

United Nations Development Programme

Country: Ukraine

PROJECT DOCUMENT¹



Project Title: Transforming the Market for Efficient Lighting

UNDAF Outcome(s): UNDAF outcome #4: By 2010, poverty reduced by 50% through equitable, area-based economic growth and targeted provision of inclusive social services

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Mobilizing environmental financing (para 109)

UNDP Strategic Plan Secondary Outcome: Mainstreaming environment and energy (para 107)

Expected CP Outcome(s): Sustainable development policies and practices make the difference.

(Those linked to the project and extracted from the country program document)

Expected CPAP Output (s) Institutional capacities and capabilities of municipalities strengthened through improved policies and practices related to energy services and environment.

Those that will result from the project and extracted from the CPAP)

Executing Entity/Implementing Partner: The Ministry of Environmental Protection of Ukraine

Implementing Entity/Responsible Partners: UNDP

Brief Description

The proposed project addresses a key issue in the reduction of greenhouse gas emissions in Ukraine by transforming market towards more energy efficient lighting technologies and gradual phase-out of inefficient lighting products in residential and public buildings. These improvements will result from a five-part approach: 1) Improve the national policy framework for promoting energy-efficient (EE) lighting 2) Improve the national quality-assurance (QA) & quality-control (QC) systems for imported and produced lighting products in Ukraine 3) Design and implement energy-efficient (EE) lighting demonstrations in the municipal sector focusing on public schools. 4) Raise residential consumers' education and awareness for EE lighting. 5) Disseminate and replicate the project results.

Program Period:	2010-2015	Total resources required	31,000,000
Atlas Award ID:	00060792	Total allocated resources:	31,000,000
Project ID:	00076692	• Regular	
PIMS #	4175	• Other:	
Start date:	1/12/2010	○ GEF	6,500,000
End Date		○ Government	19,375,000
Management Arrangements	NIM	○ In-kind (Gov-ment)	1,600,000
PAC Meeting Date		○ Private Sector	3,275,000
		○ UNDP	250,000

Agreed by (Government):

[Signature]
Date/Month/Year

Ivan Makarenko 31/03/2011
Deputy Minister

Agreed by (Executing Entity/Implementing Partner):

[Signature]
Date/Month/Year

[Signature]
Resident Representative a.o.

Agreed by (UNDP):

¹ For UNDP supported GEF funded projects as this includes GEF-specific requirements

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Acronyms

AEECU	Association “Energy Efficient Cities of Ukraine”
ALRA	Association of Local and Regional Authorities
CFL	Compact Fluorescent Lightbulb
CIS	Commonwealth of Independent States
CMU	Cabinet of Ministers of Ukraine
EA	Energy Audit
EBRD	European Bank for Reconstruction and Development
EE	Energy-efficient
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
IL	Incandescent Lighting
ILB	Incandescent Lightbulbs
IGA	Investment Grade Audit
LED	Light Emitting Diode
LPAC	Local Project Appraisal Committee
MEEI	Ministry of Economy and European Integration
MEP	Ministry of Environmental Protection
MFE	Ministry of Fuel and Energy
NAER	National Agency of Ukraine on Ensuring Efficient Energy Resources Management
NIP	National Implementing Partner
NPD	National Project Director
PB	Project Board
PIR	Project Implementation Review
QA	quality-assurance
QC	quality-control
SCMH	State Committee for Municipal Housing
tce	Tons of coal equivalent
TLF	Fluorescent Tube Lamp
ToR	Terms of Reference
UNDP	United Nations Development Program
WTA	Walk-Through Audit

I. SITUATION ANALYSIS

Context and Global Significance

1. Ukraine continues to be one of the least energy efficient countries in the world and has one of the highest GHG emissions level per unit of GDP among CIS countries. The UNFCCC national inventory estimated that total emissions from Ukraine in 2007 were 436,0 million tons of CO₂ equivalent (the corresponding figure for 2006 was 436,8 million tons). It is 53% less than the Kyoto Protocol baseline for 1990 (926,0 million tons), but it has been growing steadily along with the increase in economic activity since 2000, adding on average of 6,6 million tons a year. This results in a per capita emission of 9,45 tons of CO₂ equivalent per year (for comparison, annual per capita emissions for the USA is 19.78 tons, for Germany 10.40 tons, and for Russia 12.00 tons). Consequently, Ukraine ranks 19th among the world's largest emitters of GHGs.

Table 1: GHG emissions from energy use in Ukraine in millions of tons (source: 2007 National Inventories).

IPCC GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ e	CO ₂	CH ₄	N ₂ O
Total Energy	299,740.32	247,029.98	2,481.63	1.92
Fuel Combustion Activities (Sectoral Approach)	248,244.12	246,991.76	31.25	1.92
1. Energy Industries	111,558.95	111,168.17	1.60	1.15
a. Public Electricity and Heat Production	101,664.67	101,300.15	1.29	1.09
b. Petroleum Refining	2,016.03	2,009.29	0.07	0.02
c. Manufacture of Solid Fuels and Other Energy Industries	7,878.25	7,858.74	0.24	0.05
2. Manufacturing Industries and Construction	48,744.46	48,603.85	3.58	0.21
a. Iron and Steel	22,387.16	22,317.57	1.90	0.10
b. Non-Ferrous Metals	1,820.94	1,817.67	0.08	0.00
c. Chemicals	4,406.53	4,398.57	0.20	0.01
d. Pulp, Paper and Print	504.76	504.11	0.02	0.00
e. Food Processing, Beverages and Tobacco	5,093.52	5,082.39	0.17	0.02
f. Other	14,531.55	14,483.53	1.19	0.07
Other non-specified	14,531.55	14,483.53	1.19	0.07
3. Transport	44,462.72	44,213.13	7.07	0.33
a. Civil Aviation	217.59	213.06	0.06	0.01
b. Road Transportation	30,300.53	30,087.42	6.43	0.25
c. Railways	727.01	724.13	0.05	0.01
d. Navigation	287.27	286.14	0.02	0.00
e. Other Transportation	12,930.33	12,902.40	0.51	0.06
Pipeline transport	7,839.83	7,832.53	0.14	0.01
Off-road vehicles and other machinery	1,369.73	1,363.90	0.11	0.01
Agriculture	3,720.78	3,705.97	0.25	0.03

2. Overall, Ukraine is one of the countries in Europe with the lowest energy-efficiency. The Ukrainian energy sector contributes 69% of overall GHG emissions (299,7 million tons), including the emissions from electricity production, which in 2007 amounted to 101,7 million tons of CO₂ equivalent (refer to Table 1). The high share of coal-fired thermal power plants in electricity production and high losses in electricity distribution grid combines to give Ukraine a high CO₂ emission factor per MWh of produced power 1.031 tons CO₂/MWh².

3. High energy consumption compared to GDP is a result of the lack of investments for the modernization of industry since the collapse of the Soviet Union. Insufficient implementation of energy efficient technologies in Ukraine limits industrial global competitiveness and causes severe impacts on the local and global environment. It is worth noting that the low energy efficiency is one of the major factors that have exacerbated the financial crisis in Ukrainian economy.

4. The economic crisis and natural gas crises between Russian and Ukraine that took place in recent years has also had a strong impact on policy formation and governmental goals in Ukraine. The Government of Ukraine has established a roadmap on Energy Strategy for Ukraine till 2030 (Strategy). According to the Strategy, in 2020 Ukraine plans to save around 470 million tons of equivalent oil, which will lessen import of energy resources by around 38 billion USD. Therefore energy-efficiency measures are a policy focus for the drive to improve energy independence and security for Ukraine.

5. Energy-efficient lighting is usually given lower priority in Ukraine compared to measures for energy-efficiency related to heating supply. Energy consumption from lighting is not as seasonal compared to heating, and EE lighting impacts electricity production and distribution. In contrast, heating energy in Ukraine is largely generated from coal or gas-fired district heating-boilers and networks. So the impact of EE lighting initiatives will be on a different industrial complex than other energy-savings programs that focus on savings for heating. Therefore EE lighting measures are an important (and often under-prioritized) policy tool. If implemented on a grand-scale in Ukraine it would free-up additional electrical capacity for export, industrial use, or result in a decrease in GHG emissions from fuel savings.

6. Consequently, there is untapped potential for the development and implementation of new energy efficient technologies in Ukraine, including energy-efficient lighting. While reliable statistics do not exist, it is estimated that more than 20% of electricity produced in Ukraine goes to lighting. The Ukrainian government supports energy efficiency through some policy measures, but in general funds are lacking for implementing large-scale energy-efficiency programs. In line with the Government's priorities, this project addresses an often overlooked issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficient lighting in Ukraine's residential and communal sector.

7. These improvements will result from a five-part approach:

1. Improve the national policy framework for promoting energy-efficient (EE) lighting
2. Improve the national quality-assurance (QA) & quality-control (QC) systems for imported and produced lighting products in Ukraine
3. Design and implement EE lighting demonstrations in the municipal sector focusing on public schools

² The grid factor developed and approved for JI projects in Ukraine is currently lower (0,896 tons CO₂/MWh) than the 1.031 tons CO₂/MWh used in other national publications.

4. Improve EE Lighting product penetration in the Residential Sector
5. Replicate and disseminate the project results

Institutional, sectoral and policy context

Institutional and policy analysis

8. The legal and regulatory basis for energy efficiency policy in Ukraine consists of 7 laws of Ukraine, more than 150 regulatory and normative acts, more than 100 methodological documents, 50 national (DSTU) standards and around 60 interstate standards (GOST)³.

9. *The Energy Strategy of Ukraine for the period to 2030* is the main strategic policy report which plots a course for the development of energy efficient and environmentally friendly policy for Ukraine. The document describes common environmental problems in the power industry and proposes solutions to it, including energy-efficiency measures. It was approved by the Cabinet of Ministers of Ukraine (CMU) in 2006 but has not been updated. With recent election results in Ukraine and a changing of the Cabinet of Ministers it is highly likely that this strategy will be revised in the next year or two.

10. The State policy regarding efficient use of energy resources and energy efficiency is executed by the National Agency of Ukraine on Ensuring of Efficient use of Energy resources management (NAER)⁴. The main tasks of the Agency are increase of alternative types of fuel use; development of the State monitoring system on energy consumption, production, export and import; ensuring of unified normative unit cost system for energy resources⁵.

11. An important policy institution is the National Agency of Ukraine on Ensuring Efficient Energy Resources Management (NAER) which is subordinate to the Cabinet of Ministers. The NAER's mission is to coordinate energy-efficiency and alternative-energy policies and activities between the different ministries of Ukraine, as well as to monitor and improve the use of energy in the public sphere.

12. The major legislative and normative base for the implementation of energy efficient policy based on the following legislation listed below. However, in reality there are literally hundreds of regulations that impact energy-efficiency measures in Ukraine.

1. *The Energy strategy of Ukraine for the period till 2030*, the action plan of which was approved by Cabinet of Ministers of Ukraine from 27.07.2006 №436-r;
2. The Law of Ukraine "Regarding primary directions of science and mechanic development" (№2623-III from 11.07.2007);
3. The Law of Ukraine "Regarding primary directions of innovative activity in Ukraine" (№433-IV from 16.01.2003);
4. The Law of Ukraine "Regarding energy saving" (№74/94 from 01.07.1994);
5. The Law of Ukraine "Regarding electric power engineering" (№575/97 from 16.10.1997);

³ <http://naer.gov.ua/wp-content/uploads/2010/02/nazdopovid.pdf>

⁴ http://www.kmu.gov.ua/control/uk/publish/article?art_id=68676029&cat_id=43169

⁵ <http://naer.gov.ua/wp-content/uploads/2010/02/nazdopovid.pdf>

6. The Decree of Cabinet of Ministers of Ukraine from 26.07.99 №1357 “*Regarding approval of electric power use for population*” with amendments from 26.10.2000 №1607, from 26.09.2001 №1275, from 11.01.2006 №4, from 06.06.2007 №799;
7. The Regulation of Cabinet of Ministers of Ukraine from 28.12.2005 №577-p “*Regarding actions regarding consumer energy saving*”;
8. The Regulation of Cabinet of Ministers of Ukraine from 16.10.2008 №1334-p “*Regarding approval of primary directions of activities in the energy efficiency field and energy saving for 2008-2009*”;
9. The Regulation of Cabinet of Ministers of Ukraine from 17.12.2008 №1567-p “*Regarding program of improvement of energy efficiency and reduction of energy resources consumption*”.
10. On March 01, 2010 the Ukrainian Cabinet of Ministers approved the State addressing economic energy efficiency program for 2010-2015 (Decree No 243 dated March 01, 2010)

13. The energy efficiency in lighting is the important component of the of the overall EE measures which should be implemented. The potential for savings is big. As it was stated in the Chapter "Situation Analysis" more than 15% of electricity produced in Ukraine goes to lighting. At the same time the efficiency of the converting of fuel energy to light energy is about 3%.

14. At nearest future the basis for electrical energy saving should be the replacement of less effective incandescent Lightbulbs (ILB) with more effective energy saving Lightbulbs. Thus, in the residential sector ILB are about 99%, in agricultural companies more than 83%, in industry 44% in public buildings 40%. Average percentage of ILB in Ukraine is 75%, while in developed countries this indicator is less than 50%.

15. Besides this legislation other actions of note include:

16. On April 09, 2008 the Government approved the Concept of State Target Scientific and Research Program “Development and Introduction of Energy Efficient Light Sources and Efficient Source-Based Illumination Systems into Ukrainian Economy” (№ 612-r). Three months later, the government approved the state scientific-technical target program "Development and implementation of energy efficiency LED lightning sources and lighting systems based on them" (№ 632).

17. In 2008, the CMU developed an action plan aimed at improving attitudes to the need of energy efficiency improvement in 2008 - 2009. This plan performed through Order №1290-r from October 1, 2008. The plan includes a nationwide exhibition "Energy Efficiency", information campaign "Energy Efficiency and Energy Conservation, International Conference on Energy Efficiency, seminars and competitions, exhibitions and conferences. In addition, it is planned to include the introduction of energy efficiency and energy conservation seminars in the educational curriculum of schools.

18. The CMU Order #1337-r “Regarding the implementation of measures to reduce electricity consumption by state financed organizations” requires that from November 1, 2008 state executive authorities should the replace incandescent bulbs with energy efficient light bulbs in state-financed organizations. (The exception being that there are no stockpiles of incandescent bulbs that have been bought earlier.) This order is supposed to switch state financed

organizations during the period 2008-2009 to energy efficient lighting but in practice compliance and enforcement has been low.

19. On 17.12.2008 CMU has issued order № 1567-r "About approval of primary activities in the field of energy efficiency and energy savings for 2008 - 2009 years". Paragraph 4 in the order defines the implementation of advanced technology projects through the replacement of ILB in the public sector to energy efficient devices.

20. According to this order, budgetary organizations are not allowed to purchase of ILB for inside buildings lighting and surrounding areas.

21. Despite these movements in the right direction, analysis by Ukrainian specialists indicates that the regulation is imperfect and needs changes. In particular, M. Ginzburg (2009) notes that there is significant legal and language non-conformity among two regulatory documents: "The technical regulations on labeling lamps for domestic use", issued by CMU from 27.12.2008 № 1144 and Change 1 GOST 4441:2005 "Energy saving and Energy labeling of devices for home use" State Consumer Standard, order of Ukraine from 31.12.2008 № 525.

22. Table 2 provides an example of problems with major regulations that should be promoting energy efficient measures, but fail to do so. It is not comprehensive as there exist hundreds of regulations which could be assessed.

23. Another relevant area where Ukraine has existing legislation is regarding the quality control for CFLs and other lighting equipment. However, there are problems with the system in practice and this allows low quality "grey market" bulbs to enter the market. (These problems are discussed in more detail within the *Sectoral Context* section and in Annex 2.)

