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## **United Nations Development Programme**

### **United Nations Development Programme**

# **Terminal Evaluation of UNDP/GEF Project: Belarus: Improving Energy Efficiency in Residential Buildings**

(GEF Project ID: 4228; UNDP PIMS ID: 4290)

## **Terminal Evaluation Report**

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## SYNOPSIS

**Title of UNDP supported GEF financed project:** Improving Energy Efficiency in Residential Buildings in the Republic of Belarus (IEERB)

**UNDP Project ID:** PIMS 4290

**GEF Project ID:** 4228

**Evaluation time frame:** July 2012 to February 2018

**CEO endorsement date:** 31 July 2012

**Project implementation start date:** 31 July 2012

**Project end date:** 30 June 2018

**Date of evaluation report:** 2 April 2018

**Region and Countries included in the project:** Belarus

**GEF Focal Area Objective:** SP-1 (for GEF-4): Promoting energy efficient technologies and practices in the appliance and building sectors

**Implementing partner and other strategic partners:** Implementing partner: Department on Energy Efficiency (DEE) under the State Committee on Standardization of Belarus

**Evaluation team members:** Mr. Roland Wong, International Consultant  
Ms. Viktoryia Kalosha, National Consultant

### **Acknowledgements:**

The Evaluators wish to acknowledge with gratitude the time and effort expended by all project participants and stakeholders during the course of the IEERB Project Terminal Evaluation. In particular, we wish to thank the UNDP Belarus, the Department on Energy Efficiency, the Ministry of Architecture and Construction, the Ministry of Housing and Utilities as well as the technical experts working under RUE StroyTechNorm, RUE NIPTIS, the Mahilioŭ Oblast Department of Capital Construction, MAPID JSC, RUE “Institute of GrodnoGrazhdanProject”, RUE Belarusian Center “Ecology”, the Construction Faculty of the Belarusian National Technical University (BNTU) in Minsk and the homeowner’s associations in Mahilioŭ, Minsk and Grodno for making the efforts to recall details of their time participating on the IEERB Project. Thank you to all you for your time during the mission for your hospitality and insights. We sincerely hope that this report contributes towards a lower carbon and energy efficient future for buildings in Belarus.

## EXECUTIVE SUMMARY

This report summarizes the findings of the Terminal Evaluation Mission conducted during the 12-27 February 2018 period for the GEF project: “*Improving Energy Efficiency in Residential Buildings in the Republic of Belarus*” (hereby referred to as IEERB or the Project), where UNDP received a US\$4.50 million grant from the Global Environmental Facility (GEF) in July 30, 2012.

### Project Summary Table

Project Title:	<i>Improving Energy Efficiency in Residential Buildings in the Republic of Belarus (IEERB)</i>			
GEF Project ID:	4228		<i>at endorsement (Million US\$)</i>	<i>at completion (Million US\$)</i>
UNDP Project ID:	4290	GEF financing:	4.500	4.500
Country:	Belarus	IA/EA own:	2.700	0.400
Region:	Europe and CIS	Government:	12.000	3.600
Focal Area:	Climate Change	Other:	13.000	11.627
FA Objectives, (OP/SP):	SP1 for GEF 4: Promoting energy efficient technologies and practices in the appliance and building sectors	Total co-financing:	27.700	15.227
Executing Agency:	Department on Energy Efficiency (DEE) under the State Committee on Standardization of Belarus	Total Project Cost:	32.200	19.727
Other Partners involved:	ProDoc Signature (date project began):		30 July 2012	
	(Operational) Closing Date:	Proposed: 31 December 2016	Actual: 30 June 2018	

### Project Description

The Project “*Improving Energy Efficiency in Residential Buildings in the Republic of Belarus*” (IEERB) in Belarus sought to reduce energy consumption (imported fuel) and related GHG emissions with a focus on new residential buildings through the introduction of new performance-based building design and construction standards with improvements to their implementation and enforcement. The IEERB Project was approved with the Government of Belarus’ commitment to introduce legislation promoting new EE building standards that are compatible with the EU Energy Efficiency Performance Buildings Directive (EPPBD) or 2010/31/EU. With the energy supply of Belarus being highly dependent on imports from Russia, and the lack of indigenous energy resources, the country’s focus on energy efficiency in urban areas is an important priority for the Government of Belarus.

The energy consumption for heating of Belarus’ residential sector growing from 40% in 2008 to 45% in 2015 of all primary energy sources in Belarus is one indicator that little attention has been given to energy efficiency in buildings. Typical annual demand for space heating for residential buildings in Belarus is in the range of 120-170 kWh/m<sup>2</sup>, a value that is not in line with the EPPBD. In early 2014, the residential

building stock was close to 250 million m<sup>2</sup> including about 170 million m<sup>2</sup> of old buildings constructed before 1994 according to the old Soviet practices and norms with specific energy consumption (SEC) for heating in the range of 150 to 200 kWh/m<sup>2</sup>/yr.

The primary legislation driving the IEERB Project is the “Law on Energy Saving” adopted in 1998 but was replaced by a new “Law on Energy Saving” (No.239-3 of January 8, 2015) that entered into force in 2015. Complementary building energy efficiency regulations relevant to Belarus today to the Law on Energy Savings (see Para 18) includes:

- annual energy consumption for space heating of new buildings to 60 kWh/m<sup>2</sup>;
- the “Comprehensive Programme for the Design, Construction and Reconstruction of Energy-Efficient Homes in the Republic of Belarus for 2009-2010 and until 2020”, by which systems for heat recovery from buildings ventilation air should be installed in all newly constructed buildings by 2020 with the aim of reducing energy consumption of all new residential buildings below 40 kWh/m<sup>2</sup> by 2020;
- adjusting electricity and heating tariffs towards higher rates of cost-recovery and improving collection rates. Since 2005, the rate of subsidization of heating and electricity tariffs has been increasing in Belarus with 2017 heating and electricity tariffs at 21.4% and 80.2% respectively of their real cost (see Para 19 and Figure 1).

## Project Results

Actual outcomes of the IEERB Project are summarized on Table A in comparison with intended outcomes.

**Table A: Comparison of Intended Project Outcomes from the Inception Report to Actual Outcomes**

<b>Intended Outcomes in revised Project Results Framework of October 2013 (see Appendix G)</b>	<b>Actual Outcomes as of March 2017</b>
<b>Objective:</b> To reduce the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings.	<b>Actual achievement toward objective:</b> Measures to reduce energy consumption and GHG emission reductions on new residential buildings have been demonstrated on this Project. Notwithstanding the new TC-EPB standards for energy efficiency of buildings, the timing of adoption of energy efficient heating equipment by owners of new buildings is difficult to assess considering the uncertainty of when existing heating tariffs will be raised from a recovery rate of 21.4% to an estimated 50% that will economically justify the installation of such measures. Furthermore, the dissemination of positive information of actual energy saved from these measures <u>under normal occupancy conditions</u> in new buildings would accelerate widespread adoption.
<b>Outcome 1:</b> Strengthened legal and regulatory framework and mechanisms to enforce the legislation for improving the energy efficiency of the building sector.	<b>Actual Outcome 1:</b> Legal and regulatory framework to support the enforcement of the Technical Code for Energy Performance of Buildings (TC-EPB) has been strengthened.
<b>Outcome 2:</b> Enhanced expert capacity of the Belarusian specialists to implement new energy efficiency standards and construction norms.	<b>Actual Outcome 2:</b> The capacity of the Belarusian building specialists has been enhanced to enforce implementation of new energy efficiency standards according to the TC-EPB with an initial focus on residential buildings.
<b>Outcome 3:</b> Demonstrated energy and cost-saving potential of new energy	<b>Actual Outcome 3:</b> Demonstration energy efficient buildings have been completed, and will be able to generate normal energy

Intended Outcomes in revised Project Results Framework of October 2013 (see Appendix G)	Actual Outcomes as of March 2017
efficiency measures in at least three new residential buildings in three Belarusian cities (as provided on pg 30 of the ProDoc) .	consumption data within 18 to 24 months when these buildings are under normal occupancy conditions.
<b>Outcome 4:</b> Documented, disseminated and institutionalized project results providing a basis for further replication.	<b>Actual Outcome 4:</b> Project results on supporting legal and regulatory framework of the TC-EPB has been institutionalized as well as the results of the energy savings from the pilot EE buildings (to comply with the Order of July 4, 2017 No.04/26p by the Deputy Prime Minister that was initiated by the Project.

## Summary of Conclusions, Recommendations and Lessons

The IEERB Project has provided excellent support within a 6-year period to improve the enabling environment for increased investments into EE residential buildings in Belarus, notwithstanding the Project had a very weak Project Results Framework (PRF) which did not convey to the Evaluation Team the targets that the Project needed to meet to achieve its overall objective. With strong and stable leadership of the IEERB Project from a highly experienced and top Belarussian climate change expert, the IEERB PMU was able to facilitate significant achievements for energy efficiency in the building sector in Belarus including raised awareness of building energy efficiency amongst all key stakeholders, a draft of a Technical Code on Energy Performance of Buildings (TC-EPB) aligned with EU Directive 2010/31/EU ready for approval by the Council of Ministers, strengthened capacities of building professionals on all aspects of energy performance of buildings, and the completion of 3 energy efficient residential buildings that will serve as an excellent resource for generating information on EE buildings, and inform policy improvements for the Government of Belarus to the TC-EPB (see Para 103).

The long-term sustainability of the IEERB Project of reducing energy consumption and GHG emission reductions on new residential buildings, however, is difficult to assess. This is considering that existing heating tariff rates are too low for economic justification of the installation of energy efficient heating equipment in buildings, and the uncertainty of when these heating tariffs will be raised from a 21.4% to a 50% recovery rate that is considered by most EE experts in Belarus to be a level where such investments would be economically feasible. Notwithstanding that TC-EPB will be mandatory likely in 2018, Belarusian building developers may be slow in adopting these energy efficiency measures if heating tariffs remain at their current levels. In addition, the building sector will continue to need Government support to sustain further reductions of energy consumption and GHG emissions from the sector (see Para 105) including:

- periodic refresher courses for building technicians, operators and owners to ensure minimization of fossil fuel consumption for heat generation from district CHPs;
- refocused efforts implementing energy efficiency measures for the existing building stock which is more than 98% of all buildings in Belarus; and
- efforts to strengthen and institutionalize GHG emission reduction calculations from energy efficiency of new buildings as well as retrofitted existing buildings with the involvement of MoNREP.

### Corrective actions for the design, implementation, monitoring and evaluation of the Project:

*Action 1 (to UNDP): To improve design of the future CCM projects including any follow-up “building energy efficiency” project, the design should include:*

- a clear logical framework matrix with SMART indicators and measurable targets that can be effectively monitored by PMU staff to reflect progress towards global benefits of energy efficiency for the building sector;
- a more detailed Project Results Framework (PRF) using the Theory of Change (ToC) analysis, and with targets that are reflected in the project outputs;
- specific M&E activities that can help project teams focus on specific indicators for monitoring (in an improved PRF) which would minimize the workload of the Implementing Partner and the PMU. This should include IP and IA access to a functional database of existing and new buildings that can provide progress reports on *important and relevant metrics* such as actual buildings (new and existing) with floor area in square metres, and reports from building owners and operators on energy consumption; and
- allocation of sufficient resources for capacity building of building owners and operators to monitor energy consumption (see Action 5).

See Para 107 for details.

*Action 2 (to UNDP): To improve implementation of future projects similar to IEERB, the PRF (strengthened through ToC analysis and ROTI) needs to be used as a guide for preparing project work plans. See Para 108 for details.*

### Actions to follow up or reinforce initial benefits from the Project:

*Action 3 (to MoHU with assistance from DEE and UNDP): Continue training workshops in oblast training centres to ensure the availability of a critical mass of certified EE building operational personnel to monitor and mitigate any trends of deterioration of the energy performance of EE equipment for these buildings due to lack of knowledge of proper maintenance practices. See Para 109 for details.*

*Action 4 (to MoHU with assistance from DEE and UNDP): Set up a program that continually informs occupants of EE buildings on optimizing use of their EE systems for hot water, heating and fresh air ventilation systems. See Para 110 for details.*

*Action 5 (to MoAC with assistance from DEE and UNDP): Continue training programs to ensure the availability of a critical mass of building design personnel to enforce compliance to the TC-EPB. Similar to Action 3, oblasts training centres will deliver these training programs for TC-EPB and updates to these building designers and technicians that will provide continuous access to the latest best international practices for the design of energy efficiency in buildings as mentioned in Para 111.*

### Proposals for future directions underlining main objectives of the IEERB Project:

*Action 6 (to DEE and MoHU): Monitor progress of Decree No.1037 of 29.12.2017 on the “Concept of Improvement and Development of Housing and Utility Services until 2025” addressing elimination of cross-subsidies and upward adjustment of low heating tariff rate towards 50% and higher that should provide*



*sufficient incentives for a shorter cost recovery period for building developers and investors for EE measures in residential buildings.*

*Action 7 (to DEE and MoAC): Continue to disseminate actual monitored energy consumption data from 3 demo buildings to the Government policymakers and investors in line with Deputy Prime Minister’s Order No.04/26p of July 4, 2017, with more emphasis on the time when the pilot buildings are fully occupied and when the tenants have been in their units for a sufficient time during which their energy consumption would be normalized; this could be as long as 18-24 months when all units are occupied although the currently monitored data are being provided for decision makers. See Para 113 for details.*

*Action 8 (to MoNREP): Provide support to appropriate institutions to help formalize protocols and methodologies developed by the Project for reporting GHG emission reductions for EE buildings and retrofits that includes support to the RUE Belarusian Research Centre “Ecology” needs to be continued after the EOP. See Para 114 for details.*

*Action 9 (to DEE): Support future retrofit programs or construction of new EE buildings (supported either by GoB or donors) through training of building energy operators and energy managers using experiences gained through the Project including training of building energy managers, both state personnel (with MoHU) and private individuals and companies (ESCOs) on latest best practices for operating EE systems in buildings including introduction of energy management information systems (EMIS) building on UNDP experiences in other countries in the region; roundtables on a strengthened ESCO modality in Belarus for thermal system installations (if deemed appropriate), upkeep of operational personnel skills that can result in minimized use of fossil-fuel generated heat and hot water; and training on EE building materials as well as targeted research and development on EE building materials that can be domestically produced. See Para 115 for details.*

Best and worst practices in addressing issues relating to relevance, performance and success:

*Best practice: This UNDP project has been well-managed due to the recruitment of a well-qualified project manager with good management skills as well as strong knowledge and technical skill in the subject matter. See Para 116 for details.*

*Scope for improved practice: Many country offices including Belarus need assistance in the preparation of ProDocs, most notably the Project Results Framework which needs to be focused with insertion of SMART indicators that directly contribute to an intended outcome. The PRF could be further strengthened through adoption of ToC and ROtI analyses with the assistance of personnel from Regional Centers.*

## Evaluation Ratings<sup>1</sup>

1. Monitoring and Evaluation	Rating	2. IA & EA Execution	Rating
M&E design at entry	5	Quality of Implementation Agency - UNDP	5
M&E Plan Implementation	5	Quality of Execution - Executing Entity (DEE)	5
Overall quality of M&E	5	Overall quality of Implementation / Execution	5
3. Assessment of Outcomes	Rating	4. Sustainability <sup>2</sup>	Rating
Relevance <sup>3</sup>	2	Financial resources	4
Effectiveness	5	Socio-political	3
Efficiency	4	Institutional framework and governance	4
Overall Project Outcome Rating	5	Environmental	4
		Overall likelihood of sustainability	3

<sup>1</sup> Evaluation rating indices (except sustainability – see Footnote 2, and relevance – see Footnote 3): 6=*Highly Satisfactory (HS)*: The project has no shortcomings in the achievement of its objectives; 5=*Satisfactory (S)*: The project has minor shortcomings in the achievement of its objectives; 4=*Moderately Satisfactory (MS)*: The project has moderate shortcomings in the achievement of its objectives; 3=*Moderately Unsatisfactory (MU)*: The project has significant shortcomings in the achievement of its objectives; 2=*Unsatisfactory (U)*: The project has major shortcomings in the achievement of its objectives; 1=*Highly Unsatisfactory (HU)*: The project has severe shortcomings in the achievement of its objectives.

<sup>2</sup> Sustainability Dimension Indices: 4 = *Likely (L)*: negligible risks to sustainability; 3 = *Moderately Likely (ML)*: moderate risks to sustainability; 2 = *Moderately Unlikely (MU)*: significant risks to sustainability; and 1 = *Unlikely (U)*: severe risks to sustainability. *Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.*

<sup>3</sup> Relevance is evaluated as follows: 2 = Relevant (R); 1 = Not relevant (NR)

## ABBREVIATIONS

Acronym	Meaning
APR	Annual Progress Report
BNTU	Belarusian National Technical University
CAD	Computer assisted drafting
CCM	Climate change mitigation
CHP	Combined heat and power
CIS	Commonwealth of Independent States
CO	Country Office
DEE	Department of Energy Efficiency
EBPD	EU's Energy Performance for Buildings Directive
EE	Energy efficiency
EEPBD	EU Energy Efficiency Performance Buildings Directive (EEPBD) or 2010/31/EU
EMIS	Energy management information system
EN	European standards or norms
EOP	End of Project
EPB	Energy Performance of Buildings
ESCO	Energy service company
EU	European Union
FSP	Full Sized Project
GDP	Gross domestic product
GEF	Global Environment Facility
GEFSEC	Global Environment Facility Secretariat
GHG	greenhouse gas
GJ	Gigajoules
GOST	Government Standard
HVAC	Heating, ventilation and air conditioning
IA	Implementing agency
IEERB	Improving Energy Efficiency in Residential Buildings
IP	Implementing partner
IPMV	International Performance Measurement and Verification
JSC	Joint stock company
kWh	Kilowatt-hour
MBEPS	Minimum building energy performance standards
MEPS	Minimum Energy Performance Standard
MIV	Monitoring, Inspection and Verification
MoAC	Ministry of Architecture and Construction
MoE	Ministry of Economy
MoNREP	Ministry of Natural Resources and Environmental Protection
MoHU	Ministry of Housing and Utilities
MTR	Midterm Review
M&E	Monitoring and evaluation
MWh	Megawatt hour
NEX	UNDP's National Execution Modality
NIPTIS	State enterprise of the Institute of Housing under MoAC
NPD	National Project Director
PIF	Project Identification Form
PIR	GEF Project Implementation Report
PMU	Project Management Unit

Acronym	Meaning
PPG	Project Preparation Grant
PRF	Project results framework
ProDoc	UNDP Project Document
PSC	Project Steering Committee
PV	Photovoltaic
ROtI	Review of Outcomes to Impacts
SEC	Specific energy consumption
SMART	Specific, Measurable, Attainable, Relevant and Time-bound
STAP	GEF Scientific Technical Advisory Panel
STB	National standard of Belarus
STN	RUE StroyTechNorm
TC-EPB	Technical Code for Energy Performance of Buildings
TCS	Technical Committee on Standardization
TE	Terminal Evaluation
ToC	Theory of Change
ToR	Terms of Reference
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNDP-GEF	UNDP Global Environmental Facility
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change

## 1. INTRODUCTION

1. This report summarizes the findings of the Terminal Evaluation Mission conducted during the 12-27 February 2018 period for the GEF-financed Project entitled: “**Improving Energy Efficiency in Residential Buildings in the Republic of Belarus**” (herein referred to as the “IEERB Project” or the “Project”) where UNDP received a US\$ 4.50 million grant from the Global Environmental Facility (GEF).
2. The IEERB Project has the objective of reducing the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings by introducing new performance based building design and construction standards with related energy certification schemes and by ensuring their effective implementation and enforcement. The IEERB Project was approved along with the commitment of the Government of Belarus to introduce legislation to promote new EE building standards that are compatible with the EU Energy Efficiency Performance Buildings Directive (EPPBD) or 2010/31/EU. New legislation was intent on reducing energy consumption of new buildings by:
  - 70% in comparison with existing building stock of Belarus constructed before 1993; and
  - 40% when comparing buildings constructed in accordance to current construction norms and thermal standards.
3. The Project was designed to achieve this objective by strengthening of the legal and regulatory framework, training of local experts and other key stakeholders to implement buildings compliant with the new directives, construction of three EE demo buildings to test and gain practical experience on implementing energy efficient buildings, and related outreach and dissemination of the lesson learnt. This terminal evaluation covers these activities managed by UNDP Belarus.

### 1.1 Purpose of the Evaluation

4. The Terminal Evaluation (TE) for the IEERB Project was to evaluate the progress towards the attainment of global environmental objectives, project objectives and outcomes, capture lessons learned and suggest recommendations on major improvements. The TE was to serve as an agent of change and play a critical role in supporting accountability. As such, this TE serves to:
  - promote accountability and transparency, and to assess and disclose levels of Project accomplishments;
  - synthesize lessons that may help improve the selection, design and implementation of future GEF activities;
  - provide feedback on issues that are recurrent across the portfolio and need attention, and on improvements regarding previously identified issues; and
  - contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on effectiveness of GEF operations in achieving global environmental benefits and on the quality of monitoring and evaluation across the GEF system.
5. Outputs from this TE will provide an outlook and guidance in charting future directions on sustaining current efforts by UNDP, the Government of Belarus, their donor partners, to sustain the capacities

of relevant Belarusian government institutions to promote and regulate improved energy efficiency in the building sector throughout Belarus.

## 1.2 Scope and Methodology

6. The scope of the TE for the IEERB Project was to include all activities funded by GEF and activities from parallel co-financing. The Terms of Reference (ToRs) for the TE are contained in Appendix A. Key issues addressed on this TE include:
  - To what extent have Project activities led to improved new legislation including the adoption of minimum building energy performance standards (MBEPs)? This would involve the Project's contribution to the Technical Code on "Energy Efficiency of Buildings", a regulatory enactment that contains, inter alia, the MBEP requirements, corresponding provisions for energy certification and compliance checking systems and energy audit;
  - To what extent have Project activities led to the enhancement of knowledge of building energy efficiency issues in Belarus? This involves a wide range of training beneficiaries including building and energy efficiency practitioners within the Government of Belarus (Department of Energy Efficiency or DEE), Ministry of Architecture and Construction (MoAC), Ministry of Natural Resources and Environmental Protection (MoNREP), state and private construction companies, academia and private consultants;
  - To what extent have Project activities led to the completion of demonstration of energy efficient measures that comply with new energy efficiency standards developed by the Project?;
  - Has the Project developed any new tools to monitor compliance with higher energy efficient standards for new buildings, and to what extent are they being used to assist the Government of Belarus achieve a higher rate of compliance with improved energy efficiency standards for buildings, both new buildings and existing buildings?
7. Outputs from this TE provides an outlook and guidance in charting future directions on sustaining current efforts by UNDP and the Government of Belarus on strengthening the legal and regulatory framework for energy efficiency of building stock in Belarus, and improving the knowledge base of energy efficiency issues in buildings amongst public, private and academia stakeholders involved with building energy efficiency in Belarus. In addition, the TE will assess the value of the pilot projects implemented and the effectiveness of the mechanisms for disseminating information of these pilots.
8. The methodology adopted for this evaluation includes:
  - Review of project documentation (i.e. APR/PIRs, meeting minutes of Project Steering Committee or multipartite meetings) and pertinent background information;
  - Interviews with key Project personnel including the current Project Manager, technical advisors (domestic and international), and Project developers;
  - Interviews with relevant stakeholders including other government agencies, engineering and architectural professionals and academic institutions; and
  - Field visits to selected Project's pilot sites and interviews with beneficiaries.

A detailed itinerary of the Mission is shown in Appendix B. A full list of people interviewed and documents reviewed are given in Appendix C and Appendix D respectively. The Evaluation Mission for the UNDP-GEF Project was comprised of one lead international expert and one national expert.

9. The Project was evaluated for overall results in the context of:
- *Relevance* – the extent to which the outcome is suited to local and national development priorities and organizational policies, including changes over time;
  - *Effectiveness* – the extent to which an objective was achieved or how likely it is to be achieved;
  - *Efficiency* – the extent to which results were delivered with the least costly resources possible; and
  - *Sustainability* - The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion.
10. All possible efforts have been made to minimize the limitations of this independent evaluation. There were 15 days spent by the mission to meet all relevant stakeholders in Minsk, along with site visits to all demonstration buildings completed by the Project in Minsk, Mahilioŭ and Hrodna. In addition, the evaluation team had time to collect and triangulate as much information as possible with follow-up e-mails between the Evaluation Team and the Project after the terminal evaluation mission to fill in information gaps.

### 1.3 Structure of the Evaluation

11. This evaluation report is presented as follows:
- An overview of Project activities from commencement of operations on 31 July 2012 to the present activities of the IEERB Project;
  - An assessment of results based on Project objectives and outcomes through relevance, effectiveness and efficiency criteria;
  - Assessment of sustainability of Project outcomes;
  - Assessment of monitoring and evaluation systems;
  - Assessment of progress that affected Project outcomes and sustainability; and
  - Lessons learned and recommendations.
12. This evaluation report is designed to meet GEF’s “Guidelines for GEF Agencies in Conducting Terminal Evaluations, Evaluation Document No. 3” of 2008:
- <http://www.thegef.org/gef/sites/thegef.org/files/documents/Policies-TEguidelines7-31.pdf>
13. The Evaluation also meets conditions set by:
- the UNDP Document of 2012 entitled “UNDP GEF – Terminal Evaluation Guideline”: <http://web.undp.org/evaluation/documents/guidance/GEF/UNDP-GEF-TE-Guide.pdf>;
  - the UNDP Document entitled “Handbook on Planning, Monitoring and Evaluating for Development Results”, 2009: <http://www.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf>; and
  - the “Addendum June 2011 Evaluation”: <http://www.undp.org/evaluation/documents/HandBook/addendum/Evaluation-Addendum-June-2011.pdf>

## 2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

### 2.1 Project Start and Duration

14. The “Improving Energy Efficiency in Residential Buildings” Project officially commenced implementation on 31 July 2012, the date when the Belarusian government signature for the Project document (ProDoc) was obtained. The Project duration originally was planned for 5 years beginning in January 2012 (the formal start date as per the ProDoc) and ending in December 2016. In December 2014, the Mid-Term evaluation recommended that an extension for the Project should be considered for another 12 months to complete the demonstration buildings and allow sufficient time for monitoring of energy consumption. Currently, the final terminal date of the IEERB Project is 30 June 2018.

