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United Nations Development Programme

Terminal Evaluation of UNDP/GEF Project: Improving Energy Efficiency in Low Income Housing and Communities in Romania (IEELIHC)

(Project ID: 4115)

Terminal Evaluation Report

Mission Member:

Mr. Roland Wong, International Consultant

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TABLE OF CONTENTS

	Page
ABBREVIATIONS	III
SYNOPSIS	V
EXECUTIVE SUMMARY	VI
1. INTRODUCTION	1
1.1 BACKGROUND.....	1
1.2 TERMINAL EVALUATION.....	2
1.2.1 Purpose of the Evaluation.....	2
1.2.2 Evaluation Scope and Methodology.....	3
1.2.3 Structure of the Evaluation.....	3
1.2.4 Project Implementation Arrangements.....	4
2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT	6
2.1 PROJECT START AND DURATION.....	6
2.2 PROBLEMS THAT PROJECT SOUGHT TO ADDRESS.....	6
2.3 GOAL AND OBJECTIVE OF IEELIHC.....	7
2.4 MAIN STAKEHOLDERS.....	7
2.5 EXPECTED RESULTS.....	7
3. FINDINGS	9
3.1 PROJECT DESIGN AND FORMULATION.....	9
3.1.1 Analysis of Project Planning Matrix.....	10
3.1.2 Risks and Assumptions.....	11
3.1.3 Lessons from Other Relevant Projects Incorporated into IEELIHC Design.....	11
3.1.4 Planned Stakeholder Participation.....	11
3.1.5 Replication Approach.....	12
3.1.6 UNDP Comparative Advantage.....	12
3.1.7 Linkages between IEELIHC Project and Other Interventions within the Sector.....	12
3.1.8 Management Arrangements.....	13
3.2 PROJECT IMPLEMENTATION.....	13
3.2.1 Adaptive Management.....	14
3.2.2 Partnership Arrangements.....	15
3.2.3 Feedback from M&E Activities Used for Adaptive Management.....	16
3.2.4 Project Finance.....	17
3.2.5 M&E Design at Entry and Implementation.....	20
3.2.6 Performance of Implementing and Executing Entities.....	20
3.3 PROJECT RESULTS.....	22
3.3.1 Overall Results.....	23
3.3.2 Component 1: Improved policies to support energy efficiency in low-income communities.....	26
3.3.3 Component 2: Improved capacity at the local level to reduce fuel consumption in low income communities.....	29
3.3.4 Component 3: Direct reduction of energy consumption through community-based retrofits and market development.....	34
3.3.5 Outcome 4: Information for improved decision-making.....	36
3.3.6 Overall Evaluation of Project.....	40
3.3.7 Country Ownership and Drivenness.....	41
3.3.8 Sustainability of Project Outcomes.....	43
3.3.9 Impacts.....	46
4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS	47
4.1 CONCLUSIONS.....	47

4.2	RECOMMENDATIONS.....	48
4.3	LESSONS LEARNED	50
	APPENDIX A – MISSION TERMS OF REFERENCE FOR PROJECT FINAL EVALUATION	53
	APPENDIX B – MISSION ITINERARY (FOR MAY 2016).....	62
	APPENDIX C – LIST OF PERSONS INTERVIEWED	65
	APPENDIX D – LIST OF DOCUMENTS REVIEWED	67
	APPENDIX E – COMPLETED TRACKING TOOL	68
	APPENDIX F – PROJECT PLANNING MATRIX (PPM) (FROM JUNE 2011)	70
	APPENDIX G – GHG REDUCTIONS REPORT	75
	APPENDIX H - EVALUATION CONSULTANT AGREEMENT FORM.....	90

ABBREVIATIONS

Acronym	Meaning
AAEC	Association of Energy Auditors for Buildings in Romania
ACUE	Association of Companies for Energy Utilities
AIIR	Romanian Association for Building Services Engineers
APR	Annual Progress Report
AWP	Annual Work Plan
CCM	Climate change mitigation
CDM	Clean Development Mechanism
CDR	Combined Delivery Report
CER	Certified emission reduction
CIS	Commonwealth of Independent states (formerly the USSR)
CO	UNDP Country Office
CTA	Chief Technical Advisor
DIM	Direct implementation modality
DIY	Do-it-yourself
EA	Executing Agency
EBRD	European Bank for Reconstruction and Development
ECEEE	European Council for an Energy Efficient Economy
EE	Energy efficiency
EMIS	Energy management information systems
EOP	End of project
EPBD	European Energy Performance in Building Directive
EPC	Energy performance contract
ESCO	Energy service company
ETAG	European Technical Approval Guidelines
ETICS	External thermal insulation composite systems
EU	European Union
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GoR	Government of Romania
ICT	Information and communication technology
IEA	International Energy Agency
IEELIHC	UNDP-GEF Project: "Improving Energy Efficiency for Low Income Housing and Communities in Romania"
INC	Initial National Communication
IOWG	Inter-organizational working group
IRH	Istanbul Regional Hub of UNDP
kt	Kilotonnes or 1,000 tonnes
LPAC	Local Project Advisory Committee
M&E	Monitoring and evaluation
MoAI	Ministry of Administration and Interior
MoECC	Ministry of Environment and Climate Change
MoF	Ministry of Finance
MoLSP	Ministry of Labour and Social Protection
MRDAP	Ministry of Regional Development and Public Administration
MRV	Monitoring, reporting and verification

Acronym	Meaning
MTE	Mid-term evaluation
NES	National Energy Strategy
NEX	National Execution
NGOs	Non-governmental organizations
NIM	National Implementation Modality
NPD	National Project Director
NPM	National Project Manager
NSC	National Steering Committee
NTRP	National Thermal Rehabilitation Program under MRDAP
ProDoc	UNDP Project Document for “Improving Energy Efficiency for Low Income Housing in Romania”
PIR	Project Implementation Reports
PM	Project Manager
PMU	Project Management Unit
PPG	Project preparation grant
PPM	Project Planning Matrix
PRF	Project results framework
PSC	Project Steering Committee
RACP	UNDP’s Regional Advisory Committee on Procurement
RoGBC	Romanian Green Building Council
ROP	EU Regional Operational Programme
RTA	Regional Technical Advisor
SMART	Specific, measurable, attainable, relevant and time-bound
SNC	Second National Communication
TE	Terminal Evaluation
TEC	Technical Economic Council of MRDAP
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollars

SYNOPSIS

Title of UNDP supported GEF financed project: Improving Energy Efficiency in Low Income Housing and Communities in Romania

UNDP Project ID: PIMS 4115

GEF Project ID: 4289

Evaluation time frame: June 22, 2011 to May 31, 2016

CEO endorsement date: June 6, 2011

Project implementation start date: June 22, 2011

Project end date: June 30, 2016

Date of evaluation report: June 10, 2016

Region and Countries included in the project: Romania

GEF Focal Area Objective: CC-SP1-Building EE: Promoting energy-efficient municipal and other public buildings.

Implementing partner and other strategic partners:

- Implementing agency: United Nations Development Programme (UNDP) - under DIM modality since 2013
- Implementing partner: Ministry of Regional Development and Public Administration (MRDAP)

Evaluation team members: Mr Roland Wong, International Consultant

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EXECUTIVE SUMMARY

This report summarizes the findings of the Terminal Evaluation Mission conducted during the May 9-17, 2016 period for the UNDP-GEF Project entitled: Improving Energy Efficiency for Low Income Housing and Communities in Romania (hereby referred to as the IEELIHC Project or the Project), that received a USD 2,974,842 grant from the Global Environmental Facility (GEF).

Project Description

The IEELIHC Project was designed specifically with a goal to “reduce GHG emissions in the buildings sector in Romania” and an objective of “reducing energy consumption in buildings in low-income households and regions of Romania” with the following targets:

- An incremental direct target of “21,378 tonnes of CO₂ reduced per year by the end-of-project (EOP)”; and
- An incremental target of “41,177 MWh of heat energy saved per year as a direct result of this Project by EOP”;
- Cumulative investments in EE buildings of USD 10.74 million; and
- An increase of 106,116 people living in EE buildings by the EOP.

This was to be achieved according to actions proposed in the Project Document of June 2011. The IEELIHC Project commenced on June 22, 2011 with the Inception Phase, with completion of the Project scheduled for June 30, 2016. These changes are summarized on Table A.

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

Intended Outcomes in June 2011 ProDoc	Actual Outcomes as of June 2016
Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities.	Actual Outcome 1: Romanian energy policy has not yet been fully integrated with fuel poverty issues; however, energy efficiency needs in low income communities have been addressed in amendments to Government Ordinance 18/2009 with Ordinance 63/2012. This amendment expands the scope of EE building rehabilitation investments funded by the National Thermal Rehabilitation Programme of MRDAP and allows municipalities to identify and prioritize low income communities for EE building rehabilitation investments funded by the Programme.
Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects.	Actual Outcome 2: The supply of trained architects, building engineers, builders and auditors with EE experience has been expanded. In addition, municipalities in low income regions now have a better understanding of EE issues and have improved their abilities to support projects with building EE measures being implemented in their jurisdictions.
Outcome 3: Energy efficient buildings reconstructed (and potentially new buildings constructed) with reduced	Actual Outcome 3: More than 40 public and apartment buildings have been rehabilitated to become energy efficient with sustainable energy technologies in low-income

Intended Outcomes in June 2011 ProDoc	Actual Outcomes as of June 2016
fuel costs or using improved sustainable energy technologies in low-income communities.	communities. However, most of these improvements were made in 2016, the Project does not have sufficient time to monitor the impacts of these rehabilitations and quantify the actual reduction in reduced fuel costs.
Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty.	Actual Outcome 4: Information for designing programmes to address fuel poverty are available; however, data from the new MRDAP-hosted building registry is not yet available

Evaluation Ratings

The overall rating of the Project is moderately satisfactory (MS). This is based on the following outcomes:

- The IEELIHC Project design was considered to be satisfactory in 2010 with the exception of Output 2.3 (Local building material producers and building construction companies highly qualified and capable of producing and applying, respectively, EE building materials) where there was no real potential to develop local enterprises to supply locally sourced EE building materials;
- Fuel poverty in low income communities has only been addressed by amendments to government emergency ordinances that has empowered municipalities on the selection of buildings for rehabilitation and EE measures to implement. This would then allow the municipalities to allocate necessary budgets and subsidies to low income households who would not be able to afford implementation of such rehabilitation works. However, fuel poverty has not been adopted into the national legislation of the Government of Romania; this will continue to bog down the GoR's efforts to more effectively address the financing of EE retrofits for low income households until there is more effective interministerial dialogue on fuel poverty issues, and sustained support from parliamentarians to guide the legislation through parliament;
- The Project together with MDRAP has leveraged €447 million (USD 492 million) through the Regional Operational Programme targeting low income residential buildings, where a low income household only needs to co-finance a 3.5% portion of the rehabilitation cost (a reduction from a 25% share) with the rest being co-financed by the local municipality as non-refundable amount;
- There is now greater understanding of energy efficiency in buildings amongst more than 826 building professionals, architects, engineers and energy auditors in Romania;
- Municipal government personnel in low income regions also have an improved understanding of energy efficiency in buildings to the extent that they can manage and support building energy audits as well as implementing building EE measures;
- The technical documentation for EE measures in 50 types of apartment building blocks is an excellent output from the Project that will contribute towards the reduction of engineering costs for building rehabilitations in low income communities;
- The impact of the EE retrofits for the 43 public buildings in the 2 target counties will not be known until the winter of 2016-17 when heating bills can be compared with those prior to the retrofits. The late completion date of these retrofits is also a lost opportunity for the Project to generate and disseminate the positive results of energy savings from these EE retrofits to a wider audience that would further catalyze EE building investments in Romania;

- The Project has produced an abundance of papers on fuel poverty policy analysis, and methodologies for calculating and assessing fuel poverty, that will be useful to decision-makers in designing programs fuel poverty;
- With the recent completion of the building registry database, more building-related data and information are required before the database is useful to decision-makers in designing fuel poverty programs for the Government. Moreover, this points to the lack of emphasis on the Project on the efficient collection of this data through energy management information systems (EMIS). While the initial work on the Project had identified increasing the use of energy audits for the generation of energy efficiency data for buildings, the Project missed an opportunity in 2011 and 2012 to take advantage of the advances made in EMIS on the successful UNDP Croatia project on energy efficiency in public buildings. This was likely due to:
 - the lack of technical personnel on the Project team in 2011 and 2012 with knowledge of best practices on building energy efficiency in other countries and within UNDP Romania who could identify this opportunity; and
 - strong Project focus on fuel poverty legislation;
- Poor progress of the IEELIHC Project can be mainly attributed to the following 3 reasons:
 - the excessive efforts spent in trying to locally source and certify energy efficient thermal insulation materials despite the fact suppliers for such material did not exist; and
 - the absence of any qualified technical personnel on building energy efficiency serving as a Chief Technical Advisor during the NIM phase of the Project who could have advised against these efforts to locally sourced thermal insulation materials, and provided quality control oversight to the management of the Project and the installation of EE measures on the pilot projects; and
 - delays in the procurement of services and goods through the Romanian public procurement system during NIM.

The overall Project sustainability rating is moderately likely (ML). This is primarily due to:

- The uncertainty of the amount of funds available within NTRP and ROP for EE building retrofits in low income communities;
- The moderate risk that government priorities shift funds allocations for low income communities to other purposes;
- The enthusiasm and high demand for EE training sessions by regional development authorities and local municipalities that currently have no confirmed sources of financing for these sessions;
- The need for effective procurement of EE building materials for low income communities that could be achieved through strengthening MRDAP efforts to engage ESCOs with their EPC business model in low income communities for implementing EE building rehabilitations;
- Lack of confirmed government financing for the efficient collection of building energy-related data and information (using an EMIS) for the national buildings registry database;
- Strong support of MRDAP to manage the building rehabilitations with the use of the building registry database that contains a Romanian-made EMIS.

Table A provides a summary of the terminal evaluation of the IEELIHC Project.

Table A: Evaluation Ratings¹

1. Monitoring and Evaluation	Rating	2. IA & EA Execution	Rating
M&E design at entry	5	Quality of UNDP Implementation	2 (NIM) 5 (DIM)
M&E Plan Implementation	5	Quality of Execution - Executing Entity (MRDAP)	2 (NIM) 4 (DIM)
Overall quality of M&E	5	Overall quality of Implementation / Execution	2 (NIM) 4.5 (DIM)
3. Assessment of Outcomes	Rating	4. Sustainability²	Rating
Relevance	4.6	Financial resources	3
Effectiveness	4.0	Socio-political	4
Efficiency	3.6	Institutional framework and governance	3
Overall Project Outcome Rating	3.9	Environmental	4
		Overall likelihood of sustainability	3

Conclusions

- During the NIM regime of the Project (between the commencement of the Project in 2011 and May 2014 when the Project became DIM), excessive time and effort were spent by the Project to:
 - procure services to implement pilot building EE measures through the national procurement system. Since the Project was located in an EU environment, the Romanian government was expected to have sufficient implementation capacities. Thus, there did not appear to be any alternative to a NIM Project at the time of design;
 - obtain deliverables from the first design works contract (procured through the Romanian public tendering system). The system was a key hindrance to Project progress primarily since the system allows for the selection of a very low priced bids; in the case of the IEELILHC Project, the winning contractor who bid well below the expected price was unable to deliver quality documentation;
 - source “locally-made sustainable thermal materials”. During NIM, there was UNDP insistence on specifying the use of a certain thermal insulation material (that was to come from one of the two target counties) in the technical documentation (from the first design works contract), despite the materials not having MRDAP approval for use in public buildings as well as meeting standards for technical quality and durability. As such, the aforementioned low-priced contractor had reason to delay delivery of technical documentation for 50 typical apartment building blocks pending materials certification. Despite the certification being received in December 2013 for one material, discussions between UNDP and MRDAP were initiated on cancelling this contract and a proposed transition to a DIM project;

¹ Evaluation rating indices (except sustainability – see footnote 2): 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.

² 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.

- switch from NIM to DIM. It was only during the last 2 years of the project from mid-2014 to mid-2016 that the Project was able to operate and progress as expected using the DIM system;
- The concept of supporting local enterprises to manufacture locally-made thermal insulation material (Output 2.3) was not realistic and reveals:
 - a flaw in the Project design. During the design phase, there was no assessment to evaluate the baseline production capacities of potential enterprises in the two target counties of Dolj and Hunedoara. The assessments would have revealed the considerable efforts that would have been required to upgrade these enterprises to enable them to participate in a government tender; these efforts would have been deemed to be beyond the scope of this Project; and
 - the absence of qualified technical personnel who could have advised the team on adaptive management measures such as seeking other sources of thermal insulation materials instead of insisting on locally-made thermal insulation materials;
- The Project has contributed technical input and advocacy towards the amendment and enforcement of the “Strategy for mobilizing investment in the renovation of residential and commercial building stock, both public and private, at a national level” of MRDAP, creating an enabling environment for mainstreaming EE into national and local programmes and projects, with a focus on poor households. In addition, the Project developed a set of draft normative acts to implement distinct support schemes for fuel poor households and drafted proposals to amend a number of regulations relevant from energy efficiency.
- Fuel poverty, however, has not yet been adopted into the national legislation of the Government of Romania. The current barrier to adoption of fuel poverty into national legislation is related to a need for more effective interministerial dialogue on fuel poverty issues (notably with Ministry of Labour and Social Protection or MoLSP), and finding sustained time to work with supportive parliamentarians who will guide the legislation through to adoption in parliament;
- While the building registry database has only recently been delivered to MRDAP headquarters, there is considerably more work required to collect and process much more building related information for the database of the registry to be of any use to decision-makers in designing fuel poverty programs for the Government. The efficient collection and processing of this building-related data can be accomplished through adoption of an EMIS similar to the one developed by UNDP Croatia;
- The absence of an International Chief Technical Advisor (CTA) to support and guide the Project may have been one reason why the Project took so long to undertake adaptive management and why in certain areas, better results were not achieved including, for example, why some of the demonstration projects did not employ international best practices for energy-efficiency. In the absence of an international CTA, guidance, support for the IEELIHC Project came from the UNDP Romania Country Office which closed in June 2015; one issue here was that the person in charge did not have any technical background in energy-efficiency.

Recommendations

To the Government of Romania:

Recommendation 1: MRDAP will need to find resources to monitor energy savings resulting from the pilot projects of Component 3 using the energy management information system (EMIS) and to disseminate the results. These resources would be used to:

- Strengthen the knowledge of baseline energy consumption of buildings where pilot EE measures are being implemented. Current default values from the EU are now being used for these baselines which may not be reflective of the actual baseline;
- Support MRV activities over the winter of 2016-17 to monitor heating energy consumption with pilot EE measures in place;
- Ensure the quality of buildings registry information is bankable and would draw in the interest of ESCOs and financial institutions;
- Assist data collectors in formatting information on energy consumption and other relevant building information to a style that is compatible with the new building registry;
- Prepare leaflets and publicity material on pilot EE measures on buildings in low income communities, complete with benefit/cost analyses that should be disseminated nationally and through a focused awareness raising activity; and
- Dramatically scale up the volume of energy-related data collection into the buildings registry database (that could be done with the adoption of an EMIS), or commence this data collection with strategic priorities that may include MRDAP's focus on investments in low income communities.

Recommendation 2: MRDAP should facilitate the prioritization of technical assistance to low income municipalities that will increase access of low income communities to EE funds for public buildings and low income apartment blocks. The Project with MRDAP has recently leveraged €447 million through the EU-funded Regional Operational Programme with conditions that favour the funding of applicants who are deemed as low income households (through the use of the fuel poverty assessment by the Project). This includes a reduction of co-financing requirements of apartment owners in low-income communities from 25% to 3.5% for capital costs related to thermal rehabilitation of their apartments. Actions that could be taken by MRDAP include:

- Supporting networking events for key EE building stakeholders to improve their awareness of opportunities for implementing EE building projects; and
- Developing and launching a “pool of experts” with experience in helping municipalities to prepare EU funding proposals. This would include the screening and certification of engineering consultants and energy auditors, both foreign and domestic, who are able to assist in preparing EU funding proposals as well as providing strong linkages to suppliers of EE materials and installation services. This is related to Recommendation 3.

Recommendation 3: MRDAP should support strengthened business connections with local and foreign ESCOs. This is consistent with the new 2014 EE Law 121/2014 in Romania that transposes the EU directive on energy efficiency. This law introduces a series of EE policy measures that support ESCOs who could implement building EE measures using energy performance contracts as well as locally sourced manufactured materials or assembled equipment (they would have motivation to do so if it decreases their cost and project risk). The presence of Romanian ESCOs to provide EE building services, will provide programme managers a viable option on passing the risk of procuring new EE building materials through public

procurement to the private sector, and possibly accelerate the transformation of the EE building sector. Moreover, ESCO-type investments would have the potential to accelerate EE development in fuel poverty areas in partnership with local governments, with assurances of good quality materials and strong workmanship for installations to protect the ESCO investment. Strengthened regulations to support the further development of ESCO market should also be considered.

Recommendation 4: MRDAP should strengthen its quality control oversight on EE measures installed. The MRDAP needs to have a sustained presence on oversight to EE measures being implemented with EU-ROP and NTRP funds. This would include the need to ensure that the installation of thermal insulation materials, new windows and doors and central heating systems are all meeting international best practices. This would include, for example, insulation material overlapping with a window or door frame to ensure the closure of “cold bridges” to ensure there are no heat losses and condensate forming on the inside of the window or door frame. MRDAP quality control inspectors or their representatives in local government should convene at an annual meeting to review such issues in quality control as it relates to energy efficiency in buildings. These meetings could also be attended by leading building energy efficient experts from various EU countries to ensure the latest best practices in building energy efficiency are disseminated in Romania.

Recommendation 5: MRDAP should allocate further budgetary resources related to the full scale implementation of the national buildings database registry that would include efficient collection of building energy-related data through an energy management information system (EMIS). These budgets should be used to hold further awareness raising on EMIS, prepare new regulations to ensure mandatory usage of EMIS for public buildings, and training on the use of EMIS and its integration with the building registry database. Experience from other countries shows that EMIS can significantly improve the effectiveness of achieving energy efficiency in buildings but only if there is an appropriate high level of government commitment as well as in-kind and fiscal support.

Lessons Learned

Lesson 1: Project designs need to include a realistic and thorough assessment of Project risk. In the case of the IEELIHC Project, many of the delays in implementation were caused by factors not identified in the project documents risk assessment. With the Project being implemented in an EU environment, there was an expectation that sufficient capacity existed with this government to execute this project. There were, however, the risks that could have been identified as threats to project implementation including:

- institutional weaknesses where interministerial dialogue and cooperation is very poor. Given that one of the primary outputs of the Project was the introduction of fuel poverty legislation and associated policies, the need for policy inputs from several other ministries besides MRDAP was required. As such, the risk of a lack of cooperation between ministries to fully establish policies on fuel poverty would have been identified as very high. Yet, the targets of the IEELIHC Project included full adoption of fuel poverty legislation with 4 years of efforts in promoting interministerial dialogue. This was not achieved;
- a weak public procurement system that was not flexible, lacked clear resolution mechanisms, and was heavily weighted to the lowest price option. Moreover, the system was not designed to select unique innovative products or services which were usually higher priced. For example, in the case of procurement of thermal insulation material, the Romanian public procurement system would only allow the lowest price material such as polystyrene to be

selected notwithstanding the technical merits of other thermal insulation products that also had ETAG-004 certification for external thermal insulation composite systems. In addition, the lowest priced EE building consulting services would always be awarded without due consideration to the consultant's historical performance in such work. The evaluator is also aware of UNDP's efforts to offer the Government of Romania access to the more flexible UNDP procurement system, referred to as "NIM with direct support".

The lack of identification of all significant risks on a project design jeopardizes the timelines on which the project can achieve and deliver its goals and objectives as well as outcomes and outputs. A solution to more thorough risk assessments of the project design would be either more effective use of existing PPG resources or more time required to undertake careful consideration of the project risks.

Lesson 2: The use of GEF funds to create jobs for locally sourced products should meet the following criteria:

- there should be existing demand for the product;
- the product should have some form of official certification, domestically or internationally;
- local production capacities of the product should be scalable but not be too costly to meet the desired demand; and
- assessments for the upgrading the production of a manufacturing facility should be conducted by a business and technical professional.

In the case of the IEELIHC Project, there were noble intentions to create local jobs by assisting local enterprises to become suppliers of sustainable thermal insulation material with raw materials source locally. However, despite the identification of a few enterprises in Dolj and Hunedora counties where pilot project activities were located, these companies only had small scale production of sustainable thermal insulation material that were not scalable. The concept of assisting companies to become long-term suppliers of such material should have been accompanied with a baseline assessment of the business capacities of these companies, and an understanding of the process, equipment and associated costs required to meet supply demand. These assessments may have shown that technical assistance to such companies for production scale-up would have been beyond the scope and budget of the IEELIHC Project.

Moreover, project plans to build the supply chain of an innovative product in a region that has not yet developed a market demand should have a business and technical approach to ensuring profitability. If this is not possible, alternative materials should be sourced externally through a tendering process and the project should not wait several years (3 years with the IEELIHC Project) to undertake adaptive management. If the Project still wanted to create local jobs from tendering such material, the tender should include the names of a local distributor or partner. The IEELIHC Project took several years to realize this, delaying the Project by a period of close to 3 years. Moreover, reviews of the Project design should have recognized this as a deficiency, and should have altered the approach and source thermal insulation materials externally.

Lesson 3: Greater and sustainable impacts can be achieved through an integrated approach to capacity building of stakeholders. The training aspects of the IEELIHC Project were integrated in that it addressed building EE knowledge issues with a wide range of stakeholders from Government personnel to building professionals, energy consultants, potential building material suppliers, local tradespeople, and building maintenance personnel. In addition, the integrated approach included feedback from the stakeholders on the effectiveness of the training seminars,

and suggestions on energy and EE building topics that still needed to be addressed in future seminars. For example, some of the communities identified the use of solar PV as a supplemental source for energy instead of thermal insulation as a lone technological solution. The addition of solar PV topics into the building EE seminars created enthusiasm and buy-in with local government personnel, local building owners, and building professionals.