24. In relation to quality standards, there is a public concern regarding the hazards related to the improper disposal and recycling of CFLs in Ukraine. More recently, the Government together with NGOs and international organizations took some initial steps to solve the problem of CFL disposal. On December 11, 2008 a round table discussion took place including representatives from organizations as the Norwegian Union of Conservation of Nature, the international educational project SPARE, NGO "Ecological Club Eremurus, association of energy efficient cities of Ukraine, representative of UNDP in Ukraine, and the NAER. The disposal of compact fluorescent lamps and electronic waste, as well as ways to develop legislation, funding and experience of similar projects implementation was discussed but, as for today, there are no concrete initiatives from the workshops. (Annex 5 provides a current description of CFL recycling and problems related to it.)

25. Ukraine currently has no official rating system for energy standards for state buildings, unlike many EU countries. Most recently, in Russia, a new Federal Law came into force on November 27, 2009. This legislation calls for "Energy Passports" for buildings, along with other measures that may be interesting for Ukraine to analyze as possible solutions for Ukraine. For example, from January 1, 2011, placements of orders for the supply of incandescent bulbs (of any power) to meet state or municipal needs will no longer be permitted. As from the same date, incandescent bulbs of over 100W will be forbidden in Russia. It is planned that circulation of bulbs with power exceeding 75W will be banned from January 1, 2013, and those over 25W from January 1, 2014. Similar measures in Ukraine would rapidly transform the lighting market.

26. In Ukraine the municipalities and local administrations are responsible for the promotion of energy efficiency due to Article 10 in the Law "Regarding Electricity". As a result, any energy-efficiency project should deal directly with municipalities and local administrations. On the one hand, it would be much easier to deal with one Ministry in terms of strategy and comprehensive

plan development. On the other hand, when working directly with municipalities it is much easier to implement a plan of action.

27. The major weaknesses regarding energy efficient policy implementation in Ukraine are the ineffective implementation of financing for the measures, a lack of administrative capacity for

Table 2: Expert assessment of major laws in Ukraine which encourage energy-efficient measures.

Aim of the regulation	Law	Action	Real practice
Stimulation	Law of Ukraine from 16 March 2007 N760-V "Regarding some changes in legislative acts of Ukraine regarding stimulation of energy saving actions"	Benefits on custom duty, VAT and income tax for entities that implement, develop or use energy efficient projects or technologies.	Not working – import procedures, lists and volumes of goods are not defined by Cabinet of Ministers of Ukraine.
	Law of Ukraine from 18 December 2008 N694-VI "Regarding some changes of legislative acts of Ukraine regarding minimization of financial crises influence on development of national production"	Emancipation from custom duty and VAT until January 1, 2011 for importing of equipment for implementation of energy efficient technologies.	Not working – the Law is recognized as Anti-Constitutional; Decision of the Constitution Court from 14 July 2009 № 18-rp/2009
Financing	Law of Ukraine from 16 March 2007 N760-V "Regarding some changes in legislative acts of Ukraine regarding stimulation of energy saving actions"	Establishment of State Energy Efficient Fund for financing of projects that focused on effective use of energy resources.	Not working – procedure and volumes of charges as well as procedure of funds distribution are not defined by Cabinet of Ministers of Ukraine.
Legal responsibility	Law of Ukraine from 16 March 2007 N760-V "Regarding some changes in legislative acts of Ukraine regarding stimulation of energy saving actions"	<ul style="list-style-type: none"> • Increased maximum fine for wasteful use of energy-fuel resources, from 5 to 50 minimum incomes that are not due to tax (art. 98 Code of Ukraine on Administrative Offences); • Increased maximum fine for not meeting requirements of State Energy Saving Inspection, from 15 to 150 minimum incomes that are not due to tax (art. 188-14 Code of Ukraine on Administrative Offences); 	The fines are used in practice; however, their size is too small to have an impact.
	Law of Ukraine from 16 March 2007 N760-V "Regarding some changes in legislative acts of Ukraine regarding stimulation of energy saving actions"	Charge for overuse of energy-fuel resources over established rates (energy duty)	Not working – absence of the collection and utilization of the resources.

implementation, and a lack of politicians which wish to take the political risk related to the unpopular re-structuring of energy markets.

28. In conclusion, Ukraine has hundreds of regulations which overlap into the area of energy-efficiency and lighting. Unfortunately, they are typically not aligned and create implementation problems for organizations trying to follow them. Couple this with enforcement problems as mentioned in Table 2 and we find a system that needs serious policy improvements at the National and Municipal level.

Sectoral Context (Ukrainian Lighting Market & Supply)

29. The market for energy-efficient lighting formed years ago in Ukraine and today the population has access to much of the same technology that is available in other countries in Europe. The year-on-year growth of energy-saving lighting market was 10-15% in quantitative terms and 20-25% in monetary terms since 2000 till 2008. At the end of 2008 and beginning of 2009 there are declining rates of growth most likely caused by the recent financial crisis. In terms of market penetration there is still room for growth as incandescent lighting (IL) purchases are still ten times greater (273 million pieces versus 27 million pieces in 2008) compared to CFLs.

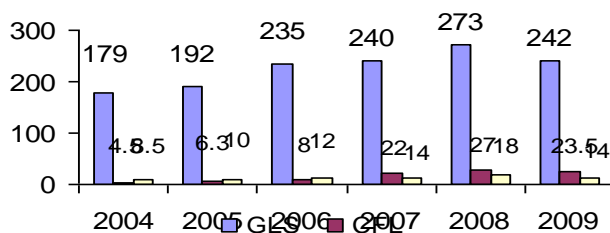


Figure 1: Dynamics of Ukrainian lighting market development in 2004-2009, millions of pieces.

30. According to estimations in 2008, the size of the domestic market of lighting sources was worth \$210 million and 355 million pieces were purchased in a country of 46 million people. In Ukraine there is only one full-line producer of compact fluorescent lamps (Gazotron Lux) which occupies 5% of CFL market. Another local manufacturer of lighting products (ISKRA) assembles CFLs from imported components. The rest of the energy-saving lighting products are imported. *Therefore 95% of energy-saving lamps are imported to the Ukrainian market, but the capacity to provide quality control of these imports is insufficient.* In addition current standards for CFLs in Ukraine are not as high as those found in other European countries. More statistics and data for this market is provided in Annex 1.

31. There are systemic reasons behind the ability of low-quality so-called “grey market” CFLs to enter the Ukraine market. Currently, the “State Accreditation Agency” accredits laboratories

(state and private) to perform testing according to legislative standards on CFLs and other lighting products. For any CFLs to enter into the territory of Ukraine a “certificate of conformity” needs to be issued by an intermediary agency that receive a “testing protocol” from an accredited laboratory. Supposedly, many of the private testing laboratories in Ukraine do not have the correct testing equipment to fully test the CFLs against the national standards. Even so, these laboratories are issuing the testing protocols which later allow the certificates of conformity to be issued to the “grey-market” CFL importer. Another way some importers could circumvent the current system is to give higher quality samples to the testing laboratory and receive certificate of conformity for entire shipment of products. With this certificate importer can bring to country products of low quality, since there is currently no control of the products once they enter Ukraine.

32. In summary the Ukrainian lighting market is characterized by high competition from imported lighting products and a limited number of local producers. In addition, intervention is desperately needed to support quality control activities, information dissemination for finding and using quality products, and innovative financing for products with high initial costs but with lifecycle cost savings. While the market for efficient lighting products has grown dramatically in the past decade, there exists a potential for market declines due to quality problems and perceptions that efficient lighting products are not good investments for people with limited disposable income. The problems caused by poor quality products flooding the market may result in longer periods of time to overcome negative perceptions by consumers who have had bad experiences with efficient lighting products.

Stakeholder analysis

33. The Project has benefited from extensive stakeholder involvement (Ministry of Environmental Protection, Ministry of Economy and European Integration, State Committee for Municipal Housing, Oblast Administrations, Municipalities, Association “Energy Efficient Cities of Ukraine”, Association of Local and Regional Authorities, etc.) during its implementation. Discussions have also been held with potential project partners from the private sector, e.g. Phillips Lighting, OSRAM, Kosmos, Gazotron-Lux, etc. At the national level, the project has the full support of the State Committee for Municipal Housing, the Ministry of Environmental Protection and benefits from the participation of the Association “Energy Efficient Cities of Ukraine” and Association of Local and Regional Authorities, an NGO very active in the environment field. A more comprehensive list of the stakeholders which were involved during the preparation phase is shown in Table 3 below.

Table 3: List of stakeholders which were contacted as part of the preparation phase.

Public Sector	Municipal	Private Sector	International/Multi-lateral Organizations	NGOs
Ministry of Environmental Protection.	L'viv City Municipality	Gazotron-Lux	World Bank	Association "Energy Efficient Cities of Ukraine"
Ministry of Education and Science of Ukraine	Rivne City Municipality	TM "Kosmos"	European Bank for Reconstruction and Development (EBRD)	Association of Local and Regional Authorities
Ministry of Health of Ukraine	Chernivtsi Regional State Administration	Phillips Lighting	(NEFCO)	
Ministry of Industrial Policy of Ukraine	Cherkasy Regional State Administration	Osram	EU Mission to Ukraine	
National Environmental Investment Agency of Ukraine	Autonomous Republic of Crimea	General Electric		
National Agency of Ukraine for Efficient Use of Energy	Dnipropetrovs'k city council	Platinum Bank		
State Committee for Standardization, Metrology and Certification of Ukraine	Kamianets-Podilskyi city council	Cool NRG		
Institute of Legislation of the Verkhovna Rada of Ukraine	Mariupol city council	Sanyo		
National Technical University of Ukraine "Kyiv Polytechnic Institute"	Vinnytsia Regional State Administration	UKREXIM Bank		
Dehrzstandard	Luganska Oblast State Administration			
	Khmelnitska Oblast Rada (Local Parliament)			

Barriers Analysis

In Ukraine, as well as in other transition economies, the legacy of the socialist central planning system is particularly evident in its use of energy. A number of barriers to the spread of EE lighting exist, including regulatory, institutional, awareness and market barriers as outlined below and in

Table 4. According to most stakeholders, however, the price of EE lighting components, e.g. CFLs, is still the major barrier in the residential sector. Prices are currently 10 times or more the cost of a comparable incandescent bulb. With regards to the most advanced LED lamps the price is even higher (currently LED lamps are 5 to 8 times more expensive than CFLs depending on the manufacturer). Although energy saving is 90% more than ILB (LED consumed energy is 12.5 times less than ILB) and 65% more than a CFL (LED consumed energy is 3 times less than CFL).

Table 4: A list of major EE lighting barriers and the means by which the project addresses these.

Barrier	Proposed means by which the project will aim to overcome this barrier	Referenced Project Component
<i>Current energy standards do not encourage municipal energy efficiency</i>	Introduce legislation which will allow municipalities to re-invest/re-allocate money saved from budgets to other priorities.	1.1, 1.3
<i>Inefficient execution of existing government programs that promote energy-efficiency</i>	Improved alignment of measures at the municipal and state level by promoting concrete changes to the government	1.1, 1.2, 1.3
<i>Monitoring and reporting of consumption</i>	Changes in regulations will be introduced to promote usage of electric metering equipment.	1.1, 1.2
<i>Absence of adequate legal responsibility regarding inefficient energy use in Ukraine.</i>	Assist with the development of adequate legal responsibility for entities and officials which are responsible for inefficient use of energy resources.	1.1, 1.2, 1.3
<i>Low consumer awareness of EE Lighting benefits</i>	Marketing and promotion activities will improve consumer knowledge of the advantages of EE lighting products, as well as the programs for EE lighting home renovation/retrofitting.	4.1, 4.2, 4.3, 4.4
<i>Price barrier for consumers</i>	Collaboration of retail chain participants for scheme which reduces the upfront cost for residential consumers.	4.1
<i>Low quality of imported “grey market” CFLs</i>	Introduction of better testing equipment in Dehrzstandard and an enforcement mechanism	2.1, 2.2
<i>Unreliable information on EE product packaging</i>	A mechanism for fining companies and laboratories which provide false information on performance & packages should be introduced	1.1, 1.2, 2.1, 2.2, 4.2
<i>Absence of a fully equipped and accredited EE lighting</i>	DehrzStandard shall receive equipment upgrades in order to fully test EE lighting	2.1, 2.2, 2.3

<i>testing facility:</i>	equipment.	
<i>Electricity tariffs</i>	The project will support efforts to encourage government to design electricity tariff programs dictated more by market prices and less by political imperatives.	1.1, 1.2
<i>Voltage instabilities in the electric grid</i>	The project shall introduce mechanisms that encourage grid operators to invest in their system maintenance.	1.2
Improved system for CFL recycling	Improved directives for hazardous waste-handling and promotion of a better recycling system	1.4, 2.4

Regulatory and institutional barriers

34. *Current energy standards:* Current energy standards in Ukraine need to be improved at the municipal and residential level. Norms for building construction exists but they are rarely enforced and need amendments to improve compliance. Also, incentives do not exist to save money from state/municipal budgets via reduced energy consumption as the money is not returned the following year to the budget. A few municipalities have introduced rating systems (e.g. L'viv) for municipal building energy use and the energy consumption and ratings are posted at the entrance to all public buildings. This has had a positive impact on energy consumption and awareness and can rapidly be replicated in other regions. Regulation regarding statistical reporting on energy consumption needs to be amended. Currently it is not clear how much energy is used on lightning in the private and municipal sectors. A related problem is that the state owned institutions are not interested in investments in energy efficient lighting of the buildings because if the institution replaces e.g. all the ILs to CFLs, the amount of saved money on energy will be subtracted from the budget for the next year.

35. *Inefficient execution of existing government programs that promote energy-efficiency:* Current government programs that promoting energy saving and penetration of EE lighting have more of a declarative character and are applied very slowly in practice.

36. *Monitoring and reporting of consumption:* Changes in regulations are needed to promote usage of electric metering equipment. For instance, some of the entities in Ukraine are paying for the electricity according to the manufacturer specification of the equipment that is used by them, instead of paying for actual amount of energy used. There is an urgent need for streamlining the payment for the consumption of resources by consumers of utility services, which are currently carried out mainly by established standards that far exceed the actual consumption of resources. Some of the state administrative functions in the field of energy conservation and its efficiency are duplicated by the Ministries and special Agencies. As a result, it makes very difficult to monitor and evaluate the process of Governmental energy saving policy implementation.

37. *Enforcement and Legal Responsibility:* There is an absence of adequate legal responsibility regarding inefficient energy use in Ukraine. Development of adequate legal responsibility for entities and officials for inefficient use of energy resources, namely: the preparation of amendments to articles of Code of Ukraine about administrative violations, increase fines for violations in the field of energy, the introduction of financial responsibility of the entities for inefficient use of fuel and energy resources. Improvements of the regulation will spur up interest of private and municipal sector in the best available technology of energy efficient lighting. In addition, there is a lack of enforcement of quality standards for EE lighting products. This is

partly due to legislative and systemic reasons as customs controls for EE lighting products is ineffective. Regarding EE standards for new construction, the current legislated process does not effectively monitor the actual construction once it is finished. It only reviews the plans which quite often are not followed properly because short-cuts are made during the construction process.

38. *Legislative foundation:* the need of adaptation of the laws aligned to the EU legislation in accordance to Agreement on partnership and cooperation between Ukraine and the EU, Program of Ukraine’s integration in the EU (President of Ukraine decree from 14 September 2000 N 1072/2000 and Program of Ukraine legislation adaptation to the EU Legislation from 18 March 2004 N 1629-IV).

39. *Certification/Quality Control:* Only one laboratory in Ukraine can provide a full range of lighting product tests (safety, light and electric parameters, spectral and colour parameters, etc.). Other laboratories have facilities and equipment that allows conducting the tests partly or not completely, which sometimes leads to improper protocols of conformity being issued. This is presented in more detail in Annex 2.

