such as current Russian and CIS thermal performance codes and the European Energy Performance Building Directive.
- Simplify and "regularize" procedures, which regulating revisions of Building code to comply with the Energy Law requirements, e.g. the need for check and update of the code every 3 years (has not been followed since 1998)
- Elaborate and adopt national calculation methodology to determine building energy consumption based on standardized use and establish minimal requirements for thermal insulation, heating and air-conditioning systems, application of renewable energy sources and design of the building. The new regulatory basis will consider the total building energy balance (including heating, air conditioning, and ventilation).

Outcome 2 Improved enforcement levels of mandatory energy efficiency building codes

- Training for building inspectors on performance assessment and calculation methodology to help improve compliance levels of mandatory building codes.
- Develop procedures for the creation of an energy certification system for all buildings, including the issuing building efficient energy passports, to promote an economic driver for energy performance in buildings.
- Strengthen national capacity for certification of building materials and components for the building sector, to

[1] SNiP stands for "Building Norms and Rules" in Russian

simplify the task of building inspectors.

Outcome 3 Pilot project utilizing an integrated building approach

- Design and construct (or reconstruct) two public objects in two settlements of Kyrgyzstan (desirable in northern and southern climatic zones of the country), using an integrated building design approach within available budget and time schedule. Following low- or no-costs measures (the list is not exhaustive) will be integrated:
  - orientation of the building to ensure maximum solar gains,
  - zoning of the used areas within the building to ensure that areas requiring more warmth are located where solar gains are most effective,
  - optimum ventilation to reduce heat loss,
  - reduction of wall block thickness by means of locally produced insulation materials,
  - optimal planning of the building to reduce the energy losses.
- Adopt integrated energy efficient design methodology in all planned public construction in Bishkek, Osh and in other big cities

Outcome 4 Promotion of best energy design and construction practices

- Develop and introduce module on energy efficient building design in the curricula of Kyrgyz universities of higher education with architectural specialization and provide training assistance and support materials for teaching staff
- Design and approve training courses at the Licensing and Certification Department of the State Architecture and Construction Agency in the field of building energy performance, solar architecture and applications for renewable energy sources in buildings
- Provide training courses for practicing architects and engineers concerning the application of the new codes and calculation methodologies including instruction in bioclimatic architecture and thermal solar applications
- Raise awareness of building constructors on economic, environment and social benefits of integrated building design and on locally available and tested technologies, materials and other EE applications in buildings (e.g. though public events at major construction events such as annual BishkekBuild Construction Exhibition)
- Organize information campaign for the general public promoting benefits of the new building code and the Energy Passport
- Promote issues on the increasing of the energy efficiency through the national media, portal CARnet (www.caresd.net) and Information Bulletin.

Outcome 5 Monitoring of energy efficiency in buildings and emissions of GHG.

- Support Gosstroi and SAEPF in putting in place a system to monitor energy savings and CO2 emissions reduction in buildings. The building energy performance requirements will be reviewed and strengthened at regular intervals (3 years minimum) based on technology and market advances
- Prepare and arrange for two independent evaluations of project results (mid-term and final).

1. The new standards (component 1) and their enforcement (component 2) will be applicable to all new buildings, public and private alike. Pilot (component 3) will be applicable to both public and residential buildings in the following ways: it will demonstrate how the new standards can be implemented with no- or low-cost measures, using a) a new approach to design, i.e. integrated building design; and b) new or different materials, technologies, construction techniques. The project aims to pilot IBD in the public sector, and embed the approach through all public construction activities in the future, and thus offers high levels of replicability and energy savings in Kyrgyzstan. IBD will be voluntary for the private sector, however, there is expected to be strong uptake of IBD by the private sector because of the cost effectiveness of this approach. Finally, replication across all sectors will be enhanced by dissemination activities and the information and training of the sector professionals (Component 4).

2. The key expected climate change impact of the project is the reduction of CO2 emission by 267,000t CO2 by 2022 year, including 1,140 t CO2 directly from application of IBD in two new pilot buildings. Further indicators and the expected impact of the project are outlined in Section II Strategic results framework.