Lesson 4: Project implementation teams need to carefully prepare procurement packages for goods or services to ensure that the desired goods or services are procured and that risks of a prolonged tendering process are minimized. In the case of the IEELIHC Project, acquisition or procurement of sustainable thermal insulation material should have been strategically analyzed by:

- undertaking market research of the goods or services to be acquired;
- undertaking discussions with prospective suppliers or consultants to understand their conditions under which they would submit a bid; and
- preparing terms and conditions of a tender that would solicit a bid from a supplier or consultant.

In the experience of the evaluator, there are many instances on GEF projects (including the IEELIHC Project) where the practice of careful preparation of procurement packages for goods and services has not been satisfactory. In many cases, project teams mistakenly confine their search within their own country (where these goods and services may be of poor quality or even nonexistent), and not externally (where these goods and services would be available). An experienced project manager or Chief Technical Advisor should be able to provide guidance to project teams with regards to procurement issues.

Lesson 5: All GEF climate change mitigation projects should employ a part time Chief Technical Advisor (CTA) to provide oversight to project management and technical guidance. GEF projects are an opportunity for developing countries to access international expertise as well as to provide oversight in management and quality control; however, with the presence of international expertise, a GEF project can also have access to experiences from similar projects outside the country. On the IEELIHC Project after 2012, there were no technical personnel implementing the Project in UNDP until 2015. With a part time International Chief Technical Advisor with a background in building energy efficiency, the IEELIHC Project would have resolved issues more efficiently including:

- procurement of consultants for preparing energy audits and EE measures;
- sourcing thermal insulation;
- ensuring that the PMU ensures that pilot EE installations meet international best practices through oversight to the general installation of windows, thermal materials and central heating systems; and
- identification of the opportunity to take advantage of the advances made in EMIS in Croatia in 2011 that could efficiently generate buildings energy consumption data from the EMIS into the national buildings registry database in Romania.

Lesson 6: NIM with full CO support does not work well when it involves setting up two parallel implementation units. Many of the problems of this project over the period 2012-2014 can be attributed to the fact that for approximately two years there were two parallel implementation units who did not work well together. The lesson learned here is that UNDP projects should be NIM or DIM but that a half NIM and half DIM approach does not work well.

1. INTRODUCTION

This report summarizes the findings of the Terminal Evaluation Mission conducted during the May 9-17, 2016 period for the UNDP-GEF Project entitled: “Improving energy efficiency for low income housing and communities in Romania” (hereby referred to as the IEELIHC or the Project), that received a USD 2,974,840 grant from the Global Environmental Facility (GEF).

The Project was developed in 2009-10 by UNDP originally as a nationally executed (NEX) project (now referred to as National Implemented Modality or NIM). The Project Document (ProDoc) provides details on the low energy efficiency of buildings in Romania, particularly with low income households and the related GHG emissions reductions that could be achieved through implementation of energy efficiency measures in buildings. Furthermore, the ProDoc introduced the concept of fuel poverty in reference to households that cannot afford to maintain an adequate level of warmth as opposed to energy poverty where a household lacks physical access to energy resources. The Project commenced operations on June 20, 2011. The Project terminal date is scheduled for June 30, 2016.

1.1 Background

The accession of Romania to the EU in January 2007 has served as a driver to the Government of Romania (GoR) to accelerate its adoption to number of EU standards including energy efficiency. Romania adopted a National Energy Strategy (NES) in 2007 covering the 2007 to 2020 period that covered targets for energy efficiency. Information from the National Institute of Statistics provides final energy consumption of various sectors within Romania as seen in Table 1. Aside from the industrial sector, the residential sector energy consumption can be seen to be significant comprising in the order of 25% of Romania’s energy consumption.

Table 1: Romanian energy consumption 2007 to 2012 (GWh)³

Sector	2007	2008	2009	2010	2011	2012
Industry	21,758	21,993	17,214	19,734	20,392	19,685
Construction	934	842	793	967	691	720
Transport	1,463	1,401	1,383	1,355	1,424	1,228
Residential	10,039	10,040	11,021	11,329	11,577	12,035
Agriculture and forestry	539	555	493	671	761	820
Utilities	5,720	6,432	6,526	7,581	7,869	7,895
Total energy consumption	40,949	41,775	37,605	41,317	42,714	42,383

Within the NES, Romania needed to align its energy efficiency standards for buildings with the European Energy Performance in Building Directive (EPBD). The EPBD forces building owners and developers in Romania to meet higher energy efficiency standards in buildings that typically have poor thermal qualities in the range of 137 - 220 kWh/m². At the time of the design of the IEELIHC Project, the GoR had put into force regulatory instruments in an effort to accelerate the pace of adoption of the EPBD in new building construction to replace old buildings:

³ Romanian energy balance from the National Institute of Statistics

- Law No. 372/2005 that transposes EU Directive 2002/91/EC on the energy performance of buildings to remaining law. This law made it mandatory for building owners to obtain an energy performance certificate of existing buildings when they are being sold rented or refurbished;
- A policy under the Ministry of Administration and Interior (MoAI) to modernize the remaining heating system through implementation of EE measures such as technology improvements, minimization of energy losses and the promotion of EE behaviour amongst consumers.

Implementation of EE measures under this regulatory environment was very slow due to several barriers related to issues to regulatory framework, awareness and technical knowledge and financing. The IEELIHC Project was designed to assist the GoR to overcome these barriers that would result in the accelerated adoption of EE measures in buildings in Romania, a large proportion of which are low income households. The objective of IEELIHC was expected to be significant reductions in energy consumption and GHG emissions through cost-effective EE measures that would be demonstrated in low income households and communities in Romania. To achieve this objective, IEELIHC was designed to improve the regulatory framework for building energy efficiency, to strengthen existing technical knowledge of key stakeholders in the public and private sectors, to strengthen awareness of EE building practices through demonstration of EE measures in low income communities, and disseminating lessons learned. IEELIHC has been operational just over 5 years with the terminal date of June 30, 2016.

The IEELIHC project was implemented as a NIM project up to 2014 under the auspices of the Ministry of Regional Development and Public Administration (MRDAP)⁴. After 2014, IEELIHC was implemented under direct implementation mode (DIM).

1.2 Terminal Evaluation

1.2.1 Purpose of the Evaluation

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 (TE) upon completion of implementation of a project to provide a comprehensive and systematic account of the performance of the completed project by evaluating its design, process of implementation and achievements vis-à-vis GEF project objectives and any agreed changes during project implementation. As such, the TE for this Project will serve 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 recurrent issues across the portfolio, attention needed, and on improvements regarding previously identified issues;
- 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.

⁴ Formerly the Ministry of Regional Development and Tourism (MDRT) up to its name change in 2013.

This TE was prepared to:

- ⇒ be undertaken independent of Project management to ensure independent quality assurance;
- ⇒ apply UNDP-GEF norms and standards for evaluations;
- ⇒ assess achievements of outputs and outcomes, likelihood of the sustainability of outcomes, and if the Project met the minimum M&E requirements;
- ⇒ report basic data of the evaluation and the Project, as well as provide lessons from the Project on broader applicability.

The TE mission was fielded to Bucharest as well as Dolj and Hunedoara counties in Romania between the 9th and 17th of May 2016. The Terms of Reference (ToRs) for the TE are contained in Appendix A. Key issues addressed on this TE include:

- The actual impact of Project activities given the difficulties the Project has experienced in efficiently delivering its outputs and objectives; and
- The contribution of the Project to the sustainability of current efforts on implementing projects on energy efficiency for low income housing.

Outputs from this TE will provide an outlook and guidance in charting future directions on sustaining current efforts by the Government of Romania, particularly MRDAP, to reduce energy consumption and GHG emissions from low income housing and communities.

1.2.2 Evaluation Scope and Methodology

The methodology adopted for this evaluation includes:

- Review of project documentation (i.e. APR/PIRs, meeting minutes of National Steering Committee or NSC) and pertinent background information;
- Interviews with key project personnel including the current and former Project Managers, technical advisors (domestic and international), and Project developers;
- Interview with relevant stakeholders from Government; and
- Field visits to selected Project sites and interviews with beneficiaries.

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

1.2.3 Structure of the Evaluation

This evaluation report is presented as follows:

- An overview of Project activities from commencement of operations in June 2011;
- An assessment of Project 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.

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>

The Evaluation also meets conditions set by the UNDP Document entitled “UNDP GEF – Terminal Evaluation Guideline” (<http://erc.undp.org/resources/docs/UNDP-GEF-TE-Guide.pdf>) and 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>)

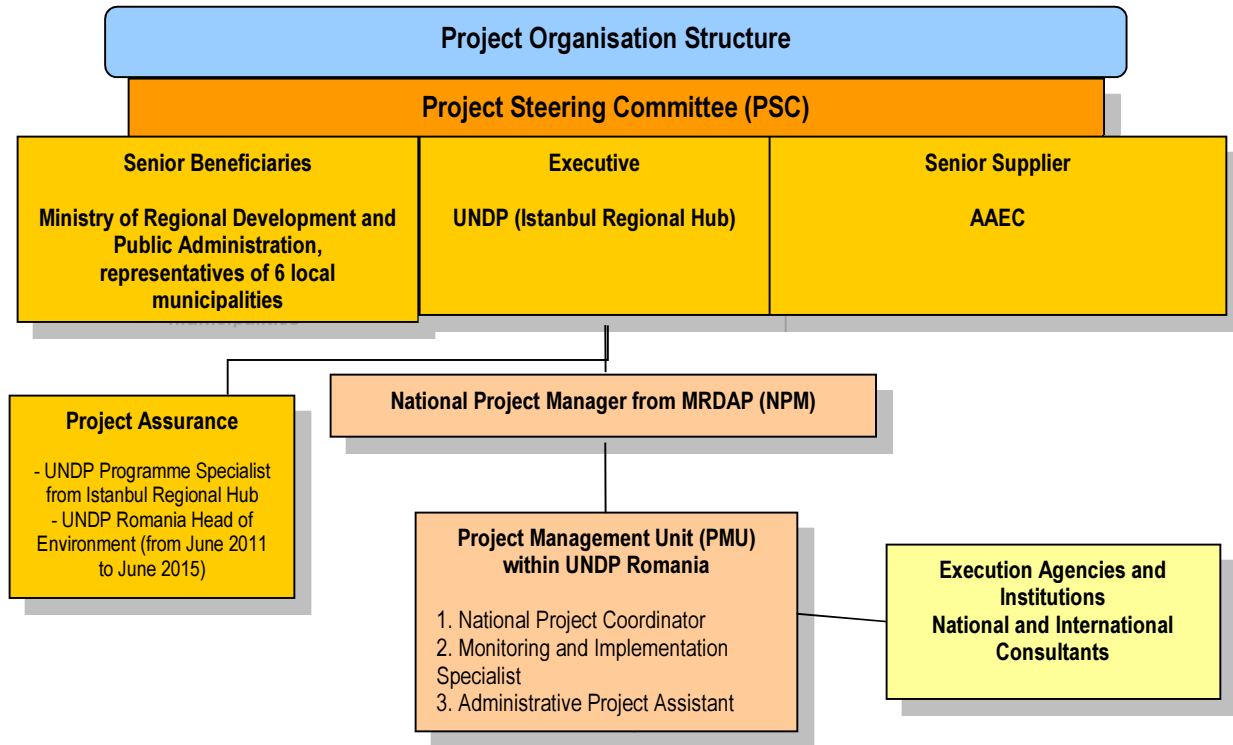
and the “Addendum June 2011 Evaluation”:

<http://www.undp.org/evaluation/documents/HandBook/addendum/Evaluation-Addendum-June-2011.pdf>

1.2.4 Project Implementation Arrangements

Implementation arrangements for the IEELIHC Project were under national implementation modality (NIM) from June 2011 to May 2014 that involved the former Ministry of Regional Development and Tourism (MDRT) as the Executing Entity. Following the recommendations from the Midterm Evaluation of the IEELIHC Project in 2013 to improve the delivery efficiency and management, the Project implementation arrangements of the IEELIHC Project were changed to direct implementation modality (DIM) which took place from May 2014 to June 2016. The Project was managed from UNDP Romania office from June 2011 to June 2015; with the closure of the UNDP Romania office in June 2015, the project was managed from the UNDP Istanbul Regional Hub (IRH) from June 2015 to June 2016. An organogram of current IEELIHC DIM implementation arrangements (after 2015) is provided on Figure 1.

Figure 1: Current Management Arrangements for the UNDP-GEF “Improving Energy Efficiency for Low Income Housing and Communities in Romania” (IEELIHC) Project



2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Project Start and Duration

The IEELIHC Project document (ProDoc) was signed on June 6, 2011 with an assumed 4-year duration. The actual Project operations were started on June 22, 2011; however, the inception workshop was not conducted until October 2011, and the Project Management Unit (PMU) was not fully established until April 2012. The current termination date of the IEELIHC Project is June 30, 2016.

2.2 Problems that Project Sought to Address

Within Romania's National Energy Strategy (NES) of 2007, the GoR recognizes the importance of building energy efficiency especially within the residential sector. Despite efforts by the GoR to address regulatory and financial barriers to energy efficiency in buildings in Romania, the pace of construction to convert a significant proportion of the country's building stock was not going to meet the targets set in the NES. Financial assistance programs set up by the Government in 2009 included funds for energy efficient housing and renewable energy programs under the National Thermal Rehabilitation program of MDRT, and a green housing program under the Ministry of Environment.

The GoR also had a €2 million program between 2007 and 2010 known as the "Structural and Thermal Rehabilitation of Blocks of Flats in Poor Regions" that was to be used to support energy efficiency retrofits for low income communities. Considering the large proportions of low income housing that exist in Romania, the impact of these funds since 2009 to implement energy efficiency retrofits in low income communities has been low⁵. More importantly, the GoR in 2009 was unable to assist low income households especially those in public housing projects where many of these low income households would not be able to afford the costs of energy required for heating during the winter season. As a result, these households would live under less than normal cold conditions without heat.

Despite the limited availability of GoR funds to assist low income households to become more energy efficient, there were a number of barriers at the commencement of the Project in 2011 that slowed the pace of energy efficiency improvements in low income households and communities including:

- A lack of institutional support and coordination of government programs that have resulted in poor municipality readiness to address building EE measures through applying for government EE financing schemes;
- Policymakers lacked the necessary information to formulate policy on fuel poverty. This included a lack of data amongst utilities and municipalities on fuel usage, and the general lack of information on the benefits of EE in buildings;
- Limited local exposure to best international practices for implementing EE measures amongst municipalities, building professionals and people in low income communities and rural areas; and

⁵ According to AAEC, less than 2% of all residential buildings have had some support for thermal rehabilitation from these funds each year.

- the lack of local demonstrations on successful EE measures, tangible energy savings and GHG emission reductions.

2.3 Goal and Objective of IEELIHC

By addressing and overcoming these barriers, the goal of the IEELIHC Project was “to directly reduce GHG emissions from the building sector in Romania by 22,227 tonnes of CO₂ by the end of project (EOP) or 668,800 tonnes of CO₂ over the lifetime of measures introduced. Based on the project results framework (PRF) of June 2011, the objective of the IEELIHC Project was designed specifically to “reduce energy consumption in buildings in low income households and regions of Romania” with the following targets:

- An increase in heat energy saved per year of “43,374 MWh by the EOP”;
- A cumulative volume of investments in EE buildings of USD 10.741 million by the EOP; and
- An estimated 110,616 people living in EE buildings by the EOP.

The IEELIHC PRF from June 2011 is contained in Appendix F.

2.4 Main Stakeholders

The main stakeholders of the IEELIHC Project that were interviewed (unless otherwise noted) during the TE mission included:

- Ministry of Regional Development and Public Administration (MRDAP);
- Ministry of Environment and Climate Change (MoECC);
- Association of Energy Auditors for Buildings in Romania (AAEC) (www.aaec.ro);
- Association of Companies for Energy Utilities (ACUE) (www.acue.ro), comprised of leading companies in Romania in the production, distribution, supply electricity and natural gas and related services such activities;
- Romanian Association for Building Services Engineers (AIR) (www.aiiro.ro);
- MTsys, a private IT company, responsible for the development of the National Building Registry Database; and
- Arabesque (www.arabesque.ro), a private company with numerous retail outlets for construction and home building materials that served as a primary supplier for thermal insulation on the IEELIHC Project.

2.5 Expected Results

To achieve the overall objective of reducing energy consumption in buildings in low income households and regions of Romania, the IEELIHC Project was designed for the removal of barriers with the following expected **Project outcomes** (from the 2011 PRF):

- Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities;
- Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects including disseminating information for Do-It-Yourself projects;

- Outcome 3: Energy efficient buildings reconstructed (and potentially new buildings constructed) with reduced fuel costs or using improved sustainable energy technologies in low-income communities;
- Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty.

3. FINDINGS

3.1 Project Design and Formulation

The design of the IEELIHC Project was prepared between 2009 and 2010 with a project preparation team comprised of international and national consultants that included a person from MDRT. During the early stages of project preparations, the need for policy reform to deal with issues related to fuel poverty was identified as a priority in light of the significant proportion of apartment blocks where low income families could not afford heating energy costs during the winter season; without such a policy, the country would not be able to effectively address financing of retrofits for low income households. Project preparations were conducted by international consultants with experience in drafting fuel poverty legislation and national consultants familiar with the legal framework and energy auditing practices related to buildings as required under Romanian Law No. 372/2005.

The project preparation team work closely with MDRT to understand the key baseline issues including:

- Ongoing and existing EE legislation including issues not covered by the existing legal framework regarding households that could not afford to pay for energy;
- A review of operational and planned financial mechanisms for building energy efficiency of the Government as well as donor agencies. This included:
 - funds from the National Thermal Rehabilitation Program (NTRP) under MRDAP;
 - funds from the National Green Homes program under MoE;
 - municipal funds for rehabilitation of public apartment blocks; and
 - EBRD funds for public municipal buildings targeting municipalities with good credit ratings;
- The state of energy auditing practices for buildings and required efforts to upgrade the skills of these practitioners to best international practices; and
- The availability of energy efficiency building materials in Romania especially in regions where low income housing is more prevalent.

At the core of the IEELIHC Project design was how to address energy efficiency in buildings for households that could not afford costly building retrofits, and increase the number of low income multifamily apartment buildings that would be retrofitted with EE building materials with financing from operational EE building programs. To increase the numbers of retrofitted apartment buildings in low income communities, the Project design adopted an integrated approach to addressing barriers related to the regulatory framework, local technical capacity for planning, engineering and implementing EE measures in buildings, and the lack of building energy efficiency information that can be used by decision-makers to design fuel poverty programs.

For Romania to be able to achieve its objectives of energy efficiency in buildings especially in low income communities, the design had to provide resources to develop a comprehensive database containing relevant information on energy consumption in buildings and household incomes. The development of such a database would improve the capacity of the Government to monitor the progress of rehabilitation under the ongoing programs such as the NTRP. Without this type of information, the Government would have difficulties in designing fuel poverty programs and allocating appropriate budgets for building rehabilitations in low income communities. Moreover, the design of the Project was

prepared in 2009 and 2010 when energy management information systems (EMIS) for public buildings were being developed in Croatia by UNDP. As such, the IEELIHC Project document did not identify EMIS as a tool to improve energy efficiency in public buildings.

3.1.1 Analysis of Project Planning Matrix

The Project Results Framework (PRF) provides number of indicators and targets to support the Project objective of reducing energy consumption in buildings in low income households and regions of Romania. Moreover, the wording of *most of the indicators does meet SMART criteria*⁶; as such, the “intent” of the indicators and targets set in the PPM has been sufficiently clear for the Project team to plan activities.

There are a total of 45 indicators and targets (12 outcome indicators and 28 output indicators as well as 2 indicators for the project goal and 3 indicators for the Project objective) contained within the IEELIHC PRF. The evaluator is of the opinion that this is an excessive number of indicators and targets that only serves as a burden to Project management for monitoring. Furthermore, many of the outcome indicators are actually output indicators and targets; as such, outcome indicators are superfluous in the PRF since the intended outcomes of the Project are to be achieved through delivery of the outputs.

Two indicators and targets of concern in the PRF are related to:

- Outcome 2: 6 building materials and construction companies within the two pilot counties which are producing and selling locally produced, sustainable EE materials at EOP; and
- Output 2.3: Two counties with active producers of locally produced, sustainable EE materials by EOP

The issue for the evaluation is whether or not these indicators and targets were attainable. Given the outcome of the Project where these targets were not even achieved, the question for the evaluation is what baseline information was collected during the design to have these indicators in the PRF. The activities defined within Output 2.3 are related to supporting existing companies that have the potential for the supply of affordable, sustainable and locally produced EE building materials that would stimulate local economic activity, and facilitate local residences, especially poor households, into undertaking EE renovations. While the intent of the activity to stimulate local economic activity in poor regions of Romania is admirable, the outcome at the EOP was that there were no companies producing any locally produced EE building materials, namely thermal insulation materials.

These targets and indicators were included in the PRF despite the absence of an assessment of existing capabilities of local companies to produce thermal insulation material. To include such an activity at the design stage of this Project, a more thorough assessment of the incremental assistance required for the establishment of such a business should have been made. This would have involved a fairly extensive study of government certified thermal insulation materials, an assessment of existing facilities where government certified thermal insulation materials would have the potential to be manufactured, discussions with these prospective enterprises on their interest in such a manufacturing

⁶ Specific, Measurable, Attainable, Relevant and Time-bound

line, and a rough estimate of the cost to upgrade these manufacturing facilities. Such an assessment would have been beyond the scope of the project preparation team.

3.1.2 Risks and Assumptions

The PRF contained the standard risks and assumptions including no radical shift in government priorities (as it pertains to EE in buildings), and sustained interest of building professionals and households in energy efficiency in buildings. In consideration of the lack of efficiency in implementing the Project due to government bureaucracy, one risk that could have been identified in the PRF would have been possible capacity constraints of central government agencies to efficiently implement the Project. This would have applied, most notably, on implementing policy reform which has been acknowledged on a previous UNDP GEF project in Romania of “being a very time-consuming endeavour that can absorb substantial project staff resources”⁷. The majority of difficulties experienced in implementing policy reform is related to the lack of interministerial dialogue. In the case of policies related to fuel poverty, MRDAP would need to initiate dialogue with a number of other ministries including the Ministry of Labour and Social Protection (MoSLP), the Ministry of Environment and Climate Change (MoECC), and the Ministry of Finance (MoF).

In defence of the Project preparation team, the IEELIHC Project was being implemented in an EU country where governments are expected to have sufficient implementation capacities. As such, there were no other options but to implement the IEELIHC project as NIM. However, the identification of existing government capacity constraints would have been useful to those managing and evaluating the Project. In hindsight, the Project might have made better overall progress had it started out as DIM.

3.1.3 Lessons from Other Relevant Projects Incorporated into IEELIHC Design

Some lessons were taken from the previous UNDP GEF project implemented in Romania entitled “Capacity building for GHG emission reduction through energy efficiency” (GEF ID 284), and incorporated into the design of the IEELIHC Project. This included the incorporation of a flexible level of subsidies to cover incremental costs of EE measures in low income households in Romania (this would cover a wide range of EE measures and applications) as well as incremental costs to upgrade manufacturing facilities for locally produced sustainable EE building materials (between 20 to 50%).

However, the successes and lessons learned from the UNDP-GEF project in Croatia entitled “Removing barriers to improving energy efficiency of the residential and service sectors” (GEF ID 882) on energy management information systems (EMIS) to achieve energy efficiency in public buildings, was not incorporated into the IEELIHC Project design nor was it proposed as a change during the inception phase.

3.1.4 Planned Stakeholder Participation

Stakeholder participation was to be facilitated through the IEELIHC project design through:

- Inter-organizational working group (IOWG) meetings for the purposes of formulating and analysing policies related to fuel poverty. These group meetings were to bring in

⁷ From page 5 of the UNDP GEF independent final review of “Capacity building for GHG emission reductions through energy efficiency improvement in Romania”, accessible on <https://erc.undp.org/evaluation/documents/download/927>

- noted policy consultants in Romania as well as relevant government personnel from various ministries including MRDAP, MoLSP, MoECC, and MoF;
- Training workshops on designing and implementing best practices for EE building measures that would be held mainly in the target counties and bring together municipal personnel as well as local and regional EE building practitioners; and
 - Implementing pilot activities under Component 3. This would include consultants to prepare standard EE building designs and analysis, suppliers of EE building materials, and local trades persons who will install the retrofitted equipment and thermal insulation materials.

3.1.5 Replication Approach

The Project design envisaged a replication approach where the lessons learned on the pilot activities IEELIHC Project under Component 3 would be of direct interest to other counties in Romania as well as other countries regionally such as Moldova and Bulgaria. This would have required the IEELIHC Project to be implemented with close monitoring and evaluation of the Project results.

In addition, the Project design also sought to generate 2 knowledge products that would replicate EE measures in fuel poverty areas of Romania: i) preparation of a guide for municipal decision-makers on a methodology to assess fuel poverty issues in various regions throughout Romania; and ii) a database of local and regional building stock complete with energy information and potential EE measures that could be implemented; this database could be used by municipal officials as a tool to determine EE building investments in fuel poverty areas, and decision-makers in the national government for designing national programs that address fuel poverty.

3.1.6 UNDP Comparative Advantage

The comparative advantage of UNDP's involvement on IEELIHC is its focus on long-term involvement and close collaboration with the Government of Romania and local stakeholders on energy efficiency and other climate change mitigation developments. UNDP has undertaken one similar type project in Romania and several in other regional countries that provide a focus on improving the energy efficiency of the building stock in CIS countries.

With UNDP's strong track record of developing local capacity, and effectively working with a wide range of local stakeholders from public and private sectors, technical experts, civil society, and grassroots level organizations, it has the corporate vision, experience and capacity to implement projects that include improving the lives of the most vulnerable sectors of the country's population. This would include implementing difficult approaches to improving access to building energy efficiency for low income households that cannot afford the investments required to modernize their households; implementing such approaches would need a multi-dimensional development perspective, and the capacity to address cross-sectoral issues.