Market Barriers

40. *Low consumer awareness:* CFLs are theoretically affordable to most main consumer groups in Ukraine, however the price being several times (approx. 10x) higher than for incandescent bulbs represents a barrier. The barrier is often of psychological nature - it is created by very vague knowledge of the payback period and the overall financial potential of savings in connection with high price sensitivity of consumers. To overcome the barrier, people must receive clear and trustworthy information on the actual savings.

41. *Price barrier:* As mentioned above, the initial price difference between an IL and a CFL (3-6 UAH vs. 30-60+ UAH) is an important barrier to increased market penetration in Ukraine. The recent economic crisis in Ukraine has exacerbated this barrier for many consumers as they are focused on short-term finances (month-to-month) and not longer-term savings.

Table 5: A list of various lamps and average market prices

Lamp Various Techology	ILB Incandescent Lightbulbs	TLF Fluorescent Tube Lamp	CFL Compact Flourescent Lightbulb	LED Light Emitting Diode
Average price (UAH)	2 - 5	20 – 100 depending on quality, manufacturer, supplier etc	30+ (depending on quality, supplier etc.)	200+

42. *Low quality of imported CFLs:* Low quality imports (often from China) undermine consumers’ confidence and demand for new EE lighting products. In Ukraine there is a prevalence of low quality projects from a shadow or grey market. These low quality products, which do not conform to the standards of EE lighting anticipated to be put in place under this project, pollute the markets as consumers have difficulty identifying them versus higher quality CFLs. This is presented in more detail in Annex 2.

43. *Unreliable information on EE product packaging:* Information from producers on EE lighting packing does not always correspond to real performance figures. Information, indicated on most packing of CFL presented at the Ukrainian market only gives the buyer partial information about the performance characteristics of the product in a language/format that they can understand.

44. *Absence of a fully equipped and accredited EE lighting testing facility:* Insufficient quality control of the imported products results in plenty of low-quality energy saving lamps reaching the market.

45. *Non-residential lighting:* Awareness of the advantages of EE lighting in the industrial, commercial, and municipal sectors is also quite low. Improvements are hampered by poor energy management expertise in the companies, especially in the municipal and public sectors, as well as by ineffective interaction between top management and technical specialists resulting in a lack of prioritization of energy saving investments.

46. *Electricity tariffs:* Current rates are very low (approx. \$0.03 per kWh) and does not effectively stimulate energy saving among the population. Installing energy saving technologies in household requires significant investments and pay-back period of such investments with current rates will be very long. Tariffs for residential consumers are set more by political considerations than by market costs as subsidies are considerable. Recent demands from the International Monetary Fund propose that Ukraine should increase its tariff price by 20% each quarter from 2010. However, the adoption of this measure is viewed as highly unlikely due to political reasons.

47. *Voltage instability in the electric system:* Voltage fluctuations in the electricity system results in poor performance by even high-quality CFL. Incandescent lamps are more proof to the voltage fluctuations and therefore preferred by consumers who experience frequent voltage fluctuations.

Project Baseline

Baseline analysis

48. Nuclear and thermal coal-fired facilities dominate the electricity production in Ukraine. In addition losses are high in the electricity distribution grid which combines to give Ukraine a high CO₂ emission factor per MWh of produced electricity 1.031 tons CO₂/MWh⁶. The baseline situation for electricity demand and production in Ukraine is projected to increase (as stated in the “Energy strategy of Ukraine to 2030”) together with a decrease in incandescent bulb usage as electricity tariffs rise and energy efficient alternatives continue to gain market-share.

49. Currently CFLs represent approximately 2% of the installed lighting in Ukraine and the growth is 10-15% increase year on year in recent times. Therefore baseline CFL penetration is expected to increase gradually over the project lifetime (2010 – 2015).

50. Currently, electricity tariffs for residential consumers remain heavily subsidized and artificially low. For example residential tariffs for households is approximately \$0.03 per kWh. This is much lower than the range for other classes of electricity users which paid between approximately \$0.06 to \$0.09 per kWh in 2010. While average incomes in Ukraine are lower

⁶ The grid factor developed and approved for JI projects in Ukraine is currently lower (0,896 tons CO₂/MWh) than the 1.031 tons CO₂/MWh used in other national publications. For the baseline and project estimates we use the lower figure to be conservative.

than in EU countries this electricity tariff is rather low to stimulate the market for EE lighting equipment by itself without project interventions aimed at rationalising the electricity tariff system in Ukraine, improving the compliance/enforcement of EE regulations, and promoting and reducing the upfront cost barrier EE lighting equipment.

Electricity consumption for lighting in the residential sector

51. There are no official statistics or reliable national studies on electricity consumptions for lighting in Ukraine. That is why several approaches were combined to provide a best estimate of electricity consumption for lighting purposes in residential buildings in Ukraine.

The first approach is based on the residential properties data presented in Table 6 below and the following conservative assumptions:

- the amount of bulbs in one room households was considered as 5, two rooms households – 7, three rooms households – 9 and four rooms and more households – 11;
- the power consumption capacity of the incandescent lamp was considered as 100W;
- average yearly utilization of the installed power for lighting was assumed to 550 hours (about 1,5 hours per day).

Table 6: Residential properties data in millions of apartments and houses. (Source: State Committee of Statistics)

Residential properties	2002	2003	2004	2005	2006	2007	2008
One room	3692	3702	3699	3697	3688	3693	3705
Two rooms	7098	7106	7118	7132	7112	7127	7145
Three rooms	6303	6303	6308	6331	6313	6339	6352
Four rooms and more	1930	1938	1950	1967	1987	2006	2025

52. The second approach is based on the area of residential properties in Ukraine presented in Table 7 below and the following conservative assumptions:

- lighting norm for residential buildings is 150 lx;
- average annual period of time for ensuring lighting norm by artificial lighting was assumed to 550 hours (about 1,5 hours per day);
- the power consumption capacity of the incandescent lamp was considered as 100W;
- lighting efficiency of the incandescent lamp was considered as 12 lm/Wt.

Table 7: Residential data for interior area of homes. (Source: State Committee of Statistics)

Residential properties	2002	2003	2004	2005	2006	2007	2008
Residential properties, million m ²	1031,7	1035,7	1040,0	1046,4	1049,2	1057,6	1066,6

53. The results of calculations by both approaches are presented in Figure 2.

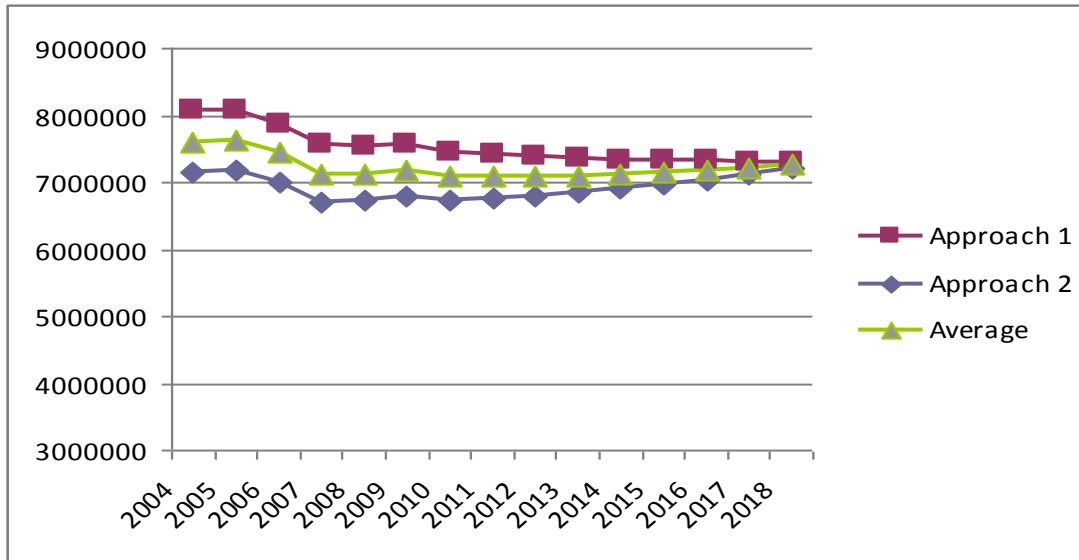


Figure 2: Estimates of the baseline residential electricity consumption in Ukraine in MWh during the project lifetime.

54. The assumption can also be cross-checked with the existing expert estimates that electricity consumption for lighting purposes corresponds to 30% of overall electricity consumption for the residential sector in Ukraine. Electricity consumption of the residential sector in Ukraine has grown from 21.8 TWh to 31.3 TWh during the period 2002-2008 and the average 30% during this period corresponds to 7.8 TWh. This is in line with the modeled average estimates for lighting electricity consumption in Ukraine during the period 2002-2008.

55. Using the average estimate for electricity consumption one can estimate the baseline CO₂ emissions for the residential sector (Figure 3). It is estimated that CO₂ emissions will grow unless actions are taken to speed up the penetration of EE lighting technology in the residential sector by this project.

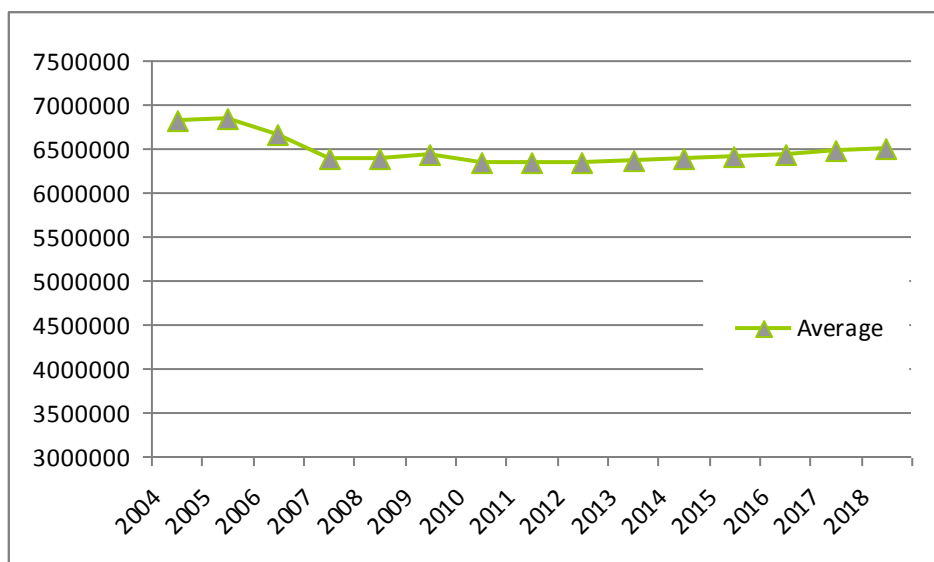


Figure 3: Estimated baseline emissions of tons CO2 from the residential lighting in Ukraine.

Electricity consumption for lighting in the municipal sector

56. There is no official data on electricity consumption for lighting for the municipal sector in Ukraine. The estimation of electricity consumption for lighting in the municipal sector has been made based on the approved norms of electricity consumption for public sector buildings and on incomplete (i.e. incomplete geographic coverage) statistical data for educational and healthcare institutions, cultural clubs and camps. Some simplifying assumptions had to be made in order to extrapolate the available data for all of Ukraine, and the share of electricity consumption for lighting was assumed as 30% in line with the data for residential sector. Table 8 shows the available results for previous years.

Table 8: Electricity consumption by municipal sector buildings, MWh

Year	Educational Institutions	Healthcare institutions	Camps and Resthouses	Cultural Associations/ Clubs	Total	Electricity consumption for lighting
2000	2 917 868	1 922 000	528 000	1 431 000	6 798 868	2 039 660
2001	2 952 660	1 918 500	518 000	1 404 500	6 793 660	2 038 098
2002	2 962 508	1 913 300	530 000	1 378 000	6 783 808	2 035 142
2003	2 964 680	1 882 000	526 000	1 351 500	6 724 180	2 017 254
2004	2 961 773	1 859 050	549 000	1 351 500	6 721 323	2 016 397
2005	2 944 593	1 833 350	534 000	1 325 000	6 636 943	1 991 083
2006	2 906 025	1 839 550	526 000	1 298 500	6 570 075	1 971 023
2007	2 850 970	1 810 200	514 000	1 272 000	6 447 170	1 934 151

2008	2 766 183	1 798 500	503 000	1 272 000	6 339 683	1 901 905
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57. The CMU Order #1567-r “Regarding the implementation of measures to reduce electricity consumption by state financed organizations” requires that from November 1, 2008 state executive authorities should the replace incandescent bulbs with energy efficient light bulbs in state-financed organizations. (The exception being that there are no stockpiles of incandescent bulbs that have been bought earlier.) This order was supposed to switch state financed organizations during the period 2008-2009 to energy efficient lighting. However, due to inefficient execution of governmental programs and lack of adequate legal responsibility regarding inefficient energy usage the process of substitution of incandescent bulbs is still ongoing and could be significantly improved. Based on sparse, incomplete data obtained by the local experts there appears to be large differences between the municipalities in complying with this order (e.g. between 10 - 60%). Without official data to rely on the team conservatively assumed a current compliance rate of 25%, i.e. 25% of ILBs have been replaced with CFLs in the municipal sector.

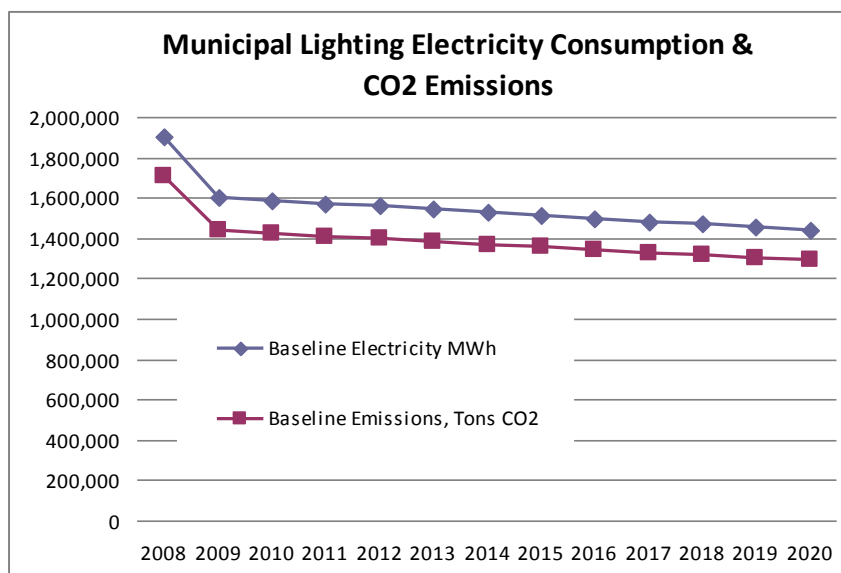


Figure 4: Baseline estimates for electricity consumption due to lighting in the municipal sector and the corresponding CO2 emissions.

II. STRATEGY

Institutional, sectoral and policy context

58. The economic crisis and natural gas crises between Russian and Ukraine that took place in recent years has had a strong impact on policy formation and governmental goals in Ukraine. The Government of Ukraine has established a roadmap on Energy Strategy for Ukraine till 2030 (Strategy). Therefore energy-efficiency measures are a policy focus for the drive to improve energy independence and security for Ukraine. Please refer to Section “*Institutional and policy analysis*” for more detailed information.

Project Rationale and Policy Conformity

59. The aim of this project - to reduce CO₂ emissions by increasing market penetration of EE lighting – fits with the successful outcomes listed for CC-SP1.