### 2.2 Problems that IEERB Project Sought to Address

15. The IEERB ProDoc provides details on the problems that the Project sought to address. The price and other delivery terms of the gas and oil imported from Russia and its transit to other European countries through Belarus have been subject to several disputes between the Governments of Belarus and Russia since 2004. The previous low price paid by Belarus for the Russian gas has been gradually increasing, thereby providing a higher impetus also for different energy efficiency measures. This has led to the country’s issues related to increased energy security and greater energy independence remaining high on the Government agenda.
16. The energy supply in Belarus is highly dependent on imports, mainly from Russia. Apart from small deposits of natural gas, oil, peat and some hydro resources as well as the forests covering close to 40% of the country, there are no significant other indigenous energy resources available. In 2015, the imports covered close to 88% of the total primary energy use for heating, and close to 98% for electricity generation<sup>4</sup>. With more than 75% of Belarus’s 9.5 million citizens living in urban areas, the country’s focus on energy efficiency in urban areas is an important priority for the Government of Belarus.
17. As a percentage of all primary energy resources available in Belarus, energy consumption for residential sector heating in Belarus has grown from 40% in 2008 to 45% in 2015, while electricity consumption in this sector has only grown from 21% in 2008 to 22.5% in 2015. This is one indicator that little attention has been given to energy efficiency in buildings resulting in typical annual demand for space heating of about 120-170 kWh/m<sup>2</sup>, a value that is not in line with EU Directives. In early 2014, the residential building stock was close to 250 million m<sup>2</sup> including about 170 million m<sup>2</sup> of old buildings constructed before 1994 according to the old Soviet practices and norms with specific energy consumption (SEC) for heating in the range of 150 to 200 kWh/m<sup>2</sup>/yr.
18. Since 1993, the Government of Belarus has been seeking improvements to specific consumption of heat energy:
  - In 1993, a new national standard “Construction Heat Engineering” was adopted, enhancing the requirements for the insulation of the building envelope to annual space-heating demand of 86-

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<sup>4</sup> IEA Energy Statistics 2015 available on:

<https://www.iea.org/statistics/statisticssearch/report/?year=2015&country=BELARUS&product=ElectricityandHeat>



91 kWh/m<sup>2</sup> for buildings of 9 floors or higher and to 89-105 kWh/m<sup>2</sup> for a typical 4-5 storey building. While comparable to similar norms in Russia and Ukraine, these standards were not in line with EU countries;

- The “Law on Architecture, Urban Planning and Construction Activities in the Republic of Belarus” (2004, amended in 2009), set the framework for relations between governmental agencies, private organizations and individuals engaged in architecture, urban planning and construction activities. This is relevant to the IEERB Project in the context of the institutions responsible for enforcing compliance with technical regulations, contracts, as well as non-contractual obligations;
  - The “Regulation on Preparation and Issuance of Construction Permits” (2007, amended in 2010) established procedures for obtaining permits for construction, reconstruction, restoration and repair of buildings. The process would include obtaining the required permits and approvals for building retrofits and new building permits that would need to comply with any new regulations and standards on building heating energy consumption;
  - The installation of heat meters and automatic regulation of heating in residential and public buildings has been mandatory since 2007;
  - The “Law on Energy Saving” adopted in 1998 but was replaced by a new “Law on Energy Saving” (No.239-3 of January 8, 2015) that entered into force in 2015. Complementary building energy efficiency regulations around the current Law on Energy Savings that are relevant to the energy situation in Belarus today, specifically the building energy efficiency, includes:
    - New thermal standards introduced in 2010 to reduce annual energy consumption for space heating of new buildings to 60 kWh/m<sup>2</sup>. At this time, many EU countries were developing new regulations reducing space-heating energy consumption to less than 30 kWh/m<sup>2</sup>/yr with the best achieved engineering solutions leading to about 15 kWh/m<sup>2</sup>/yr;
    - The “Comprehensive Programme for the Design, Construction and Reconstruction of Energy-Efficient Homes in the Republic of Belarus for 2009-2010 and until 2020”, by which systems for heat recovery from buildings ventilation air should be installed in all newly constructed buildings by 2020. This is in accordance with the stated goal of the energy efficiency program to reduce space-heating energy consumption of all new residential buildings below 40 kWh/m<sup>2</sup> by 2020;
    - Electricity and heating tariffs with the intention of:
      - increasing tariffs to cost-recovery levels (at the Belenergo level);
      - reducing cross-subsidies between different consumer groups; and
      - improving payment discipline to improve the collection rate and eliminate barter.
  - MoAC with support of the State Standardization Committee’s DEE implemented a couple of pilot projects (prior to the commencement of IEERB) to demonstrate that there is still large energy savings potential while introducing some other state-of-the-art techniques into building construction practice.
19. As of October 2010, the district heating tariffs in Belarus were about €0.008 euro cents per kWh, roughly 37% of the real tariff costs, and €0.0042 per kWh for electricity, roughly 59% of the real electricity tariff. As of 2017, the heating tariff has decreased to 21.4%, an increase in the level of the electricity tariff now at 80% of the real cost. Figure 1 provides an overview of heating and electricity tariffs between 2005 and 2017 as a percentage of their real cost. These highly regressive subsidies only add costs to business, and create significant fiscal risks and macroeconomic vulnerabilities. Studies indicate that negative social impact is manageable if a tariff increase is accompanied by countervailing measures to compensate for the loss of purchasing power, in particular of the poor, through targeted social assistance and energy efficiency programs. While the goal of the

Government is to reduce the subsidies to zero<sup>5</sup>, the further subsidization resulted from unforeseen circumstances including the 2011-2016 devaluation of the Russian rouble, and the resulting increase of heating costs to the population. Notwithstanding, the energy efficiency of buildings is high on the GoB's development agenda.

**Figure 1: Belarus Electricity and Heating Tariffs as a % of Real Cost<sup>6</sup>**



20. In 2010, the Government also made projections on an increase of more than 120 million m<sup>2</sup> of new residential buildings during the period of 2012-2026. Along with the aforementioned legislation for building energy efficiency in Para 18, MoAC set an objective and adopted a program to move towards mass construction of energy efficient buildings in Belarus. Despite the availability of technical skills, appropriate building materials and equipment as well as basic engineering capacity in Belarus to implement such a program, barriers to the full adoption of the program remained including:

- the prevalence of traditional approaches to building design within the engineering and architectural professions in Belarus. As such, design of the energy performance of a building is undertaken without a holistic view of the energy performance of the entire building;
- the absence of a legal and regulatory framework that is less prescriptive in its approach to energy efficiency in buildings, and more encouraging towards minimum energy performance standards for the entire building;

<sup>5</sup> Decision № 1180 of the Council of Ministers of Belarus dated August 9, 2010 on “Approval of the development strategy of the energy potential of the Republic of Belarus” which calls for the phase out of all energy tariff subsidies including those for natural gas used for food preparation by 2011, for electricity by 2013 and for district heating by 2014.

<sup>6</sup> Accessible from Belenergo website: [http://belenergo.by/content/devatelnost-obedineniya/sbytovaya-devatelnost/tarifnaya-politika/index.php?sphrase\\_id=1065](http://belenergo.by/content/devatelnost-obedineniya/sbytovaya-devatelnost/tarifnaya-politika/index.php?sphrase_id=1065)

- a lack of comprehensive energy audits on buildings in Belarus;
- lack of guidance in the context of technical details of energy efficient equipment, and proper methods of their installation; and
- lack of financial incentives to catalyze the construction of energy efficient buildings.

The IEERB Project seeks to address the lowering of these barriers and catalyze instruction of energy efficient buildings in the residential sector in Belarus.

### 2.3 Development Objective of IEERB Project

21. The objective of the IEERB Project was to “reduce the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings”. This objective was to be achieved through the meeting of the targets of 80 new buildings (roughly 10% of all new buildings in Belarus) that have in their design an SEC of 60 kWh/m<sup>2</sup>/yr for space heating and hot water and a resulting lifetime GHG emission reduction target of 220,000 tonnes CO<sub>2</sub>. These are defined in the Project Results Framework (PRF) for the IEERB Project that was amended and approved in June 2013. This PRF is contained in Appendix G.

### 2.4 Baseline Indicators Established

22. The baseline value for all these indicators of the IEERB Project can be found in the approved PRF in Appendix G.

### 2.5 Main Stakeholders

23. The formulation and implementation of energy saving policies in Belarus was started in 1993 together with the establishment of an inter-institutional body, the State Committee for Energy Efficiency and Energy Control of Belarus. This entity was transformed in 2001 to the Committee on Energy Efficiency under the Council of Ministers and in 2006 to the Department on Energy Efficiency (DEE) under the State Committee on Standardization. The ground level implementation of energy saving policies is done through the development and implementation of national, regional and sectoral energy efficiency programs. DEE, the Ministry of Economy (MoE) and other national stakeholders are setting national targets for energy conservation, which are further transformed to mandatory tasks to be implemented by different line ministries, other governmental agencies and state-owned enterprises.
24. A listing of groupings of stakeholders of interest to the Evaluation includes:
  - Stakeholders within the Government of Belarus including those involved with the Project in the DEE, MoAC and MoE, notably those involved with the setting of energy efficiency standards and policies (including those advocating the removal of fuel subsidies), enforcement of these standards and policies, and those with oversight on financial mechanism programs (such as interest rate subsidies) to catalyze interest in energy efficient buildings;
  - Building and energy efficiency practitioners within state construction companies, private engineering firms and academia, notably those who have been involved with engineering and design of buildings that comply with the policies and standards, and those involved with

construction inspection of new buildings the need to comply with new energy efficient standards and policies;

- Energy auditors who have developed their skills in preparing reports on building energy consumption with a focus on primary energy consumed for HVAC and hot water on new and retrofitted buildings;
- Building owners and managers on their satisfaction in undertaking EE measures for their residential buildings; and
- Building operators whose capacities to manage and minimize building energy consumption are important towards maximizing GHG emission reductions from the building sector.

25. A complete listing of stakeholders who have participated on the IEERB Project is provided in Section 3.2.2 (Paras 46-47).

## 2.6 Expected Results

26. To achieve the specific IEERB objective to “reduce the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings”, the IEERB Project was designed with the following expected **Project outcomes**:

- Outcome 1: Strengthened legal and regulatory framework and mechanisms to enforce the legislation for improving the energy efficiency of the building sector;
- Outcome 2: Enhanced expert capacity of the Belarusian specialists to implement new energy efficiency standards and construction norms;
- Outcome 3: Implementation of demonstration projects for energy efficient buildings;
- Outcome 4: Documented, disseminated and institutionalized project results providing a basis for further replication.

## 3. FINDINGS

### 3.1 Project Design and Formulation

27. Design of the IEERB Project was first conceived in 2010 after Belarus had introduced new thermal standards for buildings in support of the Law on Energy Savings of 1998. The IEERB ProDoc packaged these designs into a GEF climate change mitigation project that would support the country's efforts to lower the barriers to the full adoption in Belarus of a program to build energy efficient buildings as described in Para 20.
28. The strategy of the IEERB Project to lower these barriers included implementing Project activities divided into 4 components, the outcomes of which are described in Para 26. However, prior to presenting Project results, an analysis of the IEERB Project design is presented in this section.

#### 3.1.1 Analysis of Project Results Framework

29. The Project Results Framework (PRF) for the IEERB Project was slightly revised after the Inception Phase workshop of June 2013 and the MTR of December 2014 in consideration of the 9-month delay to start-up the IEERB Project (see Para 42 for details). The PRF only contains 2 objective level indicators and 6 indicators for 4 outcomes. In the context of best practices for preparing PRF's for GEF projects, the wording of *the indicators and targets are poorly formulated and do not meet SMART criteria*<sup>7</sup>. Some specific comments on the 2013 PRF includes:

- 5 of the outcome indicators not being specific and measurable. This includes indicators such as “demonstrated capacity” and the “status” of regulatory documents and demonstration projects, both of which are not specific or measurable for the purposes of monitoring the progress of the Project;
- indicator descriptors should be a short description reflecting the numerical value of the target;
- the EOP target should be just a number with a footnote to describe the conditions of meeting that target (such as an indicator “tonnes CO<sub>2</sub> emissions reductions by the EOP” and a target of “220,000” with a footnote to indicate “these are lifetime CO<sub>2</sub> emission reductions for which construction has started or which have adopted into their design new energy efficiency elements that reduce energy consumption for heating and hot water in residential buildings”);
- in instances where the “status” needs to be measured (such as in Outcome 1 on the status of national laws or Outcome 3 on this status of demonstration projects), the PRF should have entered output level targets such as Output 1.2 with an indicator of number of completed energy audits and the target of 50, or Output 3.3 with an indicator of number of demonstration buildings covered in monitoring reports with a target of 3.

*While this Evaluation points out the shortcomings of this PRF that may add to the difficulties of properly evaluating progress of most GEF projects, the PMU for the IEERB Project was still able to effectively monitor progress of the IEERB Project towards its intended objective, outcomes and outputs.*

30. The GHG emission reductions target of the IEERB Project is 220,000 tonnes CO<sub>2</sub> that are lifetime emission reductions generated mainly from more than 80 EE new residential buildings which comply

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<sup>7</sup> Specific, Measurable, Attainable, Relevant and Time-bound

to Technical Code “Energy Efficiency of Buildings” which is actually the Technical Code for Energy Performance of Buildings (TC-EPB). This was to be calculated by taking the baseline annual specific energy consumption (SEC) for space heating demand from the average of 60 kWh/m<sup>2</sup> (as adopted in 2010) to 20 kWh/m<sup>2</sup> and the annual heat demand for sanitary hot water from the current average of 65 kWh/m<sup>2</sup> similarly to 40 kWh/m<sup>2</sup>. The Ministry of Architecture and Construction (MoAC) maintain a database of buildings that are approved for construction and compliance with EEB Technical Code, complete with the actual SEC values of the new building and the building area in m<sup>2</sup>. GHG emission reductions can then be calculated by applying an average energy emissions factor in Belarus (consisting of composite electricity and heat factors). Table 1 provides a sample calculation from the IEERB ProDoc of the direct GHG reduction impact with the target of 65 kWh/m<sup>2</sup>/yr savings in final energy use compared to similar constructed buildings in accordance with the construction norms in force in 2012. This analysis would also be applicable to the detailed design of the 3 demo buildings that were implemented on this Project as well as other buildings that are approved for construction and in compliance to the TC-EPB.

**Table 1: Summary of the assumptions and results from calculating the direct (lifetime) GHG reduction impact of the Project**

Estimated total demonstration project floor area	36,000	m <sup>2</sup>
Average annual savings in space heating demand	40	kWh/m <sup>2</sup> /yr
Average annual savings in the use of heat for sanitary hot water preparation	25	kWh/m <sup>2</sup> /yr
Calculation period for energy savings in space heating	30	years
Calculation period for energy savings in sanitary hot water preparation	15	years
Total energy savings over the calculation period	1,575	kWh/m <sup>2</sup>
Average emission factor for final energy use	0.216	kgCO <sub>2</sub> /kWh
<b>Demo project CO<sub>2</sub> reduction over the calculation period</b>	<b>12.2</b>	<b>kt CO<sub>2eq</sub></b>

31. The objective level target in the PRF of 220 ktCO<sub>2eq</sub> for GHG emission reductions would appear to be reasonable based on 80 buildings adopting the energy efficiency norms for buildings of the EEB Technical Code, for which the design or construction has started during the project implementation. With the enforcement system in place with MoAC approving project designs that are in compliance with the TC-EPB, the PMU will be reliant on reporting from the implementing partner, DEE, of buildings that have received these design and construction approvals. The target of 80 buildings assumes approximately 800,000 m<sup>2</sup> of floor area for each of the 80 buildings.

### 3.1.2 Risks and Assumptions

32. A number of assumptions were identified in the PRF from 2012 as well as the revised PRF in June 2013 and Dec 2014 as keys to the achievement of IEERB Project objectives. This included:
- suggested EE measures are adopted by design institutes and construction companies into the design of new buildings;
  - continued commitment of the Government of Belarus to proceed with suggested legislation;
  - demonstration projects adding value to new approaches for targeted building practitioners;
  - the assumption that the design of the demonstration buildings would be completed in the first 18 months of IEERB, and construction would be completed at the end of Year 3.

33. The ProDoc also identified 9 risks in a draft risk log. Many of the risks identified in the ProDoc's Annex 7-1 represent the barriers to be removed by the Project. One exception is Risk #1 which identifies local energy pricing policies not being supportive of energy efficiency investments. While this risk was initially rated as relatively low, the devaluation of the Russian ruble between 2012 and 2015 only made the price of natural gas and heating more costly for Belarusian citizens, making it more difficult for the Government of Belarus to eliminate heating subsidies (that are mentioned in Paras 18 and 19). This risk would have been difficult to have predict by IEERB Project designers.

### **3.1.3 Lessons from Other Relevant Projects Incorporated into IEERB Project Design**

34. The ProDoc of the IEERB Project does not list any other relevant Projects into its design.

### **3.1.4 Planned Stakeholder Participation**

35. One of the primary purposes of IEERB Project was to increase the knowledge and build the capacity of key stakeholders<sup>8</sup> while concurrently strengthening the legal and regulatory framework to support the Law on Energy Savings, and defining minimum energy performance standards (MEPS) for energy efficiency in buildings in line with best international practice. In addition, the IEERB Project also planned stronger engagement of stakeholders through supporting implementation of demonstration energy efficient buildings and disseminating positive information of these EE buildings to raise the confidence of targeted stakeholders.
36. The stakeholder involvement approach in the IEERB ProDoc involves a wide spectrum of stakeholders including:
- the Government of Belarus including the implementing partner, DEE (under the State Committee on Standardization of the Council of Ministers), the Ministry of Architecture and Construction, and the Ministry of Natural Resources and Environmental Protection;
  - state enterprises such as Stroytechnorm and Institute of Housing (NIPTIS) who are responsible for formulating policies;
  - municipal and private engineering and construction enterprises who are responsible for design and construction of energy efficiency in buildings;
  - various universities and educational institutes with building construction faculties to build the capacity of engineers and technicians involved in energy efficiency in building projects throughout Belarus.

In reviewing the intended outcomes of the IEERB Project, this level of stakeholder involvement appears sound.

### **3.1.5 Replication Approach**

37. The Project design envisaged a replication approach by improving and adopting mandatory minimum energy performance standards (MEPS) in the process for approvals of new building construction. Replication would be bolstered through new building designs needing to comply with these mandatory MEPS, increased knowledge of all building practitioners to implement energy efficient

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<sup>8</sup> Government personnel, building owners, engineers and architects of state and private construction companies, and building practitioners from private firms and academia.

designs in residential buildings, and increased confidence of building practitioners to implement energy efficient residential buildings through examples set in completed demonstration EE buildings.

### 3.1.6 UNDP Comparative Advantage

38. UNDP's comparative advantage to other donor agencies is its focus on policy-based and cross-sectoral approaches as well as building local capacities through effective collaboration with a wide range of local stakeholders, ranging from the public and private sectors to technical experts, civil society and grassroots level organizations. These approaches are strongly applicable on energy efficiency projects such as this IEERB Project. In particular, UNDP has carried out over 15 projects related to energy efficiency in buildings in the Europe & CIS region over the past 10 years. Given UNDP's long track record on a wide variety of projects within the energy sector, UNDP is suited as an implementing agency for this Project.

### 3.1.7 Linkages between IEERB Project and Other Interventions within the Sector

39. The IEERB Project was intended to be linked with several completed energy sector related projects by the Government of Belarus with their donor partners including:
- **The UNDP/GEF project “Biomass Energy for Heating and Hot Water Supply”** with an objective to reduce GHG emissions of Belarus by removing barriers to economically feasible wood and wood waste utilization for heat and hot water supply. The project was completed in 2008 with a satisfactory rating;
  - **UNDP/GEF project “Removing the Barriers to Improving Energy Efficiency in the State Sector of Belarus”** with an objective to attract investments in the implementation of energy efficiency activities in the state sector. The project was completed in 2011 with a satisfactory rating;
  - **World Bank Social Infrastructure Retrofitting Project** was approved in 2001. The project aims to improve the social sector facilities with particular emphasis on reducing energy consumption. The project has two main components. The first component supports investment in physical infrastructure. Energy retrofitting measures in schools and medical facilities include building envelope and heating system improvements as well as conversion or replacement of individual autonomous boilers. Rehabilitation of limited parts of the district heating network is also included, when deemed as necessary, to capture savings at the heat production source. Project was completed in 2010 with a satisfactory rating;
  - **World Bank Energy Efficiency Project** was approved in May 2009. The objective of the project is to improve energy efficiency in heat and power generation in selected towns of Belarus. The project has three components: The first component is the conversion of existing heat-only-boiler plants to combined heat and power plants at six sites. The Project has had a satisfactory completion in December 2017.

### 3.1.8 Management Arrangements

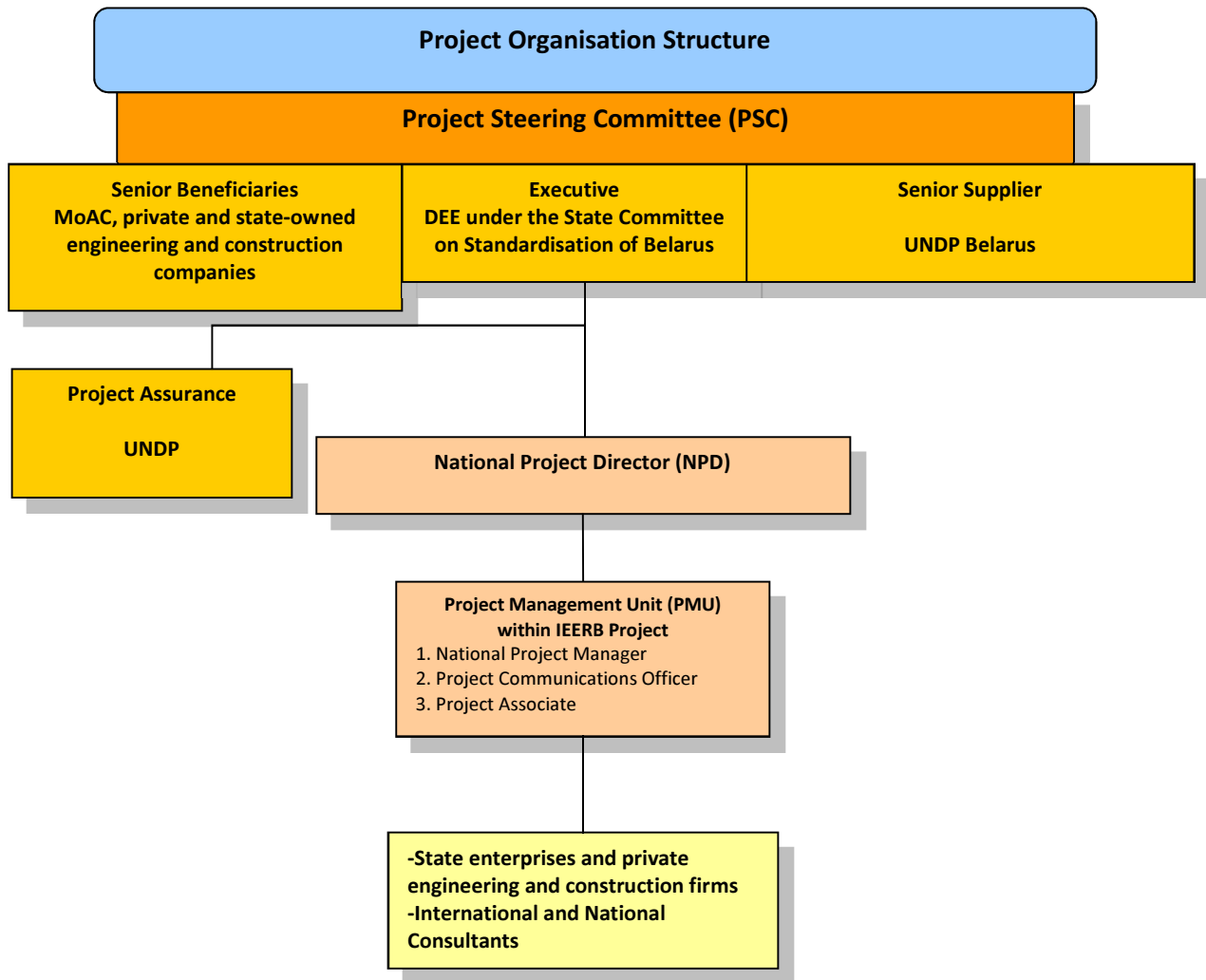
40. The national implementing partner of the IEERB Project is the Department of Energy Efficiency (DEE) under the State Committee on Standardization of Belarus. The IEERB Project was to be implemented in accordance with UNDP's National Implementation Modality (now referred to as National Execution or NEX modality). NEX modality tasks DEE with responsibility for certifying work plans and approved budgets, reporting on procurement, coordinating and tracking co-financing, terms of reference for



contractors and tender documentation, and chairing the Project Steering Committee (PSC). The Chair of the PSC was to be the National Project Director (NPD) from DEE.

41. In the ProDoc, UNDP provides Project implementation support to DEE by managing the budget and project expenditures, contracting project personnel, executing actions for procurement, and implementing the day-to-day management and monitoring of the project operations. An organogram of the IEERB Project implementation arrangements is provided on Figure 2.

**Figure 2: Current Management Arrangements for the UNDP-GEF Project “Improving Energy Efficiency in Residential Buildings” (IEERB)**



### 3.2 Project Implementation

42. The following is a compilation of critical path events and issues of IEERB Project implementation in chronological order:

- The IEERB Project was approved by the GEF CEO on 15 December 2011;

- The Government of Belarus signed the ProDoc on July 31, 2012 and registered it on August 10, 2012 marking the official commencement of the IEERB Project;
- The Project Management Unit (PMU) for the IEERB Project was only established in December 2012. This coincided with the hiring of the first and only National Project Manager for the IEERB Project (17 December 2012), nearly 11 months after the formal start of IEERB according to the ProDoc and 5 months after its official registration by the Belarusian Government on Aug 10, 2012;
- The Project’s Inception Workshop was conducted in June 2013 (three months later than anticipated) due to long-lasting negotiations between the PMU, DEE and the Ministry of Natural Resources and Environmental Protection (MoNREP) to verify and secure MoNREP’s co-financing commitments;
- In November 2013, MoNREP formally withdrew from its co-financing commitments on the IEERB Project;
- A Mid Term Review (MTR) for the IEERB Project was conducted during the September-December 2014 period;
- Support was provided to selected policymakers and building development practitioners for study tours to Austria, Czech Republic, United Kingdom and Germany in 2013-2015;
- During 2014 and 2015, the Project initiated and helped organize a “Technical Committee” to lead development of the Technical Code for Energy Performance of Buildings along with several interrelated standards in support of the TC-EPB’s key provisions. This subsequently led to a draft of the TC-EPB that was approved by the State Standardization Committee (GosStandard) on 21 December 2015, and a recommendation by the GosStandard to the Council of Ministers for full adoption;
- Studies into the construction and designs of the 3 demonstration buildings commenced during 2014 and 2015;
- Since June-July 2016, the Project has been sharing its experiences with UNDP-GEF sister projects in building energy efficiency in Turkmenistan, Kazakhstan and Uzbekistan;
- Approval of an 18-month extension on 10 November 2016 from 31 December 2017 to 30 June 2018;
- By December 2016, demonstration buildings in Mahilioŭ and Minsk were completed;
- By May 2017, demonstration building in Hrodna was completed;
- By early 2016, the Belarusian National Technical University (BNTU) adopted educational materials, tutorials and reference books on building energy efficiency developed by the IEERB Project into their Construction Faculty curriculum;
- During 2013-2017, the Project organized and held more than 100 different informational campaigns (international and national conferences, seminars, roundtables, trainings, press-conferences, etc.).
- Since June 2017, extensive training campaigns started both for residents of the pilot buildings and specialists from the housing and utility companies responsible for operation and maintenance of the buildings.