3.1.7 Linkages between IEELIHC Project and Other Interventions within the Sector

The intention of the IEELIHC Project was to create synergies with similar building energy efficiency initiatives of being undertaken by EBRD. The focus of the EBRD initiative would be to work with higher income municipalities that have stronger credit ratings and access to

more sophisticated financing mechanisms related to publicly owned assets. The IEELIHC Project would then focus solely on building energy efficiency in the residential sector with a focus on low income households that suffer from fuel poverty.

3.1.8 Management Arrangements

The original management arrangements of the IEELIHC Project was to have MRDAP as the Executing Entity that would coordinate Project activities through a PIU that was set up within the premises of MRDAP. A Project Board consisting of MRDAP, representatives of the two counties, and AAEC and the Romanian Green Building Council (RoGBC) would provide oversight and guidance is required by the Project manager. Success of these management arrangements were based on the assumption that the capacity of MRDAP would be sufficient to efficiently implement and coordinate the IEELIHC Project. Given the poor progress of the Project up to 2014, the Project was changed to Direct Implementation Modality.

3.2 Project Implementation

Implementation of the IEELIHC Project is basically a tale of two projects, NIM modality between June 2011 and May 2014 and DIM modality between May 2014 and June 2016. The following is a compilation of key events and issues of how the IEELIHC Project was implemented:

- The IEELIHC project commenced operations in June 2011 under “National Implementation Mode with advances”;
- The Inception Phase of the Project did not commence until October 2011 with the delivery of the Inception Report in July 2012, an 8-month delay from inception workshop to inception report delivery. Typically, this should only require a maximum of 3 months;
- Establishment of the Project Management Unit (PMU) did not occur until December 2011, 6 months after the commencement of the Project due to numerous bureaucratic delays by the Government of Romania. A National Project Manager was put in place in December 2011. As such, the Project was immediately placed in a position to not deliver Project results in a timely manner;
- The UNDP Country Office (CO) made decisions to assist the PMU in implementing the Project and reduce the risk of further delays in implementation. This included:
 - Decision to sign the first micro-capital grant agreement in November 2011 without the establishment of the PMU to commence the training activities under Component 2. This allowed the Project to kick-start project activities rather than risk further delays in the establishment of the PMU;
 - In early 2012, the UNDP CO had discussions and had offered the Government of Romania a slight change in the implementation modality of the Project to “NIM with full CO support”, citing concerns over slow approvals for issues such as the establishment of the PMU. This offer was declined by the GoR;
 - The midterm evaluation conducted in October 2013 recommended that UNDP takeover formal responsibility and direct control of the IEELIHC Project or direct implementation modality (DIM). One significant reason for this recommendation was the lack of delivery of Output 3.1: Standard EE building design analyses for key types of existing apartment blocks and retrofitted thermal systems of selected apartment blocks. Delivery of this documentation was critical in the Project being able to implement the pilot projects for EE measures planned in Output 3.2;

- The GoR signed an agreement in May 2014 relinquishing its control of the IEELIHC project to DIM. This was done to save the Project from returning its funds back to GEF.

3.2.1 Adaptive Management

In consideration of the numerous obstacles during the course of implementing the IEELIHC Project, there were numerous instances where the Project needed to be adaptively managed. In many cases, adaptive management was required to ensure completion of certain processes deemed vital towards achievement of the Project objectives. Instances of adaptive management during the implementation of the IEELIHC Project includes:

- UNDP undertaking necessary actions to undertake energy audit training prior to the establishment of the Project Management Unit (PMU) in 2012. Without this action, the Project would have immediately fallen behind schedule;
- The change in the management arrangements of the Project from NIM to DIM was an adaptive management decision taken in response to the MTE recommendations and to remove the numerous implementation bottlenecks. Moreover, under DIM, the PMU could make critical decisions in a more timely manner as opposed to decisions taken with the PMU housed within the premises of MRDAP;
- Support for integrating the highly successful EMIS developed by UNDP Croatia into the national buildings registry database (Output 4.2) through UNDP's Regional Technical Advisor (RTA) in late 2014. However, with less than 18 months remaining on the Project, there was insufficient time for the PMU to adapt the Croatia EMIS to Romania. During the first half of the IEELIHC Project from 2011 to 2014, there was no focus on energy management or meaningful development of the buildings registry database;
- After the Project became DIM in May 2014, adaptive management was applied in the identification of the best possible solution for sourcing sustainable EE insulation materials for the rehabilitation of 43 buildings (as a part of Output 3.2), considering that the local market of sustainable EE building materials producers was underdeveloped, and that any upgrading of their production capacities was beyond the scope of the Project. In April 2015, the current PIU team of IEELIHC re-launched the procurement process for thermal insulation material by specifying standardized EU and Romanian-certified ETICS (external thermal insulation composite systems), widely produced in Europe that would remove the bottleneck to implementing the thermal retrofits of 43 social buildings. More importantly, the Project had finally dropped the ill-fated concept of sourcing Romanian-made sustainable EE building materials (related to Output 2.3) after 3 years;
- To speed up and ensure implementation of the pilot EE measures under Component 3, decisions were made by the PMU and NSC to address rehabilitations in public buildings (mainly kindergartens and schools) rather than apartment buildings. The rehabilitation of apartment buildings involves a large number of building owners, all of whom needed to be involved in the decision-making process and commit to investment, increasing both the time required and the risk that the activity would fail. By addressing public buildings, the Project was able to deal with centralized building ownership and decision-making processes in the municipalities;
- Finally, the Project has adapted well to develop and sustain strong relationships with high-ranking officials of MRDAP since early 2015, despite the absence of a UNDP Resident Representative. The result has been the Project Coordinator of the PMU

having excellent access to the General Secretary of MRDAP and MRDAP's Project Coordinator, a person who is knowledgeable on the Project as well as on topics related to energy efficiency in buildings. The IEELIHC Project has benefited from the management of this relationship to the extent that the General Secretary of MRDAP had stated that the Project is now providing national benefits as originally envisaged by the Government of Romania.

Adaptive management should have been applied to efforts to achieve Output 2.3 related to "2 counties with active producers of locally produced, sustainable EE materials by EOP". In 2012 and 2013, the PMU and UNDP did not recognize that there was an absence of any capacity to supply thermal insulation material in the two target counties of Dolj and Hunedoara on a commercial scale. Furthermore, this material was specified by UNDP in the first contract on technical documentation of EE designs for 50 typical apartment building blocks (Output 3.1) as a selected material for the documentation. However, the material had not yet received certification by MRDAP as a government approved thermal insulation materials for use in public buildings and therefore, further delayed the first contractor in delivering this technical documentation.

Notwithstanding the poor performance of this first contractor, early recognition of this barrier would have helped chart a different course of action and improve the prospects of earlier delivery of thermal insulation material for the pilot projects in Output 3.2. Instead, there was an insistence by UNDP to wait for the certification of their selected material for thermal insulation. This decision proved very costly to the entire Project delaying not only the energy audits and technical documentation for 50 typical apartment types, but also delaying delivery of the pilot projects that were to generate energy savings and GHG emission reductions for the purposes of designing fuel poverty programs.

3.2.2 Partnership Arrangements

The PMU established a number of partnership arrangements as originally envisaged in the ProDoc. The most prominent Project partners at the time of this evaluation includes:

- MRDAP;
- The Ministry of Environment and Climate Change (MoECC);
- The administrative governments of Dolj and Hunedoara (the two counties targeted by the Project);
- Municipal governments where pilot projects were to be implemented (Calafat, Calan, Craiova, Petrița, Petrosani, and Vulcan);
- The Association of Energy Auditors for Buildings in Romania (AAEC);
- Association of Companies for Energy Utilities (ACUE) (www.acue.ro), comprised of leading companies in Romania in the production, distribution, supply electricity and natural gas and related services such activities;
- Romanian Association for Building Services Engineers (AIIR) (www.aiiro.ro); and
- Arabesque (www.arabesque.ro), a private company with numerous retail outlets for construction and home building materials that served as the primary supplier for thermal insulation on the IEELIHC Project.

In 2012, there was an issue with respect to who would organize the pilot projects. In the ProDoc, RoGBC was identified as a co-financer to organize training amongst low income housing communities and to coordinate the implementation of pilot projects that would

demonstrate tangible energy savings for public buildings in apartment blocks. RoGBC was accused at the time of not providing quality materials for training while at the same time, one their senior personnel was holding a senior technical advisor position in UNDP. In addition, RoGBC claimed that the scope of the project had changed from their original agreement, and that their services to coordinate implementation of these pilot projects was no longer feasible for them organizationally, especially with no firm commitment from municipal partners to invest in building EE measures⁸. The involvement of RoGBC on the IEELIHC Project was terminated in December 2012.

3.2.3 Feedback from M&E Activities Used for Adaptive Management

Feedback for M&E activities has been provided through:

- Progress reports that were annually issued from 2012 to 2015;
- PIRs from 2013 to 2015 that provided more details that could be used for adaptively managing the Project;
- PSC meeting minutes from 2012 to 2015 that provides details of important findings from M&E activities and the adaptive management measures to resolve these issues. This would include discussions in 2015 on the selection of stone wool as thermal insulation material and the development of an international tender to source standardized materials commonly used in the EU. Such a tender would increase the likelihood that a thermal insulation suitable material could be procured in a timely manner and allow the pilot projects of Output 3.2 to proceed;
- Mission reports available since 2012 that provided information of visits to various pilot project sites and assessments on progress; and
- The Mid-Term Evaluation (MTE) report from January 2014 which can be considered as feedback for adaptive management of the Project. On the basis of a moderately unsatisfactory rating (MU) mainly due to delays to the delivery of critical outputs, the MTE contained recommendations, the most important of which are listed below required adaptive management from the UNDP CO:
 - UNDP taking full and formal responsibility of the IEELIHC Project through direct implementation modality (DIM);
 - UNDP needing to hire one full-time project manager responsible for management and coordination of all Project activities; and
 - develop a backup plan for demonstrating alternative sustainable insulation solutions based on local raw materials; and

MTE report, however, did not make a recommendation on integrating energy management information systems (EMIS) with the development of the national buildings registry database.

In conclusion, the Project had sufficient feedback from M&E activities to adaptively manage the Project; however, adaptive management could have been applied earlier in 2012 and 2013 especially with regards to Output 2.3 as mentioned in Section 3.2.1, instead of waiting for the completion of the MTE in 2014.

⁸ This was related to many of these communities dealing with difficult economic circumstances with the closure of local coal mines and district heating systems, removal of subsidies and high unemployment rates.

3.2.4 Project Finance

The IEELIHC Project had a GEF budget of USD 2,974,840 that was utilized over a 60-month duration, managed by a PMU under a “NIM” regime from June 2011 to May 2014, followed by management by a PMU under a “DIM” regime from May 2014 to June 2016. Table 1 provides an overview of expenditures of the GEF Project budget of USD 2,974,840 from June 2011 to May 31, 2016. An analysis of IEELIHC Project expenditures reveals that during the NIM regime, Project expenditures were mainly confined to:

- technical assistance to preparing fuel poverty analysis and information (under Component 1);
- providing capacity building and training for government and municipal personnel as well as building professionals and architects (under Component 2). This also included ill-fated efforts to assist two companies to become local suppliers of thermal insulation material for pilot projects in Component 3; and
- providing technical assistance towards energy audits and technical documentation for 50 typical apartment building blocks.

The cost effectiveness of the Project under NIM regime had been unsatisfactory in consideration that the expended funds had not yet yielded any demonstrations of EE measures using locally sourced and produced EE building materials. This is somewhat also reflected in the expected expenditures for Component 3 that were underspent.

The cost effectiveness of the Project under DIM regime has been satisfactory in consideration that Component 3 expenditures were meeting original expectations, notably in 2015. Notwithstanding, the final Component 3 expenditures of USD 1.68 million will not meet the original expenditures of USD 2.0 million. Moreover, though not reflected in Table 3, the real PMU costs are likely USD 137,569 plus a portion of the other component expenditures where there were separate budget lines for M&E. This means that in reality, PMU costs were likely higher than the expected 5% for project management cost which is expected of UNDP projects. An actual higher PMU cost could also be attributed to more intense administrative activities required by the PMU to meet with several personnel MRDAP and local government officials from, noting the frequent changes of these personnel during the course of the IEELIHC Project.

Actual Project co-financing was down by 17% under the ProDoc estimate of USD 119.2 million. Lower co-financing estimates were due to lesser contributions from MRDAP on the size of their NTRP and MoECC with regards to the sizes of their Green Homes Program respectively on the size of their fund. Co-financing details can be found on Table 2.

Table 1: GEF Project Budget and Expenditures for IEELIHC Project (in USD as of May 31, 2016)

Outcome	Budget (from Inception Report)	2011*	2012	2013	2014	2015	2016**	Total Disbursed	Remainder for Project (until the end of project)	Total Remaining
Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities.	144,420	0	39,850	74,512	47,747	38,892	17,614	218,614	14,116	
Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects	438,960	13,445	90,067	65,291	38,546	110,441	21,132	338,923	61,175	
Outcome 3: Energy efficient buildings reconstructed (and potentially new buildings constructed) with reduced fuel costs or using improved sustainable energy technologies in low-income communities.	2,027,100	0	135,166	226,057	236,978	745,842	332,255	1,676,298	74,619	
Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty.	170,570	0	0	26,496	26,518	100,183	17,817		110,015	
Inception Workshop, Mid-Term and Final Evaluations	60,000	0	7,506	14,879	42,054	37,905	11,251	113,595	40,998	
Project Management Unit	133,790	12,842	56,602	34,992	22,147	9,683	1,304	137,569	1,304	
Gain/loss			2,825	-183	1,225		607	4,473	-	
Total (Actual)	2,974,840	26,287	332,016	442,043	415,213	1,042,947	401,373	2,489,472	149.1%	0
Total (Cumulative Actual)	2,974,842	26,287	358,303	800,346	1,215,559	2,258,505	2,659,879			
Annual Planned Disbursement (from Inception Report)		381,970	922,878	1,045,161	624,833	0	0			
% Expended of Planned Disbursement		7%	36%	42%	66%					
Remarks: * Commencing June 22, 2011.										
** Up to May 31, 2016 (that would include nominal commitments to cover pilot projects, final project workshop and PIU staff salaries by June 30, 2016)										

Table 2: Co-Financing for IEELIHC project (as of May 31, 2016)

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 ²¹	0.050	0.050	118.50 ²²	98.67 ²³					118.55	98.72
Loans/Concessions										
• In-kind support			0.50	0.56 ²⁴	0.15 ²⁵	0.08			0.65	0.64
• Other										
Totals	0.050	0.050	119.00	99.23	0.15	0.08	0	0	119.20	99.36

²¹ Includes all cash contributions

²² Includes USD 36.5 million from MRDAP and USD 82 million from the MoE

²³ Includes USD 58.57 million from MoE and USD 40.1 million from MDRAP

²⁴ Co-financing of central heating units, window replacement and external thermal insulation from Craiova, Craiova Metropolitan Area, Calafat, Petrosani, Petrila, Vulcan, Calan Municipalities

²⁵ Includes USD 71,000 from RoGBC and USD 81,000 from AAEC

3.2.5 M&E Design at Entry and Implementation

An M&E design of the IEELIHC Project was elaborated in the Inception Report of July 2012 when the Project was under NIM. The design assigned M&E functions at the municipal and national levels with overall responsibilities for monitoring being undertaken by MRDAP with the aim of implementing the EU Energy Performance Building Directive. This included MRDAP's role in collecting and reviewing reports at specified intervals from the municipalities, the RoGBC, the AAEC and other project partners. MRDAP had also agreed to develop appropriate M&E forms and reporting protocols to ensure consistencies in reporting. M&E information would then be aggregated to analyse overall program outcomes and results, bring attention to the PSC issues of concern for adaptive management, and highlighting of best practices and successes that could be disseminated as a part of the knowledge management aspects of the Project.

The reporting quality of the PMU (during NIM and DIM) was satisfactory. The evaluators had access to annual PIRs that included reports on all targets in the PRF as well as monthly and progress reports, and mission reports. These reports were sufficiently thorough in conveying the Project achievements and issues that were addressed in minutes to PSC meetings.

As such, *the ratings for M&E plan design and implementation are both rated as satisfactory*. Ratings according to the GEF Monitoring and Evaluation system²⁶ 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

The performance of the implementing and executing agencies of the IEELIHC Project is divided into NIM and DIM regimes:

- During the NIM period of the Project (June 2011 to May 2014, UNDP served as the implementing agency and MDRT (with ministry name changed to MRDAP in January 2014) serving as the executing partner;
- During the DIM period of the project (May 2014 to June 2016), UNDP undertook the dual role of implementing and executing entity with MRDAP serving as an executing partner (with support from a National Project Manager based in MRDAP).

The performance of MDRT during NIM as the executing partner of this Project is rated unsatisfactory. The reason for this rating can be attributed to the political instability in Romania during the 2011 to 2014 period of the Project. During this time, MDRT underwent 3 management changes including ministers and state secretaries, and MOE underwent 4

²⁶ 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.

changes in top management. The impact of these changes led to weak ownership of the Project during the NIM, excessive efforts by the PMU to familiarize new government staff of the Project, and lengthy decision-making processes at the MDRT.

The performance of MRDAP during DIM as an executing partner is rated as moderately satisfactory. The reason for this rating during the 2014 to 2016 period of the Project was the excellent support from the current General Secretary of MRDAP and their Project coordinator for the IEELIHC Project. Their role in coordinating implementation of the pilot projects in Component 3 has helped the Project towards meeting some of its targets, namely Outputs 3.1 and 3.2 that has resulted in the installation of 21 sustainable heating systems in 2016, and 43 apartment and a social buildings undergoing thermal rehabilitation and other EE measures. In addition, they have been very supportive in facilitating dialogue with parliamentarians so that fuel poverty is adopted in the national legislation of Romania.

However, by the EOP of June 30, 2016, MRDAP will not have delivered its target of having fuel poverty adopted in the national legislation of Romania, despite their strong support in disseminating policy papers and analyses of fuel poverty to all of its departments. Due to upcoming national elections in November 2016, there is uncertainty as to when fuel poverty will be adopted into the national legislation of Romania.

The performance of UNDP during NIM as an implementing entity is rated as unsatisfactory. There were difficulties experienced by the Project in working with the first design works consultant in 2012 and 2013 to prepare energy audits and EE measures for 50 typical apartment blocks. Moreover, their work was further delayed by UNDP's insistence on using locally-sourced rockwool as a thermal insulation system from a company named Mopatel that required more than one year to obtain MRDAP certification. This was critical since:

- this consultant was unable to include this material in their documentation for EE measures by a critical date of February 2013 until there was certification of this new material;
- conditional certification was received in December 2013 that allowed the material to be used on pilot projects only for 2 years, the period of time determined to be sufficient to evaluate the performance of the material;
- the contract for the first consultant was cancelled in February 2014 by MRDAP;
- during discussions of a transition of the Project from NIM to DIM (from December 2013 to May 2014), more effort was expended into identifying a second locally supplied thermal material from a company named Izomiorita, and certifying its materials as a means to allow 2 companies (Mopatel and Izomiorita) to participate in a tender for locally supplied thermal material;
- no assessments were made from December 2013 to May 2014 on the feasibility of upgrading these 2 companies to commercial scale production of locally sourced thermal solar insulation materials in early 2014;
- by the time the Project was transitioning to DIM in May 2014, an entirely new strategy to sourcing thermal insulation material was required;
- this entire search for locally sourced thermal insulation materials delayed the Project by 15 months during NIM (from February 2013 to May 2014). This also caused delays during the DIM phase of the Project by more than 9 months while the team re-strategized its approach to procuring locally sourced thermal insulation materials; and

- there appears to be an absence of any qualified technical personnel to make decisions on the quality of thermal insulation material as well as how to upgrade small enterprises to commercially produce such materials locally.

The performance of UNDP during DIM as an implementing and executing entity is rated as satisfactory. New personnel in the PMU in late 2014 were tasked with accelerating Project activities to make up for lost time during NIM. The team performed satisfactorily by placing more focus on:

- procurement and installation of central heating systems in a number of social buildings in target low income communities of Calafat, Petrosani, Vulcan and Petrița through UNDP's procurement system commencing in early 2014 (Output 3.1);
- a re-tendering for the completion of documentation for energy audits and EE measures for 50 typical apartment block designs that was finally delivered in late 2015 (Output 3.1);
- re-strategizing procurement of thermal insulation material and subsequently preparing its tender and organizing the pilot installation of an EU standard thermal insulation material on public buildings and apartments (Output 3.2). Ironically, both Mopatel and Izomiorita did not participate in this tender, despite receiving support from the Project for the certification of its materials. Neither company had the production capacity to supply the volume of thermal insulation material for the pilot projects;
- working with local municipal governments in efforts to mainstream fuel poverty into local development strategies including Petrosani, Calafat, Vulcan and Craiova; and
- development of the building registry database that can be used as a tool by decision-makers in MRDAP in designing fuel poverty programs (Output 4.2).

Furthermore, UNDP's PMU have developed a good working relationship with MRDAP, as evidenced by frequent meetings between the MRDAP's General Secretary and their Project Coordinator with PMU staff. It is unfortunate that the UNDP PMU team does not have sufficient time to fully complete the Project activities. With additional time, the evaluator is certain that the Project would have been able to generate useful information on the energy savings from the pilot projects of Outputs 3.1 and 3.2, and have this information entered onto the buildings registry database (Output 4.2). This type of information would have been useful in the preparation and design of fuel poverty programs and its adoption into national legislation.

A summary of ratings of the implementing and executing entities of the IEELIHC Project are as follows:

- National Executing Partner during NIM (MRDAP) - 2;
- National Executing Partner during DIM (MRDAP) - 4
- Implementing Entity during NIM (UNDP) - 2
- Implementing and Executing Entity during DIM (UNDP) – 5.

3.3 Project Results

Assessment of Project achievements and shortcomings are provided in this section against the revised December 2010 Project log-frame. Each outcome was evaluated against individual criterion 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.

The Project outcomes were rated based on the following scale:

- *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.

3.3.1 Overall Results

Project Objective: Reduction of energy consumption in buildings in low-income households and regions of Romania.

Intended EOP outcome or target (from 2011 PRF):	Actual EOP outcome or target:
22,227 tonnes CO _{2eq} per year reduced (direct reductions) by end-of-project (EOP) from a baseline of 849 tonnes CO _{2eq} per year.	⇒ An <i>satisfactory</i> outcome was achieved with an estimate of 37,357 tonnes CO _{2eq} /yr of GHG emission reductions of which 34,125 tonnes CO _{2eq} per year was reduced on the basis of the Project's involvement with the amendment of Ordinance 18/2009 with Ordinance 63/2012 (enacted in November 2012). This amendment directly influenced the expansion of the scope of energy efficient measures that would be financed by the National Thermal Rehabilitation Program, to empower municipalities on the selection of buildings for rehabilitation and EE measures to implement. This would allow the municipalities then to allocate necessary budgets and subsidies to low income households who would not be able to afford implementation of such rehabilitation works. Information from MRDAP on local rehabilitation programs financed under Article 2 of Ordinance 63/2012 to the end of 2015 indicated that 216 buildings (9,626 apartments) have been rehabilitated. See Table 3 for summary of GHG reductions from the Project.

666,800 tonnes CO _{2eq} reduced over the lifetime of the EE measures introduced (direct reductions) from a baseline of 25,456 tonnes CO _{2eq} .	⇒ A <i>satisfactory</i> outcome was achieved with an estimated 747,140 tonnes CO _{2eq} reduced over a 20 year lifetime investment ²⁷ ;
43,374 MWh in heat energy per year saved as a direct result of this project by EOP from a baseline of 2197 MWh.	⇒ A <i>satisfactory</i> outcome was achieved with an estimated 82,309 MWh per year of energy saved. Similar to the GHG emission reductions, most of these energy savings come from building rehabilitations facilitated by the amendment of Ordinance 18/2009
USD 10.741 million of investments in EE buildings leveraged (cumulative USD by end-of-project)	⇒ The Project together with MDRAP has leveraged €447 million (USD 492 million) through the Regional Operational Programme that will target residential buildings with specifications for financing low income households rehabilitations, where instead of a 25% share in co-financing for thermal rehabilitation of their apartments, a reduction to 3,5% has been provided as a guideline with the rest being co-financed by the local municipality as non-refundable amount.
110,616 people living in EE buildings by EOP from a baseline of 4,500 people	⇒ Through the National Thermal Rehabilitation Programme, an additional 183,078 people are living in thermally retrofitted buildings (taking into consideration of the apartment blocks thermally retrofitted through the project's lifetime and calculated at an average of 3 persons per apartment). ⇒ Through the “Casa Verde” programme financed by the Ministry of Environment and Climate Change, 80,995 people (based on an estimate of 3 people/household) are benefiting from the installation of sustainable heating systems, between 2011-2016.

Rating: relevance: 5
 effectiveness: 5
 efficiency: 4
 overall rating: 4.7

The original target of the project for GHG emission reductions in the building sector in Romania was to achieve 22,227 tonnes CO_{2eq} reductions per year by the EOP. These direct GHG reductions were to be generated mainly from completed pilot projects, technical assistance to build local capacity to implement building EE projects, and from EE building projects that are financed from national programs such as NTRP.

As can be seen from Table 3, most of the direct GHG emission reductions of the Project were generated from the Project's involvement in amending Ordinance 18/2009 with Ordinance 63/2012. This was unexpected since the original calculations in the ProDoc were expecting to generate GHG emission reductions from the pilot projects using locally sourced sustainable EE building materials. Furthermore, GEF's GHG calculation methodology of 2013 now allows direct and post-project direct emissions reductions to be generated from legislative changes brought about by the GEF project. With the data provided by MRDAP

²⁷ The ProDoc used a 30-year investment period. However, the 2013 GEF guidelines recommend a maximum investment lifetime of 20 years which applies to all estimates made in this evaluation.

on actual achievements under Article 2 of Ordinance 63/2012, 216 buildings were rehabilitated from 2013. The MRDAP data and the GHG calculation makes the assumption that these rehabilitations reduce energy consumption of these buildings by 40%.