60. Energy efficiency has been one of UNDP Ukraine’s priorities since it launched its Environmental Program in the country. The realization and implementation of energy efficiency technologies is the one areas where UNDP address the Climate Change related issues in Ukraine (UNDP performs projects at various stages of implementation: UNDP Projects “Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System”; “Energy Efficiency in Ukraine’s Educational Sector”, “Community Based Approach to Local Development”; “Municipal Governance and Sustainable Development Program”; “UNDP Crimea Integration and Development Program”, “Sustainable Development Program of Lugansk Region”). However the realization of these measures (investments in machinery, equipment, appliances, pursuing an active energy saving policy and use of the additional renewable energy) is the most expensive measures for GHG emissions decrease from the economic view point and is to a great extent depend on the investments.

61. The proposed project will build on, and leverage, partnerships with regional and municipal authorities, education institutions and the expert network developed under this initiative in Ukraine.

62. The proposed project will complement the GEF/UNEP/UNDP project “Global Market Transformation for Efficient Lighting”. It will benefit from the resource centre that the Global project will establish at the international level and it will cooperate with the UNDP/GEF EE lighting project in the Russian Federation. Further, the knowledge and expertise to be provided through the global framework will be made available throughout Ukraine. The Ukrainian project will translate and distribute the global program’s newsletter at the National Level.

63. The proposed project is innovative for Ukraine as most energy efficiency projects and programs focus on energy savings related to heating supply or for the heating insulation in buildings. Energy efficient lighting has been a GEF priority for over a decade and this project builds on GEF experiences while taking into account that the market for energy efficient lighting has become established in Ukraine. However, though it is an established market with many importers of products, it has not reached the same potential as in other European countries due to policy, cost barriers, and poor consumer experiences with “grey market” (low quality) products.

Project Goal, Objective, Outcomes and Outputs/activities

Project Description and Activities

64. The project's objective is to help transform the market towards more EE lighting technologies by removing barriers which will contribute to the goal of reducing GHG emissions. Actions will be taken by the project to promote a gradual phase-out of inefficient lighting products in residential and public buildings. GEF participation in pilot projects at schools will remove existing barriers in seven pilot cities/municipalities and provide for the replication of defined approaches and measures in other major cities of Ukraine.

65. In addition to reflecting national priorities in Ukraine, the proposed 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. This project will also provide an innovative approach to energy efficiency projects, and be an important part of UNDP-GEF portfolio complementing and building upon the lessons learned from other similar UNDP-GEF projects in Russia, Romania and Vietnam. For example, the project design addresses policy improvements in parallel with concrete actions to raise the quality of EE lighting products on the market while providing initiatives for overcoming the larger upfront cost of quality EE lighting products. In previous GEF EE projects overcoming the upfront cost barrier was seen as more critical for success than e.g. only providing awareness raising activities.⁷

66. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (Province/State) and municipal levels, and energy plans are included as part of these strategies.

67. The project will target five areas in order to accomplish its goals:

1. Residential/Consumer Lighting
2. Public Sector Lighting
3. Domestic Lighting Suppliers
4. Foreign Lighting Suppliers
5. Domestic Testing Facilities for Quality Control

68. These five areas will be targeted within five components designed to produce real and demonstrable results with outcomes that can be monitored. These components consist of actions to:

1. Improve the national policy framework for promoting energy-efficient (EE) lighting
2. Improve the national quality-assurance (QA) & quality-control (QC) systems for imported and produced lighting products in Ukraine
3. Improve the collection, recycling, and waste-handling schemes for EE lighting products, e.g. CFLs which contain mercury.

⁷ See World Bank, 2006, *Post-Implementation Impact Assessment: WORLD BANK GEF ENERGY EFFICIENCY PROJECTS SYNTHESIS REPORT*.

4. Design and implement energy-efficient (EE) lighting demonstrations in the municipal sector focusing on public schools
5. Improve EE Lighting product penetration in the Residential Sector
6. Disseminate and replicate and the project results

69. The relationship between the five target areas and the five project components is summarized in Table 9 on the following page. A more detailed description of each component follows:

Component 1: Prepare and set-up national policy framework to promote EE lighting

- 1.1. Develop and submit a national road-map for EE lighting market transformation, including deadlines and targets for phasing out the use of inefficient technologies
 - Campaign to the Cabinet of Ministers of Ukraine (CMU) and other relevant stakeholders to support new legislation to phase-out incandescent light-bulbs by 2015.
- 1.2. Campaign for and introduce legislation targeting Oblenergos (electricity grid operators) for improving electricity supply to residential and public consumers in Ukraine.
 - Analyze the current system for establishing electricity tariffs in different Oblasts.
 - Recommend legislation aimed at removing “perverse incentives” for Oblenergos to maximize electricity consumption or discourage energy savings by consumers.
 - Recommend the establishment of an enforcement mechanism regarding the repair and upkeep of the electricity grid by Oblenergos to reduce voltage instabilities that break CFLs.
 - Recommend a tariff system and plan that reduces electricity subsidies to residential and other consumers.
- 1.3. Develop and submit for governmental acceptance an energy efficient lighting scheme that is harmonized with European standards and norms for EE lighting and the usage of such products.
 - Identify products and lighting technologies (incandescent, CFLs, LED, others) with the highest energy saving potential to be covered by the labelling scheme; and set-up benchmarks for the products’ technical and environmental characteristics (e.g. not only energy performance, but also mercury content in CFL will have to be in line with the established benchmarks)
 - Work with at least 7 municipalities to integrate requirements for “Green lighting” and Energy-efficiency labelled products in the rules for municipal/public procurement.
- 1.4. Improve or introduce new legislation that improves the collection, disposal, and waste-handling of e.g. CFLs and other potentially hazardous lighting products.
 - Develop and submit for governmental acceptance a CFL/TFL collection, disposal, and waste-handling scheme that is harmonized with European standards and norms for EE lighting and the usage of such products.

Table 9: Project components and targeted areas for cooperation and implementation.

Components & Targeted Areas	Residential & Consumer Lighting	Public Sector Lighting	Domestic Lighting Suppliers	Foreign Lighting Suppliers	Domestic Testing Facilities
1. Improve the National policy framework for promoting EE lighting					
1.1. Develop and submit a national road-map for EE lighting market transformation	X	X	X	X	
1.2. Develop and prepare for governmental acceptance draft legislation for improving the electricity supply for Ukrainian consumers	X	X			
1.3. Develop and submit for governmental acceptance an energy efficient lighting scheme that is harmonized with European standards and norms for EE lighting and the usage of such products	X	X	X	X	X
1.4. Improve waste-handling directives for EE lighting products	X	X	X	X	
2. Improved Quality-Assurance & Quality Control systems for imported and produced lighting products in Ukraine					
2.1. Support the development of improved environmental, energy-efficiency and quality standards and norms for lighting products.	X	X	X	X	X
2.2. Improve the Ukrainian institutional capabilities for auditing and assessing the quality of imported EE lighting products.			X	X	X
2.3. Support for local development of EE lighting products and modernization of national lighting industry			X		
2.4. To create an improved system for CFL/TFL collection, recycling and/or disposal.	X	X	X	X	
3. Implement efficient lighting demonstrations in the municipal educational sector					
3.1. Provide bankable municipal projects for co-financing by existing credit facilities (including working with credit facilities to ensure they are specifically tailored towards municipal lighting projects)		X	X	X	
3.2. Design and implement pilot demonstration projects in 7 participating municipalities that targets school buildings.		X			
3.3. Provide independent performance audits of the pilot projects		X			
4. Improve EE Lighting product penetration in the Residential Sector					
4.1. Design and implement the CFL dissemination program for residential consumers	X		X	X	
4.2. Introduce EE lighting and Green Light Label component in educational curricula	X	X	X	X	
4.3. Design and implement municipal PR campaigns on EE lighting	X	X			
4.4. Tailor selected global EE lighting promotional activities to Ukrainian consumers	X				
5. Dissemination and Replication of the Project Results					
5.1. Implement project website	X	X	X	X	X
5.2. Design the second stage of demonstration project covering at least 20 municipalities across Ukraine		X			
5.3. Support and work-with local organizations that focus on energy efficiency in the public sector		X			
5.4. Develop and conduct seminars for municipal governments regarding EE projects and opportunities for leveraging carbon finance, and other alternative finance	X	X			

Component 2: Improved QA/QC framework for EE lighting market

- 2.1. Support the NAER and DerzhStandard in the development of improved environmental, energy-efficiency and quality standards and norms for lighting products.
 - Compare current Ukrainian EE lighting standards with EU best practice for quality, environmental, and health standards.
 - Develop a scheme for penalty provisions for testing laboratories which incorrectly issue approval protocols for imported low-quality EE products.
 - Promote independent testing of EE products on the market to check for incorrectly labelled products.

- 2.2. Improve the Ukrainian institutional capabilities for auditing and assessing the quality of imported EE lighting products.
 - Provide technical assistance and improve the capacity of private testing laboratories to help them identify which equipment and procedures are needed to fully comply with existing and new EE lighting quality standards developed by this project.
 - Improve existing certification procedures for the quality assurance scheme.
 - Improve the technical capacity for Dehrstandard by providing additional equipment as listed in Annex 2 for their testing lab.
 - Initiate a dialogue among stakeholders as to what future standards need to be applied to new EE technology e.g. LED lighting equipment.

- 2.3. Support for local development of EE lighting products and modernization of national lighting industry.
 - Identify risks to the Ukrainian lighting sector associated with the phase-out of incandescent bulbs, and to develop strategies and recommendations for the government and manufacturers to mitigate these risks.
 - Support the preparation of business plans for a conversion to EE lighting production by delivering training and advisory services to incandescent manufacturers and building on the experience in incandescent manufacturing conversion from other countries.
 - Provide technical assistance to selected incandescent manufacturers for implementation of their conversion plans. Companies will be selected through an open and competitive tender process.
 - Work with institutions such as EBRD, World Bank, IFC, KfW etc. to secure project finance for the conversion projects that are selected and further developed into bankable projects.

There are 4 operating manufacturers in the national lighting industry. Three of them produce outdated incandescent and gas-discharge (glow) lamps with possibility for conversion to energy efficient lamps (CFL or LED). The only full cycle CFL production is arranged at Rivne based Company “Gazotron-Lux” (Trade Mark “Lummax”). Currently local CFL production is 1,769,390 (5% of total national CFL market) with the installed

capacity of 6,000,000 per year. Additionally to Gazotron-Lux, other local manufacturers such as Lviv based Open Joint Stock Company ISKRA (TM “Volta”) produce CFLs but not full cycle (they are assembled from imported parts).

- 2.4. To create with domestic manufacturers, suppliers, recycling companies, and cooperating municipalities a system for CFL collection, recycling and/or disposal.
- Review and analyze CFL collection and recycling schemes in other European countries.
 - Establish how such a scheme(s) can be funded in Ukrainian cities.
 - Combine successful elements from other schemes and modify them for the local context and funding realities, with support from CFL suppliers and municipalities.

Component 3: Efficient lighting demonstration in municipal educational sector

- 3.1. Provide bankable municipal projects for co-financing based upon municipal EE lighting projects in the tertiary sector. This will be done in cooperation with partner organizations such as the World Bank and NEFCO as these institutions have, or are currently planning, credit facilities for EE projects for qualifying Ukrainian municipal clients. . This component will include support for designing a credit line facility in such a way that they are specifically tailor made for municipal EE lighting project, as required.

Currently, project partners such as the Ukraine Government, World Bank, EBRD, NEFCO, etc. have identified municipal governments as being difficult counter-parties for project finance in general, and for energy saving projects in particular. They have a mutual goal of overcoming this barrier, and the project will cooperate with their initiatives. In some cases the EE lighting component will only be a part of a larger energy-saving project in the municipality. The UNDP project will provide technical assistance to the municipality through the planning and preparation of the project and financing application(s).

- For projects under €350,000 (\$476,000) NEFCO credit facilities would be the first priority. Currently 2 exist, the Cleaner Production Facility, and Eco-Efficiency Facility including assisting the redesign (as required) of such facilities to focus specifically on municipal EE projects.
- For larger EE projects the World Bank or EBRD could be the preferred partner through their planned Clean Technology Fund and EE Credit Line, which will be launched in 2010 and managed by Ukreximbank of Ukraine.

UNDP Ukraine has met with representatives of the International Finance Institutions such as World Bank, EBRD, and NEFCO, The letters of support indicating that the Project activities are fully in line with plans/activities of other partner organizations have been received. Those are provided as Annex to Project Document.

- 3.2. Design and implement pilot demonstration projects in 7 participating municipalities that targets school buildings. The pilot municipalities will be chosen through a competitive application process which will include criteria such as a) a technically realistic proposal, b) proposed support by the municipality, c) suitable school buildings and varying climatic

conditions for the pilot activities, d) an assessment of the willingness to implement the project, e) support by local partners, etc.

- Select a range of “typical” project locations (school & universities etc) for pilot projects implementation (e.g. there are 9,000 elementary schools constructed across Ukraine in 1970s all following the similar “typical” design and standards);
- Organize a tender for “turn-key” energy efficient lighting solutions for these selected pilot buildings in each municipality. All major lighting suppliers (domestic and international) will be invited to provide solutions for each municipality. The lighting solution will need to meet at a minimum current EU & Ukrainian standards (whichever are higher) for the lighting application.
- Organize lighting and Energy Audits (EA), including not only Walk-Through Audit (WTA), but also Investment Grade Audit (IGA) in selected buildings and prepare economic and technical feasibility study for lighting retrofits projects, including but not limited to replacement of incandescent bulbs with CFLs, more energy efficient linear fluorescent bulbs, LEDs and other EE lighting products
- Implement projects and monitor the impact, including energy and cost saving, GHG emission reduction, tenants/users comfort, performance (e.g. school children), etc
- Community outreach and awareness raising activities in collaboration with the municipality and UNDP.

3.3. Pay for independent EA of the final pilot project EE lighting solution and performance against relevant lighting standards and the design requirements stated in the service contracts. This task will be tendered out to a reputable service provider.

Component 4: Improve EE Lighting product penetration in the Residential Sector

4.1. In collaboration with local and international EE lighting producers, consumer banks like Platinum Bank, and national retailer networks design and implement EE lighting dissemination program for residential consumers with the goal of doubling of the growth rate of CFLs in Ukraine market (currently approximately 12% year on year) and the dissemination of at least 40 million Energy Efficient lighting products through the project activities.

- Identify and recruit an appropriate retail-chain partner(s) for providing a consumer EE lighting “micro-finance” facility for residences in Ukraine. Potential partners include large retail chains, consumer banks like Platinum Bank (which supports the project), and EE lighting product suppliers.⁸ Annex 4 provides a description of the EE lighting promotion scheme. This scheme will be launched in several Oblasts simultaneously once the final details are agreed with the project partners. A minimum goal will be to cover the five largest population centers (Kiev, Kharkiv, L’viv, Dnipropetrovsk, Donetsk, and Odessa) during the project lifetime.

⁸ Due to the nature the Ukrainian electricity sector, which separates energy producers and grid-operators, electricity grid-operators (Oblenergos) are not viewed as appropriate partners. However, this will be investigated further and concluded by the project.

- In parallel with this scheme design and implementation, the project shall investigate the possibility of using Joint Implementation (JI) “Program of Activities” (POA) and/or JI Track 1 to improve financing for residential EE lighting (for example in cooperation with the upcoming KfW JI PoA project). It is envisioned that a CFL producer/supplier would be the lead institution for implementing a JI POA for the residential sector. Funding from Ukraine’s Green Investment Scheme may also be evaluated. The project would promote and support the establishment of such projects through assistance to the JI project developer(s) but not take the lead in managing and implementing any JI projects for the residential sector.
 - As part of the preparation for the above, the project will include specific market surveys, including monitoring of end-use metering in selected regions and households.
- 4.2. Introduce EE lighting and Green Light Label component in educational curricula for school children (developed jointly under an on-going UNDP project with Ministry of Education) including dissemination of the training booklet developed under Component 5.
 - 4.3. Design and implement municipal PR campaigns on EE lighting in parallel with implementation of demonstration projects, including establishing of EE lighting corners at municipal energy efficiency centers, organization of municipal lighting days, bill-board advertisements, advertisements in local media, etc.
 - 4.4. Tailor selected global CFLs promotional activities to Ukrainian consumers in supermarkets, petrol stations, and/or other consumer outlets in cooperation with lighting product suppliers.