### 3.2.1 Adaptive Management

43. Adaptive management is discussed in GEF terminal evaluations to gauge performance of project personnel to adapt to changing regulatory and environmental conditions, common occurrences that afflict the majority of GEF projects. Without adaptive management, GEF investments would not be

effective in achieving their intended outcomes, outputs and targets. Examples of adaptive management during implementation of the 5.75-year duration of the IEERB to March 2018 included:

- The PMU needing to accelerate performance of all activities considering the delay from July 2012 to May 2013 to put in place the PMU and to setup activities and consultants for the identification of appropriate consultants and stakeholders for the design and construction of 3 energy efficient pilot buildings to be done under Component 3. Under a compressed timeframe of less than 2 years, the PMU needed to engage local consultants, organize and conduct the necessary training workshops and seminars required to catalyze interest in energy efficiency in buildings, and perform the necessary energy audits to show the opportunities for energy savings that could be realized under Component 3 activities;
- Actions required to identify co-financing with the withdrawal of the Ministry of Natural Resources and Environmental Protection co-financing for a pilot building as of 8 November 2013. Despite the approval of the PSC in April 2014 for the construction of 3 pilot buildings in Hrodna, Minsk and Mahilioŭ, this withdrawal of co-financing affected negotiations with “RUE Mahilioŭ UKS”, a building construction owner that did not yet have a legally binding contract with a building, raising the risk of delays to the completion date of the IEERB Project. The PMU recommended DEE to consider directly contracting NIPTIS, the developer of pilot buildings in Grodno and Minsk. This recommendation was accepted in December 2013 and contributed to reducing the risk of delay and avoid the long international tendering process;
- Inclusion of training of building operators and residents in energy efficient buildings which was not originally envisioned in the ProDoc. Para 77 has more details;
- The inclusion of the Ministry of Housing and Utilities (MoHU) into the list of Project’s key stakeholders that was initiated by PMU through a special PSC meeting and a memorandum duly registered by the Government. Their inclusion, which was not envisioned in the ProDoc, was important since MoHU’s entities have responsibilities over a number of public housing projects as well as the operation of residential buildings. Besides, the MoHU cooperates with Oblast Executive Committees and the Ministry of Economy as to the rationale and setting of heating tariffs. With the emergence of heating tariffs not being amended towards full cost recovery during IEERB implementation, inclusion of MoHU has led to Project discussions on the importance of mitigating this significant risk.
- The inclusion of MoHU also opened doors for a wider training campaign that addressed operation of energy efficient buildings and the procurement, installation and handover of all necessary training models, samples, and simulators to the Housing & Utility Training Centers;
- Development of a communications strategy by the Project’s communication specialist to more effectively disseminate the positive results of IEERB activities. The strategy provided identification of target audiences of the strategy including technical, the public sector, EE building tenants and the general public, and appropriate communications to each target group with the assistance of IEERB technical staff and its experts;
- Adjustments resulting from the IEERB Mid-Term Review (MTR) of December 2014. The PMU provided a Management Response to the MTR, a summary of which is provided on Table 2. In general, the PMU implemented these recommendations to the extent that they were feasible within the time frame of the Project including the 18-month extension.

44. In conclusion, UNDP’s efforts to adaptively manage this Project were sincere and **satisfactory** in consideration of the successful outcomes of this Project.

**Table 2: Management Response of IEERB PMU to MTR Recommendations**

Recommendation	Management Response of April 2015	Evaluation Comment
Because of the delayed start of the implementation of the project the MTE recommends drafting a realistic time planning	Project team to draft a realistic time-frame for project implementation in close consultations with all the key national partners	The PMU did complete this keeping in mind the critical path of the IEERB Project was the implementation of EE demonstration buildings of Outcome 3.
Because of the delayed start of the implementation of the project the MTE recommends to prolong the project for 18 months	Consider a possibility for project no-cost extension	No-cost extension was successfully obtained.
The MTE recommends paying more attention to institutional capacity building of the public authorities to ensure effective enforcement of this regulatory framework	The project team should work closely with national counterparts, particularly with the Energy Efficiency Department and the Ministry of Architecture and Construction to identify capacity building needs and then develop a capacity building plan and follow it.	There was an increase in the number of study tours to allow personnel from DEE and MoAC to observe best international practices for implementing EE buildings.
The MTE recommends paying more attention in the project to energy management. Consideration could be given to transferring the highly successful energy management information system (EMIS) developed by UNDP in Croatia to Belarus	Agree. The project should consider including activities addressing energy management issues into the project scope (if it is feasible), along with considering a possibility of obtaining the EMIS developed by UNDP in Croatia and transferring it to Belarus	PMU were not able to implement this recommendation due to time constraints and late completion of the demonstration buildings. There remains, however, continued interest in EMIS with a recommendation made for its use in monitoring energy consumption in buildings in Belarus.
Although there is no reason to doubt the accuracy of financial reporting by the PMU it would be advisable to have an annual or at least bi-annual financial audit of the project	UNDP actions with respect to auditing its projects are governed by the respective corporate rules and procedures. It should be noted that the approved Project Document provides budget for project financial auditing. A possibility and necessity to conduct an external mid-term project audit should be discusses internally	The ProDoc in its Article 5, “Monitoring Framework & Evaluation” refers to the Inception Stage, which should, inter alia, address some relevant issues as follows: “... d) Discuss financial reporting ... and arrangements for annual audit.” The discussion held under the Inception Seminar’s agenda item “Suggestions for a respective adjustment of Project’s activities based on the inception stage results” did not concern this issue, for there was the general opinion on the fact that the Project was not of pure NIM modality. In line with this decision, neither the 2013 AWP nor future AWPs included such an audit. The MTE Report noticed this and recommended to review the issue again.

### 3.2.2 Partnership Arrangements

45. The National Implementing Partner of the IEERB Project is the Department of Energy Efficiency (DEE) under the State Committee on Standardization of Belarus. The IEERB Project was designed to bring together the appropriate partners to promote and catalyze the interest in energy efficiency in residential buildings in Belarus. With many of these partners already identified in the IEERB ProDoc, Project resources were utilized to define partnership arrangements with these partners to strengthen the regulatory and legal framework for energy efficiency in buildings, build the awareness and technical capacity of these partners, and to collaborate with key partners to plan, design and construct pilot energy efficient buildings under Component 3.
46. In comparison with the partners identified in Para 35-36, the PMU has effectively made partnership arrangements with:
- the Ministry of Architecture and Construction and its various agencies including:
    - Stroytechnorm, a state enterprise who was a key partner in the drafting of new building norms and standards under the Technical Code for Energy Efficient Buildings;
    - The Institute of Housing (NIPTIS) who was principal designer of the entire pilot building in Mahilioŭ and designer of energy efficient equipment for pilot buildings in Minsk and Hrodna, and involved in the formulation of various construction norms and standards;
  - the Ministry of Housing and Utilities and its utility companies in Minsk, Hrodna and Mahilioŭ who were responsible for operation and maintenance of 3 pilot energy efficient buildings under Component 3;
  - Mahilioŭ Oblast Department of Capital Construction who was involved as a developer of the pilot building in Mahilioŭ, thus substituting the Ministry of Natural Resources and Environmental Protection in this capacity after the Ministry has removed from itself obligations to act as a developer;
  - Oblast Executive Committees in Minsk, Hrodna and Mahilioŭ and their departments of housing and communal services who elaborated and supervised implementation of local norms and provisions for utility companies. They also have oversight on heating tariffs as discussed in Para 43;
  - MAPID JSC, a private construction firm who was responsible for design and construction of the energy efficient building in Minsk;
  - GrodnoGrazhdanProject RUE who was a pilot building designer in Hrodna;
  - the Ministry of Environmental Protection and Natural Resources (MoNREP) and its agency “RUE Belarusian Research Centre Ecology” who undertake work and research related to the calculation and reporting of GHG emission reductions from energy efficient buildings in Belarus;
  - entities involved in the training of building technicians and practitioners including:
    - the Construction Faculty of the Belarusian National Technical University (BNTU) in Minsk responsible for the preparation of course materials in building energy efficiency which has been disseminated to other relevant faculties and training institutes throughout Belarus;
    - Oblast training centres in the majority of secondary cities in Belarus (such as Hrodna and Mahilioŭ) to build the capacity of engineers and technicians of utility companies under the MoHU to operate and maintain energy efficient buildings throughout Belarus.
47. Overall efforts by the PMU to forge effective partnership arrangements on the IEERB Project have been **satisfactory**. This includes partnership arrangements with entities with direct responsibility for shaping intended outcomes of the Project including the strengthening of the new construction norms

and standards in Component 1, building the technical capacities of all related stakeholders under Component 2, and the development of 3 pilot energy efficient buildings under Component 3.

### 3.2.3 Feedback from M&E Activities Used for Adaptive Management

48. Feedback for M&E activities was provided primarily through PSC Meeting Minutes (9 PSC meetings from April 2013 to December 2017) and PIRs (from 2014 to 2017) providing details of activities for adaptively managing the Project. This would include sections in the PIRs on “annual project quality assurance assessments” and “critical risk management” where recommendations on managing risks are divided into political, regulatory, organizational, and strategic categories. Strategic risks would include risks with stakeholder engagement of an important stakeholder group such as construction companies or building professionals.
49. The quality of PSC meeting minutes was satisfactory with these reports providing details of structured discussions on the progress of the Project, how to improve implementation performance and reduce risks, and approval of ongoing work plans or changes to these work plans. The Evaluation Team notes that the discussions and adaptive management changes proposed during these meetings were completed with 13 to 20 PSC members in attendance for the 9 PSC meetings.
50. The 4 PIRs produced by the IEERB Project were also sufficiently detailed to provide Project progress against objective level and outcome targets, notwithstanding the issues with the PRF (mainly lack of SMART indicators) which are discussed in Paras 29-31.
51. With the overall outcomes of the Project being satisfactory, the feedback provided by these PIRs to monitor progress towards meeting set PRF targets of the IEERB Project is **satisfactory**.

### 3.2.4 Project Finance

52. The IEERB Project had a GEF budget of USD 4.50 million that was to be fully disbursed over a 6-year duration, managed by the PMU under the direction of DEE. Table 3 reveals very little deviation between the actual outcome expenditures and original ProDoc Outcome expenditures. The only significant deviation would be the actual annual expenditures versus the projected annual expenditures. The information notes that annual expenditures in 2014 and 2015 were only 81% and 76% of projected expenditures while 2016 expenditures were 144% of ProDoc expenditures. This indicates and is confirmed by the Evaluation that implementation of the demonstration buildings under Component 3 was slow in delivery primarily due to late commencement of these buildings in 2014 after MoNREP withdrew its co-financing support of the Project.
53. Project co-financing was US\$15.2 million which is only 55% of the ProDoc estimate of USD 27.70 million. Co-financing details can be found on Table 4. The level of co-financing on the IEERB Project is reflective of the commitments of all stakeholders, of which 76% came from the owners of the demonstration buildings, 10.5% from in-kind contributions from DEE, and the remaining 10.5% from in-kind contributions from other government agencies involved with IEERB (such as oblasts training centres and state enterprises). Though the co-financing for IEERB did not meeting its target, the cost effectiveness of the IEERB Project has been satisfactory in consideration of impacts of the IEERB Project, some of which are significant such as the preparation of the TC-EPB, capacity building of stakeholders, and the completion of 3 demonstration buildings, the details of which are provided Sections 3.3.8 and 3.3.9.

**Table 3: GEF Project Budget and Expenditures for Belarus' IEERB Project (in USD as of 31 March 2018)**

IEERB Outcomes	Budget (from Inception Report)	2012 <sup>21</sup>	2013	2014	2015	2016	2017	2018 <sup>22</sup>	Total Disbursed	Total to be expended in 2018 <sup>23</sup>
OUTCOME 1: Strengthened legal and regulatory framework and mechanisms to enforce the legislation for improving the energy efficiency of the building sector	405,000	0	128,555	200,125	51,753	9,321	6,763		396,517	5,730
OUTCOME 2: Enhanced capacity of the Belarusian specialists to implement and effectively enforce new energy efficiency standards and construction norms with the initial focus on new residential buildings	310,000	0	64,532	130,387	75,851	6,513	11,101		288,384	12,180
OUTCOME 3: Implementation of demonstration projects for energy efficient buildings	3,270,000	0	173,910	326,580	1,326,765	1,131,360	197,853		3,156,468	93,826
OUTCOME 4: Documented, disseminated and institutionalized Project results providing a basis for further replication	290,000	0	48,276	88,283	53,201	29,716	63,447		282,923	46,371
Project Management	225,000	1,739	61,062	61,698	53,905	37,474	6,942		222,820	13,687
<b>Total (Actual)</b>	<b>4,500,000</b>	<b>1,739</b>	<b>476,335</b>	<b>807,073</b>	<b>1,561,475</b>	<b>1,214,384</b>	<b>286,106</b>	<b>0</b>	<b>4,347,111</b>	<b>171,794</b>
Total (Cumulative Actual)	4,500,000	204,000	402,000	998,000	2,054,000	842,000	-	-		
Annual Planned Disbursement (from ProDoc) <sup>24</sup>		1%	118%	81%	76%	144%	-	-		
<b>% Expended of Planned Disbursement</b>		<b>1,739</b>	<b>478,074</b>	<b>1,285,147</b>	<b>2,846,622</b>	<b>4,061,006</b>	<b>4,347,111</b>	<b>4,347,111</b>		

<sup>21</sup> Commencing 31 July 2012 - the Project Document signed by the Government of Belarus on 31 July 2012

<sup>22</sup> Up to 31 March 2018

<sup>23</sup> Up to terminal date of the Project of 30 June 2018

<sup>24</sup> From planned ProDoc disbursements

**Table 4: Co-Financing for Belarus IEERB Project (as of 31 March 2018)**

Co-financing (type/source)	UNDP own financing (million USD)		Government (million USD)		Partner Agency (million USD)		Private Sector (million USD)		Total (million USD)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants <sup>25</sup>	0.400	0.400							0.400	0.400
Loans/Concessions									0.000	0.000
• In-kind support			2.000	1.600	2.300	1.600			4.300	3.200
• Other							23.000	11.627 <sup>26</sup>	23.000	11.627
<b>Totals</b>	0.400	0.400	2.000	1.600	2.300	1.600	23.000	11.627	27.700	15.227

<sup>25</sup> Includes all cash contributions

<sup>26</sup> Cash contribution from MAPID, GrodnoGrazhdanProject, GrodnoZhylStroj, UKS Mahilioŭ



**Table 5: Breakdown of GEF and UNDP Co-financing by ATLAS Budget Lines**

Atlas Budgetary Account Code	ATLAS Budget Description	GEF (US\$)	UNDP (co-financing) (US\$)
71200	International Consultants	324,900	2,178
71300	Local Consultants	342,198	95,496
71400	Contractual services – Individuals	348,652	97,286
71600	Travel	215,171	95,878
72100	Contractual Services – Companies	486,248	30,362
72200	Equipment	755,617	0
72300	Materials & Goods	484,754	0
72400	Communication / Courier Charges	29,431	109
72500	Office Supplies	12,034	0
72700	Hospitality / Catering	0	3,817
72800	Information Technology Equipment	13,578	3,041
73100	Rental & Maintenance – Premises	784	24,579
73200	Construction Services	1,215,334	0
73400	Rental & Maintenance of Other Equipment	1,164	1,823
74200	Audio Visual & Print Prod Costs	85,133	12,858
74500	Miscellaneous	7,913	2,189
75700	Training, Workshops and Conferences	178,764	30,495
76125	Realized Loss	4,848	2
76135	Realized Gain	-6,522	-114
<b>TOTAL</b>		<b>4,500,000</b>	<b>400,000</b>

54. Table 5 provides IEERB Project expenditures during the 6-year implementation period. The breakdown shows 54% of GEF funds were expended on supporting capital costs of the demonstration buildings (as indicated by ATLAS budgetary lines for 72200, 72300 and 73200 which cover construction services and the procurement and installation of energy efficient equipment in the pilot buildings). Roughly 33% of the GEF funds were spent on Project personnel and consultants (as indicated by ATLAS budgetary lines for 71200, 71300, 71400 and 71600); this includes services for the engineering design of the demonstration buildings as well as international consultants. The remaining 13% of the funds for workshops, trainings and conferences, and travel costs to neighboring regional countries. Roughly 5% of GEF funds were for Project Management. Shortfalls in the budgets for consulting time, travel costs to other countries and workshops were made up through UNDP co-financing.

### 3.2.5 M&E Design at Entry and Implementation

55. The M&E design as covered in Section IV (Pgs 29-34) in the IEERB Project ProDoc is robust and thorough. The design thoroughly covers all M&E activities including:

- the Project inception phase;
- monitoring responsibilities and advance;
- monitoring reporting requirements including annual Project reviews and Project implementation reports (APRs/PIRs);
- independent evaluations that includes the Midterm Evaluation as well as the Final Evaluation;
- Project audits; and
- dissemination of Project results to encourage learning and knowledge sharing.

Despite the weaknesses of the PRF (as explained in Para 29), *the M&E design is rated as **satisfactory**.*

56. The M&E plan was executed according to the designed as detailed in Para 55. The Evaluation Team has had access to review a Project Inception phase report, PIRs, MTR, Project audits, PSC meeting minutes, as well as Project logs (for risk, monitoring, lessons and issues). All these files especially the Project logs provide good insights into the management of the IEERB Project in the identification of risk, issues and corresponding management responses. In addition, these Project logs also documented checklists for the M&E plan on a semi-annual basis to ensure compliance with the original M&E plan. With these files having been reviewed by the Evaluation Team, *M&E plan implementation is rated as **satisfactory**.* Ratings according to the GEF Monitoring and Evaluation system<sup>27</sup> are as follows:

- *M&E design at entry - 5;*
- *M&E plan implementation - 5;*
- *Overall quality of M&E - 5.*

### 3.2.6 Performance of Implementing and Executing Entities

57. The performance of the implementing partner, the Department of Energy Efficiency, can be characterized as follows:
- DEE provided an appropriate level of guidance to the PMU with regards to the work required to update the Technical Code for energy efficiency in buildings during the early stages of the Project. This included assistance in sourcing technical specialists for the Technical Committee for Standardization or TCS-14 for preparing the TC-EPB;
  - accelerated the approval of the TC-EPB by involving and informing policy makers of other ministries (such as Ministry of Energy, MoNREP, Ministry of Economy, and MoAC) of the work of the Technical Committee on updating the TC-EPB;
  - support to the PMU to obtain approval for the full adoption of the TC-EPB from the Council of Ministers;

<sup>27</sup> 6 = HS or Highly Satisfactory: There were no shortcomings;

5 = S or Satisfactory: There were minor shortcomings,

4 = MS or Moderately Satisfactory: There were moderate shortcomings;

3 = MU or Moderately Unsatisfactory: There were significant shortcomings;

2 = U or Unsatisfactory: There were major shortcomings;

1 = HU or Highly Unsatisfactory

U/A = Unable to assess

N/A = Not applicable.

- Overall performance is rated as **satisfactory**.

58. The performance of UNDP (the Implementing Agency) can be characterized as follows:

- UNDP’s responsibility for the design of the IEERB Project should have included the sufficient time required for the proper monitoring of energy savings from pilot buildings. From the observations of the TE team, monitoring of energy savings from these buildings was not able to commence upon completion of these buildings due to the normal practice of new tenants not immediately occupying these units (due to the work required to retrofit these units to the liking of the tenants, work that often takes more than 6 months). In addition, full occupancy of the buildings would be necessary for establishing normal energy consumption of these buildings which likely would not occur for 12 months more after the completion of the EE building;
- UNDP support for the early adaptive management measures of the IEERB Project, much of which was required to minimize implementation delays to the Project during its early stages in 2012 and 2013;
- Highly effective PMU engaged in facilitating several effective Project partnerships with key stakeholders with direct impacts on the intended outcomes of the Project;
- Excellent engagement of PMU with design and construction teams of the pilot energy efficient buildings to the extent that these buildings were completed by December 2016 and May 2017;
- UNDP efforts to link with other similar building energy efficiency projects in the region has facilitated knowledge building on energy efficiency in buildings regionally (mainly CIS countries) and raised the profile of the IEERB Project in Belarus and other countries;
- UNDP assistance in providing a communications strategy (identification of targets audiences and scoping communications modalities) to more effectively raise the profile of energy efficiency in residential buildings;
- Overall performance of UNDP on the IEERB Project is rated as **satisfactory**.

59. A summary of ratings of the implementing and executing entities of the IEERB Project are as follows:

- *Implementing Partner (DEE)* – 5;
- *Implementing Entity (UNDP)* – 5;
- *Overall quality of implementation/execution (UNDP/DEE)* – 5.

### 3.3 Project Results

60. This section provides an overview of the overall results of the IEERB Project and assessment of the relevance, effectiveness and efficiency, country ownership, mainstreaming, sustainability, and impact of the IEERB Project. In addition, evaluation ratings for overall results, effectiveness, efficiency and sustainability are also provided against the revised June 2013 PRF (as provided in Appendix G)<sup>28</sup>. For Tables 6, 8, 9, 10 and 11, the “status of target achieved” is color-coded according to the following color coding scheme:

Green: Completed, indicator shows successful achievements	Yellow: Indicator shows expected completion by the EOP	Red: Indicator shows poor achievement – unlikely to be completed by Project closure
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<sup>28</sup> Evaluation ratings are on a scale of 1 to 6 as defined in Footnote 27.

### 3.3.1 Overall Results

61. A summary of the achievements of IEERB Project at the Project Objective level with evaluation ratings are provided on Table 6.
62. Progress towards the target of 80 multistory residential buildings that have integrated new EE measures into their design did not commence until substantial progress was made by 2014 in the preparation of the “Technical Code for Energy Performance of Buildings” or TC-EPB within Outcome 1, which is explained in detail in Section 3.3.2. To date, the State Standardization Committee and its Principal Department of State Expertise in Construction report that there are over 87 buildings (520,000 m<sup>2</sup>) that have been designed to consume less than 30 kWh/m<sup>2</sup> annually for heating (from a baseline of 60 kWh/m<sup>2</sup> annually that is the current energy performance of most of the buildings and corresponding to the currently valid standards until the TC-EPB is adopted).
63. GHG emission reduction estimates against the targets of 80 buildings and 220,000 tonnes of CO<sub>2</sub> (lifetime) of emission reductions were calculated:
  - from energy audits of expected energy savings from 87 buildings<sup>29</sup> totaling 520,000 m<sup>2</sup> developed by several companies (such as “10-UNR-Invest” JSC, Saint-Gobain Construction Product BelRus and “Magistr” JSC) with some of energy efficiency improvement measures that were advocated by the Project to help improve the energy performance of buildings from class B to classes A and A+ (such as the forced ventilation with exhaust air heat recuperation, solar heaters, automatic regulation and dispatching of thermal energy consumption). These design features were included for reducing annual SEC for HVAC systems to comply with Amendment #3 to Technical Standard No. 45-2.04-196-2010 enforced since October 1, 2015. Detailed calculation of the estimated 706,200 tons CO<sub>2</sub> emission reductions using the GEF EE Tool is provided in Appendix E. The number of EE buildings constructed during IEERB implementation are shown on Table 7;
  - by including the expected energy consumption of the 3 pilot buildings in Mahilioŭ, Minsk, and Hrodna (under Outcome 3) within the 87 completed buildings where space heating is 25, 25 and 15 kWh/m<sup>2</sup> respectively and for hot water supply is 20, 40 and 30 kWh/m<sup>2</sup> respectively, totaling 45, 65 and 45 kWh/m<sup>2</sup> for these pilot buildings. Baseline values for heating and hot water supply were assumed to be 40-50 and 80-90 kWh/m<sup>2</sup> respectively on which GHG emission reductions were calculated. Assuming a 30-year lifetime of the pilot buildings, a lifetime GHG emission reductions from these 3 demonstration buildings was estimated to be 24,100 tonnes CO<sub>2</sub>.
64. For these reasons and the Project having met its objective level targets, the evaluation has determined that the rating for objective level achievements of IEERB is **highly satisfactory**. While these targets are based on the assumption of submitted design documentation of the EE buildings, the Project has not yet had an opportunity to develop large monitoring data sets for actual specific thermal energy consumption of these EE buildings through direct energy monitoring consumption. This is further discussed in Para 88. GHG emission reductions estimated for the Project are summarized on the GEF Tracking Tool as provided in Appendix F.

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<sup>29</sup> As officially reported by the State Construction Expertise through the Energy Efficiency Department.