The Project has five primary outcomes summarized below:

Outcome I: SNiP KR 23-01:2009 "Thermal Engineering (Thermal Performance of Buildings)" is revised and revised SNiP KR 23-01:2013 "Thermal Engineering (Thermal Performance of Buildings)" is put into force on 1 July 2013. The amendment introduced in the revised SNiP KR 23-01:2013 refers to energy performance classes - there are 7 energy performance classes in the revised SNiP compared to 5 classes in the original version.

Outcome II: The Regulation of the Government of the Kyrgyz Republic indicated SNiP KR 23-01:2013 mandatory, building expertise of all the submitted design proposals serves as an evidence of that.

Outcome III: Design of 2 pilot projects (school for 850 occupants and a village school gymnasium for 120 occupants are developed; donor funding was mobilized; construction of both pilot projects was completed by November 2012.

Outcome IV: Learning, evaluation, and adaptive management.

Outcome V: Monitoring of energy efficiency in buildings and emissions of GHG is performed.

An overall approach and method[2] for conducting project terminal evaluations of UNDP supported GEF financed projects have been developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR (*see Annex C*). The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point, UNDP Country Office, project team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to Kyrgyzstan, including the following project sites in Bishkek (Ak-Kashat, Alchaluu, Konush villages) and Osh. Interviews will be held with the following organizations and individuals at a minimum:

- Project team;
- UNDP Country Office;
- GEF OFP;
- UNCCD FP;
- Ministry of Energy and Industry of the KR;
- State Agency on Environment Protection and Forestry & GEF Focal Point;
- State Agency on Architecture and Construction and Housing and Utilities (Gosstroy)
- UNDP "Environment for Sustainable Development" Programme;
- UNDP/GEF SHP Project;
- UNDP/UNEP "Poverty & Environment Initiative" Project

The evaluator will review all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in Annex B of this Terms of Reference.

[2] For additional information on methods, see the Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 7, pg. 163

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework (see Annex A), which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of: **relevance, effectiveness, efficiency, sustainability and impact.** Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary. The obligatory rating scales are included in Annex D.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry		Quality of UNDP Implementation	
M&E Plan Implementation		Quality of Execution - Executing Agency	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental :	
		Overall likelihood of sustainability:	

PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US$)		Government (mill. US$)		Partner Agency (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	0.050	0.050		0.045		6.965	0.050	7.06
Loans/Concessions								
• In-kind support	0.082	0.082	3.1	0.10			3.182	0.182
• Other								
Totals	0.132	0.132	3.1	0.145		6.965	3.232	7.242

MAINSTREAMING

UNDP supported GEF financed projects are key components in UNDP country programming, as well as regional and global programmes. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender.

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated: a) verifiable improvements in ecological status, b) verifiable reductions in stress on ecological systems, and/or c) demonstrated progress towards these impact achievements.[3]

CONCLUSIONS, RECOMMENDATIONS & LESSONS

The evaluation report must include a chapter providing a set of **conclusions**, **recommendations** and **lessons**.

IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation resides with the UNDP CO in Kyrgyzstan. The UNDP CO will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

DELIVARABLES

PRODUCTS	FINAL DEADLINE	FEE STRUCTURE
Preparation (desk review) Evaluator provides clarifications on timing and method	20 October 2013	30%
Evaluation Mission (in-country field visits, interviews) Draft Evaluation Report Presentation of Initial Findings to project management, UNDP CO and key stakeholders Final Report (Sent to CO, reviewed by RTA, PMU, GEF OFP for comments) Revised Final Report* (Sent to CO for uploading to UNDP ERC)	20 November 2013	70%

*When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report

REPORTING REQUIREMENTS

Accountability and reporting:

1. Expert will fulfill their obligations under the direct and overall supervision of UNDP/GEF Improving Energy Efficiency in Buildings project coordinator.
2. The structure and content of the report will be developed by expert in consultation with UNDP/GEF Improving Energy Efficiency in Buildings project coordinator, UNDP policy adviser in Kyrgyzstan, Regional Technical Adviser.
3. Expert will report to the project coordinator on a regular basis and will fulfill their duties in accordance with the work schedule.
4. Products developed under this term of reference will be available to other interested parties only in coordination with the UNDP, and are not subject to public access, as long as they are not officially published.

