TERMINAL EVALUATION

UNDP-SUPPORTED GEF-FINANCED PROJECT

PROMOTION OF ENERGY EFFICIENT LIGHTING IN KAZAKHSTAN

UNDP PIMS 4326, GEF PROJECT ID #4166

UNDP ATLAS AWARD ID # 00063090

UNDP ATLAS PROJECT ID #00080414

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LIST OF ABBREVIATIONS AND ACRONYMS

APR	Annual Project Review
ADS ZhKH	Agency on Construction, Housing and Municipal Infrastructure (Kazakhstan)
CAO	Association of Apartment Owners
AWP	Annual Workplan
BTOR	Back to Office Report
CO	UNDP Country Office
CEO	Chief Executive Officer
CFL	Compact fluorescent lamp(s)
CSO	Civil Society organization
CJSC	Closed Joint Stock Company
CLIM	Climate Laws, Institutions and Measures
EE	Energy efficiency
EEL	Promotion of Energy Efficient Lighting in Kazakhstan
ES	Energy Saving
EA	Executing Agency
EU	European Union
EBRD	European Bank for Reconstruction and Development
ESCO	Energy Service Contract
EAEU	Eurasian Economic Union
FSP	Full-Sized Project
FGD	Focus Group Discussions
FB	Facebook
GEF	Global Environment Facility
GoK	Government of the Republic of Kazakhstan
GHG	Greenhouse gas
HQ	Headquarter
IL	Incandescent lamp(s)
KCCMP	Kazakhstan Climate Change Mitigation Program (USAID Kazakhstan)
KEEP	Kazakhstan Energy Efficiency Program (World Bank Kazakhstan)
KZT	Kazakh Tenge
LED	Light-emitting diode(s)
LGGE	Low Greenhouse Gas Emission
LogFrame	Logical Framework Matrix
LEE	UNDP-supported GEF-financed project "Promotion of Energy Efficient Lighting in Kazakhstan"
Ltd	Limited Liability Company
MINT	Ministry of Industry and New Technologies of the Republic of Kazakhstan
MID	Ministry of Investments and Development of the Republic of Kazakhstan
MEP	Ministry of Environmental Protection of the Republic of Kazakhstan
MEMR	Ministry of Energy and Mineral resources of Republic of Kazakhstan
MEBP	Ministry of Economy and Budget Planning of the Republic of Kazakhstan
MoH	Ministry of Health of the Republic of Kazakhstan
MTE	Mid-Term Evaluation
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
NGO	Non-Governmental Organization
NAMA	Nationally Appropriate Mitigation Actions

NEX	National Execution
ProDoc	Project Document
PIF	Project Information Form
PRF	Project Results Framework
PIU	Project Implementation Unit
PIMS	Project Information Management System (UNDP GEF)
PIR	Project Implementation Review
PPP	Public Private Partnership
PM	Project Manager
PB	Project Board
RCU	Regional Coordinating Unit
RK	Republic of Kazakhstan
RTA	Regional Technical Advisor
RTA a.i.	Temporary Regional Technical Advisor
SE4ALL	Sustainable Energy for All
SNiP	Building Code and Regulations (from Russian Строительные Нормы и Правила)
SMART	Specific, Measurable, Assignable, Realistic and Time-related (indicators)
SWM	Solid Waste Management
SGP	Small Grants Programme (GEF)
TOR	Terms of Reference
TOT	Training of Trainers
TRAC	Target for Resource Assignments from the Core
US	Unite States
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
USAID	United States Agency for International Development
WB	World Bank
W	Watt
RUS	Russian
TBD	To Be Determined
UN	United Nations
WEEC	World Energy Engineering Congress
WP	Work Program/Plan
WTO	World Trade Organization
ZD	Zhasyl Damu

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The author express his special thanks to Mr. Syrym Nurgaliyev, Project Manager, all project team members, as well as to all interviewed parties, who provided all requested information and valuable inputs for the project evaluation during the terminal evaluation mission. The cooperation with the project team and all project partners was effective, and the evaluator received all requested information.

1A. EXECUTIVE SUMMARY

This report describes the findings of the Terminal Evaluation (TE) of the UNDP-supported GEF-financed Full-Sized Project 4326 "Promotion of Energy Efficient Lighting in Kazakhstan" (EEL) carried out by the UNDP Country Office in Astana, Kazakhstan. The Evaluation was conducted by an independent international consultant. The evaluation mission to Astana and Almaty took place from 31 March to 7 April 2017. The purpose of this TE is to provide the management (Project implementation group, UNDP in Kazakhstan country office and at the level of UNDP- GEF) with the strategies and options on more effective and efficient achievement of project deliverables and their dissemination.

In August 2012, the UNDP, jointly with the Ministry of Industry and New Technologies (MINT) and the Ministry of Environmental Protection (MEP) of the Republic of Kazakhstan (RK hereafter) launched a new project entitled "Promotion of Energy-Efficient Lighting in Kazakhstan" and financially supported by the Global Environment Facility (GEF)[1] under the UNDP-GEF ***en.lighten initiative*** as well as various sources of national co-financing. The essentials of the evaluated project are present in the following Project Summary Table:

Table 1. Project Summary of UNDP-supported GEF-financed project "Promotion of Energy Efficient Lighting in Kazakhstan"

Project Title:	**UNDP-supported GEF-financed project Promotion of Energy Efficient Lighting in Kazakhstan (EEL)**			
GEF Project ID:	3758 (PMIS #)		*at endorsement (Million US$)*	*at completion (Million US$)*
UNDP Project ID:	00080414 (PIMS# 4326) 00063090 (Atlas ID)	**GEF financing:**	3,400,000	3,400,000
Country:	Kazakhstan	**IA/EA own:**		
Region:	RBEC/CA	**Government (co-financing):**	27,403,502	27,403,502
		UNDP	50,000	50,000
Focal Area:	Climate Change - Mitigation	**Other investors:**	1, 168,836	2,383,500
FA Objectives, (OP/SP):		**Total co-financing:**	28,622,338.00	29,787,002
Executing Agency:		**Total Project Cost:**	32 022 338	33,237,002
Other Partners involved:	Ministry for Investments and Development RK	**ProDoc Signature (date project began):**		1.06. 2012
		(Operational) Closing Date:	31.05.2017	31.05.2017

The Project Document (ProDoc) of EEL was signed on 1 June 2012. Project execution was through UNDP CO and the Government of Kazakhstan. The project preparation phase including development and approval of the ProDoc lasted 2 years (end of 2010-2012). The five-year full-size project was planned to be completed by May 31, 2017. The project started in August 2012 (signing of the ProDoc by all parties).

[1] http://www.enlighten-initiative.org/About.aspx

The objective of the project is to achieve energy savings and avoid greenhouse gas emissions (GHG) via transformation of the lighting market in the RK, including implementation of a phase-out of Incandescent Lamps (ILs), while ensuring product quality and cost-effectiveness as well as safe disposition of spent mercury-containing lamps. The legislative mandate for the phase-out of ILs and other inefficient lighting in Kazakhstan is contained in the law "On Energy Conservation and Increasing of Energy Efficiency" (01/2012), which entered effect shortly before the formal commencement of the project, necessitating introduction of certain modifications to the project design in the Inception Report. This Law contains provisions for the gradual phase-out of ILs in Kazakhstan. After the passage of this Law, ensuring its effective implementation via supporting regulations became a priority for the Government. The rapid growth of interest in light-emitting diodes (LEDs) posed the second priority, namely the expansion of LED market (including LED production) in Kazakhstan.

The project is designed along four components.

1. Policy development and implementation, through: contributing to the Government "Energy Efficiency (EE)-2020" program; development of new standards, building and health codes, supporting the establishment of quality testing system for EE lighting products and a system of safe collection and disposal of mercury containing compact fluorescent lamps (CFLs) from the residential sector and reforms in the public procurement system to ensure that the procurement rules promote the use of EE lighting products;
2. Lighting market development, through: product labeling regulations and implementing market stimulus measures, including, inter alia a discount program for low income households and a promotion campaign for LEDs;
3. Promotion and educational outreach, including a public awareness campaign for the general population and an awareness/training program for energy market professionals (e.g. energy auditors);
4. Demonstration projects embodying best practices and technologies of the current energy efficient lighting.

It should be emphasised that from August 2012 until April 2017 (time of TE) the EEL Project directly affected the development and adoption of the incandescent lamps phase-out, through advocacy, research and stakeholder outreach during the preparatory period of the EEL project. Furthermore, the EEL project played a major and direct role in the orderly and rapid implementation of the phase-out through its work on regulations and standards. In addition, the Project actively supported the idea of laboratories certification and accreditation. Previously, Kazakhstan lacked laboratories that could perform services for verification and quality evaluation of market lighting products. In this regard, the Project has created a network of multifunctional testing laboratories with a wide range of verifiable parameters of lighting industry. This work has been done with an active support of the Committee for Technical Regulation and Metrology of the Ministry for Investments and Development (MID) RK.

The EEL project deserves big credit for design, implementation, and replication of the residential recycling programs for spent mercury-containing lamps. The experience proved that promotion of EE lighting cannot be efficient without a duly functioning system of utilization of the spent mercury lamps collected from people. The Project developed schemes of collection, transportation, and utilization of mercury lamps tested on pilot areas together with municipalities and demonstrated efficiency of these schemes. Replication of this experience is taking place in 9 regions of the country.

The project also directly contributed to municipal and regional investment in EE lighting and accelerated market transformation nationwide. The project played a pivotal role in establishing national policy mandates contained in the 2020 National Strategic Program, as well as MID's issuance of rules for state procurement of lighting. Through its workshops, conferences, and dissemination of best practices and success stories, the EEL project directly communicated to executive authorities regarding the EE lighting choice solutions. More broadly, the project's promotional efforts among general public reached hundreds of thousands of citizens with focused

messaging on EE lighting and mercury recycling that they would have difficulty to receive without organized efforts by a knowledgeable team.

Finally, it is evident that lighting in Kazakhstan has undergone a profound transformation in remarkably little time, with impressive results in terms of market transformation, energy savings, and avoided GHG emissions. It is evident that the EEL project has played a significant role in it.

The following conclusions are presented in the report:

1. The UNDP-supported GEF-financed EEL Project has been implemented efficiently and expected to be closed in due time scheduled for May 2017. The disbursement rate of the GEF resources as of 17 April 2017 is 96%. The main disbursements are done in procurement area. Thus, in the Outcome 1 the contractual services amounted to 58%, expenses for international consultants amounted to 11%, in the Outcome 2 the contractual services amounted to 51%, and expenses for international consultants amounted to 15%, in the Outcome 3 the contractual services amounted to 51%, expenses for publication amounted to 20%, in the Outcome 4 the contractual services amounted to 80%. All expenditures are committed. Based on the evidence available (mission reports, purchase orders, descriptions of training events) the Evaluator concludes that the outputs have been delivered as reported. As a general appreciation, the procured goods and services are of good value. The Evaluator has observed that the procured installed laboratory equipment agrees with their purpose.
2. The Evaluator found the local counterparts and the UNDP Country Office highly committed to the EEL Project. UNDP made a great effort by assigning the office staff and financial resources to support the EEL Project implementation from 2012-2017. The Evaluator observed constructive working relations between the UNDP and the key national counterparts. The EEL Project has also demonstrated excellent coordination approach within the UNDP Programme Policy Unit areas through implementation of joint projects with Governance Programme and GEF/SGP, and UNV, as well as similar projects in Russia and Armenia.
3. The EEL Project has achieved all the anticipated outcomes contributing to catalyzing investments, transforming market, saving energy, and preventing GHG emissions, and the EEL Project deserves credits for these great results. The ILs phase-out had been approved before the Project inception. Kazakhstan has successfully been removing its tariff caps on electricity since 2009, bringing tariffs in line with costs and creating strong new economic incentives to conserve. Worldwide trends including the steep rise of LED availability on global markets, as well as adoption of lighting standards and regulations in many countries worldwide, could surely have affected Kazakhstan and assisted for the EEL Project successful implementation.
4. Thus, the total direct emission reduction is 47,0 thousand t CO2, exceeds by 1.5 times the planned target (31 thousand t CO2), energy saving is 50 GWh, exceeds by 1.5 times the planned target (33 GWh) respectively. The indirect energy savings amount 4 14 GWh, exceeds the planned target (1607 GWh) 2,6 times and indirect 3964 thousand t CO2, exceeds by 2,6 times the planned target (1495 GWh) respectively, for the period of the UNDP/GEF project implementation (2013-2027). The analysis of the results revealed that the greatest effect on reducing greenhouse gas emissions was achieved through modernization of street lighting, especially of the building surrounding ground, and the healthcare facilities, therefore it is recommended to replicate such projects. Monitoring of energy saving is necessary on annual basis per the indications of electric meters and bills for payment. Monitoring of GHG emissions reduction depends on CEF indicators. This indicator should be monitored; it is recommended to use the CEF officially adopted

at the national level. In addition to the effect of energy saving and reduction of GHG emissions, there is a substantial saving in cash to prevent the acquisition and replacement of lamps in the baseline case.[2]

5. As expressed by the counterparts, the EEL Project did directly affect the development and adoption of the ILs phase-out, through advocacy, as well as research and stakeholder outreach during the preparatory period of the EEL Project. Furthermore, the EEL Project played a big role in the orderly and rapid implementation of the phase-out, through its work on regulations and standards, support for laboratories certification and accreditation, and promotion among public. The EEL Project deserves credit for design, implementation, and replication of the residential recycling programs for spent mercury-containing lamps.
6. The EEL Project also contributed directly to municipal and regional investment in EE lighting and accelerated market transformation nationwide. The project played a pivotal role in establishing national policy mandates contained in the 2020 national strategic program, as well as MID's issuance of rules for state procurement of lighting.
7. Through its workshops, conferences, dissemination of best practices and success stories the EEL Project directly communicated to executive authorities on EE lighting choice solutions. More broadly, the Project's promotional efforts among public reached hundreds of thousands of citizens with focused messaging on EE lighting and mercury recycling that they would have difficulty to receive without organized effort by a knowledgeable team.
8. In the project design there is a lack of information broken down by gender—both quantitative data and qualitative information although the development challenge of increasing GHG emissions from lighting have gender-related dimensions.
9. It is observed that low-income citizens face barriers against the purchase of EEL (as well as other EE items) when they have higher initial costs. To the extent that women have lower average salaries, greater unemployment, and greater likelihood of widowhood than men, they almost certainly face this barrier more than men do. Both women and men lack knowledge and awareness of energy costs, energy performance, and the benefits of energy efficiency of appliances.
10. As the State Procurement Committee of the Ministry of Finance has informed about 20,000 cases of ILs procurement in RK during 2016, the ILs can still be found on Kazakhstan market. 25W and lower ILs are still permitted although decrease of its procurement shall be an important aspect. The main thing for the project results sustainability is to make sure that there is a constant and consistent control over use of 25W and higher ILs. It is very important to make sure that in Kazakhstan market the EEL should be of a good quality and comply to the international requirements.
11. By the end of the EEL Project it became clear that low quality of EEL is a main risk for further promotion of good quality EEL in Kazakhstan as the State procurement regulations were based on principles of cost minimization, fair competition, transparency, and support of domestic suppliers, but not energy performance or life-cycle cost. During mission interviews, several representatives of different organizations (MIR, IMC, LED System Ltd, etc.) supported the idea of establishing a National Association of Producers of Energy Efficient Lamps and Appliances to insure sustainability in promotion of EE quality products on Kazakhstani market. One of the business companies (LED System Ltd.) has expressed willingness to act as a champion in promoting this kind of Association creation.

[2] Report on Monitoring and Inspection of Energy Saving and Reduction of Greenhouse Gas Emissions Achieved within Pilot Projects for the 3rd Stage (Starting from 2016-2017) and for the Whole Period of Project Implementation. January 2017.

12. EEL Project enabled energy efficiency lighting development in Kazakhstan and generated useful learning experiences attracting sufficient municipal and regional investments for lighting demonstration projects which can serve as input not only in Kazakhstan but also for future all UNDP-supported GEF-financed projects under the global UNDP-GEF ***en.lighten initiative***[3]. The possibility of sharing EEL Project experience on the regional level has a good framework since for years Kazakhstan has been providing official development and humanitarian assistance, helping various countries in the Central Asian region and beyond. To strengthen its role as an emerging donor, Kazakhstan wants to systematize and professionalize its efforts and align ODA with the priorities of its foreign policy. The MFA is partnering with UNDP in designing and elaborating its development cooperation. The cooperation project aims to support MFA RK to establish a national ODA agency. Through expert support the project provides the analysis of the best international experience and situation of the ODA new donors, shows common threats and problems and ways to solve them effectively.

The list below summarizes the main recommendations for the UNDP Kazakhstan CO future programming:

1. UNDP CO should recommend the MFA RK a replication of EEL Project's results in the Kazakhstan ODA recipient countries in Afghanistan, Tajikistan and Kyrgyzstan and involvement of GEF RBEC/RBAP and UNDP COs in respective countries to ensure smooth and successful replication process to achieve Climate Change Global benefits.
2. It is recommended that future project/s[4] should pay more attention to the gender aspects in the design of activities. Professional training and public outreach should be designed with a special eye toward both gender equity and responsiveness to gender-specific issues. Outreach materials should portray both sexes and indeed also multiple generations as sharing responsibility for managing households, including and especially lighting, with efficient appliances playing a significant role in providing comfort and safeness while also limiting costs and health and environmental impact. It is also important to note mandatory Annex on gender mainstreaming analysis and action plan for future GEF projects.
3. It is recommended to address gender dimensions of consumer preferences and household decision-making dynamics with market research, including both surveys and focus groups structured to allow for breakdowns by gender.
4. It is recommended to make sure in future projects engagement of women, recognizing their role as stakeholders regarding energy costs, energy performance, consumer information, environmental protection, and so on. Attention should be placed on the importance of avoiding perpetuation of gender-role stereotypes regarding household responsibilities.
5. It is recommended to address low income and other barriers to purchase of EE items with high initial cost with targeted incentives to be delivered with the assistance of NGOs and local Akimats for the advancement of the welfare of low-income valnurable part of population.
6. UNDP CO should continue considering joining forces with UN agencies, international donors and Government stakeholders for promotion of changes in the budgeting codex/laws/regulations in the country which currently do not allow municipalities to allocate necessary finances for EE projects (including EE lighting) through ESCO mechanisms.
7. The certified laboratories should be properly equipped and completely functional with qualified technical staff.

[3] http://www.enlighten-initiative.org/About.aspx

[4] UNDP-supported GEF-financed project "Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan", planned from 2017-2022.

8. It is recommended to support establishment of a National Association of Producers of Energy Efficient Lamps and Appliances to insure sustainability in promotion of EE quality products available on Kazakhstani market.
9. It is recommended to consider the above 1-8 recommendations for its inclusion in the new UNDP-supported GEF-financed project on Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan.

The table below is summarizing all required terminal evaluation ratings:

Table 2. Evaluation Ratings: UNDP-supported GEF-financed Full-Sized Project 4326 "Promotion of Energy Efficient Lighting in Kazakhstan"

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

*Using a six-point rating scale: 6: Highly Satisfactory (HS), 5: Satisfactory (S), 4: Marginally Satisfactory (MS) , 3: Marginally Unsatisfactory (MU), 2: Unsatisfactory (U) and 1: Highly Unsatisfactory (HU)
**Using a four-point rating scale: Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U)
***Relevance rating scale: Relevant (R); Not Relevant (NR).

The Evaluator has identified the following lessons that can be drawn from the EEL Project:

1. Establishing a close collaboration early-on with similar projects in other countries, with similar socio-economic conditions, is an effective and efficient way to learn from the experiences and challenges that others have faced while providing support and advice to projects that are at an earlier implementation phase. The EEL Project worked closely with the UNDP lighting projects in Russia and Belarus and that demonstrated strong regional synergetic effects which allowed to include joint efforts into development of project strategy on political and legal aspects, standards and norms on energy efficiency that shall be common within the Eurasian Customs Union.
2. Considering different formal and informal sources of information while conducting market researches is a reliable tool to obtain broader and realistic picture of the country lighting market. The EEL Project has learned that it is challenging to bring official statistics only for market research, since some small shops still sell incandescent lamps delivered through black market. This situation with the uncontrolled import

of the banned ILs showed that there is a necessity to improve dissemination of information of the Energy Efficiency Law among small-scale retailers. The executive agency (MID RK) was recommended to examine the system of control of ILs sale at stores and on black market.

3. Carefully testing of mercury lamps utilization scheme at the initial stage of its developing in one city/town and subsequent analyzing the results is a realistic basis for the following replication in other regions applying the relevant scale depending on population and size of a city/town. This EEL Project's careful approach ended with successful launching of mercury lamps utilization in Astana and had been replicated in other Kazakhstan regions – Mangystau and Kyzylorda.
4. Applying the results of pilot projects for legislative and institutional frameworks could be used for relevant legislation enforcements. The research which analyzed the possibility to introduce ESCO into the RK lighting sector served as a basis for amendments made in the legislation. The changes were accepted by the Law "Introduction of amendments and additions in regards of energy saving issues" of the RK №279-V dated January 14, 2015.
5. Providing modern and proper testing equipment for new and/or existing testing laboratories for the lighting verification process is a fundamental condition to create the necessary technical basis to ensure access of good quality EEL to the country market. It is very important as poor quality products and dubiously credible certification in both legal and black markets are the most negative factors that can seriously impact on distribution of EE lighting among population. Also, the emergence and rapid development of new lighting technologies revealed the unpreparedness of national laboratories to test modern lighting products. The EEL Project has supported national laboratories lacking relevant facilities, arranged transferring knowledge of testing procedures and improved required skills to create a viable network of certifying laboratories.
6. Keeping close monitoring over new emerging lighting technologies may contribute to the project benefits. The EEL Project has implemented the new Phyto LED Lighting technology project for the attention of public, business, school principals, etc. and proved the potential of the new lighting technology and using spaces like basements to grow vegetables the whole year round.
7. Promoting successful pilot projects results through broad awareness campaigns is an important pre-condition for project sustainability and replication. The EEL Discount Program accompanied with a wide raising awareness campaign and implemented by the Project in 2016 discovered still existing barriers in purchasing LED lamps by public from certified manufacturers/distributors as in some cases they set unaffordable price, demonstrated lack of knowledge about LED benefits. Regardless the ILs ban they are still sold in some small shops as they are cheaper than EE lamps. The Discount program results identified a room for further work on raising awareness among consumers, as well as for future correlation of LED price towards decrease. Finally, the Discount program has demonstrated to manufacturers and distributors a possibility to develop their own rebate and credit systems to get public involved in purchasing LED lamps more actively.
8. Analyzinge the legislative framework for possible co-financing by local partners and finding of innovative and creative approaches can contribute to project's financial sustainability. The implementation of pilot projects allowed to learn that local Akimats do not have direct access to loans from commercial banks/international financial organizations, since it is only allowed for Akimats to receive a loan from the central government. In most of the street lighting projects funded by Akimats the funding was organized through establishing of joint ventures with private sector where Akimats had only part of ownership. Without promoting this type of joint companies, it will remain difficult for local authorities to get an access to funding from international organizations.

9. Continuation the development of mercury lamps utilization system is a way to ensure environmental benefits of EEL. Regardless the good progress of mercury lamps collection the EEL Project still observing big import of mercury lamps. Within the period from 2012 to 2016 there were 53.8 million mercury lamps imported into the country. Although according to the market analysis the share of mercury lamps in Kazakhstan market decreased: - (i) according to the PIR regulations the reporting period is from June of one year till June of the next one, thus, within 2012-2013 there were 1.6 million mercury lamps. (ii) within 2013-2014 there were collected 2.5 million mercury lamps, within 2014-2015 – 2.47 million, within 2015-2016 – 3.1 million, within 2016-2017 – 3.6 million. For the whole project lifespan, the number of the collected mercury lamps makes 13.27 million.

1B. EXECUTIVE SUMMARY (RUSSIAN)

Настоящий отчет описывает результаты, полученные в ходе Финальной оценки полномасштабного проекта, проводимого ПРООН и финансируемого ГЭФ-4326 «Продвижение энергоэффективного освещении в Казахстане» (ЭЭО), выполненного страновым офисом ПРООН в Астане, Казахстан. Оценка была проведена международным консультантом. Служебная командировка в Астане и Алматы в рамках проведения оценки проходила с 31 марта по 7 апреля 2017. Цель Финальной оценки – предложить руководству (т.е. группе управления проектом, страновому офису ПРООН в Казахстане, включая руководство на уровне ПРООН-ГЭФ) стратегии и пути, направленные на более эффективное достижение результатов проекта и их распространение.

В августе 2012 ПРООН совместно с Министерством индустрии и новых технологий (МИНТ) и Министерством по охране окружающей среды (МООС) Республики Казахстан (далее РК) запустила новый проект «Продвижение энергоэффективного освещении в Казахстане» при финансовой поддержке Глобального Экологического Фонда (ГЭФ) [5] под инициативой ПРООН-ГЭФ **en.lighten**, а также других национальных источников совместного финансирования. Основные параметры Проекта представлены в следующей сводной таблице 1:

Таблица 1. Основные параметры Проекта Продвижение энергоэффективного освещения в Казахстане, Казахстан

Название проекта:	**Продвижение энергоэффективного освещения в Казахстане (ЭЭО), Казахстан**			
ИН Проекта в ГЭФ:	3758 (PMIS #)		*При подписании (миллионов долларов США)*	*При завершении (миллионов долларов США)*
ИН Проекта в ПРООН:	00080414 (PIMS# 4326) 00063090 (ИН в Атлас)	**Финансирование ГЭФ:**	3,400,000	3,400,000
Страна:	Казахстан	**IA/EA own:**		
Регион:	РегБюро по странам Европы и СНГ/ЦА	**Правительство (совместное финансирование):**	27,403,502	27,403,502
		ПРООН	50,000	50,000
Направление:	Смягчение последствий изменения климата	**Другие инвесторы:**	1, 168,836	2,383,500
Цели направления, (OP/SP):		**Общее совместное финансирование:**	28,622,338.00	29,787,002
Исполнительное агентство:		**Общая стоимость проекта:**	32 022 338	33,237,002
Другие вовлеченные проекты:	Министерство по инвестициям и развитию РК	**Подписание Продока (дата начала проекта):**		1.06. 2012
		(Операционная) Дата закрытия:	31.05.2017	31.05.2017

[5] http://www.enlighten-initiative.org/About.aspx

Проектный документ (Продок) по ЭЭО был подписан 1 июня 2012. Проект выполнялся страновым офисом ПРООН и Правительством Казахстана. Фаза подготовки проекта, включая разработку и утверждение Продока, длилось 2 года (конец 2010-2012). Завершение полномасштабного пятилетнего проекта было запланировано к 31 мая, 2017. Проект начался в августе 2012 (подписание Продока всеми сторонами).

Цель проекта – достижение энергосбережения и предотвращение выбросов парниковых газов через трансформацию рынка осветительной продукции в РК, включая постепенный вывод из эксплуатации ламп накаливания, и обеспечение качества продукции, экономической эффективности, а также безопасной утилизации отработанных ртутьсодержащих ламп. Законодательная основа для постепенного вывода из эксплуатации ламп накаливании и другого неэффективного освещения в Казахстане отражена в Законе «Об энергосбережении и повышении энергоэффективности» (01/2012), который вступил в силу незадолго до официального начала проекта, и вызвал необходимость в введении определенных изменений в разработку проекта в Первоначальном отчете. Данный Закон содержит положения о постепенном выводе из эксплуатации ламп накаливания в Казахстане. После того, как данный Закон был принят, его эффективное исполнение посредством нормативно-правовых актов стало приоритетом для Правительства. Быстрорастущий интерес к светодиодам привел к расширению светодиодного рынка (включая производство светодиодов) в Казахстане.

Проект состоит из четырех компонентов:

1. Разработка политики и мер посредством оказания вклада в государственную программу «Энергоэффективность (ЭЭ) – 2020», разработку новых стандартов, строительных и здравоохранительных норм. Также этот компонент подразумевает оказание поддержки при разработке системы проверки качества ЭЭ осветительной продукции, схемы сбора компактных люминесцентных ламп (КЛЛ) от населения и их безопасной утилизации, и преобразование правил в системе государственных закупок с целью продвижения использования ЭЭ осветительной продукции.
2. Развитие рынка осветительной продукции через маркировку продукции и стимулирование рынка, включая дисконтную программу для социально уязвимых групп и агитационные кампании в поддержку светодиодной технологии.
3. Повышение осведомленности и распространение знаний среди широкой общественности, и проведение тренингов для профессионалов энергорынка (например, среди энергоаудиторов).
4. Демонстрационные проекты, воплощающие лучшие практики и технологии современного энергоэффективного освещения.

Необходимо отметить, что с августа 2012 по апрель 2017 (время ФО) проект по продвижение ЭЭО напрямую повлиял на разработку и принятие вывода из эксплуатации ламп накаливания через поддержку, исследование и охват заинтересованных сторон во время подготовительного периода проекта. Более того, проект по ЭЭО сыграл важную роль в планомерной и быстрой реализации вывода из эксплуатации ламп накаливания через работу над правилами и стандартами. Также Проект активно поддерживал идею о сертификации и аккредитации лабораторий. Ранее в Казахстане не существовало лабораторий, которые могли бы оказывать услуги по верификации и оценке качества осветительной продукции. В связи с этим Проект создал сеть многофункциональных испытательных лабораторий с широким спектром проверяемых параметров в сфере освещения. Эта работа была проделана при активной поддержке Комитета по техническому регулированию и метрологии Министерства по инвестициям и развитию (МИР) РК.

Проект, несомненно, внес огромный вклад в разработку, исполнение и репликацию программы по утилизации отработанных ртутьсодержащих ламп, собранных у населения. Опыт показал, что без должной

и работающей системы утилизации ртутьсодержащих ламп невозможно обеспечить эффективность мер по продвижению ЭЭ освещения. Проект разработал схемы по сбору, транспортировке и утилизации ртутьсодержащих ламп, которые были опробованы на пилотных территориях совместно с местными исполнительными органами и продемонстрировали свою эффективность. Репликация данного опыта проходит уже в 9 регионах страны.

Проект способствовал росту местных и региональных инвестиций в ЭЭ освещение и ускорил трансформацию рынка освещения по всей стране. Проект сыграл важную роль в установлении национальной политики, содержащейся в Национальной Стратегической Программе 2020, а также в правилах МИР РК по государственным закупкам осветительной продукции. Проект установил прямой диалог с органами исполнительной власти по вопросам выбора ЭЭ освещения через семинары, конференции и распространение лучших практик и показательных примеров. В более широком плане работы проекта по распространению знаний среди широкой общественности охватили сотни тысяч граждан, распространяя информацию непосредственно об ЭЭО и утилизации ртути, что было бы гораздо более затруднительно в отсутствие организованных усилий квалифицированной команды.

В заключении нужно отметить, что сфера освещения в Казахстане прошла серьезную трансформацию в существенно небольшой срок, достигнув впечатляющих результатов как в плане трансформации рынка, так и в плане энергосбережения и сокращении выбросов парниковых газов, и в этих преобразованиях огромную роль сыграл Проект по продвижению ЭЭО.

В отчете даны следующие выводы:

1. Проект ЭЭО, проводимый ПРООН и финансируемый ГЭФ, был эффективно выполнен и его закрытие ожидается в мае 2017 согласно запланированному графику. Объем использованных средств ГЭФ на апрель 2017 составляет 96%. Основные расходы пришлись на область закупок.
   Таким образом, на результат 1 пришлось 58%, затраченных на, расходы на международных консультантов составили 11%;
   В разделе результата 2 контрактные услуги составили 51%, расходы на международных консультантов - 15%;
   Результат 3: контрактные услуги -51%, расходы на публикации составили 20%;
   В результате 4 контрактные услуги составили 80%.
   Все расходы завершены. Основываясь на имеющихся подтверждающих материалах (отчеты по командировкам, платежные поручения, описания тренингов) Оценщик пришел к заключению, что расходы по результатам были совершены согласно отчетности. Согласно оценке, все приобретенные товары и услуги были хорошего качества. Оценщик убедился в том, что приобретенное оборудование, установленное в лабораториях, соответствует своему предназначению.
2. Местные партнеры и Страновой Офис ПРООН были активно вовлечены в проект. ПРООН проделала большую работу через привлечение квалифицированного персонала и финансовых средств в целях реализации проекта ЭЭО с 2012 по 2017 год. Оценщик отметил конструктивные рабочие отношения между ПРООН и ключевыми национальными партнерами. Проект также продемонстрировал успешный подход в координировании работ в рамках политики проведения работ ПРООН через сотрудничество с другими проектами ГЭФ, Программы Малых Грантов, Программу волонтерства ООН, а также аналогичными проектами в России и Армении.
3. Большая заслуга проекта заключается в достижении таких результатов, как ускорение процессов инвестирования, трансформации рынка, энергосбережения и сокращения выбросов ПГ. Вывод из эксплуатации ламп накаливания был утвержден еще до начала проекта. Казахстан успешно

отменял увеличение тарифов на электричество с 2009 года, приводя, таким образом, тарифы в соответствие с расходами и создавая сильные новые экономические стимулы. Мировые тренды, включая стремительное распространение светодиодной технологии на мировых рынках, а также принятие новых стандартов и правил в области освещения в других странах, несомненно повлияло на Казахстан и способствовало успешной реализации проекта ЭЭО.