**Table 6: Project-level achievements against IEERB Project targets**

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating <sup>30</sup>
<b>Project objective: To reduce the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings.</b>	Number of buildings designed and constructed in accordance with the new energy efficiency standards	0	At least 10% (around 80 buildings) of all new residential multi-storey buildings, for which the design is started during the last year of the Project are integrating new EE measures into their design with the target of reducing their combined, annual energy demand for space heating and hot water below 60 kWh/m <sup>2</sup>	87 buildings completed with energy audits indicating energy consumption to be less than 60 kWh/m <sup>2</sup> for hot water and heating (A and A+ ratings).	See Paras 62-63	6
	Amount of reduced CO <sub>2</sub> emissions compared to the projected baseline	0	“Lifetime” reduction of 220,000 tons of CO <sub>2eq</sub> resulting from the energy saving in buildings, for which the construction has started or which have adopted into their design new energy efficiency elements that reduce the energy consumption for heating and hot water in residential buildings below the current thermal standards in force	706,200 tons of CO <sub>2eq</sub>	See Paras 63-64	6
<b>Overall Rating – Project-Level Targets</b>						<b>6</b>

**Table 7: Number of energy efficient buildings constructed during IEERB Project implementation<sup>31</sup>**

Year	Class A	Class A+	Total	% of total residential houses
2013	5	0	5	1.1
2014 <sup>32</sup>	35	5	40	7.3
2015	9	9	18	3.6
2016	5	18	23	5.8
2017	1	0	1	0.3
<b>Total</b>	<b>55</b>	<b>32</b>	<b>87</b>	<b>3.2</b>

### 3.3.2 Outcome 1: Strengthened legal and regulatory framework and mechanisms to enforce legislation for improving energy efficiency of building sector

65. To achieve Outcome 1, Project resources would be used to:

- develop for adoption an endorsed methodology for building energy performance monitoring in line with EN and other applicable international standards (Output 1.1);
- complete at least 50 completed energy audits providing information on factual energy consumption and energy balance of different type of existing residential buildings of different age and using different construction techniques (Output 1.2);

<sup>30</sup> Ibid 27

<sup>31</sup> These are buildings that comply with Amendment #3 to Technical Standard No. 45-2.04-196-2010 where Class A+: <24 kWh/m<sup>2</sup>, Class A: 24-30 kWh/m<sup>2</sup>, and Class B: 30-48 kWh/m<sup>2</sup>. The design of these energy efficient multi-storey residential buildings to the standard of Classes A and A+ were a result of the capacity building efforts under Outcome 2 involving seminars and workshops on technical designs in engineering solutions for energy efficient buildings.

<sup>32</sup> Received retroactive certification to Amendment #3.

- complete a review and cost-efficiency analysis of different technical options to improve building energy efficiency and the use of renewable energy sources, including an analysis of the cost-efficiency of different heat supply and distribution methods to serve low or close to zero-energy buildings (Output 1.3);
- complete an analysis of the possibility of using different heat supply systems typically used in Belarus, including centralized heating systems, in particular, radiator systems connected to district heating and water heating systems for designing and construction of new efficient buildings with recommendations for future development prepared (Output 1.4);
- prepare a finalized draft (with agreement from all stakeholders) of new national functional energy performance-based norms and standards for newly constructed buildings, and buildings subjected to a major renovation for primary use in residential buildings (Output 1.5);
- elaborate on practical procedures for the establishment of a mandatory system of EE certification of buildings that is adopted by the Government of Belarus, including issuing of EE passports and an established system of monitoring and compliance checking with set norms (Output 1.6); and
- further develop quality standards and a system of EE certification for the construction materials, equipment and accessories used in the construction sector that are adopted by all stakeholders (Output 1.7).

A summary of the actual achievements of the Outcome 1 with evaluation ratings are provided on Table 8.

66. The baseline of this activity were ongoing efforts to develop the *TC-EPB* which resulted in slow adoption of any proposed revisions on construction norms related to minimum energy performance standards (MEPS) for buildings by the Government. In April 2013, the GoB adopted the State Housing Policy Concept (to 2016) stipulating newly constructed residential buildings to be in line with improved energy performance standards. The timing of the Project was excellent in providing incremental assistance through the formation of a technical committee with international advisors to accelerate the development of a Technical Code to serve as a key legal framework to enforce MEPS that improve energy efficiency of new buildings.
67. The thrust of the development of the TC-EPB was its harmonization with EU Directive 2010/31/EU concerning energy performance of residential buildings. The Project engaged "RUE StroyTechNorm" (STN) who assembled the Technical Committee on Standardization in the Field of Architecture & Construction (TCS-14) in 2014 to lead the development of the TC-EPB; the Technical Committee consisted of 20 members (including four Project's experts) from various entities throughout Belarus including those working under an Energy Efficiency Committee within DEE. TCS-14 with the assistance of Project resources undertook a number of activities to develop the TC-EPB including:
  - a critical analysis of methodologies and practices established in EU and in Belarus in 2013 and 2014. This analysis revealed a high level of harmonization of these methodologies and practices between national standards and the corresponding EU Directive 2010/31/EU, notwithstanding that the national regulations were still missing important provisions for minimum energy performance and the measurement and verification of integral energy performance of different types of residential buildings;

**Table 8: Outcome 1 achievements against targets**

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating <sup>33</sup>
<b>Outcome 1: Strengthened legal and regulatory framework and mechanisms to enforce the legislation for improving the energy efficiency of the building sector</b>	Status of the national laws and other regulatory documents controlling the energy consumption of the newly constructed buildings	Prescriptive thermal standards adopted in 2010 defining minimum mandatory U-values for the building envelope, corresponding to the average annual heat demand of 60 kWh/m <sup>2</sup> for space heating of typical multi-apartment buildings and 120-130 kWh/m <sup>2</sup> together with sanitary hot water preparation	Revised minimum energy performance standards adopted for new construction and reaching a status of a law by the end of the Project with a target of reducing the energy consumption of new residential buildings for space heating and hot water together below 60 kWh/m <sup>2</sup> .	<i>The Technical Code for “Energy Performance of Buildings” (TC-EPB) containing MEPS for new building construction has been with the Council of Ministers since late 2016 for signing as a law specifying energy consumption of new residential buildings for space heating and hot water together below 60 kWh/m<sup>2</sup>. The MEPS under the TC-EPB is mandatory. As of 12 June 2018, the TC-EPB was given No.28 as a Governmental Decree pending final signature of the Prime-Minister.</i>	See Paras 66-67	5
			An energy performance certification and labelling scheme for both new and existing buildings adopted and under implementation by the end of the Project	<i>The TC-EPB also contains an energy performance and labelling scheme. The TC-EPB is currently undergoing final legal procedures as law (see above).</i>	See Para 67-68	5
<b>Overall Rating – Component 1</b>						<b>5</b>

<sup>33</sup> Ibid 27

- developing of a roadmap for the upgraded TC-EPB including recommendations to strengthen relevant legal and regulatory framework (supported by MoAC and Gosstandart) for integration into the National Standardization Plan of Belarus;
- collection and analysis of available data on different construction techniques and materials, design arrangements of heat supply and distribution schemes, and renewable energy systems with cost-efficiency analyses to improve energy efficiency of various types of residential buildings. The resulting report and recommendations were used to develop the pilot buildings under Outcome 3;
- providing additional new standards for the TC-EPB including corresponding amendments to existing standards (such as to GOST EN 15217-2007, STB EN 15603, STB ISO 6242-1-20, TKP 45-2.04-43-2006, TKP 45-2.04-196-2010)<sup>34</sup>;
- preparing methodology guidelines based on the IPMV protocol (in line with the best international practice) and adapted to Belarusian conditions for energy auditing, energy performance monitoring and calculations applicable to different types of multi-storey residential buildings<sup>35</sup>. These methodologies were used as a basis for carrying out of 55 energy audits of multi-storey residential buildings in 2013-2015 (see Para 75 for more details), the experience of which was disseminated during training workshops for 70 professional energy auditors in 2013 and 2014;
- developing an energy efficiency certification system and a system of monitoring and compliance checking applicable to residential buildings in late 2014 with the assistance of international and national consultants;
- support for 2 round-table sessions for relevant stakeholders where main principles and framework of the certification system were discussed, leading to the development of a “Building Energy Passport” that includes energy efficiency rating of building’s HVAC system. The Passport was to serve as an integral part of approved design and construction documentation that would contain all major requirements for certifying energy performance of a building;
- drafting of the TC-EPB as a regulatory enactment that contains, inter alia, the minimum building energy performance (MBEP) requirements, and corresponding provisions for energy certification and compliance checking systems and energy audit. This was approved by TCS-14 and incorporated in 2015 into the State List of Technical Norms & Standards Pending Adoption in the Field of Energy Saving for 2011-2015 (as amended №1, №2, №3) and Amendment No.1 to the State Standardization Plan of the Republic of Belarus for 2014-2015;
- revision of some of core standards integral to the TC-EPB leading to its adoption and approval by GosStandard as of 21 December 2015<sup>36</sup>;
- assisting DEE since late 2016 to obtain approval of the TC-EPB of a number of ministries as a legal act, which has been successfully passed national conciliation procedures and forwarded to the Council of Ministers for final adoption. As of May 2018, this process was nearing completion with possible completion within 2018, and is an excellent accomplishment by the IEERB Project.

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<sup>34</sup> This would include “Method of calculation of specific heat consumption for heating and ventilation in residential buildings”; “Energy performance of buildings - Assessment of overall energy consumption and energy performance of buildings”; “Energy efficiency of buildings - Methods for determination of energy efficiency and energy certification buildings ”; and amendments to “Thermal protection of buildings. Energy performance characteristics. Rules of definition”.

<sup>35</sup> To validate the guidelines and build capacity for project partners, IEERB Project supported an energy audit of 5 multi-storey houses built by these partners.

<sup>36</sup> Such as STB 2409-2015; amendments to STB EN 15603-2014; STB EN 15316-4-2015 (eight parts); amendments to STB EN 15217-2014; amendments to TCP 45-2.04-196-2010



68. Adoption of the TC-EPB and its standards, however, was initially not embraced by the construction industry in Belarus in 2016. Feasibility of the required measures was questioned along with the preliminary cost-effectiveness analyses of different technical solutions to improve energy efficiency of buildings. *Project-supported analysis in 2017 has demonstrated that under the existing tariff regime where heating tariffs are too low, there was and currently is a lack of incentives both for developers and households to build and operate buildings with energy efficient heating and hot water systems.* Notwithstanding the work of TCS-14 to justify the feasibility of the EE designs of the Outcome 3 demonstration projects and its benchmarking against EU experience as best practice to local developers and builders, this discussion has only raised the importance of monitoring and reporting the energy consumption of the demonstration buildings under Outcome 3. This information could then inform revised tariff policies for heating and hot water. This is further discussed in Paras 102, 105 and 112.
69. In conclusion, the results of Outcome 1 are rated as **satisfactory** with the following rationale:
- The completion of the development of MBEP standards, specifically for energy efficiency for heating and hot water in new buildings that are now mandatory;
  - The development and completion of an energy audit methodology for assessing building energy efficiency for heating and hot water;
  - The completion and use of a certification scheme for EE buildings, both of which have been included in the TC-EPB;
  - Review of the TC-EPB by the Council of Ministers and the Ministry of Justice for promulgation likely in June 2018; and
  - Lack of incentives for the construction industry to install costly energy efficient heating and hot water systems due to existing heating tariffs, which prolong cost recovery periods of the investments.

### **3.3.3 Outcome 2: Enhanced expert capacity of the Belarusian specialists to implement new energy efficiency standards and construction norms**

70. To achieve Outcome 2, Project resources would be utilized to:
- develop and publish different target groups' technical guides, handbooks and other related training materials on energy efficiency design and construction of new buildings, materials that would be used for introducing new construction norms and disseminated through an internet-based energy platform and the Project's website (Output 2.1);
  - develop new courses on integrated building design and building energy efficiency to be included into the curricula of universities educating architects and building engineers, and with at least 200 students having passed new courses by the end of the Project (Output 2.2);
  - train at least 50 experts from different state and municipal administrative bodies (who deal with construction policies, norms and standards) on the most recent international developments, practices and international experience learnt on building energy efficiency and environmentally sustainable construction (Output 2.3);
  - train at least 50 architects and construction engineers from the leading architectural-construction institutes (Output 2.4) on:

- the most recent international developments in the area of energy efficient buildings; technical and managerial aspects;
- integrated energy efficient building design principles and techniques;
- practical aspects of designing buildings when moving from prescriptive to functional construction norms in the energy saving sphere;
- possible technical solutions and principles of cost-effective design for optimizing building energy performance; and
- presentation of the available, state-of-the-art software to support integrated, energy efficient building design and training for its use;
- train at least 50 construction inspectors from Regional and District centers on methodologies for assessing building energy performance and the correct installation of the materials and equipment used (Output 2.5);
- train least 50 mid-level supervisors of the construction companies on correct installation of materials and equipment, and provide other advice for private construction companies on how to integrate elements of energy-efficient design throughout the project cycle from the design of buildings to their construction and operation (Output 2.6);
- deliver a 2-week training seminar to 25 people including professional designers, representatives of the state expertise and building supervision to familiarize them with the experiences of energy-efficient building design (including visiting the facilities), and organization of state supervision from EU countries including the role of municipal authorities (Output 2.7); and
- deliver other trainings and information meetings to facilitate exchange of experience and knowledge based on co-operation with other international initiatives promoting energy efficient and environmentally sustainable building construction (Output 2.8).

A summary of the actual achievements of Outcome 2 with evaluation ratings are provided on Table 9.

71. The baseline scenario of the Project was only 3 out of more than 120 design institutes in Belarus using a new design approach to energy efficiency for buildings, with little to no dissemination of this new approach beyond the local design institutes of NIPTIS, MAPID and Grodnograzhdanproekt. Prior to training being delivered (around June 2014), the Project had completed:
- an analysis of target groups along with assessment of needs in their capacity building (following meetings with Energy Efficiency Department and round-table discussions on a capacity building action plan for 2014-2015);
  - 15 special technical reports and guidelines on energy efficiency design principles for dissemination to various training and academic institutes (as a part of Output 2.1). This included important issues such as cost efficiency analysis of different technical options applicable to the development of energy efficient residential buildings and development of designs for the pilot buildings of Outcome 3;
  - analysis of curricula of different relevant universities and proposals to improve the curricula to address building energy efficiency through suggested university courses;
  - drafting of recommendations for updating relevant university curricular as approved at a round table with 60 stakeholders; and
  - a draft of the proposed syllabus to the boards of universities for their adoption.

**Table 9: Outcome 2 achievements against targets**

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating <sup>37</sup>
<b>Outcome 2: Enhanced expert capacity of the Belarusian specialists to implement new energy efficiency standards and construction norms</b>	Demonstrated capacity of the Belarusian building sector specialists to integrate new EE approaches and measures into the design of the buildings and to implement them in the construction sector	Non-integrated design of the buildings just complying with the current prescriptive thermal standards in force.	Integrated, energy efficient building design approach together with buildings' overall energy performance based design principles adopted into the work of at least 30% of all local design institutes as well as into the curricula of all educational institutes in Belarus educating new architects and building construction and HVAC engineers.	<i>13% of all design institutes as of June 2017</i>	See Paras 71-74	5
		Lack of capacity of the public authorities to effectively supervise and enforce implementation of the planned new, overall energy performance based norms and standards.	By the end of the Project, at least 50 experts from each key professional group and 200 university students have taken and successfully passed courses on energy efficient building design and construction. Key public authorities responsible for supervision and enforcement of the planned new norms and regulations trained.	<i>More than 100 experts from construction companies and the engineering profession as well as over 500 university students have taken courses on EE building design and construction.</i>	See Para 75-78	6
<b>Overall Rating – Component 2</b>						<b>6</b>

<sup>37</sup> Ibid 27

72. The Project supported the training for a wide spectrum of building professionals that commenced with the preparation of appropriate training materials in 2013 and 2014. Project consultants prepared 250 technical reports of high quality for introducing new principles into design and construction of energy efficient housing as delivery of Outputs 2.1. Many of these reports have been adopted by academic institutes such as the Construction Faculty of BNTU in Minsk. Dissemination of these materials were supplemented by presentations, lectures, leaflets, brochures and guidelines through numerous 6-day training sessions in Minsk and Hrodna, dedicated to construction policies, norms and standards, recent international developments, integrated energy efficient building design principles and techniques, available technical options and correct installation of the materials and equipment used, and methodologies for assessing energy performance.
73. By 2014, the 3 new courses related to best international and national practice in the field of design and construction of energy efficient residential buildings were presented by the Project through meetings and round-table discussions with 14 faculties of 7 universities, 3 national universities. The outcome of these meetings was agreement for inclusion of these new courses in their syllabi, serving as a deliverable of Output 2.2. In June 2017, the Belarusian National Technical University (BNTU) incorporated 16 tutorials and reference books developed by the Project into the curriculum of their Construction Faculty that provides up to 90 hours of lectures for 540 students within 5 specialized construction fields.
74. As a part of the delivery of Outputs 2.3 and 2.4, a training campaign from 2014 to 2016 was attended by over 30 construction companies with more than 70 specialists and decision-makers attending these sessions. Attendees also received certificates for the completion of these training sessions from DEE. As a part of Output 2.5, more than 50 representatives of construction companies had passed practical courses by late 2016, coupled with actual visits to become familiar with the energy efficient engineering systems being installed in three demonstration buildings in Mahilioŭ, Minsk and Hrodna. By June 2017, there were already 16 local design organizations<sup>38</sup> out of 120 design institutes that are incorporating energy efficiency improvements as developed and advocated by the Project into the design and construction of residential buildings. This is a good indicator of the gradual adoption of energy efficiency improvements for housing construction practices.
75. A common theme for the trainings delivered by Outputs 2.5 and 2.6 was energy auditing of buildings. By November 2016, detailed energy audits were completed for 55 multi-storey residential buildings of different type and age. The collective conclusion of these audits were that multi-storey residential buildings in Belarus have an average annual energy consumption of 170 kWh/m<sup>2</sup> of thermal energy for HVAC and hot water. This report with its recommendations to improve energy efficiency of the monitored buildings was distributed to 70 professionals who attended five 2-day training workshops on energy audits of residential building. These workshops focused on methodology guidelines for energy audit, energy performance monitoring and calculation as applicable to residential buildings and based on the results of actual energy audits of the 55 buildings conducted by the Project between 2014 and 2016. A follow-up survey by the Project indicated that more than 35% of trainees became involved and performed energy audit of residential buildings in practice.

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<sup>38</sup> Includes "Stroykurs" LLC, "Head Specialized Design Bureau for a Complex of Equipment for Microclimate" LLC, "SRC Magister" LLC, PE "Energeo" JSC, "Light Solutions" LLC, "Inspectsproject" LLC, "MBA GARANT group" LLC.

76. To enhance the delivery of Outputs 2.7 and 2.8, the Project provided support and organized logistics for 58 decision-makers, designers, builders and other relevant specialists for their participation on 8 study visits to five European countries (Germany, Austria, Czech Republic, England and France)<sup>39</sup> and 16 international events abroad on best practice for energy efficient residential buildings design, construction and operation as well as legal framework, standards and policies. Some of these visits and events included:
- 3 attendees from NIPTIS and MoAC who took part in 2 Annual International Conferences on Passive Houses in Germany in 2015 and 2016;
  - 5 DEE representatives took part in annual UNECE sessions in Geneva from 2013 to 2018;
  - the first study tour for 9 professionals and officials in September 2013 to Germany focusing on construction of residential buildings;
  - two 5-day study tours to the United Kingdom concurrent with EcoBuild Forums during 3-7 March 2014 and 2-6 March 2015 for 13 professionals and officials with a focus on policies and standards, and as well as on advanced principles in design, construction and operation of energy efficient buildings;
  - three 5-day study tours to Austria in between 2012 and 2014 for 30 decision-makers and relevant specialists to study design, construction and operation practices as well as with legal framework, standards and policies in the energy efficiency and energy saving in the residential sector.
77. By late 2016, the Project was also supporting as part of the delivery of Output 2.8 attendance of DEE officials and specialists trained by the Project to higher profile events and initiatives including:
- The ENES-2016 Forum in Russian Federation for persons including decision-makers and a technical specialist. The Forum was an opportunity for the Project to share their experiences on best practices in energy efficiency and environmentally sound construction and operation of buildings with their foreign colleagues;
  - the Conferences of the Parties to the UNFCCC in Paris in December 2015 and in Marrakech in November 2016 for one expert as a response from requests from the MoNREP and Ministry of Foreign Affairs for participation. Project experts provided background information for the official delegation before and during the Conferences to formulate and specify country positions; and
  - South-South cooperation with the UNDP projects dedicated to improvement of energy efficiency of residential buildings in Turkmenistan, Kazakhstan and Uzbekistan. The Project organized a series of activities in July 2016 that included visits to the pilot project sites, as well as to house-building factories in Minsk, Mahilioŭ and Hrodna. Twelve experts from these projects and representatives of governmental agencies of these countries took part in these activities and received additional and detailed information about energy efficiency improvement measures, practices and regulation exercised in Belarus.
78. As an adaptive management measure as mentioned in Para 43, the Project in early 2017 commenced a new series of trainings for professionals from construction companies, housing operation entities and utilities as well as for tenants with practical courses at the project pilot sites in Minsk, Mahilioŭ and Hrodna. In May 2017, three training sessions were held for tenants in the demonstration

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<sup>39</sup> Some of the study tours were co-financed by host parties totalling close to US\$105,000. This would include IWO e.V., Germany, Sep 2-7, 2013; Austrian Energy Agency, Austria, Dec 2-5, 2013, March 26-28, 2014, Sep 08-11, 2014; Czech Trust Fund, Czech Republic, Nov 22-28, 2015.

residential buildings in Minsk, Hrodna and Mahilioŭ. During the heating season of 2017-2018, four 1-day training workshops with on-site practical exercises were conducted for 50 specialists of municipal services responsible for operation of the pilot residential buildings in Hrodna and Mahilioŭ.

79. An important outcome from these activities is the improved capacity of the construction industry and the engineering profession in Belarus to plan, design and implement energy efficient building according to the standards set in the TC-EPB. With regards to the 87 new buildings that comply with the TC-EPB as reported by the Principal Department of State Expertise in Construction (mentioned in Paras 62, 63 and 87), not all of these energy efficient buildings inherited all aspects of the EE designs from the Outcome 3 demonstration building designs. Notwithstanding, the Project has made a significant contribution to the capacities of building sector personnel to be able to implement an A/A+ class building, an improvement from the B and C classes. These building developers are incorporating a range of improvements such as automatic regulation and dispatching of thermal energy, and special designs for building envelope that use heat recuperation, solar collectors, and small compact ventilators with heat recovery. None of them, however, have designed a residential building with heat pumps.
80. In conclusion, the results of Outcome 2 can be rated **highly satisfactory** due to:
- the PMU effectively engaging the appropriate stakeholders in Belarus to advance activities of the Project to achieve desired outcomes and objective; and
  - catalysing interest amongst a wide range of stakeholder on energy efficiency in buildings.

### 3.3.4 Outcome 3: Implementation of demonstration projects for energy efficient buildings

81. To achieve Outcome 3, Project resources would be utilized to:
- finalize design of the demo buildings by applying integrated building design principles and incorporating new technologies and approaches for meeting the HVAC needs of those buildings in a most energy and cost-efficient way (Output 3.1);
  - provide oversight in the completion of construction of the demo buildings by ensuring that construction and equipment installation are completed in accordance with the adopted standards and guidelines (Output 3.2);
  - prepare a monitoring report on the progress of construction of three demonstration buildings, documenting costs, experiences gained and lessons learnt from procuring, installing and testing the new energy efficient materials, and new construction techniques and appliances, as well as documenting the experiences and lessons learnt from procuring, installing and testing the new energy efficient materials, construction techniques and appliances (Output 3.3);
  - prepare a monitoring report on the energy performance of the demonstration buildings, documenting the actual energy and financial savings and GHG emission reductions, and documenting the actual energy and financial savings and GHG emission reduction from each building as a whole and from each specific energy efficiency measure and appliance tested (Output 3.4);
  - conduct at least 30 private showings of the new buildings organized for architects, designers and other responsible decision-makers, including half-day training sessions with an objective to promote the solutions adopted for the demonstration projects and buildings (Output 3.5).

A summary of the actual achievements of Outcome 3 with evaluation ratings are provided on Table 10.

82. Prior to the commencement of Component 3, there were no energy efficient residential buildings with comparable energy performance in Belarus that could be monitored and used to inform policy for energy efficient buildings, and which could be used to demonstrate to the public and relevant building stakeholders the potential and feasibility of energy efficiency improvement measures in residential buildings.
83. By the end of 2013, sites of the 3 pilot buildings with energy efficient heating and hot water systems were finalized with NIPTIS serving as the designer of these systems for all 3 demonstration buildings located in:
- Grodno for a 10-storey house where the general designer is RUE "Grodnograzhdanproyekt Institute" and the builder is "GrodnoZhylStroy" JSC;
  - Mahilioŭ for a 10-storey building<sup>40</sup> where the general designer is NIPTIS and the builder is "UKS Mahilioŭ"; and
  - Minsk for a 19-floor building where the general designer and builder is JSC MAPID.
84. During 2014, design studies for these 3 demonstration buildings were completed by Project's experts and NIPTIS as delivery of Output 3.1 that included:
- Optimization of the architectural design of the building (including the shape, orientation, and placing of windows) through the inclusion of energy efficient equipment and increasing use of renewable energy resources;
  - Improved thermal insulation of the building envelope in accordance with the most recent norms and requirements that are or will be adopted in EU countries with the climatic conditions similar to Belarus and by optimizing required thermal retention values of each building component by integrating cost and energy consumption considerations of the entire building;
  - Forced ventilation with heat recovery up to 80% from the exhaust air for each of the buildings;
  - Heat recovery from wastewater to be used for preheating of sanitary hot water for each of the buildings;
  - Solar water heaters to provide thermal energy for HVAC system and sanitary hot water for building in Mahilioŭ;
  - Heat pumps that utilize ground heat through foundation piles and utilize heat from district sewage collector for building in Hrodna;
  - Solar PV-panels to reduce electricity consumption of the heat pumps in Hrodna;
  - Real time and remote monitoring and regulation of heat and hot water consumption; and
  - Dispatcher system for energy consumption data.

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<sup>40</sup> This building was a replacement for the building MoNREP was to co-finance with "RUE Mahilioŭ UKS" serving as the building construction owner. See para 43 for details.