[3] A useful tool for gauging progress to impact is the Review of Outcomes to Impacts (ROtI) method developed by the GEF Evaluation Office: ROTI Handbook 2009

Place of work

1. Place of work – desk work.
2. Travel to Bishkek, Osh and Chui province

Payment conditions

1. Payment to the expert will be made by tranches based on the table "Expected results" and the presentation and approval of the relevant products. Expert provides reports based on the achieved results in the agreed format to the specialists mentioned above according to the prescribed schedule. Upon completion of the work, expert submits final report for approval to UNDP/GEF Improving Energy Efficiency in Buildings project coordinator, after that the final payment will be made.
2. The service provider will be responsible for all personal administrative and travel expenses associated with undertaking this assignment including office accommodation, printing, stationary, telephone and electronic communications, and report copies incurred in this assignment. For this reason, the contract is prepared as a lump sum contract.

Other terms

1. Expert - an individual person with whom UNDP contracts for the implementation of the terms of reference and obtaining of concrete results/products. In certain circumstances, expert may participate on corporate committees without the right to vote to provide advice/support, in part related to the substantive examination.
2. Expert services do not include authority or legal right that requires the UNDP for any agreements. Services should be implemented within the time specified in this term of reference and contract of the Expert.
3. Expert shall be solely responsible for payment of the relevant taxes and other deductions on income arising from the performance of the contract. There is not entitled to compensation of any tax and expert is solely responsible for the payment of contributions to the Social Fund.
4. Expert does not any benefits, compensation or subsidies, except for those designated in the contract details of the Expert. Hence, on the Expert is not entitled to the rights of staff, such as annual leave, sick leave or maternity leave.
5. There is not any representation, or administrative authority given to expert to sign, requiring UNDP any legal and/or financial liabilities.
6. Expert is not party of the Joint Staff Pension Fund, and there is not rely on any benefit from Pension Fund as a result of execution of the contract.
7. Expert fulfills its duties without being a representative of the UNDP or its staff across the state. In this regard, it is not subject to the privileges and immunities of the United Nations.
8. The rights to titles, copyrights, patents and other rights to the materials issued as part of this ToR rightfully belong to the UNDP.
9. Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (Annex E) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluations'

QUALIFICATION REQUIREMENTS

- Master degree or equivalent in social or natural sciences;
- Minimum 10-years of professional experience in the field of energy efficiency;

- At least three years of proven track record of application of results-based monitoring approaches to evaluation of projects focusing on in environment/ climate change/energy efficiency (relevant experience in the CIS region and within UN system would be an asset);
- Familiarity with priorities and basic principles of energy efficiency and relevant international best-practices;
- Knowledge of and recent experience in applying UNDP and GEF M&E policies and procedures;
- Excellent English communication skills,
- Good Russian communication skills.

DOCUMENTS TO BE INCLUDED WHEN SUBMITTING THE PROPOSALS

Interested individual consultants must submit the following documents/information to demonstrate their qualifications:

1. Current and complete P.11 form/CV;
2. Confirmation of Interest and Submission of Financial Proposal as per template;
3. At least two recommendation letters.

EVALUATION PROCESS

Candidates will be selected based on the Vetted Expert Roster for GEF Climate Mitigation project development and in compliance with the qualification requirements and the financial proposal. The contract will be awarded to technically qualified and lowest price consultant based on at least 3 (three) offers from the consultants in the Roster and should be based on a lump sum "all inclusive" approach (travel expenses, including DSA, tickets, accommodation, etc.; supplies, communication, required vaccination and/or medical examination, and other expenses in reference to the ToR tasks completion), but the daily rate should not exceed the rate quoted during the selection process.

