Mid Term Review

of the UNDP GEF project

"ESCO Moldova"

Transforming the market for urban energy efficiency in Moldova by introducing Energy Service Companies

7th March 2017

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Contents

In accordance with MTR guidelines, a separate annex issued on the same day as this report details how all received comments have (and have not) been addressed in this report.

Acronyms and Abbreviations

BL	Baseline
CAP	Contracts, Asset and Procurement Committee
DOA	Delegation of Authority
EEA	Energy Efficiency Agency (Agenția pentru Eficiență Energetică)
EEF	Energy Efficiency Fund (Fondul pentru Eficienta Energetica)
EPC	Energy Performance Contract
ESCO	Energy Services Company
GEF	Global Environment Facility
GoRM	Government of the Republic of Moldova
GUDP	Green Urban Development Plan
INOGATE	An EU multi-country energy technical assistance programme
LEDS	Low Emission Development Strategy of GoRM to 2020
LGF	Loan Guarantee Fund
LPAC	Local Project Appraisal Committee
MoE	Ministry of Economy
MoENV	Ministry of Environment
MTR	Mid-term Review
PAA	Public Acquisition Agency (Agenția Achiziții Publice)
PIF	Project Identification Form
PIF	Project Implementation Form
PIR	Project Implementation Review
PMC	Chisinau Municipality (Primaria Municipalitate Chisinau)
PMU	Project Management Unit
RACP	Regional Advisory Committee on Procurement
RCPO	Regional Chief Procurement Officer
RPG	Role-Playing Game
SEAP	Sustainable Energy Action Plan
TA	Technical Assistance
UDP	Urban Development Plan
UNDP	United Nations Development Programme

1. Executive Summary

1.1. Project Information Table

Title of UNDP supported GEF financed project	ESCO Moldova - transforming the market for urban energy efficiency in Moldova by introducing Energy Service Companies
UNDP PIMS#	5135
GEF project ID#	00089623
MTR time frame and date of MTR report	November/December 2016
Region and countries included in the project	Europe and Central Asia, Republic of Moldova
GEF Operational Focal Area/Strategic Program	Climate Change, Strategic Priority #4 "Promote energy efficient, low carbon transport and urban systems."
Executing Agency/Implementing Partner and other project partners	UNDP Moldova/Ministry of Environment, Ministry of Economy, City of Chisinau, Energy Efficiency Fund.
Mid-term Review consultant	Mark Velody

1.2. Project Description (brief)

UNDP GEF 'ESCO Moldova'

The Project Objective is to create a functioning, sustainable and effective ESCO market in Moldova by converting existing energy service provider companies into ESCOs, as the basis for scaling up mitigation efforts in the whole municipal building sector in Moldova in line with the Green Urban Development Plan (GUDP) leading to at least 68,000 tonnes of direct CO_2 emission reductions from EPC projects supported by the project and 240,000 tonnes of indirect CO_2 emission reductions during the period of project influence. Planned Outcomes are:

1) GUDP adopted by City of Chisinau; additional emission reduction projects financed and implemented in Chisinau; and a GU Procurement Guide being utilized by City of Chisinau.
2) ESCOs successfully investing in buildings using Energy Performance Contracting.
3) A financial mechanism set up, functional, providing financial support to ESCOs; and
4) EPC Projects replicated in other municipalities; and information disseminated.

1.3. Project Progress Summary

UNDP GEF 'ESCO Moldova' - Progress to February 2017

Outcome1, 'Green Urban Development Plan (GUDP) Adopted by City of Chisinau', is unlikely within the lifetime of the Project. A plan to take the existing UDP, add green elements and arrive at a Green UDP, was frustrated as the UDP is out-of-date/unusable. UNDP applied adaptive management and instead prepared a report on essential elements of a Green UDP which is being incorporated into existing municipal ToR for a new UDP. Hence the eventual UDP will be 'green'. The Project Board and Chisinau Municipality have both confirmed in writing that they are satisfied with this outcome. Chisinau has no current plans to contract new UDP which would be a major task, beyond the limited financial means of this Project. Discussions have opened with another city, Balti, which is understood to have an up-to-date UDP that, in principle, could be transformed to a GUDP with the assistance of the Project if the Project Board approves.

Outcome 2 - 'ESCO Business Model in Moldova is operational as result of strengthening Energy Service Providers capacities and implementation of EE projects using Energy Performance contracting (EPC) modality'. Just as the Project started, three Moldovan banks collapsed and borrowing rates rose to 17-24%. Plans for a local bank to manage a UNDP-GEF Loan Guarantee Fund (LGF) and lend to ESCOs became unviable. Adaptive Management and multiple studies designed, justified and carried out due diligence for a financing solution that - on paper - is innovative and fit-for-purpose. The state Energy Efficiency Fund (EEF) will now support 20 investments in Chisinau Municipality 1). Grants of 20x $50,000 = $1 million; 2) 20x loans totalling up to $2.7 million at 3% interest EPCs using private sector ESCOs; and a $900,000 Loan Guarantee Fund (LGF) to protect the loans, which it manages under a December 2015 contract with UNDP.

Running the LGF through EEF was a good decision, but no consideration is documented about how the financing needs of the LGF changed when the principal risk became that a public institution (Chisinau) defaults on another public institution (EEF), which is not the same type of risk as that of a private company defaulting on a bank for which the LGF was originally envisaged. The Project today has an over-sized LGF, an under-sized management budget and insufficient time and budget to achieve its Objectives and Outcomes.

For clarity, the LFG is oversized for its specific Project purpose of leveraging 20x municipal investments of $200,000 in Chisinau. It is not oversized for its presumed legacy purpose which is to continue to support municipal investment in Moldova.

Outcome 3 - 'Financial Mechanism is available to ESCOs'. Considerable work on adapting the legal, financial, institutional and project framework and on training means systems are in place - but unproven. EPC tenders for the first buildings will run in 2017. Most interviewees were optimistic that EPC will work, at least for the first 20x investments in Chisinau. Some interviewees were sceptical about the model being sustainable and replicable in smaller municipalities. The consultant considers that further delays are likely as new systems are tested and issues emerge.

Outcome 4 - 'EPC Projects and GUDP replicated in other Municipalities and Information Dissemination'. 'Soft' outputs like case-studies and lessons learned are likely to be achieved. There is unlikely to be sufficient time for other municipalities to replicate (except for a possible GUDP for Balti which may be considered within Outcome 1, replacing the GUDP for Chisinau for which efforts to prepare a GUDP have been frustrated).

1.3.1. Summary of recommendations

These recommendations are described in detail in Section 5.2 of this report.

		MTR Recommendations	Action by
Corrective actions for the design, implementation, monitoring and evaluation of the project			
	1	Build a tailored EE financing model that meets all stakeholders needs	Board, EEF
	2	Mitigate risk of non-payment escalation triggering the LGF	Board, EEF
	3	Reallocate part of LGF budget into a no-cost extension	Board, UNDP
	4	Consider a GUDP for a city other than Chisinau as part of Component 1	Board
	5	Find and implement a solution to the conundrum of EPC in public accounting.	Board
	6	Establish a focus-group to rapidly-develop a shared vision of (Moldovan) EPC.	Team
	7	Agree a fallback plan if EPC for residential buildings is unworkable	Board
	8	Develop a shortlist several of 'backup' EPC investment proposals.	Team
	9	Address the issue that the Project Objective and Outcome 1 are frustrated.	Board
Actions to follow up or reinforce initial benefits from the project			
	9	Improve, use and publish the Green Urban Procurement Guidelines.	Team
	10	Improve the use of the Project website and training materials	Team
	11	Take a simple step to 'seed' a Professional Association of ESCOs in Moldova	Team
Proposals for future directions underlining main objectives and mitigating risks to sustainability			
	12	Address barriers to individual consumption-based billing for apartments.	Board

1.3.1. MTR Rating and Achievement Summary Table

This MTR Rating and Achievement Summary Table is (a little) non-standard as it splits the long texts of the Objective and Outcomes into individual short phrases. It would be misleading to do this otherwise as the Project Objective asks whether objectives have been achieved '...in line with the GUDP'. There is no UDP so there can be no GUDP. Hence the answer would have to be 'no', which would be accurate, but misleading.

Ratings meanings are summarised below the table and detailed in Appendix 6.4.

MTR Rating and Achievement Summary Table for ESCO Moldova Project

Progress towards results		
Measure	**MTR Rating**	**Achievement Description**
Overall rating	Although an overall rating is not required for an MTR, UNDP encouraged the consultant to make one. (MU or 3)	The Project Objective and Outcome 1 refer to adoption of a GUDP by the City of Chisinau – which is highly unlikely to emerge during the lifetime of the Project, so the Project cannot be described as satisfactory. The Project Objective and Outcome 2 refer to a using EPC to finance investments in municipal and residential *buildings* which is model more characterised internationally by failure than success and not likely to be sustainable. EPC for the public sector is better-suited to services (street lighting, public transport, water networks), than buildings. Typical energy-saving investments in buildings take too long to pay back or are too small to be of commercial interest to an ESCO. Hence it is unlikely that a objective of a sustainable EPC model for public sector buildings will be met. The reason that the rating is not lower than MU is that the Project is very well-managed, has used adaptive management intelligently to overcome major hurdles and has credible proposals for recovery, subject to agreement of the Project Board. For example: 1. Although achieving a GUDP for Chisinau is frustrated, achieving a GUDP for another city may be considered a proxy success; 2. If the EPC is proved to work in Moldova it may prove to be sustainable (albeit probably not for municipal buildings); and 3. If the Project is successful in its efforts to blends grants and commercial financing, its example is likely to be 'picked-up' and 'scaled-up' by large-scale donors who want to use multiple financing sources for EE in buildings.
Project design & strategy	(MS or 4)	There is a disconnect in the Project design. The themes or urban development planning and investment in improving the energy efficiency of existing municipal buildings are only tangentially related, have (mainly) `different stakeholders, need different skill sets. It is difficult to see why the Project combines these two elements.

Progress towards results		
Measure	**MTR Rating**	**Achievement Description**
Progress towards results: Project Objective	**Objective "**A functioning, sustainable and effective ESCO market... (S or 5)	The Project overcame significant barriers to develop a financing model that (although not yet operational and with more barriers to overcome) is likely to achieve this aspect of the Objective.
	... in line with the GUDP... (Not rated)	As there is no up-to-date Urban Development Plan (UDP), there can be no Green UDP.
	... leading to at least 68kt direct CO2 savings from Project EPCs... (S or 5)	On track, if behind schedule, to achieve 20 investments in Chisinau; but
	... and 240,000 tonnes of indirect CO2 emission reductions during the period of project influence**"** (MS or 4).	... it has been necessary to move to a closed circle of state financing, so it will be necessary to adapt the model (if it works) in order to replicate, expand, upscale.
Progress, of Output 1	**Output 1**. 1a. GUDP adopted by City of Chisinau; (U or 2)	The project 'greened' the ToR for a future Urban Development Plan (UDP) for Chisinau, but there are no plans to prepare one within the lifetime of the Project. Another planned (but not approved) GEF project, 'Sustainable Green Cities' may use the materials prepared by the Project within its plans to establish an innovation hub to prepare for green urban development proposals, so the Outputs may, at least, be used (hence, U, not HU). However, an Output that feeds into an uncertain Project is not the same as a GUDP adopted by a capital city. Although an external factor outside the influence of the Project Team it cannot be described as satisfactory.
Progress of Output 1 (cont)	1b additional emission reduction projects financed and implemented in Chisinau; (S or 5).	The Project has made a significant contribution by helping Chisinau to prepare a Strategic Energy Action Plan which (if approved by the council) is likely to be catalytic in attracting substantial investment financing for energy efficiency.
Progress of Output 1 (cont)	1c. A Green Urban Procurement Guide... (S or 5).	Materials have been prepared and handed over...
Progress of Output 1 (cont)	... being utilized by City of Chisinau. (MS or 4)	... but the Project has established no measureable way (yet) to tell if the materials are being used and/or are considered to be useful by their intended users.
Progress of Output 2	**Output 2.** ESCOs successfully investing in buildings using EPC. (S or 5)	Although no investments have taken place yet, this is on track and likely to happen.
Progress of Output 3	**Output 3**. 3a. A financial mechanism set up... (HS or 6)	Overcoming the hurdle that working with banks became impractical after the 2014 Moldovan bank crisis by securing agreement that EEF will become a loan fund and operate the LGF is a significant success for the Project...

Progress towards results		
Measure	**MTR Rating**	**Achievement Description**
Progress of Output 3 (cont.)	3b... functional and providing financial support to ESCOs (MS or 4)	... but more than 12 months later the first loans and guarantees are expected 6-months hence. Progress is slow and there is a risk of running out of Project time.
Progress of Output 4	**Output 4.** 4a EPC Projects replicated in other municipalities... (MS or 4)	At the historical and current rate of progress, there is unlikely to be enough time to replicate within the lifetime of the Project.
Progress of Output 4 cont)	4b. ...and information disseminated. (S or 5)	There are no investment successes to report yet, but they are likely to be well publicised when they arrive.
Progress	**Project implementation and adaptive management** (S or 5).	Innovative adaptation to difficult circumstances. Would have been HS had consideration of the changing value needs of the LGF been considered and/or a compelling reason documented for the change of the programmed capital disbursement pattern from three tranches to one.
Progress	**Sustainability** (rating out of four) (MU or 2).	Too many interviewees expressed scepticism that EPC for public sector buildings in Moldova is a realistic business model to rate this higher.

Legend

- Ratings are scored out of six: Highly Satisfactory (HS or 6), Satisfactory (S or 5), Moderately Satisfactory (MS or 4), Moderately Unsatisfactory (MU or 3), Unsatisfactory (U or 2), or Highly Unsatisfactory (HU or 1).
- Except ratings for Sustainability, which are scored out of four: Likely (L or 4), Moderately Likely (ML or 3); Moderately Unlikely (MU or 2); Unlikely (1).

2. Introduction

2.1. Purpose of the MTR and objectives

The purpose of the MTR is to consider the mid-sized UNDP-GEF Project "ESCO Moldova", whether it is on track to its stated objective to "create a functioning, sustainable and effective ESCO market in Moldova, as the basis for scaling up mitigation efforts in the whole municipal building sector in Chisinau and Moldova in line with the Green Urban Development Plan", and, if and as appropriate, recommend changes with the potential to improve the project's results.

As specified in the Terms of Reference for this assignment, the output is a specific set of recommendations for adaptive management to improve the project over the second half of its lifetime

2.2. Scope and Methodology

Principles of design and execution of the MTR, MTR approach and data collection methods, limitations to the MTR

The standard MTR approach of reviewing project documentation and interviewing project stakeholders was applied.

An initial discussion took place between the consultant, the Project Manager and the Regional Technical Advisor on Climate Change Mitigation on 17.11.2016. Based on desktop research, the consultant had already developed a long-list of potential interviewees and submitted to the Project Team on 12.11.2016, who refined it into a robust list of twenty relevant, appropriate meetings, which took place a five-day mission to Chisinau commencing 21.11.2016. Three of these meetings were with were with energy services providers to enable the consultant to assess whether the business community has realistic expectations about what it means to become an ESCO, which is essential to meeting the primary objective of the Project. Interviews or correspondence with other stakeholders who are not located in Moldova took place remotely thereafter.

The GEF Operational Focal Point (OFP) is understood not to have been present in Chisinau during the week of the mission, which is noted as the MTR Guidelines state that a meeting with the OFP should normally take place during MTR missions. A full list of meeting appears as Appendix 6.6 of this report.

The Project Team set up a Google Drive and started to share documents with the international consultant on 15.11.2016, adding additional titles throughout the period of assignments, sometimes on their own initiative and sometimes at the request of the consultant for specific report. In total, more than 140 documents were reviewed. A list of titles appears as Appendix 6.7 of this report.

A potential limitations of this MTR that is was prepared by a international expert rather than an international expert and a local expert, as envisaged in the Project Document. However the Project Team kindly provided substantial and timely advisory and logistical support in Moldova, and the consultant has a working-level knowledge of Romanian language so was able to review Romanian documents and participate in Romanian language meetings.

2.3. Structure of the MTR report

This report is structured along according to the 'Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects' (UNDP-GEF Directorate, UNDP, 2014).

Chapter 3 describes the project, its background and context, including the problem it is designed to address, barriers it is expected to overcome, objective, outcomes and expected results. Implementation arrangements and stakeholders are described, project timing and milestones are outlined.

Chapter 4 describes the findings of the MTR regarding project strategy and design. The results framework/logframe is described, as is progress towards results and remaining barriers to overcome. Management arrangements and work planning are described, financing considerations are reviewed as are project -level monitoring and evaluation systems, stakeholder engagement, reporting and communications. Sustainability is considered together with financial, socio-economic, governance and environmental risks to sustainability.

Chapter 5 describes the MTR conclusions, which are evidence-based and connected to the MTR findings. Recommendations for corrective and follow-items are described.

Annexes include the ToR for this assignment, an MTR evaluative matrix, how data was collected, ratings, the itinerary of the consultant's five-day mission to Chisinau, lists of interviewees and documents reviewed, a co-financing table, a UNEG code-of-conduct declaration and a (space for a future) signed MTR final report clearance form.

3. Project Description and Background Context

3.1. Development context

Environmental, socio-economic, institutional, and policy factors relevant to the project objective and scope

The development context for this project falls within the Outcome 'low-emission and resilient development: strengthened national policies and capacities enable climate and disaster resiliency, low emission economic development and sustainable consumption', and:

- The UNDP strategic planning context is 'growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded' and specifically the project contributes to the Output 'Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)'.
- The expected Country Programme Outcome is 'low emission and resilient development: strengthened national policies and capacities enable climate and disaster resiliency, low emission economic development and sustainable consumption'.
- The expected Country Programme Action Plan Output is 'public and private sector and individual consumers change production and consumption patterns towards increased energy and resources efficiency and use of renewable energy'.

3.2. Problems that the project sought to address: threats and barriers targeted

Practically, the MTR consultant's understanding this is that this Project aims to:

- Bring environment into the heart of urban planning.
- Stimulate new investment in municipal buildings (including old apartment blocks) by introducing the concept of Energy Performance Contracting and introducing the ESCO concept to Moldova.
- Demonstrate the above with a Green Urban Development Plan (GUDP) for Chisinau and 20 financed investments as well as leaving a model of urban development planning and municipal investment financing that will continue in Chisinau and extend to other cities and towns of Moldova.

The GUDP work has reached a barrier that may or may not be surmounted. There is no up-to-date Chisinau UDP for UNDP to help to 'green'. Hence activities have been limited to preparation works, training and activities to ensure that the ToR for a future Chisinau UDP leads to a GUDP. Development of a new UDP, though, is far beyond the financial means of this small Project. So this aspect of the Project has reached an impasse. Both the Project Board (minutes of annual meeting) and Chisinau Municipality (letter from the vice-Mayor) have confirmed satisfaction with this outcome but in terms of the formal Outcome defined in the Project Document for Component 1, it has not been achieved.

The energy efficiency investment work is behind schedule because just as the Project started, a banking crisis made the original concept of using private sector financing for public sector investment using EPCs clearly unworkable. Adaptive management was applied and an alternative and innovative solution to enable private sector companies to carry out EPCs for municipalities is now at an advanced planning stage. An existing national grant-awarding body, the Energy Efficiency Fund (EEF), will become a lender for the first time, setting up a $2.7 million revolving fund. EEF has also been contracted to by UNDP to manage a $900,000 GEF Loan Guarantee Fund. Complexity barriers have been lowered by a great deal of stakeholder training. Legal, accounting and public procurement barriers have been identified and addressed (whether they have been overcome is still untested). The first 15 investment sites have been identified and calls for offers to carry out EPCs are planned to take place in early 2017.

Two principal barriers remain. A short-term barrier is that the financial model is new and untested. EEF has never extended a loan nor provided a guarantee before; neither Chisinau nor local ESCOs have entered into public sector EPCs before.

A medium-term barrier is that even if the financial model works well and 20 new successful investment projects take place, the early removal of the private sector (with unrestricted access to capital) from the financial model means it now a 'closed circuit' of public sector financing only.

Sustainability and replication of Project outcomes are significant uncertainties. The Chisinau GUDP was expected to be catalytic in persuading other cities and towns to adopt green urban planning. Some development progress is being made based on Project outputs such as green procurement guidelines, but the GUDP was the principal planned Outcome, as municipalities tend to follow the lead of the capital. Similarly, for municipal EPC, although funds will roll slowly back to EEF, it will not be able to keep up the 2017/2018 pace of lending, much less the kind of large-scale EE investment financing needs of Moldovan municipalities. It is now too early to attract private sector interest in keeping an unproven model going, but, even if by 2018, the model is a roaring success and banking interest rates have started to normalise, it is likely to be too late for the Project to be the driving force behind expansion in Chisinau and replication to other cities.

3.3. Project Description and Strategy

Objective, outcomes and expected results, description of field sites (if any)

This Project is effectively two separate projects.

- Component 1 is a Green Urban Development Plan (GUDP) for Chisinau. For clarity, although GUDP is a recent concept, it is not a new type of document that demands supplemental municipal resources, institutions or planning capacity. GUDP refers to a classic Urban Development Plan (UDP) that conforms to higher 21st Century public and international expectations of environmental excellence - so it is a 'green' UDP. UDPs are broad documents, encompassing pedestrian, cycling, passenger and vehicle transport; street design; land usage; housing markets; retail, commercial and leisure zones; green infrastructure; sustainable urban drainage; building renovation including energy efficiency and neighbourhood-scale renewables; rural landscapes; waste strategy; water catchment, floods and emergency management; river restoration; wastewater and biogas; district heating; air quality; and more.

- Components 2 and 3 of the Project, by contrast, are narrow and specific. Creation and application of a financing model to implement energy savings investments in municipal buildings, including 20 financed investment projects.

The GUDP aspects of the Project are only loosely/tangentially-related to the ESCO aspects. Component 4 is principally about replication and dissemination of the results of the other components. The four components are intended to progress towards four Outcomes, as described below:

Outcome1, 'Green Urban Development Plan (GUDP) Adopted by City of Chisinau', is unlikely within the lifetime of the Project. A plan to take the existing UDP, add green elements and arrive at a Green UDP was frustrated as the UDP is out-of-date/unusable. UNDP applied Adaptive Management and instead prepared a report on essential elements of a Green UDP which is being incorporated by the Project into existing municipal ToR for a new UDP. Hence the eventual UDP will be 'green'. However, contracting an entire UDP is a major task that is clearly beyond the limited financial means of this Project.

Outcome 2 - 'ESCO Business Model in Moldova is operational as result of strengthening Energy Service Providers capacities and implementation of EE projects using Energy Performance contracting (EPC) modality'. Just as the Project started, three Moldovan banks collapsed and borrowing rates rose to 17-24%. Plans for a local bank to manage a UNDP-GEF Loan Guarantee Fund (LGF) and lend to ESCOs became unviable. Adaptive Management and multiple studies designed, justified and carried out due diligence for a financing solution that - on paper - is innovative and fit-for-purpose. A state Energy Efficiency Fund (EEF) who currently manages grants will lend up to 2.7 million USD at 3% interest to private sector ESCOs who carry out investment projects for Chisinau Municipality. UNDP also contracted EEF to manage the LGF, transferring the entire $900,000 LGF budget to EEF in December 2015.

Running the LGF through EEF was a good decision, but no consideration is documented about how the financing needs of an LGF may change when the lender became a state institution. A bank would consider the risks to be that some ESCOs default in small way (high probability, low impact) and that the Chisinau Municipality defaults on its obligations to pay all the ESCOs, who in turn can't pay the bank (low probability, high impact). Introduction of EEF virtually eliminates the second kind of risk, which would effectively be debt between state institutions, and clearly not the kind of debt for which the LGF is intended. If the LGF had been transferred to the financial institution in tranches, as envisaged in the Project Document and Project Budget, there would today be $400,000 at EEF and $500,000 available for the Board to consider for reallocation to other Project activities and a no-cost extension.

As a result the Project today has an over-sized LGF, an under-sized management budget, insufficient remaining time and no clear path for a no-cost extension.

For clarity, the LFG now appears over-sized for its specific initial purpose of leveraging 20x small municipal EPCs in Chisinau - not for its legacy purpose, which is loosely defined at present.

Outcome 3 - 'Financial Mechanism is available to ESCOs'. Considerable training and preparation has taken place to help stakeholders understand EPCs with a view to helping it to work in the specific legal, fiscal, institutional environment of Moldova. Although systems are not fully in place the first call for offers is to be launched in the first part of 2017. Despite training, there is clearly no real common understanding between stakeholders about how financing will flow, which is unsurprising as EPCs are notoriously complicated. Most interviewees were optimistic that a 'we won't know for sure until we try' approach will work - at least for the first 20x investments in Chisinau. Some interviewees were sceptical about the model being sustainable and replicable in smaller municipalities. The consultant considers that further delays are likely as new systems are tested and issues emerge.