4. Таким образом, общее прямое сокращение выбросов составило 47,0 тысяч тонн CO2, что в 1,5 раза превышает установленную цель (31 тысяч тонн CO2), энергосбережение составило 50 ГВт/час, что в 1,5 раза превышает установленную цель (33 ГВт/час) соответственно. Непрямое энергосбережение составляет 4 14 ГВт/час, что в 2,6 раза превышает установленную цель (1607 ГВт/час) и непрямое сокращение CO2 составляет 3964 тысяч тонн, что в 2,6 раза превышает установленную цель (1495 ГВт/час) соответственно, на период реализации проекта ПРООН-ГЭФ (2012-2017). Анализ результатов показал, что основное влияние на сокращение выбросов было достигнуто через модернизацию школьного и уличного освещения, придворового освещения, освещения в больницах, следовательно, рекомендуется реплицировать такие проекты. Мониторинг энергосбережения необходимо проводить на основе ежегодных индикаторов электроизмерительных приборов и счетов за оплату электричества. Мониторинг выбросов зависит от индикаторов коэффициента выбросов углерода. Необходимо следить за этим индикатором; рекомендуется использовать КВУ, официально принятый на национальном уровне. В дополнение к эффекту энергосбережения и сокращения выбросов ПГ, наблюдается существенная экономия средств ввиду отсутствия необходимости приобретения и замены ламп, исходя из базового уровня.[6]
5. Как утверждают партнеры, Проект ЭЭО напрямую повлиял на разработку и принятие вывода из эксплуатации ламп накаливания через поддержку, исследования и донесение информации во время подготовительно периода проекта. Более того, проект ЭЭО сыграл существенную и главную роль в должном и быстром исполнении вывода через работу по стандартам и правилам, поддержке и аккредитации лабораторий, и привлечения внимания общественности. Вне сомнения остаётся тот факт, что заслугой проекта ЭЭО является разработка, исполнение и репликация программы по утилизации отработанных ртутьсодержащих ламп.
6. Также очевидно, что проект внес прямой вклад в развитие городских и областных инвестиций в ЭЭ освещение и в ускоренную трансформацию рынка. Проект сыграл центральную роль в установлении национальной политики, отраженной в стратегической программе 2020, а также в установлении правил МИР касательно государственных закупок осветительной продукции.
7. Посредством семинаров, конференций и распространения лучших практик и историй успеха проект ЭЭО вел прямой контакт с исполнительными органами власти при решении того, какое вид освещения выбирать и почему. Если говорить о проекте в целом, то работа по продвижению идей энергоэффективного освещения среди широкой общественности позволила охватить сотни тысяч граждан, передав основную идею об ЭЭ освещении и утилизации ртути, которые невозможно было бы получить без хорошо организованной работы квалифицированной команды.
8. В структуре проекта мало информации с разбивкой по гендеру как в количественном, так и в качественном плане, в то же время задача развития ввиду увеличения выбросов от области освещения имеет гендерный аспект.

[6]Report on Monitoring and Inspection of Energy Saving and Reduction of Greenhouse Gas Emissions Achieved within Pilot Projects for the 3rd Stage (Starting from 2016-2017) and for the Whole Period of Project Implementation. January 2017.

9. Граждане с низким доходом испытывают трудности в приобретении ЭЭ осветительной продукции (как и других ЭЭ товаров) ввиду их высокой первоначальной стоимости. Обычно у женщин меньше зарплаты, чаще встречается безработица, больше вероятность вдовства, поэтому с такой трудностью они встречаются чаще, чем мужчины. Как женщинам, так и мужчинам не хватает знаний о стоимости электроэнергии, энергоэффективности и выгодах при использовании ЭЭ приборов.
10. Как было указано Комитетом по Госзакупкам Министерства Финансов РК, в 2016 было 20,000 случаев приобретения ламп накаливания, т.е. на казахстанском рынке все еще встречаются лампы накаливания. Лампы накаливания мощностью 25Вт и ниже допускаются к закупке, хотя снижение их объемов приобретения представляет собой важный вопрос. Главным аспектом устойчивости результатов проекта заключается в постоянном и стабильном контроле использования ламп накаливания мощностью 25 Вт и выше. Крайне важно убедиться в том, что казахстанский рынок ЭЭ освещения наполнен качественной продукцией, соответствующей международным требованиям.
11. К завершению проекта стало очевидно, что ЭЭО низкого представляет главный риск для дальнейшего продвижения ЭЭО хорошего качества в Казахстане, т.к. правила госзакупок были основаны на принципах минимизации расходов, честной конкуренции, прозрачности и поддержке отечественных производителей, а не на энергоэффективности или стоимости жизненного цикла продукции. Во время интервью, проведенных во время миссии, несколько представителей различных организаций (МИР, ТОО ЛЕД систем, и т.д.) высказали поддержку идеи установления Национальной Ассоциации Производителей ЭЭ ламп и приборов, чтобы гарантировать устойчивость продвижения ЭЭ продукции в Казахстане. Один из производителей (ТОО ЛЕД систем) выразил готовность действовать в качестве пионера в продвижении создания такого рода Ассоциации.
12. Проект ЭЭО создал возможности для развития ЭЭ освещения в Казахстане и полезного поучительного опыта, привлекая достаточные муниципальные и региональные инвестиции для демонстрационных проектов освещения, которые служат не только в качестве вклада в Казахстан, но также как предпосылки к будущим проектам ПРООН-ГЭФ в рамках глобальной инициативы ПРООН-ГЭФ ***en.lighten initiative***[7]. Возможность делиться опытом проекта ЭЭО на региональном уровне является хорошей основой, т.к. на протяжении уже нескольких лет Казахстан оказывал официальную гуманитарную помощь и помощь в развитии различным странам Центральной Азии и странам других регионов. Для усиления роли нового донора Казахстан планирует систематизировать и укреплять профессионализм в своей работе, чтобы ОПР отвечала приоритетам внешней политики. МИД РК работает в партнерстве с ПРООН при разработке и исполнении сотрудничества в процессах развития. Проект по сотрудничеству ставит своей целью поддерживать МИД РК в установлении агентства ОПР. Через экспертную поддержку проект обеспечивает анализ лучшего международного опыта и состояния дел новых доноров ОПР, показывает общие угрозы и проблемы, а также методы их эффективного решения.

Представленный ниже список резюмирует основные рекомендации для будущего планирования работ страновым офисом ПРООН:

[7] http://www.enlighten-initiative.org/About.aspx

1. Страновому офису ПРООН следует рекомендовать МИД РК репликацию результатов Проекта по продвижению ЭЭО в странах, получающих официальную помощь Казахстана, т.е. в Афганистане, Таджикистане, и Кыргызстане. Также следует предусмотреть вовлечение ГЭФ, Регионального Бюро по странам Европы и СНГ, Регионального Бюро по Азии и странам Тихоокеанского региона и страновых офисов ПРООН в вышеперечисленных странах в целях беспрепятственной и успешной репликации опыта во благо мировой борьбы с последствиями изменения климата.
2. Будущему проекту/проектам[8] рекомендуется обращать больше внимания на гендерный вопрос при планировании работ. Профессиональное обучение и информирование общественности должны планироваться с учетом гендерного равенства и реагирования на гендерные вопросы. Материалы проекта должны отображать роль обоих полов и различных поколений в плане распределения обязанностей в быту, включая освещение, где энерго-эффективные приборы играют существенную роль в обеспечении комфорта и безопасности, при этом снижая расходы на энергопотребление и оказывая позитивное влияние на состояние здоровья и окружающей среды. Также очень важно отметить обязательное Приложение касательно анализа комплексного гендерного подхода и плана действий для будущих проектов ГЭФ.
3. Рекомендуется учитывать гендерный аспект в предпочтениях потребителей и динамике принятия решений домохозяйств в исследованиях рынка, включая как сами исследования, так и фокус-группы, структурированные с учетом гендерного разделения.
4. Следует обеспечивать должное вовлечение женщин в будущих проектах, учитывая их роль как заинтересованных сторон в вопросах энергозатрат, энергоэффективности, информации для потребителей, охране окружающей среды, и т.д. Важно избегать сохранения гендерных стереотипов в отношении распределения домашних обязанностей в быту.
5. Рекомендуется обращать внимание на проблему низкого дохода и другие барьеры при покупке ЭЭ товаров с первоначальной высокой стоимостью и принимать соответствующие меры для обеспечения намеченного стимула, используя поддержку НПО, местных акиматов, и др. для повышения благосостояния социально уязвимой части населения.
6. Учитывая тот факт, что пока местным властям не позволяется выделять необходимые средства на проекты по энергоэффективности (включая ЭЭ освещение) через механизмы ЭСКО, Страновому офису ПРООН следует рассмотреть вопрос объединения сил с агентствами ООН, международными донорами и заинтересованными сторонами от Правительства для успешного продвижения изменений в правилах бюджетирования, законодательствах, уставах и пр.
7. Сертифицированные лаборатории должны иметь необходимое оборудование, быть полностью функционирующими и обслуживаться квалифицированным персоналом.
8. Рекомендуется оказывать поддержку в установлении Национальной Ассоциации Производителей энергоэффективных ламп и приборов в целях обеспечения неуклонного продвижения ЭЭ товаров высокого качества на рынке Казахстана.
9. Необходимо рассмотреть рекомендации 1-8 для их включения в новый проект ПРООН-ГЭФ по энергоэффективным стандартам, сертификации и маркировке приборов и оборудования в Казахстане.

Ниже представлена таблица 2, резюмирующая все требуемые составные части Финальной оценки:

[8] Проект ПРООН-ГЭФ по энергоэффективным стандартам, сертификации и маркировке приборов и оборудования в Казахстане, планируемый на период с 2017 по 2022.

Таблица 2. Финальная оценка: полномасштабный проект ПРООН-ГЭФ 4326 «Продвижение энергоэффективного освещения в Казахстане»			
1. Мониторинг и Оценка*	***оценка***	**2. IA& EA Исполнение***	***оценка***
М и О плана проекта в начале	Х	Качество исполнения ПРООН	О
М и О Плана исполнения	Х	Качество исполнения – Исполнительное Агентство	Х
Общее качество М и О	Х	Общее качество выполнения	О
3. Оценка результатов*	**оценка**	**4. Устойчивость****	**оценка**
Соответствие***	С	Финансовые ресурсы	У
Эффективность	О	Социально-политическая	У
Продуктивность	О	Институциональная структура и управление	ВУ
Оценка общего результата Проекта	О	Экологическая	ВУ
		Общая вероятность устойчивости	У

*Используя шестизначную оценочную шкалу: 6: Отлично (О), 5: Хорошо (Х), 4: Удовлетворительно (У), 3: Недостаточно удовлетворительно (НУ), 2: Неудовлетворительно (Н) и 1: Очень неудовлетворительно (ОН)
**Используя четырехзначную оценочную шкалу: Устойчиво (У); Возможно устойчиво (ВУ); Возможно неустойчиво (ВН); Неустойчиво (Н)
***Шкала оценки соответствия: Соответствует (С); Не соответствует (НС)

Оценщик определил следующие выводы, которые можно извлечь из проекта ЭЭО:

1. Установление партнерства на ранней стадии с аналогичными проектами в других странах с похожими социально-экономическими условиями является эффективным методом учиться на опыте и задачах, с которыми столкнулись другие проекты. В то же время необходимо самому оказывать поддержку другим проектам, находящимся на своей начальной стадии реализации. Проект ЭЭО тесно сотрудничал с другими проектами освещения ПРООН в России и Белоруссии, что показало сильный синергетический эффект, при этом совместные усилия были учтены при разработке проектной стратегии в политическом и законодательном аспектах, стандартов и норм по энергоэффективности, которые будут общими на территории Евразийского Таможенного Союза.
2. Учитывать различные официальные и неофициальные источники информации при проведении исследований рынка – это надежный инструмент для приобретения более широкой и реалистичной картины рынка освещения в стране. Проект ЭЭО узнал, что довольно-таки трудно приводить только официальную статистику в исследование рынка, т.к. до сих пор маленькие магазины продают лампа накаливания, доставленные через черный рынок. Эта ситуация с неконтролируемым импортом запрещенных ламп накаливания показала, что существует необходимость в распространении информации о законе об Энергоэффективности среди представителей розничной торговли. Исполнительному агентству (МИР РК) было рекомендовано изучить систему контроля продажи ламп накаливания в магазинах и на черном рынке.

3. Эффективное испытание схемы утилизации ртутных ламп на начальной стадии в одном городе и анализ результатов является базой для последующей репликации в других регионах при применении соответствующего масштаба в зависимости от населения и размера города. Успешная реализации пилотного проекта по утилизации ртутных ламп в Астане проектом ЭЭО была реплицирована в других регионах Казахстана – Мангыстау и Кызылорде.
4. Применение результатов пилотов в законодательных и институциональных рамках может быть использовано для обеспечения исполнения соответствующего законодательства. Исследование, которое провело анализ возможности представить ЭСКО в сектор освещения Казахстана, стало основой для поправок в законодательстве. Изменения были сделаны в Законе РК «Введение поправок и дополнений в отношении вопросов энергосбережения» №279-V от 14 января, 2015.
5. Обеспечение современным и подходящим испытательным оборудованием новых и/или существующих испытательных лабораторий для верификации осветительной продукции является основополагающим условием для создания необходимой технической базы для того, чтобы на рынок страны поступало продукция ЭЭО хорошего качества. Этот вопрос является очень важным, т.к. товары низкого качества и сомнительных производителей как на официальном, так и на черном рынках, являются крайне негативными факторами, которые серьезно влияют на распространение ЭЭ освещения среди населения. Также возникновение и быстрое распространение новых технологий освещения обнаружило неподготовленность национальных лабораторий тестировать современную осветительную продукцию. Проект ЭЭО поддержал национальные лаборатории в приобретении недостающего оборудования, организовал передачу знаний по процедурам испытаний и улучшил навыки, необходимые для создания функционирующей сети сертифицирующих лабораторий.
6. Тщательный мониторинг новых возникающих технологий освещения может внести вклад в выгоды реализации проекта. Проект ЭЭО реализовал пилотный проект по фитодиодному освещению для привлечения внимания общественности, бизнеса, директоров школ, и т.д. и продемонстрировал потенциал новой технологии и использования таких помещений как подвалы для выращивания овощей круглый год.
7. Продвижение результатов успешных пилотных проектов через активную пропаганду является важной предпосылкой для устойчивости и репликации проекта. Дисконтная Программа проекта ЭЭО сопровождалась широкой PR кампанией и ее реализация в 2016 году обнаружила все еще существующие барьеры в области приобретения светодиодных ламп сертифицированных производителей/дистрибьюторов широкой общественностью ввиду иногда высокой цены, нехватку знаний о светодиодах и выгоде от их владения. Несмотря на запрет ламп накаливания, они все еще продаются в некоторых маленьких магазинах, т.к. они дешевле, чем ЭЭ лампы. Результаты Дисконтной программы указали на необходимость дальнейшей работы по повышению информированности среди потребителей, а также на будущее снижение цены на светодиоды. Наконец Дисконтная программа показала производителям и дистрибьюторам возможность развивать свои системы скидок для вовлечения широкой общественности в более активное приобретение светодиодных ламп.
8. Анализ законодательной основы для возможного софинансирования местными партнерами, нахождение инновационных и творческих подходов может внести вклад в финансовую устойчивость проекта. Реализация пилотных проектов позволила узнать, что местные акиматы не имеет прямого доступа к займам коммерческих банков/международных финансовых организаций, т..к акиматам разрешается только получать займы от центрального Правительства. В большинстве проектов уличного освещения, финансируемых акиматами, средства были обеспечены через установление совместных предприятий с частным сектором, где акиматы обладали только

частичным владением. Без таких совместных компаний местным органам власти будет все также тяжело получать доступ к финансированию от международных организаций.

9. Продолжение развития системы утилизации ртутных ламп является еще одним способом обеспечить экологические выгоды ЭЭО. Проект ЭЭО наблюдает как хороший прогресс сбора ртутных ламп, так и все еще большой их импорт. В период с 2012 по 2016 год в страну было ввезено 53.8 миллиона ртутных ламп. Хотя согласно анализу рынка доля ртутных ламп на казахстанском рынке снизилась: - (i) согласно правилам PIR за отчетный период с июня одного года по июль следующего, т.е. за период 2012-2013 было собрано 1.6 миллиона ртутных ламп. (ii) за 2013-2014 – 2.5 миллиона ртутных ламп, за 2014-2015 – 2.47 миллиона, 2015-2016 – 3.1 миллиона, 2016-2017 – 3.6 миллиона. За весь период проекта количество собранных ртутных ламп составляет 13.27 миллиона.

2. INTRODUCTION

The Kazakhstan economy is strongly extractive industry resource and heavy industry based and is such is energy-intensive. Kazakhstan is the largest economy in greenhouse gas (GHG) emissions terms in Central Asia.[9] As with other ex-Soviet countries, Kazakhstan GHG emissions fell sharply after independence in 1991. Following a recovery period, GHG emissions began rising again.

The Government of Kazakhstan (GoK) has stated a strategic objective to be an energy efficient economy[10] as well as a strategy to reduce energy intensity 25% by 2020[11]. The GoK has ambitious low emissions objectives[12], and in 2012 passed a Law on Energy Savings and Energy Efficiency (LES) and it is developing a GHG Emissions Trading System (ETS).

Electricity consumption in buildings represents 22 percent of the total electricity consumption of the country[13], with the residential sector constituting 9.3 percent of total electricity consumption, the service sector about 8 percent, and the public sector about 5 percent. About three-fourths of Kazakhstan's electricity is generated at coal-fired power stations and cogeneration facilities.

As in other countries, lighting is a major contributor to electricity consumption in buildings in Kazakhstan. Lighting constitutes about 13 percent of total electricity consumption in the country, or nearly 10 TWh per year.

However, as clearly stated in the EEL Project the objective of the full-sized UNDP-supported GEF-financed project was to achieve energy savings and avoided GHG emissions via transformation of the lighting market in Kazakhstan towards greater energy efficiency, while ensuring product quality and cost-effectiveness, as well as safe disposition of spent mercury-containing lamps.
Achievement of the objectives was supposed to be reached within the framework of the following four Components:

1. Policy design and implementation;
2. Development of energy efficient lighting market;
3. Teaching and outreach activities;
4. Demonstrational projects, including best practices and technologies.

The EEL Project was designed to support Kazakhstan's efforts to pursue long-term, transformative development and accelerate sustainable economic growth, while slowing and eventually reversing the growth of GHG emissions. The EEL Project is implemented since June 2012. The EEL Project has a project office in Astana, Kazakhstan. This project office gives easy access to the government based in Astana, and to the two main project implementation sites of Astana and Almaty. The EEL Project office has four staff positions: (1) Project Manager; (2) Policy Design and Implementation Expert; (3) PR specialist and (4) Project Assistant. The project has a website[14] containing information on Project's activities, trainings and partners in both Russian and English are highlighted in both Russian and English. The website was created based on another UNDP-supported GEF-financed project «The Energy efficient design and construction of residential buildings».

9 Country Partnership Strategy: Kazakhstan 2012–2016 - Summary Sector Assessment: Energy, ADB, undated)
10 Kazakh.TV, "Global Talk" program: Attracting investments into energy saving and energy efficiency projects (12.05.2016)
11 Zakon.kz: Asset Issekeshev: Global demand for primary energy will grow by a third by 2030 (13.04.2016)
12 USAID/CENTRAL ASIA. RFTOP No. SOL-176-16-000008. (15.6.2016)
13 http://www.powerexpo.kz/en/2008/power resources

14 See www.eep.kz

The Total required budget for the Project was $32,022,338. Total allocated resources $32,022,338 including regular UNDP resources: $ 50,000, GEF $ 3,400,000, Government resources: $ 27,403,502 (cost share allocation by Government – it is considered to use funds from state and local budgets due to the new lighting policy and mercury utilization), and other resources: $ 1,168,836 (in-kind by business companies) and an estimated completion date of May 31, 2017.

The Long-term objective of the UNDP-supported GEF-financed Project[15] (the Project) was to achieve energy efficiency and reduce greenhouse gas emissions through the transformation of lighting products market in the Republic of Kazakhstan, including the implementation of phased decommissioning of incandescent light bulbs, while ensuring the quality of alternative products and cost-effectiveness as well as secure disposal of spent mercury lamps.

The four (4) Components of the EEL Project included:
Component 1 focusing on removal of institutional and policy-related barriers to energy-efficient (EE) lighting in the country, in direct support of a legislatively-mandated nationwide phase-out of incandescent lighting.
Component 2 addressing barriers concerning the marketing and promotion of EE lighting.
Component 3 providing educational outreach to consumers.
Component 4 demonstrating the technical feasibility and the economic, social and environmental impact of energy-efficient lighting in municipalities and public organizations.

There were two key assumptions underlying the design for the objective of the Project[16].

1. The incandescent lamps (IL) phase-out mandate is not delayed, weakened, or abandoned.
2. Sufficient political will to pass and implement IL phase-out, mercury recovery provisions, and other key policies.

As well as seven assumptions were underlying for the Output 1:

1. The IL phase-out mandate is not delayed, weakened, or abandoned.
2. Continued support from Committee for Technical Regulation of MID.
3. Code revision will continuously be prioritized by the responsible agency
4. Political resistance from government agencies and entrenched suppliers is ensured.
5. Political resistance from government agencies and entrenched suppliers is ensured.
6. Adequate logistics available for effective collection program in all regions
7. Adequate logistical capacity available for effective collection program in all regions

Two assumptions were underlying for the Output 2:

1. Cost-effective distribution is possible even to remote towns and rural areas
2. Promotion, targeted discounts, and new national laws and policies are enough to overcome cost barriers among poor rural consumers

One assumption was underlying for the Output 3

1. Continued stability of cost-sharing will make large-scale media campaigns possible

One assumptions was underlying for the Output 4:

1. Continued stability of partnership and cost-sharing

[15] The UNDP-supported GEF-financed project "Promotion of Energy Efficient Lighting in Kazakhstan" (PIMS #4326)
[16] As detailed in the Project Results Framework

2.1 PURPOSE AND SCOPE OF THE EVALUATION

The UNDP-supported GEF-financed project "Promotion of energy efficient lighting in Kazakhstan" (PIMS #4326), a five year project until 31 May 2017, was launched on 1 June 2012, and is being implemented by UNDP Kazakhstan CO. In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation.

This evaluation focused on providing evidence and information for the UNDP-supported GEF-financed project to help determine: what the Project components and activities have worked well and why; which have not worked so well and why; lessons learned; and recommendations on how the program can be improved in its remaining implementation period to 31 May 2017 and in future activities.

The evaluation linked the program design, assumptions, planning, implementation, risk management, and adaptive management of the Project components and activities to the outputs, outcomes and lessons learned and recommendations that are drawn from the Project to date. The evaluation highlighted specific ways in which the Project can be improved in its follow up activities as new project/s, and to inform the planning of the proposed any new follow-on project scheduled for following years. The primary audience for the evaluation is the UNDP-supported GEF-financed project through the UNDP CO in Kazakhstan. The secondary evaluation audiences are the Government of Kazakhstan (GoK), program stakeholders, beneficiaries, and other donors.

Initially it was expected that the evaluation team will be composed of 1 international evaluator and 1 national evaluator (see Annex 1). Due to difficulties to find experienced national evaluator in the given timeframe it was suggested that the work will be conducted only by one international evaluator with requirement to have fluent Russian language ability. The evaluation team (ET) was represented by Dr. Zharas Takenov, International Evaluator. Dr. Takenov was responsible for ensuring the overall technical delivery of the contract. This includes managing the development of all written deliverables and providing final review and sign off on the technical quality of all deliverables. Dr. Takenov was involved in all phases of the evaluation including the desk review, data collection, and the analysis and report writing.

2.2 KEY ISSUES ADDRESSED

In agreement with the inception plan for the TE and meetings held with UNDP CO on April 4 and April 7, 2017 and Skype conversation with RTA on April 13, 2017[17] it was decided that the TE would focus especially on the aspects of the EEL project implementation and lessons learned that are relevant for future programming of UNDP initiatives[18] (Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan n.d.) in Kazakhstan, including:

- The EEL project relation to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels;
- Achievement of expected outcomes and objectives of the EEL project;
- The EEL project implementation in-line with international and national norms and standards;
- The EEL project long-term sustainability and financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results.
- The EEL project contribution or its role in enabling progress toward, reduced environmental stress and/or improved ecological status.

[17] Interview with Cynthia Page, UNDP/GEF Regional Technical Specialist (RTA) at RBEC Istanbul, 13 April 2017 (skype).

[18] Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan.

The Regional Bureau in Istanbul could provide useful information about the expectations regarding EEL project. However, there is new staff working at RBEC that was not involved in the design and implementation phase of EEL project. Therefore, additional Skype interview was contacted with previous Regional Technical Adviser in RBEC Regional Center in Istanbul[19].

2.3 METHODOLOGY OF THE EVALUATION

The methodology followed for the TE is based on the UNDP/GEF M&E guidelines and the Terms of Reference and consists of:

- A review of the project documentation submitted by UNDP to the evaluator;
- Collection of lacking information from UNDP Country Office;
- Collection of additional information regarding EEL project implementation context;
- Conducting semi-structured interviews with the national project stakeholders, UNDP CO staff[20], Project Manager, former RTA; and retained consultants;
- Analysis of information;
- Assessment of the outputs, outcomes and impact of the EEL Project in relation to the objectives and indicators set forth in the project logical framework;
- A review of the assumptions and the strategy of the project;
- A review of the achievements made by EEL in terms of EE lighting promotion; and:
- Two field visits in Almaty and Astana.

The desk review has looked at the documents supplied by UNDP CO and Project Team. The Evaluator has reviewed all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, in particular evaluator shall validate the data in the GEF CCM Tracking tool (how the tool is filed in and confirmed the figures there filled in by the project team), project files, national strategic and legal documents, website of regional projects www.eep.kz and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team has provided to the evaluator for review is included in Annex 6. The Evaluator has added supplemental documents to the desk review identified during the evaluation mission to Astana.

The Evaluator has used a mixed-methods approach to collect data for the evaluation. There were two phases of data collection: 1) a desk review and 2) fieldwork involving key informant interviews (KIIs). The desk review phase has largely been completed prior field missions. The desk review provided the necessary context for the field evaluation, preparing the Evaluator for the development of data collection tools, and identifying data gaps, regarding the development disparities between women and men. In terms of location, the Evaluator focused data collection in Almaty and Astana were the locations identified in the inception phase as specific locations for the Project operations and management.

An initial list of respondents for the Key Informant Interviews has been created based on input from UNDP CO, Project Team, and desk review. The following types of individuals/entities were targeted:

Project:

1 Mr. Syrym Nurgaliyev Project Manager, UNDP CO.
2 Ms. Sergey Inyutin, Policy Design and implementation expert.
3 Ms. Dinara Tamabayeva, PR specialist.
4 Ms. Zulfiya Suleimenova, Project Assistant.

[19] Interview with Marina Olshanskaya, former UNDP/GEF RTA at RBEC Istanbul, 6 April 2017 (skype).
[20] Specifically: UNDP RK's Deputy Resident-Representative, Assistant Resident Representative, Programme Analyst, Programme Associate.

UNDP:
1 Ms. Cynthia Page, UNDP-GEF RTA a.i., UNDP, Istanbul.
2 Ms. Irina Goryunova; ARR, UNDP CO.
3 Mr. Rassul Rakhimov, Head of SD and Urbanization Unit.
4 Ms. Zhanetta Babasheva, M&E focal point.
5 Ms. Viktorya Baigazina, Programme Associate.
6 Ms. Marina Olshanskaya, former UNDP-GEF RTA.

GEF Operational Focal Point:
1 Mr. Gani Sadibekov, Vice Ministry, Ministry of Energy of the RK.

Ministry for Investments and Development RK – Main Partner:
1 Mr. Olzhas Alibekov, Head of Department of energy efficiency and energy saving, National Project Coordinator, Department of energy efficiency and energy saving, Ministry for Investment and Development RK.

Project Partners:
1. Alibek Kabylbay, Adviser to the Minister, The Ministry of Economy, Astana.
2. Aitmukhan Mussin, Head of Testing Laboratory Assessment Department, National Center of Accreditation RK, Astana.
3. Aydar Mahambet, Chairman of the Board, «Institute of Electricity development and Energy Saving (Kazakhenergoexpertise)» JSC, Astana.
4. Natalya Vyrodova, Head of the Department of measuring Instruments Metrological Certification , Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK, Astana.
5. Amangeldy Taukenov Director, Led System Ltd, Astana.
6. Tatyana Nemtsan, co-founder, Centre of Green Technologies, Astana.
7. Iskander Khamitov, Chief Expert, «Kazakhstan Institute of Standardization and Certification» RSE Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK, Astana.
8. Katerina Yushenko, National Coordinator, UNDP/ GEF SMALL GRANTS PROGRAMME, Almaty.
9. Madi Agybay Technical Director, Saiman Corporation, LLP «GREENTEK», Almaty.
10. Valeryi Dvornikov, Head of RC, Almaty University of Power Engineering & Telecommunications, Research Center.

Due care was taken by the Evaluator to avoid bias regarding the Project design, situation and baseline analysis, implementation, risk assessment and management, project outputs/results and so forth.

Where applicable, the Evaluator has utilized tools for measuring EE that have been developed and widely used globally by other major actors in the EE sector, for the Global Environmental Facility (GEF)[21]. These tools give a standardized way to estimate direct and indirect GHG savings, both for during the project implementation period and following the end of the implementation period.

The Evaluator has spent one week for the field mission in Kazakhstan. The Evaluator conducted its field mission to the following project sites:

- Phyto-diode lighting Arnasai village (Akmolinskaya oblast, 30 km from Astana);
- Testing Laboratory (Astana);
- Testing laboratory (Almaty).

[21] Calculating GHG Benefits of GEF Energy Efficiency Projects - v1.0 - GEF STAP, March 2013, and Manual for Calculating GHG Benefits of GEF Energy Efficiency & Renewable Energy Projects - GEF/C.33/Inf.18 April 16, 2008

The Evaluator examined evidences from all data sources using a combination of pre/post, descriptive, and qualitative analysis. The findings from these analyses were used to triangulate findings in response to each evaluation question, allowing the Evaluator to substantiate conclusions. All findings were supported with quantitative project performance monitoring data when possible, as well as other program documentation, interviewee statements, and other secondary data identified during the fieldwork evaluation phase. Where it exists, the Evaluator conducted secondary data analysis.

Findings examined both intended and unintended impacts affecting women and men, discussions of gender-sensitive issues, and were disaggregated by sex as appropriate. Data analysis continued after the field-based phase of the evaluation has been completed. Oral briefings of the preliminary findings of the evaluation has been presented to the UNDP CO and Project Team in Astana on the last day of the field missions on 7 April 2017. Upon UNDP approval of the final report, the Project Team will submit it to the GEF OFP and translate the Executive Summary of the report into Russian.

2.4 STRUCTURE OF THE EVALUATION

The evaluation report follows the general document structure[22] as suggested for this purpose. Section 3 provides a description of the Project and the devised strategy in relation to its development context. Section 4 presents the findings of the Evaluator covering project design, implementation and results. The sections 5 and 6 summarize the conclusions, recommendations and lessons learned.

3 THE PROJECT AND ITS DEVELOPMENT CONTEXT

The citizens of Kazakhstan depend on artificial light at home and at work, in buildings and along streets, day and night. It is an indispensable part of the productivity and safety we expect in modern life in Kazakhstan and indeed throughout the world.

But the ubiquity of lighting means huge associated demand for electricity, with correspondingly large environmental impact. Lighting accounts for about 15 percent of Kazakhstan's electricity consumption, or more than 10 terawatt-hours (TWh) per year as of 2009. Accordingly, given Kazakhstan's heavy reliance on carbon-intensive coal for electricity generation, this demand for lighting leads to millions of tons of greenhouse gas (GHG) emissions per year – about one million tons of CO_2 for every TWh of electricity consumed.

Experience in many countries has shown that transition to new generations of fixtures and lamps can save up to 75-90 percent of lighting electricity consumption compared to previous technology while yielding equal or better lighting quality, creating huge environmental benefits, and saving consumers money. The Government of Kazakhstan is committed to achieving this transition, but has recognized that success requires not only technical solutions, but also the correct combination of policy, investment, and information delivery.

Toward these ends, since 2012, the UNDP, under financial support from the GEF, has supported the Ministry of Investment and Development (MID) of the RK in a project entitled Promotion of Energy-Efficient Lighting in Kazakhstan (the "EEL project"). As it draws to its scheduled close after five years, the project can present numerous achievements and impacts, for the benefit of Kazakhstan and the whole planet.

[22] Project-Level Evaluation: Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects, Evaluation Office, 2012, United Nations Development Programme

3.1 PROJECT START AND ITS DURATION

The project proposal entitled "Promotion of energy-efficient lighting in Kazakhstan" was endorsed by GEF CEO on April 23, 2012 under umbrella of UNDP GEF ***en. lighten initiative***, which was established in 2009 to accelerate a global market transformation to environmentally sustainable, energy efficient lighting technologies, as well as to develop strategies to phase-out inefficient incandescent lamps to reduce CO2 emissions[23]. Project implementation started effectively without undue delays immediately after ProDoc signature on August 01, 2012, i.e. within three months since the receipt of official communication from the GEF Secretariat. Timing of the inception workshop has been delayed by two (2) months due to changes in the leadership in the Ministry of Industry and New Technologies, the project's Implementing partner, resulting in the need to re-establishment the partnership and reconfirm previously agreed commitments. The inception workshop and afterwards planning period was used to revisit and adjust the Project Results Framework and the entire project document before moving ahead in earnest with project implementation. Changes to the project logframe resulted in changes to project outputs as specified in the Inception report and reflected in the Project's first PIR in 2013[24].

The original PRF was revised during the Inception phase of the Project, in light of changed conditions and new findings from the Inception Workshop (December 10-13, 2012)[25]:

- ***Overall Objective and Objective-level targets***: The baseline condition was updated to reflect the adoption of the IL phase-out before the start of the project. Mid-term and final targets of adoption of supporting policies were introduced, including technical standards for lighting, targets for light sources by wattage, consistent with stipulations of the new phase-out law, were updated. Indicators and targets for mercury containment from spent lamps underwent significant changes, as the original target was too ambitious. The revised target accounted not only for mercury containment (establishment of regional programs with documented 50 percent recovery), but also for mercury content and operating life of CFLs. Finally, figures for mobilization of investment and other financial support were added.
- ***Outcome 1:*** The description of the outcome was revised to reflect a broader, more rational goal with regard to mercury control. Targets and indicators for IL phase-out were updated to reflect specifics of the new law on Energy Efficiency. Targets for technical standards revised with specific reference to desired content of the standards, including maximum allowed mercury content and operating life of lamps. A target for building codes was updated to reflect addition of health standards for LED light sources. The procurement indicator remained unchanged, but targets, sources of verification, and assumptions were adjusted to indicate the project's shifted focus on guidance and selection criteria, instead of revision of the state procurement law itself. Targets for mercury containment were changed for greater practicality and consistency with world best practice.
- ***Outcome 2:*** The targets were revised to specifically address market expansion of LEDs, with an ambitious but realistic project-end target of a doubling of their market share.
- ***Outcome 3:*** The quantitative targets for total outreach have been revised downward to reflect updated analysis of demographic information and estimates of audience sizes for various mass media channels.
- ***Outcome 4:*** Original indicators and targets remained unchanged, except for the addition of a co-financing target for investment by national partners, consistent with estimates shown in the original Request for GEF CEO Endorsement.