**Table 10: Outcome 3 achievements against targets**

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating <sup>41</sup>
<b>Outcome 3: Implementation of demonstration projects for energy efficient buildings</b>	Status of the demonstration projects	N/A	Each of the 3 demonstration buildings constructed on schedule.	<i>All 3 demonstration buildings were completed by May 2017. No schedule was specified in the ProDoc.</i>	See Para 86	5
			For each of the 3 constructed demonstration buildings, annual total external energy demand for space heating and hot water equaled or was less than 60 kWh/m <sup>2</sup> .	<i>Design documentation for the 3 pilot buildings was approved with space heating and hot water specific energy consumption being less than 60 kWh/m<sup>2</sup>.</i>	See Paras 83-84	5
			Energy consumption for each of the 3 buildings and also other performance indicators (living comfort etc.) monitored for at least one full year.	<i>Energy consumption for each of the 3 pilot buildings has been monitored already one full year. However, information on actual energy consumption is not reflective of normal energy consumption since there is about 42% occupancy of all units in all 3 pilot buildings.</i>	See Paras 87 and 88	4
			The baseline cost for designing and construction of the 3 demonstration buildings is covered in full by the Project's co-financing resources of developers and additional GEF financing for designing and construction of demo buildings was not in excess of 15% of the total construction costs of each demo building	<i>Cost of the design and construction of the 3 pilot buildings has been covered through co-financing from Project partners and from GEF financing (consisting of around 17% of the total capital cost of each pilot building)</i>	See Para 85	5
<b>Overall Rating – Component 3</b>						<b>5</b>

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<sup>41</sup> Ibid 27



85. The outcome of these design studies led to the installation of the most cost-effective energy efficient solutions based on integrated building design principles and renewable energy technologies that minimize heat and power consumption of the buildings at least by a minimum factor of 2. Design documentation for the above principals and technologies for all 3 pilot buildings was completed by NIPTIS in mid-2015 and submitted to the State Expert Appraisal Committee under MoAC in October 2015 for approval to construct. This included construction documentation for the installation of energy efficient equipment, general provisions and instructions for construction techniques, building operation and maintenance works of the pilot buildings. Approval for construction was received in June 2016. One issue that did arise for these buildings was RUE “GrodnoGrazhdanProject” informing the PMU in 2015 that they will not be able to provide further sustainable financing of the demonstration building in Hrodna. The PMU and UNDP CO have, in cooperation with the Head of EE Department, approached the Grodno authorities to recruit “GrodnoZhylStroi” JSC to take over this demonstration project.
86. Project resources were used to cover the cost of additional energy efficiency measures estimated to be around 17% of the total capital cost of these buildings. Project partners provided the necessary technical supervision during the construction of the building envelope and installation of the energy efficient equipment by subcontractors. Technical supervision reports as a part of the delivery of Output 3.2 were generated during this period including information on necessary adjustments to ensure proper installation of equipment that would perform to the intended standards and guidelines in the design documentation. Construction completion dates of the demonstration buildings were 14 December 2016 for Mahilioŭ, 26 January 2017 for Minsk and 20 May 2017 for Hrodna. Energy efficiency features of each demonstration building consisted of supplementing heat supplies from district CHP plants with heat from:
- recovery of wastewater heat in each building using heat exchangers to supplement energy for heating and hot water;
  - mechanical heating and ventilation system for each residential unit with a system to recover heat from air exhaust from each unit;
  - heat pumps for the demonstration building in Hrodna that were integrated with the foundation piles including 32 heat exchangers and thermal probes and the recovery of heat from a district sewage pipe;
  - PV-panels on the south façade and roof to generate grid electricity in pilot building in Hrodna which is to be sold to the grid and reduce electricity costs to the building tenants;
  - solar collectors using heated glycol that supplements heat both for HVAC system and for the hot water supply system in the Mahilioŭ demonstration building.
87. The resulting energy performance of these buildings for space heating and hot water supply was to be equal or less than 60 kWh/m<sup>2</sup>/yr according to design documents. Specific thermal energy consumption for the Mahilioŭ, Minsk and Hrodna pilot buildings was estimated as 25, 25 and 15 kWh/m<sup>2</sup>/yr respectively for space heating, and 20, 40 and 30 kWh/m<sup>2</sup>/yr, respectively for hot water supply. A monitoring report on the progress of construction of three demonstration buildings, documenting costs, experiences gained and lessons learnt has been completed in 2018 as delivery of Output 3. This report includes lessons learned from procuring, installing and testing the new energy efficient materials, and new construction techniques and appliances, as well as documenting

the experiences and lessons learnt from procuring, installing and testing the new energy efficient materials, construction techniques and appliances.

88. During 2017 and 2018, regular visits to the pilot buildings were made by local architects, designers, builders and decision makers as delivery of Output 3.5. However, despite the Project's target to monitor the energy consumption from these pilot buildings for a period of one year, the Project, although conducting the monitoring of these pilot buildings for a period of 12 months, has not had the opportunity to obtain continuous energy consumption data and has not delivered Output 3.4 in full due to:

- occupancy of the pilot buildings during the evaluation mission of February 2018 being less than 30%. In May 2018, the occupancy rate reached 42%. With this occupancy rate, the inhabitants of each unit in each building have been reluctant to use the energy efficiency features, which have been resulting in higher utility costs (for both heating and electricity). This is due to:
  - the use of electricity (at the 80.2% cost recovery tariff as shown on Figure 1) for these features has a fixed cost for operating the pumps, fans and meters all of which would have been distributed amongst fewer households due to the low occupancy rate; and
  - the preference for heat from the CHPs which is only charged at a tariff equivalent to a 21.4% cost recovery rate (see Figure 1);
- most of the occupied units of the demonstration buildings not having normalized energy consumptive patterns due to the common practice when new housing units are purchased in Belarus, of new tenants typically taking up to one year to undertake retrofits (required for painting walls, installation of necessary kitchen appliances and washing machines along with piping for these facilities, ducting and electrical connections, and other adjustments). It is highly probable that normalized energy consumptive patterns would occur in the next heating season of 2018-2019 when there is a stronger likelihood all units would be occupied with completed retrofits;
- the recent data of monitoring nevertheless show that almost two third of families who have already occupied the buildings consciously and properly use the system of forced ventilation with heat recuperation installed in each flat; and
- the solar heaters, the system of heat pumps and the PV-station are under normal operation, as designed, and provide heat and electricity with certain deviations related to low energy demand.

89. In conclusion, the results of Outcome 3 can be rated **satisfactory** with the following rationale:

- The Project had managed to oversee the completion of 3 pilot energy efficient buildings as targeted in the ProDoc;
- Pilot building design documentation was approved on the basis of space heating and hot water energy consumption being less than 60 kWh/m<sup>2</sup>/yr;
- Due to typical local practices of new tenants spending up to one year retrofitting a new unit, normal energy consumption information of space heating and hot water heating from these demonstration buildings could not be collected.

### 3.3.5 Outcome 4: Documented, disseminated and institutionalized project results providing a basis for further replication

90. To achieve Outcome 4, Project resources would be utilized to deliver the following outputs:

- Developed public awareness-raising materials and completed nation-wide awareness and information campaign advocating the benefits of energy saving measures, including economic, social, health, environmental and aesthetical aspects (Output 4.1);
- Agreed methodology and sustainable institutional arrangements for annual market monitoring keeping track on buildings constructed each year, as well as the sale of key building materials, accessories and appliances together with their energy performance characteristics (Output 4.2);
- Fully mandated and capacitated state agency with a responsibility to monitor the energy savings and CO<sub>2</sub> emission reductions in residential and other buildings, together with the agreed procedures for compiling the respective data (Output 4.3);
- Approved national procedures for extending energy audit practice in residential and other buildings and forming mechanisms for using the energy audit results for elaboration of the energy efficiency strategies for the building sector at the national level (Output 4.4);
- Energy-efficiency aspects integrated into the regional and local plans for territorial development being developed by the Institute of Urban and Regional Planning (IURP) (Output 4.5);
- An International conference on energy efficiency in residential sector held in Belarus, including a field visit to the pilot demonstration sites; coordination with the results of other UNDP/GEF Project “Removing the Barriers to Improving Energy Efficiency in the State Sector of Belarus” (Output 4.6);
- A regularly updated Project website with postings on Project information that are of interest for all stakeholders, including the general public (with a link to an Expanded Energy Platform) (Output 4.7);
- Annual market monitoring reports for new building construction (Output 4.8); and
- Final Project Report consolidating the results and lessons learnt from the implementation of the proposed Project components and future recommendations (Output 4.9).

A summary of actual achievements of Outcome 4 with evaluation ratings are provided on Table 11.

91. To date, the Project has successfully implemented numerous outreach and institutional activities since late 2013:

- Preparation and distribution of public awareness raising materials on energy savings in buildings as a part of Outputs 4.1 and 4.2. This included:
  - The Project briefs are updated and issued every quarter and distributed as leaflets to more than 2,500 recipients;
  - More than 90 articles, press-releases, and reviews were prepared for broadcasting through television broadcasts and web-based media<sup>42</sup>. This also included animated videos for residential households residents on energy efficiency in residential buildings<sup>43</sup>;

<sup>42</sup> Includes BT, regional TV channels, STV Channel, Onliner.by, First Channel of Belarusian Radio, Belarus Today, tut.by, "Energy Efficiency" magazine, "Architecture and Construction" magazine, "Studio", BelTA, "Komsomolskaya Pravda in Belarus", TV and Radio Company "Mahilioŭ".

<sup>43</sup> <http://effbuild.by/news/366.html>

Table 11: Outcome 4 achievements against targets

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating <sup>44</sup>
<b>Outcome 4: Documented, disseminated and institutionalized project results providing a basis for further replication</b>	Status of the planned public outreach activities.	N/A	Planned public outreach activities successfully completed	<i>Numerous public outreach activities have been successfully completed. However, annual marketing reports for new building construction have not yet been delivered.</i>	See Paras 90-91	4
	Readiness of the entity to follow up and continue the activities initiated by the Project.	N/A	An entity to be responsible for replication of the Project results has been designated and provided with adequate resources to perform its work	<i>Based on recent Government Orders in 2017 and 2018, NIPTIS has been designated as an entity responsible for a State Programme for monitoring and energy auditing of the housing sector to be continued until 2020.</i>  <i>In 2014, the Government assigned RUE “BelNITS Ecologiya” to perform as National Agency responsible for monitoring of GHG emission reductions in all branches of economy and for respective reporting to the UNFCCC Secretariat.</i>  <i>The Institute of Urban and Regional Planning and TCS-14 had several meetings during 2017-2018 to address integration of EE buildings into urban development. These discussions are still ongoing since IURP has yet to agree with all new approaches.</i>	See Para 91-2	5
	Number of visits and downloads from the Project website	N/A	At least 100 hits and 10 downloaded documents per month from the Project website	<i>A Project website on building energy efficiency (<a href="http://www.effbuild.by">www.effbuild.by</a>) has been regularly updated and averaging 600 hits and 4,000 documents per month downloaded since 2013</i>	See Para 90	6
<b>Overall Rating – Component 4</b>						<b>5</b>

<sup>44</sup> Ibid 27

- Interviews and news on television broadcasts and web-based media;
  - 65 communication campaigns<sup>45</sup>;
  - More than 250 technical reports, brochures, reference books and guidelines posted on web-based media;
  - As mentioned in Para 67, methodology guidelines for energy auditing of buildings was approved nationally based on the IPMV protocol (in line with the best international practice) and adapted to Belarusian conditions as a part of Output 4.4;
  - 11 international conferences and seminars on best practice in energy efficiency improvement in residential buildings were organized and held under the auspices of the Project and in cooperation with the Energy Efficiency Department, Ministry of Architecture and Construction, UNDP and Austrian Energy Agency. The total audience represented more than 650 participants from eight countries. This is a part of Output 4.6;
  - A Project website on building energy efficiency ([www.effbuild.by](http://www.effbuild.by)) has been regularly updated since 2013 as a part of Output 4.7. This site averages 600 hits per month, and has had more than 4,000 downloads per month since 2013;
92. With regards to the Project’s contribution to the “readiness of the entity to follow up and continue the activities initiated by the Project”, the IEERB Project has undertaken the following:
- To deliver Output 4.2, the Project initiated a number of meetings to attract the Government’s attention to the monitoring issue (in addition to the fact that the energy survey has been already included into the Technical Code elaborated by the Project that is pending adoption). As a result, the Order of the Deputy Minister of MoAC (as of August 18, 2017, No.02-1-07/10773) and the Order of the Vice-Prime-Minister (as of February 2, 2018, No.04/8pr) were issued to assign responsible organizations that includes NIPTIS to prepare a related State Programme for monitoring and energy auditing of the housing sector to continue this monitoring until 2020 under upcoming state programmes;
  - To deliver Output 4.3, the Government in 2014 assigned RUE “BelNITS Ecologiya” to perform as National Agency responsible for monitoring of GHG emission reductions in all branches of economy and for respective reporting to the UNFCCC Secretariat. To date, their work through the support of the Project and the use of the IPCC Expert Facility (that is used for preparation of National Communications and the National GHG Cadaster) has been used to create and verify the calculation protocol for GHG emission reductions generated from energy efficient buildings based on best international practices;
  - For Output 4.5, the Project in 2017-2018 initiated several meetings with the Institute of Urban and Regional Planning and TCS-14 addressing integration of EE pattern into urban development. In addition, the issues of urban development with energy efficient housing were discussed during several of the Project’s conferences and workshops starting from 2016. These discussions are still ongoing since the Institute of Urban and Regional Planning is reluctant to accommodate all new approaches. The Project issued 2 reports in 2017 and 2018 on EE urban development that were submitted to DEE and IURP for consideration:
    - “Proposals for urban development concepts, regional and local development plans based on recommendations on the integration of energy efficiency approaches into these plans”;

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<sup>45</sup> Includes Earth Day Event, UN70 Express Event, 3D-Picture Event, Inclusive Belarus Campaign with press-event in Mahilioŭ, VII International Conference "Energy Conservation and Improving Energy Efficiency" in the framework of the XXII Energy & Environment Forum in 2016; "Energy efficient construction" under V Belarusian-German Energy Forum in 2016.

- Amendments and additions to the technical standard TCH 45-01-284-2014 "Urban detailed planning. Structure and order of development" that was sent to the Institute of Urban and Regional Planning and TCS-14.;
- Issuance of 3 relevant Project reports to DEE in April 2018 as a part of Output 4.8 including:
  - "Analysis of practical procedures (methodologies) and relevant provisions for the system of annual monitoring of the status of energy efficient housing";
  - "Institutional mechanisms for annual monitoring of the status of energy-efficient housing";
  - "Draft provisions and methodology of the system for annual monitoring of the status of energy efficient housing";
- For Output 4.9, the Final Project Report consolidating the results and lessons learnt from the implementation of the IEERB Project is being prepared for completion by 30 June 2018.

93. In conclusion, the results of Outcome 4 can be rated **satisfactory** with the following rationale:

- Delivery of a number of international and public awareness raising events a significantly raised the profile of energy efficiency in buildings to the Belarusian public;
- Ongoing process of institutionalizing Project results with NIPTIS for annual market monitoring of new buildings and RUE "BeINITS Ecologiya" for reporting GHG emission reductions from EE buildings;
- A Project website that is frequently visited and used by building practitioners in Belarus.

### 3.3.6 Relevance

94. The IEERB Project is **relevant** to the development priorities of the Government of Belarus which has been seeking efficiency improvements to specific energy consumption within building envelopes since 1993 as described in Para 18. In 1998, the Government of Belarus adopted a "Law on Energy Saving", which was replaced by a new Law in 2015. The legal framework of this Law seeks to accelerate the harmonization of the country's entire regulatory and legal system for energy efficiency with relevant legislative framework and technical regulations of the European Union.

### 3.3.7 Effectiveness and Efficiency

95. The effectiveness of the IEERB Project has been **satisfactory**, in consideration of resources being used to develop the TC-EPB that has received approval from several ministries within the Government of Belarus, engaged relevant building practitioners, professionals and policymakers to build their knowledge base on energy efficiency in buildings, and technically and financially supported the completion of 3 pilot EE buildings in 3 cities in Belarus. Effectiveness could have improved if the PMU had a PRF that better described the targets and outputs of the IEERB Project.

96. The efficiency of the IEERB Project has been rated as **moderately satisfactory** in consideration of delays beyond the control of the Project, in the Project start-up between 2012 and 2013, delays in co-financing commitments including the withdrawal of MoNREP, the late commencement and completion of demonstration EE buildings, and the subsequent loss of opportunity for the IEERB Project to collect useful energy consumptive information from demonstration buildings (due to lag time of tenants in new buildings to generate normal energy consumptive patterns). Notwithstanding, the PMU for the IEERB Project has performed well under these challenging circumstances.

### 3.3.8 Country Ownership and Drivenness

97. The drivenness of the Government of Belarus to lower its carbon intensity within the residential building sector is reflected in:

- several standards and laws as described in Para 18 to bring specific energy consumption of heating and hot water systems in Belarus residential buildings closer to EU Directives;
- actions and strong support of the Department of Energy Efficiency at PSC meetings to direct the IEERB PMU towards the strengthening of the TC-EPB and the capacities of building practitioners and professionals throughout Belarus that will improve their abilities to comply with new building MEPS;
- strong support from DEE at PSC meetings to engage appropriate stakeholders to implement energy efficiency in new buildings;
- Strong support from the Ministry of Architecture and Construction to implement the systems for the checking of designs of new buildings for compliance with the new TC-EPB.

### 3.3.9 Mainstreaming

98. The IEERB Project was successfully mainstreamed with the Belarus UNDAF (2011-2015)<sup>46</sup>, notably:

- UNDAF Area of Cooperation 3: Assistance for ensuring environmental sustainability;
- Agency Outcome 3.1: National capacity to mitigate and adapt to climate change enhanced;
- Agency Output 3.1.1: Energy efficiency in buildings is improved.

99. The IEERB Project is also successfully mainstreamed with the UNDAF for Belarus (2016-2020)<sup>47</sup>, notably:

- UNDAF Area of Cooperation 3: Environmental protection and sustainable environmental management based on principles of green economy;
- Outcome 3.1.1: By 2020, policies will have been improved and measures effectively implemented to increase energy efficiency and the production of renewable energy to protect landscape and biological diversity, and to reduce anthropogenic burden on the environment;
- Indicator 3.1.1: Reduction of GDP energy intensity (%).

100. The IEERB Project has not made any specific efforts to mainstream gender in its activities. However, there was a gender balance of persons met during the Evaluation mission during February 2018, a positive indicator of the outcomes of the Gender Policy being implemented by the Government of Belarus. Several of the persons interviewed on the IEERB Evaluation mission were women in senior management positions with influence on Project results.

### 3.3.10 Sustainability of Project Outcomes

101. In assessing sustainability of the IEERB Project, the evaluators asked “how likely will the Project outcomes be sustained beyond Project termination?” Sustainability of these objectives was

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<sup>46</sup> [https://www.unece.org/fileadmin/DAM/operact/Technical\\_Cooperation/Delivering\\_as\\_One/UNDAF\\_country\\_files/Belarus-UNDAF-2011-2015-Final.pdf](https://www.unece.org/fileadmin/DAM/operact/Technical_Cooperation/Delivering_as_One/UNDAF_country_files/Belarus-UNDAF-2011-2015-Final.pdf)

<sup>47</sup> [http://un.by/images/files/ramochnaya-programma/Book\\_Framework\\_Programm\\_2015\\_ENG\\_LATEST\\_plus\\_COVER.pdf](http://un.by/images/files/ramochnaya-programma/Book_Framework_Programm_2015_ENG_LATEST_plus_COVER.pdf)

evaluated in the dimensions of financial resources, socio-political risks, institutional framework and governance, and environmental factors, using a simple ranking scheme:

- 4 = *Likely (L)*: negligible risks to sustainability;
- 3 = *Moderately Likely (ML)*: moderate risks to sustainability;
- 2 = *Moderately Unlikely (MU)*: significant risks to sustainability; and
- 1 = *Unlikely (U)*: severe risks to sustainability; and
- U/A = *unable to assess*.

Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions. Details of sustainability ratings for the IEEIRS Project are provided on Table 12.

102. The overall IEERB Project sustainability rating is Moderately Likely (ML). This is primarily due to:

- new buildings needing to comply with the TC-EPB to obtain approval for construction with a strong likelihood that the TC-EPB will be mandatory during 2018;
- the lack of motivation of building developers in Belarus to invest in energy efficient hot water and heating systems until the cross subsidization of heating tariffs is reduced from 21.4% to 50% that will reduce payback periods from these investments to a reasonable period of time;
- heightened awareness of the benefits of energy efficiency in buildings amongst all building stakeholders including various Ministry personnel with oversight on building developments in Belarus as well as public and private enterprises involved with designing and constructing buildings. This heightened awareness has led to numerous public discussions regarding the need for reducing cross subsidization of heating tariffs;
- integration of energy efficiency in buildings into the curricula of several universities in training institutes, strengthening the capacity of building practitioners and technicians to plan, design, implement and operate and maintain equipment related to energy efficiency in buildings;
- completed pilot energy efficiency buildings which can be used in future for demonstrating energy savings from such measures and informing Government policies on energy efficiency in buildings.

### 3.3.11 Impacts

103. The Project has made significant impacts within the building sector in Belarus:

- Most of the standards and regulations of the TC-EPB are mandatory to ensure minimum energy performance of new buildings. Compliance to the TC-EPB should now be higher for the building sector given that building developers will now be required to comply considering that approval for construction of these buildings is contingent on compliance. A remaining issue for the Government is to strengthen their building inspections to ensure that installed equipment complies with their TC-EPB compliant construction drawings;
- Completion of pilot energy efficient residential buildings has raised awareness amongst key building professionals of key engineering design aspects of TC-EPB compliant buildings. This in turn has informed construction companies, both state and private entities, of a key business direction for construction companies;
- The IEERB Project has raised the profile of energy efficiency in buildings through increasing the availability of EE building information on several and easily accessible platforms (such as the Project website: [www.effbuild.by](http://www.effbuild.by)).



**Table 12: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of March 2018)	Assessment of Sustainability	Dimensions of Sustainability
<p><b>Actual Outcome 1:</b> Legal and regulatory framework to support the enforcement of the Technical Code for Energy Performance of Buildings (TC-EPB) has been strengthened.</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> MoAC has sufficient financial resources for enforcement personnel to approve new building applications that comply with the new TC-EPB;</li> <li>• <i>Socio-Political Risks:</i> Recent trends in the rate of cross subsidization of heating tariffs is indicative of the ongoing difficulties in raising heating tariffs to the extent that the Government recovers the full cost of heating to the residential sector. However, official statements from the MoHU are an indication of their commitment to elimination of these cross subsidies for both heating and electricity;</li> <li>• <i>Institutional Framework and Governance:</i> The TC-EPB will become mandatory after its imminent 2018 approval by the Council of Ministers;</li> <li>• <i>Environmental Factors:</i> The TC-EPB was designed to reduce intensity of consumption of primary fuels for heating and hot water in buildings, thereby reducing GHG emissions from the building sector.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p style="text-align: center;">4</p> <p style="text-align: center;">3</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;"><b>3</b></p>
<p><b>Actual Outcome 2:</b> The capacity of the Belarusian building specialists has been enhanced to enforce new energy efficiency standards according to the TC-EPB with an initial focus on residential buildings.</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> Financial resources are sufficient amongst Belarusian building specialists to sustain continued capacity building activities;</li> <li>• <i>Socio-Political Risks:</i> Interest within the building sector to invest in energy efficient heating and hot water systems is currently low due to the 78% subsidization of the heating and hot water tariffs. Their interest would increase if the rate of subsidization was decreased to a 40 to 50% subsidization rate, an action that MoHU has been committed to undertaking. Notwithstanding that demand for sustained capacity building is high, training is planned (but not confirmed) for a critical mass of maintenance personnel to maintain optimal performance of energy efficient equipment related to heating and hot water (which may involve an ESCO modality);</li> <li>• <i>Institutional Framework and Governance:</i> With the Project supporting capacity building of 58 decision-makers within various relevant ministries, there is likely sufficient oversight capacity on energy efficiency issues in the building sector;</li> <li>• <i>Environmental Factors:</i> All public and private stakeholders involved with the Project are aware of the environmental, social and economic benefits of energy efficiency in the Belarusian building sector.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p style="text-align: center;">4</p> <p style="text-align: center;">3</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;"><b>3</b></p>
<p><b>Actual Outcome 3:</b> Demonstration energy efficient buildings have been completed, and will be able to generate normal energy consumption data within 18 to 24 months.</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> Financial resources are sufficient in Belarus to continue the implementation of energy efficient buildings;</li> <li>• <i>Socio-Political Risks:</i> Interest within the building sector to invest in energy efficient heating and hot water systems is currently low due to the 79% subsidization of the heating and hot water</li> </ul>	<p style="text-align: center;">4</p> <p style="text-align: center;">3</p>

**Table 12: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of March 2018)	Assessment of Sustainability	Dimensions of Sustainability
	<p>tariffs. Their interest would increase if the rate of subsidization was decreased to a 50% subsidization rate, an action that MoHU has been committed to undertaking;</p> <ul style="list-style-type: none"> <li>• <i>Institutional Framework and Governance:</i> The TC-EPB will become mandatory after its imminent approval by the Council of Ministers, likely within 2018;</li> <li>• <i>Environmental Factors:</i> The implementation of energy efficient buildings will comply with the TC-EPB that was designed to reduce intensity of consumption of primary fuels for heating and hot water in buildings, thereby reducing GHG emissions from the building sector.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p>4</p> <p>4</p> <p><b>3</b></p>
<p><b>Actual Outcome 4:</b> Project results on supporting legal and regulatory framework of the TC-EPB have been institutionalized as well as the results of the energy savings from the pilot EE buildings (to comply with the Order of July 4, 2017 No.04/26p by the Deputy Prime Minister that was initiated by the Project..</p>	<ul style="list-style-type: none"> <li>• <i>Financial Resources:</i> Sufficient financial resources are available within the Government to continue the development and dissemination of material reporting Project results, notably the energy savings from the pilot EE buildings;</li> <li>• <i>Socio-Political Risks:</i> Government of Belarus is committed to promote compliance to the TC-EPB. However, a strengthening of efforts is required to sustain information flows to occupants of EE buildings on optimizing the use of their hot water, heating and fresh air ventilation systems while minimizing their utility bills;</li> <li>• <i>Institutional Framework and Governance:</i> The TC-EPB will become mandatory after its imminent approval by the Council of Ministers, likely within 2018. MoAC have the personnel and the legal mandate to enforce compliance to the TC-EPB;</li> <li>• <i>Environmental Factors:</i> No environmental factors identified that would hinder continued institutionalization of Project results.</li> </ul> <p style="text-align: right;"><b><i>Overall Rating</i></b></p>	<p>4</p> <p>3</p> <p>4</p> <p>4</p> <p><b>3</b></p>
	<p><b><i>Overall Rating of Project Sustainability:</i></b></p>	<p><b>3</b></p>

## 4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS

104. The IEERB Project has provided excellent support within a period of 6 years to improve the enabling environment for increased investments into EE residential buildings in Belarus, notwithstanding the Project having a weak Project Results Framework (PRF) which did not convey to the Evaluation Team the targets that the Project needed to meet to achieve its overall objective. With strong and stable leadership of the IEERB Project from a highly experienced and top Belarussian climate change expert, the IEERB PMU was able to overcome this issue and facilitate significant achievements for energy efficiency in the building sector in Belarus:

- It has raised awareness in Belarus amongst all building stakeholders of the benefits of energy efficiency in residential buildings;
- It has provided support to the Government of Belarus in the preparation of a Technical Code on Energy Performance of Buildings (TC-EPB) that is aligned with EU Directive 2010/31/EU and has been approved by a number of key technical entities prior to its full adoption;
- It has also improved the capacities of building professionals with various academic institutes through the process of preparing the TC-EPB, disseminating knowledge products and contributing to academic construction curriculums;
- It has supported the completion of 3 A+ energy efficient residential buildings that will serve as an excellent resource for generating information on EE buildings, and inform policy improvements for the Government of Belarus to the TC-EPB.