Outcome 4 - 'EPC Projects and GUDP replicated in other Municipalities and Information Dissemination'. 'Soft' outputs such as case-studies and lessons learned are likely to be achieved, but there is unlikely to be enough time for other municipalities to implement EPCs and prepare GUDPs.

3.4. Project Implementation Arrangements

The challenges brought by the banking crisis, the high complexity barrier of EPC and the need for close attention by a range of diverse stakeholders meant that progress during the first part of the Project life-span was slow. A decision to move leadership of the Project Board from the Ministry of Environment to the Ministry of Economy was signed by the Prime Minister and formalised through 'Disposition 60', published in the Official Monitor of the Republic of Moldova on 6.5.2016. As a result, there is a formally established high-level Project Board with two Ministers (Economy, Environment); the Mayor of Chisinau; senior representatives of the ministries of Finance; Regional Development and Cooperation; and the State Chancellery; the heads of the Energy Efficiency Agency and the Energy Efficiency Fund; and the DRR of UNDP.

The high level and broad composition of this board demonstrates political will for this Project to succeed. This is significant as, without such will, a Project that changes the status quo about how public sector bodies raise financing and invest (which ultimately is what EPC involves) would not be very likely to succeed.

3.5. Project timing and milestones

Also includes Energy Efficiency milestones leading up to the inception of ESCO Moldova:

- 06.01.2012 - Dorin Chirtoaca, Mayor of Chisinau, signed the Covenant of Mayors
- 12.06.2012 - Government Decision 401/2012 established Energy Efficiency Fund (EEF)
- 11.07.2012 - Law 166 - National Development Strategy "Moldova 2020" - sets Energy Efficiency and Renewable Energy as national objectives
- 20.09.2012 - ESCO Moldova project received by GEF
- 14.03.2013 - ESCO Moldova preparation grant and concept note both approved by GEF
- 08.03.2013 - Submission date, final Project Implementation Form (PIF) (Source: GEFWEB)
- 28.03.2013 - UNDP Call for International Finance Expert to package ESCO Moldova for GEF
- 15.08.2014 - ESCO Moldova project approved for implementation by GEF
- 21.08.2014 - UNDP-GEF ESCO Moldova Local Project Appraisal Committee (LPAC).
- 22.09.2014 - UNDP started recruitment processes to staff the Project
- 27.11.2014 - UNDP-GEF Executive Coordinator NY authorised UNDP Moldova RC to sign PJ
- 28.11.2014 - UNDP-GEF ESCO Moldova Project start date (4 years)
- December 2014 - Moldovan banking fraud crisis - three banks lost 1 billion USD.
- January 2015 - UNDP-GEF ESCO Moldova Inception Phase began (source: MTR ToR)

- 13.03.2015 - UNDP-GEF ESCO Moldova call for a International Green Urban Development Consultant to Update the Urban Development Plan of Chisinau Municipality by Introducing a “Green focus” and Special Emphasis on Energy Efficiency Measures to be Adopted (for Outcome 1). STE Timothy CRAWSHAW was selected.
- 29.03.2015 - 1st mission of STE Konstantinos KONSTANTINOU for stakeholder training
- 29.03.2015 - 1st mission of STE Louis-Philippe LAVOIE, Outcome 2 and stakeholder training
- 01.04.2015 - Official launch of UNDP-GEF ESCO Moldova (high-level event)
- 09.04.2015 - STE Louis-Philippe LAVOIE issues LGF Operational Guidelines
- 30.03.20152015-03-30 - First Project Board Meeting with eight Board members and PM Nicolae ZAHARIA, PA Iuliana BOSTAN, UNDP-GEF RC John O'BRIEN, STEs Louis-Philippe LAVOIE and Konstantinos KONSTANTINOU
- June 2015 - Inception workshops (several training events for a range of stakeholders)
- 23.06.2015 - STE Louis-Philippe LAVOIE - ESCO training for candidate ESCO, AEE and FEE.
- 27.07.2015 - STE Konstantinos KONSTANTINOU - two days ESCO training for stakeholders
- 08.11.2015 - STE company ENVIROS conducts two days of ESCO training for stakeholders
- 26.11.2015 - EEF issues a technical proposal to UNDP to manage the $900,000 GEF Loan Guarantee Fund and to finance selected EE projects in Chisinau.
- 27.11.2015 - UNDP Moldova issues request to Chair of to Regional Advisory Committee on Procurement (RACP) for approval of a 900,000 USD transfer to EEF.
- 07.12.2015 - RACP approval of 900,000 USD transfer to EEFF.
- 17.12.2015 - ESCO-FEE LGF agreement signed, including the services of 5x technical experts until 2018, contract value 900,000 USD, guarantees for 20 projects, due date 31.12.2018.
- 18.12.2015 - (or shortly thereafter) 900,000 USD transferred to EEF.
- 15.04.2016 - AEE's Sustainable Energy Information Centre inaugurated (INOGATE).
- 07.04.2016 - UNDP-GEF ESCO Moldova call for consultant facilitators (won by ENVIROS).
- 06.05.2016 - 'Disposition 60' published, establishing ESCO Moldova Steering Committee
- 31.05.2016 - Second Project Board Meeting (8 Board members + Project team and others)
- 22.07.2016 - Press release announces proposal to the Green Climate Fund (GCF), 30M USD, mentions planned dialogue between UNDP and the international and local banks.
- 01.08.2016 - UNDP GEF ESCO Moldova contracts ENVIROS as consultant facilitator for 20 EPC contracts for 440 days to November 2017 (3x international and 3x local experts). Hence there are two ENVIROS contracts - the first as trainers, the second as facilitators.
- 18.10.2016 - Nicolae ZAHARIA presented ESCO Moldova at UNECE EE Expert Group
- 20.11.2016 - Mark VELODY arrived in Chisinau for five-day MTR mission.
- 28.11.2016 - ENVIROS international event for ESCOs (within a wider energy event)
- 21.12.2016 - Draft MTR issued
- 07.03.2017 - MTR issued, taking into account UNDP feedback of January/February 2017

Future milestones

- 15.12.2018 - Deadline for EEF to issue 20 guarantees under UNDP-EEFF contract of 2015
- 21.12.2018 - UNDP-GEF ESCO Moldova planned closure date (source MTE ToR)
- 31.12.2018 - Expiry date of UNDP-GEF ESCO-EEFF contract of 17.12.2015

3.6. Main stakeholders: summary list

There are many stakeholders in this complex Project:

- High-level stakeholders (The Board - see above) whose principal role is to steer the project and whose practical role is to remove otherwise barriers to its success
- UNDP, particularly the Project team of Nicolae ZAHARIA and Iuliana BOSTAN, supported by Georgi ARZUMANYAN in the country office, UNDP-GEF's John O'BRIEN in Istanbul, STEs (whose roles have now ended) and the company ENVIROS as ESCO facilitators.
- Local companies who are expected to transform into ESCOs
- The Energy Efficiency Fund - who has three hats:
    - As lender for 20 municipal ESCO projects from a $2.7 million loan fund
    - As grantor of $1 million for the same projects ($50,000 each)
    - As guarantor for the same projects using the UNDP-GEF $900,000 fund
- The Municipality of Chisinau and the people of Chisinau
    - Beneficiary of energy-saving investments in 13x education buildings, 2x hospitals and 5x residential buildings. Chisinau may or may not benefit from an improved Urban Development Plan updates based on a ToR that was 'Greened' by the Project.
- The Energy Efficiency Agency - (board member and host to the Project team), who will be the 'de facto' future champion of EPC, spreading it beyond Chisinau to other municipalities.
- The Municipalities and People of the Republic of Moldova.
    - If the EPC for Chisinau is successful it could be replicated nationally.

4. Findings

4.1. Project Strategy

4.1.1. Project Design

There is a disconnect in the Project design. Component 1 is not a good fit with the other components of the Project, as:

- Urban development planning is a broad theme that involves road and street design, public lighting, land usage, zoning, water and sewerage, landscaping waste disposal, flood management, air quality, transportation, biogas; district heating; air quality; and more.
- Investing in existing municipal buildings to bring energy savings through EPC is a narrow, specific theme.

The themes also enjoy a very different degree of apparent stakeholder interest and commitment:

- A new UDP does not appear to be high on the municipal agenda.
- Energy efficiency in public buildings (or more specifically, in schools and hospitals) is clearly high on the municipal agenda, with Chisinau contributing time, resources and technical assistance (energy audits) to help smooth the path.

As a result, the impact of the GUDP work being carried out by the Project is likely to be low. A leading edge green urban planning report and a green procurement report were prepared by the Project, but there was no related training, it is not clear whether or by whom they are being used and there is no (measurable) impact. The only areas in which Component 1 is likely to have a impact are:

- The Sustainable Energy Action Plan, which, if/when approved by the Chisinau Council, is likely to catalyse investment in energy efficiency, which will be a good result for the Project - but is also only tangentially related to GUDP; and
- As an input into another GEF project, 'Sustainable Green Cities' (SGC), which is not yet approved. SGC plans to update GUDP-related Outputs from ESCO Moldova within its plans to establish an innovation hub to prepare and securing finance for green urban development proposals, following an integrated urban planning approach (IUPA) approach. If approved and implemented, this could represent a useful legacy purpose for materials prepared under Component 1 of this Project - but is not exactly an achievement in itself on the same scale 'GUDP adopted by City of Chisinau', which is supposed to be an Outcome of *this* Project.

Note that if that proposed new GEF project is approved and becomes operational within the lifetime of ESCO Moldova, there is strong case for the two project teams to work together closely, perhaps sharing facilities and/or personnel to transfer the full benefits of ESCO Moldova's green planning experience to SGC.

4.1.2. Results Framework/Logframe

The consultant suggested (and UNDP comments on the draft of this report concurred) that reference to a GUDP for Chisinau should be removed from the logframe. As there is no current

Chisinau Urban Development Plan (UDP), the intention to transform it into a Green UDP have been frustrated..

Two additional SMART indicators are proposed for future use

- Number of known non-Project EPCs taking place in Moldova
- Estimated value of non-Project EPCs taking place in Moldova

for which the baseline is zero. The reason for the indicators is that the Project, by 'blazing the trail' enables all future EPC, may be said to have seeded all future EPC investment in Moldova.

Indicators chosen by the Project Manager for the PIR are considered well-selected and applied in Section 5.1.3, immediately below.

4.2. Progress Towards Results

4.2.1. Progress towards outcomes analysis

Assessments from the 'progress towards results' matrix with achievement of outcomes against end-of-progress targets (EPOT) against baseline (BL) indicators from the Project Implementation Review (PIR) of June 2016 are compared with the consultant's MTR assessment of progress.

The 'assessment towards progress results matrix', compares indicators used in the Project Implementation Review (PIR) of June 2016 with the findings of the MTR consultant. For simplicity (to make the table shorter/more readable):

- Long textual indicators are distilled into short phrases
  - e.g. '20 buildings', 'LGF signed'
- The indicators are described more fully in the pages below the table, showing:
  - The short phrase and the full indicator
  - PIR Assessment (from June 2016)
  - MTR Assessment

Some of the indicators and assessments are rather long and have been paraphrased)

Note: The problem of rating the Green Urban Development Plan

The Assessment Towards Progress Results matrix, overleaf, does not assess one of the indicators.

- Outcome 2 is: 'GUDP Adopted by the City of Chisinau...' which is not on possible, as there is no Urban Development Plan to 'green'.
- The wording of the Outcome is clear and specific. Strictly speaking, this Outcome should be rated 'Highly Unsatisfactory', but, given the unusual circumstance, it is not rated.
- Proposals about how to deal with this issue ('greening' the UDP of another city, possibly Balti) are discussed in this report.

ESCO Moldova

Assessment towards progress results matrix

PIR of June 2016 vs. MTR at December 2016

Project Strategy	Indicator	Baseline Level	Level in 1st PIR	End of Project Target	MTR Assessment	Achieve-ment Rating	Justification for rating
Objective	'20 buildings'	0	0	20	On target	S	Late but achievable
	'LGF signed'	Unsigned	Signed	Signed	On target	S	Good home
	'5x ESCOs'	0	0	5	On target	HS	Small hard core
	'CO2'	0	0	381kt	Not on target	S	Extra step needed
Outcome 1	'GUDP'	No	Yes	Yes	Not on target	*	GUDP Unlikely
	'Green procure'	No	Yes	Yes?	Achieved	MS	Being used?
	'Green aware'	No	No	Yes	On target	S	Showcase now
Outcome 2	'ESCOs trained'	0% trained		100%	Achieved	HS	Effective training
	'Tripartite'	No	No	Yes	On target	S	Soon
	'Energy audits'	0	9	30-40	On target	HS	Indicator that PMC is engaged
	'Short list'	0	20	20	Not on target	MS	Late
	'Payments'	0	0	20	On target	S	Behind schedule
	'M&E'	Yrly, Qrtly	All	All	On target	HS	Good reports
Outcome 3	'LGF Regs'	Unsigned	Unsigned	Signed	On target	MS	Critical path
	'Fin. Frame'	Unsigned	Unsigned	Signed	On target	MS	Critical path
Outcome 4	'Replicate': 1 GUDP, 10 case studies, 3 buildings	0+0+0	0+0+0	10+1+3	Not on target	MS	Likely to run out of time

* See box on previous page.

Legend: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), or Highly Unsatisfactory (HU). This legend is described in detail in Appendix 6.4.

Ratings summarised in this table are detailed below.

Progress towards OBJECTIVE: Create a functioning, sustainable and effective ESCO market in Moldova, as the basis for scaling up mitigation efforts in the whole municipal building sector in Chisinau and Moldova in line with the GUDP.

- Indicator **'20 buildings'** : EE projects implemented under the EPC modality and loan guarantee to ESCOs from 0 to EPOT of 20
    - PIR assessment: on-track. Comprehensive database of all public and residential buildings compiled; 20 public buildings selected as having the best potential for EPC; list endorsed by beneficiary and approved by the Project Board. Selected and approved pilot projects are expected to start in October 2016.
    - MTR assessment: **On-target. Late but achievable.** no buildings are likely to be financed until mid-2017 at the earliest. Model involves only public-sector financing, may be replicable but not very scalable. Up-scaling with private sector finance, following small redesign, may be possible if first 20 investments succeed. There may not be new Chisinau UDP within the lifetime of the project, but if/when one emerges it is likely to be 'green' as a result of the input of the project. **Rating S**.

- Indicator **'LGF signed'**: EPOT of guarantees of at least $2.7 million signed with the financial institution managing the Loan Guarantee Fund
    - PIR assessment: LGF scheme is set up, LGF established under umbrella of the EEF through agreement with UNDP of 17.12.2015. A Loan Framework Program is being developed by EEF and will be launched in September 2016.
    - MTR assessment: **On target**. **Good home** for the LGF. No guarantees yet signed yet, but ready-and-waiting for first EPCs (but see also comments under 'LGF Regs', below' **Rating S**.

- Indicator **'5x ESCOs'**: EPOT of at least 5 Energy Service Providers (ESPs) operating as ESCOs
    - PIR assessment: not achieved yet but expect ESPs will become ESCOS when access to finance through the LGF will be provided
    - MTR assessment: **On target. Small hard core** of ESPs has participated regularly in Project training activities. Most of these companies were identified in the PJ. Technical capacity is no problem; EPC principles are well understood; likely to participate in tenders if there is a still a good business case when EPC, loan and LGF terms are clear. **Rating HS**

- Indicator **'CO2'**: EPOT of Cumulative (20 year) energy saving of 295 GWh as a result of 20 demo projects. Cumulative (2014-2038); Direct: 68 ktonsCO_2; Post-project (2024-2038): 40 ktonsCO_2; Indirect (2018-2038): 240 ktonCO_2 Total: 381 ktonsCO_2
    - PIR assessment: Expect to start register savings in December 2016, when the first energy performance contracts will be operated.
    - MTR assessment: **Not on target. Extra step needed**. Adaptive management changes mean that the EPC model to be demonstrated is now a 'closed circuit' of public sector financing. As a result, achieving CO_2 savings for the first 20 buildings is likely to be easier, but achieving longer term targets more difficult. An extra step to re-introduce private sector capital to the model will be required if/when the first 20

investments are a success in order to grow. Slow progress and a difficult road ahead suggest there may not be enough time to focus on replication and sustainability and hence achieving higher CO2 savings. The rating is satisfactory because stakeholders are aware of and are already thinking about future solutions. **Rating S**.

Progress towards Outcome 1: GUDP adopted by City of Chisinau and additional emission reduction projects are financed and implemented in Chisinau. In addition, Green Urban Procurement Guide is being utilized by City of Chisinau

- Indicator **'GUDP'**: towards the EPOT of Chisinau GUDP approved, Resource Mobilization Plan is implemented. There is no GUDP but Chisinau already approved the UDP.
    - PIR assessment: On-track. A situation analysis and assessment of the current status of Urban Planning in Chisinau was conducted. The plan was long past an update within the existing national legislation and as such was further out of date. A Practice Guide to Green Urban Development Planning was developed to respond to the immediate needs of the municipality in developing a more sustainable and green Urban Development Plan. A new Urban Development Plan is expected to be developed starting 2016.
    - MTR assessment. **Not on target. GUDP Unlikely**. The existing UDP is not suitable for 'greening'. Although a ToR for a future UDP is being edited by UNDP to make it a ToR for a Green UDP, there is significant risk that Chisinau will not order a new UDP within the lifetime of the project. Hence the specific Project Outcome defined in the Project Document - 'Chisinau Green Urban Development Plan approved' is unlikely to be achieved. The Project Team has taken this issue as far as it realistically can in the circumstances. A recommendation in this report deals with this matter in detail, and proposes a solution. **No rating given.**

- Indicator **'Green procure'**: EPOT of Green Public Procurement Plan
    - PIR assessment: Achieved. A Green Public Procurement Guideline (GPPG) was developed, approved by the project board and handed over to the Municipality of Chisinau. A set of standard public procurement documents for the acquisition of energy services were also developed, endorsed by Public Procurement Agency and delivered to Municipality of Chisinau.
    - MTR assessment. **Achieved**. **Being used?** the GPPG was been handed over but the document is not very user-friendly, there has been no user training, users have not been identified in Chisinau or other towns/cities and there is no measurable way of determining whether materials are being used at all. So although technically achieved and handed over, it is not possible to demonstrate whether this outcome is a success. **Rating MS.**

- Indicator **'Green aware'**: Awareness raising and replication mechanism towards EPOT of Information related to GUDP available to all other municipalities through documents and workshops.
    - PIR assessment: Not achieved yet. As unclear status of Chisinau UDP no special awareness activities conducted to promote the GUDP in other municipalities.

- MTR assessment: **On track. Showcase now.** If the downside is that a Chisinau GUDP will not emerge as an example of best practice to showcase within the Project lifetime, the upside is that the UNDP team does not have to wait to before beginning to showcase/disseminate the work that has been done. Project materials, some of which are very good, may be showcased at events, etc. over the remaining two years of the Project. The team could also identify which, if any, of Moldova's 66 municipalities happen to be planning to update UDPs during 2017/2018, and focus awareness support there. (The institute Urban Proiect is likely to know this). **Rating S.**

Progress towards Outcome 2. ESCOs are successfully investing in energy savings green urban development projects in the building sector using EPC modality

- Indicator: **'EPC training'** (A long list of EPC stakeholders, numbers and what they should be trained in).
    - PIR assessment: On-track. A comprehensive training program developed and delivered. 12 trainings organized for 17 potential ESCOs, 5 local banks, local public administration, etc. Around 150 participants from all target groups attended.
    - MTR assessment: **Achieved. Effective training**. Good ratings from participants. Trainee numbers for some stakeholder categories were a little lower than planned, but training materials are excellent and awareness of EPC has been raised. **Rating HS**.

- Indicator **'Tripartite'**: Long-term tripartite agreement between the EEA, Chisinau and PMC
    - PIR assessment: On-track. The draft agreement with clear delineation of roles and responsibilities of all involved partners in the process is developed and available. Document signature will be done together with launching the loan framework program of the EEF.
    - MTR assessment: **On target. Soon.** Expected to be signed after roles have been fully defined and before the first EPCs are launched. **Rating S.**

- Indicator: **'Energy audits'** Documented long-list of EE projects towards EPOT of 30 to 40 Energy Audits carried out in buildings owned and operated by the municipality. Baseline - 9 EA were already carried out by Chisinau.
    - PIR assessment: On-track. The Municipality of Chisinau is concluding the contracts with specialized companies to conduct the energy audits of the first 15 selected target public buildings. The final energy audits are expected in 1-month period.
    - MTR assessment: **On target. Indicator that PMC is engaged**. The consultant did not have sight of the energy audits, but the fact that Chisinau is working with UNDP and making this type of in-kind contribution, and hence starting to build internal capacity and understanding of the requirements of EPC, is important for sustainability. **Rating HS.**

- Indicator **'Short list'** Short-list of 20 EE projects selected towards EPOT of 20 EE from BL of 0
    - PIR assessment: On-track. A comprehensive database of all public and residential buildings in Chisinau has been compiled, containing energy, architectural and other

relevant information. A selection of 20 buildings was conducted, the list was agreed with beneficiaries and approved by the Project Board.

- MTR assessment: **Not on target. Late.** 15x public buildings (13x educational and 2x hospitals) have been selected. 5x residential buildings, who are likely to be the most difficult to work with and need longer lead times are still to be identified, and it may be difficult to find large enough numbers/values of investments. Interviews suggested that even for public buildings, ESCOs may not find high-enough value investments. This implies that several additional buildings may need to be added to portfolio to achieve target investment values, energy savings and CO_2 targets. **Rating MS**.

- Indicator **<u>'Payments'</u>**: Steady stream of payments by Chisinau in line with the EPC modality
  - PIR assessment: Not achieved yet. It is expected to start the investment phase in October 2016 upon signature of the first EPC.
  - MTR assessment: **On target. Behind schedule,** but this indicator is about the effectiveness of the payment scheme, and will (in time) become an important indicator that the model works. **Rating S**.

- Indicator **<u>'M&E'</u>**: Data available in regard to actual ESCO Moldova progress Towards EPOT of M&E plan drafted and implemented within 3 months after the project start-up.
  - PIR assessment: On-going. The project has systematically developed Quarterly Progress Reports (QPR) and Annual Report was presented to the Project Board.
  - MTR assessment: **On target. Good reports**. The consultant did not see Quarterly Reports, but Annual Reports and Annual Work Plans are very good. **Rating HS.**

Progress towards Outcome 3. Financial Mechanism is set up and functional, providing financing to ESCOs

- Indicator **<u>'LGF Regs'</u>**: Loan Guarantee Fund Regulation and Operational Guidelines towards EPOT of LGF Regulation Document negotiated and duly signed by all parties...
  - PIR assessment: On-track. The draft LGF Operational Guidelines and the LGF Regulation were developed and consulted with EEF as the institution selected to manage the LGF on competitive basis. The document will be signed when the loan framework program will be agreed and approved by the partners. The documents will be used by EEF to lay the ground for a dedicated call for proposals to finance energy service projects under the framework of ESCO Moldova project.
  - MTR assessment: **On target - critical path**. The consultant did not have sight of the quarterly reports from EEF to UNDP, but understands that a year after signature of the LGF agreement, guidelines are not complete, which is a matter of concern so close to the planned launch of the first tenders. The delay is understandable - EEF staff are not bankers, have never extended loans before, have never operated a guarantee scheme. The UNDP team and its facilitators may need to offer advisory support to EEF, as delays with lending and guarantee procedures should not delay the first EPCs. So on target but travelling too slowly. **Rating MS**.

- Indicator **'Fin. Frame'**: Financial Frame Agreements (several indicators)
  - PIR assessment: Achieved. LGF agreement between UNDP and EEF signed 10.12.2015. It envisages a 3 Mil. USD loan program offered against financial guarantees of only 900,000 USD (provided by UNDP) that will stimulate the local energy services market resulting in energy savings and reductions of CO2 emissions. In addition, 1 Mil. USD will be offered as grants to selected companies for keeping the investment payback period at a level of up to 5 years. Not achieved yet. The project is expected to start the investment phase in October 2016 when the first EPC will be signed and the first loans will be disbursed.
  - MTR assessment: **On target - critical path.** Linked also to the previous indicator. There is still no definitive contractual and financial model of payment flow the ESCO, the EEFF and Chisinau, nor how EPC-Loan-Guarantee-Grant relationship. **Rating MS**.