On the other hand, the pilot projects implemented in Component 3 only made a minor contribution to the overall direct GHG emission reductions. If the Project was more efficiently implemented with earlier approvals of the documentation standard EE building design analysis for key types of existing apartment blocks (Output 3.1) and the securing of the supply of locally sourced thermal insulation material (Output 2.3), GHG emission reductions generated from pilot projects under Component 3 would have been realized. Furthermore, had they been effectively monitored before and after rehabilitation, these pilot projects would have demonstrated tangible energy savings and GHG reductions, from which positive information could have been disseminated to other stakeholders, increasing the interest in EE building measures.

Table 3 is a summary of energy savings and emission reductions against outcomes and activities. Table 4 is a summary of the main targets of the IEELIHC Project in the ProDoc and corresponding achievements. Details on the calculations and determination of GHG emission reductions from this Project are provided in a separate report in Annex G.

Table 3: Summary of energy savings and CO₂ reductions from the IEELIHC Project

	Project Period (2011- 2016)		10 year post-project (2016-2025)	
	MWh savings per year	Lifetime direct emission reductions (tonnes of CO ₂ /yr)	Direct post-project emission reductions (tonnes of CO ₂ /yr)	Indirect emission reductions (tonnes of CO ₂ /yr)
Outcome 1: Amendments to Ord. 18/2009 with Ord. 63/2012	74,994	683,000	1,366,000	n/a
Activity 3.1.1: Technical Documentation for 50 building types	0	0	n/a	36,700
Activity 3.1.2: Boiler Replacements in 21 public buildings	427	11,440	n/a	22,800
Activity 3.2.1: Insulation Programme for 43 public buildings	6,243	48,700	n/a	97,400
Activity 3.3.1: Renovation of windows and doors of 7 Public Buildings	645	4,000	n/a	8,000
Outcome 4: Building Energy Performance database	0	0	0	0
TOTAL	82,309	747,140	1,366,000	164,980

Table 4: Summary of Targets and Achievements

Indicator	Targeted	Achieved
Direct ER over lifetime (ktCO ₂)	641.3	746.6
Annual Direct ER (ktCO ₂ /yr)	21.4	37.3
Annual Energy saving (MWh/yr)	41,177	82,309
Number of buildings rehabilitated	1,274	321
Additional persons in EE buildings	110,620	28,350
Post Project Direct ER (ktCO ₂)	No target	1,365
Indirect ER (ktCO ₂)	1,600-1,900	165

3.3.2 Component 1: Improved policies to support energy efficiency in low-income communities

Intended Outcome 1 and associated outputs and targets (from 2011 PRF):	Actual Outcome 1 as well as associated outputs and targets:
<p>Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low income communities. Target includes 3 national-level Government institutions integrating the reduction of fuel poverty through EE/RE into their programmes and policies by EOP</p>	<p>⇒ <i>A moderately satisfactory outcome has been achieved with regards to Project support to integrate Romanian energy policy with fuel poverty issues and addressing EE needs in low income communities. While the Project has provided robust efforts that contribute to policy analysis, policy formulation, and draft amendments, none of these legislative acts has yet been promoted by MRDAP and other ministries for legislation endorsement. Moreover, legislative approvals are unlikely for the EOP due to local and national elections to be held in June and November 2016 respectively.</i></p>
<p>Output 1.1: Established national level functional multi-organizational working group that formulates and facilitates approval and adoption of policy recommendations and action plans for EE integrating poverty alleviation into their working group programs. Targets include:</p> <ul style="list-style-type: none"> • 8 working group meetings by EOP; • 3 actions taken to change programmes and policies to address fuel poverty by the institutions involved in the working group by EOP 	<p>Output 1.1 was partially achieved:</p> <p>⇒ <i>8 inter-organizational working group (IOWG) meetings were organized during the course of the Project. Meeting participants ranged from national government personnel to municipal representatives, special interest groups within the energy sector and UNDP. These meetings covered a wide range of discussions that were focused on the formulation of policy recommendations and action plans that integrate fuel poverty and EE with poverty alleviation (i.e. definition of fuel poverty, methodology for fuel poverty assessment, available financing mechanisms for fuel poverty, transposition of existing directives on EE performance of buildings that integrate fuel poverty within the national legislative framework;</i></p> <p>⇒ <i>At IOWG meeting in December 2015, only 1 action was taken to change programmes and</i></p>

Intended Outcome 1 and associated outputs and targets (from 2011 PRF):	Actual Outcome 1 as well as associated outputs and targets:
	<p><i>policies to address fuel poverty by MRDAP that includes the amendment of Ordinance 18/2009 with Ordinance 63/2012. During the last two IOWG meetings in February and March 2016, the legislative amendments proposed by the Project through the work of the National Policy Advisor were presented; however, due to lack of participation from central level decision makers, these meetings resulted in presenting these proposals to other institutions such as the National Authority for Energy Regulation and EBRD and representatives on behalf of the authors of the National Energy Strategy for Romania with the promise of integrating these recommendations into the National Energy Strategy under development. Unfortunately, other institutions such as the MoLSP that need to take some action on fuel poverty legislation have not yet had any meaningful dialogue with MRDAP on fuel poverty. Moreover, with the Project ending in June 2016, there is some uncertainty as to whether MRDAP personnel will continue to facilitate the necessary interministerial dialogue.</i></p>
<p>Output 1.2: Identified fuel poverty-related EE improvement activities that are integrated into, and implemented within, development plans and energy plans of selected municipalities/counties; including leveraging funding sources for EE improvements. Targets include:</p> <ul style="list-style-type: none"> • 2 counties with action plans implemented to address fuel poverty by EOP; • 2 new sources of funding identified along with concrete project plans developed for financing by Year 3.5. 	<p><i>Output 1.2 was achieved:</i></p> <p>⇒ <i>Both Calafat and Petrosani municipalities have approved action plans to address energy efficiency and fuel poverty within their jurisdictions with Project assistance. In addition, the Project also assisted in the preparation of approved local development strategies for both the Municipality of Vulcan and Craiova Metropolitan Area;</i></p> <p>⇒ <i>There are currently 3 sources of funding identified for addressing EE in low income households:</i></p> <ul style="list-style-type: none"> • <i>National Thermal Rehabilitation Program under MRDAP;</i> • <i>local municipal funds; and</i> • <i>EU Regional Operational Programme funds</i>

Rating: *relevance:* 5
 effectiveness: 4
 efficiency: 3
 overall rating: 4

One of the main Project results of this component has been to draft the concept of fuel poverty into its energy legislation. Fuel poverty has been introduced into Romanian legislation as “a situation in which one cannot ensure the normal conditions of thermal

comfort or because the household cannot pay for the fuel or heating service in the quantity or quality required". Fuel poverty legislation would allow the GoR to more effectively address the issues related to 42% of households that cannot afford the costs of energy required for normal heating in Romania²⁸. The legislation would be designed to prioritize investments including blocks of flats and public housing where some households cannot ensure their normal conditions of thermal comfort, and where defined social welfare measures can be provided in force. In particular, legislation would provide MoLSP with a methodology to calculate subsidies to vulnerable heat consumers who are in a state of fuel poverty.

In summary, Project efforts to support this effort have been robust. This included:

- inputs by an international consultant to prepare background information and strategies that could be employed by the government on fuel poverty (based on experiences in the UK) including how fuel poverty be assessed and its impacts evaluated;
- preparing proposals for defining "fuel poverty" concept in Romania and a methodology for "Fuel Poverty Assessment in Romania" that defines specific means to assist vulnerable consumers to receive basic services to ensure normal thermal comfort;
- efforts to facilitate national dialogue through the Inter-Organizational Working Group (IOWG), with emphasis on the vulnerable consumers' category, and contributing to the official approval of the legislative package for the transposition of the EU Energy Efficiency Directive 2012/27/EU;
- preparation of a detailed action plan to integrate the energy efficiency policy and legislative recommendations for MRDAP on fuel poverty assessment methodology and defining and evaluating fuel poverty for MoLSP for review and adoption.

To transpose EU Energy Efficiency Directive 2012/27/EU, the GoR proposed that the Project look at amendments to existing laws rather than proposing new laws to improve the efficiency of adoption to which the Project assisted in drafting legislative amendments in August 2015 including:

- Law on the establishment, organization and functioning of owners' associations and management of condominiums;
- The Government Emergency Ordinance no.18/2009;
- The Electricity and Natural Gas Law no.123/2012;
- The Public Heating Supply Service Law no.325/2006; and
- The Strategy for directing investments towards the renovation of residential and commercial, public as well as private buildings, on a national scale (Version 1/2014), included in the National Energy Efficiency Action Plan.

These activities have resulted in the issuance of guidelines to apply for the MRDAP Regional Operational Programme (ROP) (2014 to 2020) funds that acknowledge the existence of a "vulnerable consumers" category (via revisions to Government Ordinance 18/2009), modified by the Government Ordinance 63/2012 on which the National Rehabilitation Programme is based. Under ROP funds, provisions were made for the

²⁸ World Bank estimates

granting of social aid or assistance to these groups that included amongst others, single persons or families who earn an average net monthly income below a regional or national net income. These guidelines, however, do not include methodologies for evaluating households with fuel poverty; this is due to the lack of response from MoLSP on fuel poverty methodologies drafted by the Project.

At local level, the Project has continuously worked with the targeted local municipalities, in the mainstreaming of fuel poverty measures into the local development and energy strategies. This has been aided through outputs from other components, namely technical design documentation for 50 types of apartment blocks (Component 2), and procurement of thermal insulation material, central heating systems and other measures for pilot projects (Component 3).

The issue for the evaluation of the IEELIHC Project is the lack of adoption of the amended legislation near its terminal date. Unfortunately for the Project, despite the existence of sufficient documentation to analyse policies related to fuel poverty, a complex process to adopt this legislation in Romania is required with participation of elected parliamentarians. At the time of this terminal evaluation in May 2016, the current “technocratic” Government only has a one-year mandate; as such, parliamentary elections are to be held in November 2016, and local municipal elections are being held in June 2016. Under such a political environment, it is difficult to predict if and when fuel poverty legislation will be adopted by parliament.

To the credit of the Project, MRDAP has distributed the proposed legislation to all relevant departments for analysis and the State Minister of MRDAP has promised an official letter stating that MRDAP fully agrees with the concepts on fuel poverty and efforts to integrate it with energy policy.

3.3.3 Component 2: Improved capacity at the local level to reduce fuel consumption in low income communities

Intended Outcome 2 and associated outputs and targets (from 2011 PRF):	Actual Outcome 2 as well as associated outputs and targets:
<p>Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects. Targets include:</p> <ul style="list-style-type: none"> • 200 building engineers, architects and energy auditors qualified, certified and using the information in their work for the application of EE measures (and applicable Renewable Energy Technologies-RETs) and in the use of sustainable, locally available/produced building materials by EOP • 10% households that plan to/have already implemented EE measures due to the 	<p>⇒ A <i>satisfactory</i> outcome was achieved with regards to improving capacity at the local level to reduce fuel consumption in low income communities. This is reflected in the achievement of the following targets:</p> <ul style="list-style-type: none"> • a total of 826 building engineers, architects and energy auditors trained and certified and using the information in their work for the application of EE measures (and applicable Renewable Energy Technologies-RETs) and in the use of sustainable, locally available building materials; • 49% of the households interviewed have already implemented EE measures according to a survey undertaken in Dolj and Hunedoara counties in 2016, while another 46% would rehabilitate their homes should the state authorities provide co-financing

Intended Outcome 2 and associated outputs and targets (from 2011 PRF):	Actual Outcome 2 as well as associated outputs and targets:
<p>public information points and other public education activities of the project in the two main counties of the project at EOP;</p> <ul style="list-style-type: none"> • 6 building materials and construction companies within the two pilot counties which are producing and selling locally produced, sustainable EE materials at EOP; • 3 additional counties (beyond the 2 pilot counties) which have expressed interest in replicating project activities due to the information campaign activities at EOP; • 2 additional countries (beyond Romania) which have expressed interest in replicating project activities due to the information campaign activities EOP 	<p><i>subsidies (as already in place via the National Building Rehabilitation Programme). The completion of a 2014 consumer awareness survey indicates that energy efficiency is a top priority of consumers in comparison with the equivalent survey in 2012 that ranked energy efficiency as a third priority amongst consumers²⁹;</i></p> <ul style="list-style-type: none"> • <i>Only 1 building materials and construction company, Arabesque, has been identified for the supply of sustainable EE materials. Two previous companies (Mopatel using as raw material slaked lime and Izomiorita using as raw material wool) had been identified in the two pilot counties; however, the production capacity of these companies could not be scaled up to meet demand; this would have required extensive engineering and high investment costs that were beyond the scope of this Project;</i> • <i>17 additional counties have expressed interest in replicating project activities resulting in 43 additional information points being set up within these counties with information materials produced by the project;</i> • <i>UNDP Armenia has expressed interest in replicating project activities during the 6th international forum on Energy for Sustainable Development organized in Yerevan, Armenia in 2015. Reports and deliverables were shared with Armenia Country Office. The project also disseminated its results and activities at various international conferences including “ESCO Moldova project - Transforming the urban energy efficiency market by introducing the energy services companies”. This is possibly due to the lack of finalized pilot projects to demonstrate energy savings from EE measures in apartment blocks and public buildings.</i>
<p>Output 2.1: Increased number of building professionals, local government authorities and technical personnel capable of providing technical advice and services on the application of EE measures and techniques in</p>	<p><i>The targets of Output 2.1 were achieved:</i> ⇒ <i>826 building engineers, architects and energy auditors were trained and certified and using the information in their work for the application of EE measures and in the use of sustainable, locally available building materials;</i></p>

²⁹ The May 2016 survey indicated that amongst people exposed to the Project, the implemented EE measures for reducing electricity increased by 10%; a 9.2% increase was observed for reducing costs related to thermal energy and 12.3% increase for using measures to reduce costs through the thermal insulation of households in comparison to the survey responses gathered in 2013

Intended Outcome 2 and associated outputs and targets (from 2011 PRF):	Actual Outcome 2 as well as associated outputs and targets:
<p>the design, construction and operation of buildings. Targets include:</p> <ul style="list-style-type: none"> • 300 building professionals trained and certified in target counties by Year 2; • 4 professional training courses for building professionals by Year 2; • 1000 handbooks of training activities, best practices and lessons learned by Year 2; • 60 municipal employees trained on identifying critical issues and major energy losses in their buildings by Year 2. 	<p>⇒ A total of 10 professional training courses were completed by Year 2. By Year 3, a total of 20 professional training courses were completed;</p> <p>⇒ Over 45,000 handbooks for training activities, best practices and lessons learned have been issued by Year 3;</p> <p>⇒ More than 250 municipal employees were trained on identification of energy losses in their buildings by Year 2.</p>
<p>Output 2.2: Information points in selected public municipalities within two counties for promoting public education on EE measures using commonly used and locally available technologies. Targets include:</p> <ul style="list-style-type: none"> • 50 information points within municipalities distributing information and materials on how to implement EE measures into houses by EOP; • 50,000 households receiving information and materials on the basics of EE measures by EOP 	<p>The targets of Output 2.2 were achieved:</p> <p>⇒ 50 information points established in 2013 and 2014 to promote to low-income households affordable sustainable thermal insulation materials identified for do-it-yourself purposes for increasing the energy efficiency of the buildings;</p> <p>⇒ More than 50,000 households received information on the basics of EE measures within the 2 pilot counties and at national level, the brochures being disseminated at the 50 information points established within the Project. In addition, a national communication and media campaign on promoting EE measures conducted in 2013 reached an estimated 4.7 million people. A final campaign held in May 2016 reached an estimated 1,32 million people.</p>
<p>Output 2.3: Local building material producers and building construction companies highly qualified and capable of producing and applying EE building materials. Targets include:</p> <ul style="list-style-type: none"> • 20 local building material producers and building construction companies trained by Year 2; • 2 counties with active producers of locally produced sustainable EE materials by EOP 	<p>The main target of Output 2.3 was not achieved:</p> <p>⇒ More than 20 local building material producers and building construction companies were trained on the application of EE building materials;</p> <p>⇒ There are no counties with active producers of locally produced sustainable EE materials. The 2 counties targeted by the Project for such production, unfortunately, did not have any companies that could supply sufficient quantities of thermal insulation material with a proposed retrofits in Component 3. Instead, there is a national supplier of thermal insulation material with a product that has ETAG-004 certification.</p>
<p>Output 2.4: Information campaign results and EE success stories disseminated within Romania, UNDP and in the international community. Targets include:</p> <ul style="list-style-type: none"> • 20 media stories in Romania relating to government EE/RE programmes as influenced by project on fuel poverty by EOP; • 3 awards ceremonies carried out for EE/RE measures by EOP; 	<p>Output 2.4 was partially achieved:</p> <p>⇒ More than 40 media stories delivered by Romanian media relating to government EE programs and its integration with fuel poverty;</p> <p>⇒ There were 1 awarding ceremonies carried out for best EE measures including Energy Efficiency Begins with Local Communities” contest that resulted in the installation of central heating systems in 3 municipalities;</p>

Intended Outcome 2 and associated outputs and targets (from 2011 PRF):	Actual Outcome 2 as well as associated outputs and targets:
<ul style="list-style-type: none"> 15 media stories at international level on EE activities in Romania by EOP. 	⇒ At least 8 media stories of EE activities in Romania delivered by international media

Rating: relevance: 4
 effectiveness: 4
 efficiency: 4
 overall rating: 4

With MDRT setting mandatory minimum standards for energy efficiency in buildings in 2009 that required the commissioning and certification of a building for EE standards, the technical knowledge of local building professionals as well as local government personnel maintaining public buildings needed to be improved to enable them to implement and enforce these standards.

Outputs 2.1 and 2.2 were achieved successfully. Targets for the number of building professionals and municipal employees were exceeded with requests from other regions in Romania to conduct additional training seminars on EE building designs and energy audits. The success of Output 2.1 could be partially attributed to the successes of achieving Outputs 2.2 where information points and promotion of public education on EE measures were established to promote the use of EE building materials to increase the energy efficiency of low income households.

The reasons for not being able to achieve the targets of Output 2.3: “Local building material producers and building construction companies highly qualified and capable of producing and applying, respectively, EE building materials”, can be attributed to the lack of an assessment of the baseline scenario that states “there are active local construction companies which produce their own building materials and have some technical capacity”. Moreover, Project consultants were to work with these companies (including those from RoGBC) to develop processes for producing EE building materials including the provision of a 20 to 50% subsidy for the purchase of machinery³⁰. Starting in 2012, the Project invested considerable efforts into the identification of potential companies to become local suppliers of EE materials. While the intentions of this plan to create local employment were noble, realization of this plan would need to overcome 3 barriers:

- The EE building materials from these companies needed the approval of the Technical Economic Council (TEC) of MRDAP, a normal requirement for any public investment;
- The company producing the EE building materials needed to have the production capacity to meet the demands of the pilot program for EE building materials of the project; and
- To supply the material to the proposed retrofits Component 3 of this Project, the company would need to be successful on a public tender.

Within the IEELIHC Project, rockwool was identified as a sustainable EE insulation material that could be produced from locally available, renewable and affordable raw materials, and using a local workforce in targeted poor communities in Dolj and Hunedoara counties. The

³⁰ ProDoc, pg 49

material proved to have thermal conductivity comparable with polystyrene or mineral wool, and the density is 10 to 20 times higher than the density of mineral wool and polystyrene. Other properties promoting these materials were the higher energy efficiency and their contribution to improving air quality due to noxious absorption and bacteria destruction.

The IEELIHC Project provided support for the accreditation process of Mopatel, a small company that the Project determined could produce these materials. Unfortunately, the accreditation process required considerable efforts to obtain the certifications and approvals from the TEC or another equivalent institution. In December 2013, Mopatel received conditional certification for its rockwool thermal insulation material that could only be used on pilot projects for a period of 2 years, sufficient time to monitor the durability and performance of the material (after which the material would need to undergo another certification process to remove conditions for its use on all buildings). One of the concerns raised by MRDAP was the weight and density of the rock wool material, and attendant issues related to structural integrity of the buildings as well as ability of work crews to properly install the material.

Unfortunately for the progress of the Project, considerable efforts were also made towards directly contracting Mopatel from late 2013 to mid-2014 (since they were the only company providing such materials with the Government accreditation) to supply locally made thermal insulation materials. The request for direct contracting was rejected by UNDP's Regional Advisory Committee on Procurement (RACP) that stipulated the need for an open bid with at least two tenderers. As such, the Project then identified another company, Izomiorita that could also supply locally sourced thermal insulation material. They also received Project assistance for accreditation of their materials.

Upon receiving the required certifications, both companies in early 2015 were expecting to receive subsidies for equipment to scale up their production line to meet the demands of the pilot projects that were in the order of 20 to 50% as stated in the ProDoc. With prohibitive costs required to scale up their production facilities, these companies were no longer positioned to provide any bids on tenders to provide thermal insulation products to the pilot projects. Moreover, the PMU revealed in mid-2015 that there were actually no companies in Romania that could have developed such a business. As such, the outcome of these efforts did not contribute to the overall objectives of the IEELIHC Project. Furthermore, the relevance of Output 2.3 to project outcomes is unsatisfactory since locally sourced thermal insulation material makes no contribution to GHG emission reductions sought by the Project objective.

To reduce the risk of a lengthy Project delay and as an alternative solution to secure the supply of thermal insulation material for the pilot projects in Dolj and Hunedoara counties, the PMU proposed the issuance an international open tender mid-2015 with a condition that polystyrene (an imported EE material) would not be acceptable (this would only have been possible under a DIM regime). The international tender was awarded to the lowest bidder in late 2015, Arabesque (www.arabesque.ro), who are the Romanian suppliers of Knauf insulation brand of thermal insulation material and Henkel adhesives (www.henkel.ro). Actual delivery of the thermal insulation material (from Serbia and Romania that met the ETAG-04 EU certification for thermal insulation thermal insulation material) was made in December 2015.

In summary, the opportunity cost of trying to locally source thermal insulation materials was considerable, and was one of the primary reasons that the IEELIHC Project did not achieve its full objectives.

3.3.4 Component 3: Direct reduction of energy consumption through community-based retrofits and market development

Intended Outcome 3 and associated outputs and targets (from 2011 PRF):	Actual Outcome 3 as well as associated outputs and targets:
<p>Outcome 3: Energy efficient buildings reconstructed (and potentially new buildings constructed) with reduced fuel costs or using improved sustainable energy technologies in low-income communities.</p>	<p>⇒ A <i>moderately satisfactory</i> outcome has been achieved with the completion of retrofitted public buildings that have the potential for reduced fuel costs in low income communities. For many of these buildings, the actual quantification of the reduced fuel costs and GHG emission reductions from the retrofits will not be done on this Project due to late implementation of these retrofits and the subsequent lack of time to monitor these reductions.</p>
<p>Output 3.1: Standard EE building design analysis for key types of existing apartment blocks and retrofitted thermal systems of selected apartment blocks. Targets include:</p> <ul style="list-style-type: none"> • 50 apartment building types with technical properties analysed for EE possibilities and available for public use by EOP; • 900 apartment buildings undergoing thermal rehabilitation and through the NTRP by EOP (includes 50 apartment buildings in the baseline); • 484 sustainable heating systems installed by EOP (includes 310 sustainable heating systems in the baseline); • 40 apartment buildings undergoing thermal rehabilitation using subsidy scheme by EOP 	<p>Output 3.1 has been partially achieved:</p> <p>⇒ 50 apartment building types now have documented technical properties analysed for EE possibilities that are to be posted on the MRDAP website. This will reduce engineering costs and time for municipalities preparing applications for funding under government thermal rehabilitation programmes. Due to late delivery, no buildings have been rehabilitated using this documentation by EoP. Two municipalities have begun to prepare applications for funding using the documentation.;</p> <p>⇒ 1,606 residential buildings have been retrofitted thermally since the Project start, through the National Thermal Rehabilitation Programme, involving Government Ordinance 69/2010 and 18/2009: 913 buildings (2009-2011), 398 buildings (2011-2012), 97 buildings (2012-2013), 85 buildings (2013-2014), 73 buildings (2014-2015), 40 buildings (2015-2016);</p> <p>⇒ 21 energy efficient central heating units (less than the incremental target of 174 sustainable heating systems) have been installed in public buildings located in 6 municipalities (including the Craiova Metropolitan Area and municipalities in Dolj and Hunedoara Counties) that will soon be disconnected from district heating systems;</p> <p>⇒ With no subsidy scheme in place, there are zero apartment buildings undergoing thermal rehabilitation.</p>

Intended Outcome 3 and associated outputs and targets (from 2011 PRF):	Actual Outcome 3 as well as associated outputs and targets:
<p>Output 3.2: Thermally retrofitted social buildings (schools, kindergartens, municipal offices and social houses/residences owned by the local government) in selected counties. Target includes 40 social buildings which have undergone EE measures by EOP in selected counties</p>	<p>Output 3.2 has been achieved:</p> <p>⇒ 71 social buildings have benefitted from the project's financial support in 6 municipalities (that includes Craiova Metropolitan Area and other municipalities from Dolj and Hunedoara Counties), implementing various EE measures such as:</p> <ul style="list-style-type: none"> i. replacement of old windows and doors in 7 buildings; ii. installation of 21 energy efficient central heating units (a target of Output 3.1); and iii. installation of thermal insulation material on 43 social buildings of which 9 buildings will have completed this installation after the EOP;
<p>Output 3.3: Houses built/ refurbished using energy efficient, locally-produced materials. Target includes 150 houses refurbished using EE and locally produced materials by EOP.</p>	<p>Output 3.3 has not been achieved;</p> <p>⇒ No houses were refurbished using locally produced EE materials. The reasons for the lack of progress on this output was the lack of approval of these materials by the Technical Economic Council of MRDAP, and late dissemination of 3 handbooks describing appropriate application techniques of affordable sustainable thermal insulation materials identified for do-it-yourself (DIY) purposes for increasing the energy efficiency of the buildings (that were prepared by an affordable materials specialist);</p> <p>⇒ During late 2015 and the first half of 2016, 45,000 copies of the 3 handbooks were distributed to the 50 information points (a target of Output 2.2) and at 3 public meetings for 130 participants in Bucharest, Craiova and Petrosani, with intentions of promoting the use of such materials to low-income households. In addition to the insufficient time to monitor the use of these handbooks for DIY projects for EE buildings, monitoring of this output would have been problematic due to effort required to verify these measures in remote locations of these households,.</p>

Rating: relevance: 4
 effectiveness: 3
 efficiency: 3
 overall rating: 3.3

The achievement of intended results of Component 3 fell short due to a number of key events during implementation of the planned activities:

- Delays were experienced in the delivery of documentation of technology analysis and energy performance of typical apartment building designs (Activity 3.1.1) until late 2015. The contract with the first consultant in 2012 (under NIM) to provide technical documents for 50 apartment building blocks specified the use of thermal insulation materials that did not yet have TEC approval, making it very difficult for this consultant to deliver its technical documents in a timely manner. Their contract was cancelled in early 2014 that was replaced by a second contractor under DIM in late 2014; as a result of the delayed delivery, no buildings have been rehabilitated by EoP using the technical documentation;
- The discontinuation of the partnership with RoGBC with the IEELIHC Project which left a void in terms of who would manage the pilot projects with the low income communities. UNDP PMU personnel under DIM managed these pilot projects in late 2015 and 2016;
- Delays in securing the supply of thermal insulation material until March 2016 that was complicated by several issues related to Output 2.3 as described in Section 3.3.3;
- The commencement in April 2016 of building rehabilitations involving the installation of thermal insulation material supplied by Arabesque. The late commencement of these installations does not provide sufficient time for the project to monitor energy savings and GHG emission reductions. Moreover, the Project will be unable to disseminate this type of positive information that would have an impact on people's willingness to invest in EE building materials.