[23] http://www.enlighten-initiative.org/About.aspx
[24] Mid-term Evaluation Report of UNDP-supported GEF-financed project "Promotion of Energy-Efficient Lighting in Kazakhstan"
[25] Please refer to the revised LFM in Annex A of the Inception Report, April 2013

- ***Sources of Verification*** were expanded and made more specific, in order to match more closely with revised indicators.

The inception phase reconfirmed the timeliness of the UNDP-supported GEF-financed project's onset and matching needs of MINT, MEP, and Akimats for technical assistance with the project's position to deliver it. Technically, the inception phase was completed but with some delays (though these delays had objective reasons as discussed above): inception workshop conducted (four (4) months after the project's signing), Inception report prepared (three (3) months after the inception workshop), the project team and the Project Board established.

The project had no major delays in implementation of its activities, except for Outcome 2, where the implementation was slow. The key factors affecting the speed were largely external and include: (i) Customs Union lengthy procedures for review of technical regulations and standards; (ii) unsustainable financial situation of Akimats in Kzyl-Orda and Shymkent that makes the administration hesitant to commit co-funding for demonstration projects on street lighting; and (iii) frequent government restructuring (the project already survived two major changes in the government; yet another reshuffling is expected following the recent presidential elections). Two of the factors (Customs Union and changes in the government) have been captured by the project's risk management system and are being closely monitored by the project adjusting its planning and implementation accordingly[26].

3.2 PROBLEMS THAT THE PROJECT SEEKS TO ADDRESS

During project preparation, UNDP and a team of national and international consultants gathered detailed market information and assessed the existing and developing legislative framework regarding lighting in Kazakhstan. The project development team met with senior representatives of MID, other national government agencies, municipal administrations and utility companies, and private lighting vendors. This research and stakeholder consultation led in turn to a comprehensive barrier analysis and elaboration of proposed activities to address the barriers.

The barriers were identified as follows:

Informational barriers: Final end-users and other market participants such as distributors and retailers often did not know about the potential savings and practical advantages of energy efficient lighting.

Cost barriers: Consumers, including both individuals and corporate or even governmental entities, tended to resist purchasing energy-efficient lighting because of its higher initial prices, despite significantly lower life-cycle operating costs. Poverty exacerbates this resistance especially in Kazakhstan's rural areas, where about half the population resides. State procurement regulations were based on principles of cost minimization, fair competition, transparency, and support of domestic suppliers, but not energy performance or life-cycle cost.

Lack of quality control over energy-efficient lighting: Government procedures for testing and certification of lighting products were not only insufficiently thorough, especially given the emergence of new technologies. Products of poor quality and dubiously credible certification were present in both legal markets and in Kazakhstan's extensive black market.

[26]See also Mid-Term Evaluation Report of the UNDP-supported GEF-financed Full Size Project "Promotion of Energy Efficient Lighting in Kazakhstan, 6/22/2015, Lilit V Melikyan, International Consultant, Natalya Panchenko, National Consultant.

Geographic barriers: Another problem was simply that the country is large, with vast distances between population centers. As a result, the reach of market innovation is limited, and advanced lighting technology is sparsely represented and poorly understood among end-users in much of the market.

Lack of policy support - At the time of project development, there were no adopted mandatory national legal requirements, standards, or official incentive programs in support of energy-efficient lighting in Kazakhstan. Kazakhstan also lacked policies and programs for collection and safe disposition of mercury-containing lamps. These policy gaps severely impede the potential of EE lighting to overcome market barriers and gain widespread use in the country. Significantly, this barrier was already being lifted toward the end of the project preparatory period, as the national legislature was putting the finishing touches on a new energy-efficiency law that mandated a phase-out of high-wattage lamps. So, the expected policy challenge was the development of regulations and programs to ensure this law's effective implementation. (The law was adopted in January 2012 and entered force in July 2012, after GEF approval and just before the project's official launch on August 1, 2012.)

To address these barriers, all parties agreed that the project should embody an integrated approach involving four interrelated components:

- Policy development and implementation;
- Market development for EE lighting;
- Promotion and educational outreach; and
- Demonstration projects.

The initial project design, including the definition of these components, remained largely unchanged between the PIF and project preparatory stages. Similarly, during project implementation until its end in May 2017, the structure and components of the project proved to be enduringly relevant and well aligned with real needs.

3.3 OBJECTIVES OF THE PROJECT

The direct objective of the Project is defined as follows[27]:

To achieve energy savings and avoided GHG emissions via transformation of the lighting market in the Republic of Kazakhstan, including implementation of a phase-out of incandescent lamps, while ensuring product quality and cost-effectiveness as well as safe disposition of spent mercury-containing lamps

Applicable GEF Focal Area: Climate Change; GEF-4 Strategic Program: CC-1 "Promoting energy efficient technologies and practices in the appliance and building sectors"; Parent Programme/Umbrella Project: UNEP/UNDP "Global Market Transformation for Efficient Lighting" As per the Project Document it is expected that by replacing the IL technology with CFLs (and eventually with LEDs), the project would contribute to the reduction of 2.8 (from 9.3 to 6.5) million tons of CO2 over the project's lifetime (2013 – 2017) from reduced electricity consumption (see Annex 12). The main project objective is planned to be achieved through improving policy framework, strengthening the market for EE lighting, increased awareness among the population and professionals and demonstration projects. There are two key assumptions underlying the design for the objective of the Project[28] .

1. The incandescent lamps (IL) phase-out mandate is not delayed, weakened, or abandoned.

[27] The UNDP-supported GEF-financed project "Promotion of Energy Efficient Lighting in Kazakhstan" (PIMS #4326) ProDoc.

[28] As detailed in the Project Results Framework

2. Sufficient political will to pass and implement IL phase-out, mercury recovery provisions, and other key policies.

3.4 EXPECTED RESULTS

The intended activities, outputs, and outcomes of the EEL project presented below. Numbering and content of components and activities in the Table 3 (see below) are the same as shown in the Project Document and Inception report, except some updates as highlighted.

Table 3: Intended activities, outputs, and outcomes[29]

Activities		Outputs	Outcomes
1.1.1.	A comprehensive market assessment and forecast for lighting in Kazakhstan	**Output 1.1: Developed and implemented roadmap for IL phase-out**	**Outcome 1: Policy development and implementation supports effective IL phase-out, expansion of market share and use of EE lighting, and minimization of release into the environment of Hg from spent lamps**
1.1.2.	Development and adoption of a roadmap for implementation of IL phase-out		
1.2.1.	Formation of a working group for development of technical standards.	**Output 1.2: Developed and adopted official technical standards and certification procedures for quality and performance for EE lighting products**	
1.2.2.	Development of the technical standards.		
1.2.3	Establishment of an enforcement mechanism for these standards, including processes for certification and testing. ***System of quality control*** **(additional compared with to the Inception Report)**		
1.2.4	Assurance of consistency of any new standards with the requirements of the Customs Union. Entry of additions and changes into the Technical Regulations of the Customs Union on lighting equipment energy efficiency. Participation in meetings with lighting-industry representatives from all three countries.		
1.3.1.	Review of RK building codes and other normative documents and identification of opportunities to include and/or increase requirements for lighting efficiency.	**Output 1.3: Updated relevant mandatory and recommended sections of the national building code on lighting, as well as other normative documents**	
1.3.2	Review of international best practices with regard to efficiency requirements for lighting in building codes. This work will also include examination of health codes with regard to lighting quality.		
1.3.3.	Preparation of recommendations to the RK Agency on Construction and Residential-Communal Affairs and other relevant agencies on new requirements and/or recommendatory sections in lighting codes and/or other normative documents. In addition to recommendations regarding energy efficiency for lighting in buildings, the project will seek to develop recommendations on health-related requirements for lighting, and specifically the possibility of expanded acceptance of LED lighting in public buildings.		
1.3.4.	Delivery of training to relevant agencies on implementation of new lighting requirements in new codes		
1.3.5	Development and delivery to relevant agencies of practical methodological guidance on energy audit of indoor and/or outdoor lighting		
1.4.1	Elaboration of guidance for government ministries, regional administrations, and large state entities on criteria for bulk purchase of high-quality energy-efficient lighting. [This activity, which is similar to the original Activity 1.4.2, now replaces the original Activity 1.4.1, in order to reflect a new focus on technical guidance rather than legal reform of the government procurement process.]	**Output 1.4: Enhanced public procurement processes favouring EE and life-cycle cost criteria**	
1.4.2	Preparation and regular updating of registers of recommended products and suppliers		
1.5.1	Review of existing practices in Kazakhstan and international best practices regarding collection, containment, and recycling of mercury-containing lamps	**Output 1.5: Established systems for collection,**	

[29] Mid-term Evaluation Report of UNDP-supported GEF-financed project "Promotion of Energy-Efficient Lighting in Kazakhstan"

1.5.2	Development, implementation, and assessment of pilot program for collection of spent mercury-containing lamps in one region.	**recycling, and storage of Hg-containing lamps**	
1.5.3	In other regions of Kazakhstan, promotion of replication and/or dissemination of lessons learned from early adopters of collection/recycling programs		
1.5.4	Preparation and dissemination of materials, via electronic and/or print media, instructing consumers nationwide on handling of mercury-containing lamps, including both spent and broken ones.		
.			
2.1.1.	Preparation of proposal for one or more programs for consumer discounts and/or financing for LEDs or other qualifying energy-efficient lighting, possibly in conjunction with mercury recycling programs	**Output 2.1: Market stimulus to promote EE lighting**	**Outcome 2: Market development for EE lighting**
2.1.2	Negotiation and finalization of partnerships for such program(s)		
2.1.3	Implementation and evaluation of program(s)		
2.2.1	Determination of further activity for this output on the basis of the market study of Output 1.1 and the development of technical standards of Output 1.2.	**Output 2.2: Implemented labelling program for energy-efficient lighting products**	
2.2.2.	As needed, facilitation of revisions to the national policy framework on consumer protection to accommodate product labeling		
2.2.3.	Based on the results of Activity 2.2.1 and 2.2.2., creation and implementation of a voluntary labeling program for CFLs and/or other EE lighting products, including a post-project strategy for transition to sustainable management by another party		
3.1.1.	Hosting and co-hosting of seminars and other events to promote energy-efficient lighting among the general public	**Output 3.1: Completed promotional campaigns for EE lighting among the general public.**	**Outcome 3: Increased familiarity among diverse stakeholders with EE lighting and associated issues**
3.1.2	Production and dissemination of advertisements to promote energy-efficient lighting and proper handling of spent mercury-containing lamps		
3.1.3	Development of a website on energy-efficient lighting, including a plan for transfer to another organization that will maintain the site and update content after the UNDP/GEF project is completed		
3.2.1	Hosting and co-hosting of seminars and other events to promote energy-efficient lighting among building-industry professionals, responsible regional officials, and other specialists, including industrial energy auditors	**Output 3.2: Completed EE lighting promotional campaigns among professionals**	
4.1.1.	Elaboration of selection criteria and solicitation of demonstration project applications:	**Output 4.1: Completed new demonstration projects**	**Outcome 4: Increased investor confidence, design and administrative capacity, and market share of EE lighting as a result of demonstration projects**
4.1.2	Evaluation and selection of demonstration projects, with subsequent formalization of agreements		
4.1.3	Installation and management of EE lighting		
4.1.4	Monitoring and evaluation, including quantification of both baseline and EE electricity consumption, as well as illumination and occupant satisfaction.		
4.1.5	Documentation of results and lessons learned		
4.1.6	Dissemination of results via seminars and distribution of information via electronic and print media		
4.1.7	Facilitation of implementation of replication projects		
4.2.1	Review of documentation of previous EE lighting projects and verification of quantitative results	**Output 4.2: Replicated other known lighting upgrades.**	
4.2.2	Dissemination of results and solicitation of replication applications		
4.2.3	Facilitation of connections among clients, suppliers, and installers		
4.2.4	Implementation of the selected replication projects		
4.2.5	Monitoring and verification of energy savings and GHG emission reductions realized from the replication projects.		

4.2.6	Documentation of results and lessons learned
4.2.7	Dissemination of results via seminars and distribution of information via electronic and print media

3.5 DEVELOPMENT CONTEXT

In addition to reflecting national priorities in Kazakhstan, the project also builds upon the existing goals and activities of UNDP, with environmental sustainability being one of the eight millennium development goals (MDGs) that UNDP is playing a central role in helping to promote. The project strongly supported the implementation of UNDP CDP 2011-2015 and 2016-2020, in which EE and the concept of sustainable cities in general occupies the central role. The project builds on the previous UNDP-supported GEF-financed projects in Kazakhstan, and the project on "Energy-Efficient Design and Construction of Residential Buildings" (2010-2015) and "Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply" (2007-2013). The project is an integral part of the current UNDP/GEF portfolio in Kazakhstan and the lessons learned from this project are expected to contribute to the successful implementation of the current and new UNDP-supported GEF-financed projects to support: "Nationally Appropriate Mitigation Actions for Low-carbon Urban Development in Kazakhstan (NAMA)" (2015-2020) and "Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan" planned for the period from second part of 2017- 2022.

The project is one of the four (4) similar projects in the RBEC region (in Ukraine – currently going through terminal evaluation and due to close in April 2017, Russia – also having TE and starting its closure process for April 2017, and Armenia – project works till the end of 2017) funded under GEF IV). The projects in these countries cooperate and share lessons as they progress. In its turn, it is expected that this project will provide lessons for other EE lighting projects, and be an important part of UNDP-GEF portfolio regionally.

This project (as well as the entire portfolio of UNDP-supported GEF-financed projects on EE lighting) is under umbrella of UNEP/GEF ***en.lighten initiative***[30] established in 2009 to accelerate a global market transformation to environmentally sustainable EE lighting technologies, as well as to develop strategies to phase-out inefficient incandescent lamps to reduce CO2 emissions and the release of mercury from fossil fuel combustion. The enlighten initiative serves as a platform to build synergies among international stakeholders; identify global best practices and share this knowledge and information; create policy and regulatory frameworks; address technical and quality issues; and encourage countries to develop National and/or Regional Efficient Lighting Strategies. The UN Secretary General's Sustainable Energy for All (SE4ALL) initiative has identified advanced lighting as a "High Opportunity Area" and enlighten has been selected to lead this international effort.

3.6 BENEFICIARIES AND STAKEHOLDERS

The list of stakeholders consulted during the **EEL project design** include: Department of Innovative Technologies, MINT; Committee for Technical Regulation, MINT; Ministry of Environmental Protection; Agency for Construction and Residential-Communal Affairs; Mercury-recovery facilities, including Almatygorsvet and Almatyekologostroi; Lighting companies, including Siemens OSRAM and Philips, and their distributors; AlmatyEnergoSbyt; Almaty University of Energy and Communications; Turan-Profi Academy; Regional/city Akimats (Astana, Almaty); Ministry of Health Ministry of Education; Association of Apartment Owners "Maksat" in Almaty; NGO "Women of Sary Arka" in Karaganda.

[30] http://www.enlighten-initiative.org/About.aspx

The **EEL inception phase** of the project was also highly consultative and the project could be credited for that. The main stakeholders involved in the **implementation of the EEL project** are grouped in the following five (5) categories:

- Government at all levels, including: Ministry of Investments and Development (MID), formerly MINT (Ministry of Industry and New Technologies) - the main government counterpart of the project currently; Ministry of Environmental protection (MEP), which was the 2nd main government counterpart, dissolved in August 2014 with some of the functions transferred to the Ministry of Energy; former Agency for Construction, Housing and Municipal Infrastructure, dissolved in August 2014, currently a Committee under MID; Ministry of Energy (Department of Waste Management and Green Economy); and Akimats: 9 regional Akimats and 2 cities of republican significance (Astana and Almaty)
- Institutional stakeholders, including
  - Kazakhstan Center for Modernization and Development of Housing and Communal Services OJSC (АО «Казахстанский Центр модернизации и развития ЖКХ»);
  - Republican State Enterprise "State Examination" (РГП «Госэкспертиза»);
  - Training Center on Housing and Communal Services" (Центр обучения ЖКХ);
  - Center on Energy Efficiency in Housing and Communal Services (Центр энергоэффективности ЖКХ);
  - Committee for Technical Regulation and Metrology of MID;
  - National Center of Accreditation of RK, Testing Laboratory Assessment Department;
  - RSE "Kazakhstan institute of Metrology";
  - Republican state enterprise "Sanitary and Epidemiological Examination and Monitoring" (РГП «Санитарно-эпидемиологическая экспертиза и мониторинг» МЗ РК);
  - "KazEnergyaudit" OJSC (АО «Казахэнергоэкспертиза»);
  - KazMediaCenter (КазМедиаЦентр), etc.
- Private sector. The project cooperates with a number of private sector companies, including: Holding "Parasat"; "LED System" CJSC; "KazEcotech Astana Ltd." Scientific Technical Enterprise Ltd (ТОО "НТП Казэкотех Астана"); "Lighting Technologies" CJSC, Phillips, etc.; Greentek (ТОО «Гринтек»), Danfoss LLP (ТОО Данфосс); Philips Lighting, ООО «ТК Световые технологии в РК».
- Academia and educational Institutes. The project works closely with a number of higher educational and research institutes, including: Kazakhstan Institute for Standards and Certification (Казахстанский институт стандартизации и сертификации (КазИнСт); Kazakhstan Agrotechnical University (Университет КАТУ); Almaty University of Energy and Communications (Алматинский университет энергетики и связи (АУЭС)); Institute of physics and technology(ТОО «Физико-технический институт») Turan-Profi Academy (Академия Туран-Профи); Turan University (Университет Туран); secondary schools (see for example Annex 7: Brief description of site visits for the summary of the site visit to the school in Arnasai Village, Akmola oblast), etc.
- Non-Governmental Organizations (NGOs): The project cooperates with a number of NGOs, including: National Chamber of Entrepreneurs of Kazakhstan "Atameken", НПП РК «Атамекен»; ОО «Green Innovation Technology»; Kazakhstan Association of Hi-tech, EE and Innovation Companies and Partnership (Казахстанская Ассоциация высокотехнологичных, энерго-эфективных и инновационных компаний и партнерства); National Chamber for Housing and Communal Services (Национальная Палата ЖКХ), NGO "Plant a tree" ("Посади дерево"), Ak Bota, etc.

3.7 MANAGEMENT ARRANGEMENT

Full-time **Project Manager** and full-time **Project Assistant** were carrying day-to-day activities of the project. They work under the support and direct oversight of the **Portfolio Manager of UNDP's Energy and Environment Unit.**

National and international **consultant services**, including the contracted services of firms as well as individuals, were engaged across all components in various technical areas, including policy and standards development, mercury-recycling program development and implementation, market assessment, education and outreach, and demonstration project design, implementation, and evaluation.

Outside direction and oversight were provided by two separate but closely linked bodies. The **Project Board** consisted of the **National Project Director**, a representative of the Government implementation body, and a senior representative of UNDP. This committee provided consensus management decisions when guidance is required by the Project Manager. The Project Board also had final authority on matters requiring official review and approval, including annual work plans, budgets, and key hires. Expected responsibilities of the National Project Director and the Project Board were elaborated in detail in their ToRs.

The **Technical Advisory Committee** comprised various stakeholders from a broader range of interested public and private agencies. This board provided guidance on various aspects of project implementation, including technical and policy goals, implementation strategies, consultant searches, evaluation, and coordination with related activities. This group met annually, with periodic consultation as needed throughout the year. The Project Board actively seek and took account of the input of the Technical Advisory Committee. Project Board meetings, where possible, occurred immediately after the annual meetings of the Technical Advisory Committee.

UNDP acted as **GEF Implementing Agency** for this Project. The project built on UNDP's strong experience in Kazakhstan and in Central Asia with promoting energy efficiency and environmental protection, and building capacity of governmental organizations and the public. UNDP has conducted several projects in Kazakhstan in diverse subject areas, including energy efficiency in buildings; energy efficiency in municipal heating; development of the wind energy market; conservation of wetlands; protection of the Altai-Sayan forest ecosystem; support for democratic governance; and other areas. Moreover, UNDP in neighboring Russia has already begun implementation of a highly analogous project on energy-efficient lighting, with much potential for synergy and mutual support.

UNDP's Country Office in Kazakhstan was responsible for ensuring transparency, appropriate conduct and financial responsibility. This office oversaw annual financial audits, as well as the execution of independent Midterm and Terminal Evaluations. All financial transactions and agreements, including contracts with staff and consultants, followed the rules and regulations of the United Nations. The **UNDP/GEF RTA** and on final stages **UNDP/GEF RTA a.i.** in the Regional Coordinating Unit provided regular programmatic and administrative oversight as well.

4. FINDINGS OF THE EVALUATION

Project strategy and relevance

Since its independence twenty-five years ago, the Republic of Kazakhstan has taken good strides in terms of social and economic development. This large land-locked country located at the heart of Eurasia attracts attention in the form of trade and investment from the West, East, North and South. Its engagement in multi-lateral diplomatic process (including 2010 Chairmanship of the OSCE, Shanghai Cooperation Organization, and OIC), shows its growing influence as a trusted international partner, including for championing global development agendas such as the Sustainable Development Goals (SDGs).

While Kazakhstan recently attained the status of a middle-income country, it remains dependent to a large extent on revenues from the sale of oil and other fossil fuels. It is also the largest GHG emitter and second most energy intensive country in the region. There is a considerable potential for improving energy efficiency in industry, housing and transport sectors. On this backdrop, it is important to note that the Government of Kazakhstan (GoK) has set an ambitious vision of the path to address these challenges, most notably with the adoption of the "Concept

on Transition to Green Economy of Kazakhstan" and "Strategy 2050". These documents signal the plans to shift to a principally new way of economic and social development.

A key aspect in the gradual transition to a green economy is energy efficiency (EE). Since 2012, many legislative acts, defining the basic requirements in the field of EE were adopted, including the Law "On Energy Saving and Energy Efficiency" (2012) and the "Program on Energy Saving and Increasing Energy Efficiency 2020", setting at least 40% energy intensity reduction target until 2020. The latter program implemented in five main directions with energy efficient lighting being among them, was adopted in support of implementation of the Law on Energy Saving and Energy Efficiency (2012). This direction envisages a step-by-step transition to LEDs, modernization of street lighting in cities and communities, and 60% reduction of electricity consumption by the lighting sector in the whole country. In this regard, the Government sees the successful implementation and enforcement of the existing legislative framework, as its main task.

Hence the objective the project was very relevant for Kazakhstan. The project is also very well timed with the Law "On Energy Saving and Energy Efficiency" slightly preceding the start of the project with a mandate for the gradual phase-out se-out of incandescent lighting (IL) in Kazakhstan. The needs of MINT, MEP, and regional governments (Akimats) for technical assistance matched very well with the project's position to deliver it – and the potential for significant energy savings and nationwide market transformation seemed very high at the onset of the project, if the phase-out and the nation's associated plans were to be implemented successfully. In this context, the main planned final Outcomes of the project contribute to addressing this challenge as follows:

1. Policy development and implementation: Environmental, and climate policies can provide an important lever to establish incentives for the transformation of the energy sector. In 2011, the Climate Laws, Institutions and Measures (CLIM) Index[31] indicated that Kazakhstan experienced important problems in both formulation and implementation of relevant policies (EBRD, 2011). Hence the large share of the project focus on the policy aspects in Kazakhstan was well justified. The RK government needed and still needs to ensure effective implementation of the phase-out via supporting regulations;

2. Market development: The gaps in the competitive environment in the manufacturing and supply of light engineering products; virtual absence of local manufacturers; low quality of imported light engineering products available in the market, limited line and substantially inflated prices; lagging in the introduction and use of LED products and energy conservation technologies at the stage of the preparation of the project – all of the above are testimonies for the overall relevance of the presence of this component of the project.[32]

3. Promotion and educational outreach. Changing consumer behavior is one of the important challenges in many areas of public policies and shift to EE lighting as well as related issues, like the safe disposal of the CFLs are no exception. Hence the focus on public awareness campaigns was and is very relevant. Equally relevant was the focus on improving the knowledge base of the energy (lighting industry) professionals, e.g. related to lighting audits. The EEL Project used of website www.eep.kz which was already created based on another UNDP-supported GEF-financed project «The Energy Efficient Design and Construction of Residential Buildings». However, some of the activities in the website are not up to date or not yet developed, and many of the activities are not available in English. Since the Project Facebook (FB) page had been created at the very beginning of the project and got numerous followers and subscribers, it got

[31] EBRD (2011), the low carbon transition. Report prepared in association with Grantham Research Institute on Climate Change and the Environment, EBRD, London. With a CLIM Index of 0.226, Kazakhstan was 61st in the world http://www.ebrd.com/downloads/research/transition/trsp.pdf;

[32] http://www.powerexpo.kz/en/lighting-kazakhstan/about-the-exhibition

better public outreach, while the website served more as a resource center for downloading project materials. The FB page is easy to update through mobile phones both in terms of posting news, pictures, and links. Every post gets immediate feedback as likes, comments, and questions, since the FB users are always online. It was noted that the project posts/publications often get reposted on the UNDP FB page which has much wider coverage, thus, appealing to more people nationwide and internationally.

4. Demonstration projects embodying best practices and technology. Demonstration projects help to raise technical experience as well as create technical and financial track record as a basis for future replication. Hence this component was relevant in that it supports addressing such barriers on the way of the promotion of EE lighting as low technical capacity and risk aversion related to modern technologies and practices. National health norms in Kazakhstan for conventional elementary and secondary schools require lighting levels of 300 lumens/m^2 in study areas around students' desks, and 500 lumens/m^2 at the blackboard. But for Kazakhstan's special schools for visually impaired students, such as Boarding School No. 3 in the city of Semey in the Eastern Kazakhstan Oblast, norms are increased to require 500-750 lumens/m^2 in study areas. Furthermore, to further support the children's productivity and safety, light fixtures are required to be on for 12 hours a day, from 8 am till 8 pm. But as of 2014, these requirements were not being fulfilled, as the lighting equipment in the school was out of date. Recognizing the opportunity to save energy and demonstrate new technology while also serving an urgent social need of a vulnerable group, the EEL Project and the UN-Semey joint programme sought private companies to support technical modernization of the school by providing modern and efficient fixtures and lamps. Three private companies (Philips, Focus Tech, and Svetoviye Technologii) agreed to help and provided free lighting equipment. Because of the lighting upgrade in the school, the level of lighting in classrooms has increased by 80 percent, even as electricity consumption for lighting has declined by 20 percent. Most importantly, the students and teachers are delighted that they can see better and learn better in their bright classrooms! Considering much of female teachers in schools it also has a gender dimension with improvement of women health aspects.

5. The project outcomes correspond to thematic areas of GEF, namely Climate Change mitigation, covering, inter alia, energy efficiency. Many international organizations in Kazakhstan support the Government in achieving its energy efficiency related goals including in the lighting sector. These include WB, EBRD, and USAID. UNDP GEF project has established cooperation with EBRD and the WB. UNDP/GEF project remains, however, a partner of choice for the Government for the policy related matters.

6. Mobilization of financing for EE/GHG mitigation finance dependents on: -

- General economic conditions affecting the willingness of businesses to invest in EE and banks to lend the necessary funds and government to invest in improving its own operations;
- The Kazakhstan Tenge (KZT) exchange rate affecting the cost of imported equipment;
- Business borrowing (debt) interest rates for businesses investing in energy efficiency/GHG mitigation;
- The existence and effective level of the cost of carbon/GHG emissions for businesses in Kazakhstan.

In other words, the Project's trainings and capacity building needed business buy-in and business own financing or bank financing to make an EE and GHG mitigation impact. However, none of these management buy in and provision of finance issues appear to have been tracked or monitored in the EEL Project's reports or documentation.

7. Important, the EEL Project team managed to establish excellent partnership with the MINT, MER, MIR as well as with other numerous market stakeholders, including the private sector and NGOs.

4.1 PROJECT DESIGN AND SCOPE

The evidence suggests that both the capacity of the executive partner, Ministry of Industry and New Technologies (currently MID), and other partners as well as partnership mechanisms were adequately considered during project design. Despite the restructuring in 2010, MINT was best positioned to perform the role of the project's implementing partner in the government, as it was entrusted with the government energy efficiency policies, development of a strategic plan for cross sectoral EE plan. During the design stage, the Ministry of Environmental Protection (MEP) retained a major role, aithough not as the nominal national implementing partner. A series of workshops and face-to-face consultations with government, local authorities and academic institutions resulted in the assessment of, and recommendations for, their involvement in the project execution. As a result, the project strategy included joint activities on policy and legal issues, standards design, etc. Beyond this, consultations with market parties and NGOs were conducted including numerous bilateral consultations with private manufacturers and market players. This consultation allowed for understanding and detailing the cooperation with manufacturers and other suppliers, distributors and retailers of lighting equipment as well as coordinating arrangements for pilot projects, supply-chain initiatives and marketing of EE lighting.

The choice of the four (4) Project Outcomes was, and is still very relevant, and the choice of the planned outputs/strategies is overall relevant as it was showed by the experience during the past 5 years of the project, as well as the interviews conducted in the framework of the current TE, highlight the areas under each Outcome have been well designed with minor issues responded and corrected by the Project Management during the implementation process. This is best discussed along the four (4) Outcomes:

Outcome 1: Policy development and implementation

The policy component planned to tackle 5 main areas: (1) general policy guidance/roadmap; (2) Standards (development of the technical standards; and establishment of an enforcement mechanism for these standards, including processes for certification and testing); (3) Review of RK building codes and other normative documents, including health codes with regard to lighting quality; (4) guidance for bulk purchase/procurement of high-quality EE lighting and (5) Established systems for collection, recycling, and storage of Hg-containing lamps. Seven assumptions has been designed for the Outcome 1:
1. The IL phase-out mandate is not delayed, weakened, or abandoned.
2. Continued support from Committee for Technical Regulation of MINT.
3. Code revision will continuously be prioritized by the responsible agency
4. Political resistance from government agencies and entrenched suppliers is ensured.
5. Political resistance from government agencies and entrenched suppliers is ensured.
6. Adequate logistics available for effective collection program in all regions.
7. Adequate logistical capacity available for effective collection program in all regions.
The relevance for these selected strategies and assamptions under this component was confirmed during the interviews and in the third-party reports.

Outcome 2 Market development

The Market Development Component planned to tackle two (2) main areas, namely (1) Market stimulus to promote EE lighting and (2) labeling program for energy-efficient lighting products. Two assumptions has been designed for the Outcome 2:
1. Cost-effective distribution is possible even to remote towns and rural areas

2. Promotion, targeted discounts, and new national laws and policies are enough to overcome cost barriers among poor rural consumers.
The project has commissioned background research into the market for EE lighting and a study to identify the exact strategy for "Component 2.1: Market Stimulus".

Outcome 3 Promotion and educational outreach

The "Promotion and educational outreach" Component planned to tackle 2 main areas: (1) awareness raising campaigns among the public (including a website and FB on EE lighting) and (2) promotional campaigns/training for EE market professionals (building-industry professionals, responsible regional officials, and other specialists, including industrial energy auditors). One assumption has been designed for the Outcome 3: (1) Continued stability of cost-sharing will make large-scale media campaigns possible. The both areas and the assumption are very relevant as avenues to pursue the objectives of this project.

Outcome 4. Demonstration projects embodying best practices and technology.

The Project Document foresaw 2 avenues for this component:

Execution and replication of new demonstration projects. Except for 1 new residential building in Karaganda (where the project added the EE lighting to the heating modernization completed under the UNDP-supported GEF-financed project on district heat and hot water supply) the project so far has targeted (a) schools and (b) street lighting. Both target groups are relevant. Under the EE-2020 program it is planned to cut the energy consumption in street lighting in the Kazakhstan cities in the coming years by 60%. Using EE lighting in the schools ensures not only savings but also improves lighting environments for the study of the schoolchildren with corresponding health benefits. However, the residential sector is equally important, and while for the new buildings using EE lighting will be ensured through the to-be-developed and adopted new building codes (once approved), it is also important to target the existing housing stock. This supports the merits of the recommendation made earlier related to CAOs. The relevance of one assumption for the Outcome 4: (1) Continued stability of partnership and cost-sharing was confirmed during the interviews and reports.

The objectives of the EEL Project and components are clear, practically attainable and feasible within the timeframe specified. The timely accomplishment is ensured by good work planning and coordination between various activities and efficient implementation. The EEL Project document identified potential project risks, assessed the risk and specified risk mitigation strategy. The Inception Report has an updated Risk assessment and mitigation strategy, whereby certain risks, identified earlier were proposed to be removed. All risks were entered into the UNDP online risk log (Atlas Finance, Project Management) at the onset of the project. None of the risks were identified as critical. Project Manager and UNDP CO monitor the status of each risk on a quarterly basis with risk management strategy being updated, as needed. The EEL Project complied with the risk management reporting requirements. The EEL Project document does not have a sustainability plan as a separate document: having such plan is a best practice and it was recommended by MTE that such a plan is developed. Instead by end of EEL Project it has prepared a list of comments and ideas that can be considered for developing an exit strategy for promotion of energy effective lighting in the RK after EEL Project closeout (See Annex 11). This information has been prepared for further approval for the last Project Board meeting on 22 May 2017.