Progress towards Outcome 4: ESCO(s) are designing, financing and successfully implementing energy efficiency projects using EPC modality in at least one (1) other city in Moldova outside of Chisinau

- Indicator: **'Replicate'**: EPC projects towards EPOT of 10 EPC Case Studies; EPC replicated in another town/city. One short project video; Min. 3 EPC projects implemented in min.1 other city. GUDP lessons learnt reports widely available; At least another town will have developed or started to develop a GUDP; all from BLs of zero.
  - PIR assessment: Not started yet. The project is expected to promote and replicate positive examples during the 3rd and 4th year of project activity.
  - MTR assessment: **Not on target. Likely to run out of time**. So far, the Project has been characterised by (unavoidable) delays. It is likely that future steps will also take longer than planned, as: 1. EPC is a new contracting model for companies that will become ESCOs; 2. EPCs involve a public procurement modality that is envisaged in the legislation but has never been used before; 3. EEF has not loaned before; 4. EEF has not extended guarantees before; 5. There are still untested or semi-resolved issues such as how to treat EPC payments within public accounts. The project team is tiny (two persons), there is insufficient unallocated budget for a no-cost time extension, and it is hard to see how there will be time for effective replication. **Rating MS.**

4.2.2. Remaining barriers to achieving the project objective

The remaining barriers are:

- Solving the 'conundrum' of how to enter EPC payments in public accounts.
- The complexity and hard work that the first use of multiple new systems to achieve the first EPCs with loans and guarantees.
- Packaging up buildings so that the number and value of investments meets target.
- Overcoming unexpected hurdles, as, having hired facilitators, there is no remaining capacity in the budget to address any new needs that may occur
- Finding time to replicate and disseminate effectively with only two years to achieve so much
- Finding ways to introduce private capital into the financing model after it has been proved
- Work-life balance of the tiny Project Team in the stressful and difficult period to come.

4.3. Project Implementation and Adaptive Management

4.3.1. Management Arrangements

Question: Is implementation efficient, cost-effective, adaptive, monitored, communicated?

- The consultant considered whether inefficient implementation of the Project could be the reason that it will fail to produce a GUDP for Chisinau, which is part of the Project Objective, a Project Outcome, and hence is critical to perceived success of the Project. The firm conclusion is that it has nothing whatsoever to do with implementation. The Project is clearly very well managed.
- Further analysis traced the source of the reason that the Project is not on track to meet its objective to an assumption, in 2012, that by 2015 there would be a new UDP for the project to work on. According to the MTR ToR, the MTR may not be used to change Objectives and Outcomes. Annex 1 of UNDPs MTR Guidelines suggests that there is some flexibility. Discussions between UNDP and the consultant on the draft of this MTR report confirmed that Objectives and Outcomes may not be changed, but may be adapted or expanded by the Project Board if necessary.
- This Project is well-managed. Adaptive management was used extensively and necessarily to adapt the Project for the new financing realities that followed the banking scandal of 2014. Time was lost, and schedules are likely to continue to slip until the first EPCs, loans and guarantees are in place. Thereafter the pace of progress should be fast, as although the financing and contractual arrangements are all new and involved, the resulting energy efficiency investment projects are likely to straightforward. Interviewees were confident the point that getting the first EPC on this point.
- Project communications are good. Stakeholders generally know what the project is about, which is a success taking into account the novelty of the ESCO concept, complexity of the emerging EEF-LGF-EPC model, new public procurement procedures, accounting issues and the diversity of stakeholders. A step-by-step guide is understood to be under development, but until mechanisms and procedures are 'set in stone' it is not possible even to communicate definitive answers to common questions. Reports to the Project Board are excellent.
- Monitoring is carried out by the country office and UNDP/GEF Regional office, who have an in-depth understanding of this complex Project.

Questions from the ToR (reproduced in full as Appendix 6.1) are paraphrased and answered below:

4.3.1.1. Overall effectiveness

Question: On track to a functioning, sustainable and effective ESCO market?

- Yes. Some interviewees responded with a very firm 'no', but the most stakeholders, including those best placed to influence the outcome, are positive and there is high-level will to overcome remaining barriers. The first 20 investments are likely to take place. The market for EPC in municipal buildings is likely to be limited (see Annex 6.12 for explanation) but there is credible potential for EPC in municipal services such as street lighting, water systems, public transport and perhaps district heating. There is also potential for ESCO involvement in investments that are not strictly EPCs as they do not repay the ESCO only from energy savings but involve multiple financing sources or 'blended financing'.

- Question: On track to meet GHG targets defined in objective?
- Too early to tell as target buildings have not fully assessed yet.

Question: Is LGF on track?

- Yes: it has been contracted to the EEF since 2015 and is building systems to be ready to guarantee the first loans in 2017.

Question: are at least five companies likely to work as ESCOs after the project ends

- Too early to fully assess, but there is a small core of companies showing sufficient interest to turn up at multiple Project training sessions/activities.

4.3.1.2. Component 1: Green Urban Development Plan Adopted by City of Chisinau

Question: On track to have a GUDP including a RMP for the SEAP developed and approved?

- GUDP - no. Support from the GUDP has gone (almost) as far as it can, with the result that:
  - If the municipality adopts the ToR for a new UDP that was 'greened' with the help of the Project based on the work of the international expert brought in by UNDP, then a Green UDP is the likely outcome; but...
  - ... this has not occurred (yet) and even if it does, it is unlikely to lead to be in place within the lifetime of this Project.
- SEAP - yes. The report was issued in December 2015.
  - Having passed through two municipal committees, the SEAP is now ready for consideration by the Municipal Council. (It was expected to be tabled in December 2016, but has been delayed).
  - If the SEAP does pass through, it is likely, in time, it will be possible to demonstrate a relationship between the Project report and capital for energy efficiency flowing to Chisinau.

Question: On track to have a public green procurement plan developed and applied by Chisinau?

- A Green Urban Procurement Guide has been produced directly in Romanian language and passed to the Mayor, but it was not clear (at the time of the MTR mission) whether it is being used. Subsequent discussions between the international consultant and the Project Manager concluded that the report probably is being used, that there is currently no system in place to demonstrate/measure its use and impact and that this issue should be addressed so that the Project Team (and, in time, the Final Evaluator) may assess the impact of this measure. The document would benefit from being made user-friendly.

- This document is referred to in the Project Document as 'plan', 'guide', 'guidelines' interchangeably in the same row, but it is clearly referring to the same thing:
  - o Outcome - Green Urban Procurement Guide is being utilized by City of Chisinau
  - o Indicator - the municipal Green Procurement Plan

- Baseline There is no Green Public Procurement guidelines enforced in Chisinau
- End of Project Target Public Green Procurement Plan applied by Chisinau

- Hence the required document has been produced and handed over, but there is no documentation on it being (as described in the PJ), 'widely distributed'. No related training or capacity-building has taken place and there are no related presentation materials. The Project Document refers to four workshops 'related to GUDP and Green Procurement Plan', but then goes on to describe the workshops in more detail as the training that took place on EPC/ESCO/energy savings and other aspects of Components 2 and 3, not of Component 1.

- Proposals for making better use of the guidelines raised in the Recommendations section of this report (Section 5.2.2, Recommendation 10)

4.3.1.3. *Component 2 ESCO Business Model in Moldova is operational as result of strengthening Energy Service Providers capacities and implementation of EE projects using EPC modality.*

Question: Progress on training?

- Very thorough training indeed has been carried out for the governmental, financial, business and engineering stakeholders in the project, including a study tour to the Czech Republic that was financed by the Czech Trust Fund. The composition/number of trainee groups is not exactly as planned, but a small core (fewer than 10) credible companies who have regularly participated in Project events and are likely to bid for the first EPCs.
- There are also understood to be some more interested companies from an international workshop that took place in the week after the MTR mission, but details are not known.
- Training for buildings and maintenance managers is for a later phase (for selected buildings).

Question: On track for 20x projects selected, contracted, under implementation using EPC?

- 15 municipal projects have been selected. 5 residential project have not been selected. Calls for tender for the first four investments will be run in early 2017. The working target for contract signature (in late November 2016) was May 2017 – 4 public; June 2017 – 6 public; Oct 2017 – 5 public; December 2017 – 5 residential.
- As many procedures are new, delays are likely, but the Project team is strong and the Project Board is high level and able to help overcome hurdles, so it is reasonable to expect the first contracts emerge in the summer or early autumn. Thereafter the pace is likely to accelerate, as there is no reason to expect that the preparation work will be delayed, so when first contracts have 'blazed a trail', the others should be relatively straightforward.
- Assuming three months for implementation, the first projects may be commissioned and saving energy towards the end of 2017 and all investments should be in place by summer 2018.

- The five residential Projects are likely to be ESCO investments but not strictly Energy Performance Contracts. This issue is discussed in the recommendations section of this report.

Question: is a framework agreement between EEA, City of Chisinau and PMU in place?

- No. The tripartite agreement is expected to be signed early in 2017 when all target buildings have been identified and approved or, at latest, when the first tenders have been prepared.
- The consultant requested, but was not provided with sight of a draft agreement.
- Until the contractual, administrative and financial flows are defined between the ESCO as borrower, EEF as lender, EEF as guarantor, EEF as grantor, the ESCO as EPC contractor and Chisinau Municipality as EPC client, it is unlikely to be possible to finalise the agreement.
- Some of the recommendations in this report address this issue, both about financial flows and also about ways of arriving at common vision.

4.3.1.4. *Component 3. Financial Mechanism is available to ESCOs*

Question: Is LGF mechanism adequately designed, set up?

- The contract between UNDP and EEF for the LGF is well-designed and tailored for its intended task. According to the contract, LGF may only be used to provide collateral for 20 loans with the sole purpose of serving as guarantee for loans offered to selected candidate ESCOs for UNDP-approved EE projects with residential and public sectors of Chisinau Municipality. The scope of the contract is providing financial guarantees (100% collateral) to ESCOs for the implementation these projects. The parties for both the loan contract and the guarantee contract are the ESCO and EEF. The parties for EPC agreements - which will be signed simultaneously with the loan and LGF agreements, are the ESCO and Chisinau. Payments stream from Chisinau to EEF who deducts the sum due to it from the ESCO (loan repayments) and pays the balance to the to ESCO. The min/max loan guarantee commitment per project is $50,000/$150,000.

Question: Have changes to LGF mechanism from description in PJ strengthened or otherwise?

- LGF Operational Guidelines are understood to be at an advanced stage of development, but the consultant has not had sight. Note that when a final version is ready, it will have to be checked for consistency against the contract of December 2015 between EEF and UNDP and one-or-the other (the contract or the mechanism) adapted so that they harmonise. This point is mentioned as there is a general expectation that the payments will normally stream from Chisinau to the ESCO, not as described in the contract.

- As the MTR is intended to bring specific recommendations to improve the project over the second half of its lifetime, the consultant has proposed a lending and guarantee model tailored to the unique situation in which the Project finds itself today, in a 'closed circuit' of EEF in a triple role of lender, grantor and guarantor.

  A beneficial side-effect of removing banks sector from the model is that it has substantially lowered the risk for the EEF whose triple-role opens the door to faster, flexible and lower-risk transactions than would be possible with a bank. Banks are concerned about both:

- 1. Risk that the ESCO does not pay the bank; and
- 2. Risk that the ESCO's client does not pay the ESCO, who in turn cannot pay the bank.

The first form of risk is diversified and easy to mitigate. If one of 20 ESCOs fails to pay, then 1/20th of the value of the portfolio nominally at risk, but as a prudent lender disburses against delivery benchmarks, the probability of losing the entire value of a loan is low. Also, as there will normally be a lien on equipment and/or on the revenue stream of successfully-implemented EPCs, it may be possible to recover up to the full value of a default. The probability of multiple loans for EPCs becoming problematic in a significant way is very, very low indeed. Except if:

The second form of risk is very much higher for a bank if all of the ESCOs have the same client. Even if that client is robust, 'all the eggs are in one basket', which is perceived by banks to be a significant commercial risk. For ESCO Moldova, as the lender is a state institution, the risk is of a different character. Payment indiscipline by the ESCO's client (the municipality – which is the state) that may lead to payment indiscipline by the ESCO's to its lender (EEF) is more similar in character to an administrative debt between two state institutions, not a genuine commercial loss for a lender. Risk of non-payment between state institutions is low anyway (although some commentators suggested that public sector bodies do not always pay on time). Risk of non-payment by Chisinau Municipality to an ESCO who has invested in one of its schools using a loan from EEF is unlikely, and mitigated by the fact that EEF already has a $50,000 grant fund, destined help pay the ESCO for the investment in the school, in its bank account. Also, in the case of default by the ESCO, EEF will be in a position to 'call in' the loan which case the ESCOs receivables from EPC will become EEF's receivables - and hence state-to-state payments.

Furthermore, using the LGF to cover the risk that default by a Moldovan state institution triggers a payment from the LGF to another Moldovan state institution was clearly not what GEF had in mind when it agreed to the Project.

As a result, (and subject to EEF's final definition of lending flows and the LGF mechanism), the Project today is in a position to provide faster, more flexible, lower risk, lower cost financing for EPCs than would have been possible if a bank had been involved, and it very likely that, even if the first 20 transactions turn out to be a 'rocky road', the LGF will emerge with its original value substantially intact.

To clarify, the LGF is comfortably oversized for its specific task of guaranteeing 20x loans of $50,000 to $150,000 each. This point is important as it opens the possibility of moving some of the $900,000 into other activities at a later stage of the Project, as discussed elsewhere in this report.

- Note that for 2017, the entire $900,000 LGF should remain intact and visible. It is 'Dumbo's magic feather', which provided confidence that the young elephant can fly. After the first few EPC transactions have taken place, it will become apparent to stakeholders that EPC, like Dumbo, can fly without the feather.

- (A senior interviewee commented that the LGF is not oversized for its expected legacy role of continuing to guarantee lending for EPCs in Chisinau and other municipalities. This is correct but the intended purpose of the GEF grant is to establish the EPC model, support 20 EPC investments in Chisinau, a green urban plan for Chisinau and replication/promotion. These Outcomes should take budgetary priority over leaving a $900,000 guarantee fund as a legacy of the Project).

Question: Is the LGF mechanism likely to be sustainable beyond the project lifetime?

- According to the contract between UNDP and EEF, LGF will remain an asset to be leveraged by a multiplication factor of 3 for at least 3 years after the project end. When all funds used to guarantee the selected EE projects will be released and the LGF will become available to guarantee additional financing, it can continue with our without an expiry date, and its specific use will be subject to Government Decisions, not, as at present, a contract with UNDP.
- As mentioned above, the consultant has not seen the draft mechanism, but if the financing and loan guarantee mechanism recommended in this report is applied is designed to be replicable and scale-able, so and the first 20 projects succeed, there is every likelihood that EEF will consider continuing to use it. Discussions with the development community suggest that ESCO Moldova is considered a high-risk project that may or may not work, but if it does work there are always funds available to 'scale-up' successful models that leverage energy efficiency investment.

Question: Has the banking sector of Moldova worked with the LGF? What could be done?

- The banking sector does not feature in the LGF model at present. The model (proposed in this MTR) is unlike a classic bank guarantee, being designed for the specific needs of EPC for public sector investments in Moldova. Security against financial non-performance is provided to both the lender and the ESCO, not only the lender. For the first 20 investments, LGF and the EEF grant protect EEF (as lender) and its customer (the ESCO) from non-payment by PMC; and the LGF also protects EEF from non-payment by the ESCO that is not a result of non-payment by PMC. Subject to the successful outcome of the first 20 investments, both of the following situations, each of which involve banks, may become possible:
    - EEF could recapitalise by forfaiting its portfolio, probably to a development bank in the first instance but in principle to any bank. Hence EEF may continue to offer guarantees in what may, by then, be a 'business-as-usual' basis for EEF;
    - The model applied by EEF for the first 20 investments may be used to protect any financing source, including an ESCO's own funds; and/or an ESCO who acquires equipment from its suppliers (supplier credit); and/or the case where an ESCO borrows from a bank. The model described in this report differentiates EEFL, the lender from EEFG, the guarantor, to highlight the different roles. The role of EEFL could be taken by any bank.

Question: What changes, if any, could be used to strengthen the loan guarantee mechanism?

- Proposals in the recommendations section of this report are summarised as:
    - EEF is protected from payment indiscipline by ESCO using LGF; except where

- EEF is protected from payment indiscipline by ESCO that is a result of payment indiscipline by the Municipality, in which case the municipal grant is drawn upon first and the LGF is drawn upon second.
- In both cases, a flexible approach enables payment that are missed / calls upon the LGF or the grant may be recovered, putting the EPC back on track and minimising the risk of both failure of a single EPC and failure of the entire portfolio of EPCs.

4.3.1.5. *Component 4: EPC Projects and GUDP replicated in other Municipalities and Information Dissemination.*

Question: Replication and dissemination to other towns cities?

- Any work on extending the ESCO model to another town/city would be premature at this stage, and it is likely anyway that the very small Project Team (two persons) will be fully occupied during 2017 and possibly well into 2018 with getting the first 20 investment projects to work. Thereafter, time will be running out. The team has already developed contacts and discussed and presented the Project in other cities, but there are no successes to replicate yet. If, towards the end of 2017, the model is working well, then finding budget for a no-cost extension to end of 2019, funded from the surplus in the LGF, could be considered.

Question: On track to support development of a GUDP in another city?

- A GUDP in another city is not, in fact, a planned Outcome for the Project. Only a GUDP for Chisinau, which is both an integral part of the Project Objective and a planned Outcome, is described- and is most unlikely to be achieved within the lifetime of the Project.
- Taking this into account, the following measures are proposed as a possible 'proxy' for this (unachieved) Outcome:
  - Identify whether any other towns/cities in Moldova are planning to improve UDPS in 2017/2018 and actively participate to ensure that they achieve Green UDPs; and
  - Improve and publish (online) the Green Urban Procurement Guidelines; identify and support target users - in Chisinau and beyond - to make sure they are aware of and use the report; and present it at events and meetings in other cities.
- Following the issue of this report as a draft in December 2016, opening discussions have already taken place between the ESCO Moldova Project Manager and the city of Balti regarding the possibility of ‘greening’ its UDP.

4.3.2. *Work planning*

Question: What caused of delays to start-up and implementation, and have they been resolved?

- There have been three significant sources of delay. 1. The Ministry of Environment was not the natural home for governmental leadership of the project, as this ministry is involved in the impacts of CO2 emissions but not the day-to-day business of energy-saving. This was resolved by moving leadership of the project to the Ministry of Economy. 2. Adaptive management to reconfigure the Project for lending and guarantees without banks; and 3. A delay in contracting facilitators, as offers were all beyond the means of the Project budget so the scope of work had to be reduced. It is likely that there will be additional delays as the first loans, first guarantees, first use of competitive dialogue for municipal procurement, first EPCs and first decisions on how to account for municipal revenue from EPC is likely to be a difficult period.

- Chisinau's decision on whether to order a new Urban Development Plan (UDP) is continually delayed. The Project team cannot influence this. The UDP ToR that was 'greened' by the Project may lead to a Green UDP one day, but it is unlikely to be within the lifetime of the Project.

Question: Is work planning consistent with the PJ are there significant deviations.

- There have been three significant deviations from the direction of the project work plan. 1). preparing documentation aimed at transforming a future UDP to a GUDP rather than actually transforming an existing UPD to a GUDP; 2). replacing the bank with the EEF; and 3). introducing ENVIROS as consultant facilitator, as that the task of technical and contractual facilitation for the first EPCs could not have be done by institutional stakeholders who do not have EPC experience.

Question: Are work-planning processes results-based? If not, suggest how to focus on results.

- Work planning is results based. Achievable elements of the Project Objectives and Outcomes are clearly in focus. What to do about the (likely to be) unachievable Outcome, which is also part of the Project Objective, the GUDP, is discussed in the Recommendations section of this report.

4.3.3. Finance and co-finance

Question: Consider financial management of the project, cost-effectiveness of interventions.

- When the decision was taken to choose EEF as lender and guarantor for EPC investments to be financed using the Project, no financial consideration appears to have been given to whether the risk of non-payment in state-to-state transactions is than lower than for transactions that involve commercial banks, private sector companies and a municipality. As a result, the $900,000 LGF fund appears to be substantially oversized for its specific task of leveraging 20 EPC investments in for the municipality of Chisinau.

- Also, the $900,000 fund was intended to be delivered in tranches of $400,000, $400,000 and $100,000 against contracted performance benchmarks. The Project Document, the 2015 Work Plan and the draft LGF agreement prepared by the international expert Louis-Philippe LAVOIE of November 2015 all envisage this same delivery profile. UNDPs ToR for EEF to manage the fund did not specify staggered payment against performance, and EEF responded with a technical proposal of 26.11.2015 that specifies a single payment in December 2015. EEF and UNDP entered into a UNDP Service Contract on 17.12.2015 that describes the due date for a single payment as 31.12.2018, but funds were transferred to EEF as a single payment in December 2015. The first loan to be secured with a loan guarantee from the LGF is not likely to take place until mid-2017.

- Due diligence on the proposal for EEF to manage the LGF was carried out by UNDP, who commissioned an external report entitled Financial and Procurement Micro-Assessment of EEA; an external study on potential and risks of financial institutions to manage the LGF; and an external study on fiscal aspects related to implementing EPCs. A UNDP Regional Advisory Committee on Procurement (RACP) reviewed and approved the proposal, concluding '... that the proposed offer is reasonable and offers a win-win scenario, where UNDP/ESCO Moldova gets a sustainable framework for the implementation of the LGF and EEF - an excellent opportunity to set-up and pilot a financing facility for energy efficiency projects.' There is no documented discussion about an intentional change of plan from staggered disbursement to one-time disbursement. The consultant asked about this issue and understands that the rationale was that as the EEA is the likely final beneficiary of the $900,000 fund anyway so there was no reason to consider staggered payments.

- At the mid-term, the Project is (unavoidably) behind schedule; is unlikely to achieve its Chisinau GUDP-related objective within the lifetime of the Project; is likely to produce its immediate EPC-related objectives of 20 financed investments within the lifetime of the project; is unlikely to have enough time or budget to meet its sustainability and replication objectives; and has insufficient budget for a no-cost extension to 'catch up'. The decision to disburse the LGF as a single tranche means that $500,000 that would otherwise be with UNDP today to consider as a possible source of financing for a no-cost extension to achieve more or all of the Project Objectives is not available. The funds are not being used, but it is not clear whether they are available for UNDP to redeploy.

Question: Were budget revisions appropriate and relevant?

- A significant budget revision involved replacing disbursement of $400,000, $400,000 and $100,000 over three years into a single payment of $900,000. The decision to use EEF instead of a bank is well documented, but no specific documentation on the change in delivery profile, nor documentation about budget revisions has been seen by the consultant.

Question: are financial controls, including reporting and planning in place?

- UNDP standard financial reporting tools are used for the Project. The 2015 contract with EEF includes a requirement for a detailed quarterly progress report to UNDP. The consultant has not had sight of these reports, but there are unlikely to be any loan guarantees until mid-2017.

Question: Are there comments on co-financing table?

- The Project Team should track and report on the use of co financing by the Project Partners in its regular reports so that there is something clear to report at the time of the Final Evaluation. This point is highlighted as the $6,425,000 contribution to the Project from the City of Chisinau is a nominal contribution only.
- A co-financing table was not provided, but the co-financing budget is known:
- Practically, the Project started with $550,000 over 4 years (average $137,500 per year) to fund a two-strong Project Team, consulting support for technical, financial and other experts to carry out training, capacity-building, technical support for ESCOs and many other Project outputs and activities (except office accommodation). This is a very small budget.

- The entire $900,000 LGF budget was transferred to EEF in December 2015.

Budgets description (Project Document)	USD	Comment (MTR)
Total resources required	8,915,000	
Total allocated resources	8,915,000	
GEF	1,300,000	Includes $900,000 Loan Guarantee Fund so the operational budget over 4 years is $550,000
UNDP (cash)	150,000	
Government EEF	1,000,000	20x $50,000 grants for Project investments
City of Chisinau	6,425,000	Explained to the consultant as the budget for paying utilities that may be freed for investment in EE as a result of cost savings brought by EPC.
In-kind contribution	40,000	A free serviced Project Office at the EEA

UNDP also leveraged financing from Czech Trust Fund (value unknown) for a study tour for a group of Project stakeholders to visit ESCO-financed investments in the Czech Republic.

4.3.4.Project-level monitoring and evaluation systems

Question: Based on PIR and quarterly financial reporting... are additional tools required.

- PIR was reviewed. Quarterly financial reports were not reviewed. No additional monitoring tools are required as the budget for day-to-day project activities of the two-strong team and all the international and local experts described in this report is very small, as shown in the table above.

Question: Project monitoring and evaluation budget - sufficient resources, allocated effectively?

- There are budgets for this MTR and a Final Evaluation.

4.3.5.Stakeholder engagement

Question: had the project developed and leveraged necessary and appropriate partnerships?

- Stakeholder engagement is high for the EPC aspects of the Project. The Project team, though small, is very visible and based at the EEA which provides free office space and is a close and proactive partner.
- The main barrier to stakeholder engagement is the high complexity of EPC which, in fairness, is more usually associated with finance professionals and large deals than small transactions with municipalities. The large number of stakeholders and natural job rotation means that Project Manager is constantly explaining, re-explaining or clarifying principles of EPC to direct or tangential stakeholders.
- For the GUDP aspects of the project. Urban development planning falls within the purview of the Chief Architect who, at the time of the MTR, was a new appointee so the consultant was unable to assess the level of engagement.