Nevertheless, there have been positive contributions from activities in this component including:

- The aforementioned technical documentation for EE measures for 50 typical apartment block designs from Activity 3.1.1. The MRDAP website currently indicates that the posting of these block designs on their website is in progress. This documentation will be very useful especially to low income housing blocks in reducing or even eliminating the cost of preparing plans for EE measures in such buildings;
- Positive feedback from the users of the public buildings where Knauf thermal insulation materials were installed in March 2016. For kindergarten buildings, children no longer have to dress in winter clothes for classes.

3.3.5 Outcome 4: Information for improved decision-making

Intended Outcome 4 and associated outputs and targets (from 2011 PRF):	Actual Outcome 4 as well as associated outputs and targets:
<p>Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty. Targets include:</p> <ul style="list-style-type: none"> • Final project report consolidating the results and lesson learnt from the implementation of the different project components and recommendations for the required next steps; • Project mid-term and final evaluations and other required reviews 	<p>⇒ A <i>moderately satisfactory</i> outcome has been achieved with a number of documents containing information, data and methodologies being available to decision-makers that can be used for designing fuel poverty programs in Romania. Unfortunately, the database that will house the local registry of building stock was only completed this month, leaving little time for MRDAP to populate the database;</p> <p>⇒ The only targets of this outcome that can be confirmed as completed is the midterm evaluation;</p>

Intended Outcome 4 and associated outputs and targets (from 2011 PRF):	Actual Outcome 4 as well as associated outputs and targets:
	⇒ Other reports including final project report, lessons learned from implementation, and the final evaluation are currently in progress
<p>Output 4.1: Regionally-adaptable methodology for fuel poverty assessment proposed and a guide for municipal decision-makers on fuel poverty issues. Targets include:</p> <ul style="list-style-type: none"> • 1 methodology adopted at national level for measuring fuel poverty by EOP; • 2 local governments which have adopted a methodology and begun measuring fuel poverty by EOP; • 1 report developed on cost and benefits of implementing EE measures to address fuel poverty by end of Year 3; • 1000 guides and reports distributed to building sector actors by EOP. 	<p>Output 4.1 has been partially completed:</p> <ul style="list-style-type: none"> ⇒ The Project has developed the fuel poverty definition and the methodology for fuel poverty assessment that includes cost-benefit analysis, and is oriented towards the national-level policy-making process for formulating exact EE and fuel poverty alleviation measures to be introduced in local strategies and programmes. The issuance of the methodology also will facilitate the development of guidelines for mainstreaming an explicit fuel poverty approach. The fuel poverty definition will be embedded into new national legislation that will transpose EU Directive 2012/27/EC; ⇒ 3 local governments have adopted fuel poverty measures into their programmes: <ul style="list-style-type: none"> ○ Vulcan municipality has revised with Project support their Local Development Strategy for 2014-2020 for integrating fuel poverty measures developed by the project. With the support of a National Policy Advisor, the municipality will receive policy technical assistance on recommendations for 2 other local policies on energy efficiency in buildings; ○ the municipalities of Petrosani and Calafat have each prepared energy strategies that includes improving energy efficiency within their jurisdictions, detailing the current situation, projected impacts with EE measures, planned activities for implementation by 2020, and a plan for monitoring the result of implementing these EE improvements; ⇒ A report on costs and benefits of implementing EE measures to address fuel poverty has been produced by the Project with a detailed action plan to integrate the energy efficiency policy/legislative recommendations prepared within the Project, in the national framework – MRDAP (Fuel poverty assessment methodology and its complementary study developed in 2012 and submitted in 2013, the definition and new methodology for defining and evaluating fuel poverty to the MoLSP for review and adoption; ⇒ Guides for EE in buildings and reports, consisting of up to date legislative information, have been distributed to 50 municipalities

Intended Outcome 4 and associated outputs and targets (from 2011 PRF):	Actual Outcome 4 as well as associated outputs and targets:
<p>Output 4.2: Local and regional registries/databases of building stock. Targets include:</p> <ul style="list-style-type: none"> • one central registry for buildings by Year 1; • 10 donors or investors with access to building registry by EOP. 	<p>Output 4.2 has only partially achieved its targets:</p> <p>⇒ The database system for the Central building registry for buildings has been completed with a user's and administrator's manual, and source code. The registry can accommodate data for social buildings, apartment blocks, and publicly owned housing was delivered. The Project drafted an MOU for the transfer of the information system to MRDAP outlining owner responsibilities, maintenance requirements and further registry development. In addition, the Project contracted a firm for the delivery of (project-procured) hardware and software to the headquarters of MRDAP, where the information system will be hosted. Information on more than 100 buildings has been entered into the registry;</p> <p>⇒ Currently, there are no donors or investors with access to this building registry as it is being hosted at MRDAP headquarters.</p>

Rating: relevance: 5
 effectiveness: 4
 efficiency: 4
 overall rating: 4.3

The Project has provided resources to decision-makers on fuel poverty and methodologies to assess fuel poverty in Romania including:

- Documents on the definition of “fuel poverty” concept in Romania that provides specific means for “vulnerable” consumers to access basic services ensuring thermal comfort at an acceptable level;
- Fuel poverty assessment methodology from 2012;
- Drafts of distinct support schemes for fuel poor households for implementation;
- Draft proposals for amending or supplementing regulations relevant to energy efficiency including:
 - Proposed legislation for establishment, organisation and functioning of owners associations and condominium administration;
 - Government Emergency Ordinance 18/2009;
 - The Law 325/2006 on the public service for thermal energy supply;
 - Strategy for mobilizing investment in renovation of residential and commercial building stock, both public and private, at a national level (version 1/2014), that is included in the National Action Plan for Energy Efficiency;
 - The Electricity and Natural Gas Law 123/2012;
 - Public Heating Supply Service Law 325/2006;

- Detailed action plan to integrate the energy efficiency policy and legislative recommendations prepared within the project, into the national framework for MRDAP and the Ministry of Labour and Social Protection;

A remaining but important challenge for MRDAP personnel responsible for these EE building schemes will be to engage parliamentarians to adopt fuel poverty into the national legislation.

The development of the local and regional building registry commenced in late 2012 with the initial listing of the database parameters for energy efficiency in buildings and the development of methodologies for database design. The development of this building registry aligned with Government Ordinance 18/2009 that includes a methodology for the national inventory assessment of buildings in need of rehabilitation including, most importantly for this Project, low income areas of Romania. The database design would serve as a structured building registry for MRDAP to identify buildings needing rehabilitation in low income areas, with sufficient building information that could interest ESCOs for investment opportunities in Romania.

Consultations on the design of the database were made between 2013 and 2014 with main government stakeholders including MRDAP, MoECC, MoLSP, Department of Energy under the Ministry of Economy; and the Regulatory Authority for Energy as well as energy auditors and information and communication technology (ICT) experts. Their collective interests were in setting up a comprehensive meta-database useful for integrated policy making decisions (that would include fuel poverty alleviation measures and their impacts, monitoring of completed EE measures in specific buildings, and GHG emission reductions). Moreover, the registry should be able to produce reports that can be used to prioritize public investments aimed at increasing energy efficiency in buildings (of interest to MRDAP), reducing the carbon footprint of buildings (of interest to MECC), and efficient allocation of heating subsidies based on fuel poverty assessments (of interest to MoLSP).

Efforts were made by the RTA based in Istanbul in late 2014 to link Output 4.2 with the energy management information system (EMIS) developed by UNDP Croatia under the UNDP-GEF project entitled “Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors” (GEF ID 882). The application of this EMIS would have been highly relevant to Output 4.2 especially in the efficient collection of building-related data on energy consumption and GHG reductions. Unfortunately, the Project could not come to a timely agreement with the Croatian based software developer for the source codes that would allow the Romanian-based software personnel to make changes to adapt the EMIS to the stated needs of the Romanian government. In addition, there were also procurement issues regarding the “free transfer of the EMIS codes” that would have required direct contracting of the Croatian software developer to adapt the EMIS to Romanian needs. Since the estimated work was beyond the threshold of direct contracting under UNDP procurement rules, services for this work could only be procured through an open tender. With the remaining Project time, this was not possible. In conclusion, this is unfortunate given that the linkage to this successfully developed EMIS was not identified earlier in the Project especially during the inception phase.

Instead, the PMU recruited a software developer in Romania to develop the database and building registry commencing in early 2015. The buildings registry database is currently

available on www.registrucladiri.ro, accessible with a username and password. The database is structured with several fields for relevant building information, energy and electricity bills, with functions to produce reports on yearly or monthly energy consumption and GHG emissions that can be used to monitor energy efficiency of the building. The use of software such as the EMIS from UNDP Croatia would increase the volumes of data being loaded onto the building registry database, and have the impact of accelerating the development of the database for its use in designing of fuel poverty programs

Currently, the registry has information for over 100 buildings collected over the past 3 years. With MRDAP headquarters hosting the buildings registry, MRDAP has appointed personnel to manage and maintain the database for its use by government personnel, and eventually the public.

3.3.6 Overall Evaluation of Project

The overall rating of the Project is moderately satisfactory (MS). This is based on the following outcomes:

- The IEELIHC Project design was considered to be satisfactory in 2010 with the exception of Output 2.3 (Local building material producers and building construction companies highly qualified and capable of producing and applying, respectively, EE building materials) where there was no real potential to develop local enterprises to supply locally sourced EE building materials;
- Fuel poverty in low income communities has only been addressed by amendments to government emergency ordinances that has empowered municipalities on the selection of buildings for rehabilitation and EE measures to implement. This would then allow the municipalities to allocate necessary budgets and subsidies to low income households who would not be able to afford implementation of such rehabilitation works. Moreover, fuel poverty has not yet been adopted into the national legislation of the Government of Romania; this will continue to bog down the GoR's efforts to more effectively address the financing of EE retrofits for low income households until there is more effective interministerial dialogue on fuel poverty issues, and sustained support from parliamentarians to guide the legislation through parliament;
- The Project together with MDRAP has leveraged €447 million (USD 492 million) through the Regional Operational Programme targeting low income residential buildings, where a low income household only needs to co-finance a 3.5% portion of the rehabilitation cost (a reduction from a 25% share) with the rest being co-financed by the local municipality as non-refundable amount;
- There is now greater understanding of energy efficiency in buildings amongst more than 826 building professionals, architects, engineers and energy auditors in Romania;
- Municipal government personnel in low income regions also have an improved understanding of energy efficiency in buildings to the extent that they can manage and support building energy audits as well as implementing building EE measures;
- The technical documentation for EE measures in 50 types of apartment building blocks is an excellent output from the Project that will contribute towards the reduction of engineering costs for building rehabilitations in low income communities;
- The impact of the EE retrofits for the 43 public buildings in the 2 target counties will not be known until the winter of 2016-17 when heating bills can be compared with those prior to the retrofits. The late completion date of these retrofits is also a lost opportunity

for the Project to generate and disseminate the positive results of energy savings from these EE retrofits to a wider audience that would further catalyze EE building investments in Romania;

- The Project has produced an abundance of papers on fuel poverty policy analysis, and methodologies for calculating and assessing fuel poverty, that will be useful to decision-makers in designing programs fuel poverty;
- With the recent completion of the building registry database, more building-related data and information are required before the database is useful to decision-makers in designing fuel poverty programs for the Government. Moreover, this points to the lack of emphasis on the Project on the efficient collection of this data through energy management information systems (EMIS). While the initial work on the Project had identified increasing the use of energy audits for the generation of energy efficiency data for buildings, the Project missed an opportunity in 2011 introduce the concepts of EMIS on the aforementioned and successful UNDP Croatia project on energy efficiency in public buildings. This was likely due to:
 - the lack of technical personnel on the Project team with knowledge of best practices on building energy efficiency in other countries and within UNDP who could identify this opportunity; and
 - strong Project focus on fuel poverty legislation;
- In summary, the 3 main reasons this Project fell behind schedule were due to:
 - the excessive efforts spent in trying to locally source and certify energy efficient thermal insulation materials despite the fact suppliers for such material did not exist; and
 - the absence of any qualified technical personnel on building energy efficiency serving as a Chief Technical Advisor during the NIM phase of the Project who could have advised against these efforts to locally sourced thermal insulation materials and to provide quality control oversight to the management of the Project as well as the installation of EE measures on the pilot projects; and
 - delays in the procurement of services and goods through the Romanian public procurement system during NIM.

Overall project ratings are provided on Table 5.

3.3.7 Country Ownership and Drivenness

Government ownership of the IEELIHC Project has not been strong. In particular, the implementing partner, MRDAP, has experienced and continues to experience political instability and frequent changes in government personnel since the Project commencement in 2011. This included changes and top management of the ministries including state secretaries that have been replaced several times within the Project duration (4 times with MRDAP and 5 times with MoE); since the PMU has not been set up as a standalone entity with full decision powers, the Project was dependent on the bureaucratic decision-making process of MRDAP and the Minister of MRDAP who serves as the National Project Director.

A number of conflicts have arisen between MRDAP and UNDP with regards to the progress of the first consultant to prepare technical documents; the issue of contention was the insistence by UNDP to incorporate the use of two types of thermal insulation material that did not yet have government approval. This contributed to the slow progress of the first

consultant, an occurrence that initiated UNDP discussions in late 2013 with MRDAP to a direct implementation modality (DIM) where UNDP essentially would manage the Project. While MRDAP was reluctant to switch to DIM, it agreed to DIM in May 2014 due to the expected delays if the Project were implemented under a NIM regime.

Table 5: Ratings for Each Project Outcome³¹

	Relevance	Effective-ness	Efficiency	Overall Rating
Monitoring and Evaluation:				
M&E design at entry	-	-	-	5
M&E plan implementation	-	-	-	5
Overall quality of M&E	-	-	-	5
UNDP and Executing Partner Performance:				
Quality of Implementation:				
UNDP under NIM	-	-	-	2
UNDP under DIM	-	-	-	5
Quality of Execution:				
MRDAP under NIM	-	-	-	2
MRDAP under DIM	-	-	-	4
Overall quality of implementation/ execution:				
UNDP/MRDAP under NIM	-	-	-	2
UNDP/MRDAP under DIM	-	-	-	4.5
Overall Results	5	5	4	4.7
Outcomes:				
Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low income communities	5	4	3	4
Outcome 2: Expanded supply of trained EE professionals; municipalities in low-income regions have a better understanding of EE issues	4	4	4	4
Outcome 3: EE buildings reconstructed with reduced fuel costs or using improved sustainable energy technologies in low income communities	4	3	3	3.3
Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty	5	4	4	4.3
Overall Rating:	4.6	4.0	3.6	3.9

³¹ 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.

3.3.8 Sustainability of Project Outcomes

In assessing Project sustainability, the evaluator asked “how likely will the Project outcomes be sustained beyond Project termination?” Sustainability of these objectives was 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.
- *Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.*

The overall Project sustainability rating is moderately likely (ML). This is primarily due to:

- The uncertainty of the amount of funds available within NTRP and ROP for EE building retrofits in low income communities;
- The moderate risk that government priorities shift funds allocations for low income communities to other purposes;
- The enthusiasm and high demand for EE training sessions by regional development authorities and local municipalities that currently have no confirmed sources of financing for these sessions;
- The need for effective procurement of EE building materials for low income communities that could be achieved through strengthening MRDAP efforts to engage ESCOs with their EPC business model in low income communities for implementing EE building rehabilitations;
- Lack of confirmed government financing for the efficient collection of building energy-related data and information (using an EMIS) for the national buildings registry database;
- Strong support of MRDAP to manage the building rehabilitations with the use of the building registry database that contains a Romanian-made EMIS.

Details of sustainability ratings for the IEELIHC Project are provided on Table 5.

Table 5: Assessment of Sustainability of Outcomes

Actual Outcomes (as of May 2016)	Assessment of Sustainability	Dimensions of Sustainability
<p>Actual Outcome 1: Romanian energy policy has not yet been fully integrated with fuel poverty issues; however, energy efficiency needs in low income communities have been addressed in amendments to Government Ordinance 18/2009 with Ordinance 63/2012. This amendment allows municipalities to identify and prioritize low income communities for EE building rehabilitation investments funded by the National Thermal Rehabilitation Programme of MRDAP.</p>	<ul style="list-style-type: none"> • <u>Financial Resources:</u> MRDAP has funds under its NTRP to continue funding EE building rehabilitations in low income communities. The issue with the NTRP is related to what proportion can the Government allocate towards a low income communities. There are also €470 million of EU Regional Operational Programme (ROP) funds for EE building projects which are currently being structured to reduce the financing share of a low income households to as low as 3.5% (that would be recovered through the Homeowners Association). Similar to the NTRP, however, there is some uncertainty as to the amount of available funds within the ROP that can be allocated to low income communities; and • <u>Socio-Political Risks:</u> Socio-political risks to continued support for priority investments in low income communities is considered low in Romania; • <u>Institutional Framework and Governance:</u> With frequent changes in elected government personnel who often serve as decision-makers, there is a risk that investments in low-income communities no longer becomes a priority; • <u>Environmental Factors:</u> There are no environmental factors that would hinder development and implementation of fuel poverty legislation and accompanying building EE measures. <p style="text-align: right;">Overall Rating</p>	<p style="text-align: center;">3</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;">3</p>
<p>Actual Outcome 2: The supply of trained architects, building engineers, builders and auditors with EE experience has been expanded. In addition, municipalities in low income regions now have a better understanding of EE issues and have improved their abilities to support projects with building EE measures being implemented in their jurisdictions.</p>	<ul style="list-style-type: none"> • <u>Financial Resources:</u> The training sessions for building EE measures have been very popular. Interest has been expressed by AAEC in the continuation of these training sessions after the EOP. At this time, it is uncertain if MRDAP would fund these training sessions through the ROP or its and NTRP; • <u>Socio-Political Risks:</u> There are no social political risks to the continuation of training or building EE issues since there is high demand for these training sessions; • <u>Institutional Framework and Governance:</u> MRDAP is supportive of these training sessions; • <u>Environmental Factors:</u> There are no environmental factors that would hinder the support for additional training for EE in buildings. <p style="text-align: right;">Overall Rating</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;">4</p> <p style="text-align: center;">3</p>
<p>Actual Outcome 3: More than 40 public and apartment buildings have been rehabilitated to become energy efficient with</p>	<ul style="list-style-type: none"> • <u>Financial Resources:</u> The Romanian public procurement system will likely not be able to procure sustainable locally sourced thermal insulation material developed by the Project. The only other option to source sustainable thermal insulation material for low 	<p style="text-align: center;">3</p>

Table 5: Assessment of Sustainability of Outcomes

Actual Outcomes (as of May 2016)	Assessment of Sustainability	Dimensions of Sustainability
sustainable energy technologies in low-income communities. However, since these improvements were made in 2016, the Project does not have sufficient time to monitor the impacts of these rehabilitations and quantify the reduction in reduced fuel costs.	<p>income households would be the use of ESCOs and their energy performance contracts which are not fully developed in Romania;</p> <ul style="list-style-type: none"> • <i>Socio-Political Risks:</i> These risks are low as these pilot building rehabilitation projects are popular demonstrations that provide immediate benefits of warmth to various public buildings and public housing projects during the winter season; • <i>Institutional Framework and Governance:</i> Local municipal governments are highly supportive of these pilot projects as it enables them to become more aware of EE benefits in buildings and to be better prepared for applying for ROP or NTRP funds; • <i>Environmental Factors:</i> There are no environmental factors that would hinder activities related to further piloting or implementation of EE building projects in low income communities. <p style="text-align: right;"><i>Overall Rating</i></p>	<p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;">3</p>
<p>Actual Outcome 4: Information for designing programmes to address fuel poverty are available; however, data from the new MRDAP-hosted building registry is not yet available.</p>	<ul style="list-style-type: none"> • <i>Financial Resources:</i> Government has fiscal resources to manage the building registry but does not yet have confirmed finances for the efficient collection of building data through the use of an EMIS; • <i>Socio-Political Risks:</i> In addition, MRDAP and other ministries see the registry has having excellent value in dealing with integrated policy making decisions; hence, no socio-political risks are envisaged in expanding the buildings registry database and building upon the existing information base on fuel poverty in Romania; • <i>Institutional Framework and Governance:</i> MRDAP is hosting the building registry database and will be undertaking the responsibility for its management, maintenance, and gradual outreach to the public; • <i>Environmental Factors:</i> There are no environmental factors that would hinder the continuation of this actual outcome. <p style="text-align: right;"><i>Overall Rating</i></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;">4</p> <p style="text-align: center;">3</p>
	<i>Overall Rating of Project Sustainability:</i>	3

3.3.9 Impacts

The Project has had some significant and positive impacts:

- The preparation of documentation of 50 technical analyses of typical apartment designs in Romania. This will shortly be available on the MRDAP website which will benefit low income communities in reducing their costs on current engineering designs for EE rehabilitations on their buildings;
- Generation of interest in the municipalities of Calafat, Petrosani and Vulcan in fuel poverty issues to the extent that these municipalities prepared long-term strategies to reduce fuel poverty in their municipalities;
- Project involvement on increasing the pool of available personnel who are able to analyse the building opportunities and prepare bankable documents for financing such investments.

Unfortunately, the Project did not generate significant impacts from the following activities:

- The pilot installation of sustainable and locally sourced EE building materials in low income communities. Due to the late installations of these thermal insulation materials near the EOP date in April and May 2016, the Project does not have sufficient time to monitor the energy savings and GHG emission reductions, positive information that can be disseminated to decision-makers in government and other interested stakeholders who want to invest in building EE projects;
- The completed development of the building registry database that could have provided structured information on building energy consumption patterns for government decision-makers and other government stakeholders. Although the building registry database contains information on 100 buildings, more building energy-related information will be needed in the registry database for it to be of any use to decision-makers in designing fuel poverty programs.

4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS

4.1 Conclusions

- During the NIM regime of the Project (between the commencement of the Project in 2011 and May 2014 when the Project became DIM), excessive time and effort were spent by the Project to:
 - procure services to implement pilot building EE measures through the national procurement system. Since the Project was located in an EU environment, the Romanian government was expected to have sufficient implementation capacities. Thus, there did not appear to be any alternative to a NIM Project at the time of design;
 - in obtaining deliverables from the first design works contract (procured through the Romanian public tendering system). The system was a key hindrance to Project progress primarily since the system allows for the selection of a very low priced bids; in the case of the IEELIHC Project, the winning contractor who bid well below the expected price was unable to deliver quality documentation;
 - source “locally-made sustainable thermal materials”. During NIM, there was UNDP insistence on specifying the use of a certain thermal insulation material (that was to come from one of the two target counties) in the technical documentation (from the first design works contract), despite the materials not having MRDAP approval for use in public buildings as well as meeting standards for technical quality and durability. As such, the aforementioned low-priced contractor had reason to delay delivery of technical documentation for 50 typical apartment building blocks pending materials certification. Despite the certification being received in December 2013 for one material, discussions between UNDP and MRDAP were initiated on cancelling this contract and a proposed transition to a DIM project;
 - switch from NIM to DIM. It was only during the last 2 years of the project from mid-2014 to mid-2016 that the Project was able to operate and progress as expected using the DIM system;
- The concept of supporting local enterprises to manufacture locally-made thermal insulation material (Output 2.3) was not realistic and reveals:
 - a flaw in the Project design. During the design phase, there was no assessment to evaluate the baseline production capacities of potential enterprises in the two target counties of Dolj and Hunedoara. The assessments would have revealed the considerable efforts that would have been required to upgrade these enterprises to enable them to participate in a government tender; these efforts would have been deemed to be beyond the scope of this Project; and
 - the absence of qualified technical personnel who could have advised the team on adaptive management measures such as seeking other sources of thermal insulation materials instead of insisting on locally-made thermal insulation materials;
- The Project has contributed technical input and advocacy towards the amendment and enforcement of the “Strategy for mobilizing investment in the renovation of residential and commercial building stock, both public and private, at a national level” of MRDAP, creating an enabling environment for mainstreaming EE into national and local

programmes and projects, with a focus on poor households. In addition, the Project developed a set of draft normative acts to implement distinct support schemes for fuel poor households and drafted proposals to amend a number of regulations relevant from energy efficiency.

- Fuel poverty, however, has not yet been adopted into the national legislation of the Government of Romania. The current barrier to adoption of fuel poverty into national legislation is related to a need for more effective interministerial dialogue on fuel poverty issues (notably with MoLSP), and finding sustained time to work with supportive parliamentarians who will guide the legislation through to adoption in parliament;
- While the building registry database has only recently been delivered to MRDAP headquarters, there is considerably more work required to collect and process much more building energy-related information for the registry database to be of any use to decision-makers in designing fuel poverty programs for the Government. The efficient collection and processing of this building-related data can be accomplished through adoption of an EMIS similar to the one developed by UNDP Croatia;
- The absence of an International Chief Technical Advisor (CTA) to support and guide the Project may have been one reason why the Project took so long to undertake adaptive management and why in certain areas, better results were not achieved including, for example, why some of the demonstration projects did not employ international best practices for energy-efficiency. In the absence of an international CTA, guidance, support for the IEELIHC Project came from the UNDP Romania Country Office which closed in June 2015; one issue here was that the person in charge did not have any technical background in energy-efficiency.