4.2 INSTITUTIONAL SET-UP AND MANAGEMENT ARRANGEMENTS

The Ministry of Energy and Mineral Resources (MEMR), which was listed in the PIF as one of the original national implementing partners, ceased to exist in 2010, upon government restructuring. Many of MEMR's responsibilities were transferred to the new Ministry of Oil and Gas. Responsibilities regarding energy efficiency were transferred to the new Ministry of Industry and New Technologies (MINT), which itself comprised many of the functions of the former RK Ministry of Industry and Trade. These responsibilities included transformation of markets for energy-efficient lighting, including implementation of the IL phase-out. Then, further reorganization of the Government of Kazakhstan led to the dissolution of MINT, with most of its key functions, including those related to energy efficiency, transferred to the newly formed MID. MID thus became the national implementing partner of the project.

Throughout this process, the essential functions of the national implementing partner continued without interruption. Notably, key committees and departments dealing with technical standards and metrology, industry, and energy efficiency continued to respond essentially to the same chain of command. Three different senior representatives of MID served throughout the project as National Project Coordinator (NPC) – (1) **Alibek Kabylbay**, deputy director of the Energy Saving Department; (2) **Maksut Ordabayev**, Deputy Chairman of the Committee of Industrial Safety; and (3) **Olzhas Alibekov**, Head of Energy Saving Department. But despite these transitions at the level of personnel as well as the agency itself, communication between project staff and the NPCs also remained steady throughout the whole project period, within and outside business hours.

All three NPCs were aware of the importance of the project, and its great potential not only to save energy, but also to build capacity of professionals and officials, and to bring Kazakhstan in line with international best practice about lighting policy and technology. All three NPCs spearheaded the development and reconciliation of proposed regulatory content with other agencies. They also provided interagency coordination of working plans, expedited signing of financial documents, participation in important project events, and monitoring of pilot projects in Kazakhstan cities.

Though its full-time office was housed in the UN building in Astana, the EEL Project had a wide presence throughout the whole country via the presence of MID offices in every region of the country, as well as travel by the full-time staff. The NPCs greatly facilitated interactions and agreements with Akimat's agencies, even engaging the executive authority at the Vice Minister level when certain proposed actions required such high-level approval. It appears that excellent inter-relationships were established between the three parties, PMU, UNDP CO and MID.

The EEL project implementation strategy was developed taking into account international experience (e.g. that of the *en.lighten initiative* of GEF and UNEP) and was based on experience from similar UNDP-supported, GEF-funded projects energy efficiency projects implemented and under implementation in Central and Eastern Europe, Russia and Central Asia. For example, experience of the highly similar project in Russia has been extensively used during the project preparation phase with cooperation continuing during implementation, e.g. in regard to technical regulations and standards for the Customs Union, design of demonstration projects. The design of the project benefited heavily also from several UNDP-supported, GEF-funded projects implemented in Kazakhstan, namely from the full-size projects "Removing barriers to energy efficiency in municipal heat and hot water supply" (2007-2013) and "Energy-efficient design and construction of residential buildings" (2010 – 2015). For example, the partnership with the UNDP/GEF project on energy-efficient design and construction of residential buildings was reflected in the regional financing plans (energy efficiency programs). The link with the cities project has helped extend the EEL Project's geographic reach within Kazakhstan, insofar as the cities project has 15 partner cities throughout the country.

Overall, the project roles (Project Board, Project Manager (PM) and UNDP CO roles and responsibilities) are properly distributed in the Project Document and comply with the UNDP and GEF guidance.

The implementation approach uses the Nationally Executed (NEX) modality. This was realised in a competent manner, with the appointment of staff to create a Project Management Unit (PMU) that was independent of but answerable to the client (MINT and then MID) and both supported and overseen by the implementing agency (UNDP CO). Aside from the strong project design, another major asset of the project was its implementation team, led by the Project Manager, Mr. Syrym Nurgaliyev. Mr. Nurgaliyev oversaw all aspects of project management, including hiring and supervision of other staff and consultants; strategy, work planning, and monitoring of progress; representation of the project in contacts with partners, media, and the public; and budgetary, financial, and administrative matters. In all these aspects, Mr. Nurgaliyev was assisted full-time by Project Assistant Zulfiya Suleymenova, with support from the UNDP Country Office and the UNDP/GEF Istanbul Regional Hub.

The full-time project team also included a strong and diverse set of technical specialists, including PR expert Dinara Tamabayeva, lighting markets expert Lyudmila Teplovodskaya, and policy expert Sergey Inyutin. Ms. Tamabayeva led the project's extensive work in generating printed media, videos, print publications, and television coverage. Ms. Teplovodskaya carried out major market research studies and led the project's work on certification and labeling. Mr. Inyutin oversaw policy and standards development, and took the lead on the project's work on mercury waste management.

4.3 PROJECT IMPLEMENTATION, ROLE OF UNDP AND FINANCIAL MANAGEMENT

The support role of UNDP, as the Implementing Agency through its Country Office and RTA, has been sustained and effective throughout current project implementation, undoubtedly contributing significantly to the achievements. Its support has been particularly beneficial on a number of occasions, including the initial selection of PMU staff (jointly with MINT) through an open application process, regular monthly meetings with the Project Manager to formally review project achievements and project implementation strategy, and the RTA challenging the project's pace related to establishment of pilot project monitoring and evaluation framework, collection and analysis of baseline data, selection of pilot projects for demonstration and replication.
In addition to routine progress monitoring exercised by UNDP CO, the EEL Project has been supported by Ms. Zhanetta Babasheva, UNDP Resource Monitoring Associate, to meet UNDP procedures and accounting requirements. UNDP has several instruments at its disposal for project monitoring and steering, as well as for evaluating progress and results, including:

- Project inception workshop and report;
- Annual reporting (APR, PIR);
- Quarterly progress reports;
- Annual work plans and budgets;
- Project Board meetings;
- UNDP field visits to the project;
- Mid-term and terminal evaluations; and
- Ad-hoc evaluations and expert missions.
- Atlas issue and risks logs

As a general appreciation, UNDP CO has made effective use of the available tools for monitoring. The effectiveness of annual work plans and budgets, as a tool for monitoring and planning, was very well maintained

throughout the lifespan of EEL Project. The monitoring and evaluation (M&E) plan of the EEL Project is overall adequate for following up the outcomes and progress assessment in the achievement of project objectives. To clarify, this statement applies to the revised M&E plan of the EEL Project contained in the Inception Report, which had addressed some of the issues present in the Project Document, including revisions of several targets.
In particular, the M&E plan includes:
• midterm and end-of project targets, (mostly) SMART[33] indicators and potential data sources;
• provisions for two comprehensive studies: (a) baseline, midterm, and final market studies of lighting and associated energy consumption (to document the market availability of lamps under the phase-out, and contains calculations of energy consumption from lighting, based on data on import, domestic production, and sale of lamps, obtained from suppliers, distributors, and retailers, as well as the RK relevant Ministries; and (b) baseline and final surveys, assessing the general public's lighting awareness and preferences (budgeted);
• requirements for MTE and final evaluation (budgeted).

UNDP CO team of Energy and Environment Unit, the Project Team and teams of parallel UNDP-supported GEF-financed projects have, through their work, positioned UNDP in Kazakhstan as a highly recognized local expert organization. All key project stakeholders, including governmental agencies, appreciate UNDP not only as a source of funding but as a source of professional expertise in EE lighting.

The Evaluator found the local counterparts and the UNDP Country Office highly committed to the Project. UNDP made available office staff and financial resources. The Evaluator observed constructive working relations between UNDP and the national counterparts. The implementation approach uses the Nationally Executed (NEX) modality. This was realised in a competent manner, with the appointment of staff to create a Project Management Unit (PMU) that was independent of but answerable to the client (MINT and then MID) and both supported and overseen by the implementing agency (UNDP CO).

As for the implementing partner, it appears that excellent inter-relationships were established between the three parties, PMU, UNDP CO and MINT, as observed during this MTE[34]. The Head of the Department of New Technologies and Energy Efficiency of MINT was appointed as the National Project Director and Chairman of the Project Board in January 2013. Following internal changes in MINT, a new Project Director, Mr. Alibek Kabylbai, Head of Energy Efficiency and Saving Unit, was appointed in 2014. Finally, after yet another restructuring in the government in August 2014, the project was moved to the newly established Ministry of Investments and Development of the Republic of Kazakhstan , and Mr. Maksut Ordabaev, Deputy Chairman of the Committee of Industrial Development and Safety of the MID was appointed as the project's National Director and Chair of the Project Board (PB) and later Mr. Olzhas Alibekov, Head of Energy Saving and Energy Saving Department, MID has been serving in this capacity since October 2015. Despite these seemingly unfortunate changes in the government, MID was a successor of MINT and most of its staff remained in the new ministry. Also, in the end, the project benefited from having a higher-level government official as its Project Director that can potentially result in greater ownership of project results by the government. The PB, led by its Chairman, took a keen interest in the implementation activities and supported PMU on several critical occasions, such as amendments to the law on EE and saving, inclusion of provisions on EE lighting the Energy Efficiency Program-2020.

As expressed by the counterparts, the EEL Project enabled the development of energy efficiency lighting in Kazakhstan. The Project also generated useful learning experiences which can serve as input for future UNDP and GEF programming not only in Kazakhstan but for whole Central Asian region. All key project stakeholders, including governmental agencies, appreciate UNDP not only as a source of funding but as a source of professional expertise in EE lighting.

[33] Specific – target a specific area for improvement; Measurable – quantify or at least suggest an indicator of progress. Assignable – specify who will do it; Realistic – state what results can realistically be achieved, given available resources. Time-related – specify when the result(s) can be achieved.
[34] Mid-term Evaluation Report of UNDP-supported GEF-financed project "Promotion of Energy-Efficient Lighting in Kazakhstan"

Development assistance is an integral part of the Kazakhstan's foreign policy that contributes to the achievement of its objectives and supports its national security through effective partnership, enabling poor and undeveloped nations to realize their development goals. Recent Kazakhstani initiatives, such as the establishment of the national system of Official Development Assistance (ODA), indicates an intention to deliver solid expertise and aid to recipient countries, and bring up the developmental agenda from sporadic bilateral interactions to a new level of systematic and well-structured aid programs/projects. To promote peace and security, to date Kazakhstan has provided an estimated more than $100 million worth of humanitarian and development aid to other countries. To strengthen its role as an emerging donor, Kazakhstan intends to systematize and professionalize its efforts and align ODA with its foreign policy. The country is working to create the Kazakhstan Agency for International Development with the purpose to expand the geographical and thematic dimensions, types and formats of technical assistance to the countries in need. In December 2014, Kazakhstan adopted a law on ODA. Through joint projects with UNDP and other organizations in the major aid recipient countries - Afghanistan, Tajikistan and Kyrgyzstan, the Kazakhstan's ODA has outlined a course aimed at obtaining the know-how in development assistance and improving the skills of the administration. Subsequently, UNDP and the MFA have launched a project to support establishment of the ODA system. Assisting an expert support, the project provides an analysis of the best international experience and situation on ODA of new donors, shows the common threats and problems, although searches the effective decisions.

Financial management

The total budget in the Project Document was US$ 32,022,338, of which US$ 3,400,000 (11%) was grant-aided

Table 4: Annual project budgets as in approved Project Document, 2012-2016, in US$

Project Outcomes	***2012***	***2013***	***2014***	***2015***	***2016***	***Total***	***% Total Budget by Outcomes***
Outcome 1: Policy dev & implementation	151,900	167,620	181,920	167,320	161,420	**830,180**	***24%***
Outcome 2: Market dev for EE lighting	43,100	91,180	94,560	57,880	9,380	**296,100**	***9%***
Outcome 3: Promotion & educational outreach	79,300	83,680	94,700	93,280	82,580	**433,540**	***13%***
Outcome 4: Demonstration projects	493,500	497,620	509,220	49,120	60,720	**1,610,180**	***47%***
INV	454,600	458,200	459,400	19,200	20,400	**1,317,000**	
TA	38,900	39,420	49,820	29,920	40,320	**293,180**	
Project Implementation	45,760	58,330	46,970	81,970	46,970	**280,000**	***8%***
GEF	45,760	43,330	46,970	46,970	46,970	**230,000**	
UNDP	0	15,000	0	35,000	0	**50,000**	
Total	**813,560**	**898,430**	**927,370**	**449,570**	**361,070**	**3,450,000**	
% of Total Budget by Yr	***24%***	***26%***	***27%***	***13%***	***10%***		

by GEF[35] and US$ 28,622,338 co-financed by national and city governments, private companies, and NGOs (89%). Total project budget and work plan (Section III of the approved Project Document) includes 3,450,000 US$, of which GEF resources accounts for 3,400,000 US$ and 50,000 US$ of UNDP TRAC. The original planned budget is shown in Table 4 below.

Each year a new annual budget has been prepared for the next year and submitted for approval to the Project Board in the form of Annual Work Plan. These annual budgets as shown in AWPs are summarized in below. By the end of the project it does not go beyond the permitted threshold of 10% (earlier there was a remark from MT evaluators about possible exceeding). The main disbursements were done in procurement area, thus in Outcome 1 the contractual services make up for 58%, expenses for international consultants make up for 11%, in the Outcome 2 – the contractual services make up 51%, and expenses for international consultants make up for 15%, in the Outcome 3 – the contractual services make up 51%, expenses for publication make up for 20%, in the Outcome 4 – the contractual services make up 80%.

Table 5: Annual project budgets as approved by Project Board, in US$, 2012-2017

Project Outcomes	*авг.12*	*2013*	*2014*	*2015*	*2016*	*2017*	*Total*	*% of Total Approved Budget per Outcome*
Outcome 1: Policy dev & implementation	50 100,00	247 359,00	357 799,00	347 389,00	121 388,00	60 300,00	**1 184 335,00**	**143%**
Outcome 2: Market dev for EE lighting	19 150,00	134 226,00	47 204,00	67 704,00	82 205,00	38 800,00	**389 289,00**	**131%**
Outcome 3: Promotion & educational outreach	21 200,00	126 860,00	143 220,00	58 720,00	53 035,00	44 000,00	**447 035,00**	**103%**
Outcome 4: Demonstration projects	0,00	102 950,00	385 650,00	196 150,00	371 681,00	85 000,00	**1 141 431,00**	**71%**
INV	0,00	77 000,00	315 400,00	129 000,00	274 151,00	70 000,00	**865 551,00**	66%
TA	0,00	25 950,00	70 250,00	67 150,00	97 530,00	15 000,00	**275 880,00**	94%
PMU:	33 050,00	53 320,00	46 660,00	44 360,00	86 691,00	23 829,00	**287 910,00**	103%
GEF	26 050,00	45 320,00	46 660,00	9 360,00	86 691,00	23 829,00	**237 910,00**	103%
UNDP	7 000,00	8 000,00	0,00	35 000,00	0,00	0,00	**50 000,00**	100%
Total	***123 500,00***	***664 715,00***	***980 533,00***	***714 323,00***	***715 000,00***	***251 929,00***	***3 450 000,00***	100%

Annual budget and disbursements are typical of a normal project cycle, with a lower allocation in the first year while the Project got up to speed, establishing the necessary infrastructure, contracting staff and consultants etc., following by years of higher investments (Table 6) Total project expenditures over the project implementation

[35] GEF grant for PPG amounted to 77,000 US$ with matching co-financing of 90,000 US$ from the government.

period, August 2012 - May 2017, are 3,450,000 US$, of which GEF resources account for 3,400,000 US$ and UNDP TRAC resources for 50,000 US$.

Table 6: Annual project disbursements by outcomes, 08/2012 – 05/2017

Project Outcomes	*авг.12*	*2013*	*2014*	*2015*	*2016*	*2017*	*Total*	*% of Total Approved Budget*
Outcome 1:Policy development & implementation	42 115,35	248 666,80	330 541,54	138 190,26	121 281,07	60 300,00	**941 095,02**	79%
Outcome 2: Market dev for EE lighting	18 054,53	133 858,20	45 446,87	24 147,78	79 354,70	38 800,00	**339 662,08**	87%
Outcome 3: Promotion & educational outreach	18 204,14	127 864,75	167 811,98	82 412,50	53 807,77	44 000,00	**494 101,14**	111%
Outcome 4: Demonstration projects	2 300,000	103 272,97	408 542,38	308 546,02	425 190,94	221 607,86	**1 469 460,17**	129%
INV	0	77 535,40	353 718,74	248 984,00	290 060,64	170 307,22	**1 140 606,00**	132%
TA	2 300,00	25 737,57	54 823,64	59 562,02	135 130,30	51 300,64	**328 854,17**	119%
PMU:	28 903,56	46 991,76	34 825,06	48 080,47	23 034,30	23 846,44	**205 681,59**	71%
GEF	21 902,97	39 006,33	34 825,06	13 066,49	23 034,30	23 846,44	**155 681,59**	65%
UNDP	7 000,59	7 985,43	0,00	35 013,98	0,00	0,00	**50 000,00**	100%
	109 577,58	***660 654,48***	***987 167,83***	***601 377,03***	***702 668,78***	***388 554,30***	***3 450 000,00***	***100%***

The project was subject to three financial audits in 2013[36], 2014 and 2015. All three financial audits had "no comments or observations" and provided the overall satisfactory rating across the following audit areas: (i) review of project progress; (ii) human resources; (iii) finance; (iv) procurement; (v) asset management; (vi) cash management; (vii) general administration; (viii) information systems; (ix) follow-up on previous audits. The audits confirmed that the project has been implemented in accordance with UNDP accounting requirements.[37]

4.4 PROJECT RESULTS

GEF Tracking Tool (TT)

[36] This audit report covers years 2012 and 2012 of cumulative spending of 600,000 US$ and above.

[37] Financial audit report and management letter. Audit report of the Project "Promotion of Energy Efficient Lighting in Kazakhstan" (2012-2013). Fabel, Werner & Schnittke GmbH
Financial audit report and management letter. Audit report of the Project "Promotion of Energy Efficient Lighting in Kazakhstan" (2014). Fabel, Werner & Schnittke GmbH

The Terminal GEF Tracking Tool (TT) reports 11,520,000 MJ of lifetime energy saved (vs. the end-of-project target of 10,800,000,000 MJ as reported in GEF TT at CEO endorsement). The reported fuel savings realized from the government ban on the use of incandescent lamps 2012 and 2016.

Thus, the total direct emission reduction is 47,062 t CO2, exceeds by 1.5 times the planned target (vs. 31,329 t CO2 equivalent in CEO Endorsement TT), energy saving is 50 GWh, exceeds by 1.5 times the planned target (33 GWh) respectively (see Annex 12). The indirect energy savings amount 4 14 GWh, exceeds the planned target (1607 GWh) 2,6 times and indirect 3964 thousand t CO2, exceeds by 2,6 times the planned target (1495 GWh) respectively, for the period of the UNDP-supported GEF-financed project implementation (2013-2027). The analysis of the results revealed that the greatest effect on reducing greenhouse gas emissions was achieved in the implementation of modernization of street lighting and especially of the building surrounding ground, and then healthcare facilities, it is recommended to replicate such projects. Monitoring of energy saving is necessary on annual basis per the indications of electric meters and bills for payment. Monitoring of GHG emissions reduction depends on CEF i[38]ndicators. This indicator should be monitored; it is recommended to use CEF officially adopted indicators at the national level. In addition to the effect of energy saving and reduction of GHG emissions, there is a substantial savings in cash to prevent the acquisition and replacement of lamps in the baseline case.

In terms of the policy aspects, the terminal evaluator believes that the rating 5 (policy/regulation/strategy enforced) is given due to the project invested considerable efforts in designing and revising relevant policies and regulations that await adoption.

Outcome 1: Policy development and implementation

On January 13, 2012, President Nursultan Nazarbayev signed a new national law entitled "On Energy Conservation and Increasing of Energy Efficiency." This law mandates the gradual phase-out of high-wattage lamps in Kazakhstan, including essentially all incandescent lamps, as follows:

- lamps of 100 watts and above banned starting from July 1, 2012;
- lamps of 75 watts or more banned starting from January 1, 2013; and
- lamps 25 watts and above banned starting in 2014.

The mandate was a very strong first step, but orderly, complete, and effective implementation has required development of extensive additional policy – including codes and regulations, standards, and programs. The EEL project has provided comprehensive support to MID and other agencies in all these areas, with the following results.

- Adoption of **seven mandatory standards** on specific lighting technology and applications, including LEDs
  - RK GOST R 54815 LED lamps with built-in controls for general lighting at voltages above 50 V. Performance requirements;
  - RK GOST R 54943 Buildings and facilities. Method for determination of discomfort under artificial lighting of facilities;

[38] CEF indicators

years	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
tCO2/Mwh	1	1	0,99	0,95	0,95	0,95	0,95	0,95	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91

  - RK GOST R 54945 Buildings and facilities. Methods of measurement of the pulsation light coefficient;
  - RK IEC / TS 62504 General lighting. Light-emitting diodes and modules. Terms and definitions;
  - RK GOST R 54305 Public roads and highways. Horizontal illumination from artificial lighting. Technical requirements;
  - RK GOST R 54308 Public roads and highways. Horizontal illumination from artificial lighting. Methods of control; and
  - RK GOST R 54984 Outdoor lighting of railway facilities. Norms and methods of control.
- Issuance of a decree by MID on March 31, 2015, setting new requirements for minimum light efficiency of LED lamps, as well as **new performance requirements for all lighting procured by state agencies** for both buildings and street lighting.
- Advocacy for inclusion of EE lighting investment in the **national strategic program for 2020**, which helped shape objectives for regional and municipal programs and budgets.
- Delivery of needed testing equipment and training to five testing laboratories responsible for **verifying the compliance of lighting products with new requirements.**
- Delivery of needed equipment and other assistance to MID's Institute of Metrology, which is responsible for **accrediting these laboratories.**
- Amendments and additions to national energy efficiency law, adopted in January 2015, allowing for **implementation of energy performance contracts by energy service companies, including in the lighting sector.**

Outcome 2 Market development

With the implementation of the phase-out of high-wattage lamps, a large segment of the consumer market in Kazakhstan has shifted from incandescent to compact fluorescent lamps (CFLs). Rising use of CFLs has led in turn to a new challenge – containment of mercury from spent lamps.

Mercury (Hg) is highly toxic, a serious hazard to humans and many other organisms. Both older-generation and newer, more efficient fluorescent lamps contain mercury in vapor and/or powder forms. Therefore, proper containment of spent Hg-containing lamps is a vitally important consideration for public health and environmental protection.

Before 2013, Kazakhstan had no systems for collection and recycling of Hg-containing wastes in the residential sector. Then the city administration of Astana and the EEL project jointly launched a pilot project on collection and safe processing of Hg-containing lamps from the public. The city administration purchased 100 containers for the collection of linear and compact fluorescent lamps, as well as batteries. The containers have already been installed in 50 public areas in the city. The EEL project provided informational and promotional support, through a video aired in movie theaters and television, as well as posters and instructions in both Kazakh and Russian.

The project has supported the replication of residential mercury waste collection in the Mangystau and Kyzylorda regions, with the purchase and installation of containers, as well as the delivery of education and promotion among the public. Such containers are gradually being installed in public areas of Almaty as well. Across the country, as of July 2016, the EEL project has **prevented the uncontained disposal of 9.67 million fluorescent lamps.**

Outcome 3 Promotion and educational outreach

The project has delivered extensive technical assistance and training to professionals and decision makers on EE lighting, including the following.

- **Publication of a technical manual** for design of energy efficient electric lighting, which was then approved for use by higher educational institutions.
- **Creation of a new system for conducting of lighting energy audits**, including development of methods, training of auditors, publication of a training manual, and purchase and delivery of a training booth for the national Center for Energy Efficiency in Housing and Communal Services
- **Training for building energy managers** on EE lighting
- **Seminars in educational institutions** in five cities of Kazakhstan on EE lighting technology, as well as safe disposition of mercury from spent lamps.
- **Press briefings and media training** in seven cities on EE lighting and new programs
- **Direct technical assistance to the city administration of Almaty** on modernization of its public lighting network

The project also promoted EE lighting widely among the public via original videos (the abovementioned information about the mercury-lamp collection program, plus four others on other themes), aired in movie theaters and on television; booklets, leaflets, and infographics; a website and social media outreach; and participation in exhibitions and events. In total, it is estimated that the project reached at least **1.5 million viewers** with its videos and around **1 million viewers, readers, and trainees** with seminars, media training, and television coverage.

Finally, and not least, the EEL project also implemented a temporary program to promote LEDs among the public, combining informational promotion with **access to coupons for 50-percent discounts on qualifying LEDs**. This effort led to the sale of 3,000 LED lamps, leading to lifetime energy savings of 5,708 MWh and GHG emission reductions of 5422 tons of CO2.

Outcome 4. Demonstration projects embodying best practices and technology.

The EEL project has conducted several pilot projects throughout Kazakhstan to demonstrate, document, and promote the cost-effectiveness and other benefits of energy efficient lighting, in both indoor and outdoor spaces. These projects included the following.

Indoor lighting:

- Modernization of lighting in 41 classrooms in seven schools in six cities and villages of central and eastern Kazakhstan, involving replacement of 100W incandescent lamps and their fixtures with 42W linear fluorescent lamps. The project then supported similar lighting upgrades in four other schools in the cities of Aktau and Kyzylorda, plus a school for visually-impaired students in Semey, under UN joint programs with the Mangystau and Kyzylorda regional administrations.
- Installation of efficient lighting systems for stairwells and common areas in a large residential building complex in Karaganda.
- Modernization of lighting from incandescent to LEDs in health-care facilities in Ust-Kamenogorsk, Aktau, Kyzylorda, and Fort Shevchenko.
- Delivery of direct technical support for lighting upgrades to the headquarters building of MID, which have been approved and will lead to the prevention of more than 5,445 tons of CO_2 emissions.
- A special integrated project on narrow-spectrum LED greenhouse lighting in the village of Arnasai. This technology is highly energy-efficient relative to other supplemental greenhouse lighting. It also reduces the vegetative period of crops by half, increasing the local availability of vegetables for a local school canteen and other customers in winter. Highly innovative for Kazakhstan, this project is attracting research attention from the national Agrarian University and Nazarbayev University. Thus, the project addresses several of UNDP's sustainable development goals – climate change mitigation, food availability, and innovation -- all at once.

Street lighting:
The EEL project has implemented street lighting upgrades on several streets in five cities of Kazakhstan, replacing 250W high-pressure sodium lamps with LED fixtures and 157W lamps. These upgrades also included new systems for monitoring and control. After the upgrades, energy consumption dropped by an average of 53 percent even as lighting levels and quality improved, with bright white light replacing yellow. The respective municipal agencies are witnessing huge financial savings, not only from reduced energy bills, but from reductions by up to 35 percent in maintenance costs.
Apart from street lighting, the EEL project also implemented lighting upgrades in 594 entryways and courtyards around residential and office buildings in six cities (Lisakovsk, Uralsk, Almaty, Astana, Aktau, Satpayev). The project replaced more than 3300 lamps ranging from 60 to 250 watts with LEDs of 4 to 21 watts.

Mainstreaming UNDP priorities:

There are no activities planned in the project design to address gender issues, and other developmental goals such as women's empowerment, income generation and improved governance. There are opportunities however in this regard under the new UNDP-supported GEF-financed project on Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan[39].

Cost effectivenes.

Most of GHG emission reductions in the project are planned to be achieved from direct realization of demonstration projects as well as replication efforts and market transformation following the adopted or expected to be adopted regulations, yielding highly cost-effective results. A summary of total disbursements vs. the budgeted costs is provided in Table 7 below. The project is cost-effective and procured best available services and goods by balancing the quality of submitted offers/proposals and financial offers. The project is also considered to be cost-effective because of strong synergies between similar projects in 4 countries.

In terms of consultancy costs, the project has disbursed 175,758 US$ for international consultants (or 46% of originally budgeted resources) and 305,474 US$ for local consultants, (or 65% of originally budgeted resources) to implement component related activities.

Table 7. Actual disbursement of selected cost items vs. originally budgeted costs.

Cost Item	2012-13	2014	2015	2016	2017	Total	% of allocated GEF amount
International consultants	120,582.00	0	19,000.00	7,676.52	28,500.00	175,758.52	46%
Local consultants	132,548.000	94,910.00	29,689.00	16,127.02	32,200.00	305,474.02	65%
Contractual services	281,657.00	666,040.00	38,982.00	471,999.87	244,496.88	1,703,175.75	96%

[39] See Section 5. Conclusions and Recommendations.

Travel	32,267.00	47,000.00	4,718.00	53,293.29	17,623.00	154,901.29	81%
Workshops	41,830.00	85,000.00	2,409.00	50,579.88	27,000.64	206,819.52	445%

Other important project costs include contractual services, travel and workshops. The TE noticed an overspending for the workshops due to expanding the project work with replication piolot projects in planned 4 regions up to all 16 regions of Kazakhstan[40]. It is also observed by MTE that most likely workshop participants' travel costs had been charged to the workshop accounting line, which was not assumed in the original budget. In addition the EEL Project has delivered extensive technical assistance and training to professionals and decision makers on EE lighting. Other than that, the evaluator observed no discrepancies.

4.5 RATING OF THE RESULT INDICATORS

This Section is organized in a line with the 4 outcomes: for each one the extent of achievement of the planned outputs is described based on a quantitative assessment of the planned end- of -project targets in May 2017[41].

Outcome 1: Policy development and implementation supports effective IL phase-out, expansion of market share and use of EE lighting, and safe disposition of spent Hg-containing spent lamps

Indicator: 1.1. Implementation of incandescent-lighting phase-out

Delivery of the main planned outputs

The project indirectly contributed to the adoption of the "Law on Energy saving and increasing energy efficiency" (2012), even though it was passed before the project started. The key stakeholders from the MID confirmed that the project preparation process incentivized them to accelerate the adoption of the Law and consultations during the preparation of the Project Document also contributed to its content. After the passage of the Law the project contributed to the elaboration of the State program "Energy saving - 2020" in the parts related to the regulatory framework stimulating activities and disposal of mercury-containing lamps. The program was approved by the Government in August 2013. Amendments and additions to Energy Efficiency Law of the RK 279-V dated January 14, 2015 have been proposed and adopted allowing for implementation of energy performance contracts by ESCOs, including in the lighting sector. The project's contribution was highly valued by the stakeholders interviewed as part of this TE.

Extent of achievement of planned targets

The end-of-project target, namely "**Phase-out implemented in stages and documented (100W bulbs phased out by 2013, 75W bulbs by 2014, and 25W bulbs by 2015)**" has been met. Although the cases of relabeling by the importers, unauthorized sales of the banned lamps are common. As for information of Prosecutor's office 24,254 cases of procuring IL through the Government procurement processes were recorded during 2016.

Indicator 1.2 Requirements of technical standards for EE lighting

Delivery of the main planned outputs

The project supported the Kazakhstan Institute for Standardization and Certification in developing seven (7) national technical standards on lighting. All below standards were developed and approved, namely:

- Art RK GOST R 54815 LED lamps with built-in controls for general lighting at voltages above 50 V. Performance requirements;

[40] See Section 4.5 RATING OF THE RESULT INDICATORS

[41] See Annex: Extend of Achievements of End-of-project Targets for Objective and Outcomes of the EEL project

- Art RK GOST R 54943 Buildings and facilities. Method for determination of discomfort under artificial lighting of facilities;
- Art RK GOST R 54945 Buildings and facilities. Methods of measurement of the pulsation light coefficient;
- Art RK IEC / TS 62504, general lighting. Light-emitting diodes and modules. Terms and definitions;
- Art RK GOST R 54305 Auto-roads of public use. Horizontal illumination from artificial lighting. Technical requirements;
- Art RK GOST R 54308 Auto-roads of public use. Horizontal illumination from artificial lighting. Methods of control; and
- Art RK GOST R 54984 Outside lighting of railway vehicle objects. Norms and methods of control.

To facilitate and strengthen the national compliance system for the adopted standards for domestically produced and imported lighting equipment, the project has identified the list of certified testing laboratories for domestic lighting market products, conducted their capacity assessment, and strengthened capacity building plan, including the needs in specialized testing equipment. The standards are included into the state registry of technical regulation system.

Extent of achievement of planned targets

The End-of- project target, namely "**Technical standards developed, adopted, and enforced for EE lighting**", is met. The accepted technical standards are the national and voluntary and for Kazakhstan came into force in July 2015. Due to the Regulations of the Eurasian Union only documents accepted within the Customs Union are being the actual norms. In this regard, in 2014, the Project Board and the Executive Agency decided to start the process of norms acceptance at the national level, since acceptance of the mandatory norms was taking very long time because of the very prolong negotiations and coordination, and time-consuming bureaucracy of the Eurasian Union and lobbying of various interests of large companies in lighting market.

Indicator 1.3 Code requirements for energy performance of lighting in buildings

Delivery of the main planned outputs

Recommendations for the Committee on Construction and Communal Services (as well as other organizations) related to the new requirements and other norms were developed. In particular, MID introduced the draft amendments to the legislation of the RK on the issues of Energy Service Contracts (ESCOs). Project contributed to the drafting of the "Law on the changes and additions in relation to the matters concerning Energy Saving" (RK №279-V from the 14 January 2015) with an analysis on using ESCO model for EE lighting. This Law defines the term ESCO as a juridical term and defines an unified format for ESCO contracts. Additional research on the assessment of the LED lighting impact on human organism was carried out with the agreement of the Ministry of Healthcare of the RK. Draft amendments into the existing sanitary regulations have been prepared jointly with the Sanitary and Epidemiological Expertise and Monitoring Republican State Enterprise of the Ministry of Health (MoH) of the RoK and formally circulated within the GoK for comments. All the interested governmental agencies and organizations had agreed upon. The approval is expected in June-July 2017. At the same time this document is not an indicator. Along the project progress it was found out that it was necessary to amend the SanPin.

In pilot projects on lighting modernization in schools it was found out that norms are not complied with and it is related to the outdated SanPin because of which it was not porssible to use the modern technologies.

In 2014, recommendations for the Committee of Construction and Communal Services and other related organizations in relation to the new requirements and/or recommendations towards the norms of lighting and/or

other normative documents were developed. The recommendations were developed for the changes to be introduced in the relevant SNiPs, and as it is happening within the framework of the Customs Union as part of the efforts on setting an unified Set of Rules that might take some time.

The suggested documents of SanPin are accepted by the Health Ministry and got all the approvals. There remained only final procedures on signing the SanPin within two months from June-July 2017. The Committee for the Governmental affairs accepted SNiPs and now it is going through internal consultations with other interested governmental agencies, since there are procedures which should be followed within the Customs Union (in acoordance with the general requirements of the SNiP of the Eurasian Union).