- For replication and dissemination beyond Chisinau, no problems are envisaged with developing a stakeholder base as UNDPs outreach capability is clearly good. This is something for 2018, but there are three risks - will there be a Chisinau GUDP to showcase as a success story? (uncertain); will there be EPC successes to showcase and replicate? (likely); and will there still be enough time to disseminate and replicate effectively (unlikely).

Question: Do local and national government stakeholders support the Project?

- The project benefits from a high-level board established by the Prime Minister and a number of determined, committed stakeholders.

Question: Extent of participation stakeholders?

- Very good indeed. Everyone interviewed by the consultant understood their role in future EPC.

4.3.6. Reporting

Reporting is clear and shared appropriately, stakeholders are well-informed and involved, project activities are well communicated internally and externally.

4.3.7. Communications (including half-page summary for reporting purposes)

4.3.7.1. Internal and external communications

Internal communications benefit from the fact that the team of two people work from an office in the Energy Efficiency Agency, so is at the heart everything. Communications with stakeholders through reports on formal board meetings are excellent, and, based on the MTR meetings, the working relationships with stakeholders appears to e strong..

External communications through the website www.esco.md are necessarily rather general at present, but it is well-designed and will become useful when the project reaches the stage of needing to convey specific explanatory information about defined business opportunities for companies who will become future ESCOs. The Romanian language version is more comprehensive than the English language version at present, which is understood to be a matter of the Project team finding time (or budget) for translation.

4.3.7.2. Half-page Project description for reporting purposes

UNDP-GEF ESCO Moldova has two themes: 1). enable a Green Urban Development Plan for Chisinau and 2). enable private sector energy efficiency investment in municipal buildings using Energy Service Companies (ESCOs), including 20x financed investments.

1. Transforming the Urban Development Plan (UDP) of Chisinau into a Green UDP encountered an insurmountable barrier - there is no (modern, up-to-date) UDP for the Project to 'green'. The root of this issue may be traced to a reasonable assumption in the PIF of 2012 that that, by 2015, there would be a new UDP to work on. The Project is contributing to sustainable development in

related ways, such as drafting Chisinau's Sustainable Energy Action Plan, a practice guide for green development planning, green procurement guidelines and has even a 'greened' a Terms of Reference for a future UDP. But, without an UDP there can be no GUDP, so full achievement of the Project Objective is frustrated. Metaphorically, the Project has prepared the icing for the cake - but there is no cake.

2. The ESCO theme also ran into a significant barrier, which it appears to have surmounted it rather well. The intention was to finance ESCOs through a local bank holding a $900,000 Loan Guarantee Fund (LGF) from GEF. Just as the Project commenced, a banking crisis (3x banks failed, borrowing rates rose to 17-24%) made this proposal clearly unworkable. An innovative solution was found (but is not yet tested). A existing state grant-making body, the Energy Efficiency Fund (EEF) will lend at 3% interest to ESCOs for Energy Performance Contracts (EPC) in public buildings. The advantage is that financing is under one roof with EEF as lender, guarantor and grantor, bringing simplicity to the difficult initial period when multiple complex informational legal, fiscal, administrative and capacity hurdles have to be overcome. The disadvantage is that financing is now a closed-circle of state financing, so when the model has been proved, it will be necessary to adapt it to bring in private capital in order to scale-up and replicate.

4.4. Sustainability

Question: Are risks identified in the Project Document valid?

	Risk identified in the PJ (Short description, refer to PJ for full text)	**P**	**I**	**MTR Comment** On Probability (P) and Impact (I) as rated in the Project Document where 1=low risk, 5=high risk
1	Resistance of municipalities to ESCOs	3	5	Probability overestimated - resistance to off-budget investment is not likely
2	Inter-institutional cooperation issues	2	4	OK. For example there are understood to be only two entities legally authorised for urban planning, who are naturally competitors in some areas but have to co-operate in others.
3	Lack of interest from potential ESCOs	3	3	OK. There is a hard core of clearly interested, credible future ESCOs - but it is a small hard core.
4	Low awareness and understanding of the Green Urban Development Plan (Green UDP).	1	5	Probability underestimated. There is no clear commitment to a UDP, hence no possibility of a Green UDP. Note that UDPs in any country change the status quo, so competing interest areas and political sensitivity is commonplace. It is not likely to be the 'green' element that is impeding progress with the UDP.
5	Inadequate project team	3	5	Probability overestimated
6	Project co financing does not materialise.	2	5	OK
7	Lack of reliable market data	4	3	Probability overestimated. Market data for Chisinau is good (as EEA and EEF are closely involved).

	Risk identified in the PJ (Short description, refer to PJ for full text)	P	I	MTR Comment On Probability (P) and Impact (I) as rated in the Project Document where 1=low risk, 5=high risk
8	Inadequate local availability of EE equipment.	2	4	OK
9	Lack of financing for technical assistance.	2	4	Probability underestimated. Chisinau has not prepared a UDP, which has undermined efforts to transform it into a Green UDP)
10		1	1	OK

4.4.1. Financial risks to sustainability

Question: What is the likelihood of financing not being available after GEF assistance ends

- Assuming that the Project is successful in financing 20 investments, it is likely that EEF will continue to offer grants (its principal activity since inception), loans (from the revolving fund that it established because of the Project) and guarantees (from the GEF fund). It is also likely that AEE will take on the organisational role of the small UNDP Project Team in promoting EPC investments by municipalities, probably through its internal Sustainable Energy Information Centre which it established in 2016 with assistance from INOGATE.
- The likelihood of continuing to finance municipal EPC on a larger scale than the few investments to be demonstrated by the Project is necessarily limited by public financing considerations. The model envisaged in the Project Document envisaged EPC as a tool to use the profit-motive to attract private-sector financing for public sector investments. The model represented an elegant 'win-win' that generates energy savings that otherwise would not occur to bring both profit to the ESCO and cost savings for the municipality. The model that is actually being demonstrated is a closed loop of public sector financing that brings in private sector energy-saving expertise, but not private sector capital.
- In the case of 20 successful investments, the likelihood of finding a ways to re-introduce the private sector and expand/replicate/scale-up is high. As an exit strategy, UNDP could help EEF to bring in financing two ways:

    1 - Recapitalise EEF by forfaiting its EPC portfolio. There is a clear appetite within the development community to 'pick up and run with' successful energy efficiency financing models.

    2. - Enable private sector financing to be used for public sector investments for which EEF provides grants by disbursing the grants to meet the final municipal payment obligations under EPCs. For the period between the moment a municipal investment is operational/generating a revenue stream until near the end of the EPC, the grant would be held by EEF as a guarantee of good performance (payment on time) by the municipality, to the maximum limit of the value of the grant. In the final months, the grant would be paid to the ESCO on the behalf of the municipality to meet its payment obligations. This is effectively the same model as proposed for the first 20 investments, but without the EEF as lender, so EEF guarantees good payment performance by the municipality to the ESCO directly (or to its bank).

Question: is financial support mechanism sustainable/likely to continue beyond project lifetime?

- This answer is nuanced.
  - Sustainable, yes, because if it is successful, the EEF, AEE other members of the development community are likely to pick it up and help to scale up and replicate.
  - Self-sustainable, no - taking into account that the model features grants, subsidised loans, a free loan guarantee and free technical support. Conditions are too 'soft' to be described as self-sustainable.
  - For public buildings, not very sustainable as although EPC is an excellent model for ‘low hanging fruit’ such as improving energy efficiency at an open air swimming pool, a hospital laundry etc. that can pay back quickly from energy savings, most energy-saving investments for buildings have much longer payback periods and are less suitable candidates for EPC. (In response to feedback from UNDP on a draft of this report, this point is explained in more detail in Annex 6.2 of this report).
  - For other types of public sector investments – public services such as streetlighting, water systems, transport, parts of district heating - yes – much more so than for buildings. EPC is much better suited to this kind of investment than to buildings. However the Project Objective refers only to buildings.
  - For other cities, in principle yes but it is too early to tell. If EPC works in Chisinau, that does not necessarily mean it will work in other cities and towns whose budgets are sent annually and by central government, so they have less investment decision autonomy.
  - For the residential sector, EPC is not a good fit. Lighting is typically the only compelling energy saving investment with a short payback, and investment values are low. Residents associations are often not well managed so the cost of sales/achieving consensus among residents for any investment is high; a draft condominium law is understood to be in circulation for some time and there is no housing code. Windows and insulation don't pay back quickly enough for EPC; substations are generally considered to be the district heating company's job (although it is technically the residents job); retrofitting buildings with horizontal networks is costly and disruptive; heat cost allocators are illegal; solar hot water is unlikely as buildings are district heated.
- Note that all of these answers assume that the Project will not only be successful, but also be successful in its efforts to involve banks and private sector financing one the model has been proven to work, so that it may evolve. If not, then the likelihood of the financial support mechanism being established by the project being sustainable is low. A classic EPC is a self-sustaining commercial model.

4.4.2. Socio-economic to sustainability

Question: Are there social or political risks that may jeopardize project outcomes?

- Chisinau Municipality does not have firm plans to order a new Urban Development Plan, so there it is not possible to achieve part of the Project Objective and one of the Project Outcomes. This issue is explored in detail in this report.

Question: What is the risk stakeholder ownership is insufficient to achieve Outcomes/benefits.

- The plan to use EPC for residential investments will probably turn out not to be credible as residents' associations are weak and may have difficulty mobilising the final stakeholders, the apartment owners. However, there are thousands of blocks in Chisinau so it is possible that five customers for ESCOs will be found. A plan for how to do this is suggested in this report, together with the recommendation that if advertising does not produce a reasonable pool of financially credible blocks, give up. The Project Objective and Outcomes do not specify that some investments have to be in residential buildings, and – although it is worth the effort of trying - successful use of EPC for residential investments in a lower-middle-income country is (probably) unknown. It should not come as a surprise if this turns out to be an impractical proposition. So, if it turns out to be necessary, replacing the proposed investments in blocks with more public sector energy efficiency investments would represent sensible adaptive management.

Question. Do key stakeholders see in their interest that the project benefits continue to flow?

- Yes. The scale of investment need in energy efficiency is widely recognised and there is a general expectation that UNDP will somehow bring or catalyse investment, even amongst stakeholders who have doubts about aspects of the model.

Question. Are lessons learned shared to parties who could potentially replicate and/or scale up

- Yes. The Project Manager is a embedded into the donor community, and is a deal-maker. The There is considerable scepticism about whether EPC is a realistic model for Moldova, but the donor community is lining up to replicate the Project... if it works.

4.4.3. Institutional framework and governance risks to sustainability

Question. May legal frameworks, policies etc jeopardise project benefits?

- There is an identified and unresolved risk in the form of how a municipality should account for EPC payments in its books. If EPC is considered to be repayment of a loan, it contributes to the borrowing cap of a municipality. If EPC payments are considered as payments for a contractual service, they do not enter into the lending cap. This issue is critical, but not strictly urgent as the UNDP-GEF ESCO Moldova is a small experimental project at a large municipality, so is not likely to encounter problems with the borrowing cap. For demonstration, replication and sustainability purposes, it would be better to find a permanent solution now that can be adopted by all public bodies in the future as the default way to account for EPC. If the model works and is successful, it has the potential to attract large scale private capital. One of the fundamental characteristics of the EPC model is that it should be 'off balance sheet' financing - so should not be considered to be lending. Legislation envisages this, but there is no clear way to enter EPC payments in public accounts in any way other than as loan repayments.

Question: do legal framework, policies, governance pose a threat to project benefits.

- There greatest threat to the Project is the 'conundrum' that, so far, the only way identified to report EPC payments in public accounts is as loan repayments - which is also the only unsuitable way to report EPC. This issue is reviewed elsewhere in this report. The Ministry of Finance is aware, but no solution has been identified yet.
- There is a new, but so far untested, procedure for public sector contracting through competitive dialogue. The consultant's understanding is that the procedure is fine and it is only its novelty that is a barrier - public servants prefer the procedures they already know. This is likely to be an issue in the future if-and-when EPC spreads to other cities, but the team and partners in Chisinau are prepared to use the new procedure.
- Multi-annual contracts in an environment of annual budgeting was identified as a potential legal issue, as municipalities officially cannot commit next years' budget, but it seems that there is a 'business-as-usual' practice to overcome this issue. This could have been a problem for private banks who have to meet contracting standards of their parent banks, but is unlikely to be a problem for EEF and the ESCOs.
- Multi-annual contracts in cities other than Chisinau may turn out to be more problematic. Chisinau sets its own budget. Other cities and towns send most of their finance to central government who redistributes it according to budgetary needs. This is a bridge to cross later in the project life-cycle, after EPC has already proved itself in Chisinau.

Question: has the Project Management contributed to improving the legal framework for ESCOs

- A Public Acquisition Law that came into force in March 2016 has a competitive dialogue procedure which will is believed never to have been used, so the Project will 'blaze the trail' in this respect.

4.4.4.Environmental risks to sustainability

No environmental factors were identified that that could represent a risk to the sustainability of UNDP GEF ESCO Moldova.

5. Conclusions and Recommendations

5.1. Conclusions

5.1.1. Comprehensive and balanced statements

(that are evidence-based and connected to the MTR's findings) which highlight the strengths, weaknesses and results of the project

1. Transforming the UDP of Chisinau into a GUDP has been frustrated as there is no (modern, up-to-date) UDP for the Project to 'green'. This issue may be traced back to a reasonable, logistical but ultimately incorrect assumption in the PIF of 2012 that Chisinau's UDP, which was already out-of-date and due to be renewed, would have been renewed by the time of Project implementation in 2015. The Project Objective and one of the Project Outcomes both refer to a GUDP for Chisinau, so the results of the Project are - unjustly - on track to appear to have failed.

2. Project outputs on green urban planning and the sustainable energy action plan may be adapted and used to help bring a green approach to urban planning in other cities. It is not necessary (or possible) to wait to showcase a Chisinau GUPD within the lifetime of the Project.

3. The banking crisis created an unexpected opportunity for three very well-informed, committed energy efficiency stakeholders, AEE, EEF and UNDP, backed by the Ministry of Economy, to create an integrated financial loan-grant-guarantee package for municipal EPC. This may turn out to be the Project's greatest strength. The likelihood of these actors getting EPC to work for Chisinau Municipality is high.

4. The model must prove itself, and then evolve or die, as its greatest strength is also its greatest weakness - there is no private sector financing. This is something to address in 2018, but for 2017 the priority should be 20x successful investments.

5. The first successes are likely to take longer than expected. The first EEF loans; the first LGF guarantees; the first time the public competitive dialogue procedure will be used; the first EPC contracts.

6. Tangential stakeholders are sceptical about the likelihood that EPC model working for the public sector in Moldova - but if it works, the development community are lining up to help scale-up.

7. Close stakeholders are sceptical about the likelihood that EPC will work for the residential sector. If five credible residential projects do not emerge, there is no barrier to replacing them with five public buildings. The Project Objective and Outcomes only refer to 20x buildings. The project is far too small to put meaningful resources into capacity building for block associations.

8. The issue of how to enter EPC revenue in public accounts, without being considered to be lending, unless solved, is the biggest risk to the future of EPC for the public sector.

9. Removal of the bank from the financing model has left the $900,000 LGF substantially oversized for its task of protecting a portfolio of 20x small EPC investments. There are comfortably sufficient funds for a no-cost extension of a year; and could even be sufficient funds to co-finance a (green) UDP if this is what the Project Board and UNDP would like to do.

5.2. Recommendations

5.2.1. Corrective actions

for the design, implementation, monitoring and evaluation of the project

Recommendation 1: Build a EE tailored financing model that meets all stakeholder needs

When life deals you lemons, make lemonade! The financial crisis and removal of banks from the Project was a drawback, but created an opportunity. EEF and ESCO Moldova are free to create a tailored, flexible financing and guarantee model for the (unique) situation of Moldova.

The consultant has not had sight of a draft document that is understood to describes current thinking about the possible flow of loan, grant and guarantees.

As a robust financial and guarantee model is critical to the success of the Project, and as the MTR is intended to bring specific recommendations to improve the project over the second half of its lifetime, the following model recommends on how finance could flow to meet the unique, Moldova-specific priorities, which are:

- Municipality (MUNI) saves money from Day 1

- EEF in its capacity of lender (EEFL), disburses loans and is fully repaid
- EFF disburses grants to proven, technically successful investments (EEFG in the model)
- ESCO is protected from MUNI payment indiscipline by EEFG
- EEFL is protected from ESCO payment indiscipline by the Loan Guarantee Fund (LGF)
- Risk of a small calls on LGF is minimised; risk of significant calls is tiny; and any call on a defaulting but technically successful investment is recovered by lien on income stream.
- Simplicity, the model is easy to explain and is intended to bring confidence to all parties.

A potentially important feature of this model is that it represents a simple way to 'blend' multiple source of financing, which can be difficult to do. Simplicity, incentive for the private sector to invest efficiently, financial discipline and scale-ability are integral to the design. If demonstrated to be effective by EEF and UNDP, this model could be adopted by donors who are looking for effective ways to blend grants and commercial financing to carry out larger scale investments with a longer paybacks than would normally be attractive using 'pure' EPC.

A beneficial side-effect of blending financing is that it eliminates the artificial split a technical project into 'the part to be paid with the grant' and 'the EPC part'. The investment becomes an integrated whole.

For clarity, a model of the financial flow is provide overleaf for a situation where:

- ESCO borrows $150,000 investment capital from EEFL over 2 years, repaying $150,000 capital + 10,000 interest= $160,000.
- ESCO invests the same $150,000 in MUNI's building, lowering quarterly energy bills by 50% from $60,000 to $30,000.
- Every quarter, MUNI keeps $5k of the savings and pays the other $25k to ESCO.
- Over the final two quarters, EEFG disburses the $50,000 grant. The financial flow is MUNI pays nothing, meaning it is excused from paying the final $50,000 of its EPC contract. EEFG makes an internal transfer to EEFL on the behalf of ESCO; and EEFG pays the remaining balance to ESCO on the behalf of MUNI.

Payment flow: a 150k investment over 2 years bringing 50% energy savings.

Chronological sequence of events	MUNI pays UTIL	MUNI pays ESCO	MUNI saves	EEFG pays ESCO	ESCO GETS	EEFL lends ESCO	ESCO pays EEFL	ESCO profit
	$000	$000	$000	$000	$000	$000	$000	$000
PMC pays, every quarter before investment	60							
ESCO&MUNI and ESCO&EEFL sign contracts								
ESCO orders equipment								
EEF disburses tranche 1/3 to ESCO						50		
ESCO installs equipment								
EEF disburses tranche 2/3 to ESCO						50		
ESCO commissions project, MUNI confirms								
EEF disburses tranche 3/3 to ESCO						50		
Energy bill confirms savings Y1Q1								
MUNI keeps $5k, pays UTIL and ESCO	30	25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y1Q2								
MUNI keeps $5k, pays UTIL and ESCO		25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y1Q3								
MUNI keeps $5k, pays UTIL and ESCO	30	25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y1Q4								
MUNI keeps $5k, pays UTIL and ESCO		25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y2Q1								
MUNI keeps $5k, pays UTIL and ESCO	30	25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y2Q2								
MUNI keeps $5k, pays UTIL and ESCO	30	25	5	0	25			
ESCO pays EEF							20	5
Energy bill confirms savings Y2Q3								
MUNI keeps all savings, EEFG disburses grant	30	0	30	25	25			
EEFG disburses half of the grant							20	5
Energy bill confirms savings Y2Q4								
MUNI keeps all savings, EEFG disburses grant	30	0	30	25	25			
EEFG disburses the rest of the grant							20	5
TOTAL PAYMENTS		**150**	**90**	**50**	**200**	**150**	**160**	**40**

... so MUNI saves $90k over the first two years and then $120k, every year, from Year 3.

Recommendation 2: Mitigate risk of non-payment escalation triggering the LGF

This recommendation suggests a hierarchy for dealing with risk, once again tailored for the unique situation of the project.

There are two very different kinds of financing risk in the now structure being proposed:

- Risk that an ESCO may not repay EEFL because the ESCO is (for example) bankrupt; or fraudulent; or has technical problem so is not entitled to invoice for EPC services so cannot afford to pay; or has been paid by MUNI but refuses to pay EEFL.
  - This is a high probability low impact risk. It is possible, even likely, that within a portfolio of 20 loans with a range of ESCOs there may events that may trigger an LGF payment, but this kind of risk is easy to manage and losses are likely to be few, small and, if an investment is already in place, recoverable by taking over an EPC income stream.

- Risk that MUNI defaults on its obligation to pay an ESCO, or multiple ESCOs, for their services, and ESCOs in turn have no choice but to default on their obligation to pay EEFL.
  - This event could wipe out the LGF. However, financing exists within the wider Project budget (meaning the budget as defined on the front of the Project Document) to mitigate this risk. They are:
    - A $6,425,000 MUNI contribution which is understood to represent a commitment use financial savings from the utilities budget resulting from ESCO investments to pay the EPC contracts that brought savings . This is a good commitment, but it is not a form of guarantee that can be called upon on demand by EEFL.
    - A $1,000,000 EEF contribution, representing 20x grants of $50,000 for municipal buildings. This is cash-in-the-bank at EEF which is intended for MUNI investment projects and can substantially mitigate this risk.
  - The consultant asked several stakeholders how confident they would be in a long-term contract with a municipality. A typical answer was that a contract with Chisinau is a desirable/solid, a contract other municipalities much less so, but any financial risk with a commitment horizon of more than two or three years is undesirable.

A classic bank guarantee protects the lender against the default by the borrower. This proposal offers the lender a higher level of protection (a bigger guarantee) by taking into account the reason for default, and using different financing sources accordingly:

- If indiscipline by ESCO is caused by ESCO only, redress is financed from LGF;
- If indiscipline by ESCO is caused by indiscipline by MUNI, redress of up to a limit of $50,000 per building is financed from municipal grant fund, and only thereafter from the LGF.

Another feature of this proposal that is very different from a classic bank guarantee is in-built flexibility. A classic bank guarantee, when called, pays out in full and the matter is closed. This model pays out only enough to meet the current liability of the borrower, and offers a chance to recover and put the transaction back on track.

A scenario is provided to clarify the point and demonstrate its impact. 20 EPCs are running between MUNI and 20 ESCOs. MUNI is due to pay all the EPCs on January 15th. ESCOs are due to pay loan instalments to EEFL on January 31st. The Municipal Council has not agreed the annual budget, so all payments are frozen. The ESCOs cannot afford to pay. February 1st arrives, and the bank has not been paid so it calls in the loans and triggers the guarantee. The municipal budget is agreed during February and late payments are made during March.

- A classic bank guarantee model triggers the guarantee and exhausts the LGF. There is no longer involvement by the bank. The ESCO experiment has failed.
- This proposal triggers payments to meet current liabilities only, considers subsequent late payment to also meet those liabilities so restores the guarantee and everything returns to business-as-usual. The ESCO experiment is a continuing success.
- For the first 20 investments, it is not even necessary to call upon the LGF as the municipal grant alone can absorbs the impact a missed payment (but the grant may only be used for this purpose if default by ESCOs was a consequence of default by MUNI)
- For subsequent investments (after the first 20) that may take place without municipal grants, the same principle applies. A call upon a flexible LGF that fully pays current liabilities can absorb late payment be restored to its original value when arrears are paid.

Hence the following risk mitigation procedure is recommended for the specific event of payment indiscipline by MUNI regarding an energy-saving investment financed with an EEF loan to an ESCO for an EPC at a MUNI building.

- ESCO invoices MUNI
- MUNI misses due date for payment to ESCO
- ESCO reports municipal default to EEFL
- EEFG pays EEFL the next loan repayment on the behalf of ESCO (so no default)
- MUNI pays ESCO (late)
- ESCO pays loan instalment to EEFL - (late)
- EEFL repays EEFG, restoring EEFG it to its original value.
- ESCO adds x% penalty charge to next invoice to MUNI for each day that payment was delayed (encourages future payment discipline by MUNI)
- EEFL does not add a late payment charge to the ESCO as EEFL was paid, on time, by EEFG

This solution may be applied over multiple quarters up to the Grant limit of $50,000 per building. Thereafter the LGF cuts in, so worst-case scenario for a $150,000 loan if MUNI pays nothing is:

- First $50,000 is met from the Grant
- Next $100,000 is met from the LGF, who inherits the right to the payment stream.

Exposure to payment indiscipline by MUNI may be further limited with a simple EEFL rule: 'If MUNI defaults on any ESCO who borrowed from EEF and does not restore within the same quarter, AEE shall discontinue lending for ESCOS to carry out EPC for MUNI'.