105. The long-term sustainability of the IEERB Project of reducing energy consumption and GHG emission reductions on new residential buildings, however, is difficult to assess considering that existing heating tariff rates are too low for economic justification of the installation of energy efficient heating equipment in buildings, and the uncertainty of when these heating tariffs will be raised from a 21.4% to a 50% recovery rate; as shown on Table 7, the decrease in the number of EE buildings approved from 2016 to 2017 is an indicator of this need for a heating tariff review and amendment. There have been several Government Decrees (most recently 2016) proposing the raising of heating tariffs from 20% to 50% of the real cost by 2020, making EE measures economically feasible after 2020. There is also the expected full adoption of the TC-EPB that will make it mandatory for Belarussian building developers to implement energy efficiency measures in their buildings notwithstanding the low heating tariffs.

106. Looking forward in the context of sustaining the objectives of the IEERB Project of reducing energy consumption and related GHG emissions with a focus on new residential buildings, the IEERB Project has left a solid foundation consisting of the TC-EPB, raised awareness, strengthened technical capacity and demonstration EE buildings (as described in Para 103). However, the building sector will continue to need Government support to sustain further reductions of energy consumption and GHG emissions from the sector:

- Technical capacities of building technicians, operators and owners needs to be periodically refreshed to ensure minimization of fossil fuel consumption for heat generation from district CHPs. The lack of attention to maintaining these fuel system over the long-term can lead to increasing inefficiencies and trends of increased fuel consumption;
- While the IEERB Project focused on energy efficiency of new buildings, the Government of Belarus will need to refocus its efforts in this sector on implementing energy efficiency measures

for the existing building stock which is more than 98% of all buildings in Belarus, if it wishes to sustain a downward trajectory of energy consumption and GHG emissions from the building sector;

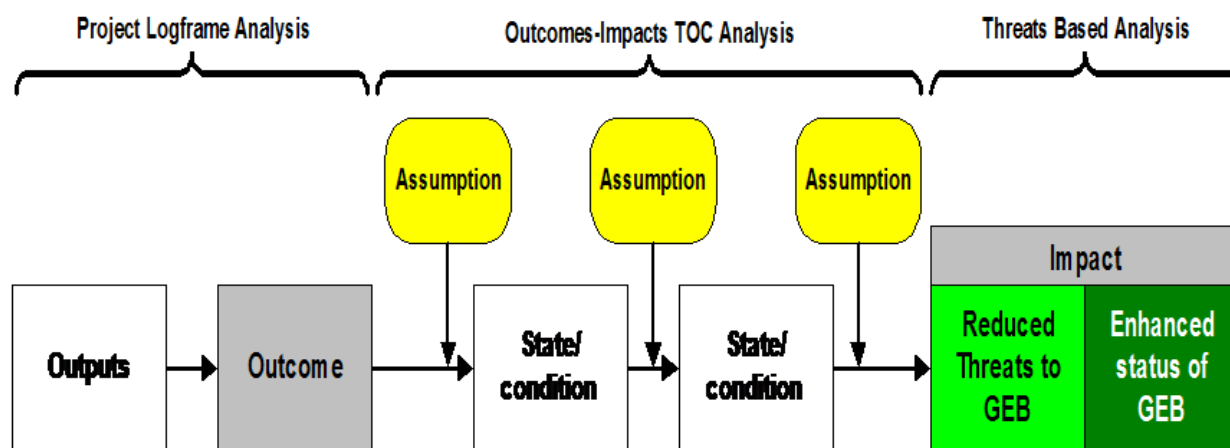
- GHG emission reduction calculations from energy efficiency of new buildings as well as retrofitted existing buildings needs to be more robust and institutionalized with the involvement of MoNREP. While the IEERB Project has initiated work towards its institutionalization with RUE Belarusian Research Centre “Ecology”, continued work in this area is required to build the country’s database on actual energy consumption in buildings, instead of a database that only contains buildings that are compliant with the TC-EPB.

#### 4.1 Corrective actions for the design, implementation, monitoring and evaluation of the Project

107. *Action 1 (to UNDP): To improve design of the future CCM projects including any follow-up “building energy efficiency” project, the design should include:*

- a clear logical framework matrix with SMART indicators and measurable targets that can be effectively monitored by PMU staff to reflect progress towards global benefits of energy efficiency for residential buildings or any other building sector. This should be developed with technical assistance GEF project designers who are familiar with Theory of Change (see Figure 3) that more strongly links baselines with project outputs, direct outcomes, intermediate states and long-term impacts;
- a more detailed Project Results Framework (PRF) using the TOC analysis, and with targets that are reflected in the project outputs. The achievement of these outputs should be linked and contribute to the intended outcomes of the project;

Figure 3: Generic Theory of Change Diagram<sup>36</sup>



<sup>36</sup> Reproduced from April 2009 GEF Presentation by Todd and Risby, accessible on: [https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiOz7Wfk-DYAhUF62MKHV6UCsQQFggnMAA&url=http%3A%2F%2Fwww.3ieimpact.org%2Fmedia%2Ffiler%2F2013%2F02%2F25%2F13\\_1\\_gef\\_eo\\_cairo\\_presentation\\_final.ppt&usq=AOvVaw3rP1GHRib0YW2cABRZ8D0g](https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiOz7Wfk-DYAhUF62MKHV6UCsQQFggnMAA&url=http%3A%2F%2Fwww.3ieimpact.org%2Fmedia%2Ffiler%2F2013%2F02%2F25%2F13_1_gef_eo_cairo_presentation_final.ppt&usq=AOvVaw3rP1GHRib0YW2cABRZ8D0g)

- specific M&E activities that can help project teams focus on specific indicators for monitoring (in an improved PRF) that can minimize the workload of the Implementing Partner and the PMU. This should include IP and IA access to a functional database of existing and new buildings that can provide progress reports on *important and relevant metrics* such as actual buildings (new and existing) with floor area in square metres, and reports from building owners and operators on energy consumption, all of which can be easily converted into an SEC value for the building in kWh/m<sup>2</sup>/yr. Entries of this information into the database can easily generate reports that can provide cumulative and quantified global benefits;
- allocation of sufficient resources for capacity building of building owners and operators to monitor energy consumption (see Action 5). This may translate into higher M&E budgets for a subsequent CCM project in building energy efficiency in Belarus.

108. Action 2 (to UNDP): To improve implementation of future projects similar to IEERB, the PRF (strengthened through ToC analysis and ROTI) needs to be used as a guide for preparing project work plans. With the various targets that reflect the intended outputs of the project, project personnel can formulate work plans by outcome that can then be more effectively managed with output work directly contributing to desired outcomes and impacts.

## 4.2 Actions to follow up or reinforce initial benefits from the Project

109. Action 3 (to MoHU with assistance from DEE and UNDP): Continue training workshops in oblast training centres to ensure the availability of a critical mass of certified EE building operational personnel. This recommendation was made to monitor and mitigate any trends of deterioration of the energy performance of EE equipment for these buildings due to lack of knowledge of proper maintenance practices. The continuation of these training workshops can strengthen the abilities of operational personnel to improve their operation of EE equipment in buildings and their monitoring of energy consumption of buildings over the long-term. This would in turn maximize long-term GHG emission reductions from EE buildings.

110. Action 4 (to MoHU with assistance from DEE and UNDP): Set up a program that continually informs occupants of EE buildings on optimizing use of their EE systems for hot water, heating and fresh air ventilation systems. This recommendation is made based on random interviews with pilot EE building occupants who did not demonstrate full understanding on how they could minimize their utility bills. This may involve building the technical capacity of the heads of tenant associations in each pilot EE building and other EE buildings.

111. Action 5 (to MoAC with assistance from DEE and UNDP): Continue training programs to ensure the availability of a critical mass of building design personnel to enforce compliance to the TC-EPB. Similar to Action 3, oblast training centers will deliver these training programs for TC-EPB and updates to these building designers and technicians that will provide continuous access to the latest best international practices for the design of energy efficiency in buildings.

## 4.3 Proposals for future directions underlining main objectives

112. Action 6 (to DEE and MoHU): Monitor progress of Decree No.1037 of 29.12.2017 on the “Concept of Improvement and Development of Housing and Utility Services until 2025” addressing elimination of cross-subsidies and upward adjustment of low heating tariff rate towards 50% and higher that should

provide sufficient incentives for a shorter cost recovery period to building developers and investors for EE measures in residential buildings.

113. Action 7 (to DEE and MoAC): Disseminate monitored energy consumption data from 3 demo buildings to the Government policymakers and investors in line with Deputy Prime Minister’s Order No.04/26p of July 4, 2017, with more emphasis on the time when the pilot buildings are fully occupied and when the tenants have been in their units for a sufficient time during which their energy consumption would be normalized; this could be as long as 18-24 months when all units are occupied although the currently monitored data are being provided for decision makers. As such, the expected data from these 3 pilot buildings should reflect the intended design heating and hot water SEC values in the range of 20 to 30 kWh/m<sup>2</sup>/yr. Combined with an expected raising of heating tariffs in the order of 50%, information on heating energy consumption and its costs to tenants should further catalyze investment interest in EE buildings.
114. Action 8 (to MoNREP): Provide support to appropriate institutions to help formalize protocols and methodologies developed by the Project for reporting GHG emission reductions for EE buildings and retrofits that includes support to the RUE Belarusian Research Centre “Ecology” to be continued after the EOP. Support to the RUE Belarusian Research Centre “Ecology” needs to be continued after the EOP as a means of institutionalizing their work on protocols for calculating and reporting GHG emission reductions from new buildings as well as retrofits for existing buildings. This work should also include a national database on actual energy consumption of buildings of all types, and their status of compliance to TC-EPB.
115. Action 9 (to DEE): Support future retrofit programs or construction of new EE buildings (supported either by GoB or donors) through training of building energy operators or managers using experiences gained through the Project. Support can be in the form of:
- Training to ensure capacities of building energy managers, both state personnel (with MoHU) and private individuals and companies (ESCOs) reflects latest best practices for operating EE systems in buildings including introduction of energy management information systems (EMIS) building on UNDP experiences in other countries in the region;
  - Roundtables on a strengthened ESCO modality in Belarus for thermal system installations (if deemed appropriate);
  - Upkeep of operational personnel skills that can result in minimized use of fossil-fuel generated heat and hot water; and
  - Training on EE building materials as well as targeted research and development on EE building materials that can be domestically produced.

#### **4.4 Best and worst practices in addressing issues relating to relevance, performance and success**

116. Best practice: This UNDP Project has been well-managed due to the recruitment of a well-qualified project manager with good management skills as well as strong knowledge and technical skill in the subject matter. The traits of this Project manager included a strong understanding of the activities of the Project, good communication skills, being responsive to all needs of the Project, and a good understanding of Belarusian government institutions and technical issues on energy efficiency and

climate change. More importantly, the IEERB Project focused on activities that were within the control of the Project such as:

- facilitating good progress on the preparations of ToRs (for design consultants, software developers, etc.), tender awards, and the completion of consultant work in an efficient manner; and
- continuing dialogue with multiple partners to sustain their engagement and interest in the IEERB Project.

117. *Scope for improved practice: Many country offices including Belarus need assistance in the preparation of ProDocs, most notably the Project Results Framework which needs to be focused with insertion of SMART indicators that directly contribute to an intended outcome.* The PRF could further be strengthened through ToC and ROTI analyses with the assistance of personnel from Regional Centers.

## APPENDIX A - MISSION TERMS OF REFERENCE FOR IEERB PROJECT TERMINAL EVALUATION

### TERMINAL EVALUATION TERMS OF REFERENCE

<b>Post title:</b>	International Consultant for the Final Evaluation of UNDP-GEF project “Improving Energy Efficiency in Residential Buildings in the Republic of Belarus”
<b>Type of contract:</b>	Individual Contract
<b>Assignment type:</b>	International Consultant
<b>Country / Duty Station:</b>	Home Based with one mission of at least 10 working days (not including travel and weekend days)
<b>Expected places of travel (if applicable):</b>	Minsk, Belarus and 2 other cities in the Republic of Belarus (Mahilioŭ and Hrodna)
<b>Languages required</b>	English
<b>Starting date of assignment:</b>	1 <sup>st</sup> February 2018
<b>Duration of Contract:</b>	40 working days over a 4 months period of 1 <sup>st</sup> February 2018 – 30 <sup>th</sup> June 2018
<b>Duration of Assignment:</b>	40 working days
<b>Payment arrangements:</b>	Lump-sum contract (payments linked to satisfactory performance and delivery of results)
<b>Administrative arrangements:</b>	UNDP will organize the logistics and travel to Minsk, Belarus and any travel within the Republic of Belarus
<b>Evaluation method:</b>	Desk Review and Interviews of Short-Listed Candidates



## INTRODUCTION

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 the *UNDP-GEF project: “Improving Energy Efficiency in Residential Buildings in the Republic of Belarus”* (PIMS # 4290).

The essentials of the Project to be evaluated are as follows:

## PROJECT SUMMARY TABLE

Project Title:		Improving Energy Efficiency in Residential Buildings in the Republic of Belarus		
GEF Project ID:	4290		<i>at endorsement</i> <i>(Million US\$)</i>	<i>at completion</i> <i>(Million US\$)</i>
UNDP Project ID:	00077154	GEF financing:	4.5	4.5
Country:	Republic of Belarus	IA/EA own:	0.4	0.4
Region:		Government:	4.3	3.2
Focal Area:	Energy, Infrastructure, Transport and Technology	Other:	23.0	11.7
FA Objectives, (OP/SP):		Total co-financing:	27.3	14.9
Executing Agency:	UNDP	Total Project Cost:	32.2	19.8
Other Partners involved:	Energy Efficiency Department; Ministry of Architecture & Construction	ProDoc Signature (date project began):		July 31, 2013
		(Operational) Closing Date:	Proposed: Dec 30, 2016	Actual: June 30, 2018

## OBJECTIVE AND SCOPE

The project was designed to *reduce the energy consumption and related GHG emissions with the focus on new residential buildings by introducing new performance based building design and construction standards with related energy certification scheme(s) and by ensuring their effective implementation and enforcement. By this, the energy consumption of new buildings is sought to be cut by at least 70% compared to the existing building stock constructed before 1993 and by 40% compared to the buildings erected in accordance with the current construction norms and thermal standards in place. The project’s principal outcomes were to support the (i) strengthening of the legal and regulatory framework; (ii) training of local experts and other key stakeholders; (iii) construction of three EE demo buildings to test and gain practical experience on different EE solutions; and (iv) related outreach and dissemination of the lesson learnt. The TE is to cover the entire programme, both the UNDP and the GEF components.*

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.

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.

## EVALUATION APPROACH AND METHOD

An overall approach and method<sup>37</sup> for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluators are 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 (*fill in [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 inception report shall be completed and submitted prior to the evaluation mission to the Republic of Belarus. The draft and final evaluation report shall be completed after the evaluation mission to the Republic of Belarus.

The evaluator will assess the following categories of project progress.

### i. Project Strategy

#### Project design:

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addressed country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country?
- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design and if there are major areas of concern, recommend areas for improvement.

#### Results Framework/Logframe:

- Undertake a critical analysis of the project's logframe indicators and targets, assess how "SMART" the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
- Are the project's objectives and outcomes or components clear, practical, and feasible within the project timeframe?
- Has the project achieved its global environmental benefits in terms of tonnes of CO<sub>2</sub> that have been reduced (direct and indirect GHG emissions) as defined in the project document?
- Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women's empowerment, improved governance, etc.) that should be included in the project results framework and monitored on an annual basis.
- Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators and indicators that capture development benefits.

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<sup>37</sup> For additional information on methods, see the [Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 7, pg. 163

## ii. Progress Towards Results

### Progress Towards Outcomes Analysis:

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and colour code the results in a “traffic light system” based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as “Not on target to be achieved” (red).

**Table A.1: Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)**

Project Strategy	Indicator <sup>38</sup>	Baseline Level <sup>39</sup>	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target <sup>40</sup>	End-of-project Target	Midterm Level & Assessment <sup>41</sup>	Achievement Rating <sup>42</sup>	Justification for Rating
<b>Objective:</b>	Indicator 1:							
	Indicator 2:							
<b>Outcome 1:</b>	Indicator 3:							
<b>Outcome 2:</b>	Indicator 4:							
<b>Outcome 3:</b>	Indicator 5:							
<b>Outcome 4:</b>	Indicator 6:							

### Indicator Assessment Key

Green = Achieved	Yellow = On target to be achieved	Red = Not on target to be achieved
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## iii. Project Implementation and Adaptive Management

### Management Arrangements:

- Review overall effectiveness of project management as outlined in the Project Document. Were changes made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Did the project employ one or more international technical advisors and did this help to advance the ability of the project to meet the overall project objective?
- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

<sup>38</sup> Populate with data from the Logframe and scorecards

<sup>39</sup> Populate with data from the Project Document

<sup>40</sup> If available

<sup>41</sup> Colour code this column only

<sup>42</sup> Use the 6 point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU

Work Planning:

- Review any delays in project implementation, identify the causes and examine if they were resolved.
- Has the work planning been carried out in a manner which is consistent with the project document and with the project workplan or are there significant deviations?
- Were work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results.
- Examine the use of the project’s results framework/ logframe as a management tool and review any changes made to it since project start.

**iv. Mid-Term Review**

- Examine the extent to which the recommendations from the mid-term review have been taken into account by the project and the extent to which the project has successfully carried out adaptive management in a timely manner following the mid-term review;
- Examine the extent to which, if mid-term review recommendations were not taken into account, the reasons why these recommendations were not taken into account, discuss, and analyse the reasons why as well as the impact that this has had on the overall success of the project.

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 Regional Technical Adviser based in Istanbul and other key stakeholders.

The evaluator is expected to spend 10 working days (not including travel or weekends) in the Republic of Belarus, as part of this assignment.

The international evaluator is expected to conduct a field mission to each of the demonstration pilot projects including *Minsk*, *Mahilioŭ* and *Hrodna*, i.e., the following project sites: (i) *Standard one-entrance 19-storey 133-apartment large-panel residential house with 9.42 thousand square meters of living area*; (ii) *Standard four-entrance 10-storey 180-apartment semi-frame panel residential house with total living area of 13.89 thousand square meters*; (iii) *Standard three-entrance 10-storey 120-apartment residential house being constructed of brick partition crosswalls with the outer walls made of foam concrete blocks and with total living area of 10.34 thousand square meters*.

The mission is expected to start and end in Minsk and have the following estimated breakdown: 2 days in Minsk followed by 2 days in Mahilioŭ (including travel) followed by 2 days in Hrodno (including travel) followed by 4 days in Minsk meaning that the 10 days are made up of 2+2+2+4 = 10 working days. Weekends should not be counted as working days meaning that working days are Monday-Friday only which means that the evaluation mission should be for a period of 2 weeks. This tentative breakdown can be changed provided that the overall number of days spent in the Republic of Belarus stays at 10 working days.

In the event, that it is agreed between the UNDP project manager and the international and national evaluators it might be possible to split the mission into 2 missions, provided that the total number of days remains at 10 working days (not including travel days). Example: International Evaluator decides to undertake 1 mission of 7 working days (not including weekends) and one mission of 3 working days.

Interviews will be held with the following organizations and individuals at a minimum: (i) *Project Manager, other project staff members and key experts*; (ii) *UNDP CO Programme Analysts and the UNDP Istanbul Regional Hub Regional Technical Advisor on Climate Change Mitigation*; (iii) *Energy Efficiency Department of State Standardization Committee as the national implementing agency*; (iv) *Ministry of Architecture & Construction*; (v) *Ministry of Housing & Communal Services*; (vi) *RUE “Institute of Housing – NIPTIS after S. Ataev”*; (vii) *MAPID JSC*; (viii) *RUE*

“GrodnoGrazhdanProject Institute”; (ix) GrodnoZhylStroy LLC; (x) Unitary Enterprise “Mahilioŭ sky UKS”; (xi) RUE “StrojTechNorm”; (xii) chairmen of Associations of Owners of houses in Minsk and Hrodna; (xiii) Belarus National Technical University – Construction and Energy Faculties. The evaluation team is encouraged to request additional interviews, so the team should thereby meet with additional key stakeholders during the mission to Republic of Belarus.

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 evaluators consider useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluators for review is included in [Annex B](#) of this Terms of Reference.

## EVALUATION CRITERIA & RATINGS

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 cover, at a minimum, 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](#).

<b>Evaluation Ratings:</b>			
<b>1. Monitoring and Evaluation</b>	<i>rating</i>	<b>2. IA&amp; EA Execution</b>	<i>rating</i>
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	
<b>3. Assessment of Outcomes</b>	<i>rating</i>	<b>4. Sustainability</b>	<i>rating</i>
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.

Specifically, the final evaluation will:

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions, as they were carried out.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
- Review whether the project has had the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds.
- Provide detailed inputs to the co-financing monitoring table to be filled out, provide commentary on co-financing: has the co-financing been used strategically to help the objectives of the project? Has the Project Team met with all co-financing partners regularly in order to align financing priorities and annual work plans?

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								
Loans/Concessions								
<ul style="list-style-type: none"> <li>• In-kind support</li> </ul>								
<ul style="list-style-type: none"> <li>• Other</li> </ul>								
Totals								

## MAINSTREAMING

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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

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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.<sup>43</sup>

## CONCLUSIONS, RECOMMENDATIONS & LESSONS

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The evaluation report must include a chapter providing a set of **conclusions, recommendations and lessons learned**. It is suggested that the number of recommendations does not exceed 15 in total.

## IMPLEMENTATION ARRANGEMENTS

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The principal responsibility for managing this evaluation resides with the UNDP CO in the Republic of Belarus. The UNDP CO will contract the evaluators. The Project Team will be responsible for liaising with the evaluation team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

## EVALUATION TIMEFRAME

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The total duration of the evaluation will be 40 days, over a 4-month period from 1<sup>st</sup> February 2018 to 30<sup>th</sup> June 2018, according to the following plan:

<sup>43</sup> 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](#)

Activity	Timing	Completion Date
<b>Preparation</b> (Inception report, which includes an Evaluation methodology compiled and a work plan to be prepared and submitted)	4 days	Feb, 2018
<b>Evaluation Mission</b> (Mission to Belarus conducted, including briefings by Project Team and UNDP CO, in-country field visits, all necessary interviews with partners and key stakeholders, data collection, and de-briefings for UNDP CO). Please note that these 10 days are working days and do not include travel days or weekends.	10 days	March, 2018
<b>Travel Days</b> – days required for travel to and from the Republic of Belarus	2 days	March 2018
<b>Draft Evaluation Report</b> (Drafting of the evaluation report completed, and the draft sent for comments. Circulation and other types of feedback mechanisms for reviewing and commenting on the draft completed, and comments received)	18 days	Apr, 2018
<b>Final Report</b> (Finalization of the evaluation report with due account of comments received on the draft report)	6 days	June, 2018
<b>Total</b>	40 days	

## EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
<b>Inception report</b>	Clarifications on timing and method of evaluation	No later than 2 weeks before the evaluation mission.	International evaluator submits the Inception Report to UNDP CO
<b>Presentation</b>	Initial Findings based on desk review and results of evaluation mission	End of evaluation mission	International evaluator prepares, submits and presents a report on Initial Findings to project management and UNDP CO.
<b>Draft Final Report</b>	Full report, (per annexed template) with annexes	Within 3 weeks of the evaluation mission	International evaluator drafts the full evaluation report and sends it to CO. The report is reviewed by RTA, PCU, GEF OFPs.
<b>Final Report<sup>44*</sup></b>	Revised report	Within 2 weeks of receiving UNDP comments on draft and no later than 30 <sup>th</sup> June 2018	International evaluator prepares the revised Final Evaluation Report and sends it to CO for uploading to UNDP ERC.

## TEAM COMPOSITION

The evaluation team will be composed of *one international and one national evaluators*. The international evaluator is designated as the team leader and will be responsible for the entire evaluation and respective evaluation deliverables mentioned above in line with this ToR, with inputs from the project. The national evaluator will provide assistance to the international evaluator in line with a separate ToR focusing on a baseline and stocktaking report, a stakeholders consultation report and detailed comments into draft evaluation report. Both consultants shall have prior experience in evaluating technical assistance projects for UNDP or other organizations or governments. Experience with UNDP and GEF financed projects is an advantage. The evaluators selected should not have

<sup>44</sup> 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.

participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The International Evaluator (the Evaluation Team leader) must present the following qualifications:

- Minimum *seven* years of relevant professional experience;
- Advanced university degree (at least the Master level);
- Knowledge of UNDP and GEF;
- Previous experience with results-based monitoring and evaluation methodologies demonstrated by an example of evaluation of at least one other UNDP project funded by GEF in the past seven years;
- Technical knowledge in the targeted focal area(s) such as environment, climate change, energy, engineering, economics, law, international relations and/or business/management demonstrated by at least 3 relevant publications and/or evidences in professional experience records (e.g., certifications, awards, inventions, membership of professional associations and ad-hoc panels, lecturing, training, participation in exhibitions and professional events, presentations, etc.);
- Experience in mid-term or final performance evaluation of at least one international and/or regional projects funded by multilateral agencies in the past seven years;
- Experience in performance evaluation of such projects in the Europe or/and CIS region is preferred;
- Familiarity with regulations in EU and CIS region in the field of energy efficiency, demonstrated by at least one relevant publication (report, article, invention, presentation, etc.), is preferred but not required;
- Familiarity with Belarusian regulations and standards in the field of energy efficiency, demonstrated by at least one relevant publication (report, article, invention, presentation, etc.), is an asset;
- Excellent written and spoken English is a must;
- Working knowledge of written and spoken Belarusian or Russian is an advantage;
- Strong report writing skills and experience in writing and presenting reports to a high professional level (an example of reports and presentations that include graphs, pictures, diagrams, figures and other illustrative tools to enhance the reporting quality shall be provided).

## EVALUATOR ETHICS

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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'](#).