ADDITIONAL REQUIREMENTS FOR RECOMMENDED CANDIDATES

Recommended contractors over 62 years of age on assignment requiring travel, at their own expense, should undergo a full medical examination including x-rays and obtaining medical clearance from an UN approved Doctor prior to taking up their assignment.

Individual Contractors are required to have vaccinations/inoculations when traveling to certain countries, as designated by the UN Medical Director. A copy of the list should be provided to the subscriber prior to signing the agreement so that his/her personal physician can attest to the required vaccinations/inoculations having been performed, as part of the certification described above. The cost of required vaccinations/inoculations must be included in the financial proposal.

SAFETY REQUIREMENTS

The Consultant should undertake the Basic Security in the Field (BSIF) training and Advanced Security in the Field (ASIF) courses prior to travelling. These requirements apply for all Consultants, attracted individually or through the Employer.

TRAVEL REQUIREMENTS

In order to implement this terms of reference, expert will have the following travels:

1) Bishkek – 4 days
2) Osh – 2 days
3) Chui province (Alchalu, Konush villages) – 1 day

UNDP CONTRIBUTION

During the contract of expert, UNDP will provide as follows:

1. All documentation, including experts' reports, project outcomes reports, publications and/or references, other materials if requested.

ANNEX A: PROJECT LOGICAL FRAMEWORK

Project Title: *Improving Energy Efficiency in Buildings*
Project Goal: Reducing energy consumption and associated GHG emissions in Kyrgyzstan building sector by 30-40%

Project strategy	**Objectively Verifiable Indicators**				
Goal	Promote low GHG intensive buildings in Kyrgyzstan				
	Indicators	**Baseline**	**Target**	**Means of Verification**	**Important assumptions**
Project objective: Reduce energy consumption and associated GHG emissions in Kyrgyzstan building sector	Average thermal energy consumption in new/renovated residential/public buildings	Thermal energy consumption on average: 140 kWh/m²	Thermal energy consumption for new code-compliant buildings reduced to an average of 100 kWh/m² (by about 30%	National statistics based on data from energy and GHG monitoring system to be set up by the project	High growth rates for new construction sustained Monitoring is accurate
	New building lifecycle CO2 emission	5,6 mln t CO2 eq	5,3 mln tCO2 or 267,000 tCO2 eq less than in baseline		
Outcome 1. Improved energy performance codes	Adoption of mandatory energy efficient building code and its regular updates implemented	Current code exists since 1998 without revisions; it does not provide for performance-based energy consumption standards	New performance-based EE code adopted in 2010 and updated by 2015	Official publication of adopted building code and supporting guidance documents, with sequence of updates	National institutions remain motivated to implement advanced mandatory legal framework for buildings
	Level of minimum mandatory thermal requirements for buildings	90-100 kWh/m²	10-20% decrease to 80 kWh/m² (or lower for larger multifamily buildings)	New performance-based EE building code	Cost-effectiveness of stricter minimum thermal performance requirements is demonstrated
	Capacity of national	Absence of trained	Calculation methodology	Available calculation	Trained staff are not

	authorities to design and regularly update advanced building codes	staff and tools	to determine building energy consumption agreed, software obtained and staff is trained in its application	methodology and tools Project progress and M&E reports	seeking employment elsewhere
Outcome 2. Improved enforcement of mandatory energy efficiency building codes	Level of enforcement of new standards (% of new buildings)	Low levels of compliance: max. 10%	Compliance levels radically improved up to 80%	National energy monitoring system for buildings	Monitoring is accurate Illegal construction of individual single-family houses is decreased
	Capacity to assess building energy performance in line with new standards	Insufficient technological base and absence of trained personnel	Laboratories equipped by end of year 1 20 staff from the Agency and University trained to undertake energy performance assessment by end of year 1	Project progress and M&E reports	Trained staff are not seeking employment elsewhere
	Enforcement capacity for EE building code: trained staff, rules and procedures for building certification	Weak capacity of building inspectorate and lack of regulations/rules to ensure compliance check	Procedures for mandatory building certification system adopted and tested by year 2 150 Building Inspectors trained in their application by end of year 3 Building certification works by year 3	Project progress and M&E reports Statistics on energy certification	Mandatory energy-efficiency building codes are in place Trained staff are not seeking employment elsewhere
Outcome 3. Pilot projects utilizing an integrated design approach	Energy- and cost-saving and social impact of integrated building design (IBD) in comparison with similar buildings	No buildings are built following IBD approach	No or maximum 10% increase in construction cost 35% decrease in building energy consumption or 1,140 tCO2e from pilot	M&E reports, site visits Specific reporting for the pilot and "reference" buildings, including energy consumption, costs and occupants	Co-funding for new school construction secure despite declines in local government revenue Integrated design and