Component 5: Replication and Dissemination of the Project Results

The primary objective of this component is to build upon the momentum and lessons learned from project Components 1 through 4. The bulk of the activities of Component 5 will be targeted at expanding the role of EE lighting in the municipal sector through new projects after 2015. This will require 2 important deliverables from this component: 1) a sustainable longer-term (i.e. post-2015) project financing model/solution for municipalities, and 2) establish a flow of “bankable” EE municipal projects for this financing mechanism. This flow of EE projects will be delivered by Components 5.3 through 5.5.

- 5.1. Develop project website which outlines all the work which the project has undertaken, is undertaking, and will undertake in future.
- 5.2. Develop training booklet for schools, in cooperation with the schools which participated in the project, and develop a training booklet for school children on energy-efficient lighting.
- 5.3. Based on the results of the pilot projects in Component 3, design the second stage of EE lighting demonstration projects in municipal buildings covering at least 20 municipalities across Ukraine for use with the sustainable financing mechanism(s) identified under

component 3.1 and further developed (if necessary) in Component 5. This will include the establishment of specific municipal financing mechanisms together with banking institutions that are project partners (NEFCO, EBRD, World Bank, etc.). The selection process shall be similar to 3.2 but shall incorporate lessons learned to improve the process.

- 5.4. Develop and conduct seminars for municipalities on the sustainable financing mechanism outlined under 3.1 & 5.1 and on how carbon finance, and other alternative financing, can finance EE lighting projects in Ukraine based on experience from this project. As part of this component a “Municipal Guide for Financing Municipal EE Lighting Projects” will be published and disseminated.
- 5.5. Support organizations that focus on energy efficiency in the public sector/municipalities of Ukraine by involving them in earlier components of this project, and by involving them with the sustainable financing mechanism outlined under component 3.1 thereby developing their capacity to continue successful actions in new regions of Ukraine and to expand their clientele and supporters.

Project Indicators, Risks and Assumptions

70. The project impact indicators will be those specified in the GEF policy paper on Focal Area Strategies and Strategic Programming for GEF-4: for CC-SP1: “indicators of success will be the tons of CO₂ avoided, the adoption of energy efficiency standards, and the estimated quantity of energy saved.”

71. The quantity of energy saved will be estimated from the market data that will be gathered annually by project management utilizing public data and market surveys. Outcome-level indicators can be found in the Strategic Results Framework. Key indicators are as follows:

1. Annual CO₂ emission reduction (ktons);
2. Quantity of energy saved (MWh); and,
3. Drafting, adoption and enforcement of policies and legislative measures contributing to EE lighting.
4. Increase in quality of EE lighting equipment available to consumers
5. Increase in awareness of the benefits of EE lighting
6. Increase in market-share of EE lighting leading to a reduction in the consumption of incandescent lighting
7. Development of electricity tariffs and the corresponding impact on EE lighting market
8. Marked increase in the sales volume of EE lighting products and EE lighting projects in municipalities which can be attributed to activities from the project.

72. As in other programs, the present project is subject to certain risks. Therefore, risk management and mitigation strategies have been incorporated into project design. Risks that might prevent the project objective(s) from being achieved are summarized in **Error! Reference source not found.**

Table 10: Major project risks and means for reducing these risks.

Major Project Risks	Means of Mitigating/Reducing the Risk
Weak Government Support	Securing firm commitments from responsible institutions during the project design stage
QA/QC enforcement measures are ineffective	Working with current suggestions for improvements in the QA/QC system that have been submitted by DehrzStandard to fix the system.
Low level of participation from the private sector	Involvement of the private sector during the project design stage
Establishing long-term financing programs for the pilot projects and replication of these is ineffective	Setting-up a realistic schedule and co-financing arrangements for the pilot projects. Provide support for creating “bankable” projects that make economic sense.
Low level of involvement of regional authorities in demonstration project activities	Incorporation of the necessary interventions for the formulation of the policies on EE Lighting applications.
Promotion campaigns have only a short-term impact and/or do not sufficiently reach target populations	Working with partner organizations that have an established outreach to various target populations

73. To mitigate these potential risks, the following actions were started during the project design and will be continued, as necessary, during project implementation:

- Securing firm commitments from responsible agencies during the project design stage, and closely coordinating with those that have expressed an interest in partnering with and supporting the project (e.g., government, municipal governments, EE lighting manufacturers and distributors, and power utilities);
- Working with current suggestions for improvements in the QA/QC system that have been submitted by DehrzStandard to fix the system.
- Involvement of the private sector during the project design stage, dissemination of the latest information through the right channels, and identification of their needs through continuous dialogue;
- Provide support for creating “bankable” projects that make economic sense. Setting-up a realistic schedule and co-financing arrangements for the demonstration project implementation, and closely coordinating with those that have issued Letters of Support for the demonstrations.
- Working with partner organizations that have an established outreach to various target populations so that the promotional campaigns can be tailored effectively to their targets.
- Incorporation of the necessary interventions for the formulation of the policies on EE Lighting applications, including the accompanying implementing rules and regulations, as well as improving the institutional arrangements for the enforcement of lighting product standards and lighting energy codes, and associated testing facilities.
- Cooperation with the recently initiated GEF/UNEP/UNDP-project “Global Market Transformation for Efficient Lighting”.

Expected global, national and local benefits

Global Benefits

74. In the absence of the project, under the business-as-usual baseline, it is reasonable to assume that improved laws and regulations promoting EE lighting would not be drafted in the near term, that the capacity of lighting testing labs would remain insufficient, and that municipalities would not receive the capacity building on the benefits and use of EE technologies. Currently, Ukraine has had limited success in promoting EE lighting as an effective policy and institutional instrument for achieving the country's energy saving objectives.

75. Ukraine will no doubt benefit from the global drive towards more efficient lighting but, in the absence of this project, the benefits for Ukraine will be limited to a slight increase in the volume and performance of imported products. With the project, however, Ukraine will develop both demand and supply of efficient lighting equipment and in parallel transform the market.

76. The project comes at an opportune time as there is strong government will to increase energy-efficiency yet there is no specific effort focused on EE lighting. The project will bring together the human and financial resources necessary to draft laws and regulations supporting EE lighting that can then feed into the wider national action on energy-efficiency, and to implement pilot projects to demonstrate the benefits of EE lighting in the residential and municipal sector.

77. Figure 2 shows the baseline for electricity consumption from incandescent lamps in the residential sector, which is the primary bulb type that this project plans to replace and phase-out through pilot projects and policy measures. We estimate that actions to promote EE lighting by this project could effectively double the growth of CFL penetration, i.e. increase the annual growth rate to 25% year on year during the project period. Such growth could be reasonably obtained if all the actions of the project operate in parallel. This would result in emissions profiles for the baseline and project case as shown in Figure 5. So by replacing the IL technology to CFLs the project would contribute a net CO₂ reduction over its lifetime of 4.15 million tons of CO₂ from 2011 to 2015 from direct electricity reduction in the residential sector.

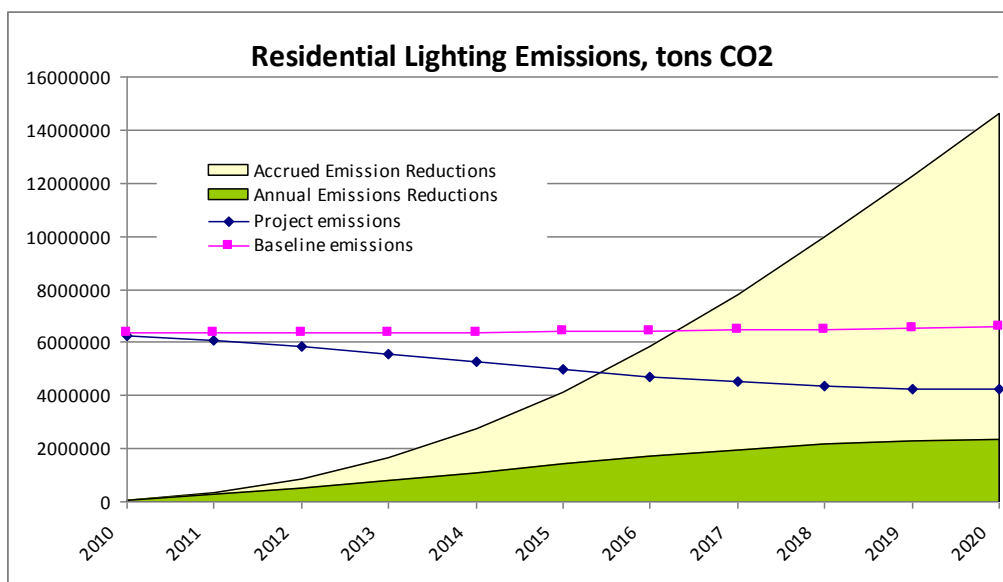


Figure 5: Baseline and project emissions of CO2 in the residential sector from lighting.

78. For the municipal sector the project goal is 100% compliance with CMU Order #1337-rr by 2020, i.e. 100% replacement of municipal ILBs with EE lighting products. The share of energy efficient light bulbs in the municipal sector buildings was assumed as 25% for the baseline in 2010. This figure increases at a faster rate due to project activities aimed at improving compliance and giving municipalities access to financing for large EE lighting renovations. Therefore by the end of 2015 the compliance rate is 63%, and 100% by 2020 respectively. The estimated results are shown in Figure 6.

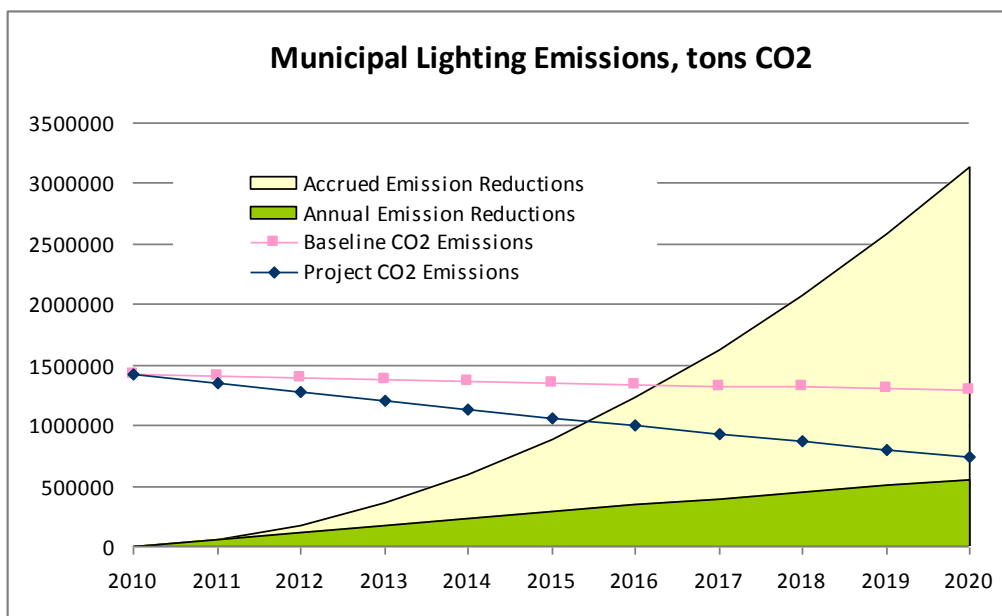


Figure 6: Estimates for lighting emissions and emission reductions in the municipal sector due to project activities.

79. The projected CO2 reductions due to the project activities by 2015 is estimated to be 4.15 million tons, and 0.9 million tons, for the residential and municipal sectors, respectively. Taking into account the project costs shown in Table 11 below one can quickly estimate the CO2 abatement cost to 2015 to be USD 6.13 per ton of CO2 reduced. The corresponding GEF incremental cost would be approximately USD 1.28 per ton of CO2 reduced. These abatement costs compare favourably with similar GEF projects in other countries.

80. National benefits will be many, including an improved local environment (reductions in SOx, NOx, and particulate emissions), long-term savings for consumers, and a better balance of payments for electricity producers and the state, which subsidizes residential electricity costs.

Table 11: Project Components with Budget.

Project Component	Total Budget	GEF Component		Co-financing Component	
	(\$)	(\$)	(%)	(\$)	(%)
1. Improve the national policy framework for promoting energy-efficient (EE) lighting	3 787 300	787,300	20.5%	3,050,000	79.5%

2. Improve the national quality-assurance (QA) & quality-control (QC) systems for imported and produced lighting products in Ukraine	6,116,700	1,066,700	17.4%	5,050,000	82.6%
3. Design and implement energy-efficient (EE) lighting demonstrations in the municipal sector focusing on public schools	8,249,000	1,799,000	21.8%	6,450,000	78.2%
4. Improve EE Lighting product penetration in the Residential Sector	7,924,000	1,624,000	20.5%	6,300,000	79.5%
5. Disseminate and replicate and the project results	2,823,000	773,000	27.4%	2,050,000	72.6%
Total	28,950,000	6,050,000	21%	22,900,000	79%

Country Ownership: Country Eligibility and Country Drivenness

COUNTRY ELIGIBILITY

81. Ukraine signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992, ratified it on 29 October 1996 and became a Party in August 1997. It also signed the Kyoto Protocol in March 1999 and the National Parliament ratified it on 4 February 2004. As a UNDP Program Country, it is eligible for assistance from UNDP.

COUNTRY DRIVENNESS

(i) National reports/communications to Conventions:

82. In the area of climate change, Ukraine's National Communication to UNFCCC in 2009 identifies energy efficiency as one of the important mitigation options for reducing greenhouse gas (GHG) emissions in the country. In addition, to address the issue of a national policy on climate change, as well as to reinforce the national climate change administrative structure and ensure the fulfilment of obligations under UNFCCC, the Government instituted the Inter-Ministerial Commission on Climate Change headed by the Deputy Prime Minister. The Commission, which meets on a regular basis, is made up of representatives of the appropriate ministries and departments, the Cabinet of Ministers, Verkhovna Rada (Parliament), the Administration of the President of Ukraine, and the National Academy of Sciences.

(ii) National legislation:

83. Improvement in energy efficiency on both supply and demand side is an important development objective presently being pursued by the Ukrainian government. Achieving this objective would contribute to lower dependence on imported fuel and reduction in GHG emissions, and have a significant social impact.

(iii) National or Sector developments plans:

84. The main directions defined by the government of Ukraine for fulfilment of the tasks on improvement of energy efficiency include, among others: economic incentives to introduce energy efficiency technologies at enterprises, improving taxation and tariff policy, promoting wide-scale application of leasing operations, obtaining investment support from lending institutions, improvement of the efficiency of generation and delivery, mass-scale introduction of energy metering, improvement of subsidy allocation mechanism to create incentives to energy saving by subsidized households, awareness raising through mass media, etc. Also included is support to commercialisation of activities in the area of energy efficiency through the modality of energy performance.

(iv) Linkages:

85. In addition to reflecting national priorities in Ukraine, the proposed project also builds upon the existing goals and activities of UNDP, with environmental sustainability one of the key Millennium Development Goals (MDGs) that UNDP is supporting. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (regional) and municipal levels, and energy plans are included in these strategies.

86. The project plans to link strongly with the recently created UNEP GEF Global Efficient Lighting Market Transformation Project. In particular the project plans to utilize this global project's planned Center of Excellence and Policy Toolkit for EE lighting initiatives. As both projects are developing in parallel it is expected that a strong relationship can be established to provide positive feedback and lessons learned for both project initiatives.