## APPENDIX B - MISSION ITINERARY (FOR FEBRUARY 2018)

#	Activity	Stakeholder involved	Place
<b>February 12, 2018 (Monday)</b>			
	Arrival of Roland Wong in Minsk		
<b>February 13, 2018 (Tuesday)</b>			
1	Briefing meeting with Mr. John O’Brien, RTA	UNDP	Minsk
<b>February 14, 2018 (Wednesday)</b>			
2	Briefing meeting with IEERB Project Staff including Mr. Alexandre Grenbekhov, Project Manager, Ms. Natallia Labaznova, Project AFA, and Ms. Maryia Vincheuskaya, Project PR	UNDP	Minsk
3	Meeting with UNDP Programme Analyst on evaluation methodology and schedule of Terminal Evaluation process	UNDP	Minsk
4	Evaluation mission briefing with National Project Director on evaluation methodology and schedule of Terminal Evaluation process	DEE	Minsk
5	Evaluation mission briefing with MoAC on evaluation methodology and schedule of Terminal Evaluation process	MoAC	Minsk
<b>February 15, 2018 (Thursday)</b>			
6	Meeting with RUE “StrojTechNorm”.	MoAC	Minsk
7	Meeting with RUE “Institute of Housing – NIPTIS”	MoAC	Minsk
	Visit of the project pilot site in Minsk with energy efficient engineering systems installed by the project		Minsk
<b>February 16, 2018 (Friday)</b>			
	Travel to Mahilioŭ		
	Visit of the project pilot site in Mahilioŭ with energy efficient engineering systems installed by the project		Mahilioŭ
8	Meeting with Mahilioŭ Department of Capital Construction on their experiences and plans on building more EE residential buildings	State construction company	
	Travel to Minsk		
<b>February 19, 2018 (Monday)</b>			

#	Activity	Stakeholder involved	Place
9	Meeting with Ministry of Housing & Utilities	MoHU	Minsk
10	Meeting with MAPID JSC, private developer of EE residential buildings	Private construction company	Minsk
	Travel to Hrodna		
<b>February 20, 2018 (Tuesday)</b>			
	Visit of the project pilot site in Hrodna with energy efficient engineering systems installed by the project		
11	Meeting and interview with the homeowners association chairman in Hrodna	Residents of EE residential buildings	Hrodna
12	Meeting with Oblast authorities, and GrodnoGrazhdanProject RUE, the pilot building designer	Design company of EE residential buildings	Hrodna
13	Meeting with Oblast Training Centre for Personnel of Housing & Utilities	EE Building maintenance personnel	Hrodna
	Travel back to Minsk		
<b>February 21, 2018 (Wednesday)</b>			
	Work on report		Minsk
<b>February 22, 2018 (Thursday)</b>			
14	Meeting with Belarus National Technical University	Academic institutes	Minsk
15	Meeting with Inter-branch Advanced Training & Personnel Retraining Institute	Training Centers	Minsk
16	Meeting with RUE Belarusian Research Centre "Ecology"	MoNREP	Minsk
<b>February 23, 2018 (Friday)</b>			
17	Meeting with Project Stakeholders (RUE Belarusian Research Institute for Energy "BeITEI" of BelENERGO State Company)	BelENERGO	Minsk
18	Mission de-briefing with DEE and UNDP	DEE	Minsk
<b>February 26, 2018 (Monday)</b>			
19	Mission de-briefing with UNDP	UNDP	Minsk
20	Meeting with RUE Belarus Ecology Research Center	MoNREP	Minsk
<b>February 27, 2018 (Tuesday)</b>			
	Departure of Roland Wong from Minsk		

Total number of meetings conducted: 20

## APPENDIX C - LIST OF PERSONS INTERVIEWED

This Draft is a listing of persons contacted in Minsk, Mahilioŭ and Hrodna (unless otherwise noted) during the Terminal Evaluation Period only. The Evaluator regrets any omissions to this list.

1. Mr. John O'Brien, UNDP Regional Technical Advisor for CCM, Istanbul Regional Hub;
2. Mr. Igar Tchoulba, Portfolio Manager, UNDP Belarus;
3. Mr. Alexandre Grebenkov, Project Manager, UNDP-IEERB, Minsk;
4. Ms. Natallia Labaznova, Project Administrative Officer, UNDP-IEERB, Minsk;
5. Ms. Maryia Vincheuskaya, Officer for Public Relations, UNDP-IEERB, Minsk;
6. Mr. Mikhail Malashenko, Director of Energy Efficiency Department, Minsk;
7. Mr. Andrew Minenkov, Project National Director, Head of Division, DEE, Minsk;
8. Ms. Galina Pavlova, Member of PSC, Chief of the Ministry's Principal Department, MoAC;
9. Mr. Gennady Troubilo, Deputy Minister, MoHU, Minsk;
10. Mr. Andrei Romashko, Head of Department of Housing, MoHU, Minsk;
11. Mr. Andrey Matyukhov, Deputy Head of the Department of Housing, MoHU, Minsk;
12. Ms. Marina Tolstik, Head of Department of Public Utilities and Energy, MoHU, Minsk;
13. Igor Yurkevich, Head of Department for Maintenance of Housing, Organization and Conduct of Housing Reform, MoHU, Minsk;
14. Mr. Igar Lishai, Director, RUE "StrojTechNorm", Minsk;
15. Ms. Olga Kudrevitch, Deputy Director, RUE "StrojTechNorm", Minsk ;
16. Mr. Leonid Sokolovsky, Head of TCS-14, RUE "StrojTechNorm", Minsk;
17. Mr. Leonid Danilevsky, Deputy Director, RUE "Institute of Housing – NIPTIS", Minsk;
18. Mr. Andrew Moskalev, Director, RUE "UKS", Mahilioŭ;
19. Mr. Dmitri Khukhriakov, Deputy Director, RUE "UKS", Mahilioŭ;
20. Mr. Dmitri Khukhriakov, Deputy Director, RUE "UKS", Mahilioŭ;
21. Mr. Vitaly Shoumeiko, Chief Engineer, RUE "UKS", Mahilioŭ;

22. Ms. Marina Razvazhnaya, Head of Planning & Contract Department, RUE “UKS”, Mahilioŭ;
23. Mr. Uladzimir Deshko, Deputy Oblast Governor, Hrodna;
24. Metchislav Goy, City Mayor, Hrodna;
25. Mr. Viatcheslav Tarasevitch, Director General, GrodnoGrazhdanProject RUE, Hrodna;
26. Mr. Alexandr Tsybulnikov, Chief Specialist, GrodnoGrazhdanProject RUE, Hrodna;
27. Ms. Anna Esipok, Director, Oblast Training Centre for Personnel of Housing & Utilities, Hrodna;
28. Ms. Tatiana Kubrak, Deputy Director, Oblast Training Centre for Personnel of Housing & Utilities, Hrodna;
29. Mr. Gennady Boltik, Deputy Director General, MAPID JSC, Minsk;
30. Mr. Igor Yakimenko, Chairman of Homeowners Association, Hrodna;
31. Mr. Sergey Leonovitch, Construction Faculty Chair, Belarus National Technical University, Minsk;
32. Ms. Kirill Dobrego, Energy Faculty Chair, Belarus National Technical University, Minsk;
33. Mr. Yuri Primak, Construction Faculty Chair, Inter-branch Advanced Training & Personnel Retraining Institute, Minsk;
34. Mr. Ivan Narkevitch, Head of Department, RUE Belarusian Research Centre "Ecology", Minsk;
35. Ms. Olga Vavilonskaya, Head of Sector, RUE Belarusian Research Centre "Ecology", Minsk;
36. Ms. Kristina Gonchar, Researcher, RUE Belarusian Research Centre "Ecology", Minsk;
37. Mr. Andrew Molochko, Head of General Energy Department, RUE Belarusian Research Institute for Energy "BelTEI" of BelENERGO State Company, Minsk.

## APPENDIX D - LIST OF DOCUMENTS REVIEWED

1. UNDP Project Document for the “Improving Energy Efficiency in Residential Buildings in the Republic of Belarus” (IEERB Project);
2. GEF approved project document and Request for CEO Endorsement
3. Project Inception Report
4. Mid-term Evaluation Report
5. Annual work plans
6. Annual GEF Project Implementation Report (2013-2017)
7. CDRs
8. Financial audit report for 2017
9. GEF Quarterly Reports
10. Project Steering Committee Minutes (April 2013 to December 2017)
11. Logs (Monitoring Logs, Offline Risk Logs, Lessons Learned Logs and Offline Issues Logs)
12. Project Technical Reports by project experts
13. Project’s Events Proceedings (including agenda and presentations/publications of conferences, workshops, trainings, etc.)
14. Selected relevant regulations in housing and construction sectors prepared and/or endorsed by the Project
15. Relevant printed documentation (brochures, flyers, booklets, briefs, publications, press releases, etc.) or visual materials (photo, video) in support of the Project’s achievements and results.
16. IEERB Information & Communications Strategy 2017-2018;
17. Second Biennial Report on the Republic of Belarus, Minsk 2015;
18. Draft of Technical Code for “Energy Performance of Buildings”, Resolution of the Council of Ministers for the Republic of Belarus;
19. Financing Climate Action in Belarus, Country Study 2016, OECD/Green Action Programme;
20. UNDAF for Belarus for 2011-15 and 2016-20.

## APPENDIX E - GHG EMISSION REDUCTION REPORT

Table E-1: Basic Project Information

### Project Information

#### Project Information

Project Title	Improving Energy Efficiency in Residential Buildings in the Republic of Belarus (IEERB)		
GEF ID Number	4228		
Country	Belarus		
Region	ECA		
GEF Agency	UNDP		
Date of Submission of GHG Accounting	28/4/61		
Contact Name			
First Year of Project	2012		
Year of Project Close	2018		
GEF Grant Amount (\$)	\$4,500,000		
Co-financing Amount (\$)	\$15,197,000		

#### General Parameters

	Default	User-Specified
Length of Analysis Period (Years After Project Close)	20	15
First Post-project Year		2019
Last Post-project Year		2033
Maximum Technology / Measure Lifetime (Years)	20	15

#### Notes


#### Fuels and Emission Factors

	Default	User-Specified
Grid Electricity T&D Loss Rate (%)	10%	9.2%
Grid Electricity Emissions (tCO2/MWh)	N/A	0.3000
Fuel: Click here to select from list	0.0000	0.0000
Fuel: Click here to select from list	0.0000	0.0000
Fuel: Click here to select from list	0.0000	0.0000

#### Notes

Sources : IEA
Source: Table 1 (Pg 4) on <a href="https://ecometrica.com/assets/Electricity-specific-emi">https://ecometrica.com/assets/Electricity-specific-emi</a>

### Step 2: List Activity Components and Select Quantification Module

Activity Component	Sector/Subsector	Logframe Output	Module/Intervention Type
Project Objective	Residential Buildings	Project Objective	Building Codes

**Figure E-2: Building Code Module**

**Building Codes Module**

**Project Information**

Project Title	Improving Energy Efficiency in Residential Buildings in the Republic of Belarus (IEERB)
Country	Belarus
Contact Name	
First Year of Project	2012
Last Year of Project	2018

**Results: Building Code Activity Components**

	Cumulative			Annual			
	Total	2012-2018	2019-2033	2012	2018	2025	2035
Direct Electricity Savings (MWh)	1,296,638	218,617	1,078,022	0	71,868	71,868	71,868
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	4,667,898	787,020	3,880,878	0	258,725	258,725	258,725
Direct GHG Emission Savings (tCO2)	424,701	71,606	353,095	0	23,540	23,540	23,540
Direct Post-project GHG Emission Savings (tCO2)	478,199		478,199	0	0	28,940	62,733
Indirect Bottom-up Emission Savings (tCO2)							

**Component 1: Project Objective -- General Inputs**

**Market Assumptions**

	Default	User-Specified
Floor Area (m2) Subject to Code Built in Year 2012		520,000
Annual Construction Growth Rate		0%

**Notes**

Form year 2009-2014

**Project Assumptions**

	Default	User-Specified
Annual Electricity Consumption (kWh/m2)		30
---		
---		
---		
Year Building Code in Force		2014
Percent New Square Meters Built Compliant with Code		100%

**Notes**

Assumes 87 buildings (520,000 m2) that have received TC-EEB approval

**Baseline Assumptions**

	Default	User-Specified
Annual Electricity Consumption (kWh/m2)		60
---		
---		
---		
Percent of Square Meters Built at Code Level Without Programme		0%
Annual Reduction in Baseline Energy Consumption	1%	1%

**Notes**

Figure E-3: Calculation of Indirect Top-Down Emission Reductions and Overall Results

	<i>User-Specified</i>
Total Market Potential (tCO <sub>2</sub> )	550,000
Causality factor	60%
Indirect Top-Down Emission Reductions (tCO <sub>2</sub> )	330,000

*Notes*Assumes 10,000 tons CO<sub>2</sub> added over the next 10 years

## Overall Results

## All Components

	Cumulative			Annual			
	<i>Total</i>	<i>2012-2018</i>	<i>2019-2033</i>	<i>2012</i>	<i>2018</i>	<i>2025</i>	<i>2035</i>
Direct Electricity Savings (MWh)	1,296,638	237,379	1,115,546	0	73,456	73,456	71,868
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	<b>4,667,898</b>	854,563	4,015,965	0	264,440	264,440	258,725
Direct GHG Emission Savings (tCO <sub>2</sub> )	<b>424,701</b>	77,751	365,386	0	24,060	24,060	23,540
Direct Post-project GHG Emission Savings (tCO <sub>2</sub> )	<b>478,199</b>		478,199	0	0	28,940	62,733
Indirect Bottom-up Emission Savings (tCO <sub>2</sub> )	0		31,840				
Indirect Top-down Emission Savings (tCO <sub>2</sub> )	<b>330,000</b>		330,000				

## Building Codes Components

	Cumulative			Annual			
	<i>Total</i>	<i>2012-2018</i>	<i>2019-2033</i>	<i>2012</i>	<i>2018</i>	<i>2025</i>	<i>2035</i>
Direct Electricity Savings (MWh)	1,296,638	218,617	1,078,022	0	71,868	71,868	71,868
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	4,667,898	787,020	3,880,878	0	258,725	258,725	258,725
Direct GHG Emission Savings (tCO <sub>2</sub> )	<b>424,701</b>	71,606	353,095	0	23,540	23,540	23,540
Direct Post-project GHG Emission Savings (tCO <sub>2</sub> )	<b>478,199</b>		478,199	0	0	28,940	62,733
Indirect Bottom-up Emission Savings (tCO <sub>2</sub> )							



**Figure E-4: Calculation of Potential GHG Emission Reductions for Period of 10 Years after EOP for “Top-Down” Emission Reductions<sup>57</sup>**

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
New Construction GHG ERs	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs		36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs			36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs				36,000	36,000	36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs					36,000	36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs						36,000	36,000	36,000	36,000	36,000
New Construction GHG ERs							36,000	36,000	36,000	36,000
New Construction GHG ERs								36,000	36,000	36,000
New Construction GHG ERs									36,000	36,000
New Construction GHG ERs										36,000
Totals	36,000	72,000	108,000	144,000	180,000	216,000	252,000	288,000	324,000	360,000
Grand Total										<b>1,980,000</b>

<sup>57</sup> 36,000 tonnes CO<sub>2</sub> annually is derived from the following assumptions: 4.0 million m<sup>2</sup> of new buildings per year, 30 kWh/m<sup>2</sup>/yr is the SEC reductions for each building, and a grid emissions factor for Belarus of 0.3 tonnes CO<sub>2</sub>/MWh. Causality factor for top-down indirect calculation in Tracking Tool was assumed to be 0.6.

## APPENDIX F - COMPLETED TRACKING TOOL

Figure F-1: Screenshot of Page 1 of Tracking Tool


 <b>Tracking Tool for Climate Change Mitigation Projects (For Terminal Evaluation)</b>		
<b>Special Notes: reporting on lifetime emissions avoided</b>		
<p><b>Lifetime direct GHG emissions avoided:</b> Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made during the project's supervised implementation period, totaled over the respective lifetime of the investments.</p> <p><b>Lifetime direct post-project emissions avoided:</b> Lifetime direct post-project emissions avoided are the emissions reductions attributable to the investments made outside the project's supervised implementation period, but supported by financial facilities put in place by the GEF project, totaled over the respective lifetime of the investments. These financial facilities will still be operational after the project ends, such as partial credit guarantee facilities, risk mitigation facilities, or revolving funds.</p> <p><b>Lifetime indirect GHG emissions avoided (top-down and bottom-up):</b> indirect emissions reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation, catalytic action for replication.</p> <p>Please refer to the Manual for Calculating GHG Benefits of GEF Projects.</p> <p><a href="#">Manual for Energy Efficiency and Renewable Energy Projects</a>  <a href="#">Manual for Transportation Projects</a></p> <p>For LULUCF projects, the definitions of "lifetime direct and indirect" apply. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO<sub>2</sub>eq per hectare per year), use IPCC defaults or country specific factors.</p>		
General Data	Results at Terminal Evaluation	Notes
Project Title	Improving Energy Efficiency in Residential Buildings in the Republic of Belarus	
GEF ID	4228	
Agency Project ID	4290	
Country	Belarus	
Region	ECA	
GEF Agency	UNDP	
Date of Council/CEO Approval	December 15, 2011	Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	4,500,000	
Date of submission of the tracking tool	May 28, 2018	Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1	Yes = 1, No = 0
Is the project linked to carbon finance?	0	Yes = 1, No = 0
Cumulative cofinancing realized (US\$)	\$15,227,000	
Cumulative additional resources mobilized (US\$)		additional resources means beyond the cofinancing committed at CEO endorsement

Figure F-2: Screenshot of EE Page of Tracking Tool

Objective 2: Energy Efficiency		
Please specify if the project targets any of the following areas		
Lighting	0	Yes = 1, No = 0
Appliances (white goods)	0	Yes = 1, No = 0
Equipment	1	Yes = 1, No = 0
Cook stoves	0	Yes = 1, No = 0
Existing building	1	Yes = 1, No = 0
New building	1	Yes = 1, No = 0
Industrial processes	0	Yes = 1, No = 0
Synergy with phase-out of ozone depleting substances	0	Yes = 1, No = 0
Other (please specify)	RES	
Policy and regulatory framework	4	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	0	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	4	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Lifetime energy saved	4,667,898,000	MJ (Million Joule, IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a> ) Fuel savings should be converted to energy savings by using the net calorific value of the specific fuel. End-use electricity savings should be converted to energy savings by using the conversion factor for the specific supply and distribution system. These energy savings are then totaled over the respective lifetime of the investments.
Lifetime direct GHG emissions avoided	424,701	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	478,199	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	-	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	1,188,000	tonnes CO2eq (see Special Notes above)

## APPENDIX G - PROJECT RESULTS FRAMEWORK FOR BELARUS'S IEERB PROJECT (AMENDED AND APPROVED IN JUNE 2013)

<b>This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:</b> 3.1: Country's capacity to mitigate and adapt to the climate change strengthened					
<b>Country Programme Outcome Indicators:</b> GHG emission (tons of CO2 equivalent) into the atmosphere.					
<b>Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):</b> <u>1. Mainstreaming environment and energy</u> OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.					
<b>Applicable GEF Strategic Objective and Program:</b> GEF's Strategic Programme #1 of GEF-4 on "Promoting Energy-Efficient Buildings and Appliances".					
	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
<b>Project Objective<sup>46</sup></b> To reduce the energy consumption (imported fuel) and related GHG emissions with the focus on new residential buildings.	Number of buildings designed and constructed in accordance with the new energy efficiency standards.	0	At least 10% (around 80 buildings) of all new residential multi-storey buildings, for which the design is started during the last year of the project are integrating new EE measures into their design with the target of reducing their combined, annual energy demand for space heating and hot water below 60 kWh/m <sup>2</sup> .	Project monitoring reports and final evaluation.  As applicable, post project market monitoring and evaluations	Suggested EE measures are adopted by the design institutes and construction companies into the design of new buildings.
	Amount of reduced CO <sub>2</sub> emissions compared to the projected baseline	0	"Lifetime" reduction of 220,000 tons of CO <sub>2</sub> eq resulting from the energy saving in buildings, for which the construction has started or which have	Project monitoring reports and final evaluation.	See above

<sup>46</sup> Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR

			adopted into their design new energy efficiency elements that reduce the energy consumption for heating and hot water in the residential buildings below the current thermal standards in force.		
<b>Outcome 1</b> Strengthened legal and regulatory framework and mechanisms to enforce the legislation for improving the energy efficiency of the building sector.	Status of the national laws and other regulatory documents controlling the energy consumption of the newly constructed buildings.	Prescriptive thermal standards adopted in 2010 defining minimum mandatory U-values for the building envelope, corresponding to the average annual heat demand of 60 kWh/m <sup>2</sup> for space heating of typical multi-apartment buildings and 120-130 kWh/m <sup>2</sup> together with sanitary hot water preparation.	Revised minimum energy performance standards adopted for new construction and reaching a status of a law by the end of the project with a target of reducing the energy consumption of new residential buildings for space heating and hot water together below 60 kWh/m <sup>2</sup> .  An energy performance certification and labelling scheme for both new and existing buildings adopted and under implementation by the end of the project	Official government publications and assumptions	Continuing commitment of the Government of Belarus to proceed with the suggested legislation.
<b>Outcome 2</b> Enhanced expert capacity of the Belarusian specialists to implement new energy efficiency standards and construction norms.	Demonstrated capacity of the Belarusian building sector specialists to integrate new EE approaches and measures into the design of the	Non-integrated design of the buildings just complying with the current prescriptive thermal standards in force.	Integrated, energy efficient building design approach together with buildings' overall energy performance based design principles adopted into the work of at least 30% of all local design institutes as well as into the	The curricular of the Belarusian educational institutes training architects and building construction and HVAC engineers.	Demonstrated value added of the suggested new approaches to the targeted professional groups.

	buildings and to implement them in the construction sector.	Lack of capacity of the public authorities to effectively supervise and enforce implementation of the planned new, overall energy performance based norms and standards.	<p>curricula of all educational institutes in Belarus educating new architects and building construction and HVAC engineers.</p> <p>By the end of the project, at least 50 experts from each key professional group (see outputs 2,2-2.6) and 200 university students have taken and successfully passed courses on energy efficient building design and construction. Key public authorities responsible for supervision and enforcement of the planned new norms and regulations trained,</p>	<p>Design documents of new buildings submitted for review of the state authorities.</p> <p>Surveys and interviews conducted during project implementation</p>	
<b>Outcome 3:</b> Implementation of demonstration projects for energy efficient buildings.	Status of the demonstration projects.	N/A	<p>Each of the 3 demonstration buildings constructed on schedule.</p> <p>For each of the 3 constructed demonstration buildings annual total external energy demand for space heating and hot water equaled or was less than 60 kWh/m<sup>2</sup>.</p> <p>Energy consumption for each of the 3 buildings and also other performance</p>	Monitoring reports of the demonstration projects.	All the required agreements concluded and the design of the demo buildings completed in schedule during the first 18 months of project implementation and the construction completed by the end of the third year of project implementation.

			<p>indicators (living comfort etc.) monitored for at least one full year.</p> <p>The baseline cost for designing and construction of the 3 demonstration buildings is covered in full by the Project's co-financing resources of developers and additional GEF financing for designing and construction of demo buildings was not in excess of 15% of the total construction costs of each demo building.</p>		
<p><b>Outcome 4:</b> Documented, disseminated and institutionalized project results providing a basis for further replication.</p>	<p>Status of the planned public outreach activities.</p> <p>Readiness of the entity to follow up and continue the activities initiated by the Project.</p> <p>Number of visits and downloads from the Project website</p>	N/A	<p>Planned public outreach activities successfully completed.</p> <p>An entity to be responsible for replication of the Project results has been designated and provided with adequate resources to perform its work.</p> <p>At least 100 hits and 10 downloaded documents per month from the Project website.</p>	<p>Final project report</p> <p>Number of hits and downloads from the project website</p>	<p>Project implementation successfully concluded.</p>

## APPENDIX H - EVALUATION QUESTIONNAIRE

Evaluative Criteria Questions	Indicators	Sources	Methodology
<b>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?</b>			
<ul style="list-style-type: none"> <li>Does the project’s objective fit within the priorities of the government?</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of Project activities with “Comprehensive Programme for the Design, Construction and Reconstruction of Energy-Efficient Homes in the Republic of Belarus for 2009-2010 and until 2020”</li> </ul>	<ul style="list-style-type: none"> <li>ProDoc</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> </ul>
<ul style="list-style-type: none"> <li>Does the project’s objective fit within Belarus’s national energy conservation strategies?</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of Project activities with Law on Energy Saving in 1998 and its complementary regulations, specifically dealing building energy efficiency</li> </ul>	<ul style="list-style-type: none"> <li>ProDoc</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> </ul>
<ul style="list-style-type: none"> <li>Does the project’s objective fit GEF strategic priorities and operational principles?</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of Project activities with GEF-4 Strategic Programme #1</li> </ul>	<ul style="list-style-type: none"> <li>ProDoc</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> </ul>
<b>Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?</b>			
<ul style="list-style-type: none"> <li>Is the project objective likely to be met? To what extent and in what timeframe?</li> </ul>	<ul style="list-style-type: none"> <li>Number of buildings designed and constructed in accordance with the new energy efficiency standards;</li> <li>Amount of reduced CO<sub>2</sub> emissions compared to the projected baseline.</li> </ul>	<ul style="list-style-type: none"> <li>Architects and designers who were beneficiaries of Project training</li> <li>Energy design reports</li> <li>Monitored energy savings</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>What are the key factors contributing to project success or underachievement?</li> </ul>	<ul style="list-style-type: none"> <li>Supportive legislation promulgated</li> <li>Adoption of new energy efficiency policies and standards by building practitioners and construction companies;</li> <li>Successfully completed demonstration buildings that comply with new MBEPS;</li> <li>Energy saved and GHG emissions reduced in demonstration buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Legislative documents</li> <li>PIRs</li> <li>MBEPS authors and users</li> <li>Demonstration building owners</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Is adaptive management being applied to ensure effectiveness?</li> </ul>	<ul style="list-style-type: none"> <li>Number of adaptive management changes during project;</li> <li>Number of buildings using EMIS for monitoring primary energy usage and reducing GHG emissions in buildings.</li> </ul>	<ul style="list-style-type: none"> <li>PIRs</li> <li>Demonstration building designers</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Is monitoring and evaluation used to ensure effective decision-making?</li> </ul>	<ul style="list-style-type: none"> <li>Number of issues identified in PIRs.</li> </ul>	<ul style="list-style-type: none"> <li>PIRs</li> <li>PSC meeting minutes</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> </ul>