			buildings Better comfort for users	survey	equipment properly installed Continued increase in gas and electricity price
	Scale of replication for IBD approach	No buildings are built following IBD approach	IBD introduced to all new public buildings in two largest Kyrgyz cities (Osh and Bishkek) by the end of the project	Municipal reports on implementation of public construction programmes	Availability of trained national staff in building industry to implement IBD Cost-effectiveness of IBD is proved and convincingly demonstrated
Outcome 4. Promotion of best energy design and building practices in construction sector	New curricula on energy efficient building design for universities	Absence of regular or vocational training opportunities on EE building design	Curricula developed, registered with Ministry of Education and introduced in Kyrgyz University for Construction, Transport and Architecture	Report on curricula implementation (number of students with certified diploma)	Sufficient capacity of professors to deliver new educational curricula
	Number of trained building engineers and architects	Slow improvement of knowledge by professionals	At least 100 industry professionals receive training in application of new codes	Project progress reports	Industry is willing to comply with new regulations
	Development of new products in conformity with new standards	Construction materials and building industry slow to develop new products	Larger availability of efficient materials and services	Industry reports: catalogue of building products, materials from BishkekBuild Exhibition	Industry has technical and financial capacity to develop new products and services
Outcome 5. Monitoring of building energy consumption and GHG emissions	Availability of accurate and up-to date data on energy consumption and CO2 emissions in buildings	Limited national capacity to monitor and assess energy savings and CO2 emissions in buildings	Monitoring system, including institutional framework, trained staff and technical tools and methodology, is in place by the end of the project	Project progress report and final evaluation report Annual reports on energy and GHG emissions in building sector	New calculation methodology to assess building energy performance and GHG emissions is officially adopted

ANNEX B: LIST OF DOCUMENTS TO BE REVIEWED BY THE EVALUATORS

General documentation

- UNDP Programme and Operations Policies and Procedures (POPP);
- UNDP Handbook for Monitoring and Evaluating for Results;
- GEF Monitoring and Evaluation Policy;
- GEF Guidelines for conducting Terminal Evaluations

Project documentation

- Project document;
- Annual Work Plans;
- Annual Project Reports;
- Project Implementation Review;
- GEF Operational Quarterly Reports;
- Midterm Evaluation Report (MTE);
- Management response to MTE;
- Revised Project Logframes;
- Project Board Meeting minutes.

ANNEX C: EVALUATION QUESTIONS

This is a generic list, to be further detailed with more specific questions by CO and UNDP GEF Technical Adviser based on the particulars of the project.

Evaluative Criteria Questions	Indicators	Sources	Methodology
Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?			
•	•	•	•
•	•	•	•
•	•	•	•
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
•	•	•	•
•	•	•	•
•		•	•
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?			
•	•	•	•
•	•	•	•
•	•	•	•
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
•	•	•	•
•	•	•	•
Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?			
•	•	•	•
•	•	•	•

Annex 1

ANNEX D: RATING SCALES

Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution	***Sustainability ratings:***	***Relevance ratings***
6: Highly Satisfactory (HS): no shortcomings 5: Satisfactory (S): minor shortcomings 4: Moderately Satisfactory (MS) 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major problems 1. Highly Unsatisfactory (HU): severe problems	4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML):moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	2. Relevant (R) 1.. Not relevant (NR) ***Impact Ratings:*** 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
Additional ratings where relevant: Not Applicable (N/A) Unable to Assess (U/A		