Hierarchy of payments	
Scenario: MUNI defaults, so municipal grant is used to repay municipal investment, and if there is more to pay, LGF is used for the balance.	MUNI does not default, ESCO defaults, so LGF is used
1. Regular EPC payments MUNI to ESCO	1. Regular payments from MUNI to ESCO
2. Regular loan payments ESCO to EEFL	2. Regular payments, ESCO to EEFL

Hierarchy of payments	
3. MUNI defaults up to maximum $50,000, LGFG pays LGFL	3. ESCO defaults so LGF makes the payment to EEFL. At this point LGF may choose to pay the full outstanding balance to EEFL and pick up the future revenue stream from MUNI, or may discuss with ESCO and choose to wait-and-see if restored quickly (flexible approach depends on circumstances).
4. MUNI pays late, restores EEFG back to $50,000	4. Late payment by ESCO (if this option was permitted by LGF) restores LGF back to its original value.
5. MUNI defaults exceeds $50,000, so LGF repays EEFL on the behalf of ESCO.	5. LGF pays full outstanding balance and picks up future revenue stream from MUNI.
6. MUNI pays late, restores	

Recommendation 3: Reallocate part of LGF budget into a no-cost extension

At the end of 2017, the Project Board should consider reallocating up to $200,000 from LGF for a one year no-cost extension to end 2019.

If, at the end of 2018, if the Project has proved to be exceptionally successful in leveraging investment for EPC, an additional extension should be considered for enhanced achievement of Outcome 4 (replication).

The reason for recommending that a decision is taken at end 2017 is that although MTR took place at the nominal mid-point of the Project, implementation delays mean that it is too early assess whether the Project is on track to replicable, sustainable success. By the end of the 2017, the Board should be able to take a more informed decision on whether an extension is desirable.

The full recommendation is:

- Timing
    - Take a decision end of 2017, based on progress during the year. Until that time the full $900,00 LGF should stay in place as it has a symbolic role and may provide confidence to financial stakeholders at the time of the first EPC contracts.
- Source
    - Reallocate budget from LGF, which, by end-2017, is likely to be acknowledged by stakeholders to be demonstrably oversized for its intended purpose.
- Size
    - Reallocate $150,000 to $200,000 for a no-cost extension.
- Duration
    - One additional year, meaning to end 2019.
- Purpose
    - 1). Funding the Project team for another year to recover from historical delays and ensure that there is enough time to fully achieve Outcome 4, taking into account that the Project is already far behind schedule and additional delays are likely;

- 2). Providing additional consulting expertise to overcome new barriers to EPC that emerge during 2017, as additional costs to address difficulties of making EPC work have already exhausted contingency budgets;
- 3). providing additional consulting expertise to help to 'green' the UDPs of any other cities that may already have an up-to-date, modern UDP in place.

Depending on the evolution of the Project, the Board could take another decision, at the end of 2018, to further extend the Project as far to the maximum of end-2020, using more budget reallocation from the LGF. It is now much too early in the Project life cycle to make a clear recommendation, but the total reallocated from the LGF could be as high as $600,000 ($200,000 + $400,000), depending on how lending for the first 20 EPCs progressed. The key determinants should be:

- If, by end 2018, the Project has been successful in kick-starting EPC, meaning that several investments are taking place in Chisinau over-and-above the 20 original investments, and additional EPC investments are taking place in other municipalities, the Board may consider keeping the Project open for an additional year to enhance sustainability and scale-up investment (enhanced Outcome 4), perhaps re-introducing banks to the model as they may have by then recovered from the financial shock of 2014 and be lending at reasonable commercial interest rates.
- If the Project has been successful in financing only the first 20 investments in Chisinau but the model has not proved to be replicable/sustainable, then there would be no justification for an extension.

Feedback from UNDP to a draft of this report requested additional support for this recommendation, taking into account that the value of the proposed budget reallocation - $150,000 - 600,000 - is very broad. This is provided as Annex 6.11, 'Notes on the timing, source, size, duration and purpose of an extension'.

Note that EEF as direct beneficiary of the $900,000 LGF contract with UNDP should abstain from voting in Project Board meetings on the subject of budget reallocation in order to avoid a conflict of interest.

Recommendation 4: Consider a GUDP for a city other than Chisinau as part of Component 1.

A GUDP for Chisinau is almost certain not to be achieved as there is no up-to-date, modern UDP for the Project to 'green'. This situation has implications for the perceived success of the Project, as a GUDP for Chisinau is embedded in the Project Objective and is the subject of Outcome 1.

Options for consideration by the Board are:

- 1). The Project co-finances a new UDP with PMC immediately. This option would be unlikely to work unless Chisinau provides substantial co-financing, as the cost of a UDP is far beyond the limited budget of this Project. Unless a budget emerges, as additional work on the theme of green urban development planning for Chisinau would be likely to consume Project resources without leading to a GUDP within the lifetime of the project, it is recommended that, for Chisinau, GUDP work is considered to be complete.
- 2). Feed the 'greened' ToR under preparation by the Project into the 'Sustainable Green Cities' (SGC) application to GEF, but do no more. This will not achieve the Project

Outcome of a GUDP, approved by Chisinau City Council within the lifetime of ESCO Moldova. Also, SGC is not an approved GEF project, so may or may not happen.

- 3). Identify whether any other towns/cities in Moldova are planning to improve UDPs in 2017/2018 and actively participate to ensure that they achieve Green UDPs that are subsequently approved by the City Council. Note that although this does not achieve Outcome 1, some smaller 'greened' cities could be regarded as a 'proxy success' to balance the fact that the Project has been frustrated in its attempts to achieve the Objective of GUDP for Chisinau.

The third option is recommended as the closest 'proxy' for achieving the otherwise frustrated Outcome 1. The City of Balti is understood to have already expressed interest in this solution.

Recommendation 5. Conundrum of EPC in public accounting - find a solution, ask Board to promote it.

It is essential to success of the ESCO model that a way of entering EPC payments in public accounts is found, without categorising them as loan repayments. Although this sounds like a minor issue, unworthy of the attention of the Board, it should be treated as a major problem. This issue is a well known 'booby trap' (not only in Moldova) that can undermine the emergence of EPC. There are two aspects:

1. Public sector accountants like to enter EPC payments as loan repayments in public accounts, which appears to be a natural fit. However, loans are controversial, subject to municipal borrowing caps, subject to credit ratings and collateral issues and are in competition with other loans with higher investment priority. EPC's potential to bring unlimited 'off balance sheet' private sector finance for public sector investments is removed if EPC is treated as lending. So it is important to enter EPC transactions in public accounts as something other than loan repayments... But.

2. Public sector accountants are typically amongst the most influential and respected members of procurement committees. Accountants naturally (and quite rightly) block proposals for strange and new types of payments, for which there is no precedent and no clear category in the public accounts. Except as loan repayments....

Another way to state this issue is a need to treat ‘Negawatts’ alongside ‘Megawatts’ as utility payments, not as debt repayments.

ESCO Moldova stakeholders generally are aware of this conundrum, but a solution has not emerged yet. The Project Team should find a solution for Moldova and ask the (high-level) Board to use its weight to promote the solution, which may involve secondary legislation or changes to public accounting rules, into law.

Recommendation 6. Establish a focus-group to rapidly-develop a shared vision of (Moldovan version of) EPC.

A shared understanding of, and confidence in EPC as a robust financing tool is essential to the success of Outcomes 2 and 3. Multiple meetings during the five-day MTR mission revealed that different stakeholders do not have a common understanding of how EPC will work and the roles of EEF as lender; EEF as guarantor; EEF as grantor; Some stakeholders are openly sceptical that it will work at all. Basic concepts are known, but important details such as who does the LGF protect? What kind of default does the LGF protect? Whose default triggers the LGF - the ESCO or the municipality? Who is the borrower? When does ownership of assets transfer between parties, and from whom to whom? Who gets the grant? Who pays whom for what and in which sequence? ... are not well-understood. In some cases, answers are not even firmly decided yet. The imminent launch of the first EPCs in early 2017 suggests that it is important to overcome this barrier very quickly. As the MTR is intended to bring specific recommendations for adaptive management to improve the project over the second half of its lifetime, a role-playing exercise (game) is provided to familiarise EPC/ESCO stakeholders with the flow of activities, contracting and financing. The game, which is designed to help participants to arrive at a shared understanding of how an EPC transaction will flow - both when modelling trouble-free transactions and also for transactions where something goes awry - is appended to this report as Appendix 6.9.

The Focus Group should be led by the UNDP Project Manager. Observations on a draft of this report suggested that the Focus Group should agree a new leader to carry on the group at the end of the Project. By that time, there may not be need for a Focus Group to consider the specific issue of how to finance municipal buildings in Chisinau which should already be a proven model. However other issues are likely to emerge such as how to extend the model beyond buildings to municipal services and complexities of making EPC compatible with the way other municipalities' annual budgets are set, which differs significantly from the way it is done in the capital. The group could also look consider alternative ways to blend financing (EPC repaying from energy cost savings together with non-reimbursable financing) in order to attract additional grant financing to Moldova, taking into account that most donors want a contribution from the private sector to accompany grants.

Recommendation 7. Agree a fallback plan if EPC for residential buildings is unworkable

For blocks, allow a more flexible approach than pure EPC

There is no clear business case for an ESCO to use EPC to finance investments in residential blocks in Moldova. Energy prices are too low/investment costs are too high; energy services can be too poor (under-heated and under-lit buildings) to demonstrate savings; the number of well-managed buildings with a good financial track record and willingness to invest is too few; the costs of achieving agreement between residents are too high; clarity about who should pay can be controversial (e.g. district heating individual substations); the legal framework can be unsupportive (heat cost allocators); and hence the range of practical, replicable investments that strictly repay from energy cost savings within five years is limited to perhaps, LED lighting with presence sensors. In cases where costs are divided equally by number of apartment, or number of residents, or per square meter, even a very, very, very low cost simple 30-second screw-on measure - that costs pennies - a low-flow water tap head, is not an attractive investment proposition for a household.

There is a business case for allowing ESCO transactions that are not strictly EPCs to be financed through the Project, only for the residential sector. Investments that bring energy savings together with social and economic benefits (desired investments), but take much longer to pay-for-themselves from energy cost savings, would become eligible. The eligibility benchmark for the Project could be 'does this investment save energy'. The benchmark for the ESCO could be 'is the client willing and able to pay'. As a result, energy-saving investments that the clients of ESCOs are most willing to pay for would be enabled. 'Popular' energy efficiency investments such as windows and doors for building insulation that cannot repay quickly from energy savings, but bring other benefits such as increased capital values, higher rental incomes and better comfort levels could be enabled by the Project. From an economic standpoint, CO_2 savings per $1 of investment for a desired investment may be lower than for a technical investment; but if households are prepared to buy the desired investment but not the technical investment, it is the desired investment that saves CO_2.

The consultant considered whether this recommendation is consistent with the Objective and Outputs of the Project, which may not be altered by recommendation of an MTR. The conclusion is... probably. The Project Objective refers only to ESCO, not to EPC. Outcome 2 refers specifically to ESCOs that use EPC; Outcome 3 refers to ESCOs; Outcome 4 is described inconsistently in different sections of the PJ. It is for UNDP and the Project Board to take a decision on this point.

For clarity, the recommendation is that if an investment saves energy; households are willing and able to pay for it in instalments of up to five years using an ESCO; and the ESCO is willing to finance it, the investment should be considered to be Project-compatible even if it is not strictly an EPC because energy cost savings will not be the only source of revenue to repay the investment within five years.

If this recommendation is accepted, the Project could rapidly advertise to find a mix of residential buildings who would like to invest in energy efficiency, select the five most credible proposals and use the Project resources (technical support; selecting an ESCO; a guaranteed loan for the ESCO; a grant) to help the block achieve its energy-saving objectives. Five different types of investment should be selected to maximise the demonstration and replication effect. Proposals should be prioritised according to the credibility of the investors (well managed blocks) and the highest rate of return from energy savings (as a factor, but not an overriding factor). Hence the outcome should be a mix of different investments rather than 5x lighting projects that pay back most quickly. As the ToR for this MTR calls for specific recommendations, the text of an advert that could be published to attract Blocks to work with ESCO Moldova is provided as Appendix 6.13 of this report.

In the case that insufficient credible ESCO-compatible investment proposals emerge after advertising to the residential sector, they may be replaced with additional investments in public buildings, a change which is compatible with not changing the overall Project Objective or Outcomes. If this occurs, the Project Board should consider broadening the range of investment types beyond the range represented by the 15 investments selected so far, to maximise the demonstration effect and replication potential of the Project. There are two ways to achieve this: either choose different types of public buildings such as a municipal office, a prison, a theatre; or choose similar public buildings with different kinds of energy efficiency needs, such as another hospital but one where the principal energy-savings opportunities are not, as with the hospitals selected so far, in the laundry and kitchen.

As a codicil to this recommendation, work with the residential sector should be brought forward (start to interact sooner). Stakeholder engagement is a challenge when working with households, and the amount of 'thinking time' for an idea to pervade through the block before a decision is taken may be long. Awareness activities such as an informational summer barbeque in the courtyard of the selected block or an explanatory poster in the common hallway of the selected building may help to build confidence in the investment and speed up decisions, but can be a drain on Project time.

Recommendation 8: Develop a shortlist several 'backup' EPC investment proposals

Some of the investment proposals developed by the Project are likely to fail to move forward.

For the municipal projects, there is a single decision-maker (PMC) so commitment should not be a problem, but it is unlikely that the Project team will develop 20x investment projects that add up neatly to the desired target investment and grant value. A 'backup list' of another few public buildings would also enable flexibility to replace potential investment projects that, for any reason, are not progressing towards an investment to be replaced rapidly with an alternative project.

For the residential sector, indecision is more likely to be a barrier to progress. It would be prudent to develop a longlist of many more than 5x investment proposals as even blocks with credible, profitable energy efficiency investment opportunities still may not be able to persuade their occupants to take a positive investment decision, and even if the residents agree, there will need to be someone with a clear legal mandate to sign the contract and pay the ESCO.

As a codicil to this recommendation, the Board should be made aware that EPC is better suited to 'non-buildings' energy efficiency 'low hanging fruit' investments in the public sector, such as streetlighting, water pumps, energy-efficient transportation and even frequency converters for very large motors at Termoelectrica. Although the Project Objective refers to municipal buildings, it may be possible to expand the definition to municipal buildings and services if the Board wants this and if UNDP agrees. These kinds of public services are likely to be more replicable and hence more useful for 'up-scaling' investment in public sector energy efficiency using EPC. Discussions on the draft of this report between UNDP and the MTR consultant about whether the reference to municipal buildings prevents the Project from using ESCOs to also finance energy efficiency at other municipal facilities concluded that it would not be inconsistent with the Objective.

Recommendation 9: Address the issue that part of the Project Objective and Outcome 1 are frustrated.

Changes to the Project Objective and Project Outcomes are not possible through the MTR as adaptive management allows changes to project activities and outputs but not to the Project Objective and Outcomes.

The Project Objective refers to a Green Urban Development Plan (GUDP) for Chisinau. Outcome 1 refers to adoption, by Chisinau Municipality, of a GUDP.

Stakeholders in the Project assumed that by the time the Project commenced, a freshly updated Urban Development Plan (UDP) of Chisinau would be available to be 'greened', transforming it into a GUDP. When the Project commenced, it was quickly discovered that there is no modern, up-to-date UDP for Chisinau for the Project to work on. Hence, although substantial work on green urban development has taken place, it will not result in a GUDP being adopted by the City of Chisinau. Metaphorically, the Project was intended to put the icing on the cake. The icing has been prepared. But there is no cake.

As a result, achievement of the full Project Objective and achievement of Outcome 1 are frustrated.

The MTR consultant looked closely into how this happened. The problem can be traced back to fair, reasonable, well-supported, logical assumption about the future in the Project Identification Form (PIF) that Chisinau Municipality would have an updated Urban Development Plan (UDP) by the time the Project took place. The facts were that it is the policy in Moldova to update UDPs every 5-7 years, the most recent update was 2007, so it was supposed that by the time the Project would be launched in 2015, a new UDP would be in place and ready to be 'greened'. However, there is no UDP, so there can be no GUDP.

The impact of the problem assumption was compounded when the Project Document (PJ) was prepared. The Project Objective of the final (4th version) of the PIF was expanded upon in the Project Document. The changes were:

- From: 'Project objective: To create a functioning, sustainable and effective ESCO market in Chisinau as the basis for scaling up mitigation efforts in other municipalities in Moldova' (PIF)
- To: 'The project objective is To create a functioning, sustainable and effective ESCO market in Moldova by converting existing energy service provider companies into ESCOs, as the basis for scaling up mitigation efforts in the whole municipal building sector in Moldova in line with the Green Urban Development Plan leading to at least 68,000 tonnes of direct CO_2 emission reductions from EPC projects supported by the project and 240,000 tonnes of indirect CO_2 emission reductions during the period of project influence.' (PJ).

When the Project commenced in 2015, the issue was quickly discovered. Several possible solutions were discussed, both at the time and again at the time of the MTR. An idea to 'green' the 2007 UDP was quickly discounted as being pointless as it is too long out-of-date to be useful. An idea to prepare a new UDP concluded it is a major assignment costing hundreds of thousands of USD, so is far beyond the budget of this Project. An idea to source external donor funds to finance a UDP for the project to 'green' was considered but no progress made. An idea to reallocate Project budget from the Loan Guarantee Fund (LGF) concluded that although the LGF fund may be considered to be oversized for its specific intended purpose, reallocation of sufficient funds to pay for a UDP would jeopardise EPC-related objectives of the Project. An idea to prepare a UDP within the planned UNDP GEF Project 'Sustainable Green Cities' (SGC) and then 'green' it through ESCO Moldova concluded that although the two projects should certainly work closely, SGC has not been fully defined or accepted yet so it is not a practical recommendation. An idea to ask GEF to change the Objective and Outcomes concluded that this solution is beyond the scope of an MTR. An idea to prepare a GUDP for a city other than Chisinau was considered something that may be considered a 'proxy' for Chisinau, even though the Objective and Outcome refer specifically to Chisinau.

There was general consensus in discussions with UNDP that something should be done. It is likely to be demotivating for the Project Team to know that no matter successful this difficult Project may turn out to be, it is at risk of being considered by GEF to have failed to meet its Objective. Furthermore, it is in the interests of none of the stakeholders to have a Project that, even if it succeeds in the difficult task of launching the EPC market in Moldova, may be branded as a failure because of an assumption about the future in made in 2012.

The only solution that emerged were that the Project Board could:

- Choose to write a note to file removing the words ‘consistent with the green urban development plan' from the Project Objective; and

- Choose to offer to prepare a GUDP for another city that already has an UDP (probably Balti), as adoption of a GUDP by another city could be considered a 'proxy' for adoption of a GUDP by Chisnau.

As a result, when it comes to the time of the Final Evaluation, the Evaluator will see that the Project Board acknowledged and acted upon the issue at the time of the MTR.

5.2.2. Actions to follow up or reinforce initial benefits from the project

Recommendation 10: Improve, use and publish the Green Urban Procurement Guidelines.

This report is a defined Project Outcome so should be accorded a high priority, especially taking into account doubt that a GUDP for Chisinau will emerge

The current version of the report would benefit from improvements to layout and illustration. For inspiration, approaches used in UNEP's Sustainable Public Procurement Implementation (UNEP, 2012); or Green Pubic Procurement, a Good Practices (EU, 2012) could be considered.

The Project team should seek to work with PMC to identify who uses the Guidelines, assess its impact upon their procurement habits and take additional steps, if necessary, to improve its impact. A presentation version with the main concepts could be produced, and the guide could be 'showcased' at events in other cities.

The Project team should be able to demonstrate in a measurable way such as with a list of named stakeholders with whom the document has been shared and with user feedback, that Guidelines are transforming the municipal approach to green procurement and not become just another report-on-a-shelf.

An electronic version of the (improved) report should be made available online on the project website.

Recommendation 11. Improve the use of project website and training materials

The website www.esco.md is well-designed and will become more useful when the project reaches the stage of needing to convey specific explanatory information about defined business opportunities for companies who will become future ESCOs. When the calls for tender are launched and throughout the period that they are open they should be the main topic of the home page of the site.

At present information on the site is necessarily rather general but when a definitive financial model of the EPC, loan and guarantees relationships between PMC, EEF, LGF and the ESCOs is eventually finalised, it should be published on the website and comments invited.

The English language pages of the site should be updated to carry the same information as the Romanian language pages, which are much more comprehensive.

Some of the training materials and reports shared with the MTR consultant for this assignment are excellent and appear to be suitable for publication on the Project website. In some cases, Romanian language versions of presentations could be prepared to reach a wider audience and broaden interest and understanding of EPC, ESCOs and green urban development.

A links page leading to a small but carefully selected number of sites about best international practice in EPC would be a useful addition to the site, to be updated with the latest links whenever there is an international event on the highly specialised topic. Links could include:

EU Energy Efficiency Finance Marketplace - Brussels, January 17-18 2017

- https://ec.europa.eu/energy/en/events/energy-efficient-finance-market-place

ENPC INTRANS International EPC Conference - Stuttgart, November 15 2016

- http://www.enpc-intrans.eu/language/en/final-conference/

UNECE 3rd Session of the Group of Experts on Energy Efficiency - Baku, October 18-19 2016

- http://www.unece.org/index.php?id=42244#/

Recommendation 12. Take a simple step to 'seed' a Professional Association of ESCOs in Moldova

ESCOs who have benefited from UNDP-GEF ESCO Moldova training or have otherwise been involved in the Project could be encouraged to set up a professional association to represent the business interests of this nascent community.

There may be no need for the association to be a 'stand-alone' organisation, it may be part of an existing group or NGO in which they are already members, or it could be an online group, but something should represent the interests of this community. This could be considered an early contribution to the Project's exit strategy.

Discussions between the MTR consultant and UNDP considered several aspects of this recommendation. Another UNDP project has a positive experience of a similar initiative, for which a junior consultant was taken on. The point that Project budget of ESCO Moldova is too tight to take on another team member was raised. A view that this may be something for a later stage of the Project when EPCs are operational so there are some veritable ESCOs to join the club was raised. A view that this should be something driven from the 'bottom up' rather than 'top down' so that the ESCOs take real ownership of the organisation was raised. The point ESCO associations of other countries could serve as a model for Moldova was raised - and that there are many to choose from such as USA (www.naesco.org), Portugal (www.apese.pt), Brazil (www.abesco.com.br), Netherlands (www.esconetwerk.nl), Belgium (www.belesco.be) and Romania (www.escorom.ro).

The general consensus was that the involvement of the Project should be positive but minimal, such as hosting an initial, informal meeting and making stakeholders aware of the scope and benefits of forming such an association - including the point that if they choose to form an association, formal or informal, its voice will be heard by the Project.

The rationale behind this recommendation is that efforts to create the 'rules-of-the-game' and an appropriate legal and business environment for EPC are being driven by UNDP and the Project Board today, but if the companies themselves don't take up an interest and start to lobby on their own behalf, the likelihood of EPC flourishing in Moldova after the Project is over is slim.

Subject to the agreement of the Project Board, an association could be invited as a representative as an observer to Board meetings.

Recommendation 13: Address barriers to individual consumption-based billing for apartments.

A text box on the cover of the Project Document notes refers to the project '...addressing the legal, institutional and financial barriers for promoting and carrying out improvements of the efficiency energy usage in Moldovan buildings, particularly those in the institutional and multi-storey residential sub-sectors.'

This recommendation addresses legal and institutional barriers to individual consumption-based billing for multi-storey residential blocks. The Project Board could consider using its seniority to help remove existing legal barriers to the use of Heat Cost Allocators (HCA) in apartment buildings.

This is a long and complicated issue but the short facts are: 1). individual consumption-based billing is a cornerstone of energy efficiency and embedded into the Energy Performance in Buildings Directive; 2). the best solution of retrofitting horizontal heating networks and individual heat meters on a large scale is impractical and very costly; so 3). HCAs - fitted to existing vertical systems like those in Moldova, despite shortcomings, are the only practical low-cost solution to achieve large-scale heat savings rapidly in blocks. If barriers are removed, EEF and UNDP could, through the ESCO Moldova Project, showcase the technologies and compare costs, energy savings and impact of horizontal networks with meters vs vertical networks with HCAs vs. the status quo of area based billing at three of the proposed residential EPC investments in Chisinau. For HCAs, care should be taken to avoid the two most common pitfalls which are 1). undermine the impact of the technology by using billing methodologies that continue to be substantially area-based; and 2) information must be excellent to prevent households accidentally buying more heat than intended during the first month of the new metering or HCA system, which can undermine confidence of households and discourage replication.

A more detailed note on the importance of consumption based billing is provided as Appendix 6.10 of this report.

6. Annexes

6.1. MTR ToR (excluding ToR annexes)

Terms of Reference: Mid Term Review of the UNDP GEF project ESCO Moldova-Transforming the market for urban energy efficiency in Moldova by introducing Energy Service Companies.