Development and delivery of recommendations to RK Ministry of Health on standards for light quality from LEDs were competed but not yet formally submitted to the RK Ministry of Health and approved.

Extent of achievement of planned targets

The End-of-project target, namely "**Additional revision of SNiP 2.04-05-2002 ("Artificial and Natural Lighting") and others for greater energy efficiency, including recommendatory section**", is partialy met. Committee for Construction of the MID RK brought up for discussion the construction norms: (CR RK 2.04-104-2012) –for general and artificial lighting in which it is required to use the most economically efficient lamps with the light output more than 70 lumen/Wt, LED - more than 90 lumen/Wt. More stringent code requirements, 90 lumen/Watt, have been proposed and included in the new draft code, which is currently undergoing internal clearance in the Government. It is planned to have new codes accepted within 2 months by July 2017. The key challenge with meeting this target was related to the lengthy processes associated with the discussions at the level of the Customs Union. There is an additional concern of fragmented revisions of the SNiPs supported under various UNDP/GEF projects (NAMA in this case) and perhaps a different strategy could be more efficient (e.g. a new unified SNiP; such an idea is being analyzed currently under NAMA).

Indicator 1.4 Procurement of energy-efficient lighting by public agencies

Delivery of the main planned outputs

An overview of the current situation in the RK in the field of procurement of EE lighting fixtures was prepared based on the analysis of the provisions of existing Law on public procurement and the provisions on the regulations pertaining to the procurement by regional governments and major state-owned enterprises. MID was assisted with drafting a Decree, subsequently adopted: MID decree № 415 (31/03/2015) stipulates that state procurement needs to comply with the newly adopted requirements for the lighting products for outdoor and indoor lighting.

The Law of the Ministry for Investments and Development of the RK 415 dated March 31, 2015 (valid as a decree of the RK) has approved the following:
- requirements to minimal light efficiency of LED lamps;
- new requirements to the lighting fixtures of indoor lighting in public and administrative buildings;
- new requirements to lighting fixtures for lighting the housing objects - new requirements to lighting fixtures for street lighting.

Extent of achievement of planned targets

The End-of-project target ("**Observance of recommended procurement guidelines by at least two national agencies or other bulk purchasers**") is met.

State procurement is implemented without consideration of energy efficiency and energy saving requirements. In this regard the Project had initiated a number of trainings for procurement administrators. Trainings resulted in capacity increase of the officials responsible for state procurement for Akimats. Trainings were given all over RK regions. The project also substancialy raised awareness among representatives of prosecution department, officials

in charge of state procurement. The Law of the Minister for Investments and Development of the RK 415 dated March 31, 2015 (valid as a decree of the RK) has approved the following:
- requirements to minimal light efficiency of LED lamps;
- new requirements to the lighting fixtures of indoor lighting in public and administrative buildings;
- new requirements to lighting fixtures for lighting the housing objects;
- new requirements to lighting fixtures for street lighting.

The above reqyuiremnets give a flexibility to procuremnet department for selection suppliers and if the condition of the requiremnet are not met it allows the proremnet departments to cencel those supliers further participation in the tendering process.

Indicator 1.5 State policy and program on mercury (Hg) containment and recovery

Delivery of the main planned outputs

An analysis of the existing schemes and systems for managing mercury-containing waste was prepared, and proposals for the application of standard schemes and mechanisms of disposal of used fluorescent lamps in the regions (Akimats) were formulated.

In 2013, a National Program for Mercury Lamp Utilization (as envisioned by the ProDoc and Inception report) was developed and tentatively approved for 2013-2015, but the start of its implementation was halted by the then Ministry of Environmental Protection, based on the negative feedback from the Ministry of Economy (due to perceived high levels of funding requested by the regional Akimats over and above the local budgets). Instead, the ideas and proposals developed by the project were included in the Program on modernization of solid waste management (SWM) system of 2014 – 2050 (approved in 2014), in the part concerning the collection and recycling of mercury-containing lamps. Project proposals were included also in the draft of state standard on accounting and control of the movement of mercury waste, ensuring strict accounting of materials, devices and equipment containing mercury, with full collection and control of mercury-containing waste.

The recommendations developed by the project were "tested" under the pilot project in Astana city (since 2014) with 297 containers at 100 sites in the city for intake of the spent mercury linear and compact fluorescent lamps and batteries. Later this pilot mercury utilization program has been implemented and replicated in two other regions of Kazakhstan, Mangystau and Kyzylorda. In Astana, the utilization from population is 100 % covered. In two other regions, it covers 60%. According to the market analysis the share of mercury lamps in Kazakhstan market decreased, thus, in 2015 there were 13 million mercury lamps. In 2016 it dropped to 7,6 million. Within the period from 2012 to 2016 there were 53,8 million mercury lamps imported into the country. With such a big quantity of mercury lamps it is necessary to upkeep the development of system of utilization of mercury lamps from people. In this regard by 2017 1,276 containers for mercury lamps collection were used in 9 regions. The quantity of the collected and utilized lamps was 11,24 mln lamps (3,6 mln for the reported period).

Extent of achievement of planned targets

The end-of-project target, namely "**Processes for collection of mercury wastes operating nationwide; at least three regional programs for collection of mercury wastes in place, with documented 50 percent recovery of mercury from spent lamps**" is met regardless of the reasons of external nature and also the worsening of the financial standings of the akimats. It is important that the project proposed a mechanism to ensure that the successful experience (e.g. in Astana) was shared with all the akimats – both at the level of regions (oblast) and below. Project also created a good basis for understanding by the Government an introduction of a more effective national system for collection, storage and disposal of mercury lamps.

Rating for Outcome 1: The rating for this Outcome is S (Satisfactory) because regardless for the reasons of external nature. e.g. reversal of the position of the Ministry of Energy in part concerning development of the regional plans for the safe collection of mercury containing lamps, lengthy review process of the drafts documents at the level of Customs Union, etc. the project mainly met its targets for most of its indicators.

Highly Satisfactory	**Satisfactory**	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

Outcome 2: Increased accessibility and market share of EE lighting

Delivery of the main planned outputs

To assess the accessibility and market share of EE lighting the EEL Project developed the following: (a) an assessment of basic power consumption and the number of light points in the lighting structure of the following various sectors; (b) scenarios on market development in Kazakhstan, including a quantitative assessment of the use of light products, electricity consumption and the potential of market transfer, energy saving and reduction of GHG emissions because of the strategies developed for 2013-2018; and (c) options for the stimulation of the market of EE lighting products. Regarding the latter, a pilot discount program has been implemented to stimulate the purchase of LED lamps by the population leading to additional sales of 3,000 LED devices by the population.

The project assisted the Committee on Technical Regulation in the development of recommendations on labelling of the lighting products to be considered in the framework of the Customs Union. The project assisted with the development of 2 sets of proposals (a) labeling of power consuming fixtures, including lamps, in the form of the Draft of the Customs Union technical regulations on "Informing consumers about energy efficiency of electrical power consuming devices"; and (b) Draft technical regulations on "Requirement to energy efficiency of power consuming devices"[42].

Since 2013 there started preparation of the Technical Regulations and the process of amendments or coordination between the CU countries took all this period. In 2013 there existed the unified Technical Regulations which combined two components (a) and (b). During 2013 and 2014 it was under the process of agreement with the CU countries. In 2015 at the Committee for consideration of the Technical regulations of the Customs Union it was decided to divide one document into two different ones. In this regards the agreement process got a new cycle within the countries of the Customs Union.

Extent of achievement of planned targets

Indicator 2.1: Market share of incandescent lamps, CFLs, and other types of conventional and energy efficient lighting.

The first **End-of-project target** "**Incandescent lighting is no longer sold for conventional applications in Kazakhstan"** is met as incandescent lighting is no longer sold for conventional applications in RK. According to the market research the incandescent lamps cover 17% of all the lighting in buildings. Although it might take place due to use of incandescent lamps up to 25W are still permitted in Kazakhstan.

The second **End-of-project target** "**LEDs are available for indoor and outdoor applications nationwide and account for 6 percent total national market share for lighting**." is met as LEDs already account for 52 percent of the market for light sources and this has surpassed the target set for end of project.

Rating for Outcome 2: Outcome 2 is rated as Highly Satisfactory as all the end-of-project targets are met.

[42] The proposals were developed based on the accepted international methodologies using the European Directive on ecological design (EU Regulations 244/2009, 245/2009 and 347/2010) and European Directive on labelling lighting products (EU 874/2012).

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

Outcome 3: Increased familiarity among diverse stakeholders with EE lighting and associated issues

Delivery of the main planned outputs

A) The population

The following were the main means of the public awareness campaign:

- **Media Training and TV talk shows**. Media training in the regions of Eastern and Southern Kazakhstan for journalists regarding the use of multi-media tools in discussions and writing on EE issues. In 2015 seminars and media-trainings were conducted in Kyzylorda, Aktau, and Shymkent cities. In Kyzylorda, , Aktau and Shymkent the project participants took part in the TV talk-show where they were answering questions about energy efficiency (about 400 000 people covered). Also, there was a regional media-training in Bishkek, Kyrgyzstan which involved journalists from various Kazakhstan media. Knowledge received from the training resulted in numerous articles both in newspapers and Internet resources. (about 500 000 people covered). In 2016, a large media-training took place in Yerevan, Armenia. Journalists from Kazakhstan and Armenia had an opportunity to interact with the representatives of UNDP Kazakhstan and UNDP Armenia, learn more about the project and its achievements and findings. Both Kazakhstan and Armenian journalists reflected the information and interviews in their articles in newspapers, Internet resources, and TV interviews. (about 800 000 people covered). The amount of reached audience through the seminars, media-trainings and its coverage in media and TV by years was the following: from 2013-2014 – 250,000 people; from 2014-2015 – 150,000 people; from 2015-2016 – 1,345,000 people.
- **Video clips:** A video clip calling for the proper disposal of waste mercury-containing lamps has been prepared and played in the network of Kinopark cinemas; also, the municipal authority of Astana city held airplay on TV channels. A video clip on the benefits of EE lighting, and several other videos (including a cartoon and a 3D video) were prepared, passed on to MID and played on state TV channels. Nowadays this video is being promoted in trade centers, buses, train stations, and other public locations of Astana. In total about 800 000 people has been reached. Total rotation of utilization video has been the following: from 2013-2014 – 620,000 people and from 2014-2015 – 200,000 people.
  Also, there had been made video about EE lighting advantages. The video was submitted to the MINT, and it was shown on state channels. It is having been regularly promoted during project events. (about 700 000 people covered. Total rotation of energy efficient lighting video on TV and project events was the folloing: from 2013-2014 – 600,000 people and from 2014-2015 – 170,000 people.
- **Seminars in educational institutions**: A series of seminars in 5 cities of Kazakhstan on the outcomes of demonstrational projects on the implementation of EE lighting and utilization schemes of mercury lamps from the population has been conducted.
- **Off-line and on-line materials destribution**: Brochures, informational materials, infographics were prepared and distributed among participants of seminars, conferences, contests, public events, and flash-mobs. EE lighting awareness installations had been made and distributed among project partners.
  The EEL project website and Facebook (FB) page were launched. Both were regularly updated. Since April 2016 FB became main on-line tool used by the Project due to its populariry and higher use. The counted reach of audince through distribution of printed materials by years was counted as the following: from 2012-2013 – 1,000 people; from from 2013-2014 – 7,000 people; from 2014-2015 – 2,000 people and from 2015-2016 – 4,000 people.

- **Other activities** related to promotion of energy saving ideas. (about 10,000 people covered) included: contests, infographics on introducing energy-efficient street lighting and on disposal schemes of mercury-containing lamps; Celebration of Environment Day with the participation of students from 5 schools, etc.

The products on awareness-raising are overall adequate. Two remarks are warranted:

- The M&E of the effectiveness of these products could have been better (e.g. in the form of inserts into published material, real time capturing of the opinions of TV audiences, etc); and
- The effectiveness of the video campaign on the benefits of EE lighting would have been higher if it happened after the adoption of the standards. A baseline sociological study about people's awareness and attitude towards EE lighting was conducted. It showed that only 30% of population was informed about EE lighting, and the information was mostly of general nature; the awareness level about types, possibilities and advantages of EE lamps was still low.

B) Lighting sector professionals:

The following were the main avenues for the awareness raising/training of lighting sector professionals:

- **Structured training**: The Project channels the training for the professionals (energy managers, energy auditors) through the Center on Energy Efficiency in Housing and Communal Services (and its regional branches) in 6 regions in Kazakhstan; About 500 people has been covered: from 2013-2014 – 350 people and from 2014-2015 – 150 people.
- **Demonstrations and discussions** on the designed training module for energy audit of lighting systems in buildings, structures and street lighting have been carried out. Trainers of energy auditors were trained according to the study module for energy audit of lighting systems in buildings, structures, and street lighting;
- A **textbook** on electric lighting and energy efficiency for the higher educational institutions was developed and approved by the Republican Methodological Center of the Ministry of Education;
- **Handbook** for the energy auditors for buildings, constructions and street lighting has been prepared and approved by scientific and technical Council of Almaty Institute of energy and communication and recommended for teaching. A Tutorial on Energy Efficient Electric Lighting has been prepared for institutions of higher education. Manual for electrical lighting and energy efficiency was developed and approved for the higher educational institutions.
- **Participation in exhibitions;**[43] and
- **The website (**www.eep.kz**)** developed with joint efforts of 3 UNDP-supported GEF-financed projects in Kazakhstan (paid for by 2 project: Energy efficient design and construction of residential buildings, including the current project) to disseminate the relevant project products, including those related to training.

According to the project partners and trainees interviews, the toolkit/training module for EE lighting of buildings and outside lighting were adequate and effective for application in the process of training energy managers. Unfortunately the project has not tracked the feedback from the trainees.

Extent of achievement of planned targets.

[43] Within the framework of the third Kazakhstani International Exhibition on Lighting, Illumination Engineering and LED technology held on October 29-30th 2013, the Project carried out a site-event on the theme of Shaping the Regulatory Framework in the Lighting Industry

Indicator 3.1 Awareness of general public about advantages of EE lighting, rating and labeling systems for lighting, and proper handling of spent mercury-containing lamps, as measured by quantitative scoring of survey data. Coverage of outreach campaigns, in terms of population.

The first **End of project target** "**Outreach campaigns conducted, reaching 6.5 million citizens**" is met as campaigns conducted has reached in total **6,790,000 people** and this amount has surpassed the target set for end of project.
The second **End-of-project target** "**Fourty (40) percent of overall population is aware of advantages of EE lighting, rating and labeling systems for lighting, and proper handling of spent mercury-containing lamps**" has been met.

Rating for Outcome 3: Outcome 3 is rated as Satisfactory as the end-of-project targets were not only met but surpassed. There was a large variety of the activities related to public awareness raising and training for the energy managers and professionals.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

Outcome 4: Increased investor confidence, design and administrative capacity, and market share of EE lighting as a result of demonstration projects

4.1. Energy savings and GHG emissions reductions from EE upgrades of lighting in selected public buildings or street-lighting projects

Delivery of the main planned outputs:

Considering each stage of the project separately, the following results can be noted in the course of monitoring: as for the first stage of the project implementation, concidering period from 2013-2014, GHG emission reduction amounted to **11,460 tons of CO2** as for the following project activities during the mentione period:

Schools:

- **Lighting audit** was conducted in selected schools in 6 villages of Kazakhstan for LEDs and CFLs to be installed with financial and technical support of Kazakh private producers,
- **Lighting modernization to LED** was performed in 24 classrooms in Central and Eastern Kazakhstan. Energy saving is 1,876 MWt/h, estimated 1,834 tons of CO2 emissions prevented. Together with UN Joint program of Mangistau and Kyzylorda and the regional akimats the lighting systems were upgraded in 4 schools with ES around 3,179 MW/h, preventing 3,053 tons CO2 emissions.

Replication: Lighting modernization in the school for children with impaired vision was funded by the Project partners, namely by Kazakhstan lighting producers. The replication of lighting modernization in the rest of classrooms is initiated by the city authorities and should be funded from the local budget. In Central Kazakhstan, municipal authorities have budgeted funds for the modernization of lighting system in all schools in the city of Kokshetau**.** However, due to the financial crisis this issue is pending.

Building

New residential building was equipped with efficient public lighting system resulting in lifetime energy saving of 840 MWh and GHG emissions reduction – 813 tCO2;

Street lighting:
Modernization of street lighting system in 5 pilot areas in Northern, Eastern, and Central regions of Kazakhstan (EE lighting equipment based on LED elements with automatic control system). Estimates of ES: 5,955 MW/h, preventing the emissions of CO2 by 5,760 tons.

Replication: There are already several cases of replication (understood broadly) by the Government:

- In East Kazakhstan region: Akimats allocated funds from the local budget in the amount of $ 50K for the modernization of street lighting. The city Ustkamenogorsk installed modern road lighting fixtures (420 pieces of LED lamps). In 2014 across the East Kazakhstan region 13,884 energy-saving lamps were installed in the amount of $ 4.1 million.
- In Central Kazakhstan: the local authorities planned funds for lighting system modernization in all the schools of the city of Kokshetau.
- In Pavlodar region: 35% lighting system were modernized to LED, investing $3.3 million. 28 autonomous street lighting systems were installed (23K USD)
- In Northern Kazakhstan: an automated system of street lighting control via the GSM network was put into operation covering 40 % of the total volume. All mercury lamps of 400W were replaced with LED saving annually 3.8 million KZT (21K $US). 55 % of street and park lighting replaced by EE lighting

For the second and third periods, starting from 2015 – 2017 – **35540 tons of CO2**, as for the following project activities during the mentioned period:

- Modernization of street lighting systems based on LED elements with automatic control was performed leading to lifetime energy saving of 3,081 MWh corresponding to GHG emission reductions of 2870 tCO2;
- Modernization of lighting system in areas adjoining to buildings was carried out in 594 entrances in six cities of Kazakhstan leading to lifetime energy saving of 13,232 MWh and GHG emission reductions of 12,270 tCO2;
- LED-based lighting modernization to LED was undertaken in 9 hospitals leading to lifetime energy saving of 10438 MWh and GHG emission reductions of 9,219 tCO2;
- Implementation of discount programme promoted purchase of LED lamps by the population results in additional sales of 3,000 LED fixture and led to lifetime energy saving of 4,953 MWh and GHG emission reductions of 4,614 tCO2
- Lighting modernization to LED was performed in a boarding school for physically disabled children Eastern Kazakhstan. Energy saving is 1,200 MWt/h, estimated 1,112 tons of CO2 emissions prevented.
- Lighting modernization in Kazakhstan (Transport Tower) administration building has been implemented and it prevented the emissions of 5,455 CO2 from fuel combustion for the production of electrical energy.

At the same time, given the assumption to consider emission reductions in the 15 years since the launch of the UNDP-supported GEF-financed project on lighting, i.e. within the period 2013-2027 and, cumulative total reduction of GHG emissions for this period will amount to 47,064 tons of CO2 (or 47 thousand of tCO2), and energy saving effect in amount of 50199 MWh, taken into consideration that emission factor CEF varies from 1.0 to 0.91 during this period (average annual 0.937). In addition, within the period of 2027-2030 it will be 7.75 thousand tons of CO2 (total for 18 years: 54.8 thousand of CO2).
Implementation of EEL project's supported **demonstration projects** committed in the amount of **direct avoided CO2 emissions in amount of 47,064 tons:**

- Lighting modernization to LED was performed in schools leading to lifetime energy saving of 5,055 MWh and GHG emission reductions of 5,999 tCO2;
- Modernization of street lighting systems based on LED elements with automatic control was performed leading to lifetime energy saving of 9,036 MWh corresponding to GHG emission reductions of 8,630 tCO2;
- New residential building was equipped with efficient public lighting system resulting in lifetime energy saving of 840 MWh and GHG emissions reduction – 813 tCO2;
- LED-based lighting modernization to LED was undertaken in 9 hospitals leading to lifetime energy saving of 10,438 MWh and GHG emission reductions of 9,219 tCO2;
- Lighting modernization in Kazakhstan (Transport Tower) administration building has been implemented and it prevented the emissions of 5,455 CO2 from fuel combustion for the production of electrical energy.
- Implementation of discount programme promoted purchase of LED lamps by the population results in additional sales of 3,000 LED fixture and led to lifetime energy saving of 4,953 MWh and GHG emission reductions of 4,614 tCO2
- Modernization of lighting system in areas adjoining to buildings was carried out in 594 entrances in six cities of Kazakhstan leading to lifetime energy saving of 13,232 MWh and GHG emission reductions of 12,270 tCO2;

Extent of achievement of planned targets

T**he End-of-project target**, namely "**31,000 tons of direct avoided CO2 emissions over operating lifetime of deployed demonstration technology. Specific technical and economic performance targets to be determined for each project.**" has surpassed and the project reported **47,064 tons of direct avoided CO2** emissions have been achieved because of implementation of EEL project-supported demonstration projects.

4.2. Replication of demonstration project results, in terms of number of projects, number of regions, and amount of financing mobilized

Delivery of the main planned outputs

Replication is taken place in 14 regions of Kazakhstan, as well as in two major cities, Astana and Almaty, with dedicated funds allocated from the National Modernization Programme for Communal Infrastructure, National Energy Efficiency Programme, as well as from the local budgets for the total of over $31 million in the period of 2013-2016. Good level of replication has been recorded in Astana, East Kazakhstan, Aktau and Pavlodar oblasts.

- **Residential building**: in Karaganda, within the UNDP/GEF Project "Energy efficient design and construction of residential buildings". Energy saving – 841 MW/year, GHG emissions reduction – 780 tons CO2/year
- **Schools**: SGP of UNDP/GEF in the context of the project «Green Pack for Caspian region as a tool for promotion of Energy Efficiency and Energy Saving technologies in schools of Caspian region of Kazakhstan (Aturau, Mangystau and Ural oblast)" promoted the EE lighting idea in the secondary schools in the Caspian region. Given that the western part of Kazakhstan was not covered by this stream of activities by 2013 the current project helped SGP with lighting audit (technical examination), facilitating the expansion of the coverage of the Green Pack project.

  In 2015-2016 in Astana 15 schools had its lighting modernized to LED for 24,4 million KZT. In the specified institutions, there were withdrawn mercury luminescent lamps, they were replaced with the LED lighting equipment.

- **Health:**
  In 2017 in Astana in 13 medical institutions it is planned to transfer to the LED lighting for the amount at 15,6 million KZT. In 2019, all the medical organizations provide funds for lighting replacement within 60% of institutions.

  In South-Kazakhstan region 35 145 energy saving lamps to the amount of 42,7 million KZT were installed in educational, health, and culture institutions.

- **Street Lighting**: Recommendations for the possible application and demonstration in Kazakhstan of the most effective technologies for outdoor lighting in urban areas (for example, Almaty city) prepared on the basis of the analysis of international best practices, at the request of municipal authorities of Almaty. These recommendations were considered by Almaty authorities during signing of the contract with EBRD on street lighting modernization (6.0 Million USD). Similar arrangement is now being discussed with the WB in their new project targeting EE in street lighting.

  In Eastern Kazakhstan in cities and regional centers street and park lighting was partially replaced with automated and energy efficient lighting with usage of energy saving street lighting fixtures. 350 LED lighting fixtures were installed within 11 km distance to the amount of 14.3 million KZT.

  In 2016 In Kyzylorda region 1.26 million KZT from the regional budget were spent for lighting of 94 streets with energy saving lamps.

  In Pavlodar, the street lighting modernization provided for us energy saving lamps that make for 8 % of the city lighting, and that means use of 1325 LED lighting fixtures.

  In Aktau 485 LED street lamps were installed.

Extent of achievement of planned targets
The End-of project target, namely, "**Replication of demonstration project results in at least five projects in five regions. At least $12 million invested in EE lighting projects**" was surpassed as the local budgets in total allocated funds of over **$31 million for EE lighting in the period from 2013-2016**.

The effectiveness of the selected pilot projects for both components was not in question from the project beginning.

Table 8. The diversity of demonstration projects

Lighting for building surrounding ground	In six cities (Lisakovsk, Uralsk, Almaty, Astana, Aktau, Satpayev)
Healthcare facilities	Healthcare facilities of Ust-Kamenogorsk (maternity hospital 2, center for maternal and child health, Clinical Diagnostic Center, children's out-patient department) Outpatient department 2, Aktau Outpatient department for 100 beds, Fort-Shevchenko, Outpatient department 6, Kyzylorda Rehabilitation center for disabled people, Kyzylorda
Administrative building	Astana («TRANSPORT TOWER»)

However MTE Report has emphasized in the lack of diversity in the choice of pilot projects (e.g. lack of existing buildings, commercial enterprises, transport facilities (railway and bus stations), health institutions, as well as the lack of effective system of capturing comprehensive lessons learnt from the pilots. In respond the project team has drastically improved the situation following MTE recommnedations. See below the Table 8, which is demonstrating the incearse of diversity of the demonstration projects and sharing of the lesons learned through preparation of information materials for busnisses, local governments and youth from 2015-2017:

Rating for Outcome 4: The end of the project targets are met and rated as Highly Satisfactory.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

Rating for Sustainability Criteria

Institutional frameworks and public administration risks for sustainable development

Adoption of the Law "On energy saving and energy efficiency" (2012) stipulates a solid platform for a high probability of the ILs gradual phase-out. There are certain concerns related to the degree of conformity and quality of CFL and LED that shall replace ILs. In this case the project strategy regarding support of quality control system had been duly developed to enable the system to become sustainable through: development of standards; support in creation of testing laboratories network, elaboration of norms and regulations. Similarly, adoption of the revised construction and health norms related to EE lighting create incentives for sustainable development for further EE lighting products accelerated acceptance and use.

The approach to training (training trainers) of energy auditors and people responsible for energy saving policy in all 14 regions of Kazakhstan who had held training in their regions for specialists in lighting, has also well-developed elements of sustainable development, including training of instructors, development of manuals for higher educational institutions and course in training programs of the Center of Energy Efficiency in housing and utilities.

Before the main institutional risk was lack of central-levelled system of strengthening introduction of spent mercury lamps at the regional level and lower. It has been weakening chances for nationwide sustainable replication of successful practices tested, for example, in Astana. On January 1, 2016 the principles of extended responsibilities of manufacturers (importers) were accepted in the Republic of Kazakhstan and it has made the current system more sustainable: creation of a unified system of complex production wastes management, development of collection infrastructure, transportation, recycling, utilization, neutralization of production (goods) wastes, using the best available technologies. In this regard, in 2017-2018 in 9 regions it was planned to use 1276 containers for collection of mercury lamps for the amount more than 500 thousand US dollars.

Adoption of the "Third modernization of Kazakhstan: global competitiveness" by the order of the President of the Republic of Kazakhstan is a strong foundation for EE projects development (including lighting industry) for public organization and through mechanisms of state-private partnership.

All the agreement procedures are being simplified at maximum, especially in regards of small scale projects. SPP is becoming the basic mechanism of infrastructure development, including modernization of housing and utilities objects.

Financial risks and sustainability

The main *financial risks* of sustainability are related to financial capacities of regional and local authorities (Akimats), also to lack of finance resources for manufacturers and large-scale consumers. This creates risk for

continuation / pace of some activities currently supported within the GEF financing trend (for example, related to safe collection of mercury CFLs, street lighting). At the same time the adoption of the extended responsibilities of manufacturers and SPP mechanisms create an opportunity to eliminate barriers that prevent from financing energy saving and energy efficiency events by Akimats.

Environmental risks and sustainability

Before the lack of the centralized level system for strengthening the implementation of mercury lamps collection at the regional level and lower was aggravated with worsening financial position of Akimats, and also by the fact that there was functioning collection system and it caused environmental and health risks related to uncontrolled disposal of mercury lamps. On January 1, 2016 the principles of extended responsibilities of manufacturers (importers) were accepted in the Republic of Kazakhstan and it has made the current system more sustainable: creation of a unified system of complex production wastes management, development of collection infrastructure, transportation, recycling, utilization, neutralization of production (goods) wastes, using the best available technologies. In this regard, in 2017-2018 in 9 regions it was planned to use 1276 containers for collection of mercury lamps for the amount more than 500 thousand US dollars.

Social-economic risks and sustainability

Serious social-political risks lack, considering constant decrease of prices of EE lighting products. Stable dropping of EE lighting price shall contribute to acceptance and use of good quality EE lighting products. There is also a good progress in public/stakeholders mentality towards project goal and EE lighting nationwide. The Government shows genuine interest in promotion of accelerated transition for EE lighting. It is proved by setting new ambitious goals, adoption of laws, programs and certain support to manufacturers (for example, in tax-free zones).

To summarize, while the fact that the big share of project activities is at the policy level is a supportive factor for the sustainability prospects, but there is a room for the substantial improvement of the environmental sustainability[44] of various activities started by the EEL project. By 2017 already 9 regions of Kazakhstan have allocated financial resources from their budgets and have started collection and utilization processes of mercury lamps.

Likely (L)	Moderately Likely (ML)	Moderately Unlikely (MU)	Unlikely (U)
L			

4.6 PROJECT IMPACT AND BENEFITS

Market transformation[45]

During the project period, **in all of Kazakhstan's 14 regional (oblast) administrations, oblast and municipal governments have invested a total of at least US $28 million in EE lighting upgrades** on streets and in public buildings. Throughout the country, technologies demonstrated and promoted by the project, including LEDs and automated street lighting controls, have become the new "business as usual," with municipalities and regional governments widely investing their own budget funds in EE lighting. Similarly, numerous major enterprises as

[44] http://tender.recycle.kz/plan.php
[45] «Report on Lighting Equipment Market Research in the RK» by Lyudmila Teplovodskaya, Independent Technical expert, 2017

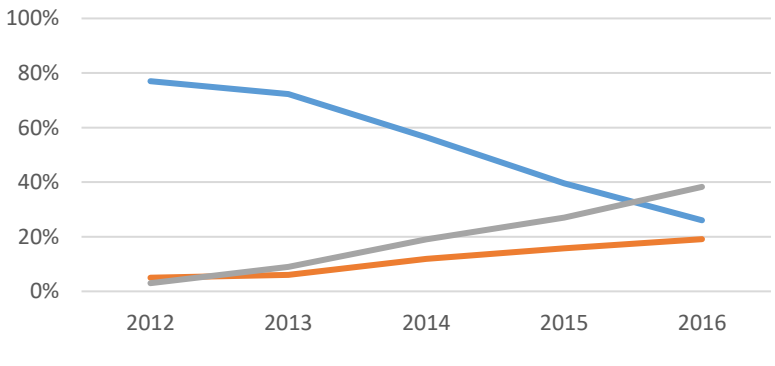
well as high-profile buildings such as the country's major monuments, concert halls, theaters, and libraries, have also widely made the transition to LED lamps.

Market figures confirm the trends that one witnesses everywhere in Kazakhstan's public and governmental sectors. Indeed, the whole lighting market in Kazakhstan has undergone a fundamental shift during the project period. The share of **incandescent lamps in the total installed lighting stock has declined from 77 percent in early 2012 to below 26 percent by 2016,** while the share of compact fluorescents has more than doubled over the same period (Table 9).

Most notably, the share of **LEDs in the total lighting stock has risen from 3 percent at the beginning of 2012, far beyond the original end-of-project target of 6 percent, to a remarkable 38 percent by the beginning of 2016**. LED market share is now at least twice that of CFLs, and the gap is growing. Thus, it is evident that Kazakhstan's commitment to a rapid and sustainable transition has led to successful "leapfrogging" over the expected interim stage of CFL market dominance, directly to widespread use of LEDs, with accompanying benefits in energy savings, avoided emissions, waste management, and light quality.

While these trends were unfolding with incandescent lamps, CFLs, and LEDs, market changes were much less dynamic and significant with other lamp types. Metal halide lamps, which like CFLs and LEDs consume only a small fraction of the electricity that incandescent lamps do for the same light output, more than tripled their market share during the project period, but still metal halide lamps constitute less than one half of one percent of total lighting stock in the country.

Table 9. Market Transformation of Lighting in Kazakhstan
2012-2016
(share of total stock of lamps)



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[46] Report On Lighting Equipment Market Research in the RK. Luidmila Teplovodskaya, Independent Technical Expert.

Estimates of energy savings

From available data on the stock of the key categories of lamps in Kazakhstan, combined with assumptions about operating hours, we can quantify electricity savings from market transformation in the lighting sector during the project period.

Table 9 below shows end-of-year figures for the national stock of the three most prevalent types of lamps: incandescent lamps, CFLs, and LEDs. This table shows the steep decline of the stock of incandescent lamps and the corresponding rise of CFLs and LEDs to make up the difference. Weighted average wattage per lamp is also shown for each lamp type, based on available data for each category (for example, relative sub sectoral share of 100W, 60W, and 40W incandescent lamps, or 23W, 16W, 12W, and other CFLs). Multiplying the number of lamps by the weighted average wattage gives us the total wattage of all lamps within each category.

Table 10. Stock and total wattage of incandescent lamps, CFLs, and LEDs in Kazakhstan, 2012-2015

		2012	2013	2014	2015	2016
Incandescent lamps	Weighted average lamp wattage (W)	74	69	69	65	21
	Number of lamps (millions)	47	34	19	12	9
	Total wattage (MW)	3460	2333	1339	749	181
Compact fluorescent lamps	Weighted average lamp wattage (W)	19	19	19	19	15
	Number of lamps (millions)	4	7	8	8	5
	Total wattage (MW)	73	135	145	159	76
LED lamps	Weighted average lamp wattage (W)	10	10	14	14	9
	Number of lamps (millions)	6	12	13	17	29
	Total wattage (MW)	60	120	185	237	257
	Total stock of these three lamp types (millions)	56	53	40	37	42
	Total wattage of these lamps (MWh) *	3593	2588	1669	1146	514
	Reduction in total wattage relative to 2012 (MWh) *		1005	1924	2447	3079
	Reduction in annual electricity consumption relative to 2012 (TWh)*		1,005	1,924	2,447	3,079

***Assuming annual average of 2000 hours of operation per lamp (4.4 hours/day).*

As the final lines of the table indicate, energy demand across these three lamp types dropped by more than 3079 MW from 2012 to 2016, using a standard conservative assumption of an annual average of 2000 hours of operation for each lamp (about 4.4 hours per day), **so the total reduction in electricity consumption – about 3.079 terawatt-hours from 2012 to the end of 2016**.