87. GEF EE Lighting projects are being implemented in other countries by different developing agencies. The UNDP/GEF Phasing-out Incandescent Lamps & Energy Saving Lamps Promotion (PILESLAMP) project in China, Peoples Republic; THE IFC/GEF Poland Efficient Lighting Project (PELP); UNDP/GEF Philippines Efficient Lighting Market Transformation Program (PELMAT); UNDP/GEF Project Vietnam: Energy Efficiency Public Lighting (VEEPL); Mexico World Bank Lighting and Appliances Efficiency Project; Togo World Bank SPWA-CC Efficient Lighting Program; UNDP/GEF Project Russian Federation: Transforming the Market for Efficient Lighting.

88. Since a similar project has recently started in Russia it is good practice for the UNDP offices in Ukraine and Russia to cooperate by sharing knowledge and ideas during the project execution phase. It will be the responsibility of the Project Manager and UNDP Project Board member to facilitate and maintain the communication link between the projects. By doing so it is envisaged that common problems or mistakes can be shared and avoid being replicated by similar projects in neighbouring countries.

89. The UNDP Ukraine Cooperation Framework for Human Development 2001-2005, under the item "Environment Conservation and Management", indicates that "Pollution control, energy efficiency, waste management and integrated soil management initiatives that promote local and community-level environmentally sound practices will be implemented. In addition, the draft UNDP Country program for 2006-2010 focuses on 3 thematic areas, viz. (1) Participatory Governance, Rule of Law and Civil Society; 2) Economic and Social Development for prosperity and Human Security and 3) Environment Management and Sustainable Development. Thematic area 3 states, among others "UNDP's support will be focused on addressing the following environmental concerns: mitigation of the climate change, conservation of globally significant biodiversity, land degradation and water management. In doing so, UNDP will promote energy efficiency, clean technologies and environmentally friendly transport.

Sustainability and Replicability

90. Sustainability and replicability is designed into the project through:

- The new standards to be introduced through various legal frameworks will greatly contribute to removing low-efficiency lighting products from the market. The strengthening of local testing laboratories will help with enforcement of these new regulations;
- Training for lighting manufacturers and market participants will equip them to comply with new regulations and use them effectively;
- The pilot projects will demonstrate efficient lighting technologies, and can be used as reference points in the training courses, and for helping pass the new laws and regulations;
- Implementation of market-based finance mechanisms for EE lighting equipment in the residential sector.

91. Thus each component of the program supports the other components. This interconnectedness will help ensure that when the program ends the newly adopted EE lighting practices will remain, and that additional market players will also adopt efficient lighting in the future (e.g., a municipality faced with a lighting upgrade would choose to upgrade to efficient lighting because it had heard of the pilot, a consumer would think to buy a CFL because they had seen one in a neighbor's house, a new building would have high-efficiency lighting because the architect designing it was trained in the proper use of new regulations, etc.).

92. For information dissemination, modern methods (e.g. Web portal with moderated forum section) will be used to ensure that the most effective information technology is adopted. The project will also make use of classic channels for information dissemination such as mailing lists, articles in specialized journals and a newsletter (published 3 times a year).

93. The project is designed with a mix of capacity building and concrete activities/projects to address Ukraine's specific conditions, markets and regulatory environment. The project's support to legislation and to industry will strengthen the likelihood that replication will take place as planned. Such a balanced mix of activities is expected to promote the application of EE lighting systems and technologies. Replication is an integral component of the project design as the expected energy savings from the application of EE lighting technologies in municipal buildings and the residential sector rely on the active replication of the relevant project activities.

94. The Project activities work towards replicating the pilot projects in new municipalities during the project lifetime. In addition, replicability of the proposed project components will be ensured through the documentation of the package of activities/inputs that went into each pilot, and dissemination of the results nationwide.

95. Beyond the project lifetime, the project's legacy will continue in three ways:

1. The project activities are designed to closely involve market stakeholders, thereby empowering many different market actors to promote efficient lighting in their own areas of special interest;

2. The project will contribute to establish institutional and professional decision-makers in the country and thereby to support ongoing growth of EE lighting markets well into the future; and,
3. The project will leave behind a certification & QA/QC process to support market development for an expanded range of EE lighting technology in Ukraine.

III. PROJECT RESULTS FRAMEWORK:

This project will contribute to achieving the following Country Program Outcome as defined in CPAP or CPD: Institutional capacities and capabilities of municipalities strengthened through improved policies and practices related to energy services and environment.
Country Program Outcome Indicators: The rate of green house gas emissions declined, energy efficiency improved and conservation practices strengthened
Primary applicable Key Environment and Sustainable Development Key Result Area): Promote climate change mitigation
Applicable GEF Strategic Objective and Program: Objective: Develop, expand, and transform the markets for energy and mobility in developing countries so that over the long term, they will be able to grow and operate efficiently toward a less carbon-intensive path Programme: OP 5 Promoting energy-efficient buildings and appliances (CC-SP1)
Applicable GEF Expected Outcomes: Favorable Conditions for Market Development in Terms of: Policy , Finance, Business Models, Information and Technology
Applicable GEF Outcome Indicators: Indicator 1 (a qualitative indicator): Drafting, Adoption and Enforcement of policies and legislative measures contributing to enabling environments Indicator 2 (quantity indicator): Quantity of Energy saved (toe saved or MWh saved or GJ saved)

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
OBJECTIVE OF THE PROJECT: To transform the Ukrainian market towards efficient lighting technologies and the phase-out of inefficient lighting	Estimated quantity of energy saved and corresponding GHG reductions from the project activities.	Approximately 26.04 TWh/yr electricity used for ILs	To reduce this to 21.08 TWh/yr by phasing-out and replacing ILs with EE Technology	Data/Monitoring from EE lighting dissemination projects and sales figures from lighting sector	1) EE lighting promotional policies will be enacted by the Gov't 2) A micro-credit facility will lower price barriers for EE technology for consumers
OUTCOME 1: Improve the National policy framework for promoting EE lighting	Passing of new EE promoting legislation	Current legislation	National Road-map for EE lighting & market transformation is accepted by the Gov't	Official decrees	That project policy documents will be formally recognized and acted upon by officials
Output 1.1: Develop and submit a national road-map for EE lighting market transformation	National Road-map for EE lighting & market transformation is developed	Energy Strategy for 2030 and NEA decrees	To develop an EE lighting specific road-map that is integrated with overall Ukraine Gov't priorities for energy security & savings	Official acceptance protocols & minutes from relevant committees	That project policy documents will be formally recognized and acted upon by officials

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
Output 1.2: Develop and prepare for governmental acceptance draft legislation for improving the electricity supply for Ukrainian consumers	Draft legislation is prepared and submitted	Current legislation	To improve the rights of consumers vis a vis Oblenergos and to provide enforcement of electricity supply standards	Official acceptance protocols & minutes from relevant committees	That project policy documents will be formally recognized and acted upon by officials
Output 1.3: Develop and submit for governmental acceptance an energy efficient lighting scheme that is harmonized with European standards and norms for EE lighting and the usage of such products	Draft legislation is prepared and submitted	Current legislation	To improve the rights of consumers vis a vis Oblenergos and to provide enforcement of electricity supply standards	Official acceptance protocols & minutes from relevant committees	1) That project policy documents will be formally recognized and acted upon by officials 2) Lobbying efforts from Oblenergos hinder efforts
Output 1.4: Improve waste-handling directives for lighting products	Draft legislation is prepared and submitted	Current legislation which lacks specific regulations for CFLs, etc.	To properly classify and promote programs to recycle/dispose of CFLs	Official acceptance protocols & minutes from relevant committees	That project policy documents will be formally recognized and acted upon by officials
OUTCOME 2: Improved Quality-Assurance & Quality Control systems for imported and produced lighting products in Ukraine	Decrease in supply/availability of sub-standard EE lighting products in Ukraine Increase in product quality/price ratios (i.e. product life, lumens, spectral output, etc.)	Needs to be established by project through sampling & product supply statistics	Increase in EE lighting product standards in the market, and a marked decrease in grey market products	Random sampling from retail outlets, Customs records, & records from testing laboratories Published standards Evaluation of standards program by independent expert. Certifications and labels issued Evaluation of certification and labeling program.	That enforcement of new standards will take place and impact companies delivering low-quality products

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
Output 2.1: Support the development of improved environmental, energy-efficiency and quality standards and norms for lighting products.	New Standards for EE lighting are developed for Dehrstandard & NEA	Current Standards	An incentive scheme is implemented for products & a penalty scheme is implemented for sub-standard products	Official decrees Evaluation of standards program by independent expert.	1) That project policy documents will be formally recognized and acted upon by officials 2) Lobbying efforts from "Grey-market suppliers" hinder efforts
Output 2.2: Improve the Ukrainian institutional capabilities for auditing and assessing the quality of imported EE lighting products.	1) Equipment delivered to DehrzStandard. 2) Independent testing of EE lighting samples in stores allowed in Ukraine	Lack of equipment and accreditations which do not match lab capabilities	Testing and certification of products is started and maintained.	Agreements, laboratory protocols, accreditation audits, and certificates	1) Laboratories will successfully be accredited. 2) Enforcement scheme for non-conforming products and labs is implemented
Output 2.3: Support for local development of EE lighting projects & modernization of national lighting industry	1) Workshops held at interested lighting manufacturers 2) Business plans developed for selected companies	Incandescent lighting manufacturers with limited future if ILs are phased out by policy initiatives	At least one IL manufacturer has new EE lighting product line	Minutes of meetings, business plans, investor commitments	The business rationale is against investing in new product lines due to strong competition already in the market.
Output 2.4: To create an improved system for CFL collection, recycling and/or disposal.	A new municipal system for CFL collection, recycling, and/or disposal is launched.	Lack of current systems	A locally adapted system that is sustainable is developed from best practices in other countries.	System is in place. Municipal records and decrees. Audits of companies performing services.	Funding for the system is devised.
OUTCOME 3: Implement efficient lighting demonstrations in the municipal educational sector	1) Interior lighting systems for municipal schools are upgraded to new EE lighting systems. 2) Energy-savings are monitored and reported.	Baselines will need to be established during the project for participating institutions.	50 schools in 7 municipalities have the lighting systems upgraded with EE lighting systems.	Audits at schools are performed by an independent and accredited organization(s). Ideally as part of a JI POA effort.	Co-financing for the projects is established for the participating municipalities.
Output 3.1: Provide bankable municipal projects for co-financing by existing credit facilities.	Municipalities receive co-financing/credit lines to support EE lighting projects developed by the project.	Different options exist but most Ukrainian municipalities are typically not seen as strong counterparties for lines of credit.	Municipalities that need co-financing for EE lighting projects can receive it on a case by case basis and/or programmatic basis from World Bank, Ukreximbank, NEFCO,	Minutes of meetings, project implementation records, etc.	1) A facility exists, or can be modified/developed with support from UNDP, to provide loans to municipalities specifically tailor made for EE lighting projects. 2) Carbon finance can be

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
			etc.		leveraged to assist these projects.
Output 3.2: Design and implement pilot demonstration projects in 7 participating municipalities that targets school buildings.	Number of schools with successful upgrading/refurbishment of school lighting systems. Energy savings per school.	Baselines for energy-savings will need to be established during the project for participating institutions.	50 schools in 7 municipalities have the lighting systems upgraded with EE lighting systems.	Project records & minutes. Independent audits performed at schools.	1) At least 7 municipalities will be interested and able to participate. 2) Monitoring & reporting systems are properly implemented at each school.
Output 3.3: Provide independent performance audits of the pilot projects	1) Number of audits performed. 2) All audit non-conformities are resolved satisfactorily.	Zero audits	50 audits at 50 schools, i.e. at least once per school per project lifetime.	Audit reports & any follow-up activities to close-out non-conformities	School/municipal officials will allow audits to take place and cooperate with them.
OUTCOME 4: Improve EE Lighting product penetration in the Residential Sector	1) Increase in residential EE lighting sales delivered via the project. 2) Corresponding energy-savings for e.g. CFLs disseminated by the project.	Current market statistics for growth in EE lighting sales in Ukraine.	To double the market growth rate of EE lighting equipment in Ukraine to 20% (currently 10-15% year on year) To disseminate at least 40 million additional EE lighting products to residences.	1) Production, import, and market share data from EE lighting companies. 2) Residential consumer awareness surveys and energy-saving audit activities by the project.	1) Campaigns are effective at raising consumer awareness and interest. 2) Technological "lock-in" resulting in new EE lighting not being promoted by the project, e.g. new LED technology. 3) Micro-credit program for consumers is established.
Output 4.1: Design and implement the CFL dissemination program for residential consumers	1) Establishment of retail chain EE lighting promotion program 2) Amount/volume of EE lighting purchased via the program	No dissemination program exists. Annual trends for residential market-share growth of EE lighting technology prior to project.	Establishment of retail chain EE lighting promotion program available for most consumers. Target 2 municipalities initially and spread to top 5 population centers by the end of the	Agreements with project partners. Project records & minutes. Data (units, amount of credit) provided by the institutions providing the	Suitable partners can be identified and persuaded to provide the micro-finance program to residential consumers. Barriers for entry to the program are low.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
		Consumer awareness survey to be conducted by the project to establish the baseline level of awareness for EE lighting technologies.	project. Increase in awareness & positive attitudes toward EE lighting technology by consumers.	finance for EE lighting. Follow-up sampling and surveys of residential households participating in the program.	
Output 4.2: Introduce EE lighting and Green Light Label component in educational curricula	Creation of the educational material. Number of institutions accepting the educational curricula throughout Ukraine.	To be established by the project.		Data from joint UNDP/Ministry of Education project regarding dissemination of material and incorporation into school curriculum.	Schools will accept the material and incorporate it into the classroom curriculum for the students.
Output 4.3: Design and implement municipal PR campaigns on EE lighting	Scope of the PR Campaign (i.e. how many cities, outlets, and media-types?) Effectiveness of the PR Campaign (as measured by baseline and follow-up awareness surveys from 4.1).	Currently no other PR campaigns are known to be planned but this will be re-confirmed by the project.	Campaign visible in the top 10 municipalities in Ukraine by population. A measurable increase of 20% in awareness by consumers in the municipalities.	Project records Agreements with project partners. Results from surveys performed in 4.1	Ukrainian celebrities can be engaged to promote the issue of EE lighting so that it is perceived as “cool” and trendy. Market surveys are performed by professional organizations with the proper capacity.
Output 4.4: Tailor selected global EE lighting promotional activities to Ukrainian consumers	Scope of the PR Campaign (i.e. how many cities, outlets, etc.) Volume of sales data for the targeted products.	To be established by the project.	Increase in sales of EE lighting products up to 20% increase per year at the participating outlets.	Agreements with project partners. Meeting minutes and protocols. Sales data supplied by outlets.	EE lighting companies and relevant consumer outlets will partner with UNDP. Sales data will be collected and supplied by participating outlets.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
OUTCOME 5: Dissemination and Replication of the Project Results	<p>Information publications & training workshops for municipality staff.</p> <p>Expansion/replication of the EE lighting school projects to new municipalities.</p> <p>New EE lighting projects co-funded by carbon finance.</p>	<p>Various publications exist regarding EE Lighting but little which show successful projects in Ukraine.</p> <p>Currently no EE lighting projects in Ukraine have been started using JI & carbon finance.</p>	<p>At least 2 information publications for municipalities.</p> <p>At least 10 training workshops in different municipalities not targeted previously by this project.</p> <p>Expansion/replication of the EE lighting school projects to 20 new municipalities.</p>	<p>Publications and project records regarding target audience/recipients.</p> <p>Protocols/minutes from training workshops.</p> <p>Project planning documents, calls for tenders, & contracts for EE lighting school projects to 20 new municipalities.</p>	<p>Project has successful outcomes with lessons learned which can be used for publication & training purposes.</p> <p>Project partners & program(s) providing municipal co-financing are willing to expand to new municipalities in Ukraine.</p> <p>Additional/alternative financing means are developed during the project lifetime for the new EE lighting school projects.</p>
Output 5.1: Implement project website	Website up and maintained regularly	No website	<p>Website updated with historical, current, and planned project activities & progress</p> <p>Knowledge base developed for Ukraine and International Practitioners</p>	Online Website	<p>Content is maintained regularly</p> <p>Content is interesting and easy to locate</p>
Output 5.2: Design the second stage of demonstration project covering at least 20 municipalities across Ukraine	<p>Municipal applications to participate in the new projects/program.</p> <p>Selection results from the application process selecting 100+ schools.</p> <p>Initial lighting site-audits at the participating schools.</p>	<p>Currently similar projects of such scale do not exist in Ukraine.</p> <p>During the project lifetime the pilot projects in Component 3 will assist with establishing average lighting & energy usage baselines at the schools.</p>	<p>Over 40 applications from municipalities to participate in the program.</p> <p>Applications result in 20 municipalities participating & supporting the program. 100 to 200 schools participate (Depending on funding e.g. approximately \$100,000 per school.)</p>	<p>Minutes from meetings.</p> <p>Applications from municipalities.</p> <p>Project planning documents, calls for tenders, & contracts for EE lighting school projects to 20 new municipalities.</p>	<p>Project partners & program(s) providing municipal co-financing are willing to expand to new municipalities in Ukraine.</p> <p>Lessons learned & knowledge from the pilot projects are successfully transferred & applied to the new projects/program.</p> <p>Additional/alternative financing means are</p>