- Job title: International Consultant on Energy Efficiency for Mid Term Review
- Type of Contract: Individual Contract (IC)
- Assignment type: International Consultant
- Section/Unit: Environment and Energy Cluster
- Duty Station: Home based with one mission of 5 working days to Moldova
- Languages required: English
- Starting Date: 01 November 2016
- Duration of Assignment: 21 working days (16 home based, 5 working days on mission).
- Payment arrangements: Lump sum contract (payments linked to satisfactory performance and delivery of outputs)
- Evaluation method: Desk review with validation interview

I. Introduction

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the full-sized project titled ESCO Moldova- Transforming the market for urban energy efficiency in Moldova by introducing Energy Service Companies, PIMS 5135, implemented in partnership with the Ministry of Environment which is to be undertaken during July-September 2016. The project started on November 2014, had the inception workshop in June 2015 and it is in its second year of implementation. This ToR sets out the expectations for this MTR.

The MTR process must follow the guidance outlined in the document Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects (attached).

See link:
http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20_EN_2014.pdf II. Project Background Information

The UNDP GEF "ESCO Moldova project - Transforming the market for Urban Energy Efficiency in Moldova by introducing Energy Service Companies", funded by the Global Environment Facility (GEF), and co-financed and implemented by the United Nations Development Program has an implementation timeframe of 4 years with a total budget of 1.45 million USD of which $1.3 million USD comes from the GEF and $150,000 USD from UNDP.

The project objective is to create a functioning, sustainable and effective ESCO market in Moldova by converting existing energy service provider companies into ESCO companies, as the basis for scaling up mitigation efforts in the whole municipal building sector in Moldova, leading to CO_2 emission reductions by implementing energy performance contracts. The project will work on the largely untapped energy efficiency market in the municipal sector, especially in facilities owned and operated by municipalities, in the Chisinau area for the first stage and then to other parts of Moldova.

The main barriers that the project is trying to address are related to:

- Energy efficiency project financing;
- The eagerness of existing Energy Service Providers to embark on the ESCO business model;
- Institutional barriers at the local level;
- Energy efficiency awareness in the municipal sector.

The ESCO Moldova Project intends to eliminate/address these impediments through the following project outputs:

- Green Urban Development Plan adopted by city of Chisinau;
- ESCO Business model in Moldova is operational;
- Financial mechanism and financial support available to ESCOs;
- EPC projects replicated in other municipalities and information disseminated.
- The main targets to be achieved by the end of the project are:
- A functional ESCO market with a functional LGF in place;
- ESCO companies created and consolidated; creation of new investments in EE measures that will lead to long term energy consumption savings and 20 EE projects implemented;
- Better conditions in public and residential buildings and overall Chisinau will advance in its sustainable green development.

Project activities were designed to respond all the outlined challenges and consequently offer feasible solutions to the requirements of the energy efficiency financing market needs. Also they envisaged the opportunity of creating synergies with local stakeholders as well as offer incentives for the ESCO market to start developing. A specific attention will be offered to development of capacities of local energy service providers (potential ESCOs), local authority as well as the banking sector. The overall project activities will also develop amendments to the legal framework for energy services and green procurement, will facilitate the improvement of the Urban Development Plan by adding energy efficiency elements, and ultimately will incentivise the implementation of the first 20 projects using the guaranties of a fund established to secure the participation of all stakeholders in the financing scheme.

The inception phase of this project began in January 2015 and the project is due to finish at the end of 2018 after a duration of 4 years. The project is implemented by UNDP Moldova. It is being implemented in close collaboration with the Ministry of Environment, Energy Efficiency Agency, Energy Efficiency Fund and the Municipality of Chisinau. Specific emphasis will be placed on capacity building of all involved stakeholders to adopt the new financing modality and understand their roles and responsibilities, improvement of urban planning and energy efficiency measures to be implemented in Chisinau as well as financial incentives required to give a push to energy services market development. The best practices and lessons learned of the pilot projects implemented in Chisinau will offer an additional argument for replicating them all over the country.

III. Objectives of the MTR:

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy, its risks to sustainability.

The main output of the MTR will be specific recommendations for adaptive management to improve the project over the second half of its lifetime.

It is recommended that the Mid Term Review not provide more than 15 recommendations in total, to improve the project.

IV. MTR APPROACH & METHODOLOGY

The MTR must provide evidence based information that is credible, reliable and useful. The MTR international consultant will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based review). The MTR international consultant will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that must be completed before the MTR field mission begins.

The international energy efficiency MTR consultant is expected to follow a collaborative and participatory approach[1] ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), the UNDP Country Office(s), UNDP-GEF Regional Technical Advisers, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR.[2] Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to Ministry of Environment, Energy Efficiency Agency, Energy Efficiency Fund and Municipality of Chisinau, UNDP Moldova staff, UNDP Istanbul Regional Technical Advisor on Climate Change Mitigation, executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc. Additionally, the MTR consultant is expected to conduct a field mission to Chisinau which will consist of a minimum of 5 working days (not including weekend or travel days). While in Moldova, the international consultant will meet with all key stakeholders and assess the results of the project and the extent that it is on track to meet its overall objective and outcomes. Skype interviews will also be carried out with all other key stakeholders involved in the design and implementation of the project.

1 For ideas on innovative and participatory Monitoring and Evaluation strategies and techniques, see UNDP Discussion Paper: Innovations in Monitoring & Evaluating Results, 05 Nov 2013.
2 For more stakeholder engagement in the M&E process, see the UNDP Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 3, pg. 93.

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

V. Detailed Scope of the MTR
The International consultant will assess the following four categories of project progress. See the Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects for extended descriptions.

1. Project Strategy

Project design:

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?
- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for further guidelines.
- If there are major areas of concern, recommend areas for improvement.

Results Framework/Logframe:

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

2. Progress Towards Results

Progress Towards Outcomes Analysis:

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and following the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; colour code progress in a "traffic light system" based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as "Not on target to be achieved" (red).

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

Project Strategy	Indicator3	Baseline Level[4]	Level in 1st PIR (self-reported)	Mid-term Target[5]	End-of-project Target	Midterm Level & Assessment[6]	Achievement Rating[7]	Justification for Rating
Objective	Indicator (if applicable):							
Outcome 1	Indicator 1:							
	Indicator 2:							
Outcome 1	Indicator 1:							
	Indicator 2:							
	Etc.							
Etc.								

3 Populate with data from the Logframe and scorecards
4 Populate with data from the Project Document
5 If available
6 Colour code this column only
7 Use the 6 point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU

Indicator Assessment Key

Green - Achieved	Yellow - On target to be achieved	Red - Not on target to be achieved

In addition to the progress towards outcomes analysis:

- Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.

- Identify remaining barriers to achieving the project objective in the remainder of the project.
- By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

3. Project Implementation and Adaptive Management

Management Arrangements:

- Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.
- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

Overall Effectiveness

- To what extent is the project on track to have 20 building rehabilitations financed in Moldova, using the ESCO modality, before the end of the project?
- Is the project on track to deliver cumulative (20 years) energy savings of 295 GWh as a result of the 20 demo projects selected?
- To what extent is the loan guarantee fund on track to deliver $2.7 million dollars of loan guarantees to be signed with the Energy Efficiency Fund?
- To what extent is the project on track to leave behind a market in Moldova for ESCOs in which there are at least 5 companies, which previously worked as engineering companies, now working as ESCOs.

Component 1

- Is the project on track to have a green urban development plan for Chisinau, including a resource mobilization plan, developed and approved, with support from this project, by the end of the project?
- Is the project on track to have a public green procurement plan developed and applied by the City of Chisinau by the end of the project?

Component 2

- What progress has the project made related to training on the ESCO business model which includes 3 target beneficiaries' groups and 3 training sessions, at least 20 ESPs are trained on the ESCO business model, public Building managers and Maintenance Managers, at least 20 staffs are trained on ESCO business model, and Financial Institutions (5), including the EEF are trained on the ESCO business model
- To what extent is the project on track to have 20 projects selected and contracted and under implementation using the EPC modality before the project ends?
- To what extent is the project on track to have a framework agreement signed with the Energy Efficiency Agency, the City of Chisinau, and the PMU

Component 3

- To what extent has the loan guarantee mechanism been adequately designed and set-up? Have the adaptive management changes to the loan guarantee mechanism from how it was described and defined in the project document helped to strengthen the project or otherwise? Please explain.
- To what extent is the loan guarantee mechanism likely to be sustainable beyond the lifetime of the project?
- To what extent, if any, has the banking sector in Moldova worked with the loan guarantee mechanism? What could be done in this regard?
- What changes, if any, could be used to strengthen the loan guarantee mechanism?

Component 4

- To what extent is the project on track to achieve replication and dissemination to another town/city in Moldova and to what extent have initial discussions been held with another town/city regarding working with the ESCO Moldova project
- To what extent is the project on track to support the development of a green urban development plan in another city?

Work Planning:

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

Finance and co-finance:

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions. Have the budget revisions strengthened or weakened the project overall?
- Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?
- Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Manager meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

Project-level Monitoring and Evaluation Systems:

- Review the monitoring tools currently being used including PIR reporting and quarterly financial reporting: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
- Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

Stakeholder Engagement:

- Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
- Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
- Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

Reporting:

- Assess how adaptive management changes have been reported by the project management and shared with the Project Board including assessing how well the project has worked with UNDP Moldova and the UNDP Istanbul Regional Hub in identifying and implementing adaptive management measures

Assess how well the Project international consultant and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)

- Assess how lessons derived from the adaptive management process has been documented, shared with key partners and internalized by partners.

Communications:

- Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
- Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
- For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.

4. Sustainability

Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.

In addition, assess the following risks to sustainability:

Financial risks to sustainability:

- What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes)?
- What is the likelihood of the financial support mechanism being established by the project being sustainable (meaning that it will continue to operate and function beyond the lifetime of the project)

Socio-economic risks to sustainability:

- Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained?
- Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project team a continual basis and shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

Institutional Framework and Governance risks to sustainability:

- Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.
- To what extent has the project managed to improve or contribute to legal frameworks related to the development of the ESCO market in Moldova

Environmental risks to sustainability:

- Are there any environmental risks that may jeopardize sustenance of project outcomes?

Conclusions & Recommendations

The MTR International consultant will include a section of the report setting out the MTR's evidence-based conclusions, in light of the findings with the main goal of making recommendations on how to significantly improve the project (i.e – how to implement adaptive management) over the second half of its lifetime.[8]

8 Alternatively, MTR conclusions may be integrated into the body of the report.

UNDP and GEF rules for adaptive management allow for change of activities and outputs to better achieve the project objective and main outcomes. However, they do not allow for the project objective or outcomes to be changed.

There should be no more than 15 recommendations. Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report's executive summary. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for guidance on a recommendation table.

Ratings

The MTR International consultant will include its ratings of the project's results and brief descriptions of the associated achievements in a *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. In addition, an overall rating for the project should be given.

Table. MTR Ratings & Achievement Summary Table for ESCO Moldova project

Measure	MTR Rating	Achievement Description
Overall Rating		*(Please note that for the mid-term review an overall rating is optional)*
Project Design and Strategy		
Progress Towards Results	Objective Achievement Rating (rate 6 pt. scale)	
	Outcome 1 Achievement Rating (rate 6 pt. scale)	
	Outcome 2 Achievement Rating (rate 6 pt. scale)	
	Outcome 3 Achievement Rating (rate 6 pt. scale)	
	Etc	
Project Implementation and Adaptive Management	(rate 6pt. scale)	
Sustainability		

V. TIMEFRAME

The total duration of the mid-term review will be **21 days** from the start date of the assignment which works out to approximately 1.5 months from November to the mid of December 2016.

ACTIVITY	TIMEFRAME	Number of Days
Preparation for the mission by the International consultant (handover of all project documents)	*beginning of November*	1

Document review and preparation and submission of MTR Inception Report	*Beginning of November*	4
5 working days MTR mission to Moldova: stakeholder meetings, interviews, field visits	*Mid-November*	5
Preparing draft MTR report and submitting to Project Manager, UNDP Moldova, and UNDP Istanbul Regional Hub and holding conference call to discuss the draft report	*By end of November*	6
Incorporating audit trail from feedback on draft report/Finalization of MTR report	*By end of November*	1
Preparation & Finalization of UNDP Management Response by UNDP Moldova in consultations with the MTR Consultant.	*By end of November*	1
Finalization of MTR incorporating all comments and responding to all issues raised by all stakeholders	*By beginning of December*	3
Total	**21**	

Options for site visits and a detailed list of interviewees and questions to be asked should be provided in the Inception Report.

VII. Expected Deliverables

#	Deliverable	Description	Timing	Responsibilities
1	**MTR Inception Report**	MTR International consultant clarifies objectives and methods of Midterm Review	No later than Beginning of November	MTR International consultant submits to the UNDP CO and project management
2	**Presentation**	Initial Findings	Last day of 7 working days MTR mission (powerpoint presentation) to be carried out in Mid-November	MTR International consultant presents to project management and the Commissioning Unit
3	**Draft Final Report**	Full report (using guidelines on content outlined in Annex B) with annexes	Within 3 weeks of the MTR mission and expected to be at the end of November	Sent to the UNDP CO reviewed by RTA, Project Coordinating Unit, GEF OFP
4	**Final Report***	Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report	Within 1 week of receiving UNDP comments on draft, and expected to be at beginning of December 2016	Sent to the UNDP CO and UNDP Regional Technical Advisor

*The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

VIII. MTR Arrangements

Institutional arrangements
The principal responsibility for managing this MTR resides with the UNDP Moldova Country Office which is the Commissioning Unit.

The Project team will be responsible for liaising with the MTR International consultant to provide all relevant documents, set up stakeholder interviews and agenda, and arrange field visits if necessary. The MTR consultant should review all documents and request meetings and interviews to take place prior to the mission.

Duty station
Home-based with 5 working days mission to Moldova which should be carried out in November 2016.

Travel:

International travel (5 working days - mission) will be required to Moldova which is called the Mid-Term Review mission; This 5 working days mission does not include travel days or weekend days which means that the consultant will need to stay one weekend in Moldova. Weekend days are not considered working days. All envisaged travel costs must be included in the financial proposal.

IX. Qualifications and experience requirements
The MTR International Consultant should be an international expert with experience and exposure to energy efficiency projects and will have some prior experience in carrying out mid-term or final evaluations. It is preferable that the international consultant has some prior familiarity with the ESCO business model. The international consultant cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project's related activities.

The International Consultant on energy-efficiency - MTR Consultant should have the following qualifications and experience:

Academic qualifications:
- Master's degree in Energy, Environment, Business Administration, Economics, Engineering, or other closely related field. PhD is an asset;

Experience:
- At least 5 (five) years work experience in providing advice to energy-efficiency projects funded by international donors including UNDP or other donors;
- At least 7 (seven) years work experience and proven track record with policy advice and/or project development/implementation in energy efficiency in transition economies;
- Experience in working with the UNDP or another GEF agency or GEF project evaluations, including experience with SMART based indicators (Project evaluation/review experiences within United Nations system will be considered an asset);
- Experience in evaluating performance based energy efficiency projects. Proven knowledge of energy performance contracting, ESCO mechanism;
- Experience in working with international technical assistance projects in the Europe and CIS region with international organizations;
- Demonstrated understanding of issues related to gender; experience in gender sensitive evaluation and analysis;
- Proven experience in preparation of written reports in an accurate and concise manner in English;

Language requirements:
- Writing and verbal skills in English, knowledge of Romanian or Russian would be an asset.

X. Payment modalities
The international consultant shall be paid in three instalments as follows:
- 10% of total contract amount payable upon approval of the final MTR Inception Report
- 50% of total contract amount payable upon submission and acceptance of the draft MTR report
- 40% of total contract amount payable upon finalization of the MTR report and its acceptance by UNDP Moldova and UNDP Istanbul Regional Hub

XI. Application process
All applications should include the following:

1. Personal information (Perosnal History Form/P11) including past experience in similar projects.
2. Financial proposal (in USD, specifying the total lump sum amount as well as the requested amount of the fee per day).
3. The most recent reports delivered in a similar position.

Incomplete applications will not be considered.

6.2. MTR evaluative matrix

Evaluation criteria with key questions, indicators, sources of data, and methodology

Evaluative questions	Indicators	Sources	Methodology
Project Objective: Create a functioning, sustainable and effective ESCO market in Moldova, as the basis for scaling up mitigation efforts in the whole municipal building sector in Chisinau and Moldova in line with the Green Urban Development Plan			
Do you think that the project is on track to the objective of creating a functioning, sustainable and effective ESCO market in Moldova by converting existing energy service provider companies into ESCOs:	Number/profile pessimists - who think EPC will fail. Number/profile optimists, who think EPC will work Incidence of EPC success for municipal buildings in other countries. Incidence of EPC success for residential buildings in other countries. Attitude of stakeholders, particularly the local energy services community.	Close stakeholders Tangential stakeholders Consultants who worked on the Project	Interviews Analyse reasons stakeholder think project will succeed / fail. Profile respondents. Analyse why pessimists think EPC will fail. Analyse why optimists think EPC will succeed
Outcome1: Green Urban Development Plan Adopted by City of Chisinau			
Is the project on track to have a green urban development plan for Chisinau, including a resource mobilization plan, developed and approved, with support from this project, by the end of the project?	It became clear that an Urban Development Plan is not on the political agenda. Institutional issues (turf issues) progress.	Discussions with staff and other stakeholders. Analysis of Project document and PIR.	Interviews in Chisinau Interview with GUDP consultant.

Evaluative questions	Indicators	Sources	Methodology
Is the project on track to have a public green procurement plan developed and applied by the City of Chisinau by the end of the project?	Local consultant Sergu Golovco prepared 'Ghid de achiziții verzi' for the Project (45pga).	Discussed with stakeholders to see if anyone knew anyone who uses it.	PJ ToR of author Read the Guide
Outcome 2 ESCO Business Model in Moldova is operational as result of strengthening Energy Service Providers capacities and implementation of EE projects using EPC modality.			
What progress has the project made related to training on the ESCO business model which includes 3 target beneficiaries' groups and 3 training sessions, at least 20 ESPs are trained on the ESCO business model, public Building managers and Maintenance Managers, at least 20 staffs are trained on ESCO business model, and Financial Institutions (5), including the EEF are trained on the ESCO business model	Extensive training has taken place over more than a year for different stakeholder groups: - Immediate stakeholders - Potential ESCOs - Financial community - Press Courses by both of the international experts 3x2 day events by ENVIROS Study tour Czech Republic	Presentations Agendas Reports on training Trainee feedback Participants lists	Read feedback reports. Analysed participants lists to assess number, type of participant. Asked trainees what they learned. Asked trainers whether trainees were credible ESCOs Read presentations.
To what extent is the project on track to have 20 projects selected and contracted and under implementation using the EPC modality before the project ends?	Reason for divergence between PIR (20 buildings) and MTR (15 buildings) Team now says 15 (municipal only) so far. Local difficulty identifying packages of investments that add and multiply to desired investment values. Degree of certainty about how to select residential buildings.	Local engineers International consultants Project team List of investment proposals at 15 buildings. Discussed stage of evolving legal framework for condominiums	Discussed issues about selecting residential buildings. Analysed of PJ to see if residential is essential. Calculated broad values of typical investments in blocks.

Evaluative questions	Indicators	Sources	Methodology
To what extent is the project on track to have a framework agreement signed with the Energy Efficiency Agency, the City of Chisinau, and the PMU.	Discussion of the state of the current draft. Discussions on expectations about when will be signed. Considered whether stakeholders had a common vision about the situation to be defined in the framework agreement.	EEF website Project document	Discussions with stakeholders Analysed contractual and financial flows likely to block progress. (detailed in this report)
Outcome 3. Financial Mechanism is available to ESCOs			
To what extent has the loan guarantee mechanism been adequately designed and set-up? Have the adaptive management changes to the loan guarantee mechanism from how it was described and defined in the project document helped to strengthen the project or otherwise? Please explain.	Risk profile of LGF using a bank vs. risk profile using EEF. Potential costs and benefits of using EEF to operate the guarantee vs a bank. Capacity of EEF to run an LGF.	UNDP due diligence package (financial and procurement report, RCAP approval report, tech. proposal from EEF, financial report on the banking sector, contract between EEF and UNDP)	Reviewed documents Discussions Modelled difference between a bank and EEF operating LGF. Interviewed a banker (unrelated to Project) who specialises in guarantees to confirme key assumptions.
To what extent is the loan guarantee mechanism likely to be sustainable beyond the lifetime of the project?	Consider scope for EEF to continue to be - lender & guarantor - stand-alone guarantor for ESCOs who borrow from a bank or self-finance - In today's market (period of crisis/recovery); vs - likely suitability In two years time and beyond	LGF contract of December 2015 EEF website Project document	Meetings Discussions in Chisinau Discussions and correspondence with bankers

Evaluative questions	Indicators	Sources	Methodology
To what extent, if any, has the banking sector in Moldova worked with the loan guarantee mechanism? What could be done in this regard?	Consider how development banks interested in forfaiting the EPC portfolio of EEF. Consider whether LGF is best placed with EEF: - In today's market - In a future properly-functioning banking market	Discussions and correspondence with development bankers Discussions with the wider development community Interview with a Moldovan bank	Review LGFs models and other financial facilities used in Moldova and other countries - that have worked well, - that have failed.
What changes, if any, could be used to strengthen the loan guarantee mechanism?	Considered using municipal grants to cover intra-state institution low-probability high-impact risk leaving LGF to cover high-probability low impact risk from the private sector ESCOS Possibility of guaranteeing ESCOs directly.	Interviewed a banker (unrelated to the Project) who specialises in guarantees to confirm key assumptions.	Interviews Documents
Outcome 4: EPC Projects and GUDP replicated in other Municipalities and Information Dissemination.			
To what extent is the project on track to achieve replication and dissemination to another town/city in Moldova and to what extent have initial discussions been held with another town/city regarding working with the ESCO Moldova project	Analysed history of project delay, likelihood of more delay, Remaining budget. Planned schedules	Project document Interviews with staff.	Discussions Analysis of work plans schedules. Budget analysis Assess risk of running out of time.

Evaluative questions	Indicators	Sources	Methodology
To what extent is the project on track to support the development of a green urban development plan in another city?	Policy to update UDPs every 5/7 years implies some of Moldova's 66 towns are likely to work on UDP in 2017/2018. Remaining Project time and budget and assessed likelihood of delay. Quality and suitability of Project materials developed so far to 'showcase' green planning and procurement.	Email / discussion with project team. Outputs from Component 1	Review outputs of component 1 Review PG Discussions Assess suitability of existing project materials to showcase green planning.

6.3. Example Questionnaire or Interview Guide used for data collection

Questions from the MTR ToR, which was clearly prepared by someone who know the project and its issues very well, were prioritised. These are already incorporated into the evaluative matrix (above) so are not reproduced here. A separate long-list of questions prepared by the consultant at the beginning of the assignment (a week before the mission) turned out to be mostly redundant as the project is well documented and the answers mostly revealed themselves.

Questions are also integrated into the structure of this report.

6.4. Ratings Scales

Ratings for Progress Towards Results: (one rating for each outcome and for the objective)		
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as “good practice”.
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

Ratings for Project Implementation & Adaptive Management: (one overall rating)		
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as “good practice”.
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

Ratings for Sustainability: (one overall rating)		
4	Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project’s closure and expected to continue into the foreseeable future
3	Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review

6.5. MTR mission itinerary

The mission to Chisinau took place during week commencing 21.11.2016. Despite a short-lead time, the logistics were managed extremely effectively by Project Financial and Administrative Assistant, Iuliana BOSTAN. 11 of 20 the meetings took place at the Energy Efficiency Agency where UNDP-GEF Project Team is based, and Project Manager Nicolae ZAHARIA took the consultant to the other meetings.

6.6. List of persons interviewed

1. UNDP-GEF ESCO Moldova Project Team

- Nicolae ZAHARIA, Project Manager
- Iuliana BOSTAN, Financial and Administrative Assistant

2. UNDP Moldova

- Georgi ARZUMANYAN, Cluster Lead / Climate change, Energy and Environment

3. Energy Efficiency Fund

- Octavian CRESTIN, Acting Executive Director, Member of the Project Board, Key implementing partner

4, 5. UNDP-GEF ESCO Moldova Project Team - Local Consultants (separate meetings)

- Veronica MURUZIUC, legal consultant who worked together with international experts
- Eugeniu PELIVAN – consultant engineer, Enviros

6. Chisinau Municipality

- Ionela CAMERZAN,
- Natalia LIPCA

7. Public Procurement Agency

- Gheorghe GHIRORA,
- Malai RUSLAN

8. Ministry of Regional Development and Construction

- Gheorghe CROITORU, Head of the Technical Economic Department, Member of the Project Board

9. Potential ESCO, Eco-Evolutions SRL

- Nicolae LUNGU

10. Termoelectrica

- Iurie RAZLOVAN, Technical Director

11. UNDP-GEF ESCO Moldova Project Team - local consultant (meeting split over two days)

- Igor ZANOAGA, senior technical consultant, GUDP and SEAP and now part of Enviros' local team.