Evaluative Criteria Questions	Indicators	Sources	Methodology
			<ul style="list-style-type: none"> <li>Stakeholder discussions</li> </ul>
<b>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</b>			
<ul style="list-style-type: none"> <li>Is the project cost-effective?</li> </ul>	<ul style="list-style-type: none"> <li>Financial disbursements;</li> <li>Outputs delivered;</li> <li>Outcomes achieved.</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Are expenditures in line with international standards and norms for development projects?</li> </ul>	<ul style="list-style-type: none"> <li>Financial disbursements;</li> <li>Outputs delivered;</li> <li>Outcomes achieved</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<b>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</b>			
<ul style="list-style-type: none"> <li>Are management and implementation arrangements efficient in delivering the outputs necessary to achieve outcomes?</li> </ul>	<ul style="list-style-type: none"> <li>PMU personnel expenditures</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Was the project implementation delayed? If so, did that affect cost-effectiveness?</li> </ul>	<ul style="list-style-type: none"> <li>Timing of delivery of outputs</li> <li>Disbursements versus outputs</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>What is the contribution of cash and in-kind co-financing to project implementation?</li> </ul>	<ul style="list-style-type: none"> <li>Co-financing amounts and details</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>To what extent is the project leveraging additional resources?</li> </ul>	<ul style="list-style-type: none"> <li>Co-financing amounts and details</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<b>Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?</b>			
<ul style="list-style-type: none"> <li>To what extent are project results likely to be dependent on continued financial support? What is the likelihood that any required financial resources will be available to sustain the project results once the GEF assistance ends?</li> </ul>	<ul style="list-style-type: none"> <li>Co-financing amounts and details;</li> <li>Number of subscribers to financing mechanisms of the GoB to encourage the development of energy efficiency in buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Financial reports</li> <li>PIRs</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Do relevant stakeholders have or are likely to achieve an adequate level of “ownership” of results, to have the interest in ensuring that project benefits are maintained? Do relevant stakeholders have the necessary</li> </ul>	<ul style="list-style-type: none"> <li>Number of building owners familiar with new MBEPS;</li> <li>Number of architects and designers familiar with new MBEPS;</li> </ul>	<ul style="list-style-type: none"> <li>Demonstration building owners</li> <li>Architects and designers who were beneficiaries of Project training</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder discussions</li> </ul>

Evaluative Criteria Questions	Indicators	Sources	Methodology
technical capacity to ensure that project benefits are maintained?	<ul style="list-style-type: none"> <li>Number of building owners using EMIS to monitor primary energy usage in their buildings for hot water and HVAC</li> </ul>		
<ul style="list-style-type: none"> <li>To what extent are the project results dependent on socio-political factors?</li> </ul>	<ul style="list-style-type: none"> <li>Public awareness of MBEPS for buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Public opinion surveys of EE in buildings</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>To what extent are the project results dependent on issues relating to institutional frameworks and governance?</li> </ul>	<ul style="list-style-type: none"> <li>MBEPS that are adopted;</li> <li>Public official knowledge of these standards and their enforcement tools.</li> </ul>	<ul style="list-style-type: none"> <li>Gazetted standards</li> <li>Public officials managing building assets</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<ul style="list-style-type: none"> <li>Are there any environmental risks that can undermine the future flow of project impacts and Global Environmental Benefits?</li> </ul>	<ul style="list-style-type: none"> <li>Energy savings of buildings in compliance with MBEPS;</li> <li>GHG emission reductions from demonstration buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstration building design reports</li> <li>Demonstration building managers</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Stakeholder discussions</li> </ul>
<b>Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?</b>			
	<ul style="list-style-type: none"> <li>Public opinions on EE buildings</li> <li>Opinions and knowledge of public officials and owners and users of demonstration EE buildings</li> </ul>	<ul style="list-style-type: none"> <li>Public opinion surveys of EE buildings</li> <li>Demonstration building managers</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder discussions</li> </ul>

## APPENDIX I – RESPONSES TO COMMENTS RECEIVED ON DRAFT TE REPORT

To the comments received on the 7, 11 and 20 of May 2018 for the Terminal Evaluation of UNDP-GEF PIMS 4290: *Belarus: Improving Energy Efficiency in Residential Buildings* (IEERB Project)

The following comments were provided in track changes to the draft Terminal Evaluation report; they are referenced by institution (“Author” column) and track change comment number (“#” column):

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
Alexandre Grebenkov	1	Page v, Executive Summary	Why low incentives are referred to here as a reason for difficulties of assessing the reduction of energy consumption and GHG emissions? The assessment should be based on the pre-project baseline and the resulting achievements in the course of the Project.	Agree with review comment with changes made to the actual outcome from the intended objective in the Executive Summary.
Alexandre Grebenkov	2	Page vi, Executive Summary	I think that this conclusion is not entirely correct. Yes, the pilot buildings were put in operation in Dec 2016 – May 2017, and the experience of only one (the first) heating season does not provide correct energy performance data. On the other hand: (i) the monitoring data of the first season, while being slightly worse (and this was actually foreseen) than the expected data of any future season, show nevertheless the results that correspond quite well with the designed data; (ii) these results are institutionalized since the Project and its partners have to provide the monitoring data every month in line with the Order of July 4, 2017 No.04/26p by the Deputy Prime Minister initiated by the Project; and (iii) there is an assignment in that Order given to NIPTIS by the Government to continue the said monitoring until 2020 under the upcoming state programmes.	The evaluation team appreciates this updated information that has been included in a revised “actual Outcome 4” description, Table 9 and Section 3.3.5.
Igar Tchoulba	3	Page vii, Executive Summary	With regards to the comment of the need for Government support for “efforts to strengthen and institutionalize GHG emission reduction calculations from energy efficiency of new buildings as well as retrofitted existing buildings with the involvement of MoEPNR”, why would the country want it? Can we prompt them?	In the opinion of the Evaluation Team, the possession of credible GHG emission reduction estimates from the building sector would interest donors and funding agencies to a building energy efficiency project. This may

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
				<i>serve as a prompt to MoNREP to undertake such data collection.</i>
<i>Igar Tchoulba</i>	<i>4</i>	<i>Page vii, Executive Summary</i>	<i>With regards to Action 1 on the “specific M&amp;E activities that can minimize the workload of the Implementing Partner and the PMU”, this is unclear from this one sentence. Is it possible to elaborate more?</i>	<i>Agree with the reviewer’s statement. Additional text was provided to the statement in this context as well as on Para 107.</i>
<i>Igar Tchoulba</i>	<i>5</i>	<i>Page vii, Executive Summary</i>	<i>With regards to Action 1 on the need for “sufficient resources on capacity building to the building owners and operators to monitor energy consumption (see Action 5)”, this is not clear.</i>	<i>This clarification is noted with changes made in this Paragraph of the executive Summary as well as Para 123.</i>
<i>Igar Tchoulba</i>	<i>6</i>	<i>Page vii, Executive Summary</i>	<i>With regards to Action 2 to “improve implementation of the IEERB Project, the PRF (strengthened through ToC analysis and ROTI) needs to be used as a guide for preparing project work plans”, the project has almost finished. This is rather for future projects not for this one</i>	<i>The reviewer is correct on this. Edits have been provided for this clarification in the Executive Summary as well as Para 108.</i>
<i>John O’Brien</i>	<i>7</i>	<i>Page vii, Executive Summary</i>	<i>With regards to Actions 3, 4, and 5, can you please be more specific on what type of programme? And who does what? UNDP? DEE? MoHU? Not clear whose roles and responsibilities. Who will pay?</i>	<i>Edits have been made to reflect the primary responsibility of these programmes which is MoHU. DEE and UNDP can provide regulatory and fiscal support if resources are available.</i>
<i>DEE</i>	<i>8</i>	<i>Page vii, Executive Summary</i>	<i>With regards to “Action 6 (to DEE): Monitor progress of Decree on the upward adjustment of low heating tariff rate towards 50% that should provide sufficient incentives to building developers for EE measures in residential buildings”, the proposed measure does not presuppose any actions. It suggests rather a simple observation while the expected result is supposed to be obtained regardless. The TE experts do not provide any justification of the figure of 50%. Thus, Action 6 can be either deleted or subjected to necessary editing..</i>	<i>The Evaluation Team appreciates this comment and has edited Action 6 to mention that a shorter cost recovery period is the incentive if tariffs are raised to a 50% recovery rate.</i>
<i>Alexandre Grebenkov</i>	<i>9</i>	<i>Page vii, Executive Summary</i>	<i>With regards to Action 6, MoHU is one of the key partners of the project. This body will be responsible for implementation of the Concept mentioned hereinafter.</i>	<i>The evaluation team appreciates this updated information that is incorporated into the Executive Summary and Para 112.</i>

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
DEE	10	Page viii, Executive Summary	<p>With regards to “Action 8 (to DEE): Provide support to appropriate institutions to develop formalized protocols and methodologies for reporting GHG emission reductions for EE buildings and retrofits that includes support to the RUE Belarusian Research Centre “Ecology” needs to be continued after the EOP”, DEE is not currently in a position (the task is out of its competence) and probably will not be able (even if it is the Department's commitment to the Project Document) to support organizations in developing formal protocols and reporting methodologies dealing with GHG emissions from housing sector. This is a direct competence of the Ministry of Environment and its RUE BRC “Ecology” as the Ministry's entity.</p> <p>The project elaborated and handed over to the RUE all necessary protocols and methodologies, and the RUE is using these documents while preparing the country's reports on GHG Cadastre, Biannual Reports and National Communications to the UNFCCC and IPCC. The protocols will be also used by the State Standardization Committee while certifying the EE classes of buildings in line with the Technical Code.</p>	Again, the evaluation team appreciates this updated information. Edits have been made to shift this action to MoNREP in the Executive Summary and Para 114.
DEE	11	Page viii, Executive Summary	<p>With regards to “Action 9 (to DEE): Support future retrofit programs or construction of new EE buildings (supported either by GoB or donors) through training of building energy operators or managers using experiences gained through the Project”, the proposed measure for the trainings is certainly worth doing. Such measure is widely realized, for instance, in many EU countries. But initially in these countries the market of EE buildings was created. Thus, this measure is the “future son” or “grandson” in our current system. This will be our 5-10-year future energy-saving level. This requires a tough market competition without any monopoly in electricity and heat supply.</p>	The Evaluation Team appreciates DEE feedback on this. There is a large network of building energy efficiency initiatives throughout Europe which the Belarusian government should be linked with (if this has not already occurred). The tariff issue, however, will need to be resolved before any such action will attract financing from donors.
DEE	12	Throughout the TE report	<p>The text refers to the old version of the Law on Energy Saving. The text says, e.g.,: ... the Law on Energy Saving adopted in 1998 with amendments in 2008 ... This is not correct. The Law on Energy Saving of 1998 lost its force in 2015. It was neither amended nor revised. In 2015, the new Law on Energy Saving</p>	The Evaluation Team appreciates this information, and has made changes throughout the document to remove any reference to a 2008 amendment.

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
			<i>was adopted and entered into force (No.239-3 of January 8, 2015)</i>	
<i>Alexandre Grebenkov</i>	<i>13</i>	<i>Para 20</i>	<i>With regards to the statement that “lack of guidance in the context of technical details of insulation and energy efficient equipment, and proper methods of their installation”, the standards and guidance for technical details with regard to isolation of building envelopes and other construction components were already in place before the project start. The respective provisions on thermal resistance, thermal bridges, etc. adopted in 2010 correspond well to those of many northern EU countries.</i>	<i>Edits have been made in Para 20 to incorporate this statement.</i>
<i>John O’Brien</i>	<i>14</i>	<i>Para 21</i>	<i>Please give some numbers about how many tonnes of CO2 were targeted to be reduced such as the target of 220,000 tonnes of GHG emission reductions lifetime emissions etc ...</i>	<i>Requested details have been added to Para 21</i>
<i>Igar Tchoulba</i>	<i>15</i>	<i>Para 24</i>	<i>Those who operate and maintain buildings are important stakeholders.</i>	<i>The evaluation team strongly agrees with this, and has made an edit in Para 24.</i>
<i>John O’Brien</i>	<i>16</i>	<i>Para 29</i>	<i>Please explain the reason for the delay. I think it is the two tier approval process where the Belarussian Government also need their own internal rules and procedures to approve the ProDoc.</i>	<i>These details are provided in Para 42. Edits have been made to reference Para 42 in Para 29.</i>
<i>John O’Brien</i>	<i>17</i>	<i>Para 43</i>	<i>You need a review of the MTR in this section and the effectiveness of which MTR was carried out following the recommendations of the MTR.</i>	<i>Text added to Para 43 as well as an addition of Table 2 which summarizes the Project Management response.</i>
<i>John O’Brien</i>	<i>18</i>	<i>Para 44</i>	<i>The mid-term review is a main opportunity for adaptive management in all projects. I suggest to take a quick look at the MTR recommendations and see if they were implemented. Please consider to add a para on this issue.</i>	<i>See Response 17.</i>
<i>John O’Brien</i>	<i>19</i>	<i>Para 54</i>	<i>Please add a table on the co-financing on what was planned and what was actually achieved. I think it is not enough to conclude this without any analysis whatsoever of how the funds have been spent by component and by activity. Please add a table 1 with what was planned in the prodoc (this can go under para 53) and</i>	<i>This has already been done in Tables 3 and 4. Table 5 was added to show the nature of GEF expenditures.</i>

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
			a table 2 (this can go under par 54) with what was actually spent , component by component.	
John O'Brien	20	Para 62	If this means the target has been met then please state this	This Para has been edited for clarification.
Alexandre Grebenkov	21	Para 63	It is important, for the sake of correctness, to understand that not all these energy efficiency buildings inherited all and every our design solutions. The key point is that our experience, suggestions and solutions have encouraged the said developers one way or another to jump from C and B classes to A/A+ classes. All of them, though, are introducing the automatic regulation and dispatching of thermal energy consumption, special designs of a building envelope, etc.; some of them used heat recuperation, solar collectors; other used their own solutions like a small compact ventilator with heat recovery; none of them have designed residential buildings with heat pumps yet.	The evaluation team appreciates this clarification, and has provided edits in Para 79 on capacity building.
Alexandre Grebenkov	22	Para 63	These data are final. We will not be able to update statistical data for Jan-June 2018 – such data will not be available	The Evaluation team will then not change the estimates as provided in the draft report.
John O'Brien	23	Para 72	Please make a brief analysis of the quality of these reports.	Edits have been made as requested.
Alexandre Grebenkov	24	Table 7, pg 35	I would put here rating "4", since formally the buildings <b>have been monitored already one full year</b> , and the model for calculation of the "actual consumption" and compare it with the designed parameters is valid in case of occupancy rate higher than 30% to provide proper extrapolation of the monitoring data. We have just finalized and issued a monitoring report from NIPITIS pending its approval by experts and DEE.	The Evaluation Team agrees with the reviewer's point. The rating assessment has been upgraded to a "4".
John O'Brien	25	Para 83	There was adaptive management done for the pilot buildings and one of the pilots was replaced with another one under adaptive management. Can we say a bit about this?	Footnote 40 was added as per the reviewer's request.
John O'Brien	26	Para 88	Do you know why it is so low and can you say? Is it because of the additional cost of the +17%. Can you please explain.	The tenants often do not occupy these units right away. I surmise it is because of the lack of money to finance the costly renovation of the units to their liking.

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
Alexandre Grebenkov	27	Para 89	<i>In fact, the problem of Outcome 3 is not related to shortcomings in the achievement of one of its objectives, I think. During the Project, the pilot buildings have been built and monitored. The design parameters have been confirmed, and energy savings and GHG emission reduction targets have been reached. This follows from the results of calculations based on the actual primary fuel consumption measured with due account of occupancy rate and its extrapolation to the full occupation. The actual problem is the risk of sustainability of these good results that is linked to the current tariff policy. This policy, however and unfortunately, is out of the Project's capacity.</i>	<i>The Evaluation Team agrees with the reviewer's assessment which is covered in other Paras in the report. The Evaluation Team, however, did upgrade the Outcome 3 assessment to "Satisfactory".</i>
Alexandre Grebenkov	28	Table 8, pg 39	<i>To what extent do public outreach activities (that were implemented through a great deal of press-releases and briefs, dozens of communication campaigns, hundreds articles, reports, reviews and interviews, extended media partnership network, a number of press-conferences, exhibitions, contests, very popular website, photo albums, animated video for the residents, video-rolls for specialists, a 15-minute video broadcasted by central TV, etc.) relate to the annual market report? The statistics for the energy efficient housing were regularly provided by project partners (one-page tables) and collected by the Project. We did not publish these reports (although we used to include the numbers in our annual reports) for there was no sense of doing this without proper analysis of trends in typology and constructive technological schemes, methodical recommendations, developers, etc., which was planned to do in 2018. The report "Analysis of Housing and Construction Market" was completed and submitted to DEE in April 2018.</i>	<i>The Evaluation Team notes that "Output 4.8: Annual market monitoring reports for new building construction" has not yet been delivered. This was reported against the indicator "status of the planned public outreach activities" for a lack of a better indicator since such a report would serve as a medium of outreach to the public on new building construction. This also shows the weakness of the PRF in that this output is not strongly related to any of the Outcome 4 indicators in the PRF. As such, no edits have been made against this comment.</i>
Alexandre Grebenkov	29	Table 8, pg 39	<i>The Project initiated a number of meetings to attract the Government's attention to the monitoring issue (in addition to the fact that the energy survey has been already included into the Technical Code elaborated by the Project that is pending adoption). As a result, the Order of the Deputy Minister of MoAC (as of August 18, 2017, No.02-1-07/10773) and the Order of the Vice-Prime-Minister (as of February 2, 2018, No.04/8pr) were</i>	<i>This response does confirm that the Project has been placing efforts to deliver "Output 4.5: Energy-efficiency aspects integrated into the regional and local plans for territorial development being developed by IURP" and "Output 4.8: Annual market</i>



Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
			<p>issued to assign responsible organizations (including NIPTIS) and to prepare a related State Programme for monitoring and energy auditing of the housing sector. Several relevant reports were prepared and submitted to DEE in April 2018, as scheduled. The said reports are:</p> <ul style="list-style-type: none"> <li>• “Analysis of practical procedures (methodologies) and relevant provisions for the system of annual monitoring of the status of energy efficient housing”;</li> <li>• “Institutional mechanisms for annual monitoring of the status of energy-efficient housing”;</li> <li>• “Draft provisions and methodology of the system for annual monitoring of the status of energy efficient housing”.</li> </ul> <p>In 2017-2018, the Project initiated several meetings with the Institute of Urban and Regional Planning and TCS-14 addressing integration of EE pattern into urban development. In addition, the issues of urban development with energy efficient quarters were discussed during several Project’s conferences and workshops starting from 2016. These discussions are still opened, since the Institute of Urban and Regional Planning is reluctant to accommodate all new approaches. Nevertheless, in 2017-2018, the Project issued a couple of reports dealing with EE urban development and submitted them to DEE and the Institute:</p> <ul style="list-style-type: none"> <li>• “Proposals for urban development concepts, regional and local development plans based on recommendations on the integration of energy efficiency approaches into these plans”; and</li> <li>• Amendments and additions to the technical standard TCH 45-01-284-2014 “Urban detailed planning. Structure and order of development” that was sent to the Institute of Urban and Regional Planning and TCS-14.</li> </ul>	<p>monitoring reports for new building construction”. The cell color has changed to yellow. The rating of the indicator has been upgraded to “4”. In addition, Para 92 and 93 have been re-written to reflect the additional information provided by the reviewer.</p> <p>This comment also shows the weakness of the PRF in that these output is not strongly related to any of the Outcome 4 indicators in the PRF. As such, no edits have been made against this comment.</p>
Alexandre Grebenkov	30	Para 92	With regards to the statement that “the Government in 2014 assigned RUE “BelNITS Ecologiya” to perform as National Agency responsible for monitoring of GHG emission reductions in all branches of economy and for respective reporting to the	The evaluation team notes the reviewer’s point and has removed the highlighted text.

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
			<p>UNFCCC Secretariat.....<b>the arrangement, however, has not yet been formalized and aligned with the calculations for GHG emission reductions for the IEERB Project</b>”, I think we should avoid making such assumptions as you make here.</p> <p><i>What shall we do with the fact that the IPCC guidelines for CO2 emission calculations (that were a formal and proven basis for the Project’s report “A methodology for calculating greenhouse gas emissions for a system for monitoring the energy efficiency of residential buildings. Estimating the amount of expected greenhouse gas emissions from the operation of the three pilot buildings”) do not correspond with the “universal” (simplified) GEF methodology used in Para 63? Instead, we should be comfortable with IPCC methodology used in the Project’s protocol for CO2 emission reduction calculation. When you say about its formalization, what way of formalization do you mean? To formalize the IPCC guidelines? To formalize the corresponding Belarusian standard (TKP 17.09-01-2011 – “Methodology for estimating GHG emissions through the implementation of energy saving measures, non-traditional and renewable energy sources”)? As to our formal reporting to GEF (in PIRs), we should use the GEF’s tool.</i></p>	<p>The use of IPCC methodologies for calculating GHG emission reductions from EE buildings is what the Project should be aiming to achieve. It is entirely separate from the GEF methodology which is only used for GEF projects. The use of the term “formalization” was to characterize the process where IPCC accepts the methodology of calculating GHG ERs from EE buildings in Belarus’s reporting. Two questions emerge:</p> <ul style="list-style-type: none"> <li>• Is there a mechanism between IPCC and the Government on acceptable methodologies for certain calculations?</li> <li>• If so, is the Belarusian standard (TKP 17.09-01-2011 – “Methodology for estimating GHG emissions through the implementation of energy saving measures, non-traditional and renewable energy sources”) accepted as this methodology?</li> </ul> <p><b>See response to Comment 37.</b></p>
Alexandre Grebenkov	31	Para 92	<p><i>With regards to the statement “for Output 4.5, the Institute of Urban and Regional Planning (IURP) has yet to develop energy-efficiency aspects integrated into the regional and local plans for territorial development: it is important to understand (and this was a sort of mistake in ProDoc), that the IURP is not responsible either for energy savings or integration of energy efficiency improvement decisions into territorial development. They integrate in their plans whatever is suggested by developers or available in the market. If the developers construct EE buildings, the IURP responds accordingly while designing infrastructure</i></p>	<p>The information in Comment 29 with regards to IURP has been added to the edits of Output 4.5.</p>

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
			(e.g., less capacity of CHPs and local boilers, optimization of thermal energy transport, etc.) and overall architecture of the territory.	
Alexandre Grebenkov	32	Para 93	Try to reformulate this sentence based on my input provided for Para 87.	Edits made.
Alexandre Grebenkov	33	Para 101	With regards to the statement that the “overall sustainability rating is equivalent to the lowest sustainability ranking score of the 4 dimensions”, is this correct? Based on Para 101 and Table 9 below one can hardly make such assumption. Or you speak about other assessments?	This is GEF guidance on sustainability ratings where the lowest score of any of the dimensions is the sustainability rating, not an arithmetic average.

**To the comments received on the 12 June May 2018 for the Terminal Evaluation of UNDP-GEF PIMS 4290: Belarus: Improving Energy Efficiency in Residential Buildings (IEERB Project)**

The following comments were provided in track changes to the draft Terminal Evaluation report; they are referenced by institution (“Author” column) and track change comment number (“#” column):


Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
Alexandre Grebenkov	34	Page vi, Executive Summary, 2 <sup>nd</sup> para	Correct, nothing to add. Although, it is not entirely correct to link investments solely with pay-back. E.g., under existing tariffs and discount rate, the forced ventilation with recuperation of exhausted air heat has negative IRR. Comfort that is provided by this system (fresh air, less diseases, exclusion of mold on/in walls, sustainable hot water supply with no or low dependence on the centralized heat, etc.) is not easy to monetize.	Agree with review comment with no changes made in the report.
Alexandre Grebenkov	35	Table 6, pg 25	The ProDoc stipulates 60 kWh/m <sup>2</sup> . I have made respective corrections in your previous version. From where did you read about 30 kWh/m <sup>2</sup> again? Even in the EU you will unlikely find such performance (30 kWh/m <sup>2</sup> ) among multi-storey buildings.	The evaluation team appreciates this correction.
Alexandre Grebenkov	36	Para 72	Correct. Although, in the beginning of June three other institutes adopted the reports in their education process already (Brest National Technical University, Minsk and Mahiliou Construction Colleges).	No changes made in the report

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
Alexandre Grebenkov	37	Para 92, and Comment 30 in Appendix I	<p><i>In general, I am fine with your recent reduction of para 92. Let us recall again Output 4.3. It says: “Fully mandated and capacitated state agency with a responsibility to monitor the ... CO2 emission reductions in residential and other buildings, together with the agreed procedures and interagency agreements for compiling the required primary data.”</i></p> <p><i>1) The fully mandated and capacitated relevant state agency has been established. This agency is used to provide monitoring of GHG emissions from all sectors in line with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.</i></p> <p><i>2) The above IPCC Guidelines prescribes three levels of GHG emission calculation methodologies for all UNFCCC Annex I Parties: (i) IPCC methodology, which is a required protocol for all such Parties and for all sectors; (ii) country specific methodology, which is a voluntary protocol for some sector(s) selected as to Party’s discretion; and (iii) country specific methodology, which is a voluntary protocol for some specific sources of emissions for sector(s) selected as to Party’s discretion.</i></p> <p><i>3) IPCC is not to standardize the country specific methodologies under levels (ii) or (iii) and is not to include such methodologies in its Guidelines. IPCC even does not care whether such methodologies are adopted (standardized) on national level or not. Instead, case-by-case, the IPCC Expert Facility while reviewing the Party’s reporting (e.g., National Communication, National GHG Cadaster) examines and verifies the results of calculations and the methodology (other than (i)) on which the calculations are based.</i></p> <p><i>4) The project, based on its results, elaborated “Methodology for calculation of greenhouse gas emissions from housing”, which is a country specific methodology of level (iii) and does not contradict with generalized IPCC methodology of level (i), and the project would like this document to become a national standard.</i></p> <p><i>Thus, the project fully responded to Output 4.3.</i></p>	<p><i>The Evaluation Team appreciates the clarity provided on this comment, and has provided additional text in Para 92 t.</i></p>

## APPENDIX J - EVALUATION CONSULTANT AGREEMENT FORM

### Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

<b>Evaluation Consultant Agreement Form<sup>59</sup></b>	
<b>Agreement to abide by the Code of Conduct for Evaluation in the UN System</b>	
<b>Name of Consultant:</b> <u>Roland Wong</u>	
<b>Name of Consultancy Organization</b> (where relevant): _____	
<b>I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.</b>	
Signed at <u>Surrey, BC, Canada</u> on <u>June 16, 2018</u>	

<sup>59</sup>[www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)

**Evaluators:**

8. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
9. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
10. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people’s right not to engage. Evaluators must respect people’s right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
11. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
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13. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
14. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**Evaluation Consultant Agreement Form<sup>60</sup>****Agreement to abide by the Code of Conduct for Evaluation in the UN System**Name of Consultant: Viktoryia KaloshaName of Consultancy Organization (where relevant): 

**I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.**

Signed at Minsk, Belarus on June 16, 2018

<sup>60</sup>[www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)