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through EE lighting market transformation.				
	Indicator	Baseline	Targets End of Project	Sources of Verification	Major Assumptions & Risks
					developed during the project lifetime for the new EE lighting school projects.
Output 5.3: Support and work with local organizations that focus on energy efficiency in the public sector	The number of and type of organizations which cooperate with GEF/UNDP project.	Currently no cooperation exists.	Cooperate and support at least 2 regional/national organizations (i.e. offices & staff in several locations). Cooperate with at least 1 organization in the 12+ pilot municipalities (Component 3.2 & Component 4.1)	MoUs or agreements with the organizations. Participation by organizations at GEF/UNDP training workshops. Minutes and protocols from meetings. Periodic interviews and answers from questionnaire/survey results sent to the organizations by the project.	Local and regional organizations will have the willingness and capacity to work with the project. If no appropriate organization exists locally, then UNDP efforts can support the creation of a new one or the expansion of an existing one.
Output 5.4: Develop and conduct seminars for municipal governments regarding EE projects and opportunities for leveraging carbon finance, and other alternative finance	Development of the training program. Number of seminars. Participants at the seminars New project ideas & financing proposals developed as the outcome from seminars.	Various carbon finance seminars have taken place in Ukraine over the last few years. But few, if any, were focused on providing workable financing solutions for EE lighting projects in municipalities.	At least 10 seminars in 10 municipalities. At least 2 new projects developed & implemented as a result of the seminars.	Seminar minutes/protocols. Attendee lists of the seminars. New project ideas & proposals from the seminars. Successful implementation of carbon co-financed EE lighting projects.	That carbon financing will still be viable after 2012, i.e. follow-up treaties & mechanisms to the Kyoto Protocol will exist. Municipal gov't attendees will be prepared enough to actively submit project ideas/proposals.

IV. TOTAL BUDGET AND WORKPLAN

Award ID:	00060792	Project ID(s):	00076692
Award Title:	GEF 4175 UKR 10 CC FSP Energy-Efficient Lighting in Residential and Public Buildings		
Business Unit:	UKR 10		
Project Title:	Energy Efficient Lighting in Residential & Public Buildings		
PIMS no.	4175		
Implementing Partner (Executing Agency)	Ministry of Environmental Protection of Ukraine (MEP)		

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTCOME 1: National Policy Framework for Promoting EE Lighting	MEP	62000	GEF	71200	International Consultants	20 000.	20 000	0.	0	0	40 000	1
				71300	Local Consultants	100 000	75 000	73 000	40 000	23 800	311 800	2
				71600	Travel	32 500	23 000	15 000	10 000	10 000	90 500	3
				72100	Contr. Company	50 000	40 000	40 000	15 000	15 000	160 000	4
				72300	Material & Goods	30 000	15 000	22 000	25 000	11 000	103 000	5
				72200	Equipment & Furn	15 000	12 000	5 000	10 000	5 000	47 000	6
				74500	Misc Exp.	15 000	5 000	5 000	5 000	5 000	35 000	7
					sub-total GEF	262 500	190 000	160 000	105 000	69 800	787 300	
				Total Outcome 1	262 500	190 000	160 000	105 000	69 800	787 300		
OUTCOME 2: Improve the National Quality-Assurance and Quality-Control (QC) systems for imported and produced lighting products in Ukraine	MEP	62000	GEF	71200	International Consultants	60 000	29 000	0	0	0	89 000	8
				71300	Local Consultants	95 000	75 000	68 050	40 000	25 000	303 050	9
				71600	Travel	35 000	25 000	15 000	10 000	10 000	95 000	10
				72100	Contr. Company	45 000	25 000	25 000	20 000	30 000	145 000	11
				72300	Material & Goods	62 700	25 000	21 950	20 000	25 000	154 650	12
				72200	Equipment & Furn	180 000	50 000	0	0	0	230 000	13
				74500	Misc Exp.	20 000	10 000	10 000	5 000	5 000	50 000	14
					sub-total GEF	497 700	239 000	140 000	95 000	95 000	1,066 700	
				Total Outcome 2	497 700	239 000	140 000	95 000	95 000	1,066 700		
OUTCOME 3: Design & Implement EE lighting demonstrations in the municipal sector focusing on public schools	MEP	62000	GEF	71200	International Consultants	60 000	39 000	0	0	0	99 000	15
				71300	Local Consultants	50 000	50 000	50 000	46 050	27 050	223 100	16
				71600	Travel	40 000	30 000	25 000	20 000	22 950	137 950	17
				72100	Contr. Company	100 000	150 000	150 000	150 000	150 000	700 000	18
				72300	Material & Goods	100 000	100 000	100 000	100 000	110 000	510 000	19
				72200	Equipment & Furn	20 000	15 000	15 000	13 950	15 000	78 950	20
				74500	Misc Exp.	15 000	10 000	15 000	10 000	5 000	50 000	21
					sub-total GEF	385 000	394 000	350 000	340 000	330 000	1,799 000	
				Total Outcome 3	385 000	394 000	350 000	340 000	330 000	1,799,000		

OUTCOME 4: Improve EE Lighting product penetration in the Residential Sector	MEP	62000	GEF	71200	International Consultants	70 000	30 000	20 000	19 000	20 000	159 000	22
				71300-71400	Local Consultants	95 200	85 200	85 200	70 200	75 200	411 000	23
				71600	Travel	55 000	35 000	25 000	24 800	24 800	164 600	24
				72100	Contr. Company	110 000	39 800	70 000	75 000	75 000	369 800	25
				72300	Material & Goods	100 000	95 000	49 800	55 000	50 000	349 800	26
				72200	Equipment & Furn	39 800	35 000	30 000	15 000	15 000	134 800	27
				74500	Misc Exp.	10 000	10 000	5 000	5 000	5 000	35 000	28
					sub-total GEF	480 000	330 000	285 000	264 000	265 000	1,624 000	
			Total Outcome 4	480 000	330 000	285 000	264 000	265 000	1,624 000			
OUTCOME 5 DISSEMINATE AND REPLICATE THE PROJECT RESULTS	MEP	62000	GEF	71200	International Consultants	9 000	9 000	20 000	20 000	20 000	78 000	29
				71300	Local Consultants	41 050	31 050	35 000	35 000	60 000	202 100	30
				71600	Travel	15 000	10 000	15 000	35 000	25 000	100 000	31
				72100	Contr. Company	20 000	20 000	20 000	30 000	20 000	110 000	32
				72300	Material & Goods	40 000	40 000	50 000	40 000	35 000	205 000	33
				72200	Equipment & Furn	8 950	8 950	10 000	10 000	10 000	47 900	33
				74500	Misc Exp.	10 000	5 000	5 000	5 000	5 000	30 000	35
					sub-total GEF	144 000	124 000	155 000	175 000	175 000	773 000	
			Total Outcome 4	144 000	124 000	155 000	175 000	175 000	773 000			
Project Management Unit	MEP	62000	GEF	71300	Local Consultants	74 950	60 950	60 950	60 950	60 950	318 750	
				71600	Travel	12 050	9 050	9 050	9 050	9 050	48 250	36
				72200	Equipment &Furnit	25 000	0	0	0	0	25 000	37
				74100	Professional Services/Fin.Audit	4 120	2 220	2 220	2 220	2 220	13 000	
				74200	Audio Visual &Print Prod Costs	6 500	4 000	4 000	3 000	2 500	20 000	
				74500	Miscellaneous exp	1 800	800	800	800	800	5 000	38
				75700	Training, Workshop, Conferences	6 500	4 000	4 000	3 000	2 500	20 000	
					sub-total GEF	130 920	81 020	81 020	79 020	78 020	450 000	
Total Project Management				130 920	81 020	81 020	79 020	78 020	450 000			
TOTAL						1,900 120	1,358 020	1,171 020	1,058 020	1,012 820	6,500 000	

1. One international consultant - International Advisor on Lighting Standards - (approximately 13 weeks) will work on outcome 1 to introduce international best practice for improving the international policy framework for promoting EE lighting including recommending elements for draft legislation/regulations as required. The international consultant in year 2 will work on making recommendations to improve the EE lighting framework based on progress.

2. This includes the cost of the Policy Expert Leader, Expert on Standards, and the National Expert on the Incandescent Phase-out Program. In addition other short-term consultants will be hired to help achieve outcome 1 according to the ongoing project needs.
3. Travel for regional meetings/lobbying and at least 2 international meetings.
4. Funds for contracting legal/policy specialists/companies specialized in lobbying/political action as necessary to produce the needed legislative results.
5. Campaign materials, publications, etc.
6. Office and staff IT equipment as needed by the component over project life-time.
7. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.
8. One (or two separate) international consultant(s) - "Incandescent Phase-out" program, lighting technologies and training - (approximately 30 weeks) will work on Component 2 (refer to ToR in Annex 7).
9. This includes the cost of the QA/QC Leader, Expert on Capacity Building for Testing Labs. and In addition other short-term consultants will be hired to help achieve Component 2 according to the ongoing project needs.
10. Travel for regional meetings outside Kiev at industrial lighting producers and to the testing laboratories,
11. Funds for contracting laboratory equipment suppliers/installation, training, etc. as necessary to produce the needed objectives of Component 2.
12. Laboratory equipment as discussed in Annex 2.
13. Office and staff IT equipment as needed by the component over project life-time.
14. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.
15. One international consultant - International Expert on Project Finance for Small-scale Energy Efficiency Projects - (approximately 33 weeks) will work on Component 3 (refer to ToR in Annex 7).
16. This includes the cost of the Municipal Pilot Project Coordinator, Expert on Monitoring of energy consumption and GHG emissions, and In addition other short-term consultants will be hired to help achieve Component 3 according to the ongoing project needs.
17. Travel for site visits outside Kiev at municipalities, to the schools, etc.
18. Funds for contracting energy/lighting audits, project assessment audits, engineering consultants, training, etc. as necessary to produce the objectives of Component 3.
19. Funds for contracting EE lighting solutions for pilot schools as discussed in Annex 3.
20. Office and staff IT equipment as needed by the component over project life-time.
21. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.
22. Three international consultants: International Expert on Monitoring of Residential Energy Savings and GHG emissions - (approximately 15 weeks), International Expert on Consumer Marketing of EE Lighting Products (approx. 18 weeks) and an International Expert on CFL Collection, Disposal & Recycling (approx. 20 weeks) who will work on Component 4 (refer to ToR in Annex 7).
23. This includes the cost of the Residential Lighting Team Leader, Expert on EE Lighting Marketing Specialist, Specialist for Consumer Product Disposal & Recycling and the Monitoring and reporting specialist. In addition other short-term consultants will be hired to help achieve Component 4 according to the ongoing project needs.
24. Travel for site visits outside Kiev to participating municipalities, some international travel may be required by local staff etc.
25. Funds for contracting EE promotion solutions, energy/lighting audits, project assessment audits, PR consultants, training, etc. as necessary to produce the objectives of Component 4.
26. Funds for purchasing EE promotional materials for the residential sector.
27. Office and staff IT equipment as needed by the component over project life-time.
28. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.
29. One international consultants: International Expert on alternative financing for Energy Efficiency activities - (approximately 26 weeks) who will work on Component 5 (refer to ToR in Annex 7).
30. This includes the cost of the Replication & Dissemination Team Leader, and In addition other short-term consultants will be hired to help achieve Component 5 according to the ongoing project needs.
31. Travel for seminars/meetings outside Kiev at municipalities, to the schools, etc.

32. Funds for contracting promotion solutions, workshops, seminars, website development, etc as necessary to produce the objectives of Component 5.
33. Funds for purchasing project promotional materials.
34. Office and staff IT equipment as needed by the component over project life-time.
35. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.
36. It is anticipated that travel costs for the project management team could include all aspects of the project depending on negotiations with project participants and other duties. In addition the project is expected to interface with similar projects in other countries and the global lighting initiative. This might require international travel.
37. Office and staff IT equipment as needed by the component over project life-time.
38. Minor annual amount reserved for unforeseen but necessary expenditures or cost increases according to best practices for successful project management.

Summary of Funds:¹

	Amount	Amount	Amount	Amount	Amount	Total
	Year 1 (2011)	Year 2 (2012)	Year 3 (2013)	Year 4 (2014)	Year 5 (2015)	
GEF Financing	\$1,900,120	\$1,358,020	\$1,171,020	\$1,058,020	\$1,012,820	\$6,500,000
GEF Agency (UNDP)	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000
Gov't of Ukraine	\$1,570,000	\$1,570,000	\$1,570,000	\$1,570,000	\$1,570,000	\$7,850,000
Cherkasy Regional State Administration	\$240,000	\$240,000	\$240,000	\$240,000	\$240,000	\$1,200,000
Chernivtsi Regional State Administration	\$625,000	\$625,000	\$625,000	\$625,000	\$625,000	\$3,125,000
Autonomous Republic of Crimea	\$260,000	\$260,000	\$260,000	\$260,000	\$260,000	\$1,300,000
Dnipropetrovs'k city council	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000
Kamianets-Podilskyi city council	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$1,875,000
Mariupol city council	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$1,875,000
Vinnytsia Regional State Administration	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
Ltd. "STK-Ukraine"	\$225,000	\$225,000	\$225,000	\$225,000	\$225,000	\$1,125,000
LLG "Gazotron-Lux"	\$430,000	\$430,000	\$430,000	\$430,000	\$430,000	\$2,150,000
Total	\$6,800,120	\$6,258,020	\$6,071,020	\$5,958,020	\$5,912,820	\$31,000,000

V. MANAGEMENT ARRANGEMENTS

96. This project will be implemented under Country Program Action Plan 2006-2010 with the ministry of Environment Protection of Ukraine as the National Implementing Partner (NIP). The capacity of this NIP is satisfactory for overall management and oversight of the project, but in course of the project implementation capacity of the Implementing Partner will be raised through relevant activities provided by Annual Work Plans. The NIP shall be responsible for the overall management of the project, primarily with regard to the responsibility for the achievement of the outputs (results), impact and objectives. Similarly, the NIP will be accountable to UNDP for the use of project resources.

97. The ultimate responsibility in the NIP for managing the project will be placed on a senior Government official who shall be designated as the National Project Director (NPD). It is expected that the NPD will devote significant part of the working time on the project. Duties and responsibilities of the NPD are described by the NPD Handbook. In the fulfilment of its responsibilities to achieve the results, the NPD will get support from the Project Board (PB).