4.2 Recommendations

To the Government of Romania:

Recommendation 1: MRDAP will need to find resources to monitor energy savings resulting from the pilot projects of Component 3 using the energy management information system (EMIS) and to disseminate the results. These resources would be used to:

- Strengthen the knowledge of baseline energy consumption of buildings where pilot EE measures are being implemented. Current default values from the EU are now being used for these baselines which may not be reflective of the actual baseline;
- Support MRV activities over the winter of 2016-17 to monitor heating energy consumption with pilot EE measures in place;
- Ensure the quality of buildings registry information is bankable and would draw in the interest of ESCOs and financial institutions;
- Assist data collectors in formatting information on energy consumption and other relevant building information to a style that is compatible with the new building registry;
- Prepare leaflets and publicity material on pilot EE measures on buildings in low income communities, complete with benefit/cost analyses that should be disseminated nationally and through a focused awareness raising activity; and

- Dramatically scale up the volume of energy-related data collection into the buildings registry database (that could be done with the adoption of an EMIS), or commence this data collection with strategic priorities that may include MRDAP's focus on investments in low income communities.

Recommendation 2: MRDAP should facilitate the prioritization of technical assistance to low income municipalities that will increase access of low income communities to EE funds for public buildings and low income apartment blocks.

The Project with MRDAP has recently leveraged €447 million through the EU-funded Regional Operational Programme with conditions that favour the funding of applicants who are deemed as low income households (through the use of the fuel poverty assessment by the Project). This includes a reduction of co-financing requirements of apartment owners in low-income communities from 25% to 3.5% for capital costs related to thermal rehabilitation of their apartments. Actions that could be taken by MRDAP include:

- Supporting networking events for key EE building stakeholders to improve their awareness of opportunities for implementing EE building projects; and
- Developing and launching a “pool of experts” with experience in helping municipalities to prepare EU funding proposals. This would include the screening and certification of engineering consultants and energy auditors, both foreign and domestic, who are able to assist in preparing EU funding proposals for low-income municipalities as well as providing strong linkages to suppliers of EE materials and installation services. This is related to Recommendation 3.

Recommendation 3: MRDAP should support strengthened business connections with local and foreign ESCOs.

This is consistent with the new 2014 EE Law 121/2014 in Romania that transposes the EU directive on energy efficiency. This law introduces a series of EE policy measures that support ESCOs who could implement building EE measures using energy performance contracts as well as locally sourced manufactured materials or assembled equipment (they would have motivation to do so if it decreases their cost and project risk). The presence of Romania ESCOs to provide EE building services, will provide programme managers a viable option on passing the risk of procuring new EE building materials through public procurement to the private sector, and possibly accelerate the transformation of the EE building sector. Moreover, ESCO-type investments would have the potential to accelerate EE development in fuel poverty areas in partnership with local governments, with assurances of good quality materials and strong workmanship for installations to protect the ESCO investment. Strengthened regulations to support the further development of ESCO market should also be considered.

Recommendation 4: MRDAP should strengthen its quality control oversight on EE measures installed.

MRDAP needs to have a sustained presence on oversight to EE measures being implemented with EU-ROP and NTRP funds. This would include the need to ensure that the installation of thermal insulation materials, new windows and doors and central heating systems are all meeting international best practices. This would include, for example, insulation material overlapping with a window or door frame to ensure the closure of “cold bridges” to ensure there are no heat losses and condensate forming on the inside of the window or door frame. MRDAP quality control inspectors or their representatives in local government should convene at an annual meeting to review such issues in quality control as it relates to energy efficiency in buildings. These meetings could also be attended

by leading building energy efficient experts from various EU countries to ensure the latest best practices in building energy efficiency are disseminated in Romania.

Recommendation 5: MRDAP should allocate further budgetary resources related to the full scale implementation of the national buildings database registry that would include efficient collection of building energy-related data through an energy management information system (EMIS). These budgets should be used to hold further awareness raising on EMIS, prepare new regulations to ensure mandatory usage of EMIS for public buildings, and training on the use of EMIS and its integration with the building registry database. Experience from other countries shows that EMIS can significantly improve the effectiveness of achieving energy efficiency in buildings but only if there is an appropriate high level of government commitment as well as in-kind and fiscal support.

4.3 Lessons Learned

Lesson 1: Project designs need to include a realistic and thorough assessment of Project risk. In the case of the IEELIHC Project, many of the delays in implementation were caused by factors not identified in the project documents risk assessment. With the Project being implemented in an EU environment, there was an expectation that sufficient capacity existed with this government to execute this project. There were, however, the risks that could have been identified as threats to project implementation including:

- Institutional weaknesses where interministerial dialogue and cooperation is very poor. Given that one of the primary outputs of the Project was the introduction of fuel poverty legislation and associated policies, the need for policy inputs from several other ministries besides MRDAP was required. As such, the risk of a lack of cooperation between ministries to fully establish policies on fuel poverty would have been identified as very high. Yet, the targets of the IEELIHC Project included full adoption of fuel poverty legislation with 4 years of efforts in promoting interministerial dialogue. This was not achieved;
- A weak public procurement system that was not flexible, lacked clear resolution mechanisms, and was heavily weighted to the lowest price option. Moreover, the system was not designed to select unique innovative products or services which were usually higher priced. For example, in the case of procurement of thermal insulation material, the Romanian public procurement system would only allow the lowest price material such as polystyrene to be selected notwithstanding the technical merits of other thermal insulation products that also had ETAG certification. In addition, the lowest priced EE building consulting services would always be awarded without due consideration to the consultant's historical performance in such work. The evaluator is also aware of UNDPs efforts to offer the Government of Romania access to the more flexible UNDP procurement system, referred to as "NIM with direct support";

The lack of identification of all significant risks on a project design jeopardizes the timelines on which the project can achieve and deliver its goals and objectives as well as outcomes and outputs. A solution to more thorough risk assessments of the project design would be either more effective use of existing PPG resources or more time required to undertake careful consideration of the project risks.

Lesson 2: The use of GEF funds to create jobs for locally sourced products should meet the following criteria:

- there should be existing demand for the product;
- the product should have some form of official certification, domestically or internationally;
- local production capacities of the product should be scalable but not be too costly to meet the desired demand; and
- assessments for the upgrading the production of a manufacturing facility should be conducted by a business and technical professional.

In the case of the IEELIHC Project, there were noble intentions to create local jobs by assisting local enterprises to become suppliers of sustainable thermal insulation material with raw materials source locally. However, despite the identification of a few enterprises in Dolj and Hunedoara counties where pilot project activities were located, these companies only had small scale production of sustainable thermal insulation material that were not scalable. The concept of assisting companies to become long-term suppliers of such material should have been accompanied with a baseline assessment of the business capacities of these companies, and an understanding of the process, equipment and associated costs required to meet supply demand. These assessments may have shown that technical assistance to such companies for production scale-up would have been beyond the scope and budget of the IEELIHC Project.

Moreover, project plans to build the supply chain of an innovative product in a region that has not yet developed a market demand should have a business and technical approach to ensuring profitability. If this is not possible, alternative materials should be sourced externally through a tendering process and the project should not wait several years (3 years with the IEELIHC Project) to undertake adaptive management. If the Project still wanted to create local jobs from tendering such material, the tender should include the names of a local distributor or partner. The IEELIHC Project took several years to realize this, delaying the Project by a period of close to 3 years. Moreover, reviews of the Project design should have recognized this as a deficiency, and should have altered the approach and source thermal insulation materials externally.

Lesson 3: Greater and sustainable impacts can be achieved through an integrated approach to capacity building of stakeholders. The training aspects of the IEELIHC Project were integrated in that it addressed building EE knowledge issues with a wide range of stakeholders from Government personnel to building professionals, energy consultants, potential building material suppliers, local tradespeople, and building maintenance personnel. In addition, the integrated approach included feedback from the stakeholders on the effectiveness of the training seminars, and suggestions on energy and EE building topics that still needed to be addressed in future seminars. For example, some of the communities identified the use of solar PV as a supplemental source for energy instead of thermal insulation as a lone technological solution. The addition of solar PV topics into the building EE seminars created enthusiasm and buy-in with local government personnel, local building owners, and building professionals.

Lesson 4: Project implementation teams need to carefully prepare procurement packages for goods or services to ensure that the desired goods or services are procured and that

risks of a prolonged tendering process are minimized: In the case of the IEELIHC Project, the acquisition or procurement of sustainable thermal insulation material should have been strategically analyzed by:

- undertaking market research of the goods or services to be acquired;
- undertaking discussions with prospective suppliers or consultants to understand their conditions under which they would submit a bid; and
- preparing terms and conditions of a tender that would solicit a bid from a supplier or consultant.

In the experience of the evaluator, there are many instances on GEF projects (including the IEELIHC Project) where the practice of careful preparation of procurement packages for goods and services has not been satisfactory. In many cases, project teams mistakenly confine their search within their own country (where these goods and services may be of poor quality or even nonexistent), and not externally (where these goods and services would be available). An experienced project manager or Chief Technical Advisor should be able to provide guidance to project teams with regards to procurement issues.

Lesson 5: All GEF climate change mitigation projects should employ a part time Chief Technical Advisor (CTA) to provide oversight to project management and technical guidance. GEF projects are an opportunity for developing countries to access international expertise as well as to provide oversight in management and quality control; however, with the presence of international expertise, a GEF project can also have access to experiences from similar projects outside the country. On the IEELIHC Project after 2012, there were no technical personnel implementing the Project in UNDP until 2015. With a part time International Chief Technical Advisor with a background in building energy efficiency, the IEELIHC Project would have resolved issues more efficiently including:

- procurement of consultants for preparing energy audits and EE measures;
- sourcing thermal insulation;
- ensuring that the PMU ensures that pilot EE installations meet international best practices through oversight to the general installation of windows, thermal materials and central heating systems; and
- identification of the opportunity to take advantage of the advances made in EMIS in Croatia in 2011 that could efficiently generate buildings energy consumption data from the EMIS into the national buildings registry database in Romania.

Lesson 6: NIM with full CO support does not work well when it involves setting up two parallel implementation units. Many of the problems of this Project over the period 2012-2014 can be attributed to the fact that for approximately 2 years, there were two parallel PMUs who did not work well together. The lesson learned here is that UNDP projects should be NIM or DIM but that a half NIM and half DIM approach does not really work well.

APPENDIX A – MISSION TERMS OF REFERENCE FOR PROJECT FINAL EVALUATION

Type of Contract: IC (Consultant)

Languages Required: *English (fluent)*

Duration: 24 March 2016 –30 June 2016 (*approximately 25 working days*)

Location: *Mostly home based, with one mission in Romania for approximately 7 business days, out of which, 3 business days will be in Bucharest and 4 business days will be in Craiova, Calafat, Petrosani, Petrila, Vulcan and Calan Municipalities*

1. Background

Project Background Information

The building sector in Romania is dominated by residential buildings that are generally old and have poor thermal performance, with average annual heating requirements of 137-220 kWh/m². Pilot projects in Romania have shown that it is possible to reduce cost-effectively heating needs by at least 40-50%. Nevertheless, the rehabilitation of these weakly energy-efficient buildings is taking place at a very slow pace. In addition, new construction in poorer households in rural areas is dominated by the use of energy inefficient materials with “Do-It-Yourself” projects resulting in inefficient, sub-standard dwellings which will not meet standards according to the European Performance in Buildings Directive.

Moreover, there is a series of inefficient district heating networks in Romania, publicly owned by the municipalities. These companies provide heating to over 1.6 million dwellings (out of a total of 8.4 million dwellings), which are mostly blocks of flats in urban areas, where customers often cannot adjust the heating level according to their needs. The average efficiency of district heating systems in the country is about 43% (i.e., primary energy utilized at the source that is converted into end-user heating).

The operations of these district heating systems are currently heavily subsidized on the supply-side, leading to artificially low heating prices for all consumers. As a result of EU requirements and budget shortages, the Government enacted a new policy for the 2011-2012 winter and the subsidies will be granted on a demand-side basis to low-income households only. Should these policies be ineffective, large amounts of energy will still be wasted while large quantities of expensive fuel (especially natural gas and oil) are imported. In this scenario, many Romanians will not afford to keep their homes at a reasonable temperature during the winter – resulting in fuel poverty.

This project will work to dismantle the barriers to the implementation of energy efficiency measures among poorer households and in poorer communities in Romania, working to alleviate fuel poverty. The project will act at a national and local level to address energy efficiency needs, develop appropriate policy measures, stimulate an on-going market for locally-produced, energy efficient building materials, build capacity for implementation of energy efficiency measures in poorer regions, and implement real energy efficiency improvements to improve the lives of 110,620 people and reduce energy-related greenhouse gas emissions by 666,800 tons of CO₂eq.

The implementing partner for the project is the Ministry of Regional Development and Public Administration.

The Ministry of Environment and Climate Change, the Romania Green Building Council (RoGBC) and the Association of Energy Auditors for Buildings (AEAB) are also partners in the project to be implemented until 2015.

A number of six municipalities, namely Craiova and Calafat in Dolj County and Petrosani, Petrila, Vulcan and Calan in Hunedoara County have also been selected as local project partners.

Project Objective and Outcomes

This general objective of the project is to dismantle the barriers to the implementation of energy efficiency measures among poorer households and in poorer communities in Romania and alleviate fuel poverty. This will be achieved through the following components/outcomes:

Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities

Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects

Outcome 3: Retrofitted buildings (and potentially new EE buildings constructed) with reduced fuel consumption or using improved sustainable energy technologies in low-income communities

Outcome 4: Data and information available for decision-makers for designing programs to address fuel poverty.

The project activities aim at reducing carbon emissions by actions directed at increasing the energy efficiency of buildings. The project document can be viewed here: http://www.undp.ro/projects.php?project_id=63.

The Terminal Evaluation 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.

2. Description of Responsibilities

• EVALUATION APPROACH AND METHOD

The international consultant for the final evaluation will perform the following tasks:

- Review all related project documents;
- Design the detailed evaluation scope and methodology (including the methods for data collection and analysis);
- Prepare a list of the outputs achieved under project;
- Organize the mission agenda including specific requests to talk/meet to specific people involved in the project (key project stakeholders);
- Conduct an analysis of the outcome, outputs and partnership strategy (as per the scope of the evaluation described above);

- Draft the evaluation report;
- Finalize the whole evaluation report.

An overall approach and method³² for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact**, as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR (Annex C) and will be discussed with UNDP IRH. The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the UNDP Istanbul Regional Hub, project team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to Bucharest, including the following project sites Dolj and Hunedoara Counties (Craiova, Calafat, Petrosani, Petrița, Vulcan, Calan Municipalities). Interviews will be held with the following organizations and individuals at a minimum: Project Management Unit, Ministry of Environment, Ministry of Regional Development, Association of Energy Auditors, UNDP Istanbul Regional Hub and Authority, members of the National Steering Committee.

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

An outline of an evaluation approach is provided below; however it should be made clear that the evaluation consultant is responsible for revising the approach as necessary. Any changes should be in-line with international criteria and professional norms and standards cleared by UNDP. The evaluation must provide evidence-based information that is credible, reliable and useful. It must be easily understood by project partners and applicable to the remaining period of project duration. The evaluation should provide as much gender disaggregated data as possible. The evaluation mission will include a visit to Bucharest and some of the project pilot sites. The international consultant is expected to follow a participatory and consultative approach ensuring close engagement with the government counterparts, UNDP IRH, Steering Committee, project team, and key stakeholders. The Evaluator is expected to consult all relevant sources of information, such as the project document (“prodoc”), project reports – incl. Annual Reports, project budget revision, progress reports, CTA mission reports, project files, national strategic and legal documents, GEF Capacity Development scores from inception to end of project, and any other material that s/he may consider useful for evidence based assessment.

The methodology to be used by the Evaluation International Consultant should be presented in the report in detail. It shall include information on:

³² For additional information on methods, see the [Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 7, pg. 163

- Documentation reviewed;
- Interviews;
- Field visits;
- Questionnaires;
- GEF CD Scorecard completed at the time of FE (by the Evaluator);
- Participatory techniques and other approaches for the gathering and analysis of data.

Although the Evaluator should feel free to discuss with the authorities concerned all matters relevant to its assignment, it s/he is not authorized to make any commitment or statement on behalf of UNDP or GEF or the project management.

The consultant's main responsibilities are:

- Desk review of documents, development of detailed work plan and TE (Terminal Evaluation) outline (maximum 5 days by International Consultant; home-based);
- Debriefing with UNDP IRH, agreement on the methodology, scope and outline of the TE report (1 day, home based);
- Interviews with project implementing partner (executing agency), relevant Government, NGO and donor representatives and UNDP/GEF Project Coordinator and/or Regional Technical Advisor (7 days in-country mission including field trips to 6 project sites, additional 2 travel days);
- Completion of the first TE report draft (7 days). The draft will be shared with the UNDP IRH, UNDP-/GEF (UNDP-/GEF RCU Bratislava) and key project stakeholders for review and commenting;
- Finalization and submission of the final TE report through incorporating suggestions received on the draft report (maximum 3 days);

• EVALUATION CRITERIA & RATINGS

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

Evaluation Ratings:			
1. Monitoring and Evaluation	rating	2. IA& EA Execution	rating
M&E design at entry		Quality of UNDP Implementation	
M&E Plan Implementation		Quality of Execution - Executing Agency	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	rating	4. Sustainability	rating
Relevance		Financial resources:	
Effectiveness		Socio-political:	

Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental :	
		Overall likelihood of sustainability:	

• PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator will receive assistance from the Istanbul Regional Hub (IRH) 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	Actual	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

• MAINSTREAMING

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

• IMPACT

The evaluator 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.³³

³³ 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](#)

• CONCLUSIONS, RECOMMENDATIONS & LESSONS

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

• IMPLEMENTATION ARRANGEMENTS

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

EVALUATION TIMEFRAME AND DELIVERABLES

The total duration of the evaluation is estimated to take *25 working days* for the assignment of the Evaluator (*travel days are excluded; the lump sum in the financial offer will include travel expenditures as well*) according to the following plan:

Deliverable and installments	Content	Estimated Timing	Responsibilities	Estimated Completion Date
Inception Report – 1st installment (10%)	Evaluator provides clarifications on timing and method	<i>5 days to review documents by International Consultant and conduction phone interviews and request additional information</i> <i>1 day to agree with IRH on the methodology, scope and outline of the TE report</i> No later than 2 weeks before the evaluation mission.	Evaluator submits to UNDP IRH	<i>8 April 2016</i>
Presentation	Initial Findings	<i>9 days: 7 days in –country mission (Bucharest +travel to pilot sites) and 2 travel days</i> End of evaluation mission	To project management, UNDP IRH	<i>22 April 2016</i>
Draft Final Report – 2nd installment (60%)	Full report, (per annexed template) with annexes	<i>7 working days by International Evaluator</i> Within 3 weeks of the evaluation mission	Sent to PIU, reviewed by RTA, UNDP Programme Specialist, GEF OFPs	<i>20 May 2016</i>
Final Report* – 3rd installment (30%)	Revised report	<i>3 days by the international evaluator</i> Within 1 week of receiving UNDP comments on draft	Sent to PIU for uploading to UNDP ERC.	<i>22 June 2016</i>

*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.

3. Competencies

Core Competencies

- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability;
- Highest standards of integrity and objectivity, discretion and loyalty.
- Excellent interpersonal skills within a range of professional contexts;
- Result orientation and client focus;

Functional Competencies

- Excellent communications, presentation, report writing skills;
- Ability to integrate knowledge and articulate linkages between multi-disciplinary materials;
- Highly organized, detailed oriented and punctual with producing outputs;
- Ability to manage relationships with a diverse range of stakeholders and incorporate diverse points of view;
- Excellent organizational and management skills in a complex multi-stakeholder environment;
- Observing deadlines and achieving results;
- Ability to work under pressure and stressful situations

4. Qualifications

Academic Qualifications/Education:

- Bachelor's Degree in Environmental Economics and Policy; Engineering; Energy or other related field ;
- Master's degree or PhD in Environmental Economics and Policy; Engineering; Energy will be an advantage;

Experience:

- At least 7 years of proven experience in conducting monitoring and evaluations / results based management, including conducting independent project evaluations, trainings, developing M&E frameworks, result based frameworks, log frames etc;
- At least 1 GEF project evaluation conducted, more evaluations will be an advantage (i.e – experience in evaluating clean energy/ energy efficiency/climate change mitigation/ climate change adaptation projects);
- Proven experience in the ECIS (Europe and the Commonwealth of Independent States) Region;
- Experience in the evaluation of technical assistance projects, if possible with UNDP or other UN development agencies, major donors as well as government;
- Good knowledge of UN system, procedures and operational activities for development, previous experience in UNDAF development is considered as plus;
- It is desirable, but not required, that the International Evaluation Consultant have knowledge/understanding of Romanian/EU policies related to clean energy (incl. energy-efficiency and renewable energy)

Language skills:

- Fluency in English language is mandatory

Payments will be made only upon confirmation of UNDP on delivering on the contract obligations in a satisfactory manner.

Individual Consultants are responsible for ensuring they have **vaccinations/inoculations** when travelling to certain countries, as designated by the UN Medical Director. Consultants are also required to comply with the UN **security directives** set forth under dss.un.org. General Terms and conditions as well as other related documents can be found under: <http://on.undp.org/t7fJs>.

• EVALUATION REPORT OUTLINE³⁴

- i. Opening page:
 - Title of UNDP supported GEF financed project
 - UNDP and GEF project ID#s.
 - Evaluation time frame and date of evaluation report
 - Region and countries included in the project
 - GEF Operational Program/Strategic Program
 - Implementing Partner and other project partners
 - Evaluator members
 - Acknowledgements
- ii. Executive Summary
 - Project Summary Table
 - Project Description (brief)
 - Evaluation Rating Table
 - Summary of conclusions, recommendations and lessons
- iii. Acronyms and Abbreviations
(See: UNDP Editorial Manual³⁵)
 1. Introduction
 - Purpose of the evaluation
 - Scope & Methodology
 - Structure of the evaluation report
 2. Project description and development context
 - Project start and duration
 - Problems that the project sought to address
 - Immediate and development objectives of the project
 - Baseline Indicators established
 - Main stakeholders
 - Expected Results
 3. Findings
(In addition to a descriptive assessment, all criteria marked with (*) must be rated³⁶)
 - 3.1 Project Design / Formulation

³⁴The Report length should not exceed 40 pages in total (not including annexes).

³⁵ UNDP Style Manual, Office of Communications, Partnerships Bureau, updated November 2008

³⁶ Using a six-point rating scale: 6: Highly Satisfactory, 5: Satisfactory, 4: Marginally Satisfactory, 3: Marginally Unsatisfactory, 2: Unsatisfactory and 1: Highly Unsatisfactory, see section 3.5, page 37 for ratings explanations.

- Analysis of LFA/Results Framework (Project logic /strategy; Indicators)
 - Assumptions and Risks
 - Lessons from other relevant projects (e.g., same focal area) incorporated into project design
 - Planned stakeholder participation
 - Replication approach
 - UNDP comparative advantage
 - Linkages between project and other interventions within the sector
 - Management arrangements
- 3.2** Project Implementation
- Adaptive management (changes to the project design and project outputs during implementation)
 - Partnership arrangements (with relevant stakeholders involved in the country/region)
 - Feedback from M&E activities used for adaptive management
 - Project Finance:
 - Monitoring and evaluation: design at entry and implementation (*)
 - UNDP and Implementing Partner implementation / execution (*) coordination, and operational issues
- 3.3** Project Results
- Overall results (attainment of objectives) (*)
 - Relevance(*)
 - Effectiveness & Efficiency (*)
 - Country ownership
 - Mainstreaming
 - Sustainability (*)
 - Impact
- 4.** Conclusions, Recommendations & Lessons
- Corrective actions for the design, implementation, monitoring and evaluation of the project
 - Actions to follow up or reinforce initial benefits from the project
 - Proposals for future directions underlining main objectives
 - Best and worst practices in addressing issues relating to relevance, performance and success
- 5.** Annexes
- ToR
 - Itinerary
 - List of persons interviewed
 - Summary of field visits
 - List of documents reviewed
 - Evaluation Question Matrix
 - Questionnaire used and summary of results
 - Evaluation Consultant Agreement Form

APPENDIX B – MISSION ITINERARY (FOR MAY 2016)

#	Activity	Stakeholder involved	Place
May 8, 2016 (Sunday)			
	Arrival of Mr Roland Wong to Bucharest		
May 9, 2016 (Monday)			
1	Briefing meeting with IEELIHC PMU personnel, Mr. Mihai Moia, Ms. Andreea Ihos, and Mr. Adrian Ciuraru	UNDP Romania	Bucharest
2	Meeting Dr. Catalin Lungu on technical documentation for EE measures on 50 types of apartment block designs	AIR	Bucharest
3	Meeting with Mr. Marulis Paun on development of the building registry database	MTsys	Bucharest
4	Meeting with Dr. Emelia-Cerna Mladin on energy auditing and training and other project issues	AAEC	Bucharest
5	Meeting with Ms. Silvia Vlasceanu on fuel poverty legislation and other regulatory issues	ACUE	Bucharest
	Travel to Calafat		
May 10, 2016 (Tuesday)			
6	Meeting with Mr. Doru Mituletu, Vice Mayor of Calafat	Calafat Municipal Government	Calafat
	Tour of pilot EE building measures undertaken in Calafat		
	Travel to Petrosani		
7	Meeting with Ms. Bianca Igarelu and tour of pilot EE building measures undertaken in Petrosani	Petrosani Municipal Government	Petrosani
May 11, 2016 (Wednesday)			
8	Meeting with Mr. Cristian Popa and Ms. Rodica Miha and tour of pilot EE building measures undertaken in Vulcan	Vulcan Municipal Government	Vulcan
	Travel to Bucharest		
May 12, 2016 (Thursday)			
9	Meeting with Dr. Adil Lari on GHG emission reduction estimations on the IEELIHC Project	UNDP	Bucharest

#	Activity	Stakeholder involved	Place
10	Skype meeting with John O'Brien on progress and preliminary findings of the evaluation	UNDP	Bucharest
11	Meeting with Mr. Mihai Busuioc, General Secretary, and Mrs. Adriana Udroui, Project Manager for IEELIHC	MRDAP	Bucharest
12	Meeting with Mr. Liviu Chelban of Arabesque and Mr. Adrian Zamfirache of Henkel on the supply of thermal insulation systems	Arabesque and Henkel	Bucharest
May 13, 2016 (Friday)			
13	Meeting with IEELIHC PMU personnel, Mr. Mihai Moia, Ms. Andreea Ihos, and Mr. Adrian Ciuraru regarding further project management issues	UNDP Romania	Bucharest
May 14-15, 2015 (Saturday-Sunday)			
	Preparation of evaluation report		Bucharest
May 16, 2016 (Monday)			
14	Meeting with Ms. Tania Mihu, consultant preparing lessons learned report during the IEELIHC Project	UNDP Romania	Bucharest
15	Meeting with Mr. Narcis Jeler on how the regional funds of the ROP and NTRP are structured to support rehabilitation of low income housing	MoECC	Bucharest
16	Meeting with Mr. Raul Pop, former UNDP Task Leader	UNDP Romania	Bucharest
17	Meeting with Mr. Mark Velody on project design and EBRD relationship with the IEELIHC Project	EBRD	Bucharest
May 10, 2015 (Tuesday)			
18	De-briefing meeting with IEELIHC PMU personnel, Mr. Mihai Moia, Ms. Andreea Ihos, and Mr. Adrian Ciuraru on the preliminary findings of the terminal evaluation	UNDP Romania	Bucharest
	Departure of Mr. Roland Wong from Bucharest		
May 27-June 7, 2016			
19	E-mail stream with Mrs. Monica Moldovan, former Head of Environment for UNDP Romania	UNDP Romania	

#	Activity	Stakeholder involved	Place
June 10, 2016			
20	Skype meeting with Mr. Seth Landau, ECO Ltd. in London, former designer of the IEELIHC Project		
June 6 and 13, 2016			
21	E-mail stream from Mrs. Gina Petrescu, former IEELIHC Project manager under DIM regime	MRDAP	

Total number of meetings conducted: 21

APPENDIX C – LIST OF PERSONS INTERVIEWED

This is a listing of persons contacted in Bucharest and pilot cities in Romania, and Istanbul (unless otherwise noted) during the Terminal Evaluation Period only. The Evaluator regrets any omissions to this list.