Avoided GHG emissions

CO_2 emissions factor for electricity

Translating electricity savings into avoided CO_2 emissions requires determination of an electricity emissions factor, in units of tons of CO_2/MWh of saved electricity per year (the same as kg CO_2/kWh per year). Here, we define this parameter based on official figures, which have been derived in turn by a methodology approved by decree No.143-e of the Minister of Environmental Protection of the Republic of Kazakhstan, dated May 10, 2012. Based on this methodology, Kazakhstan's electricity emissions factor ranged between 0.997 and 0.93 tons of CO_2/MWh (average of 1.00) during 2013 through 2017.

This figure is unusually high compared to electricity emissions factors of other countries of the world because of Kazakhstan's heavy dependence on low-quality coal for electricity generation. National plans call for a gradual transition to less carbon-intensive electricity generation, but still the emissions factor is projected to remain above 0.9 tons of CO_2/MWh through 2030.

Given this emissions factor, the above-cited calculation of 3.1 TWh in electricity savings from 2012 through 2016 would suggest a total reduction of **at least 2.995 million tons of CO2 emissions (3.0 million tCO2)** during the same period, with additional savings probably achieved during the final years of the project period (early 2017) but not calculated for lack of available year-begin data.

Impact of demonstration projects

Table 11 below summarizes the lifetime energy savings and avoided GHG emissions achieved across all pilot projects under EEL project:

Table 11. Compilated results of the energy saving monitoring and direct GHG emission reduction for the whole project implementation period: for 15 years and additionally till 2030[48]

Pilot project facilities	Energy saving and GHG emissions reduction in demo projects		Additional effect of savings	
	MWh	tCO2	MWh	tCO2
	(2013-2027)	(2013-2027)	(2027-2030)	2027-2030)
Schools	6255	5999	300	273
Street lighting	9036	8631	474	431
House	840	812	0	0
Healthcare facility	10438	9690	2321	2112
Administrative building	5445	5048	1361	1239
Promo lamps	4953	4614	762	693

[48] Report on Monitoring and Inspection of Energy Saving and Reduction of Greenhouse Gas Emissions Achieved within Pilot Projects for the 3rd Stage (Starting from 2016-2017) and for the Whole Period of Project Implementation. January 2017.

Lighting for building surrounding ground	**13232**	**12270**	**3308**	**3310**
Total	**50199**	**47064**	**8526**	**7758**

Table 2028-2030: these additional 3 years could bring additional effect (in total energy saving 85 26 MWh and 7758 tCO2 , CEF =0.91) because some pilots started in 2015, thus 15 years are 2015-2029, for those pilots started in 2016 the period of 15 years is 2016-2030.

4.7 OVERALL RATING OF PROJECT ACHIEVEMENTS

So, to summarize the clear majority of the **End-of-project targets** for the Indicators against and EEL project impact (above section **4.5 Rating of The Result Indicators** and section **4.6 Project Impact and Benefits**) it can be concluded that the main Objective of the EEL project were met. Therefore, an overall rating for extent of attainment of planned Objective is Satisfactory.

Project implementation and adaptive management of EEL project is rated as Satisfactory on the basis that Implementing and Executing agencies have worked well together, serviced by a very competent PIU that has established effective working relations with key partners and more widely at Oblast and city levels. The project team has been persistent in working with the government, the private sector and NGOs that resulted in a high percentage of disbursed as well as additionally leverage co-financing by the midpoint in project implementation, despite the challenges.

Below table is summarizing all required ratings:

Table 2. Evaluation Ratings: UNDP-supported GEF-financed Full-Sized Project 4326 "Promotion of Energy Efficient Lighting in Kazakhstan"

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

*Using a six-point rating scale: 6: Highly Satisfactory (HS), 5: Satisfactory (S), 4: Marginally Satisfactory (MS) , 3: Marginally Unsatisfactory (MU), 2: Unsatisfactory (U) and 1: Highly Unsatisfactory (HU)
**Using a four-point rating scale: Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U)
***Relevance rating scale: Relevant (R); Not Relevant (NR).

5 CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

1. The UNDP-supported GEF-financed EEL Project has been implemented efficiently and expected to be closed in due time scheduled for May 2017. The disbursement rate of the GEF resources as of 17 April 2017 is 96%. The main disbursements are done in procurement area. Thus, in the Outcome 1 the contractual services amounted to 58%, expenses for international consultants amounted to 11%, in the Outcome 2 the contractual services amounted to 51%, and expenses for international consultants amounted to 15%, in the Outcome 3 the contractual services amounted to 51%, expenses for publication amounted to 20%, in the Outcome 4 the contractual services amounted to 80%. All expenditures are committed. Based on the evidence available (mission reports, purchase orders, descriptions of training events) the Evaluator concludes that the outputs have been delivered as reported. As a general appreciation, the procured goods and services are of good value. The Evaluator has observed that the procured installed laboratory equipment agrees with their purpose.

2. The Evaluator found the local counterparts and the UNDP Country Office highly committed to the EEL Project. UNDP made a great effort by assigning the office staff and financial resources to support the EEL Project implementation from 2012-2017. The Evaluator observed constructive working relations between the UNDP and the key national counterparts. The EEL Project has also demonstrated excellent coordination approach within the UNDP Programme Policy Unit areas through implementation of joint projects with Governance Programme and GEF/SGP, and UNV, as well as similar projects in Russia and Armenia.

3. The EEL Project has achieved all the anticipated outcomes contributing to catalyzing investments, transforming market, saving energy, and preventing GHG emissions, and the EEL Project deserves credits for these great results. The ILs phase-out had been approved before the Project inception. Kazakhstan has successfully been removing its tariff caps on electricity since 2009, bringing tariffs in line with costs and creating strong new economic incentives to conserve. Worldwide trends including the steep rise of LED availability on global markets, as well as adoption of lighting standards and regulations in many countries worldwide, could surely have affected Kazakhstan and assisted for the EEL Project successful implementation.

4. Thus, the total direct emission reduction is 47,0 thousand t CO2, exceeds by 1.5 times the planned target (31 thousand t CO2), energy saving is 50 GWh, exceeds by 1.5 times the planned target (33 GWh) respectively. The indirect energy savings amount 4 14 GWh, exceeds the planned target (1607 GWh) 2,6 times and indirect 3964 thousand t CO2, exceeds by 2,6 times the planned target (1495 GWh) respectively, for the period of the UNDP/GEF project implementation (2013-2027). The analysis of the results revealed that the greatest effect on reducing greenhouse gas emissions was achieved through modernization of street lighting, especially of the building surrounding ground, and the healthcare facilities, therefore it is

recommended to replicate such projects. Monitoring of energy saving is necessary on annual basis per the indications of electric meters and bills for payment. Monitoring of GHG emissions reduction depends on CEF indicators. This indicator should be monitored; it is recommended to use the CEF officially adopted at the national level. In addition to the effect of energy saving and reduction of GHG emissions, there is a substantial saving in cash to prevent the acquisition and replacement of lamps in the baseline case.[49]

5. As expressed by the counterparts, the EEL Project did directly affect the development and adoption of the ILs phase-out, through advocacy, as well as research and stakeholder outreach during the preparatory period of the EEL Project. Furthermore, the EEL Project played a big role in the orderly and rapid implementation of the phase-out, through its work on regulations and standards, support for laboratories certification and accreditation, and promotion among public. The EEL Project deserves credit for design, implementation, and replication of the residential recycling programs for spent mercury-containing lamps.

6. The EEL Project also contributed directly to municipal and regional investment in EE lighting and accelerated market transformation nationwide. The project played a pivotal role in establishing national policy mandates contained in the 2020 national strategic program, as well as MID's issuance of rules for state procurement of lighting.

7. Through its workshops, conferences, dissemination of best practices and success stories the EEL Project directly communicated to executive authorities on EE lighting choice solutions. More broadly, the Project's promotional efforts among public reached hundreds of thousands of citizens with focused messaging on EE lighting and mercury recycling that they would have difficulty to receive without organized effort by a knowledgeable team.

8. In the project design there is a lack of information broken down by gender—both quantitative data and qualitative information although the development challenge of increasing GHG emissions from lighting have gender-related dimensions.

9. It is observed that low-income citizens face barriers against the purchase of EEL (as well as other EE items) when they have higher initial costs. To the extent that women have lower average salaries, greater unemployment, and greater likelihood of widowhood than men, they almost certainly face this barrier more than men do. Both women and men lack knowledge and awareness of energy costs, energy performance, and the benefits of energy efficiency of appliances.

[49] Report on Monitoring and Inspection of Energy Saving and Reduction of Greenhouse Gas Emissions Achieved within Pilot Projects for the 3rd Stage (Starting from 2016-2017) and for the Whole Period of Project Implementation. January 2017.

10. As the State Procurement Committee of the Ministry of Finance has informed about 20,000 cases of ILs procurement in RK during 2016, the ILs can still be found on Kazakhstan market. 25W and lower ILs are still permitted although decrease of its procurement shall be an important aspect. The main thing for the project results sustainability is to make sure that there is a constant and consistent control over use of 25W and higher ILs. It is very important to make sure that in Kazakhstan market the EEL should be of a good quality and comply to the international requirements.

11. By the end of the EEL Project it became clear that low quality of EEL is a main risk for further promotion of good quality EEL in Kazakhstan as the State procurement regulations were based on principles of cost minimization, fair competition, transparency, and support of domestic suppliers, but not energy performance or life-cycle cost. During mission interviews, several representatives of different organizations (MIR, IMC, LED System Ltd, etc.) supported the idea of establishing a National Association of Producers of Energy Efficient Lamps and Appliances to insure sustainability in promotion of EE quality products on Kazakhstani market. One of the business companies (LED System Ltd.) has expressed willingness to act as a champion in promoting this kind of Association creation.

12. EEL Project enabled energy efficiency lighting development in Kazakhstan and generated useful learning experiences attracting sufficient municipal and regional investments for lighting demonstration projects which can serve as input not only in Kazakhstan but also for future all UNDP-supported GEF-financed projects under the global UNDP-GEF ***en.lighten initiative***[50]. The possibility of sharing EEL Project experience on the regional level has a good framework since for years Kazakhstan has been providing official development and humanitarian assistance, helping various countries in the Central Asian region and beyond. To strengthen its role as an emerging donor, Kazakhstan wants to systematize and professionalize its efforts and align ODA with the priorities of its foreign policy. The MFA is partnering with UNDP in designing and elaborating its development cooperation. The cooperation project aims to support MFA RK to establish a national ODA agency. Through expert support the project provides the analysis of the best international experience and situation of the ODA new donors, shows common threats and problems and ways to solve them effectively.

[50] http://www.enlighten-initiative.org/About.aspx

Recommendations:

1. UNDP CO should recommend the MFA RK the replication of EEL Project results in the Kazakhstan ODA recipient countries in Afghanistan, Tajikistan and Kyrgyzstan and involvement of GEF RBEC/RBAP and UNDP COs in respective countries to ensure smooth and successful replication process to achieve Climate Change Global benefits.
2. It is recommended that future project/s should pay more attention to the gender aspects in the design of activities. Professional training and public outreach should be designed with a special eye toward both gender equity and responsiveness to gender-specific issues. Outreach materials should portray both sexes and indeed also multiple generations as sharing responsibility for managing households, including and especially lighting, with efficient appliances playing a significant role in providing comfort and safeness while also limiting costs and health and environmental impact. It is also important to note mandatory Annex on gender mainstreaming analysis and action plan for future GEF projects.
3. It is recommended to address gender dimensions of consumer preferences and household decision-making dynamics with market research, including both surveys and focus groups structured to allow for breakdowns by gender.
4. It is recommended to make sure in future projects engagement of women, recognizing their role as stakeholders regarding energy costs, energy performance, consumer information, environmental protection, and so on. Attention should be placed on the importance of avoiding perpetuation of gender-role stereotypes regarding household responsibilities.
5. It is recommended to address low income and other barriers to purchase of EE items with high initial cost with targeted incentives to be delivered with the assistance of NGOs and local Akimats for the advancement of the welfare of low-income valnurable part of population.
6. UNDP CO should continue considering joining forces with UN agencies, international donors and Government stakeholders for promotion of changes in the budgeting codex/laws/regulations in the country which currently does not allow municipalities to allocate necessary finances for EE projects (including EE lighting) through ESCO mechanisms.
7. The certified laboratories should be properly equipped and completely functional with qualified technical staff.
8. It is recommended to support establishment of a National Association of Producers of Energy Efficient Lamps and Appliances to insure sustainability in promotion of EE quality products available on Kazakhstani market.
9. It is recommended to consider the above 1-8 recommendations for its inclusion in the new UNDP-supported GEF-financed Project on Energy Efficient Standards, Certification, and Labelling for Appliances and Equipment in Kazakhstan.

6 LESSONS LEARNED

The Evaluator has identified the following lessons that can be drawn from the EEL Project:

1. Establishing a close collaboration early-on with similar projects in other countries, with similar socio-economic conditions, is an effective and efficient way to learn from the experiences and challenges that others have faced while providing support and advice to projects that are at an earlier implementation phase. The EEL Project worked closely with the UNDP lighting projects in Russia and Belarus and that demonstrated strong regional synergetic effects which allowed to include joint efforts into development of project strategy on political and legal aspects, standards and norms on energy efficiency that shall be common within the Eurasian Customs Union.

2. Considering different formal and informal sources of information while conducting market researches is a reliable tool to obtain broader and realistic picture of the country lighting market. The EEL Project has learned that it is challenging to bring official statistics only for market research, since some small shops still sell incandescent lamps delivered through black market. This situation with the uncontrolled import of the banned ILs showed that there is a necessity to improve dissemination of information of the Energy Efficiency Law among small-scale retailers. The executive agency (MID RK) was recommended to examine the system of control of ILs sale at stores and on black market.

3. Carefully testing of mercury lamps utilization scheme at the initial stage of its developing in one city/town and subsequent analyzing the results is a realistic basis for the following replication in other regions applying the relevant scale depending on population and size of a city/town. This EEL Project's careful approach ended with successful launching of mercury lamps utilization in Astana and had been replicated in other Kazakhstan regions – Mangystau and Kyzylorda.
4. Applying the results of pilot projects for legislative and institutional frameworks could be used for relevant legislation enforcements. The research which analyzed the possibility to introduce ESCO into the RK lighting sector served as a basis for amendments made in the legislation. The changes were accepted by the Law "Introduction of amendments and additions in regards of energy saving issues" of the RK №279-V dated January 14, 2015.

5. Providing modern and proper testing equipment for new and/or existing testing laboratories for the lighting verification process is a fundamental condition to create the necessary technical basis to ensure access of good quality EEL to the country market. It is very important as poor quality products and dubiously credible certification in both legal and black markets are the most negative factors that can seriously impact on distribution of EE lighting among population. Also, the emergence and rapid development of new lighting technologies revealed the unpreparedness of national laboratories to test modern lighting products. The EEL Project has supported national laboratories lacking relevant facilities, arranged transferring knowledge of testing procedures and improved required skills to create a viable network of certifying laboratories.

6. Keeping close monitoring over new emerging lighting technologies may contribute to the project benefits. The EEL Project has implemented the new Phyto LED Lighting technology project for the attention of public, business, school principals, etc. and proved the potential of the new lighting technology and using spaces like basements to grow vegetables the whole year round.

7. Promoting successful pilot projects results through broad awareness campaigns is an important pre-condition for project sustainability and replication. The EEL Discount Program accompanied with a wide raising awareness campaign and implemented by the Project in 2016 discovered still existing barriers in purchasing LED lamps by public from certified manufacturers/distributors as in some cases they set unaffordable price, demonstrated lack of knowledge about LED benefits. Regardless the ILs ban they are still sold in some small shops as they are cheaper than EE lamps. The Discount program results identified a room for further work on raising awareness among consumers, as well as for future correlation of LED price towards decrease. Finally, the Discount program has demonstrated to manufacturers and distributors a possibility to develop their own rebate and credit systems to get public involved in purchasing LED lamps more actively.

8. Analyzinge the legislative framework for possible co-financing by local partners and finding of innovative and creative approaches can contribute to project's financial sustainability. The implementation of pilot projects allowed to learn that local Akimats do not have direct access to loans from commercial banks/international financial organizations, since it is only allowed for Akimats to receive a loan from the central government. In most of the street lighting projects funded by Akimats the funding was organized through establishing of joint ventures with private sector where Akimats had only part of ownership. Without promoting this type of joint companies, it will remain difficult for local authorities to get an access to funding from international organizations.

9. Continuation the development of mercury lamps utilization system is a way to ensure environmental benefits of EEL. Regardless the good progress of mercury lamps collection the EEL Project still observing big import of mercury lamps. Within the period from 2012 to 2016 there were 53.8 million mercury lamps imported into the country. Although according to the market analysis the share of mercury lamps in Kazakhstan market decreased: - (i) according to the PIR regulations the reporting period is from June of one year till June of the next one, thus, within 2012-2013 there were 1.6 million mercury lamps. (ii) within 2013-2014 there were collected 2.5 million mercury lamps, within 2014-2015 – 2.47 million, within 2015-2016 – 3.1 million, within 2016-2017 – 3.6 million. For the whole project lifespan, the number of the collected mercury lamps makes 13.27 million.

ANNEX 1: EVALUATION TERMS OF REFERENCE

TERMS OF REFERENCE FOR TERMINAL EVALUATION

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of the *UNDP-supported GEF-financed project* ***"Promotion of energy efficient lighting in Kazakhstan***" (Kazakhstan) (PIMS #4326)

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

Project Title:	Promotion of energy efficient lighting in Kazakhstan, Kazakhstan			
GEF Project ID:	3758 (PMIS #)		*at endorsement (Million US$)*	*at completion (Million US$)*
UNDP Project ID:	00080414 (PIMS# 4326) 00063090 (Atlas ID)	**GEF financing:**	3,400,000	3,400,000
Country:	Kazakhstan	**IA/EA own:**		
Region:	RBEC/CA	**Government (co-financing):**	27,403,502	27,403,502
		UNDP	50,000	50,000
Focal Area:	Climate Change - Mitigation	**Other investors:**	1, 168,836	2,383,500
FA Objectives, (OP/SP):		**Total co-financing:**	28,622,338.00	29,787,002
Executing Agency:		**Total Project Cost:**	32 022 338	33,237,002
Other Partners involved:	Ministry for Investments and Development RK	**ProDoc Signature (date project began):**		1.06. 2012
		(Operational) Closing Date:	31.05.2017	31.05.2017

OBJECTIVE AND SCOPE

Long-term objective of the UNDP / GEF Project (the Project) is to achieve energy efficiency and reduce greenhouse gas emissions through the transformation of lighting products market in the Republic of Kazakhstan, including the implementation of phased decommissioning of incandescent light bulbs, while ensuring the quality of alternative products and cost-effectiveness as well as secure disposal of spent mercury lamps.

Achievement of the objectives will be made within the framework of four components:

- Policy design and implementation;
- Development of energy efficient lighting market;
- Teaching and outreach activities;
- Demonstrational projects, including best practices and technologies.

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.

The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

EVALUATION APPROACH AND METHOD

An overall approach and method[51] for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR (see *Annex C*) The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point, UNDP Country Office, project team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to the following project sites:

- Phyto-diode lighting Arnasai village (Akmolinskaya oblast, 30 km from Astana);
- Testing Laboratory (Astana)
- Discount Program and testing laboratory (Almaty)
- Communal areas lighting (Almaty)

Interviews will be held with the following organizations and individuals at a minimum:

Project

#	Name	Title	Organization
1	Mr. Syrym Nurgaliyev	Project Manager	UNDP CO
2	Ms. Sergey Inyutin	Policy Design and implementation expert	
3	Ms. Dinara Tamabayeva	PR specialist	
4	Ms. Zulfiya Suleimenova	Project Assistant	
5			

UNDP

#	Name	Title	Organization
1	Ms. Cynthia Page	UNDP-GEF RTA	UNDP, Istanbul

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

2	Ms. Irina Goryunova	ARR	UNDP CO
3	Mr. Rassul Rakhimov	Head of SD and Urbanization Unit	
4	Ms. Zhanetta Babasheva	M&E focal point.	

GEF Operational Focal Point

#	Name	Title	Organization
1	Mr. Gani Sadibekov	Vice Ministry	Ministry of Energy of the Republic of Kazakhstan

Ministry for Investments and Development RK – Main Partner

#	Name	Title	Organization
1	Mr. Olzhas Alibekov	Head of Department of energy efficiency and energy saving, National Project Coordinator	Department of energy efficiency and energy saving, Ministry for Investment and Development RK

Project Partners

#	Name	Title	Organization
1.	Alibek Kabylbay	Adviser to the Minister	The Ministry of Economy Astana
2.	Aitmukhan Mussin	Head of Testing Laboratory Assessment Department	National Center of Accreditation RK Astana
3.	Aydar Mahambet	Chairman of the Board	«Institute of Electricity development and Energy Saving (Kazakhenergoexpertise)» JSC Astana
4.	Natalya Vyrodova	Head of the Department of measuring Instruments Metrological Certification	Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK Astana
5.	Amangeldy Taukenov	Director	Led System Ltd Astana
6.	Tatyana Nemtsan	co-founder	Centre of Green Technologies Astana
7.	Iskander Khamitov	Chief Expert	«Kazakhstan Institute of Standardization and Certification» RSE Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK Astana
8.	Katerina Yushenko	National Coordinator	UNDP/ GEF SMALL GRANTS PROGRAMME Almaty
9.	Madi Agybay	Technical Director	Saiman Corporation, LLP «GREENTEK» Almaty
10.	Valeryi Dvornikov	Head of RC	Almaty University of Power Engineering & Telecommunications, Research center

The evaluator will review all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, in particular evaluator shall validate the data in the GEF CCM Tracking tool (how the tool is filed in and confirmed the figures

there filled in by the project team), project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in Annex B of this Terms of Reference.

EVALUATION CRITERIA & RATINGS

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

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

PROJECT FINANCE / COFINANCE

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

MAINSTREAMING

UNDP supported GEF financed projects are key components in UNDP country programming, as well as regional and global programs. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP

Co-financing (Type/Source)	GEF own Financing (mln USD)		Government (mln USD)		Other* (mln USD)		Total (mln USD)		Total Disbursement (mln USD)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
– Grants	3,400,000	3,400,000	27403502	27403502	1,168,836	2,383,500	28,622,338	31,005,838	32,022,338	33,237,002
– UNDP co-financing	50,000	50,000								
– Equity investments Gov			14,546,703	14,546,703						
– Equity investments local			12,856,799	12,856,799		864,000	12,856,799	13,720,799		
– In-kind support The private sector					1,154,000	1,160,500	1,154,000	1,160,500		
– In-kind support – NGO					14,836	359,000	14,836	373,836		
Totals	3,450,000	3,450,000	27403502	27403502	1,168,836	2,383,500	28,622,338	29,787,002	32,022,338	33,237,002

priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender.

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated: a) verifiable improvements in ecological status, b) verifiable reductions in stress on ecological systems, and/or c) demonstrated progress towards these impact achievements.[52]

CONCLUSIONS, RECOMMENDATIONS & LESSONS

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

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

IMPLEMENTATION ARRANGEMENTS

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

EVALUATION TIMEFRAME

The total duration of the evaluation will be 25 working days (for the international consultant) and 23 working days (for the national consultant) according to the following plan:

Activity	Timing	Date Durations and Completion Dates
Preparation	*5* working days	*8 March - 13 March, 2017*
Evaluation Mission	6 working days (4 days Astana and 2 days Almaty)	*20 March – 25 March, 2017*
Draft Evaluation Report	11 working days	*11-21 April, 2017*
Final Report	*3 working* days (for international consultant only)	*24- 26 April, 2017*

EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission: due 01 Mach	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission: 04 April	To project management, UNDP CO
Draft Final Report	Full report, (per annexed template) with annexes	Within 2 weeks of the evaluation mission: due 18 April	Sent to CO, reviewed by RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft: due 26 April	Sent to CO for uploading to UNDP ERC.

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

TEAM COMPOSITION

The evaluation team will be composed of *1 international evaluator and 1 national evaluator.* The consultants shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage. The international evaluator will be designated as the Team Leader and will be responsible for finalizing the report. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The Team members each must present the following qualifications:

- University degree in economics, energy management, policies in the area of environmental protection or related disciplines;
- Minimum 5 years of relevant professional experience in energy efficiency, experience in lighting would be an advantage.
- Experience with result-based management evaluation methodologies;
- Knowledge of results-based evaluation policies and procedures;
- Expertise in adaptive management, as applied to climate change and energy resource management projects;
- Familiarity with lighting sector, energy efficiency policies and regulations;
- Skills in drafting the institutional documents, reviews and background papers related to energy efficiency, energy efficient lighting, climate changes issues,
- Skill in conducting researches and analytical works,
- Skills in negotiating with key stakeholders, state authorities,
- Experience in countries with transition economy,
- Experience with international organizations like UNDP and/or GEF,
- Proven track record of application of results-based approaches to evaluation of projects focusing on energy efficiency (relevant experience in the CIS region is a requirement; and relevant experience within UN system would be an asset);
- Excellent knowledge of English, communication skills, knowledge of the Russian language is an advantage.
- Full proficiency in English both written and verbal including ability to review, draft guidelines and edit required project documentation; sound knowledge of Russian language would be an advantage.

EVALUATOR ETHICS

Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (Annex E) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluations'

PAYMENT MODALITIES AND SPECIFICATIONS

(*this payment schedule is indicative)*

%	Milestone
10%	At submission and approval of the Inception Report
40%	Following submission and approval of the 1ST draft terminal evaluation report
50%	Following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report

Recommended Presentation of Offer:

The following documents may be requested:

Personal CV or P11, indicating all past experience from similar projects, as well as the contact details (email and telephone number) of the Candidate and at least three (3) professional references;

Financial Proposal that indicates the all-inclusive fixed total contract price, supported by a breakdown of costs, as per template provided. If an Offeror is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the Offeror must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

COA (MUST BE INDICATED IN NUMBERS)							
Project ID	**Activity**	**Account**	**Amount**	**Fund**	**Dept ID**	**Impl Agency**	**Donor**
00080414	**4**	**71200**		**62000**	**55205**	**004409**	**10003**
JOB DESCRIPTION AUTHORISATION							
Supervisor *Syrym Nurgaliyev/ Project Manager* Name/Title				Signature			
Programme officer *Rassul Rakhimov/Programme Analyst* Name/Title				Signature			

ANNEX 2: TIMELINE OF DELIVERABLES

The total duration of the evaluation will be 25 working days per the following plan:

Activity	Timing	Date Durations and Completion Dates
Preparation	*3* working days	*28 – 30 March, 2017*
Evaluation Mission	6 working days (2 days Almaty and 4 days Astana and)	*10 April, 2017*
Draft Evaluation Report	11 working days	*25 April, 2017*
Final Report	*3 working* days	*1 May, 2017*

The Evaluator is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission: due 25 Mach 2017	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission: 10 April 2017	To project management, UNDP CO
Draft Final Report	Full report, (per annexed template) with annexes	Within 2 weeks of the evaluation mission: due 25 April 2017	Sent to CO, reviewed by RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft: due 1 May 2017	Sent to CO for uploading to UNDP ERC.

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

ANNEX 3: PROGRAMME OF COUNTRY VISISTS

TIME	ACTIVITY	PLACE
31 March 2017, Friday, Almaty		
11.30 - 12.30	Meeting with EBRD. Abbas Ofarinov	EBRD 41 Kazybek Bi Street
13.00 - 14.00	lunch	
15.00 - 16.00	Meeting with Dvornikov. Head of RC	Almaty University of Power Engineering & Telecommunications, Research center 126 Baitursynov Street
17.00 – 19.00	desk work	Project Office
3 April 2017, Monday, Almaty		
10.00-11.00	Katerina Yushenko National Coordinator SGP	UNDP/GEF SMALL GRANTS PROGRAMME CA REC Orbita 1
13.00 - 14.00	*lunch*	
15.00 – 16.30	Meeting with Madi Agybay Technical Director,	Saiman Corporation, LLP «GREENTEK» 162 "Zh" Shevchenko Street.
4 April, Tuesday, Astana		
09.30 - 10.00	In-Brief Meeting with Rassul Rakhimov Programme Analyst/ Sustainable Development Urbanization	UNDP
10.00 - 10.30	Meeting PM, national Project Team, UNDP Evaluation Officer	Project Office
10.45 - 12.30	Review of documentation, questions	OFP Office
13.00 - 14.00	*Lunch*	
14.00 - 17.00	Review of documentation, questions	Project Office
17.00 - 17.45	In-Brief Meeting with DRR Tuya Altangerel	UNDP
5 April 2017, Wednesday, Astana		
09.30- 10.30	Olzhas Alibekov. Head of Department of energy efficiency and energy saving, National Project Director	MID RK
11.00- 12.30	Natalya Vyrodova Chief Expert of measuring Instruments Metrological Certification	Committee for Technical Regulation and Metrology
13.00- 14.00	*Lunch*	
14.00- 15.30	Review of documentation, questions	Project Office
16.00- 17.00	Amangeldy Taukenov. Director	Led System Ltd

17.30- 18.00	Alibek Kabylbay ex-Adviser to the Minister of Economy	Project Office
6 April 2017, Thursday, Astana		
09.00-13.00	Tatyana Nemtsan. NGO Centre of Green Technology	To Arnasai village (40 km from Astana). Arnasai village features unique use of green technologies (water, energy, climate related aggrotech) in rural communities. It is an example of how the Sustainable Development Goals could be scaled down to a single village and bring in the real-life impact for the farmers, schools and average Kazakhstani households.
12.00 - 13.30	*lunch*	
-16.45 15.30	Skype conference call with UNDP ex-Regional Technical Specialist Marina Olshanskaya	Skype
17.00-18.00	Almat Kabykenov Director of the Center for Expertise, Management and Monitoring of the Projects	Institute of Electricity development and Energy Saving
7 April 2017, Astana		
09.00 - 11.00	Review of documentation, questions	Project Office
11.00 - 11.30	Meeting PM Alexsandr Belyi PM NAMA Project	Project Office
12.00 - 12.30	Wrap-up meeting with ARR Irina Goryunova <irina.goryunova@undp.org>	UNDP
13.00 - 14.00	*Lunch*	
14.00 - 18.00	Review of documentation, questions	Project Office
13 April 2017, Almaty		
18.00 - 19.00	Skype conference call with UNDP -Regional Technical Specialist Cynthia Page	Skype

ANNEX 4: EVALUATION CONSULTANT CODE OF CONDUCT AND AGREEMENT FORM

Evaluators:

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

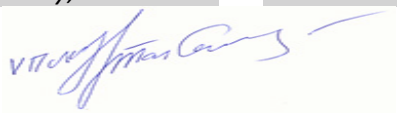
Evaluation Consultant Agreement Form[53]

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

Name of Consultant: Zharas Takenov

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

Signed at *Almaty, Kazakhstan* on *15 March 2017*

Signature: 

ANNEX 5: PROPOSED INTERVIEW LIST

[53] www.unevaluation.org/unegcodeofconduct

Project

#	Name	Title	Organization
1	Mr. Syrym Nurgaliyev	Project Manager	UNDP CO
2	Ms. Sergey Inyutin	Policy Design and implementation expert	
3	Ms. Dinara Tamabayeva	PR specialist	
4	Ms. Zulfiya Suleimenova	Project Assistant	

UNDP

#	Name	Title	Organization
1	Ms. Cynthia Page	UNDP-GEF RTA	UNDP, Istanbul
2	Ms. Irina Goryunova	ARR	UNDP CO
3	Mr. Rassul Rakhimov	Head of SD and Urbanization Unit	
4	Ms. Zhanetta Babasheva	M&E focal point.	