12. Energy Community

- Violeta KOGALNICEANU, Head of Infrastructure and Energy Efficiency Unit

13. EU Delegation to Moldova

- Alexandre DARRAS, Attaché-Project Manager

14. Potential ESCO

- Mihai LUPU, Laiola SRL

15. Mobiasbanca Groupe Société Générale

- Lila CEBAN, Head of Specialized and International Financing Direction
- Mihai PATRAS, Senior Relationship Manager
- Svetlana ARMASU, Economist Coordinator

16. Ministry of Finance

- Iurie NASTAS, Head of the National Economy Finances Department, Member of the Project Board
- Second participant from MF (name?)

17. Ministry of Economy (the Minister is chair of the Project Board)

- Calin NEGURA - Head of General Energy Security and Energy Efficiency Directorate
- Denis TUMURUC – Head of Department for energy efficiency and renewable energy policies

18. Potential ESCO

- Andrei MEREACRE, Vice-Director, Darnic Gaz

19. Energy Efficiency Agency

- Mihail STRATAN, Director, Key implementing partner, Member of the Project Board

20. UNDP Moldova

- Stefan LILLER, Deputy Resident Representative (de-briefing meeting)

Please note that some job titles of public officials were not provided at meetings, and the Project Team is kindly requested to send the information for the consultant to include in the MTR report.

In addition, discussions, meetings and/or email correspondence took place with:

- Timothy CRAWSHAW (International expert for Component 1)
- Konstantinos KONSTANTINOU (International expert for Component 2)
- Louis-Philippe LAVOIE (International expert for Component 3)
- Michael ten DONKELAAR from consultants ENVIROS
- Filip VANDEPUTTE, Senior Engineer, Energy Efficiency and Renewable Energy, EIB

Also, informal discussions/correspondence took place with.

- Wolfgang LUTZ, former key expert for Sustainable Energy, INOGATE
- Victor PARLICOV, IDIS Viitorul and former director of energy regulatory authority ANRE
- Monica MOLDOVAN, former Programme Adviser, UNDP Moldova.
- Marina OLSHANSKAYA, consultant to UNDP

6.7. List of documents reviewed

UNDP GEF ESCO Moldova - deliverable reports by short-term experts (except training materials/reports as listed separately)

- Baseline Report: "Data Report on Energy Consumption and Practices in Chisinau, Energy Savings and GHG emissions reduction potential in target sectors", 27.11.2013. Igor ZANOAGA, STE for UNDP-GEF ESCO Moldova
- 15x short reports on EE investment opportunities at municipal 13 schools and 2 hospitals. Igor ZANOAGA, STE for UNDP-GEF ESCO Moldova
- Guaranteed Savings Energy Performance Contract, 2nd Draft, 20.5.2015 (40pg). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Shared Savings Energy Performance Contract, 1st Draft, 20.5.2015 (41pg). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Institutional Recommendations towards ESCO Development - Strategic Product Development for the Energy Efficiency Services Market in Moldova. (75pg). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Technical Partnership agreement between the PMU, EEA and Municipality of Chisinau Technical Department. 30.4.2015 (unsigned). 4pg. Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- 1st Progress Report for Dec. 2014 - Jul. 2015 (on work of STE KK). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- 2nd Progress Report for Dec. 2014 - Dec. 2015 (on work of STE KK). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Supporting the ESCO Market Development in Moldova - Methodology Outline (30pg). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Methodology Outline on Training Needs Assessment for the Project Target Groups (38pg) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Sustainable Local Financing Advisory Note: Guarantees, Draft for Comment, 25.4.2016 (31pg) Louis-Philppe LAVOIE (presumably - author undefined)
- Loan Guarantee Fund Operational Guidelines, 2nd Draft, 09.04.2015 (3pg). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Loan Guarantee Fund Agreement, Second Draft, 09.04.2015 (19pg). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- 1st Progress Report, 17.06.2015 Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- 2nd Progress Report, November 2015 Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Report on the Legal Framework for Public Acquisition (Romanian language), undated (43pg). Sergiu GOLOVCO (IT and IS Mgmnt. SRL), STE for UNDP-GEF ESCO MD
- Green Procurement Guide (Romanian language). Sergiu GOLOVCO for UNDP-GEF ESCO MD.
- Pre-selection document for public acquisition of energy performance services through competitive dialogue (Romanian language). (120pg). Sergiu GOLOVCO for UNDP-GEF ESCO MD.

- Energy Performance Contract (Model - for Buildings) - Romanian language (26pg). Sergiu GOLOVCO, STE for UNDP-GEF ESCO MD.
- Energy Performance Contract (Model - for Streetlighting - Romanian language (26pg). Sergiu GOLOVCO, STE for UNDP-GEF ESCO MD.
- Chisinau Green Urban Plan, December 2015 (43pg). Timothy CRAWSHAW, STE for UNDP-GEF ESCO MD.
- Gap Analysis Report - The Status of the Current Urban Development Plan for the City of Chisinau in Relation to Green Urban Development, undated (43pg). Timothy CRAWSHAW, STE for UNDP-GEF ESCO MD.
- Review of all national and municpal energy efficiency programs and action plans, ongoing programs, green development trends and key barriers to green growth economic instruments implementation, undated (42pg). Timothy CRAWSHAW, STE for UNDP-GEF ESCO MD.
- Sustainable Energy Action Plan (Consultation Draft), December 2015 (39pg). Timothy CRAWSHAW, STE for UNDP-GEF ESCO MD.

UNDP GEF ESCO Moldova - documentation related to the transfer by UNDP Moldova of $900,000 for the Energy Efficiency Fund to establish a Loan Guarantee Fund

- Report: Financial and Procurement Micro-Assessment of UNDP Implementing Partner "Energy Efficiency Fund" (FEE), November 2015 (54pg). IT and IS Management SRL, STE Company for UNDP-GEF ESCO MD.
- UNDP Regional Advisory Committee on Procurement (RACP) approval enabling UNDP Moldova to directly contract FEE to operate the Loan Guarantee. December 2015 (9pg). Requested by Corneliu MARTINUC, signed by Davina GERCHEVA for UNDP Moldova; recommended for approval by RACP chair Cyrille PERNETTE; approved by Regional Chief Procurement Officer Adam OLIVIER.
- 2015-11-26 - EEF technical proposal to manage LGF to finance selected EE projects in Chisinau. Energy Efficiency Fund
- Contract, value 900,000 USD, between UNDP and FEE through which FEE operates a Loan Guarantee Fund, signed 7.12.2015 and including Annex II, ToR to implement the Loan Guarantee Fund. (17pg). UNDP Service Contract, signed by Narina SAHAKYAN, (former) Deputy Resident Representative for UNDP and Calin NEGURA, Director of FEE.
- Fiscal aspects related to implementing EPCs in Moldova (Romanian language, (23pg) PRIMINFO GRUP, STE Company for UNDP-GEF ESCO MD.
- Study on the Moldovan Financial and Banking Sector with the objective of identifying the potential and risks of the financial institutions to manage the Loan Guarantee Fund. (28pg). PRIMINFO GRUP, STE Company for UNDP-GEF ESCO MD.

UNDP GEF ESCO Moldova - Project Management Documents

- 2014 Annual Work Plan for UNDP-GEF ESCO Moldova. UNDP Moldova
- 2015 Annual Work Plan for UNDP-GEF ESCO Moldova (spreadsheet). UNDP Moldova
- 2016 Annual Work Plan for UNDP-GEF ESCO Moldova (spreadsheet). UNDP Moldova
- Multi-Annual Work Plan for UNDP-GEF ESCO Moldova - to 2018. UNDP Moldova

- List of UNDP GEF ESCO Moldova Board Members (Mins. Econ; Environ; Fin; Reg. Dev. & Construction; Chisinau Mayoralty; State Chancellery; EEA, FEE; UNDP). UNDP-GEF ESCO Moldova
- Disposition 60 of 6.5.2016 establishing the Board of UNDP-GEF ESCO Moldova, 6.5.2016. Signed by the Prime Minister, published in the Official Monitor of the Republic of Moldova
- 1st meeting of the UNDP-GEF ESCO Moldova Project Board, 30.3.2015. UNDP-GEF ESCO Moldova PMU
- 2nd meeting of the UNDP-GEF ESCO Moldova Project Board, 30.5.2016. UNDP-GEF ESCO Moldova PMU
- Inception Report - UNDP-GEF ESCO Moldova, June 2015 (38 pg). UNDP-GEF ESCO Moldova PMU
- Annual Report 2015, UNDP-GEF ESCO Moldova. (21 pg). UNDP-GEF ESCO Moldova PMU
- Project Document, UNDP-GEF ESCO Moldova (104 pg). Signed by Minister of Environment and UNDP Moldova.
- UNDP-GEF ESCO Moldova Project Identification Form (PIF) - 4th revision - 8.3.2013 - source GEF website GEF
- UNDP GEF ESCO Moldova - Project Implementation Review (PIR), updated to 30th June 2016. Nicolae ZAHARIA, Project Manager, UNDP-GEF ESCO Moldova.
- UNDP-GEF ESCO Moldova - Minutes of Local Project Appraisal Committee (LPAC) meeting of 21st August 2014. Signed by Deputy Minister of Environment and UNDP Moldova Deputy Resident Representative.
- Delegation of Authority (DOA) from UNDP-GEF for UNDP Moldova to run the project UNDP-GEF ESCO Moldova, 27th November 2014, with:
    - Annex 1: Letter approving UNDP-GEF ESCO Moldova from Naoko ISHII, CEO and Chairperson, GEF Secretariat to Adriana DINU, Executive Coordinator UNDP-GEF, August 15th 2014
    - Annex 2: UNDP Project Cycle Management Services
    - Annex 3: Country office Fee allocation and payment schedule
    - Annex 4: Bureau of Management (BOM) and UNDP-GEF Guidance on Direct Project Costs. (13pg)." Adriana DINU, Executive Coordinator UNDP-GEF to Nicola HARRINGTON, (former) UNDP Moldova Resident Coordinator.
- Summary scope of work, deliverables and costs of International and local short-term experts.

UNDP GEF ESCO Moldova - Training Materials

- Training - 2015-03-31 - and - 2015-04-03 - (2 days) - ESCO and EPC for ESCO Companies - Agenda UNDP-GEF ESCO Moldova - Konstantinos KONSTANTINOU and Louis-Philippe LAVOIE
- Training - 2015-03-31 (day 1) - ESCO and EPC for ESCO Companies - List of Participants 10 participants, of whom 5 represented 3 potential ESCOs and 5 were other project stakeholders.
- Training - 2015-04 - 1st Mission/1 - EPC Basics (26 slides). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.

- Training - 2015-04 - 1st Mission/2 - EPC process - from Project Identification to Procurement (43 slides). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-04 - 1st Mission/3 - EPC process - from Contract to Guaranteed Savings (24 slides). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-04 - 1st Mission/4 - for Intermediate and Advanced EPC Markets - EPC Financing (25 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-04 - 1st Mission/5 - EES/EPC Services for ESCOs - A Look at Market Potential (26 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-04-02 - EPC for State Institutions - Agenda UNDP-GEF ESCO Moldova - Konstantinos KONSTANTINOU and Louis-Philippe LAVOIE
- Training - 2015-04-02 - EPC for State Institutions - Agenda UNDP-GEF ESCO Moldova - Konstantinos KONSTANTINOU and Louis-Philippe LAVOIE
- Training - 2015-04-02 - EPC for State Institutions - Evaluation Sheets (8x responses). UNDP-GEF ESCO Moldova - Konstantinos KONSTANTINOU and Louis-Philippe LAVOIE
- Training - 2015-04-02 - EPC for State Institutions - List of Participants (9 participants). 9 participants
- Training - 2015-04-03 (day 2) - ESCO and EPC for ESCO Companies - Evaluation Sheets (9x responses). UNDP-GEF ESCO Moldova - Konstantinos KONSTANTINOU and Louis-Philippe LAVOIE
- Training - 2015-04-03 (day 2) - ESCO and EPC for ESCO Companies - List of Participants 10 participants representing 9 potential ESCOs.
- Training - 2015-06-23 - ESCO Moldova Project - EPC Financial Analysis and Mechanism. (29 slides). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Training - 2015-06-23 - Training for ESCOs, EEA and EEF - List of Participants. (20 participants) UNDP GEF ESCO Moldova.
- Training - 2015-06-23 0 EPC and LGF for ESCO Companies, EEA and EEF - Evaluation sheets 14 responses
- Training - 2015-06-25 - ESCO Moldova Project - EPC Projects Selection Financial Criteria and LGF Operation. (39 slides). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Training - 2015-06-25 - ESCO Moldova Project - Payment Default Review and Assumption (15 slides). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Training - 2015-06-25 - Session for Financial Institutions (LAVOIE) - Participants List 11 participants of whom 8 represented 4 banks and 3 other Project stakeholders.
- Training - 2015-06-25 - Training for Financial Institutions - Agenda. (Romanian language). UNDP GEF ESCO Moldova.
- Training - 2015-06-26 - ESCO Moldova Project - for Municipal Officials and Decision Makers. EPC Projects Selection Financial Criteria and Analysis. (37 slides). Louis-Philippe LAVOIE, STE for UNDP-GEF ESCO MD.
- Training - 2015-06-26 - Training for State Institutions - Agenda. (Romanian language). UNDP GEF ESCO Moldova.
- Training - 2015-06-26 - Training for State Institutions - List of Participants. (9 participants) UNDP GEF ESCO Moldova.

- Training - 2015-07 - 2nd Mission - 1. Negotiating Procedure Assessment of Potential Applicants - Energy Performance Contracting. July 2016 (15 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 2. Calculation of the Energy Consumption Baseline. (15 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 3. EPC Guaranteed Savings. (20 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 4. EPC Shared Savings. (23 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 5. Street Light Replacement / Refurbishment with LED through EPC. July 2016 (11 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 6. Energy Performance Contracts (Romanian language). (20 slides) Veronica MURUZIUC, STE for UNDP-GEF ESCO MD.
- Training - 2015-07 - 2nd Mission - 7. Tendering Energy Performance Services - Overall description of the process. A real case. July 2016 (40 slides) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07-27 - Session for journalists - Participants List - (5 participants). Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07-28/29 - Agenda - 2nd Training Mission. Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07-28/29 - List of Participants - 2nd Training Mission (25 participants) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07-30 - Agenda - 2nd Training Mission. Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-07-30 - List of Participants - 2nd Training Mission (18 participants) Konstantinos KONSTANTINOU, STE for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - 00 - Report on ESCO training for public authorities (17 pg) Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - 00 Programme: ESCO Training for Public Sector in Moldova (5 pg). UNDP GEF ESCO Moldova.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - 01 -How to get the contract. 3-4.11.2015. 9 slides. Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - Cost-effectiveness of energy efficiency investments. (27 slides). Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - European legislation - Energy Efficiency Directive and its most related articles related to buildings, energy service and the role of local governments.. (34 slides). Michael ten DONKELAAR and Lucie KOCHOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.

- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - European legislation - Energy Performance of Buildings Directive (EPBD).. (24 slides). Lucie KOCHOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - European legislation - the Energy Efficiency Directive - Article 18 - Energy services.. (17 slides). Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - Identification of an optimal set of Energy Efficiency Measures. (34 slides). Vladimira Henelova and Lucie KOCHOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - Introduction to the Training, (7 slides). Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - List of Participants, ESCO Training in Moldova (for public authorities). ENVIROS
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - Principles of Energy Performance Contracting (and other existing models). (21 slides). Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova - Selection process of an ESCO - Public Procurement of Energy Services.. (16 slides). Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova -13x training evaluation sheets (high scoring, useful comments). (26pg). 13x participants from public authorities.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova -Energy efficiency project - technical issues. . (24 slides). Lucie KOCHOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova -Financing of energy efficiency projects.. (19 slides). Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03 to 04 - 1st ESCO Training for Public Sector in Moldova -Green Urban Development Policy, Green Urban Design, Urban Energy Planning and role of ESCOs.. (22 slides). Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-03, 04, 18 and 19 (Report on both Enviros courses) - ESCO Training for Public Sector in Moldova -Sharing of Czech Experience: Capacity Building and Training for Developing the ESCO Market in Moldova: Final Report, 28.03.2016. (36pg). Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Private Sector in Moldova - 12x Evaluation Sheets by participants. 12x Trainees
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 00 - Agenda (This 2nd course targeted private sector rather than insitutions). ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 00 - List of Participants (18 Participants). 18x participants

- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 01. Introduction to the Training. (5 slides) Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 02. Principles of Energy Performance Contracting (and other existing models). (19 slides) Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 03. Czech Energy Performance Contract. (16 slides) Miroslav MARADA, ENESA a.s., STE under ENVIROS contract for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 04. Energy Efficiency project - (27 slides) Jan PEJTER, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 05. International Performance Measurement and Verification Protocol (IPMVP). (21 slides) Jan PEJTER, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 06. Scope of ESCO activities and related skills of ESCOS. (17 slides) Miroslav MARADA, ENESA a.s., STE under ENVIROS contract for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 07. Financing EPC Projects. (22 slides) Miroslav MARADA, ENESA a.s., STE under ENVIROS contract for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 08. Selection process of an ESCO - Public Procurement of Energy Services. (16 slides) Vladimira HELENOVA, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 09. Idenficaton of Optimal set of EE Measures. (16 slides) Jan PEJTER, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 12 - Report on the Workshop - Sharing the Czech experience: Capacity building and training for developing the ESCO market in Moldova. (22 pg) - Dated March 2016. Michael ten DONKELAAR, ENVIROS, STE company for UNDP-GEF ESCO MD.
- Training - 2015-11-19 to 19 - 2nd ESCO Training for Public Sector in Moldova - 11. Preparing a Bid. (14 slides) Miroslav MARADA, ENESA a.s., STE under ENVIROS contract for UNDP-GEF ESCO MD.
- Training - 2015-12 - Sharing of Czech Experience: Assistance in conducting the study tour organized by ESCO Moldova Project in the Czech Republic (11 pg). ENVIROS for UNDP-GEF ESCO MD.
- Training - 2015-12-06 to 12 - ESCO Training for Public Sector in Moldova - EPC projects to be visited (26 slides). ENVIROS for UNDP-GEF ESCO MD.
- Training - 2015-12-06 to 12 - Study tour to Czech Republic focused on Urban Energy Efficiency in Moldova by introducing Energy Service Companies - Logistics note / participants' list. (7 pg). ENVIROS for UNDP-GEF ESCO MD.
- Training -2015-06-23 - Training for ESCOs, EEA and EEF - Agenda. (Romanian language). UNDP GEF ESCO Moldova.

- Training - 2015-11-18 to 19 - 2nd ESCO Training for Public Sector in Moldova - 10. Identification of Optimal Set of EE Measures Part 2 (15 slides) Jan PEJTER, ENVIROS, STE company for UNDP-GEF ESCO MD.

UNDP-GEF ESCO Moldova - staff job descriptions / short-term experts' Terms of Reference

- ToR - UNDP-GEF ESCO Moldova - Project Manager - Nicolae ZAHARIA
- ToR - UNDP-GEF ESCO Moldova - Project Assistant - Iuliana BOSTAN
- ToR - Component 1 - Short-term Expert - CONDRATCHI
- ToR - Component 1 - Short-term Expert - Eugeniu PELIVAN
- ToR - Component 1 - Short-term Expert - Igor ZANOAGA
- ToR - Component 1 - Short-term Expert - Louis-Philippe LAVOIE
- ToR - Component 1 - Short-term Expert - Sergiu GOLOVCO
- ToR - Component 1 - Short-term Expert - Timothy CRAWSHAW (Green Urban Development Plan)
- ToR - Component 1 - Short-term Expert - Vitalie CONDRATCHI (IT/Marketing)
- ToR - Component 2 - Short-term Expert - Konstantinos KONSTANTINOU
- ToR - Component 2 - Short-term Expert - Veronica MURUZIUC (legal)
- ToR - Component 2 - Short-term Expert Company - ENVIROS (1st of two contracts - this one for training).
- ToR - Component 3 - Short-term Expert Company - ENVIROS (2nd of two contracts - this one for facilitating EPCs).

6.8. UNEG Code of Conduct declaration

MTR Consultant Agreement Form

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

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

Mark VELODY
Signed at Chisinau, 23.11.2016

Signature: ______________________

6.9. Training exercise - the ESCO Moldova EPC role playing game (RPG)

This training exercise RPG is a card game, designed for stakeholders in UNDP GEF ESCO Moldova to make sure that everyone understands how the Energy Performance Contracting model will be applied. Basic concepts are well-understood but important questions such as who does the LGF protect? What kind of default does the LGF protect? Who is the borrower? When do ownership of assets transfer between parties, and from whom to whom? Who will pay whom for what and in what sequence? are understood by different stakeholders in different ways.

The game will help participants to arrive at a shared understanding of how an EPC transaction will flow - both for smooth transactions and for transactions where something goes awry.

The stakeholders, and hence the characters in the game are:

- BANK - a commercial bank or a development bank
- EEA - Energy Efficiency Agency
- EEFG - Energy Efficiency Fund as a Grant-awarding authority
- EEFL - Energy Efficiency Fund as Lender
- EQUI - The equipment supplier (who supplies the ESCO)
- ESCO - The energy services company who wants to become an ESCO
- LGF - Loan Guarantee Fund
- MUNI - Municipality of Chisinau
- SCOUT - An engineer who pre-assesses whether municipal sites are potentially EPC-compatible
- TECHI - The engineering company who prepares the baseline and monitors
- UNDP - who has a clear role for the first 20 investments, but the game may also be played without this character to assess how an EPC would flow after the project lifetime of 'UNDP-GEF ESCO Moldova'.
- UTIL - The utility companies who supply MUNI with water, electricity, gas, heat

Additional characters may be added to represent additional stakeholders (if required). Similarly, additional cards to represent situations not envisaged above may be added.

A representative of the Ministry of Finance may like to participate as an observer or 'referee' to ensure that that the sequence of events and transactions proposed within the game are compatible with public accounting regulations. Alternatively, the Ministry could consider the final 'consensus sequence' at a separate meeting.

TO PLAY THE GAME, print the phrases below these instructions onto cards. (Or print with a large font and glue to ordinary playing cards). Distribute the cards between players according to the first word of each phrase. Any player who considers that s/he should be the 'initiator' of the EPC transaction places the first card (face up) on the table for all to read. The character who considers s/he should play the next card does so... etc. etc., until the energy efficiency investment is in place, saving money, reducing CO_2 emissions... and all commercial transactions have been paid in full!

For the purposes of the game, EEFL, EEFG and LGF should be treated as separate entities, as although the short-term objective of ESCO Moldova is to finance 20 EPCs, the long-term objective is to be sustainable and replicable. Risk considerations of lending and guaranteeing 'between brothers' (AEE/LGF) are not the same as lending and guaranteeing 'between strangers'. When the model has been proved, a mechanism to keep going, adapt or re-finance will be necessary to continue and scale-up. This is why the game contains the character 'BANK'. Although no bank will participate in the first 20 investments, in the longer term, forfaiting (selling medium-term receivables from successful energy-saving investments), or EEFG guaranteeing a loan by a BANK, other strategies will be needed to 'scale up' investment in Chisinau and to extend the model to other municipalities.

Note that this Game includes some cards that may never be required. These cards force players to think about who does what. For example, who draws up the ToR for TECHI to prepare a baseline? Today it is UNDP, but what about in the future? Is it the MUNI? or EEA? or EEF? or ESCO? And who contracts TECHI to perform this service? Similarly, what does the LGF pay in case of a loan default? Is it the full value of the outstanding loan? Or is it the value of the missed payment instalment? And who does LGF pay? The ESCO or EEF?

It is likely that the first time the game is played, there may be disputes about who is supposed to do what and in what sequence. This is OK! It is the point of the game. When the game can be played all the way through, rapidly and with universal consensus that the cards were played in the correct sequence, then all stakeholders will have a shared vision about the (unique) Moldovan version of municipal EPC. When consensus has been reached, write down the agreed sequence (each phrase is numbered) so that the game may be played in 'Solitaire Mode' to see if an individual player can place the cards in the correct logical sequence, hence demonstrating that s/he fully understands the model.