1. Mr. John O'Brien, Regional Technical Advisor, Europe and CIS regions, UNDP-GEF, Istanbul, Turkey;
2. Mr. Mihai Moia, UNDP GEF Project Coordinator, IEELIHC Project, Bucharest;
3. Ms. Andreea Ihos, UNDP GEF Project Assistant, IEELIHC Project, Bucharest;
4. Mr. Adrian Ciuraru, UNDP GEF Project Monitoring and Implementation Specialist, IEELIHC Project, Bucharest;
5. Mrs. Monica Moldovan, former Head of Environment for UNDP Romania;
6. Mr. Raul Pop, former Task Manager for UNDP Romania, Bucharest;
7. Mrs. Gina Petrescu, former MRDAP project manager for the IEELIHC Project;
8. Mr. Mihai Busuioc, General Secretary of MRDAP, and IEELIHC National Project Director, Bucharest;
9. Mrs. Adriana Udroi, IEELIHC Project Manager, MRDAP, Bucharest;
10. Mr. Narcis Jeler, MoECC, Bucharest;
11. Mr. Doru Mituletu Vice-Mayor, Calafat Municipality, Calafat, Dolj County;
12. Ms. Bianca Igarelu Petrosani Municipal Government, Petrosani;
13. Mr. Cristian Popa Vulcan Municipal Government, Vulcan;
14. Ms. Rodica Miha Vulcan Municipal Government, Vulcan;
15. Professor Catalin Lungu, President, Romanian Association for building services engineers, Bucharest;
16. Dr. Emilia-Cerna Mladin, President, Association of Energy Auditors for Buildings in Romania, Bucharest;
17. Ms. Silvia Vlasceanu, General Manager, ACUE, Bucharest;
18. Mr. Marulis Paun, Operations Director, MTsys, Bucharest;
19. Mr. Liviu Clelban, Brand Manager, Arabesque, Bucharest;

20. Mr. Adrian Zamfirache, Director, Henkel, Bucharest;
21. Mr. Seth Landau, Eco Ltd., London, UK.;
22. Mr. Mark Velody, Project Manager, EBRD, Bucharest;
23. Ms. Tania Mihiu, Consultant for Lessons Learned, Bucharest.

APPENDIX D – LIST OF DOCUMENTS REVIEWED

1. UNDP Project Document for the “Improving energy efficiency for low income housing and communities” (IEELIHC Project);
2. IEELIHC Project Inception Report (June 2012);
3. IEELIHC PIRs from 2013 to 2016;
4. IEELIHC Progress and Quarterly Report (2012-2016);
5. Combined Delivery Reports for IEELIHC from 2011 to 2016;
6. IEELIHC Project Supervision Reports (2012-2016);
7. IOWG Meeting Minutes (2011-15);
8. IEELIHC Project Team Meeting Minutes (2011-15);
9. IEELIHC Task Force Meetings (2015-16);
10. UNDP Romania, Energy Efficiency Summary Report (on Survey Results of Awareness Raised by the Project) by the ISRA Center of Marketing Research, July 2013;
11. UNDP Romania: Energetic Efficiency - Summary Report (on Survey Results of Awareness Raised by the Project), June 2016;
12. IEELIHC Project Report on “Proposal for a Methodology for Assessment of Fuel Poverty”, December 2014;
13. UNDP Romania: Mid-Term Evaluation Report for IEELIHC, January 2014;
14. MRDAP Strategy for “mobilizing investment in the renovation fund residential and commercial buildings, both public and private, existing national”, April 2014;
15. Government of Romania, Resolution for the Approval of the National Energy Efficiency Action Plan, March 2015;
16. Energy Efficiency Watch and Intelligent Energy Europe, Romanian Country Report on Assessment of Energy Efficiency Action Plans for Policies in EU Member States, 2013.

APPENDIX E – COMPLETED TRACKING TOOL

Special Notes: reporting on lifetime emissions avoided		
<p>Lifetime direct GHG emissions avoided: 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>Lifetime direct post-project emissions avoided: 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>Lifetime indirect GHG emissions avoided (top-down and bottom-up): 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>Manual for Energy Efficiency and Renewable Energy Projects Manual for Transportation Projects</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 CO₂eq 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 Low-Income Households and Communities in Romania	
GEF ID	PIMS4289	
Agency Project ID	77064	
Country	Romania	
Region	EAP	
GEF Agency	UNDP	
Date of Council/CEO Approval	June 6, 2011	Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	2,974,840	
Date of submission of the tracking tool	June 28, 2016	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\$)		
Cumulative additional resources mobilized (US\$)		additional resources means beyond the cofinancing committed at CEO endorsement

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)		
Policy and regulatory framework	3	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	5,926,248,000	MJ (Million Joule, IEA unit converter: http://www.iea.org/stats/unit.asp) 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	746,600	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	1,365,000	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	164,980	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	-	tonnes CO2eq (see Special Notes above)

APPENDIX F – PROJECT PLANNING MATRIX (PPM) (FROM JUNE 2011)

Strategy	Objectively verifiable indicators			Source of verification	Risks and Assumptions
	Indicator	Baseline	Targets End of Project		
Project Goal: Reduction of GHG emissions in the buildings sector in Romania	Tonnes CO ₂ eq per year reduced (direct reductions) by end-of-project (EOP)	849	22,227	Project reports, PIRs, mid-term evaluation and final evaluation	No radical shift in national political priorities
	Tonnes CO ₂ eq reduced over the lifetime of the EE measures introduced (direct reductions)	25,456	666,800		
Project Objective: Reduction of energy consumption in buildings in low-income households and regions of Romania	MWh in heat energy per year saved as a direct result of this project by EOP	2,197	43,374	Utility reports Project activity reports PIRs Project M&E reports	
	Volume of investments in EE buildings leveraged (cumulative USD by end-of-project)	0	10,741,000		
	No. of people living in EE buildings by EOP	4,500	110,616		
Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities	No. of national-level Government institutions integrating the reduction of fuel poverty through EE/RE into their programmes and policies by EOP	0	3	Project reports, mid-term and final evaluation, policy documents by national, municipal, and county-level government institutions	
	No. of municipal or county-level Government institutions integrating the reduction of fuel poverty through EE into their programmes and policies by EOP	0	2		
Outcome 2: Supply of trained architects, building engineers, builders and auditors with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects	Cumulative no. of building engineers, architects and energy auditors qualified, certified and using the information in their work for the application of EE measures (and applicable Renewable Energy Technologies-RETs) and in the use of sustainable, locally available/produced building materials by EOP	0	200	Training reports, project reports, follow up questionnaires	Building professionals interested in participating in capacity building exercises and implementing new service lines
	Percentage of households that plan to/already implemented EE measures due to the public information points and other public education activities of the project in the two main counties of the project at EOP	0	10%	Survey carried out at project inception and at the end of the project in the two main counties.	Households are interested in improving their homes
	No. of building materials and construction companies within the two pilot counties which are producing and selling locally produced, sustainable EE materials at EOP	0	6	Project reports and responses from the companies involved in the project	Building materials producers/ construction companies continue to be interested in developing these products

Strategy	Objectively verifiable indicators			Risks and Assumptions	
	Indicator	Baseline	Targets End of Project		Source of verification
	No. of additional counties (beyond the 2 pilot counties) which have expressed interest in replicating project activities due to the information campaign activities at EOP	0	3	Project reports and correspondence	Other counties within Romania are interested in addressing fuel poverty and improving EE
	No. of additional countries (beyond Romania) which have expressed interest in replicating project activities due to the information campaign activities EOP	0	2	Project reports and correspondence	Other countries (EU members and developing countries) interested in addressing fuel poverty and improving EE
Outcome 3: Energy efficient buildings reconstructed (and potentially new buildings constructed) with reduced fuel costs or using improved sustainable energy technologies in low-income communities	Cumulative no. of apartment blocks implementing EE/RE measures in Romania by EOP	360	1,474	Project reports, mid-term and final evaluation, applications using Technical analysis carried out by the project	Sufficient interest in EE will continue to grow throughout the country
	Cumulative no. of social buildings in the poorer counties implementing EE measures using project resources or TA from the project by EOP	0	40		
	Cumulative no. of houses implementing EE measures using locally produced, sustainable materials by EOP	0	150		
Outcome 4: Data and information available for decision-makers for designing programmes to address fuel poverty	No. of county/ municipal Governments using an adapted methodology for evaluating fuel poverty by EOP	0	2	Project reports, mid-term and final evaluation, policy documents	No major shift in municipal political priorities
	No. of buildings documented within the building registry by EOP	0	1,500	Project reports, the registry files	At least all buildings with interventions in the project will be put into the registry
Output 1.1: Established national-level, functional multi-organisational working group that formulate and facilitate the approval and adoption of policy recommendations and action plans for EE which integrate poverty alleviation into their working group members' programmes	Cumulative no. of working group meetings by EOP	0	8	Meeting minutes	Institutions will be interested in discussing their programmes with each other
	No. of actions taken to change programmes/policies in order to address fuel poverty by the institutions involved in the working group by EOP	0	3	Project reports	Institutions will incorporate lessons learned
Output 1.2: Identified fuel poverty-related EE	Cumulative no. of counties with action plans implemented to address fuel poverty by EOP	0	2	Policy documents and project reports	Continued interest within the 2 pilot counties

Strategy	Objectively verifiable indicators				Risks and Assumptions
	Indicator	Baseline	Targets End of Project	Source of verification	
improvement activities that are integrated into, and implemented within, development plans and energy plans of selected municipalities/counties; including leveraging funding sources for EE improvements	Cumulative no. of new sources of funding identified along with concrete project plans developed for their financing by Year 3.5	0	2	Project reports, financing applications	Interest within the 2 pilot counties to seek financing for EE measures
Output 2.1: Increased numbers of building professionals, local government authorities and technical personnel capable of providing technical advice and services on the application of EE measures and techniques in the design, construction and operation of buildings	Cumulative no. of building professionals trained and certified in the target counties by end of Year 2	0	300	Project reports, training reports	Interest among building professionals is strong
	No. of professional training courses for building professionals incorporating materials on EE measures due by end of Year 2	0	4	Copies of curricula, project reports	Interest among the training organisations is strong
	No. of handbooks of training activities, best practices and lessons learned in carrying out retrofitting distributed by end of Year 2	0	1,000	Web registrations, project reports with lists of recipients	Interest among building professionals is strong
	No. of municipal employees trained on identifying critical issues and major energy losses in their buildings by end of Year 2	0	60	Training reports	Interest among municipalities remains strong
Output 2.2: Information points in selected public municipalities within two counties for promoting public education on EE measures using commonly used and locally-available technologies	No. of information points within municipalities distributing information and materials on how to implement EE measures into houses, sources of funding and on locally-available materials by EOP	0	50	Project reports	Interest among municipalities remains strong
	No. of households receiving informational materials on the basics of EE measures - including information on how to implement EE practices in their homes by EOP	0	50,000	Project reports, reports from Municipalities	Interest among the public is strong and municipalities distribute literature to subsidy recipients
Output 2.3: Local building material producers and building construction companies highly qualified and capable of producing and applying, respectively, EE building materials	No. of local building material producers and building construction companies trained in producing and applying EE building materials by end of Year 2	0	20	Project reports, training reports	Interest among building materials producers and construction companies is strong
	No. of counties with active producers of locally produced, sustainable EE materials by EOP	0	2	Project reports, assessments of local markets	Interest among building materials producers and construction companies is strong, and demand for EE materials grows

Strategy	Objectively verifiable indicators			Source of verification	Risks and Assumptions
	Indicator	Baseline	Targets End of Project		
Output 2.4: Information campaign results and EE success stories disseminated within Romania, UNDP and in the international community	No. of stories in the media in Romania related to government EE/RE programmes influenced by the project/related to fuel poverty by EOP	0	20	Media clips, project reports	Interest among media outlets exists
	No. of awards ceremonies carried out for EE/RE measures by EOP	0	3	Project reports	Interest among municipalities and companies is strong
	No. of stories in the media/on list serves at EU or international level on EE activities in Romania by EOP	0	15	Media clips, project reports	Interest among international media outlets exists
Output 3.1: Standard EE building design analysis for key types of existing apartment blocks and retrofitted thermal systems of selected apartment blocks	No. of apartment building types with technical properties analysed for EE/RE possibilities and available for public use by EOP	0	50	Web-site with the technical designs, consultancy reports	Technical analysis is feasible and adaptable for the most common types of buildings
	No. of apartment buildings undergoing thermal rehabilitation through using technical analysis and/or through the MDRT programme for thermal rehabilitation by EOP	50 ³⁷	900	Project reports, reports from Municipalities	No major shifts in political priorities or in public demand for thermal rehabilitation
	No. of sustainable heating systems installed in houses influenced by the project/as a part of the MEF programmes by EOP ³⁸	310	484	Reports from the MEF	Subsidies are sufficient to trigger investments
	No. of apartment buildings undergoing thermal rehabilitation using alternative, needs-based, subsidy scheme by EOP	0	40	Project reports, spending reports	Subsidies are sufficient to trigger investments

³⁷ The baseline for this indicator is listed as 50 due to the following reasoning: The UNDP/GEF project involves the provision of subsidies and TA for apartment block retrofits and renovations (envelope and thermal systems) as demonstrations of the application of suitable EE building techniques/ technologies. The UNDP/GEF project will integrally linked with government funded program – the baseline co-financing. Thus, during monitoring, it would be impossible to track the impact of the government funded program without the GEF project (i.e. as a baseline value). It is, however, expected that – without the project – 50 apartment blocks would implement EE measures based upon motivation of the tenants associations.

³⁸ The reasoning for the baseline and target for this indicator is the following: The MEF programme “Green Home” is assumed to spend some portion (estimated 20%) of its budget as baseline financing on sustainable heating systems in apartment blocks – resulting in 310 apartment blocks implementing sustainable heating systems. The GEF project will also provide assistance and input into the “Green Home Programme”. For the purposes of evaluating the project’s impact, it is expected that at least 154 apartment buildings will have been enrolled in the Green Home Programme due to public outreach and capacity building efforts taking place within the project (as tracked over the course of the project). Additionally, the project resources will go towards providing incremental cost subsidies for 20 apartment buildings, resulting in a total incremental impact of 174 apartment buildings.

Strategy	Objectively verifiable indicators			Risks and Assumptions	
	Indicator	Baseline	Targets End of Project		
Output 3.2: Thermally retrofitted social buildings (schools, kindergartens, municipal offices and social houses/residences owned by the local government) in selected counties	No. of social buildings which have undergone EE measures by EOP in selected counties	0	40	Project reports, spending reports	No major shifts in local political priorities
Output 3.3: Houses built/ refurbished using energy efficient, locally-produced materials	No. of houses built/ refurbished using EE, locally produced materials by EOP	0	150	Project reports, spending reports	Subsidies and public information campaigns are sufficient to trigger investments, local materials producers are involved
Output 4.1: Regionally-adaptable methodology for fuel poverty assessment proposed and a guide for municipal decision-makers on fuel poverty issues	No. of methodologies adopted at the national level for measuring fuel poverty by EOP	0	1	Policy documents and project reports	It is possible to build consensus on a methodology for measurement
	No. of local municipalities/counties which have adopted a methodology and begun measuring fuel poverty by EOP	0	2	Policy documents, project reports, and statistical reports	It is possible to build consensus on a methodology for measurement
	No. of reports developed on the costs and benefits of implementing EE measures to address fuel poverty using locally-produced sustainable materials by End of Year 3	0	1	Copies of the reports	Reporting from other project activities is consistent
	No. of guides developed for policy-makers on the costs and benefits of implementing EE measures to address fuel poverty using locally-produced sustainable materials by EOP	0	1	Copies of the guides	Reporting from other project activities is consistent
	No. of guides and reports distributed to building sector actors by EOP	0	1,000	Lists of recipients, registrations from web-site	Sufficient interest exists nation-wide for these issues
Output 4.2: Local and regional registries/databases of building stock	No. of existing central registries of buildings which include information on the buildings by end of Year 1	0	1	Registry web-site	Reporting from other project activities is consistent
	No. of donors/ investors with access to the building registry by EOP	0	10	Web-site registrations	Sufficient interest exists among donors and investors

APPENDIX G – GHG REDUCTIONS REPORT

**CO₂ Emission Reduction Report
of the**

UNDP/GEF Project

**Improving Energy-Efficiency in Low Income
Households and Communities in Romania project'**

**By
Dr. Adil Lari**

June 20, 2016

Introduction

The UNDP GEF ‘Improving Energy-Efficiency in Low Income Households and Communities in Romania project’ was funded by GEF (3 mil US\$) and had a 6 year implementation period from June 2010 – June 2016.

The general objective of the project was to dismantle the barriers to the implementation of energy efficiency measures among poorer households and in poorer communities in Romania and alleviate fuel poverty. This will be achieved through the following components/outcomes:

- **Outcome 1:** Romanian energy **policy** integrating fuel poverty issues and addressing EE needs in low-income communities
- **Outcome 2:** Supply of **trained architects, building engineers, builders and auditors** with EE experience expanded; municipalities in low-income regions have a better understanding of EE issues and are able to support auditing and weatherization projects – including disseminating information for Do-It-Yourself projects
- **Outcome 3:** Energy efficient **buildings reconstructed** with reduced fuel costs or using improved sustainable technologies in low income communities
- **Outcome 4:** **Data and information available for decision-makers** for designing programs to address fuel poverty.

The project intended to act at a national and local level to address energy efficiency needs, develop appropriate policy measures, stimulate an on-going market for locally-produced, energy efficient building materials, build capacity for implementation of energy efficiency measures in poorer regions, and implement real energy efficiency improvements to improve the lives of 110,620 people and reduce energy-related greenhouse gas emissions by 666,800 tons of CO₂eq. The implementing partner for the project is the Ministry of Regional Development and Public Administration.

The principal objective of the current assignment is the effective analysis of the energy and GHG emission reductions delivered through project activities over the lifetime of the project and over the lifetime of the measures implemented through the project regarding energy consumption and related GHG emissions.

Methodology

There are 2 methodologies for calculating GHG benefits which are applicable to this evaluation;

1. As outlined in the ‘**Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects**’ from GEF Council, April, 2008. (**2008 methodology**). This methodology was applied in the project design and development and corresponds to the CO₂ calculation presented in the Prodoc.
2. Revisions to the 2008 methodology as outlined in ‘**Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, Version 1.0**’ from STAP, March 2013 (**2013 methodology**). This methodology is based on the 2008 methodology but provides a more consistent basis for calculation which is also embedded in a spreadsheet tool.

Objectives and Outcomes as Formulated in the ProDoc

Buildings in Romania are responsible for 36% of final energy consumption and approximately 56.1 million tonnes of national CO_{2eq} emissions – out of a total of 152.3 million tCO_{2eq} emissions in 2007.

The building sector in Romania is dominated by residential buildings – comprising 95.4% of all buildings. Existing residential buildings are generally old (over half of residential buildings were built before 1970). These buildings have poor thermal properties – with average annual heating requirements of between 137-220 kWh/m². However, pilot projects throughout Romania have shown that it is very possible to reduce these heating needs by at least 40- 50% from these levels. This is consistent with results in other countries as well as with large blocks of flats. They are also mostly in need of significant repairs.

This project had for its objective the removal of barriers to the implementation of energy efficiency measures among poorer households and in poorer communities in Romania – working to alleviate fuel poverty. The project intended to act at a national and local level to address energy efficiency needs, develop appropriate policy measures, stimulate an on-going market for locally produced, energy efficient building materials, build capacity for implementation of energy efficiency measures in poorer regions, and implement real energy efficiency improvements to improve the lives of 110,616 people in Romania and reducing emissions associated with energy use.

The direct reductions that could be attributed to this project were expected to be approximately 22,227 tonnes of CO_{2eq} per year without subtracting for the baseline and 21,378 tonnes of CO_{2eq} after subtracting the baseline totals. The investments were assumed to have an average useful investment lifetime of 30 years. As such, the estimated lifetime emissions reductions for the project were 666,800 tonnes CO_{2eq} without subtracting for the baseline and 641,344 tonnes CO_{2eq} after subtracting the baseline reductions. Details regarding the calculations are illustrated in the following Table from the Prodoc (pp.155-156).

Summary of expected CO_{2e} emissions reductions from the Prodoc (p160)

The project was expected to deliver the following GHG emissions reductions and energy savings above the baseline:

- Direct energy savings would be 43,373 MWh per year without subtracting for the baseline and **41,177 MWh** after subtracting for the baseline reductions.
- The direct reductions that could be attributed to this project were expected to be approximately 22,227 tonnes of CO_{2eq} per year without subtracting for the baseline and **21,378 tonnes of CO_{2eq}** per year after subtracting the baseline totals.
- The investments were assumed to have an average useful investment lifetime of 30 years.
- As such, the estimated lifetime emissions reductions for the project were 666,800 tonnes CO_{2eq} without subtracting for the baseline and **641,344 tonnes CO_{2eq}** after subtracting the baseline reductions.
- a range of indirect emissions reductions between 1.604 million and 1.924 million tonnes of CO_{2eq}
 - Indirect bottom-up emissions reductions: 1.924 million tonnes CO_{2eq}
 - Indirect top-down emissions reductions: 1.604 million tonnes CO_{2eq}

Table 1 - Description of the direct emissions reductions expected from the project (ProDoc, pp.155,156)

Activity	Heating source	Number of buildings for the programme	Surface area of the buildings	Kg GHG/ KWh	KWh/m ² heating before intervention	Correction for suppressed demand (KWh/m ²)	KWh/m ² actual before intervention	KWh/m ² - heating after intervention	KWh saved per year	Tonnes GHG per year reduced
Activity 3.1.1: Conduct of technical analysis of typical apartment block designs – including possibilities for energy efficiency improvements – and streamlining of the planning and application for government funding of building thermal rehabilitation projects	Varied	900	1,053,000	0.39	138	0	138	100	39,543,075	15,274
Activity 3.1.2: Implementation of a pilot programme on the application of sustainable heating systems in selected apartment blocks that are not on the DH system	Coal, wood, electricity stoves	194	226,405	0.39	100	0	100	100	0	4,972
Activity 3.1.3: Implementation of a pilot programme on the provision of subsidies to apartment blocks with a few poor households	Varied	20	23,400	0.62	138	0	138	100	878,735	549
Activity 3.1.3: Implementation of a pilot programme on the provision of subsidies to apartment blocks with a few poor households	Coal, wood, electricity stoves	20	23,400	0.41	220	44	176	100	1,783,184	727
Activity 3.2.1: Implementation of building rehabilitation/ refurbishment/ construction in social buildings using locally-produced EE materials	Coal and Gas District Heating	40	8,000	0.66	285	0	285	171	911,015	600
Activity 3.3.1: Conduct of energy performance inspections in selected households and implementation of thermal system rehabilitation and construction in these households using sustainable locally-produced EE materials	Wood and coal	150	5,850	0.37	220	44	176	132	257,699	106
Totals		1,324	1,340,055						43,373,708	22,227
Business as Usual	Varied	50	58,500	0.39	138			100	2,196,838	849
Total Incremental impact		1,274	1,281,555						41,176,871	21,378

INVESTMENT LIFETIME

Although an average useful investment lifetime of 30 years has been assumed in the Prodoc (p153), for the purposes of this evaluation, the maximum investment lifetime of 20 years recommended by the GEF guidelines (2013 Methodology p.10, footnote 16) has been assumed throughout this evaluation in order to enable an accountable comparison with other GEF projects.

SUPPRESSED DEMAND

The calculated heat energy savings are generally determined by the difference between the calculated annual heat energy demand (in kWh/m².a) before and after rehabilitation. These standardized calculations are based on EU calculation methodologies which assume the maintenance of a comfort temperature (20°C or more) throughout the heating season. While these comfort temperatures may in reality not be maintained (because of poor service, cut-offs or as an attempt to save on heating costs), the calculation methodology has been used without attempts to estimate reductions due to suppressed demand.