GEF Operational Focal Point

#	Name	Title	Organization
1	Mr. Gani Sadibekov	Vice Ministry	Ministry of Energy of the RK

Ministry for Investments and Development RK – Main Partner

#	Name	Title	Organization
1	Mr. Olzhas Alibekov	Head of Department of energy efficiency and energy saving, National Project Coordinator	Department of energy efficiency and energy saving, Ministry for Investment and Development RK

Project Partners

#	Name	Title	Organization
	Alibek Kabylbay	Adviser to the Minister	The Ministry of Economy, Astana
	Aitmukhan Mussin	Head of Testing Laboratory Assessment Department	National Center of Accreditation RK, Astana
	Aydar Mahambet	Chairman of the Board	«Institute of Electricity development and Energy Saving (Kazakhenergoexpertise)» JSC, Astana
	Natalya Vyrodova	Head of the Department of measuring Instruments Metrological Certification	Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK, Astana
	Amangeldy Taukenov	Director	Led System Ltd, Astana
	Tatyana Nemtsan	co-founder	Centre of Green Technologies, Astana
	Iskander Khamitov	Chief Expert	«Kazakhstan Institute of Standardization and Certification» RSE Committee for Technical Regulation and Metrology of the Ministry for Investment and Development RK, Astana
	Katerina Yushenko	National Coordinator	UNDP/ GEF SMALL GRANTS PROGRAMME, Almaty
	Madi Agybay	Technical Director	Saiman Corporation, LLP «GREENTEK», Almaty
	Valeryi Dvornikov	Head of RC	Almaty University of Power Engineering & Telecommunications, Research Center

ANNEX 6: DESK REVIEW BIBLIOGRAPHY

1. GEF Project Information Form (PIF)
2. Project Document (ProDoc)

3. Log Frame Analysis (LFA)
4. UNDP/GEF Project Document signed by UNDP and National Implementing Agency
5. Project Inception Report
6. Mid-Term Evaluation Report
7. Management Response to recommendations of Mid-Term Evaluation
8. Project quarterly (QORs and QPRs) and annual reporting (Project Implementation Reports [PIRs] and Annual Project Implementation Reports [APRs])
9. Minutes of Project Board meetings
10. Project budget and financial data
11. Project GEF Tracking Tool, at baseline, at mid-term, and at terminal points
12. Reports on monitoring of project office and pilot sites
13. ROARs
14. Project briefs and success stories
15. Project knowledge products
16. Government documentation (as an evidence of project outcomes achieved)
17. UNDP Development Assistance Framework (UNDAF)
18. UNDP Country Programme Document (CPD)
19. UNDP Country Programme Action Plan (CPAP)
20. GEF focal area strategic program objectives
21. List and contact details for project staff, key project stakeholders, including Project Boards, and other partners to be consulted

ANNEX 7: EVALUATION SITE VISIT LOCATIONS

Project sites, highlighting suggested visits:

- Phyto-diode lighting Arnasai village (Akmolinskaya oblast, 30 km from Astana);
- Testing Laboratory (Astana);
- Discount Program and testing laboratory (Almaty);
- Communal areas lighting (Almaty),

ANNEX 8: PROJECT RESULT RESOURCES FRAMEWORK

PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: The Government, industries and civil society take steps to adapt to climate change and mitigate its impact through energy efficiency measures and climate change adaptation policies.
Country Programme Outcome Indicators: Climate change mainstreamed into national environmental and sustainable development strategic action plans
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. Mainstreaming environment and energy
Applicable GEF Strategic Objective and Program: Climate change mitigation. Primarily applicable is Objective 2: Promote market transformation for energy efficiency in industry and the building sector. Also applicable is Objective 1: Promote the demonstration, deployment, and transfer of advanced low-carbon technologies.
Applicable GEF Expected Outcomes: (1) Appropriate policy, legal and regulatory frameworks adopted and enforced; (2) Technologies successfully demonstrated, deployed, and transferred; (3) GHG emissions avoided.
Applicable GEF Outcome Indicators: (1) Extent to which EE policies and regulations are adopted and enforced (score of 0 to 4); (2) Percentage of technology demonstrations reaching planned goals; (3) Tones of CO2 equivalent avoided.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Midterm	End of project		
Objective: To phase out inefficient lighting and transform lighting markets towards greater energy	Electricity consumption and associated GHG emissions from lighting	10.0 TWh/year and 9.3 million tons of CO_2/year	9 TWh/year and 8.4 million tons of CO_2/year	7 TWh/year and 6.5 million tons of CO_2/year	Data from suppliers, distributors, and retailers. Data from RK Ministry of Industry and New Technologies and RK Ministry of Environmental Protection.	The IL phase-out mandate is not delayed, weakened, or abandoned.
	Adoption of IL phase-out and associated policies	No IL phase-out	IL phase-out adopted	IL phase-out adopted with full range of accompanying policies		Sufficient political will to pass and implement IL phase-out, mercury recovery

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Midterm	End of project		
efficiency, while ensuring product quality and cost-effectiveness, as well as safe disposition of spent mercury-containing lamps.	Share of incandescent lamps, CFLs, and other types of conventional and efficient lighting	Incandescent lighting accounts for 77 percent of all lighting in buildings	Incandescent lighting accounts for 40 percent of lighting in all buildings	Incandescent lighting is no longer sold for conventional applications in Kazakhstan		provisions, and other key policies
	Proportion of mercury recovered from spent lamps	Not defined quantitatively; collection and recycling only from state agencies and larger enterprises, not general public	Documented 90 percent collection and recovery of mercury from spent lamps in pilot regions.	Documented 90 percent collection and recovery of mercury from spent lamps nationwide.		
Outcome 1: Policy development and implementation supports effective IL phase-out, expansion of market share and use of EE lighting, and safe disposition of spent Hg-containing lamps	Implementation of incandescent-lighting phase-out	Phase-out policy exists in draft of legislation, but not as detailed program; implementation is absent	Phase-out included in adopted RK law *On Energy Efficiency*. Roadmap for IL phase-out developed and adopted by MINT.	Phase-out implemented in stages (100W bulbs phased out by 2013, 60W bulbs by 2015)	Published official documentation (laws, state programs, etc.). Official statistics and enforcement documentation.	The IL phase-out mandate is not delayed, weakened, or abandoned.
	Requirements of technical standards for EE lighting	No technical standards for EE lighting	Technical standards developed and adopted for EE lighting, including enhanced rules on certification and licensure of certifying agencies	Technical standards developed, adopted, and enforced for EE lighting	Published technical standards. Agency documentation. Market data from suppliers.	Continued support from Committee for Technical Regulation of MINT.
	Code requirements for energy performance of lighting in buildings	Minimum 55 lumens per watt (for limited applications)	Requirement of minimum 75 lumens per watt (for same limited applications)	Additional revision of SNRK 2.04-05-2002 for greater energy efficiency, including recommendatory sections	Published code requirements and recommendatory sections.	Code revision will continuously be prioritized by the responsible agency
	Relative priority of first costs and life-cycle costs in state procurement policy	State procurement policy does not consider life-cycle costs or energy efficiency of lighting equipment	Adoption of revisions to national procurement law, if needed beyond new technical standards and/or code requirements.	Adoption of revisions to sub-regulations. Updated lists of approved products and suppliers. Revisions to procurement criteria for regional administrations and Samruk-Kazyna fund as appropriate.	Published regulations.	Political resistance from government agencies and entrenched suppliers is ensured
	Procurement of energy-efficient lighting by public agencies	Not defined quantitatively	20 percent increase in procurement of EE lighting, compared to baseline, which is to be determined	50 percent increase in procurement of EE lighting, compared to baseline	Evaluation study of procurement documentation	Political resistance from government agencies and entrenched suppliers is ensured
	State policy and	No national or	National mandate and	Processes for collection	Published regulations	Adequate logistics

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Midterm	End of project		
	program on mercury containment and recovery	regional programs on mercury containment and recovery. No organized collection of spent lamps among general public.	regional programs for mercury containment and recovery developed and adopted. Pilot programs for collection of mercury wastes established.	of mercury wastes operating nationwide.	and program documentation.	available for effective collection program in all regions
	Proportion of mercury recovered from spent lamps	Not defined quantitatively	Documented 90 percent collection and recovery of mercury from spent lamps in pilot regions.	National inventory system for mercury-containing lamps established. Documented 90 percent collection and recovery of mercury from spent lamps nationwide.	National mercury inventory documentation, including assessment methodology.	Adequate logistical capacity available for effective collection program in all regions
Outcome 2: Increased accessibility and market share of EE lighting across various geographic and demographic sectors	Market demand for EE lighting in cities, towns, and rural areas	Not defined quantitatively; EE lighting is available from some retailers in cities, but much less so in small towns and rural areas	Increased market demand for EE lighting in small towns and rural areas, as well as cities	Overall increase in market availability of EE lighting by 20 percent in cities, towns, and rural areas	Market study and national population data.	Cost-effective distribution is possible even to remote towns and rural areas Promotion, targeted discounts, and new national laws and policies are enough to overcome cost barriers among poor rural consumers
Outcome 3: Increased familiarity among diverse stakeholders with EE lighting and associated issues	Awareness of general public about advantages of EE lighting, rating and labelling systems for lighting, and proper handling of spent mercury-containing lamps	Not defined quantitatively. General public widely disregards advantages of EE lighting. Rating/labelling systems and mercury-lamp collection programs for general public do not exist.	Outreach campaigns conducted, reaching 2 million citizens.	Outreach campaigns conducted, reaching 10 million citizens. Forty percent of overall population is aware of advantages of EE lighting, rating and labelling systems for lighting, and proper handling of spent mercury-containing lamps	Circulation and viewership data Survey data	Continued stability of cost-sharing will make large-scale media campaigns possible
Outcome 4: Increased investor confidence, design and administrative capacity, and market share of EE lighting as a result of demonstration projects	Energy efficiency of lighting in selected public buildings or street-lighting projects	Outdated lighting technology is widely used in both buildings and street lighting. Quantitative baseline parameters to be determined based on specific project.	Measures installed and evaluation started for two new demonstration projects	Documented energy savings of at least 10 percent relative to baseline. Significantly greater energy savings, up to at least 50 percent relative to baseline, if cost-effective and replicable. Specific technical and economic performance targets to be determined for each project.	Measurement and verification, including metering of installed lighting	Continued stability of partnership and cost-sharing

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Midterm	End of project		
	Replication of demonstration project results	Business-as-usual does not reflect practices that are to be applied in demonstration projects	Replication of at least two pilot projects conducted prior to project inception (subcomponent 4.2).	Replication of demonstration project results in at least five regions	Project reports and documentation from state agencies	

ANNEX 9: EVALUATION CORE QUESTIONS

Evaluation criteria and questions presents the evaluation questions mapped against the evaluation criteria from the TOR:

Finding area	Criteria	EVALUATION AND RESEARCH QUESTIONS	INDICATORS	SOURCES	METHODOLOGY
1. PROJECT STRATEGY	**Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?**				
	1.1. Project relevance	1.1.1. Are project outcomes contributing to national development priorities and plans in accordance with the national legal and regulatory frameworks?	• % of reduced energy consumption in apartment buildings • IL phase-out adopted with full range of accompanying polices	• Project reporting, national statistics and reporting, interviews, site visit.	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.1.2. How does the project relate to the GEF Strategic objective CC – 1 "To promote energy-efficient technologies and practices in the appliances and buildings" through improved energy performance in apartment buildings?	• # of adopted and mandatory energy efficient building codes • Extent of application of Integrated Building Design principles	• Project reporting, national statistics and reporting, interviews, site visit	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.1.3. How did the project contribute to GHG emissions reduction within the project implementation cycle and beyond?	• # of tons of CO2-equv. Emission reductions • 100W bulbs phase-out by 2013 and 60W bulbs phase out by 2015.	• Project reporting, national statistics and reporting, interviews, site visit	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		1.1.4. Was the project's positioning vis a vis other sectoral initiatives relevant?	• Process for collection of mercury wastes operating nationwide documented 90% collection/recovery of mercury from spent lamps in pilot regions. • Results of monitoring Customs Union on the issues of energy-efficient lighting.	• Project reporting, national statistics and reporting, interviews	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	Effectiveness: To what extent have the expected outcomes and objectives of the project been ach				
	1.2. Approach to implementation/ coherence	1.2. 1. In what way and why do project strategies contribute to the attainment of deliverables, final outcomes and objective?	•Evidences of UNDP GEF incremental assistance for market study and roadmap.	• Project reporting, national statistics and reporting, interviews	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.2.2. Are the project strategies relevant and do they ensure the most effective way of achieving the outcomes?	•National procurement processes favouring energy efficiency and lifecycle cost criteria introduced. • 50% increase in procurement of EE lighting, compared to baseline.	• Project reporting, national statistics and reporting, interviews	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.2.3. Are final outcomes prepared at the initial stage still the best strategy for the attainment of project objectives (considering the changed factors)?	• Yes/No.	• Project reporting, national statistics and reporting, interviews	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	1.3. Preparation and preparedness	1.3.1. Are project objective and components clear, practically attainable and feasible within the timeframe specified? If not, please elaborate why?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.3.2. Was the potential of executive partner, Ministry of Industry and New Technologies and other partners properly considered during project design? If not, please explain why?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.3.3. Were the lessons learned during other projects properly considered during project design?	Lessons learned logs properly fulfilled.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		1.3.4. Were partnership mechanisms properly considered and were negotiations on relevant responsibilities of the parties held prior to project approval? If not please provide details.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.3.5. Were partners' resources (funding, staff, premises) authorizing the legislation and adequate mechanisms of project management provided at the initial stage of the project? If not please provide details.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.3.6. Is there a sustainability strategy prepared during project design? If yes, what is its relevance?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	1.4. Involvement of parties concerned	1.4.1. Did the project involve relevant parties concerned by means of information exchange, consultations and overall involvement into project design? If not, please provide details.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.4.2. How the project consulted and used skills, experience and knowledge of relevant state authorities, NGOs, public groups, private sector, local authorities and academic institutions during the design of project activities?	Examples of evidence.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	1.5. Underlying factors and assumptions	1.5.1. What are the underlying factors that go beyond project control framework and influence on final outcomes?	• Evidences and mitigation measures.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.5.2. Were the assumptions made by project management valid?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.5.3. What is the impact of any wrong assumption made by the project?	• Evidences and mitigation measures.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

	1.6. Management mechanisms	1.6.1. Were project roles properly distributed during project design?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.6.2. Do the roles within the project framework properly comply with UNDP and GEF guidance?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.6.3. Can the model of management mechanisms proposed by the project be considered optimal? If not, add suggestions and recommendations.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	1.7. Project budget and duration	1.7.1. Were the budget and duration of the project is effectively planned from the point of view of expenses (cost-effectiveness)?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.7.2. Was the project budget and duration updated, extended, added, etc.? If yes, please give details.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	1.8. System of project monitoring and evaluation	1.8.1. Does the project have a convincing monitoring and evaluation plan for following up the outcomes and progress assessment in the achievement of project objectives?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.8.2. Does the project monitoring and evaluation plan include preconditions (including data, methodology, etc.), SMART indicators and the system of data analysis as well as evaluation study at specific times for assessing the outcomes and relevant funding of monitoring and evaluation activities?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		1.8.3. Do the timeframes for various activities on monitoring and evaluation and standards on sub-outcomes were indicated?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

2.PROJECT IMPLEMENTATION	**Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?**				
	2.1. Adaptive management within project framework	2.1.1. What is the quality of the monitoring system used, including the tools? Clarification sub-questions: • Do they ensure the information required? • Do they involve key partners? • Are they effective?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.2. How effective is the application of logical framework as a management tool during the implementation and any changes in it?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.3. Does modification of the indicators affect project management? If yes, haw?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.4. Does the system of monitoring and evaluation contributes to the monitoring of progress in achieving project objectives by means of ongoing collection of data on selected indicators; whether annual reports are complete, precise and contain reasonable ratings; whether the information provided by monitoring and evaluation system is used for project efficiency and adaptation to changing needs.	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.5. Are the risks identified in the draft document and reviews on project implementation are the most crucial and that these risks are given adequate estimate (rating). If not, why?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.6. Are there additionally identified risks?	• ATLAS risk log timely fulfilled.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		2.1.7. Is the project system of risk identification effective?	• Yes/No	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.8. Is UNDP-GEF risk management system properly used? How can UNDP-GEF risk management system be used for strengthening project management?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.9. How effective is work planning? (application of regularly updated work plans, IT for the support of the implementation, participation and monitoring as well as other project activities, etc.).	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.10. Are the processes of work planning based on outcomes[54]?	• Yes/No	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.11. Is there effective financial management in place? Is the project operating in a cost-effective manner? Is there due diligence in financial management and financial audits?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.12. Was the promised co-funding provided?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.1.13. Is there an effective reporting, e.g. in relation to the changes in the project and documenting and sharing lessons learned from the processes of adaptive management?	• Project filing system is in place and properly managed.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

[54] Documents on risk management are available at http://www.undp.org/eo/methodologies.htm

		2.1.14. Where there any delays during project implementation and what the reasons behind those were? Did the delays influence on the attainment of final outcomes and/or project sustainability and if they did, in what way and as a result of what cause-and-effect relationships?	• Notes to file and other required documentation for justification delays and required mitigation actions.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	2.2. Efficiency	2.2.1. How efficient was the financial management of the project, including specific reference to cost-effectiveness of its interventions?	• Extent to which results have been delivered with the least costly resources possible	• Project reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.2.2. What was the role of UNDP and National Implementing Agency in meeting the requirements set out in UNDP Programme and Operations Policies and Procedures?	• Extent of influence to ensure meeting the required international standards	• Project reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project reporting review
		2.2.3. Are the systems for accountability and transparency of project management approach/results and meeting the relevant national norms and standards in place?	• # of national norms and standards met	• Project and national reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	2.3. Cost-effectiveness	2.3.1. Is the project cost-effective? Is the project an option based on minimal expenses? Were there any delays in project implementation and if yes, how does it affect cost-effectiveness?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.3.2. Are the achieved project outcomes commensurate with the original or modified project objectives?	• Yes/No	• Project reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project reporting review
		2.3.3. Whether the project outcomes provided the most effective way towards results?	• Yes/No	• Project reporting, national statistics and reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.3.4. What is effectiveness of project awareness raising and outreach activities/products on promoting energy efficiency in apartment buildings among all project stakeholders	• Extent of influence the design and construction and public administration practices, including in sectors other than apartment buildings (e.g. residential and commercial)	• Project reporting, national statistics and reporting	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

	2.4. Contribution of the Executive Agency and Partner	2.4.1. What was the role of UNDP and the MINT in accordance with the requirements ensured by the Policies and Procedures of UNDP on programs and activities?[55] (considering: site visits, participation in the meetings of Project Council, project overviews, preparation of project implementation reviews (PIR) and following measures, GEF guidance, Operational support and "soft" support)	• Yes/No	• Project reporting, national statistics and reporting, interviews	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	2.5. Participation of the parties concerned, partnership strategies	2.5.1. Did the local parties concerned participate in project management and decision-making and if they do, how they do it? What are the strong and weak sides of the approach taken by the project?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.5.2. Does the project receive consultations and are the skills, experience and knowledge of relevant authorities, NGOs, public groups, private sector, local authorities and academic institutions applied during project implementation and evaluation?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.5.3. Are the processes of disseminating information among partners and parties concerned has rational mechanisms?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.5.4. Are the potential opportunities for partnerships well utilized?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
3. PROJECT RESULTS	**2.6. Progress in the achievement of sub-deliverables, outcome/**	2.6.1. Is the project on track of achieving the planned outputs? If not, why?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

[55] See http://content.undp.org/go/userguide/results/project/

	measurement of change	2.6.2. Is the project on track of achieving the planned Outcomes? If not, why?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.3. How adequate is the RoK law on energy efficiency and measures proposed by the project on the creation of favourable conditions for lighting energy efficiency as well as regulations in EE developed with the aim to improve the execution of the Law on energy efficiency: Program on Energy Saving 2020, Program on modernization of MSW, including disposal of mercury-containing lamps.	• Number of standards, codes, regulations, policies, procurement norms, etc.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.4. How necessity, adequate and effective is the approval of national standards designed within project framework?	• Published official documentation (laws, state programs, etc.). Official statistics and enforcement documentation. • Implementation of incandescent-lighting phase out, requirements of technical standards for EE lighting,	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.5. Did the project achieved removing barriers on the market development, especially among consumers?	Evidence of increase of market demand for EE lighting in cities, towns and rural areas.	• Project reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.6. Were all received cost-sharing commitments from the government and private sector finally materialized into reality?	Cost-sharing agreements.	• Project reporting, interviews, site visits	
		2.6.7. How adequate and effective is the toolkit/ training module for energy effective lighting of buildings and outside lighting for application in the process of training energy managers	• Published code requirements for energy performance of lighting in buildings and recommendatory sections.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.8. How adequate and effective are the proposed technologies on the implementation of demonstration projects?	• Measurement and verification, including metering of installed lighting.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		2.6.9. How adequate and effective are the pilot project solutions?	• Documented evidence of energy efficiency of lighting in selected public buildings and street-lighting projects. • Evidence or probability of replication of demonstration projects' results.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.6.10. How adequate and effective are the products on awareness-raising in energy effectiveness in public buildings prepared by the project (website of regional projects www.eep.kz; Video clips on energy efficient lighting and disposal of mercury-containing lamps; promotional materials: calendars, t-shirts, publications, brochures, notebooks, purses, leaflets, etc.)?	• Evidence of increased awareness of public about advantages of EE lighting, rating and labelling systems for lighting, and proper handling of spent mercury-contained lamps.	• Web site information, Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	Sustainability: To what extent are there financial, institutional, social-economic, and/or environr results?				
	2.7. Sustainability	2.7.1. Whether the risks identified in project document and PIRs were appropriate and corresponding risk management strategies/systems were adopted and implemented?	• Extent of risk appropriateness • Yes/No	• Project reporting, UNDP-GEF Risk Management System	• UNDP/GEF Monitoring & Evaluation Policies
		2.7.2. Whether national stakeholders participated in project management and decision-making have ownership for project outcomes and their further replication and scaling-up?	• Yes/No.	• Project reporting, government reporting/documentation	• UNDP/GEF Monitoring & Evaluation Policies, Project and government documentation review
		2.7.3. Was the project sustainability strategy relevant and efficient?	• Yes/No.	• Project reporting; national evidences	• UNDP/GEF Monitoring & Evaluation Policies, Project and government documentation review
		2.7.4. Are there any environmental risks that may pose a threat to the sustainability of the project outcomes?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.7.5. What is the probability that the activities launched within the framework of this project will continue providing benefits for a long time after project completion?	• Yes/No. Project exit strategy consulted with key stakeholders.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		2.7.6. How project benefits will continue within project framework or beyond upon its completion (including state obligations and integration of project objectives into more extensive policies in development field and sectoral plans)?	• # of replicated projects, improved enforcement of legislation, state policy.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.7.7. Financial resources: are there any financial risks that may threaten maintaining project outcomes? Clarification sub-questions: • What is the probability that financial and economic resources will not be available upon the end of support from GEF? • What are sources of such resources in the state and private sectors, profitable activities and trends pointing out at the possibility of having adequate financial resources for maintaining project outcomes?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.7.8. Socio political: are there any social or political risks that may threaten maintaining project outcomes? Clarification sub-questions: • What is the probability that the level of commitment and responsibility of the parties concerned (including state authorities and other key parties concerned) will be insufficient for maintaining final outcomes/project benefits? • Do the various parties concerned realize that it is in their interest that project benefits keep on? • Are the community/parties concerned aware about supporting long-term project objectives?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review

		2.7.9. Institutional frameworks and management: Do statutory regulation, policy, structures and management processes pose risks that may threaten the sustainability of project benefits? Clarification sub-question: • Are there required systems for accountability and transparency and the necessary technical know-how?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.7.10. Ecological: Are there any ecological risks that may threaten maintaining project outcomes?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
		2.7.11. Whether there will be certain types of activities threatening sustainability of project outcomes?	• Yes/No.	• Project reporting, national statistics and reporting, interviews, site visits	• UNDP/GEF Monitoring & Evaluation Policies, Project and government reporting/statistics review
	Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?				
	2.8. Impact	2.8.1. What contribution did the demonstration energy efficient buildings (EE buildings and other buildings built with indirect influence of project interventions, if any) have on improving the environment situation in their locations?	• # of tons of CO2-equv. Emission reductions • Increased awareness on EE lighting	• Project reporting, government reporting/documentation/statistics	• UNDP/GEF Monitoring & Evaluation Policies, Project and government documentation review
		2.8.2. How the project did enable reducing pressure on corresponding natural resources (e.g. through reduced use of primary energy sources, and/or use of renewables)?	• # of TOE of primary energy resources saved • Type of renewable energy source used	• Project reporting, government reporting/documentation/statistics	• UNDP/GEF Monitoring & Evaluation Policies, Project and government documentation review

ANNEX 10: PROJECT LESSONS-LEARNED REPORT 2012-2017

Project Title:	"Promotion of Energy-Efficient Lighting in Kazakhstan"
Country:	Kazakhstan
Related CPAP Outcome	The Government, industries and civil society take steps to adapt to climate change and mitigate its impact through energy efficiency measures and climate change adaptation policies.
Project Description and Key Lessons-Learned	
Brief description of context	In Kazakhstan prior the project launch (in 2009) the power consumption was about 78 TWt/hr, at this lighting constituted about 13 % of total electricity consumption, or 10 TWt/hr. In 2015 power consumption reached 36% from the 2009 level. In accordance with the energy saving law (dated 01-2012) the incandescent lamps ban implied transition to energy efficient lighting and development of supportive regulation, LED lighting fixtures promotion. The objective of the project is the transformation of Kazakhstan market towards the energy efficient lighting technologies and gradual replacement of inefficient lighting equipment to reduce greenhouse gas emissions, while ensuring product quality and cost-effectiveness as well as safe disposition of spent mercury-containing lamps.
Brief description of project	The objective of the proposed full-sized UNDP/GEF project is to achieve energy savings and avoided GHG emissions via transformation of the lighting market in the Republic of Kazakhstan (RK), including implementation of a phase-out of incandescent lamps, while ensuring product quality and cost-effectiveness as well as safe disposition of spent mercury-containing lamps. The project will achieve this objective via four components: 1) policy development and implementation; 2) market development; 3) education and outreach; and 4) demonstration projects embodying best practices and technology.
Key project successes	1. Developed method and methodological recommendations for energy services (ESCO) in the lighting sector. 2. Implemented work on creating a complete network of multifunctional testing laboratories with a wide range of parameters to be tested. 3. Implemented work on strengthening functional possibilities of the Institute of Metrology at the Committee of Technical Regulation of the MID RK for accreditation of testing laboratories. 4. Jointly with the Akimat launched budget programs on collection and utilization of mercury lamps in Kyzylorda and Mangystau oblasts, within many other cities held training on raising awareness on mercury lamps collection from people and its further utilization. 5. Carried out analysis of lighting market for 2012-2015 with a detailed description of Kazakhstan lighting market common structure and listing main manufacturers and suppliers of lighting equipment.

	6. Completed LED lamps discount program for people if a number of Kazakhstan cities through a coupon service in order to raise awareness on use of energy efficient technologies. 7. Services rendered to raise awareness about energy efficient technologies including LED lamps. 8. Implemented work on Methodological support of regional Centers of energy saving and knowledge spread through training "Training for energy managers' trainers" covering 10 regions of Kazakhstan. 9. Amendments were made in current sanitary norms jointly with the Ministry of Health RK. 10. Amendments were made in construction norms and regulations in regards of making energy efficient lighting requirements more stringent. 11. Holding trainings on promotion of green technologies in lighting, trainings in Centers of energy efficiency. Coverage is more than 1000 people of the following categories: • Unemployed women willing to start their own profitable business; • Representatives of medium and small-sized business; • Students of the Agrarian University in Astana, ENU, the Nazarbayev University; • Heads of educational institutions of these regions, teachers and tutors; • Akims of regions, rural districts of these regions, leaders of NGOs, 12. Implemented modernization of lighting system in medical institutions: 4 hospitals in Kyzylorda and Mangystau oblasts. 13. The project implemented modernization of lighting system in 11 schools and 9 hospitals in four regions of Kazakhstan by installing energy efficient LED equipment. 14. Street lighting in 6 regions of Kazakhstan was replaced with the LED. 15. Implemented modernization of residential buildings space lighting system in 594 communal entrance hallways of six Kazakhstan cities.
Project shortcomings and solutions	1. During realization of pilot projects, it was found out that there is no friendly environment to have access to funding of subjects of public and private ownership (consumers as well as manufacturers), including institutional mechanisms and budgeting mechanisms for promotion of energy efficiency in lighting. 2. Responsibility for mercury lamps utilization is legally set by municipal authorities, however, at the same time this work is not being done because funds for utilization are not allocated. In this regard, it is necessary to support public organizations so that their activities affect the municipalities through successful pilot projects and PR campaigns. 3. There are 6 lighting testing laboratories which due to insufficient qualifications of staff and lack of knowledge necessary for accreditation, calibration tests in metrology system of a complete list of equipment cannot be accredited in the national accreditation system. 4. State procurement is implemented without consideration of energy efficiency and energy saving requirements. In this regard, the Project had initiated several trainings for procurement administrators. Trainings resulted in capacity increase of the officials responsible for state procurement of municipalities. Trainings were given all over RK regions. Raised awareness among representatives of prosecution department, officials in charge of state procurement.

Lessons learned	1. As it was recommended to collaborate with similar projects in other countries with the same conditions in order to consider their experience and mistakes to prevent them and warn colleagues about potential challenges and difficulties they might face based on project history, the project collaborated closely with the UNDP lighting projects in Russia and Belarus and that led to a strong regional synergetic effects which allowed to include joint efforts into development of project strategy on political and legal aspects, standards and norms on energy efficiency that shall be common within the Eurasian Customs Union. 2. Through market research the project has learned that it is quite challenging to bring official statistics only, since some small shops still sell incandescent lamps delivered through black market. This situation with uncontrolled import of the banned incandescent lamps showed that there is a necessity to improve dissemination of information of the Energy Efficiency Law among small-scale retailers. The executive agency (MID RK) was recommended to examine the system of control of incandescent lamps sale at stores and on black market. 3. Successful launch of mercury lamps utilization in Astana had been replicated in other Kazakhstan cities – Mangystau and Kyzylorda. It concluded that at the initial stage the utilization schemes can be tested in one city with the following replication in other regions applying the relevant scale depending on population and size of a city/town. 4. The research that analyzed the possibility to introduce ESCO into the RK lighting sector served as a basis for amendments which were made in the legislation. The changes were accepted by the Law "Introduction of amendments and additions in regards of energy saving issues" of the RK №279-V dated January 14, 2015. 5. The emergence and rapid development of new lighting technologies revealed ungreediness of national laboratories to test modern lighting products. Plus, poor quality products and dubiously credible certification were present in both legal and black market. To create a viable network of certifying laboratories the national laboratories lacked relevant facilities, knowledge of testing procedures and skills, plus KazInMetr didn't have the standards to accredit other national labs. Therefore, the project had implemented extensive work in upgrading existing testing laboratories through providing new and proper testing equipment. Thus, the lighting verification process now has the necessary technical basis. 6. The aroused interest to the new Phyto LED lighting project from public, business, school principals, etc. proved the potential of the new lighting technology and using spaces like basements to grow vegetable during the whole year round. 7. Discount program accompanied with a wide raising awareness campaign and implemented by the project in 2016 allowed to discover still existing barriers in purchasing LED lamps by public from certified manufacturers/distributors; they include still unaffordable price, lack of knowledge about LED benefits, sometimes availability of cheap incandescent lamps on market. The Discount program results identified room for further work on raising awareness among consumers, as well as LED price future correlation hopefully towards decrease. Finally, the Discount program has demonstrated to manufacturers and distributors that they can develop their own rebate and credit systems to get public involved in purchasing LED lamps more actively. 8. The realization of pilot projects helped to learn that local authorities have no right to directly get loans from commercial banks/international financial organizations,

	since it is only allowed to have a loan from the central government. Such an unfavorable environment makes funding of state and private subjects inaccessible (both consumers and manufacturers), including institutional and budget mechanisms to promote energy efficiency in lighting. In most of municipalities the street lighting is funded through small sub-departments in the structure of local executive authorities. Without dividing these structures into companies, it will remain difficult for the local authorities to get an access to funding from international organizations.
Follow-up Actions	1. Further project sustainability is ensured through realization of the strategy on development of quality verification system: standards development; laboratories support, establishing legal policy. 2. Improving lighting audit quality. This approach, including special training for energy auditors, allows provision of further development and introduction of EE and LED technologies at the systematic level since it includes a whole complex consisting of the Program developed for the Energy Efficiency Centers, training for trainers, methodological manuals, the textbook for education institutions and training-centers. 3. Upgrading quality of state procurement via regular trainings where they study improving quality of state procurement in fields of medicine and street lighting. Familiarizing with normative documents which regulate state procurement in modern conditions, also theoretic and practical aspects of state procurement planning in order to increase energy saving and energy efficiency. 4. Further participation of the prosecutor's department representatives gives an opportunity to inform about the existing and future norms and recommendations on energy saving and energy efficiency to be applied in state procurement. 5. Campaigns on EE lighting raising awareness, especially among professionals, helped to expand knowledge of specialist on energy sector.