Instructions: Cut out these numbered phrases and stick each phrase to a separate card

1	BANK offers to buy future receivables of ESCO at a discount		36	ESCO repays pays AEE regularly and on-time under its loan agreement
2	BANK offers to buy portfolio of future revenue from multiple EPCs from EEF at a discount		37	ESCO signs EPC contract with MUNI
3	Cut out the following phrases and glue each to a playing card (you may need two packs)		38	ESCO misses the due date for a repayment to AEE
4	EEA contracts an external SCOUT to pre-assess sites in a defined municipality		39	LGF pays EEF the value of outstanding loan payments due by MUNI to ESCO
5	EEA prepares ToR for a TECHI to identify municipal energy savings potential, prepare a baseline and monitor an EPC contract.		40	LGF pays EEF the whole balance of the outstanding ESCO debt to EEF
6	EEA uses an internal SCOUT to pre-assess sites in a defined municipality		41	LGF pays EEF the whole balance of the outstanding MUNI debt to ESCO
7	EEF (G) passes balance of grant financing to EEFL		42	LGF pays EEF value of outstanding loan payments due by ESCO to EEF
8	EEF (G) passes balance of grant financing to ESCO		43	MUNI and ESCO sign EPC;
9	EEF (G) passes partial grant financing to EEFL		44	MUNI approves report form ESCO that shows that equipment has been commissioned but does not whether that equipment suppliers have been paid.
10	EEF (G) pays EQUI		45	MUNI approves report from ESCO that shows that equipment has been commissioned and equipment suppliers have been paid.
11	EEF (G) pays ESCO		46	MUNI contracts an external SCOUT to pre-assess sites in a defined municipality
12	EEF (G) pays MUNI		47	MUNI contracts TECHI to identify energy saving opportunities and prepare a baseline.
13	EEF signs a loan guarantee agreement with LGF covering a specific EPC transaction		48	MUNI loses the asset installed by the ESCO (e.g. There is a fire at the new hospital laundry)
14	EEFG passes ownership of equipment to MUNI		49	MUNI misses the due date for a payment to AEE
15	EEFL makes the final cash disbursement to ESCO		50	MUNI misses the due-date for a payment to ESCO
16	EEFL offers to buy future receivables from ESCO at a discount		51	MUNI opens a night-time public swimming service at the heated pool, so forecast energy savings from covering the pool at night do not materialise.
17	EEFL offers to buy future receivables from ESCO at a discount		52	MUNI part-pays the ESCO

18	EEFL selects and contracts TECHI to identify municipal energy savings potential, prepare a baseline and monitor an EPC contract.		53	MUNI part-pays to AEE to settle an invoice for a higher sum
19	EEFL signs a loan agreement with ESCO		54	MUNI pays (regularly) for the ESCO service
20	EEFL signs a loan agreement with MUNI		55	MUNI pays AEE regularly and on-time under the EPC contract
21	EEG (G) passes partial grant financing to ESCO		56	MUNI pays enters payments for the ESCO service in its accounts as... ?*
22	EEL(G) makes a partial cash disbursement to ESCO		57	MUNI pays the ESCO regularly and on-time under the EPC contract
23	EQUI passes equipment ownership to ESCO		58	MUNI pays the municipal electricity, gas and heat utility bills
24	EQUI passes ownership of equipment to ESCO		59	MUNI prepares ToR for a TECHI to identify energy saving potential, prepare a baseline and monitor an EPC contract.
25	EQUI supplies the equipment ESCO (physical, not ownership transfer)		60	MUNI receives monthly UTILITIES BILLS (gas/heat/power) that relate to project
26	ESCO accepts offer to buy its future receivables at a discount		61	MUNI refuses to pay AEE
27	ESCO installs the equipment at MUNI's site (school, hospital)		62	MUNI refuses to pay ESCO
28	ESCO issues report to MUNI that shows equipment has been commissioned and equipment suppliers have been paid.		63	Muni selects and contracts TECHI to I.D. municipal energy savings potential, prepare a baseline and monitor an EPC contract.
29	ESCO issues report to MUNI that shows equipment has been commissioned not whether the equipment suppliers have been paid.		64	MUNI signs an EPC contract with ESCO
30	ESCO orders and installs equipment;		65	MUNI uses an internal SCOUT to pre-assess sites in a defined municipality
31	ESCO part pays TECHI		66	TECHI reports that energy savings from investment are better than expected
32	ESCO passes ownership of equipment to EEF		67	TECHI reports that energy savings from the investment are lower (worse) than expected
33	ESCO pays TECHI the remaining balance in full		68	TECHI reports that energy savings from the investment are OK/as expected
34	ESCO pays the MUNI's electricity, gas and heat utility bills		69	UNDP prepares ToR for a TECHI to identify municipal energy savings potential, prepare a baseline and monitor an EPC contract.
35	ESCO refuses offer to buy its future receivables at a discount		70	UNDP and contracts TECHI to i.d. energy saving potential, prepare a baseline and monitor an EPC contract.
			71	UTILs submit invoices for electricity, heat, gas, water

6.10. Note on the importance of individual consumption based billing

Individual consumption-based billing is a cornerstone of energy efficiency in buildings.

The EU Energy Efficiency Directive (2012) states "In multi-apartment and multi-purpose buildings with a central heating/cooling source or supplied from a district heating network or from a central source serving multiple buildings, individual consumption meters shall also be installed by 31 December 2016 to measure the consumption of heat or cooling or hot water for each unit where technically feasible and cost-efficient. Where the use of individual meters is not technically feasible or not cost-efficient, to measure heating, individual heat cost allocators shall be used for measuring heat consumption at each radiator, unless it is shown by the Member State in question that the installation of such heat cost allocators would not be cost-efficient. In those cases, alternative cost-efficient methods of heat consumption measurement may be considered".

UNDP-GEF and EEF grant-supported EPCs in residential apartment buildings could be used to demonstrate and publicise the impact of individual consumption-based billing combined with simple technologies to enable households to choose how much heat to buy (simple valves or thermostatic valves).

There are four possible billing systems, of which two are individual consumption-based; another (the status quo) is the energy-inefficient area-based based billing system; and another is a hybrid system. Their application or potential for application in Moldova are characterised below.

Horizontal heating systems with individual heat metering for each apartment is clearly the best solution. Average heat bills can fall by more than 25%. It is simple, fair, transparent, and the default solution for new district-heated buildings. It is conceptually straightforward - pay for what you choose to buy. However, this solution is extremely difficult to retrofit as works are costly and disruptive. Metering each apartment is simple, but installing horizontal pipe networks within every apartment involves new pipes and fittings, radiator valves, drilling holes, redecorating and high costs for households. District heating companies tend to favour this solution as investment costs within apartments are carried by households. The high levels of disruption involved in implementing this solution as a retrofit means that practically, nothing happens as consensus by all households on disruptive and costly works within all apartments is very difficult to achieve. Hence the practical likelihood of large-scale conversion from vertical to horizontal systems is extremely low.

Vertical heating systems with heat cost allocators (HCA) for each radiator in each apartment is the second-best solution. It is a low-cost, rapid retrofit solution with minimal disruption as compared to a horizontal system (some plumbing and valves, but no new pipes, drilling or decorating). Average heat bills can fall by more than 25% - so HCAs on vertical systems can be as effective as a horizontal system with heat meters. Multiple studies demonstrating the impact of this technology are available. However, HCAs represent a complicated solution that, when well-applied, can be shown to be transparent, fair and effective; but when poorly-applied can be opaque, confusing, unpopular and much less effective. HCA technologies have a very poor reputation - online articles like 'ten ways to cheat HCAs' are common. In fact, modern HCAs are sophisticated, reliable, digital, connected technologies. Their effectiveness is typically undermined by how they are used, mainly as a result of inappropriate billing methodologies, mis-managed billing systems and poor-communications. Care must be taken not to undermine HCAs by combining their introduction with billing systems that are substantially area-based, which counteracts the potential of the technology to influence consumer behaviour. Also, agreement /participation by (almost) all households in a block is an essential pre-condition for HCAs to be used. Also - in Moldova - there are legal barriers to using HCAs. If such barriers were to be removed, residents could jointly agree to install HCAs on their common initiative, without the agreement or involvement of the district heating company, with an immediate impact on lowering heating bills. As HCAs only work if applied by all/almost all households in a block at the same time, the impact on lowering district heating revenues is sudden, so if barriers are removed and the energy-saving potential of this solution is released, rapid/viral introduction of HCAs in many blocks could cause a financial 'shock' to the district heating company, potentially lowering heat sales (revenue) by more than 25% in multiple buildings in the same winter.

Vertical heating systems with area-based billing (per m2 of each apartment) is the status quo solution in Moldova. There is no financial incentive, and typically no means of lowering heating levels in unoccupied or overheated rooms, so the wasteful classic 'open the window to let the heat out' solution prevails. It is common for building administrators to raise temperatures in the morning and early evening to correspond with typical lifestyles, which benefits households whose lifestyle correspond to the norm, but not those who don't. The transition from this system to individual consumption-based billing creates the possibility for households who choose to buy more heat to do so. Typically, households consume less heat when provided with the opportunity to do so, so the total consumption of the block falls. A minority of households may choose to buy more heat for longer hours. Some households do not understand that more heat will be available 24/7 and so leave radiators on permanently, running up very high heating bills during the first month after the change from area based to individual consumption-based billing, learning (the hard way) the importance regulating their radiators. This should not be treated as a reason not to introduce consumption-based billing, but is highlights the importance of communicating effectively with households as consumption-based billing is introduced.

Hybrid horizontal/vertical systems. Moldova is considering experimenting with hybrid systems. Each apartment in a hybrid block receives a metered heat inlet/outlet at the entrance to the apartment, creating the possibility to invest in introducing a horizontal system in the apartment. Each household may choose to install a horizontal system and benefit from individual consumption-based billing, or keep radiators connected to the vertical system and continue to use area-based billing. The rationale behind this proposal is that households who invest in horizontal systems will have lower bills, and the neighbours will find out and do the same over time. This solution is relatively cheap for the district heating company and is in their financial interest as it encourages households who want individual temperature and cost control to be able to choose individually controllable district heating over individual gas boilers. This solution is untested in Moldova but has worked elsewhere. The impact on lowering district heating revenues is likely to gradual over several years as 'diffusion of innovation' theory applies (early adopters, early majority, late majority, laggards).

A final note on this topic is that although consumption-based billing makes a substantial impact on lowering the heating costs of a building, there are 'winners' and 'losers'. A south-facing/sunny apartment sandwiched between two other apartments is naturally warmer and better-insulated than a north-facing corner apartment with two exterior walls. Area based billing means that both pay the same. Consumption-based billing means that the naturally warmer apartment needs to buy less heat to maintain the same comfort level as the naturally colder apartment. Some administrations try to compensate for this difference using billing systems that cross-subsidise to 'equalise' costs between apartments, but this undermines the incentive effect that is at the heart of individual consumption-based billing so raises the energy consumption of the building (wastes energy). There is no logical justification for this approach, which is the equivalent of demanding that, in a block with apartments with individual gas boilers, households with easy-to-heat apartments should pay part of the natural gas bills of households with difficult-to-heat apartments. The most energy-efficient solution is to accept the simple fact that a south-facing apartment costs less to heat. This is not 'unfair' - the sunny apartment also costs more too cool in the summer. Billing systems designed to 'equalise' costs between apartments should be strongly discouraged.

6.11. Notes on the timing, source, size, duration and purpose of an extension

This annex responds to feedback to the draft of this report which requested more detail on the proposal for a no-cost extension, taking into account that the range of the recommendation ($150,000 - $600,000) is very broad.

The reason for the wide range is that although the MTR occurred at the chronological mid-point of the Project, historical delays mean it took place too early to conclude whether:

- GUDP and EPC are likely to take hold in Moldova and transform the market - in which there is a strong case for putting additional Project resources into replication and scale-up of results (Outcome 4); or
- GUDP does not take hold and EPC 'fizzles out' after 20 subsidised demonstration projects in which case the will be little justification for an extension.

This note looks at aspects of ESCO Moldova that the Project Board should consider, in terms of:

- Timing
    - Concludes that the Project Board should consider this issue at the end of 2017 and again at the end of 2018, taking decisions according to how the Project evolves.
- Source
    - The scope for reallocating budget from LGF, which, as the Project evolves, is likely to be revealed to be very substantially oversized for its intended purpose of leveraging 20 loans totalling $2.7 million.
- Size and purpose
    - Probably reallocate $150,000 to $200,000 for a no-cost extension to end 2019, mainly to catch up from historical delays and allow time for Outcome 4 (replication/dissemination of results) to take place effectively.
    - Possibly, if the Project proves to be very successful, leverages much more than its original targets and has scope for further replication, there may be a case for reallocating up to 2/3 of the original LGF budget.
- Duration
    - Probably one additional year, meaning to end 2019, to allow time to achieve Outcome 4 and to be able to overcome unforeseen barriers to EPC and GUDP.
    - Only if the Project proves to be very successful and replicable, to end-2020 for enhanced replication and scale-up.

<u>Source of funds for a budget reallocation</u>

The source of funds for a budget allocation would be part of the $900,000 Loan Guarantee Fund (LGF) that was transferred by UNDP to EEF in December 2015. Any budget reallocation is dependent on whether the Project Board and EEF agree funds may be returned to UNDP for reallocation.

The reason that funds are likely to be available is that the LGF appears substantially oversized for its purpose of leveraging 20x EPC loans totalling $2.7 million.

The original purpose of the LGF was to protect a commercial bank against two forms of risk:

- a 'high probability, low impact' risk that some of the 20 energy efficiency loans would run into difficulties and may not be fully repaid; and

- a 'low probability, high impact' risk that Chisinau Municipality could stop paying its EPC obligations to all ESCOs, leading to their inability to service loans and mass default.

However, the LGF is today with a state institution, not a commercial bank. There is a strong case for considering that the latter kind of risk, which involves the GEF funds indemnifying one Moldovan state institution (EEF) against payment indiscipline by another Moldovan state institution (municipality) should not be covered by the LGF. Furthermore as EEF also manages a $1 million municipal grant fund which it could use to provides additional security against payment indiscipline by the municipality.

As a result, LGF is oversized for its specific intended purpose, so the Project Board could consider reallocating part of its budget to improve the likelihood of achieving more aspects of the planned Project Objective and Outcomes.

<u>Timing of a possible budget reallocation decision</u>

It is recommended that the entire $900,000 LGF remains intact and unaltered until the end of 2017, for three reasons:

1. A $900,000 LGF is a visible symbol that EPC transactions, which are new, are safe and protected. Even though oversized, there is a strong case for leaving it fully intact during the difficult and uncertain period when the first EPC contracts are taking place.
2. EEF has no experience of lending, so until it gains some experience there is no empirical way to assess how well it manages the 'higher-probability, low impact' risk that some ESCOs may default, and whether it is has significant impact on its lending operations.
3. Three interlinked variables, all of which are currently unknowns but are likely to be known by the end of 2017, influence how much budget could be released from the LGF for other purposes: A - the number of ESCOs; B - the timing of loans; and C - the duration of investments and lifetime of the Project. To clarify:
    - A - *Number of ESCOs*. We know the number of planned investment loans is 20, but the composition of EEF's future lending portfolio is an unknown. It could be 1x loan each to 20x ESCOs; or 4x loans each to 5 ESCOs; or any other combination. Default by an ESCO with multiple loans implies a potentially large call on the LGF. If the EEF's lending portfolio is spread between many ESCOs, the impact of a failed loan would be relatively small.
    - B - *Timing of the loans.* There is a 'high-risk time period' between drawdown of the loan and commissioning of the equipment. Thereafter, there is a revenue stream (and a lien on the revenue stream) so financial risk falls sharply. This is related to the previous risk, as a prudent lender would wait until the first EPC is generating revenue before lending again to the same ESCO. However, as the lifetime of the Project is short, it may be necessary to 'bunch up' multiple loans to the same ESCO, with the 'high risk period' for several investments occurring simultaneously, which would increase the LGF's exposure during that period.
    - C - *Duration of the investment and lifetime of the Project*, which are related to both of the previous risks. Under 'normal' circumstances, the duration of the 'high-risk period' defined above is not so important for a lender. It does not matter if an investment takes a month or a year, as the principle that no new investment loan should take place until the previous investment has been commissioned may be applied. For the Project, duration is an important consideration as there may be a limited number of credible ESCOs and the Project has a deadline to achieve 20

investments. If EEF lends to the same ESCO to carry out multiple investments simultaneously, in order to meet Project deadlines, this implies much higher-risk lending. Extending the duration of the Project would enable EEF to implement a 'one-project-per-ESCO-at-a-time' policy without running out of time.

Combined, these points reinforce the conclusion that the $900,000 should stay intact until the end of 2017, and the Project Board should take stock of the situation at that time. If there are 20 loans to 10 ESCOs, of which the first 10 investments are already producing a revenue stream and the next 10 are in progress… then everything may be considered to be going well and it will be time to consider reallocating part of the oversized LGF budget.

<u>Size of a possible budget reallocation and duration of a possible no-cost extension</u>

UNDP-GEF rules allow for a no-cost extension of up to two years, meaning the maximum possible duration of an extension is to the end of 2020

Considerations are:

- Availability of budget to reallocate. If the Project Board and the EEF do not agree to reallocate budget to other activities, there can be no budget for a no-cost extension.
- Experience of 2017. It is likely that it will be apparent to all by the end of 2017 that the LGF of $900,000 is sufficiently oversized to reallocate funds. Note that the hierarchy must be:
    - Primary consideration: achieve formal Project Objectives and Outcomes;
    - Secondary consideration: leave a LGF for EEF to use after the Project ends.
- In the case that the Project proves to be extremely effective and helps leverages many millions of USD for municipal EPC over-and-above targets, there may be a case for reallocating up to 2/3 of the LGF budget for enhanced replication.

<u>Purpose of a possible budget reallocation</u>

It is likely that the purpose of a budget reallocation will be limited to overcoming barriers to implementation and catching up from historical delays in order to achieve Outcome 4.

It is possible that by end 2018 the Project will have proved to be extremely successful in leveraging investment - far more than the original 20 investments in Chisinau. In this case the Project Board could choose to reallocate much more, perhaps up to 2/3 of the original $900,000 LGF budget, for enhanced replication. This outcome is possible but not considered likely as the experience of other economies suggest that EPC for municipal buildings in a low-to-middle income country is unlikely to be widely adopted. However, ESCO Moldova is well-managed and intends to use a combination of reimbursable and non-reimbursable finance to leverage investment, which this is exactly the model that other international development organisations are trying to make work, so if successful, there could be a snowball effect. Ultimately, at the end of 2018, the Project Board should consider whether keeping the Project Team in place until end-2020, or keeping the remaining LGF fund intact, represents the most cost-effective way of leveraging additional investment in energy efficiency in Moldovan municipalities.

6.12. Note on why EPC is not well-suited to investments in municipal buildings

This annex responds to feedback to the draft of this report, which asked why EPC may not be a sustainable solution for financing energy efficiency (EE) investments projects in municipal buildings in Moldova. It explains how EPC can be an excellent solution for financing 'like-for-like' municipal EE investments, but that many investments in municipal buildings would have to raise inadequate standards of comfort or lighting to meet current norms, so are not 'like-for-like'. Hence the purely financial proposition that an ESCO may recover the cost of the investment from energy cost savings alone is undermined.

EE investments are often assessed using the concept of Specific Energy Consumption (SEC), meaning energy use per unit of production or unit of service. For example a brick manufacturer who doubles brick production while only increasing energy use by 20% is considered to have achieved a 40% Specific Energy Saving (energy saving per brick).

Many public and residential multi-family buildings in Moldova today do not have adequate lighting or heating systems, meaning they are darker and/or colder than conditions defined in legal norms. An investment to replace such systems must raise standards to comply with norms. Hence a typical energy efficiency investment is not expected to provide a like-for-like service at lower cost, but to provide an improved service at lower cost.

EPC investments have to be strictly self-financing, meaning that financial savings from the monthly energy bill pay for capital, interest and profit for the ESCO, over time. To illustrate this point, the financial impact of a like-for-like energy efficiency investment is contrasted with an energy efficiency investment that improves the level of service, as:

- Like for like: it is relatively easy for an ESCO to recover capital costs, financing costs and profit for a like-for-like investment; but
- Improved level of service: It is relatively difficult for an ESCO to make money from energy cost savings alone for an investment that substantially improves the status quo level of service.

Examples of like-for-like services: it is likely to be easy for an ESCO to use EPC to finance energy efficiency at

- an old hospital laundry using outdated equipment that will wash and dry the same quantity of bedding before and after an investment.
- a canteen using outdated refrigeration and cooking equipment and will cook the same number of meals and wash the same number of dishes before and after an investment
- an adequately-heated open-air year-round swimming pool as commonly found in sports schools in Moldova.

These like-for-like investments represent the (relatively few) 'low hanging fruit' that are most suitable for EPC.

Examples of investments that improve the level of service are:

- adequate lighting a hospital that is currently inadequately lit
- adequately heating for a school that is currently under-heated

To illustrate how this works, take the example of a (theoretical) kindergarten:

- Previous service level - inadequate lighting (below minimum standards). There are 150 lamp fittings of which perhaps 30 are working, using inefficient lamps.

- Future service level - the same kindergarten is well-lit with 150 energy-efficient lamps
- Although specific energy consumption (electricity consumption per lamp) falls substantially, the overall electricity bill for lighting may stay the same or even rise.

In this kind of case, the proposition that EPC can bring private sector investment to municipalities who do not have their own investment capital does not hold true. Hence although EPC works for the few like-for-like 'low-hanging-fruit' that exist in Moldova today, it cannot be described as a sustainable model that will continue to work after such fruit have been picked.

6.13. Proposal for an advert to attract five block associations for an ESCO

(Logos of UNDP, GEF, AEE, EEF, PMC...)

Attention Block Administrators

Call for Expressions of Interest

Energy efficiency with UNDP-GEF ESCO Moldova

UNDP and EEA are looking for five apartment blocks in the Municipality of Chisinau who are planning to invest to improve the building by carrying out measures to lower electricity, natural gas, heat or water costs.

Investments with a **net cost of about zero** will be prioritised, meaning:

- Residents pay for works, monthly, over 3 - 5 years in the întreținere; but
- Întreținere costs for energy should fall by as much or more than monthly payments

High-cost investments that take longer to pay back from energy savings, such as building insulation and 'termopan' windows, are not a priority, but may be considered if a building is very well managed, has strong finances and residents who are willing and able to invest more.

Possible investments are:

ELECTRICITY	LED lighting; new lift motors; rooftop solar PV systems.
HEAT - 'pay for what you use'	EITHER: install a metered heat point for each apartment, disconnect radiators from pipes to the apartments above/below, install new pipes to connect radiators in the apartment to each other. OR: keep the existing heating system but install radio-controlled heat cost allocators, bypass valves and thermostatic radiator valves to every radiator of every apartment and billing, and split the heating bill by individual use instead of per square metre.
HEAT - balancing	Save energy and solve the 'too hot in the top apartments and too cold in the bottom ' problem with a heating substation in the basement.
BUILDING	'Termopan' windows and doors; thermal insulation of the walls, basement, roof.
WATER saving measures	Enable 'pay for what you use' by installing individual water meters for every bathroom and kitchen; add low-flow shower and tap heads.
SIMPLE MEASURES	Plug leaks; insulate pipes; fill gaps; fix windows; spring-loaded automatic door closers; remove rust from pipes; clean inside radiators; install a bypass and on-off valve so radiators can turn on-and-off; install curtain rails and thick curtains; rainwater harvesting, natural shading; or any other proposal that saves energy!

UNDP and EEF contribution to selected investment projects

- Help the block to: 1).Define technical works. 2). Select a credible Energy Service Company (ESCO) for the works; and 3). Understand and negotiate its contract with the ESCO.
- Help the ESCO to: 1). Be able to afford to accept payment from the block over 3-5 years by extending a very low cost loan; and 2). Understand and negotiate its contract with the Block.

- When the first 75% of repayments to the company have been paid by the block, EEF will pay the final 25% in the form of an EU grant.

Why blocks?

- This initiative is not only about five blocks. It is a 'real life' experiment to show which technical measures may be successfully implemented using a blend of loan financing, donor financing (grants) and întreținere payments to private sector ESCOs. Successful investments from the five selected blocks are likely to be replicated on a large scale in the future. Block administrators who participate should expect to keep contact with UNDP and EEF to help assess the impact on energy savings, comfort levels and resident satisfaction.

Who will carry out the works?

- A tender document will be drawn up by UNDP, a public tender will be launched and a technical committee including representatives of the Block, the Energy Efficiency Fund and UNDP will select the winner.
- Companies who are interested in investing in blocks or public buildings for repayment in instalments over 3-5 years from financial savings brought by the investment are invited to make themselves known to UNDP. Special low cost financing is available to enable qualified companies who win competitive tenders to be able to invest today for payment over time.

To express interest - DEADLINE 31.1.2017

Representatives of well-managed blocks with a good track record of paying utility bills should send a short email by with the title 'Expression of interest - block Str.... (address) with:

- Name, position, address, phone
- Type of block (number of floors, staircases, apartments)
- Form of association of the block
- A very brief description of what you would like to do (maximum three lines of text)

www.undp.md www.esco.md www.fee.md

(Note: EEF should be invited to review this text to check that it is compatible with its rules for selecting grant beneficiaries.)