In the Prodoc (p.153) the issue of ‘suppressed demand’ was addressed but not considered to impact the energy and CO₂ saving calculations in a significant manner. The reasons were that

- For apartment blocks on the DH system (Activities 3.1.1 and 3.1.3): because the users of the DH system typically do not have apartment-level control over their billing, there is no heat which they do not use because of lack of income. Instead, their bills are covered through demand-side subsidies. Suppressed demand is not, therefore, an issue for this set of households.
- For public social buildings: suppressed demand is not an issue because the Government or Municipal Authorities pay for the heating bills.
- For apartments not on the DH system or for houses not on the DH system: suppressed demand is an issue which should be accounted for.
 - However, due to significant demand-side subsidies (direct to households), and based on household surveys, it does not appear that expenses in poorer households for heating are more than 20-25% less than those of wealthier households (on a basis of expenses per square metre).
 - The statistics used in estimating emissions reduction (in Table 1) are based on conservatively low analytical estimates of heating needs for apartments and houses.

Evaluation and Findings

Table 2 – Summary of CO₂ Emission reductions from the Project

Activity - planned in ProDoc	Implemented	Sources of Verification	CO ₂ ER
Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities	Project's Inter-Organization-al Working Group drafted amendments to Ord. 18/2009 with Ord 63/2012 expanding the National Thermal Rehabilitation Programme and Regional Operational Programme to cover additional EE measures and municipalities	According to Progress Report from MDRAP, 216 residential blocks have been rehabilitated to end of 2015 under Ord.63/2012 resulting in 75 million kWh annual energy savings.	Direct ER: 34,125tCO ₂ /yr = 682.5ktCO₂ over 20 year technology lifetime. Post-project direct ER potential:

Activity - planned in ProDoc	Implemented	Sources of Verification	CO2 ER
Outcome 2: Training and information dissemination (including self-help guidelines for single family houses)	DIY guidebooks made available through regional information centres	no data available on application of DIY measures in single family homes	Indirect ER: no data available on DIY prog.
Activity 3.1.1: Conduct of technical analysis of typical apartment block designs – including possibilities for energy efficiency improvements – and streamlining of the planning and application for government funding of building thermal rehabilitation projects	Technical Documentation for 50 residential building types (available on MDRAP Website) prepared by Vitastal Consulting (Report November 2015) as support for municipalities applying to Residential Building Rehabilitation Programmes	As of TE, no buildings had been commissioned based on prepared Technical Documentation. 2 municipalities are currently using documentation to prepare applications. Good potential for post-project application	No direct ER. Estimated Indirect Post-Project ER: 18.35 to 36.7ktCO ₂
Activity 3.1.2: Implementation of a pilot programme on the application of sustainable heating systems in selected apartment blocks that are not on the DH system	Boiler Replacements in municipal public buildings (Schools, Kindergartens, Administration Buildings, Sports Fac.)	Audit Reports have been prepared for 19 Demonstration Sites by AAECR. Limited potential for indirect & post-project impact	Direct ER: 572tCO ₂ eq/yr = 11.44ktCO₂ over 20 year technology lifetime
Activity 3.1.3: Implementation of a pilot programme on the provision of subsidies to apartment blocks with a few poor households	Within the National Thermal Rehab. Prog., local gvmt. already covers costs for identified households.		No direct ER.
Activity 3.2.1: Implementation of building rehabilitation/ refurbishment/ construction in social buildings using locally produced, EE building materials	Project provided insulation materials for the thermal rehabilitation of social buildings in Dolj and Hunedoara Counties	43 public buildings (schools, kindergartens, etc) have been insulated. Energy Audits have been provided.	Direct ER: 2,435tCO ₂ /yr = 48.7ktCO₂ over 20 year technology lifetime
Activity 3.3.1: Conduct of energy performance inspections in selected households and implementation of thermal system rehabilitation and construction in these households using sustainable locally-produced EE materials	Project provided grants in 2011/12 for audits, rehabilitation and retrofitting of 7 selected public buildings (schools and kindergartens) in Dolj and Hunedoara counties	Report on energy savings has been prepared for 7 Demonstration Sites by AAECR.	Direct ER: 199tCO ₂ /a = 4.0ktCO₂ over 20 year technology lifetime
Outcome 4: Data and informational for decision-makers - Building Energy Performance database	Building Energy Performance database is still incomplete and has not been launched		Potential post-project indirect ER

Outcome 1: Romanian energy policy integrates fuel poverty issues and addresses EE needs in low-income communities.

The Project has made a number of recommendations for Legislative changes, but most are aimed at establishing the concept of ‘vulnerable consumer.’ Although these recommendations are consistent with the ProDoc, they have little or no bearing on the CO2 impact of the Project. It is not expected that an additional volume of existing buildings will be rehabilitated on account of these legislative recommendations concerning fuel poverty.

Amendment of Ordinance 18/2009 with Ordinance 63/2012

According to the MTE (p.63): ‘Estimated 25 866 tonnes CO2/year are planned to be achieved by EoP by the National Programme and Regional Operational Programme - ROP, through amendment of Ordinance 18/2009 with Ordinance 63/2012, which makes provisions for the introduction of additional cities into the rehabilitation programme and additional EE measures leading to an increased CO2 emission reduction.’

Although the National Thermal Rehabilitation Programme (Ordinance 18/2009) was operational before the project start (and is thereby considered as baseline), the amendment of Ordinance 18/2009 with Ordinance 63/2012 which was enacted in November 2012, is a result of Project activities. According to the MTE, the Project formed and participated in the Inter-Organizational Working Group (MTE, p.52, Expected output 1.1) which proposed the amendment to Ordinance 18/2009 with Ordinance 63/2012 (MTE, pp.53 & 68), ‘directly influencing the expansion of the original national rehabilitation programme to cover supplementary EE measures and municipalities.’

According to the current data provided by the Ministry of Regional Development and Public Administration (MDRAP, Progress in achieving the objectives of Romania's national energy efficiency - the "buildings" from 2011-31.12.2015), under the local programs financed under art. II of Ordinance 63/2012, **216 buildings** (9626 apartments) were rehabilitated by the end of 2015 with total primary energy savings of **75 million kWh/year** (6.45 thousand toe). The calculation is reportedly based on the assumption of 40% energy savings compared to building consumption prior to rehabilitation.

The amendment has been enacted since 2013 and the data to end of 2015 has been made available by the MRD. Assuming an additional 17% to account for the final half year of the Project (January – June 2016), the energy savings would be **87.5 thousand MWh/year**.

Assuming the average conversion factor of 0.39KgCO2/kWh (Prodoc, pp.150, 156), **87.5 million kWh/year** would equate to 34,125 tCO2/year (compared with 25,886t/yr predicted in the MTE p.63) or **682.5 ktCO2** over the 20year lifetime of measures.

In the revised GEF GHG Calculation Methodology from 2013, legislative changes brought about by the Project (ie new EE buildings codes) can produce direct and post-project direct emission reductions (instead of indirect ER according to the previous GEF GHG calculation methodology from 2008). Accordingly, these ER resulting from the amendment of Ordinance 18/2009 with Ordinance 63/2012, are considered direct ER which can be credited to the Project.

Remarks:

- 1- According to the MDRAP Progress Report, 1554 buildings have been renovated under the National Thermal Rehabilitation Programme (Ordinance 18/2009) since it's start in 2009 and up to the end of 2015. Because the Programme began before Project start, the energy and emission savings resulting from the Programme (according to its original terms and scope) are considered in this evaluation as Baseline.
- 2- Unfortunately, within the scope of this evaluation, it has not been possible to attain more

detailed data and information on the additional regional scope and EE measures which are covered by the amendment of Ordinance 18/2009 with Ordinance 63/2012. It is not clear from the MDRAP Progress Report, whether further building rehabilitation programmes have benefitted from these amendments (or from other legislative interventions realized by the Project.)

- 3- Details on the 216 buildings which have been reportedly rehabilitated to the end of 2015 have been requested but supporting documentation has not been made available.
- 4- The possibility that some, many or all of the amendment of Ordinance 18/2009 would have been carried out without the Project intervention has not been considered in the calculation. In particular, it is possible that some aspects of the amendment are in response to EU Directives and deadlines.

Outcome 2: Training and information dissemination (including self-help guidelines for single family houses)

In the GEF GHG calculation methodology, training and dissemination activities alone do not produce ER but rather support effective and sustainable ER generation from other key mechanisms (policy, financial or demonstration measures). The effectiveness of the Project's training activities in Outcome 2 has been considered in the calculation of ER from Outcomes 1 and 3.

Self-help guidelines for single family house owners which provide tips on cost-efficient and readily available means to thermally improve their homes has been prepared and distributed by the Project through regional info centers. The guidelines have only been available for a few months and their impact has not been monitored. For this reason, no impact has been accounted in this evaluation.

Activity 3.1.1: According to the ProDoc, almost all of the 84,000 apartment blocks in Romania share one of 800 architectural designs, but the original designs are not available for many. This is a hindrance to the wide-scale uptake of EE measures as building owner associations must pay for this design work up front, which can cost 3-5% of the project itself. This represents an initial hurdle because apartment blocks do not want to pay USD 6000 for a technical study and instead would like to implement activities without examining their impacts first. This can lead to improvements being made without official approval and also limit the improvements of EE.

This activity was a technical analysis of 50 types of buildings which represent a significant portion of the building stock of apartment blocks in Romania – though it is not known what number of building blocks has which designs. Experts involved in the project preparation estimate that this would cover 75% of all apartment blocks in Romania.

The building documentation and analysis report have been prepared for 50 typical building types in 5 cities by Vitastal Consulting SRL in November 2015. The building documentation for the 50 types is available for free download on the Ministry of Regional Development website. The retrofitting measures include exterior mineral wool insulation, enclosure of external balconies, insulation of the roof slab and of the slab above the basement. Further, heat and hot water supply pipes are replaced and thermostatic valves installed for blocks of flats connected to the district heating network. According to the Supporting Report (Vitasol, Nov.2015), total emission reductions for the 50 'typical' blocks of flats is estimated at 4,588 tCO₂/year, accounting all similar blocks in the 5 participant cities (Calan, Petrița, Pertosani, Craiova and Vulcan) , 35,744 tCO₂/year and accounting replication in similar buildings (estimated 61,176 blocks) throughout Romania, 1.9 million tCO₂/year.

The Technical Documentation was first made available quite late in the Project (November 2015) and, as such, has not been available long enough to realize real impact. Currently, two municipalities are using the documentation to prepare applications for funding to initiate

rehabilitations. Considering then that by EoP, no buildings shall be renovated using the Technical Documentation, there are no direct ER benefits attributed to this activity. As indirect post-project impact, it is assumed 5-10 similar blocks are renovated using this documentation each year for 10 post-project years (total 50-100 buildings). According to the Supporting Report (Vitasol, Nov.2015, p56) renovations of the 50 typical buildings would save 4,588tCO₂/year. Considering a causality factor of 20% (assuming that these buildings may have also been renovated without the Technical Documentation), and 20-year lifetime of measures, the post-project indirect emission reductions from Activity 3.1.1. are estimated to be between 18.35 and 36.7 ktCO₂.

Estimated Indirect Post-Project ER:

50 buildings: 4,588 tCO₂/year x 20 years x 20% = 18,350 tCO₂
 100 buildings: 2x4,588 tCO₂/year x 20 years x 20% = 36,700 tCO₂

Activity 3.1.2: Implementation of a pilot programme on the application of sustainable heating systems in selected apartment blocks that are not on the DH system.

Due to the bureaucratic difficulties in implementing this activity in apartment blocks, the Project targeted the installation of central boilers in 21 public buildings instead of in residential buildings. Reports from the Association of Energy Auditors for Buildings in Romania (AAECR) indicate energy savings of 463,993 kWh/yr and emission reductions of 492,284 kgCO₂/yr for the first 16 buildings (AAECR, Report #1, 2014) and an additional energy requirement of 36,440 kWh/yr but emission reductions of 79,819 kgCO₂ per year for the next 3 buildings (AAECR, Report #2, 2015). In the Final Report from AAECR (Dec.2015), it is indicated that the final 2 installations were not realized due to problems raised by local authorities.

In total, as a result of Activity 3.1.2. and considering a 20-year lifetime of measures, **8551 MWh** energy was saved corresponding to **11.44 ktCO₂** direct emission reduction.

Energy Savings:

(463,993 – 36,440) kWh/yr x 20yrs = 8,551,060 kWh = 8551 MWh

Direct ER:

(492,284 + 79,819) kgCO₂/yr x 20yrs = 11,442,060 kgCO₂ = 11.44 ktCO₂

Activity 3.1.3: Implementation of a pilot programme on the provision of subsidies to apartment blocks with a few poor households.

Within the terms of the National Thermal Rehabilitation Programme, local government already covered the costs for identified poor households in apartment buildings being renovated under the Programme. The Project did not initiate a pilot programme dealing with this aspect. As such no emission reductions or energy savings are attributed to this activity.

Activity 3.2.1: Implementation of building rehabilitation/ refurbishment/ construction in social buildings using locally produced, EE building materials.

The Project provided insulation materials for the thermal rehabilitation of **43 social buildings** (schools, kindergartens and other buildings) in Dolj and Hunedoara counties. Energy Certificates were prepared for these buildings whereby the energy consumptions before and after rehabilitation were based on calculated performance according to EU calculation methodologies (which includes the assumption that comfort temperatures are maintained throughout the heating period) and not on actual measurement.

Table 3 - Savings from Buildings Insulated under Activity 3.2.1

	City	Building name	heated area (m2)	heat demand (kWh/m2a)		% saving	annual heat energy savings (MWh/yr)
				before	after		
1	Calafat	A13 social block of flats	2253	102	61	40%	93
2	Calafat	ASTRA social block of flats	1594	158	61	62%	156
3	Calafat	G7 social block of flats	1764	127	66	48%	107
4	Calafat	Culture House	2074	150	112	25%	79
5	Calafat	High School	3169	117	74	37%	139
6	Calan	Victoria Sports Center	436	337	250	26%	38
7	Petrila	Social Center (Fosta Directie)	906	439	352	20%	79
8	Petrila	Social Center	533	211	160	24%	27
9	Petrosani	Secondary School Avram Stanca	3372	396	327	18%	234
10	Petrosani	General School no.4	3748	437	351	20%	323
11	Petrosani	General School no.7	2280	201	91	55%	251
12	Petrosani	Kindergarten 2 ext. program	1522	427	221	48%	313
13	Petrosani	Kindergarten 2 normal program	948	248	131	47%	111
14	Petrosani	Kindergarten 3	1084	295	172	42%	133
15	Vulcan	Kindergarten 1 ext. program	602	490	383	22%	65
16	Vulcan	Kindergarten 1 normal program	491	375	218	42%	77
17	Vulcan	Kindergarten 1 (School 6)	1062	434	291	33%	152
18	Vulcan	Kindergarten 4	289	675	352	48%	93
19	Vulcan	Social aid canteen	127	714	374	48%	43
20	Vulcan	Social Center Sansa	597	554	352	36%	121
21	Vulcan	Sports Gymnasium	1027	175	117	33%	59
22	Craiova	Fratii Buzesti Halls	2181	461	335	27%	276
23	Craiova	Kindergarten 11	166	272	98	64%	29
24	Craiova	Kindergarten 15	441	325	95	71%	101
25	Craiova	Kindergarten 28	657	250	69	72%	119
26	Craiova	Kindergarten 31	1105	258	96	63%	179
27	Craiova	Kindergarten 51	1382	291	83	72%	288
28	Bucovat	Bucovat General School	716	212	122	43%	65
29	Bucovat	Bucovat Kindergarten	332	206	124	40%	27
30	Simnic	Lesile School	426	374	198	47%	75
31	Malu Mare	Preajba School	303	432	187	57%	74
32	Malu Mare	Malu Mare School	964	314	177	44%	132
33	Teasc	Secui Secondary School	416	330	150	55%	75
34	Terpezita	Terpezita Secondary School	784	290	154	47%	107
35	Ghercesti	Ghercesti Kindergarten - 2 bldgs.	366	260	144	45%	42

	City	Building name	heated area (m2)	heat demand (kWh/m2a)		% saving	annual heat energy savings (MWh/yr)
				before	after		
36	Pielesti	Pielesti Kindergarten	356	904	248	73%	233
37	Bradesti	Bradesti School	608	330	98	70%	141
38	Tuglui	Tuglui School	290	531	100	81%	125
39	Cotofenii d.Fata	Beharca School	152	591	99	83%	75
40	Segarcea	School	2012	165	94	43%	143
41	Vulcan	Hospital	3377	472	221	53%	849
42	Petrosani	Informatics High School	2724				323
43	Petrosani	Kindergarten Ext. Program C2	593				70
TOTAL			50227				6243

The total energy savings from these projects is reported as **6243 MWh/yr**. Together, the rehabilitated buildings have a total area of 50,277m². On average, 124 kWh/m²a (corresponding to 47%) of the original energy consumptions have been saved through the addition of insulation to these buildings.

Remarks:

1. In the original ProDoc, the average energy demand for the buildings in this Activity was assumed to be 285 kWh/m²a before, and 171 kWh/m²a after rehabilitation, corresponding to a saving of 114 kWh/m²a (or 40%). On average, the savings indicated in the table lie about 10% above this target.
2. The actual energy savings are impossible to determine accurately considering the energy consumptions before and after rehabilitation were based on calculated performance according to EU calculation methodologies and not on measurement. The calculation assumes that comfort temperatures are maintained throughout the heating period. During the evaluation mission, discussions were held with local stakeholders who mentioned that prior to the rehabilitations it was not uncommon for children to wear their winter outdoor clothes in the classroom because of cold indoor temperatures during the winter. The rehabilitations have helped a great deal towards maintaining comfortable temperatures in these buildings.
3. Based on the review of building rehabilitations completed or underway in Calafat, Petrosani and Vulcan during the evaluation mission, the insulation measures implemented may not be as effective as indicated in the certificates due to poor workmanship and the existence of cold bridges around windows and parapets. Additional training for the construction firms which are implementing the insulation measures would bring better results in terms of effectiveness.
4. A number of the buildings insulated in this activity, had previously been refitted with new boilers (under Activity 3.1.2 above) or with repairs to doors and windows (under Activity 3.3.1 below). The savings reported here are for the insulation measures only and thereby are considered additional to the measures reported in the other Activities.

Due to omissions and inconsistencies in the CO₂ emission reduction in the audit reports, an average conversion factor of 0.39 kgCO₂/kWh has been assumed for these buildings consistent

with the Prodoc (pp.150 and156). Direct emission reductions from Activity 3.2.1, over the 20 year lifetime of the measures is thereby calculated as **48.7 ktCO₂**.

$$\begin{aligned} 6243 \text{ MWh/yr} \times 0.39 \text{ tCO}_2/\text{MWh} &= 2,434.8 \text{ tCO}_2/\text{yr} \\ 2,434.8 \text{ tCO}_2/\text{yr} \times 20 \text{ years} &= 48,695 \text{ tCO}_2 \end{aligned}$$

Activity 3.3.1: Conduct of energy performance inspections in selected households and implementation of thermal system rehabilitation and construction in these households using sustainable locally-produced EE materials.

A spreadsheet on energy savings has been prepared for 7 Demonstration Sites audited by the Energy Auditors for Buildings in Romania (AAECR). The rehabilitations were completed in 2012 and the savings from these buildings were already reported in the Mid Term Evaluation (MTE, pp.56, 63). The energy savings for these 7 buildings has been reported as **645.12 MWh/yr** and the CO₂ savings have been determined as 199.84tCO₂/yr. Assuming a 20-year lifetime of measures, this equates to **4.0 ktCO₂** direct emission reductions under Activity 3.3.1.

Outcome 4: Data and informational for decision-makers - Building Energy Performance database

The Building Energy Performance database is still incomplete and has not been launched. The impact of the database is difficult to access considering it is neither complete nor does it have a clear mandate and target in terms of Building Energy Management. As described in the ProDoc, the database is a building stock registry, which can help determine priorities in terms of government policy and rehabilitation programmes. As such, according to GEF GHG calculation methodologies, it supports other key measures (in this case, policy and programmes) to generate ER but does not generate ER itself.

No emission reductions have been accounted for from this Outcome but its potential positive influence has been taken into consideration in the calculation of post-project ER from Outputs 1 and 3.

Summary

Table 4 - Summary of Key Indicators

Activity	Project Period				10 year Post-Project	
	no. of bldgs.	no. of people living in EE buildings	savings MWh/yr	direct ER (ktCO ₂)	direct ER (ktCO ₂)	Indirect ER (ktCO ₂)
Outcome 1: Amendments to Ord. 18/2009 with Ord. 63/2012	252	28 350	74 994	682.5	1365	
Activity 3.1.1: Technical Documentation for 50 building types						36.7
Activity 3.1.2: Boiler Replacements in 21 public buildings	19		427	11.44		22.88
Activity 3.2.1: Insulation Programme for 43 public buildings	43		6 243	48.7		97.4
Activity 3.3.1: Renovation of windows and doors of 7 Public Buildings	7		645	4.0		8.0
Outcome 4: Building Energy Performance database						
TOTALS	321	28 350	82 309	746.64	1 365	164.98

Remarks:

Post-project Emission Reductions are estimated as follows:

1. For Outcome 1: In the revised GEF GHG Calculation Methodology from 2013, legislative changes brought about by the Project (ie new EE buildings codes) can produce direct and post-project direct emission reductions (instead of indirect ER according to the previous GEF GHG calculation methodology from 2008). Accordingly, these ER resulting from the amendment of Ordinance 18/2009 with Ordinance 63/2012, are considered direct ER which can be credited to the Project.

The amendment of Ordinance 18/2009 with Ordinance 63/2012 was enacted end of 2012, so 3,5 years before the end of project. It is estimated that post-project direct benefits from these legislative changes during the 10-year post-project period would be twice that of the direct benefits prior to EoP.

- 1 The estimate is based on the limited information made available during the evaluation concerning these amendments and their influence. Accountable data about the future of the rehabilitation Programmes, the scope of influence which Ordinance 63/2012 has on them, and if (and when) the amendments would have been developed and enforced anyway (without the Project influence) are lacking. With more information,

a more accurate estimate of which ER benefits from these amendments are reasonably credited back to the Project would be possible.

2. For Activity 3.1.1: It is estimated that during the 10-year Post-Project period, 100 buildings will be renovated based on the technical documentation made available by the project. In the Supporting Report (Vitasol, Nov.2015) 4,588 tCO₂/year could be saved by renovations of the 50 typical apartment buildings. A 20% causality factor is used considering that the rehabilitations may have also occurred under the baseline rehabilitation programmes and under Outcome 1, without the technical documentation. Emission reductions are counted for the 20-year lifetime of measures.³
 - $2 \times 4,588 \text{ tCO}_2/\text{year} \times 20 \text{ years} \times 20\% = 36,700 \text{ tCO}_2$
3. For Activities 3.1.2, 3.2.1 and 3.3.1, it is estimated that during the 10-year Post-Project period, spin-off rehabilitation projects will be carried out based on the measures implemented in the pilot sites. A replication factor of 2 is assumed in each case.⁴

Conclusions

Table 5 - Summary of Targets and Achievements

	targeted	achieved
Direct ER over lifetime (ktCO ₂)	641.3	746.6
Annual Direct ER (ktCO ₂ /yr)	21.4	37.3
Annual Energy saving (MWh/yr)	41 177	82 309
Number of buildings rehabilitated	1 274	321
Additional persons in EE buildings	110 620	28 350
Post Project Direct ER (ktCO ₂)	-	1 365
Indirect ER (ktCO ₂)	1600- 1900	165

1. Considering the available data and information, using the GEF GHG Calculation Methodology as revised in 2013, and assuming that the Amendment to Ord. 18/2009 with Ord. 63/2012 which was developed by the Project and enacted in November 2012 would not have occurred (or occurred over 10 years later) without the Project, the direct CO₂ emission reductions accredited to the Project on account of these legislative changes are estimated to be **682.5 ktCO₂** prior to EoP and **1365 ktCO₂** in the 10-year Post-Project period. The ER accredited to these legislative changes make up the major part (90%) of the total ER accredited to the Project.

Further 64.14 ktCO₂ direct emission reductions are accredited to the demonstration activities undertaken under Component 3. Altogether, the direct ER of the Project are estimated to be **746.6 ktCO₂**. This exceeds the direct CO₂ ER target (641.3 ktCO₂) outlined in the ProDoc. In terms of achieving its overall direct GHG ER target, the Project can thus be considered successful.

2. The Project has reduced heat energy consumption in buildings in Romania during its lifetime by an estimated **82,309 MWh/yr**. 91% of this amount is accredited to the legislative changes under Outcome 1 and the remainder to demonstration projects carried out under Outcome 3. This amount is double the target for direct energy savings

(41,177 MWh) outlined in the ProDoc. In terms of achieving its overall direct energy savings target, the project can thus be considered successful.

3. In terms of the number of building renovations and number of people living in energy efficient buildings, the Project has fallen short of the targets outlined in the ProDoc. The Project has achieved the rehabilitation of **321 buildings** (compared to the target of 1274) and seen an estimated additional **28,350 people** living in EE buildings (compared to a target of 110,620). This is in part due to the fact that under Outcome 3, it was decided to concentrate on rehabilitation of public buildings rather than residential buildings.
4. The estimated post-project emission reductions are 1365 kt CO₂ direct and 165 kt CO₂ indirect. Considering that under previous GHG calculation methodologies benefits from legislative changes were considered as indirect ER (and the ProDoc thereby had no direct post-project ER targets), the total estimated (direct and indirect) post-project emission reductions; **1,530 ktCO₂** can be considered against the indirect emission reductions (between 1,600 and 1,900 ktCO₂) targeted in the ProDoc. In terms of achieving this target, the project can thus be considered marginally successful.

APPENDIX H - 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.

Evaluation Consultant Agreement Form³⁹

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Roland Wong

Name 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 Surrey, BC, Canada on June 28, 2016

Signature:  _____

³⁹www.unevaluation.org/unegcodeofconduct