Project Information	
Award ID:	00063090
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Partners:	Ministry for Investments and Development. Ministry of Energy
Project resources:	
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Date:	

ANNEX 11: STRATEGY FOR PROMOTION OF ENERGY EFFECTIVE LIGHTING IN THE REPUBLIC OF KAZAKHSTAN PROJECT CLOUSEOUT

Project UNDP/GEF #00080414

Component	Outcome		Result	Comments
Component 1: Policy development and implementation	Outcome 1.1: Developed and implemented roadmap for IL phase-out	2013-2014	- annual monitoring of statistical data and integrated assessment of the EE product market, correction of the prognosis for coverage and, based on this, a roadmap for the implementation of the LN withdrawal policy has been developed. Project reports and proposals are submitted to the government and accepted. Thus, proposals on the improvement of energy service services and the PPP mechanism in the lighting sector have been submitted to the MID of the RoK. The proposals have been processed by the Ministry and corresponding additions have been made to: p. 4.4.7 *Energy Saving - 2020* Programs on EEL (Decree of the Government of the Republic of Kazakhstan, dated August 29, 2013), a new edition of the Law on EE (2016); Law of the Republic of Kazakhstan on PPP, No. 379-V, dated 31.10. 2015	Special attention is paid to the implementation of the legislative mandate (the EE law) for the phase-out of incandescent lamps. The MID of the RoK uses project reports for planning the directions for the development of the policy of universal introduction of LED lighting, the improvement of regulatory documents based on minimum EE standards. A successful smooth transition to EE lighting with adequate product quality assurance and containment of mercury wastes may be observed. The legislative mandate is supported by the development of specific technical regulations for buildings and lighting devices, introduction of energy effective lighting products into the government procurement mechanism, assistance with the creation of regional systems for extracting mercury from spent lamps. Additions to the EE and PPP legislation increase the financial and organizational capacity for the widespread implementation of LED-based EE projects. - Policy support joins forces with other donors (EBRD, WB, USAID), other UNDP / GEF projects (NAMA in particular) to improve favorable environment for access to financing for both producers and consumers, implementation of the Green Economy concept.
		2014-2016	- The project took part in the development of recommendations on amendments to *the State Program on the Modernization of Housing and*	The use of recommendations in the amendments and the implementation of the State Program on the

			Communal Services for 2011 - 2020, submitted to the government	Modernization of Housing and Communal Services for 2011-2020 has led to the condominiums changing the lighting in the entrance halls, staircases and outside buildings to LED lamps and lighting fixtures. - Further project sustainability is ensured by the implementation of the strategy for the development of EEL quality management system: development of standards; support of laboratories, creation of a regulatory framework.
	Outcome 1.2: Developed and adopted official technical standards and certification procedures for quality and performance for EE lighting products	2103-2014	- 7 technical standards for the quality of LED products are developed in accordance with the requirements of the Customs Union (CU). The standards are officially accepted by the Committee for Technical Regulation and Metrology (CTRM) of the MID of the RK by decree No. 172-od, dated 01.08. 2014 Implementation of mechanisms for the execution of these standards, including the processes for certification, testing and quality control, compliance with the requirements of the CU is ensured by the project as follows: a) special equipment purchased and transferred and 5 new testing laboratories for measuring the parameters of EE lamps and lighting fixtures created by the Akimats of Astana and Almaty cities; b) methods for ensuring the quality of EE lighting products developed on the basis of testing laboratories and transferred to the MID of the RoK and the specialized laboratories themselves; c) "light standards" equipment purchased and transferred to the laboratories for metrology under the CTRM of the MID of the RoK.	- The technical standards approved by the Ministry came into force in July 2015 and improve environmental safety, ensure competitiveness, product quality and rational use of resources. - CTRM (Committee for Technical Regulation and Metrology) under the MID of the RoK used the recommendations of the project on energy-efficient lighting when making amendments to *the Program for the Transformation of the System of Technical Regulation and Quality Infrastructure*. The implementation of the quality system is ensured by the creation of a network of multifunctional testing laboratories. Their subsequent accreditation will improve the quality of lighting. Re-equipment of the metrology laboratory of CTRM under the MID of the RoK will allow verification and certification of lighting devices and enhance the capacities of the Institute of Metrology under the CTRM MID.-

		2014-2016	- Proposals on the introduction of amendments to the Regulations of the Customs Union (On the Requirements for Energy Efficiency of Electric Energy-Consuming Devices) have been prepared, and the standards for the quality of LED products are currently in the stage of adoption at the CU. The proposals are supported by the Government of the Republic of Kazakhstan.	- The proposals for the Regulations of the Customs Union and the standards for the quality of LED products supported by the Government of the Republic of Kazakhstan are currently in the stage of their acceptance by the Customs Union, the delay in the adoption by the Customs Union is conditioned by the position of Russia and Belarus on the prohibition of incandescent lamps and the use of LED lamps.
	Outcome 1.3: Updated relevant mandatory and recommended sections of the national building code on lighting, as well as other normative documents	2013-2014	- Proposals have been made to the existing sanitary regulations, and approved by the government (jointly with Sanitary-Epidemiological Expertise and Monitoring RSE of the Ministry of Health of the Republic of Kazakhstan) namely: Sanitary rules (SR) "Sanitary and epidemiological requirements for educational facilities" (Order of the Minister of National Economy of the RK # 179, dated December 29, 2014). - The has project developed proposals on introducing changes to the building regulations of the SR RK 2.04-104-2012 (SNiP as before) regarding general and artificial illumination for internal premises where the most cost-effective lamps should be used. The proposals have been submitted to the government, approved by the CTRM MID, and are currently at the approval stage in the Ministry of Justice of the Republic of Kazakhstan.	- The changes in SR, which are at the stage of approval in the Ministry of Justice of the Republic of Kazakhstan are approved by the CTRM MID and assume the use of LED lamps and lighting fixtures in general education institutions, considering the requirements of photobiological safety. - CTRM MID RK approved and brought up for discussion building regulations: (SR RK 2.04-104-2012) - for general and artificial lighting which require to use the most cost-effective lamps, the light output of which is more than 70 lumens / W, and for LED - More than 90 lumens / W. - Updated sanitary standards aid the state authorities with the development of technical specifications and justification of the costs for advanced lighting products, which in turn will help buyers in the choice of lighting with full understanding of costs, long-term performance, and environmental protection.

		2013-2016	- Methodologies have been developed and training equipment has been procured - everything to improve the quality of energy audit, in particular - light audit, this was done in support of the implementation of the law on EE. Methodologies and training equipment have been transferred to 14 Energy Efficiency Centers across Kazakhstan.	An integrated approach to the system of implementing regulations and standards and to the creation of a suitable quality control system applied by the project, characterizes a steady trend of using quality EE lighting products in the Republic of Kazakhstan. - Project sustainability is also ensured by improving the quality of light audit. This approach, including specialized training of energy auditors, allows for the further development and introduction of EE and LED technologies at the system level, since it includes a complex: a developed Program for Energy Efficiency Centers, training of trainers, methodological aids, a textbook intended for educational institutions and training centers.
	Output 1.4: Enhanced public procurement processes favoring EE and life-cycle cost criteria	2014-2016	- Proposals have been prepared for minimum EE standards, submitted to the MID of the RoK, which in turn approved them and approved the new requirements ensuring (at least 75 lm / W) light output in the relevant document (Decree of the Minister of IR of the Republic of Kazakhstan No. 407 dated 31.03. 2015). - The potential of government officials responsible for procurement from municipalities is increased through trainings. Trainings have been conducted across the whole territory of the Republic of Kazakhstan	- In accordance with this decree, it is possible to include only energy-efficient lamps and lighting fixtures in the state procurement tender for fixtures for state institutions. State procurement of incandescent lamps is prohibited (EE Law). The quality of public procurement is improved through training, the problems of improving the quality of public procurement in the field of education, medicine and street lighting are considered, the regulatory documents governing public procurement in modern conditions are demonstrated as well as theoretical and practical aspects of planning public procurement to improve energy saving and energy efficiency.

		2016-2017	- Increased awareness of representatives from the prosecutor's office, inspecting officials involved in public procurement.	Participation of the prosecutor's office representatives made it possible to inform them about the existing standards and recommendations for minimum energy efficiency requirements for use in public procurement. When checking public procurement, they must consider these recommendations and not consider them as a corruption component if these requirements are applied. (The recommendations grant that the equipment at a minimum price may not meet the minimum energy efficiency requirements)
	Output 1.5: Established systems for collection, recycling, and storage of Hg-containing lamps	2013-2016	The proposals to Eurasian Customs Union Technical Regulations 037/2016 on hazardous substances have been developed, accepted by Technical Regulation and Metrology Committee of the Ministry for Investments and Development as well as accepted by the Customs Union - The project proposals regarding the mercury lamp disposal have been considered in the "Energy Saving 2020" State Program (taken by the Government Resolution No. 904, dated 29.08.2013 (art. 59, 60, 63, 66), which has been effective for almost two years and then repealed by the Government Resolution No. 434, dated 25.07.2016) - Recommendations have been prepared for development of the mercury lamp collection, processing and storage system on amendments to the list "Extended Producer Responsibility (EPR)", chapter 41-1 "Environmental Code of the Republic of Kazakhstan" (No. 212-III, dated 09.01.2007). Approved by the decree of	- Eurasian Customs Union Technical Regulations 037/2016 "On Limitation of Hazardous Substances Application in Electric and Electronics Equipment" will take effect since 1.03.2018. This mechanism will be used to create a powerful mercury lamp disposal system. - Prepared proposals added as the amendments to the Environmental Code as well as the MSW regulatory base facilitate the sustainable development of the national mercury lamp collection, storage and disposal system. - The project assisted the Government in development of the effective schemes in terms of EPR concept development.

		2015-2016	the Minister of Energy of the Republic of Kazakhstan No. 695 dated 04.12.2015 (effective since 01.01.2016) Then, the following proposals to the List of Products (Goods) Subject to Extended Producer (Importer) Responsibility" were approved by the Ministry of Energy of the Republic of Kazakhstan and superseded to the List, having changed the above decree by the following decree of the Minister of Energy of the Republic of Kazakhstan No. 555 dated 22.12.2016. - A model pilot program has been developed, which includes the disposed mercury lamp collection methods, together with the Akimat of Astana In order to share the project lessons and to replicate them, the similar activities were implemented in other regions: together with the Akimats of Aktau and Kyzylorda with 80 containers installed.	The program and scheme for mercury lamp collection implemented by the Akimat of Astana with broad information support facilitated to collect more than 1.9 mln lamps. Replication of the mercury lamp disposal program in two regions and nine regions scheduled for 2017-2018 evidences on the sustainability basics laid of conducted activities and success of the policy implemented at the different levels. Further, an attention should be paid to infrastructure development for mercury lamp disposal.

Component 2: Market development for EE lighting	Output 2.1: Market stimulus to promote EE lighting	2014-2017	- A discount program for consumers purchasing the LED products has been developed. The program was given to the city Akimats (Almaty, Astana, Karaganda, Aktobe) and implemented jointly with "Chocolife". The mechanism of coupon service provided an opportunity for the poor to participate in the program, thus the poor support and promotion of the policy implemented by the Ministry for Investment and Development of Kazakhstan have been carried out for promoting EE products in lighting industry. During result assessment, the recommendations have been prepared on the next steps and transferred to the Ministry for Investment and Development, which are currently under consideration. In the future, the discount sales of LED lamps will be held in a number of trade networks of Astana and Almaty (Magnum, Line, etc.) 3000 LED lamps have been sold.	The Ministry for Investment and Development is considering recommendations within the concept of establishment of a national voluntary certification system and energy efficiency standards for energy-consuming devices, as well as promotion of market incentives for CFL with some degree of caution, and linking market promo activities, if possible, with campaigns to promote the collection of used mercury lamps, considering the best practices.
	Output 2.2: Implemented labeling program for energy-efficient lighting products	2015-2017	- In order to determine further actions in the context of consumer protection in the purchase of energy-efficient products, besides the mandatory labeling expected to be approved by the Customs Union, the proposals are being developed to expand the national policy while considering the introduction of voluntary product labeling, taking into account the parameters such as product quality, energy efficiency and the possibilities of cost-cutting and expanding the scope of application - household appliances and industrial equipment. Proposals are submitted to the Ministry for	- For the purposes of sustainability and further support of the implemented EE policy, the UNDP/GEF project "Energy Efficiency Standards, Certification and Labeling of Home Appliances and Equipment in Kazakhstan" will support the Ministry for Investment and Development in its efforts to implement the provisions of the relevant CU Regulations, technical standards, quality system and energy labeling system for electrical engineering industry, taking into account the results of this project study and the application of standards.

			Investment and Development. The proposals will be implemented within the UNDP/GEF project "Energy Efficiency Standards, Certification and Labeling of Household Appliances and Equipment in Kazakhstan", launched in 2017.	
Component 3: Promotion and educational outreach	Output 3.1: Completed promotional campaigns for EE lighting among the general public.	2013-2017	...? seminars, round tables, promotional activities and other activities have been arranged to promote EE lighting among the public and the proper handling of used mercury lamps. A web site on EE coverage has been developed, including a plan for transferring it to another organization that will support the site after the completion of the UNDP/GEF project	- Increasing knowledge among various stakeholders on EE lighting covered 10 regions of Kazakhstan, the activities included training of experts in power engineering and energy audit. The conducted training showed the change in the consumer behavior in the transition to EE lighting, as well as the safe disposal of compact fluorescent lamps.
	Output 3.2: Completed EE lighting promotional campaigns among professionals	2013-2017	...? seminars and other events have been co-organized and held to promote EE lighting among construction industry professionals, decision-makers and other professionals, including industrial energy auditors	- The conducted promotional EE campaigns among professionals helped to expand the knowledge base of specialists in the energy field (lighting industry), for example, related to light audit.

Component 4: Demonstration projects	Output 4.1: Completed new demonstration projects	2013-2016	Pilot projects have been selected in accordance with the criteria and taking into account the diversity in the overall project portfolio on the basis of the consensus of the Project Management Committee	Pilot project selection criteria demonstrate: a) the potential for cost-effective spending cuts; b) the potential for large-scale reproduction over the project period; and c) opportunities for capacity building among professionals and administrators in project planning and management. The pilot project implementation resulted in technical results on energy saving improved, as well as organizational issues addressed, energy savings monitored, greenhouse gas emission reductions assessed with direct and indirect effects, peculiarities of simulation, behavioral change, motivation, etc. defined together with the stakeholders, In particular, incentive measures were demonstrated in the area of housing and communal services by the condominium to replace existing lighting with LEDs in common areas of buildings. - Demonstration projects help to increase technical expertise, as well as to create a technical and financial reputation as a basis for future replication, help overcome barriers to promoting EE lighting and the risk associated with the rejection of new technologies and methods.
	Output 4.2: Replicated other known lighting upgrades.	2013-2017	Based on the analysis of the documentation of previous EE lighting projects and the verification of quantitative results, the selection and implementation of the replication projects has been carried out; monitoring and verification of energy saving and GHG emission reductions achieved within the	Pilot projects have been implemented in the fields of education, healthcare, housing, administrative buildings and street lighting, using the experience gained. In general, all pilot projects over a period of 15 years expect a direct effect of energy saving in the amount of

			replication projects, documenting the results of lessons learned. distribution of results and assistance in the replication. Demonstration projects have been implemented in the following cities: Aktau, Kyzylorda, Fort-Shevchenko, Ust-Kamenogorsk, Lisakovsk, Uralsk, Almaty, Astana and Satpayev.	50 GWh and reducing greenhouse gas emissions by 47 thousand tons of CO_2. Communications have established between customers, suppliers and installers during the project implementation, and the seminars on information sharing have been held afterwards both in soft and in hard copies

ANNEX 12: EXTEND OF ACHIEVEMENTS OF END-OF-PROJECT INDICATORS FOR OBJECTIVE AND OUTCOMES OF THE EEL PROJECT

	Indicator	Baseline	End-of-project target	Evidence
Objective: To phase out inefficient lighting and transform lighting markets towards greater energy efficiency, while ensuring product quality and cost-effectiveness, as	Electricity consumption and associated GHG emissions from lighting	10.0 TWh/year and 9.3 million tons of CO_2/year	7 TWh/year and 6.5 million tons of CO_2/year.	6.8 TWh/year and 6.3 million tons of CO2/year. The Terminal GEF Tracking Tool (TT) reports 11,520,000 MJ of lifetime energy saved (vs. the end-of-project target of 10,800,000,000 MJ as reported in TT at CEO endorsement). The reported fuel savings realized from the government ban on the use of incandescent lamps 2012 and 2016. In terms of lifetime direct GHG emissions avoided, the project reports 47,062 tones CO2 equivalent (vs. 31,329 tones CO2 equivalent in CEO Endorsement TT).
	Adoption of IL phase-out and associated policies	IL phase-out adopted but without specific implementation plans	IL phase-out and full range of accompanying policies implemented, including technical standards	By the Energy saving and energy efficiency Law the incandescent lamps are subject for a gradual withdrawal. The Law includes a few phases of realization: The first phase: since July 1, 2012 100 W and higher incandescent lamps are to be withdrawn from the import and production. The second phase: since January 1, 2013 75W and higher. The third phase: since January 1, 2014 - 25 W and higher.

	Indicator	Baseline	End-of-project target	Evidence
well as safe disposition of spent mercury-containing lamps.	Share of incandescent lamps, CFLs, and other types of conventional and efficient lighting	Incandescent lighting accounts for 77 percent of all lighting in buildings. Lamps up to 100W permitted as of July 2012.	Incandescent lighting is no longer sold for conventional applications in Kazakhstan	Incandescent lighting is no longer sold for conventional applications in Kazakhstan. But according to the market research the incandescent lamps cover 18% of all the lighting in buildings. It is happening probably because incandescent lamps up to 25W are still permitted in Kazakhstan.
	Quantity of contained and uncontained mercury from lamps, relative to the overall quantity of Hg-containing lamps in the market. This indicator depends	No limit on quantity of mercury in CFLs. No requirement or standards for operating life time of CFLs. Containment not defined	In addition to midterm targets, documented expansion of market share of LEDs to 6 percent of national lighting total. At least three regional programs for collection and	The number of the collected and utilized lamps is 11,24 mln lamps (3,6 mln for the reported period) Mercury utilization program is being implemented in Astana and further replicated in two other regions of Kazakhstan, Mangystau and Kzyl-Orda. In Astana, the utilization from population is 100 % covered. In two other regions, it covers 60%. In 9 regions, it is planned to purchase containers for mercury lamps collection from local population and further utilization.
	directly on Hg content of lamps, their operating lifetime, and effectiveness of collection and containment.	quantitatively; collection and recycling only from state agencies and larger enterprises, not general public	containment of spent fluorescent lamps, with documented 50 percent recovery of mercury from spent lamps.	In 2017 there were established 1276 containers for mercury lamps collection (9 regions)
	Mobilization of investment and other financial support for EE lighting in Kazakhstan	Investment and state budget support for EE lighting is just beginning in Kazakhstan	US $28 million in co-financing for EE lighting secured and applied	7.5 mln U.S. dollars were spent as co-financing from the local Akimats' budgets for the EE lighting in 2016 In total for the period from 2013-2017 it was 35.5 mln U.S. dollars In Parallel financing World Bank allocated 20 mln U.S. dollars for Kazakhstan on energy efficiency, including for street lighting upgrade

	Indicator	Baseline	End-of-project target	Evidence
Outcome 1: Policy development and implementation supports effective IL phase-out, expansion of market share and use of EE lighting, and minimization of release into the environment of Hg from spent lamps	1.1 Implementation of incandescent-lighting phase-out	Phase-out included in adopted RK law *On Energy Efficiency,* but without specific implementation plans.	Phase-out implemented in stages and documented (100W bulbs phased out by 2013, 75W bulbs by 2014, and 25W bulbs by 2015).	By the Energy saving and energy efficiency Law dated January 13, 2012 the incandescent lamps are subject for a gradual withdrawal. The Law includes a few phases of realization: The first phase: since July 1, 2012 100 Wt and higher incandescent lamps are to be withdrawn from the import and production. The second phase: since January 1, 2013 75Wt and higher. The third phase: since January 1, 2014 - 25 Wt. and higher.
				Amendments and additions to Energy Efficiency Law of the RK 279-V dated January 14, 2015 have been proposed and adopted allowing for implementation of energy performance contracts by ESCOs, including in the lighting sector.
	1.2 Requirements of technical standards for EE lighting	No technical standards for EE lighting	Technical standards developed, adopted, and enforced for EE lighting	7 technical standards for EE lighting were developed and approved, namely: • Art RK GOST R 54815 LED lamps with built-in controls for general lighting at voltages above 50 V. Performance requirements; • Art RK GOST R 54943 Buildings and facilities. Method for determination of discomfort under artificial lighting of facilities; • Art RK GOST R 54945 Buildings and facilities. Methods of measurement of the pulsation light coefficient; • Art RK IEC / TS 62504, general lighting. Light-emitting diodes and modules. Terms and definitions; • Art RK GOST R 54305 Auto-roads of public use. Horizontal illumination from artificial lighting. Technical requirements; • Art RK GOST R 54308 Auto-roads of public use. Horizontal illumination from artificial lighting. Methods of control; and • Art RK GOST R 54984 Outside lighting of railway vehicle objects. Norms and methods of control.
				To facilitate and strengthen the national compliance system for the adopted standards for domestically produced and imported lighting equipment, the project has identified the list of certified testing laboratories, conducted their capacity assessment, and strengthened capacity building plan, including the needs in specialized testing equipment.
	1.3 Code requirements for energy performance of lighting in buildings	Minimum 55 lumens per watt (for limited applications)	Additional revision of SNRK 2.04-05-2002 and others for greater energy efficiency, including recommendatory sections	The Committee of Construction of the MID RK brought up for discussion the construction norms: (CR RK 2.04-104-2012) - for general and artificial lighting in which it is required to use the most efficient lamps with the light output more than 70 lumen/Wt, for СД - more than 90 lumen/Wt. More stringent code requirements, 90 lumens minimal per 1 Watt, have been proposed and included in the new draft code, which is currently undergoing internal clearance in the Government. It is expected to have new codes accepted by end of July 2017.

	Indicator	Baseline	End-of-project target	Evidence
	1.4 Procurement of energy-efficient lighting by public agencies	Public agencies do not consider life-cycle costs or energy efficiency of lighting equipment in procurement	Observance of recommended procurement guidelines by at least two national agencies or other bulk purchasers.	An overview of the current situation in the RK in the field of procurement of EE lighting fixtures was prepared based on the analysis of the provisions of existing Law on public procurement and the provisions on the regulations pertaining to the procurement by regional governments and major state-owned enterprises. MID was assisted with drafting a Decree, subsequently adopted: MID decree № 415 (31/03/2015) stipulates that state procurement needs to comply with the newly adopted requirements for the lighting products for outdoor and indoor lighting.
				The Law of the Minister for Investments and Development of the RK 415 dated March 31, 2015 (valid as a decree of the RK) has approved the following: - requirements to minimal light efficiency of LED lamps - new requirements to the lighting fixtures of indoor lighting in public and administrative buildings - new requirements to lighting fixtures for lighting the housing objects - new requirements to lighting fixtures for street lighting
	1.5 State policy and program on mercury (Hg) containment and recovery	National mandate for Hg containment and recovery developed by RK Ministry of Environmental Protection and sent to regional governments. No regional programs yet implemented in response. No organized collection of spent lamps among general public.	Processes for collection of mercury wastes operating nationwide. At least three regional programs for collection of mercury wastes, with documented 50 percent recovery of mercury from spent lamps.	The number of the collected and utilized lamps is 11,24 mln lamps (3,6 mln for the reported period) Mercury utilization program is being implemented in Astana and further replicated in two other regions of Kazakhstan, Mangystau and Kyzylorda. In Astana, the utilization from population is 100 % covered. In two other regions, it covers 60%. In 9 regions, it is planned to purchase containers for mercury lamps collection from local population and further utilization. By 2017- 1276 containers for mercury lamps collection (9 regions)
Outcome 2: Increased accessibility and market share of EE lighting	Market share of incandescent lamps, CFLs,	Incandescent lighting accounts for 77 percent of all lighting in buildings. Lamps up to 100W permitted as of July 2012.	Incandescent lighting is no longer sold for conventional applications in Kazakhstan	Incandescent lighting is no longer sold for conventional applications in Kazakhstan. But according to the market research the incandescent lamps cover 18% of all the lighting in buildings. It is happening probably because incandescent lamps up to 25W are still permitted in Kazakhstan.

	Indicator	Baseline	End-of-project target	Evidence
	and other types of conventional and efficient lighting	LEDs account for 3 percent of the market for light sources in Kazakhstan	LEDs are available for indoor and outdoor applications nationwide and account for 6 percent total national market share for lighting.	LEDs account for 62 percent of the market for light sources. To assess the accessibility and market share of EE lighting the following were developed: (a) an assessment of basic power consumption and the number of light points in the lighting structure of the following various sectors; (b) scenarios on market development in Kazakhstan, including a quantitative assessment of the use of light products, electricity consumption and the potential of market transfer, energy saving and reduction of GHG emissions because of the strategies developed for 2013-2018; and (c) options for the stimulation of the market of EE lighting products. Regarding the latter, a pilot discount program has been implemented to stimulate the purchase of LED lamps by the population leading to additional sales of 3,000 LED devices by the population.
				The concept of voluntary certification and standards for energy efficient lighting appliances has been worked out.

	Indicator	Baseline	End-of-project target	Evidence
Outcome 3: Increased familiarity among diverse stakeholders with EE lighting and associated issues	Awareness of general public about advantages of EE lighting, rating and labelling systems for lighting, and proper handling of spent mercury-containing lamps, as measured by quantitative scoring of survey data Coverage of outreach campaigns, in	Not defined quantitatively. General public widely disregards advantages of EE lighting. Rating/labelling systems and mercury-lamp collection programs for general public do not exist.	Outreach campaigns conducted, reaching 6.5 million citizens Forty percent of overall population is aware of advantages of EE lighting, rating and labelling systems for lighting, and proper handling of spent mercury-containing lamps	Manual for electrical lighting and energy efficiency was developed and approved for the higher educational institutions.
				A baseline sociological study about people's awareness and attitude towards EE lighting was conducted. It showed that only 30% of population was informed about EE lighting, and the information was mostly of general nature; the awareness level about types, possibilities and advantages of EE lamps was still low.
				A video was made to promote safe utilization of spent mercury lamps. After the video had been rotated in the cinemas of «Kinopark" label the Astana municipality helped to show this video on TV channels. Nowadays this video is being promoted in trade centres, buses, train stations, and other public locations of Astana. (about 800 000 people were covered.) (Totally rotation of utilization video) 2013-2014 – 620,000 people 2014-2015 – 200,000 people
				Also, there had been made video about energy efficient lighting advantages. The video was submitted to the MINT, and it was shown on state channels. It is having been regularly promoted during project events. (about 700 000 people covered) (Totally rotation of energy efficient lighting video on TV and project events) 2013-2014 – 600,000 people 2014-2015 – 170,000 people

	Indicator	Baseline	End-of-project target	Evidence
	terms of population			In the regions of Eastern and Southern Kazakhstan the project had conducted media-trainings for journalists regarding use of multi-media tools in discussions and writing of energy efficiency issues. In 2015 seminars and media-trainings were given in Kyzylorda, Aktau, and Shymkent cities. In Kyzylorda, the project participants took part in the TV talk-show where they were answering questions about energy efficiency. (about 400 000 people covered) Also, there was a media-training in Bishkek, Kyrgyzstan which involved journalists from various Kazakhstan media. Knowledge received from the training resulted in numerous articles both in newspapers and Internet resources. (about 500 000 people covered) In 2016, a large media-training took place in Yerevan, Armenia. Journalists from Kazakhstan and Armenia had an opportunity to interact with the representatives of UNDP Kazakhstan and UNDP Armenia, learn more about the project and its achievements and findings. Both Kazakhstan and Armenian journalists reflected the information and interviews in their articles in newspapers, Internet resources, and TV interviews. (about 800 000 people covered) (Totally seminars and media-trainings and its coverage in media and TV) 2013-2014 – 250,000 people 2014-2015 – 150,000 people 2015-2016 – 1 345 000 people
				Printed materials were prepared (brochures, informational materials, infographics), it is constantly distributed among participants of seminars, conferences, contests, public events, and flash-mobs. The project website is launched and regularly updated. EE lighting awareness installations had been made and distributed among project partners. The Project page on Facebook is regularly updated. The Project always participates contests related to promotion of energy saving ideas. (about 10,000 people covered) (Totally printed materials distribution) 2012-2013 – 1,000 people 2013-2014 – 7,000 people 2014-2015 – 2,000 people 2015-2016 – 4,000 people
				Professional training was given to trainers of energy auditors according to the study module for energy audit of lighting systems in buildings, structures, and street lighting. Project participates in training of energy managers in centres of energy efficiency. (about 500 people covered) (Totally professional trainings) 2013-2014 – 350 people 2014-2015 – 150 people

	Indicator	Baseline	End-of-project target	Evidence
				In 2016, the Discount program (through the discount campaign itself plus PR activities involved) helped to raise awareness. Within the Discount program there were given press-conferences and TV interviews in four cities of Kazakhstan, including an online interview. TV interviews were aired both on local and national level at prime-time, thus, covering totally about 2,5 million people. Also, there was made a video promoting LED lighting and the discount program with the participation of Kazakhstan popular bloggers which helped the Project to cover 10 000 people. Project took an active part in a wide informational campaign of the Center of the Green Technologies during the visit of the UNDP management. TV and radio interviews allowed coverage of 10 000 people. The EE lighting project shared its communication experience at the XII International PR Forum in Almaty, thus, covering 500 people. Regular maintenance of the project website and Facebook account resulted in 10,000 people coverage. In total 6,790,000 people were covered.
Outcome 4: Increased investor confidence, design and administrative capacity, and market share of EE lighting as a result of demonstration projects	4.1 Energy savings and GHG emissions reductions from EE upgrades of lighting in selected public buildings or street-lighting projects	Outdated lighting technology is widely used in both buildings and street lighting. Quantitative baseline parameters to be determined during design phase for each specific project.	31,000 tons of direct avoided CO_2 emissions over operating lifetime of deployed demonstration technology. Specific technical and economic performance targets to be determined for each project.	Target for direct reduction of greenhouse gas (GHG) emissions from the demonstration projects is **31 thousand tons of CO_2.** Considering each stage of the project separately, the following results can be noted in the course of monitoring: as for the first stage of the project implementation, starting from 2013, GHG emission reduction amounted to 11 460 tons of CO_2, as for the second period, starting from 2015 - 12 185 tons of CO_2, as was considered in the first and the second reports on the monitoring and verification of energy savings and reduction of greenhouse gas emissions (total for the mid-term evaluation is 23 645 tons of $CO_)$. As for the third stage of the project (starting from 2016 to 2030 inclusive), considering separately, the reduction of GHG emission could be expected in amount of 32615 tons of CO_2 due to first assessment. At the same time, given the assumption to consider emission reductions in the 15 years since the launch of the UNDP/GEF project on lighting, i.e. within the period 2013-2027 and, cumulative total reduction of GHG emissions for this period will amount to **47,064 tons of CO2 (or 47 thousand of tCO_2)**, and energy saving effect in amount of 50199 MWh, taken into consideration that emission factor CEF varies from 1.0 to 0.91 during this period (average annual 0.937). In addition, within the period of 2027-2030 it will be 7.75 thousand tons of CO_2 (total for 18 years: 54.8 thousand of CO_2). **47,064 tons** of direct avoided CO2 emissions have been achieved because of implementation of EEL project-supported demonstration projects: • Lighting modernization to LED was performed in schools leading to lifetime energy saving of 5,055 MWh and GHG emission reductions of 5,999 tCO2; • Modernization of street lighting systems based on LED elements with automatic control was performed leading to lifetime energy saving of 9,036 MWh corresponding to GHG emission reductions of 8,630 tCO2;

	Indicator	Baseline	End-of-project target	Evidence
				• New residential building was equipped with efficient public lighting system resulting in lifetime energy saving of 840 MWh and GHG emissions reduction – 813 tCO2; • LED-based lighting modernization to LED was undertaken in 9 hospitals leading to lifetime energy saving of 10,438 MWh and GHG emission reductions of 9,219 tCO2; • Lighting modernization in Kazakhstan (Transport Tower) administration building has been implemented and it prevented the emissions of 5,455 CO2 from fuel combustion for the production of electrical energy. • Implementation of discount programme promoted purchase of LED lamps by the population results in additional sales of 3,000 LED fixture and led to lifetime energy saving of 4,953 MWh and GHG emission reductions of 4,614 tCO2 • Modernization of lighting system in areas adjoining to buildings was carried out in 594 entrances in six cities of Kazakhstan leading to lifetime energy saving of 13,232 MWh and GHG emission reductions of 12,270 tCO2
	4.2 Replication of demonstration project results, in terms of number of projects, number of regions, and amount of financing mobilized	Business-as-usual does not reflect practices that are to be applied in demonstration projects	Replication of demonstration project results in at least five projects in five regions. At least $12 million invested in EE lighting projects	Replication is taken place in all 14 regions of Kazakhstan, as well as in two major cities, Astana and Almaty, with dedicated funds allocated from the National Modernization Programme for Communal Infrastructure, National Energy Efficiency Programme, as well as from the local budgets for the total of over $31 million in the period of 2013-2016. Good level of replication has been recorded in Astana, East Kazakhstan, Aktau and Pavlodar oblasts.
				Recommendations for the possible application and demonstration in Kazakhstan of the most effective technologies for outdoor lighting in urban areas (for example, Almaty city) prepared based on the analysis of international best practices, at the request of municipal authorities of Almaty. These recommendations were considered by Almaty authorities during signing of the contract with EBRD on street lighting modernization (6.0 Million USD). Similar arrangement is now being discussed with the WB in their new project targeting EE in street lighting

ANNEX 13: DISBURSEMENT OF PROJECT COMMITTED CO-FINANCING, 2012-2016

No.	Sources /Name of Co-financier	Actual disbursed co-financing, in US 1000$						Committed co-financing (ProDoc)	% of disbursed / committed co-financing	Notes/Explanation
		2012	2013	2014	2015	2016	Total			
1	RK MINT	2,000	4,000	11,000	17,000	4,000	38,000	14,540 [10,178 (cash-investment) 4,362 (in-kind, policy development & enforcement)]	263%	Allocated for energy efficiency policies from the republican and local budgets within the government program «Energy Saving 2020» In the period 2015-2016 the funds in the amount of 21 million USD were allocated for lighting modernization (external and internal) in 14 regions of the country. At the same time, due to economic crisis in 2016 t here were less funds allocated.
2	RK MEP	0	0	0	0		0	6,868 (in-kind)	0%	The Ministry ceased to exist after the government restructuring in 2014 with some of the functions having transferred to the Ministry of Energy. The project was cooperating with the former MEP on the program that was expected to cover utilization of mercury containing appliances such as CFLs. The Ministry of Economy didn't approve that program, which made the project resort to other routes, i.e. working directly with regional and city administration.
3	City of Almaty	900	3,000	0	0	0	3,900			Investments to upgrade street lighting in Almaty as part of the EBRD loan worth 34 million US$ 6.0 In 2015 the EBRD loan was closed by the Government of Kazakhstan.

4	Philips Electronics	0	10	55	0	0	65	654	10%	Pilot projects on upgrade of indoor lighting in secondary schools. Additionally, the company co-financed activities on promoting energy efficient lighting appliances in the market of Kazakhstan.
	Private laboratories	0	0	0	44	35	79			This contribution was not envisaged in the ProDoc as the works in this direction were initiated in 2015. This is because of supply and re-equipment of technical equipment in 5 laboratories. The contribution is in the form of parallel financing and in-kind.
5	Turan-Profi Academy Green Academy	0	200	10	150	120	210 270	500	96%	In-kind contribution to training of energy managers and auditors in Kazakhstan In 2015 and 2016 the work was carried out collaboratively with the Green Academy, engaged in training and raising of qualification of government employees, students and business structures.
6	Women of the Sary-Arka Ak-bota	0	0	0	3	6	9	5,495	163%	This NGO was re-organized into an Association of women. The project cooperated with another NGO, «Women light», reflected in the table of additionally leveraged co-financing The work on support and training of women in rural area was implemented together with NGO AkBota. .
7	Maksat CAOs Almaty Association of apartment owners in 6 cities	0	1	0	0	7	1 7	9	90%	Installation of LED lamps in 7 residential buildings in Almaty. 6 associations of apartment owners take part in modernization of lighting in entrance spaces and put a contribution to in-kind.
8	UNDP	7	7	0	36	0	50	50	100%	PM costs
	Total	**2,907**	**7,219**	**14,066**	**9**		**42 591**	**28,622**	**148%**	

ANNEX 14: LIST OF TABLES

ANNEX 15: EVALUATION REPORT CLEARANCE FORM

Evaluation Report Reviewed and Cleared by

UNDP Country Office

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Resource Monitoring Associate

Signature: _____ Date: 11.05.2017

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