98. The PB is the group responsible for making on a consensus basis management decisions for a project when guidance is required by the Project Manager (PM), including recommendation for UNDP and NIP on approval of project revisions. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Manager. This group is consulted by the Project Manager for decisions when PM tolerances (i.e. constraints normally in terms of time and budget) have been exceeded.

99. This group contains three roles:

- 1) Executive (role represented by NIP) that holds the project ownership and chairs the group,
- 2) Senior Supplier (role represented by UNDP) that provides guidance regarding the technical feasibility of the project, and
- 3) Senior Beneficiary (role represented by the Ministry of Economy of Ukraine or any other state body duly authorized by the Government of Ukraine for coordination of the international technical assistance) that ensures the realization of project benefits from the perspective of project beneficiaries.

100. Potential members of the Project Board are reviewed and recommended for approval during the Local Project Appraisal Committee (LPAC) meeting. PB meets every six months on the NPD initiative. Accordingly, the authority of the NPD will be delegated to the PM for day-to-day implementation management.

101. PB ensures participation of the civil society representatives in its activity. These representatives perform a substantive advisory role for the PB and have no access/capacity for managerial and/or financial decisions.

102. Project Assurance is the responsibility of each Project Board member, but the role can be delegated. The Project Assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures that appropriate project management milestones are managed and completed. A UNDP Program Manager holds the Project Assurance role for the UNDP Board member, and a similar Government representative will undertake this role for the NIP.

103. The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Project Board within the constraints laid down by the Project Board. The Project Manager

is responsible for day-to-day management and decision-making for the project. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified limits of time and cost.

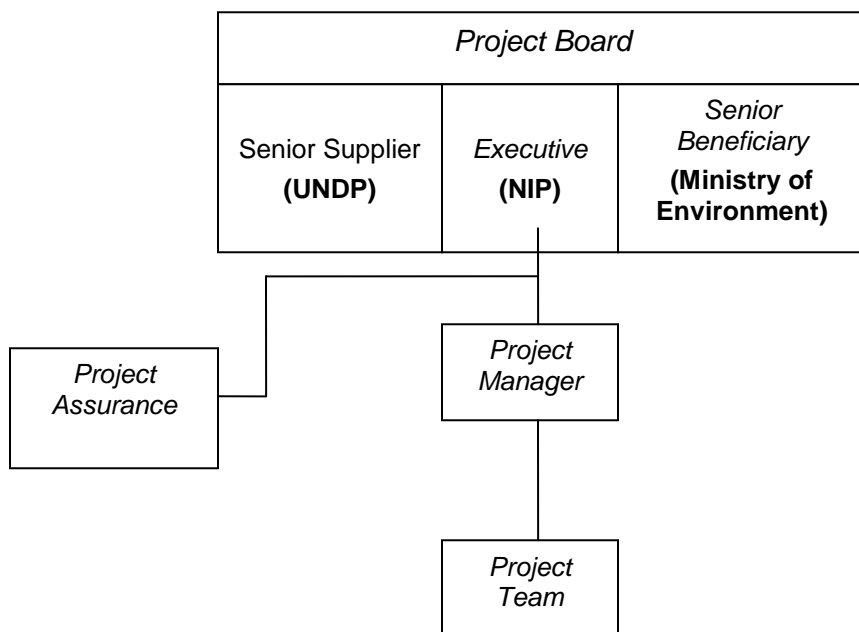


Figure 7: Basic project organization chart.

104. Project implementation will be governed by provisions of the present Project Document and Programme and Operations Policy and Procedure (POPP). The project will utilize a direct payment modality. Country office support services will be charged in accordance with the Agreement between National Project Director and UNDP for the Provision of Services by UNDP (See Annex 3). Governance of the Project will be supported through annual work planning as well as reporting and monitoring the delivery of results and impact on the basis of the results framework. The annual work plans as well as progress reporting will be the responsibility of the project management and will be approved by NPD in close consultation with UNDP.

105. NIP mechanism of project implementation ensures a principal role of the state in the project activities and national ownership for the projects results with the Project Team providing expert and technical support without substitution of the national structures/mechanisms.

106. The work plan will be implemented upon its endorsement by NIP and UNDP. The endorsed work plan will serve as an authorization to the Project Manager to disbursement of funds and project implementation. Implementation responsibility will be put on the Project Manager in close partnership with the NIP in terms of ownership and UNDP – in terms of advisory support.

107. This will create an enabling environment for participatory decisions reached in the process of preparing the work plans to be implemented effectively and efficiently. The PM will consistently inform the NIP of the progress.

108. When acting as representative of the NIP, the NPD, together with national Responsible Parties, will ensure sound linkage of all decisions and experience of the project with building the internal capacity of the Implementing Partner and Responsible Parties. Together, the NPD and UNDP Program manager will ensure participatory consultations with the key managers of the NIP to ensure the integration of project decisions and experience into national and local policies.

109. External and internal audit of the project will be organized in accordance with UNDP finance/operations rules and procedures.

110. A number of long-term international and national experts and advisors will be attracted to work with distinct components of the project. The PB and Project Manager will receive the support of Team Leaders for each project component who are experts in their respective fields.

111. The Team Leaders (TL) will coordinate Component Tasks (CTs) corresponding to the project components. Each TL will propose, in agreement with the NPD, specific guidelines to achieve the results of each TT. These guidelines, including detailed description of subtasks and timing will be proposed to the Experts hired for the execution of each specific task.

112. Much of the project success and replication is dependent upon proper outreach to different stakeholders via media campaigns, market surveys, and promotional activities. Therefore a Information and Communication Specialist (ICS) should be hired to advise the PM and TL's with tasks related to media and outreach, among other tasks. As most of the PMT will consist of personnel with technical backgrounds it is important to compliment this with a media specialist which can provide a balanced perspective when assessing planned activities involving public outreach and project promotion.

113. Appropriate communication, publishing and archiving mechanisms will support the project management and execution. An important tool is the Project website, which is a web site and associated web-based tools for working collaboratively via the internet. The overall methodology supports: project communication (individual and group email; full team access to web pages, including development); project requirements development (using an archived and threaded news group). The main idea is that the website supports both project management (including reports gathering and reports generation and publication) and the more technical aspects of requirements and system development. Further, a web site with multi-layered access and security will allow all necessary aspects of the project to be continuously available to the team and the public and, importantly, to the project sponsors (UNDP, Ukraine Government, etc.). The project management webpage will initially contain sections for General Information (including contact information) Discussion Groups, TT Management, Resource Library, etc.

114. UNDP Ukraine, together with UNDP-GEF, will carry out the GEF oversight. Working in conjunction with the various project partners, UNDP-Ukraine will be responsible for monitoring and evaluation (M&E), including organizing project reviews, approving annual implementation work plans and budget revisions, monitoring progress, identifying problems, suggesting actions to improve project performance, facilitating timely delivery of project inputs, and provide linkages to the other regional and global initiatives. All M&E functions will be carried out in line with standard UNDP and UNDP-GEF procedures. UNDP Ukraine will also provide country office support for all the activities of the project as agreed with the implementation partners of Ukraine.

115. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF.

Monitoring Framework and Evaluation

116. The project will be monitored and evaluated according to standard UNDP rules for nationally executed projects. For each of the project components, a detailed monitoring plan will be prepared during project inception. And as part project inception, the Project Logical Framework may be revised; specifically, the detailed indicators will be revisited and adapted as necessary, including measures to track the major external project risks. These indicators will draw upon all sources of information, including those of other donors active in the energy efficiency field in Ukraine. Appropriate and specific performance benchmarks will be established prior to project implementation to effectively monitor project progress and to make crucial management decisions. An annual reporting cycle will be established that will provide progress reports to be shared among all participants in the project. The proposed monitoring and evaluation activities will follow the guidelines contained in the UNDP/GEF Information Kit on Monitoring and Evaluation.

Monitoring and Evaluation

117. The NIP (Ministry of Environmental Protection) will be responsible for regularly monitoring progress in project implementation via the Project Board. Progress will be measured against targets set out in the Work Plan and SRF. Regular monitoring of the project will occur through this reporting mechanism as well as through site visits, as required. Disbursements of UNDP-GEF funds will be dependent upon the project's ability to establish a well designed reporting mechanism (e.g. a MIS-based or other system).

118. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/Annual Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame.

119. Annual Project Board Meetings, with the participation of the NIP, project team, stakeholders and UNDP, will be held to review progress, identify problems, and agree on solutions to maintain timely provision of inputs/achievement of results. The Project Board will review annual work plans as well as provide strategic advice on the most effective ways and means of implementation. Reporting to GEF will be accomplished through annual Project Implementation Reviews (PIRs).

120. In addition to normal Government monitoring, UNDP will have the monitoring and reporting obligation for the program, in accordance with the GEF Monitoring and Evaluation (M&E) guidelines. In this connection, additional M&E missions will be undertaken by UNDP when this is judged to be required, as for example when there is a need for an intermediate assessment of progress or impact before a decision is made as to the continuation of any given activity. This will be done in collaboration with the NIP as well as with other partners/stakeholders.

121. Moreover, the project will be the subject of two independent evaluations: the first one will be half way through implementation (MTE, Mid Term Evaluation), and the other at project completion (Terminal Evaluation). These independent evaluations will review progress in project implementation and make recommendations, where appropriate, to improve timeliness, relevance and impact of project inputs. They will also assist project stakeholders to draw lessons learned for use in improving the quality of future development interventions with similar activities and could be undertaken in collaboration with other development partners to the project. Such multi-stakeholder and partner evaluations could be a useful learning experience for all parties, where a 360-degree approach could be taken to evaluate all parties' inputs to the project. The results of the final evaluation will be incorporated in the publication on lessons learned for dissemination both within and outside Ukraine. All reports will be posted on the project web site.

122. The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects.

Table 12. Project monitoring and evaluation plan and budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project staff time</i>	Time frame
Inception Workshop (IW) & associated arrangements	<ul style="list-style-type: none"> ▪ PM ▪ UNDP CO ▪ UNDP GEF 	Indicative cost: 7,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP CO ▪ Consultancy support if needed 	Indicative cost 5,000 (stakeholder consultations, consultancy translation)	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> ▪ PM will oversee the hiring for specific studies and institutions, delegate responsibilities to relevant team members, and ▪ Ensure hiring outside experts if deemed necessary 	To be finalized in Inception Phase and Workshop. Indicative cost 10,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress & Performance (measured on an annual basis)	<ul style="list-style-type: none"> ▪ Oversight by Project GEF Regional Advisor and PM ▪ Measurements by regional field officers and local IAs 	To be determined as part of the Annual Work Plan's preparation. Indicative cost 10,000	Annually prior to APR/PIR and to the definition of annual work plans
APR/PIR; METT	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP-CO ▪ UNDP-GEF 	Indicative cost: 0	Annually
Steering Committee Meetings and relevant meeting proceedings (minutes)	<ul style="list-style-type: none"> ▪ PM ▪ UNDP CO 	Indicative cost: 20,000 (travel costs for relevant project stakeholders)	Following Project IW and subsequently at least bi-annually
Quarterly status reports	<ul style="list-style-type: none"> ▪ Project team 	Indicative cost: 0	To be determined by Project team and UNDP CO
Technical reports	<ul style="list-style-type: none"> ▪ Project team 	Indicative cost: 30,000	To be determined

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project staff time</i>	Time frame
	<ul style="list-style-type: none"> ▪ Hired consultants as needed 		by Project Team and UNDP-CO
Project Publications (e.g. technical manuals, field guides)	<ul style="list-style-type: none"> ▪ Project team ▪ Hired consultants as needed 	Indicative cost: 40,000	To be determined by Project Team and UNDP-CO
Mid-term External Review	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP- CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team) 	Indicative cost: 55,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> ▪ Project team, ▪ UNDP-CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team) 	Indicative cost: 55,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-CO ▪ External Consultant 	Indicative cost: 5,000	At least one month before the end of the project
Lessons learned	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-GEF RCU (suggested formats for documenting best practices, etc) 	Indicative cost: 14,000	Yearly
Audit	<ul style="list-style-type: none"> ▪ UNDP-CO ▪ Project team 	Indicative cost: \$40,000 - 60,000 (average \$10,000 – 15,000 per year)	Yearly
Visits to field sites (UNDP staff travel to be charged to IA fees)	<ul style="list-style-type: none"> ▪ UNDP Country Office ▪ UNDP-GEF RCU (as appropriate) ▪ Government representatives 	Indicative cost: 54,000 (4-5 visits per year)	Yearly
TOTAL (Excluding project team staff time and UNDP staff and travel expenses)	INDICATIVE COST	US\$ 345,000	

Legal Context

123. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Ukraine and the United Nations Development Program, signed by the parties June 18, 1993. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

124. The UNDP Resident Representative in Ukraine is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document

VI. ANNEXES

Annex 1: Ukrainian Lighting Market & Supply

125. The market for energy-efficient lighting formed years ago in Ukraine and today the population has access to much of the same technology that is available in other countries in Europe. The year-on-year growth of energy-saving lighting market was 10-15% in quantitative terms and 20-25% in monetary terms since 2000 till 2008. Although recently in 2008 and the first half of 2009 there are declining rates of growth most likely caused by the financial crisis. In terms of market penetration there is still room for growth as incandescent bulb purchases are still ten times greater (273 million pieces versus 27 million pieces in 2008) compared to CFLs.

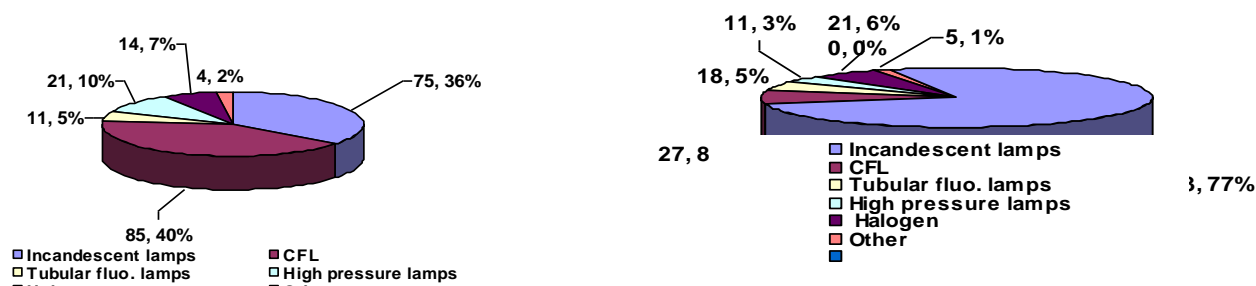


Figure 1-1: market data from 2008 for the lighting sector (left- in monetary terms; right - in quantitative terms)

126. According to estimations in 2008 the size of the domestic market of lighting sources was worth \$210 million and 355 million pieces were purchased in a country of 46 million people. The main suppliers in the market for energy efficient lighting of Ukraine are:

- National suppliers with some local production (Gazotron Lux, TM Lummax, ISKRA)
- Subsidiaries of world lighting brands (Philips, Osram, General Electric)
- Ukrainian trading companies which have an assortment of lightning products and work with a few brands (Sofit Lux, Soyuz Svitlo, Elotek, EST, Trade Light and other)
- Trading companies which mainly sell energy-saving lamps produced primarily in China under a local name

127. Currently in Ukraine there is only one full-line producer of compact fluorescent lamps (Gazotron Lux) which occupies 5% of CFL market. Another local manufacturer of lighting products (ISKRA) assembles CFLs from imported components. The rest of the energy-saving

lighting products are imported. The import of CFLs for 2006-2008 in Ukraine is presented in the Table 2 below (source: Ukrainian Customs Service).

Table 1-1: Major countries exporting CFLs to Ukraine with annual volumes.

Exporter country	2006 (pcs)	Exporter country	2007 (pcs)	Exporter country	2008 (pcs)
China	7 176 416	China	18923658	China	25 772 736
Poland	308 788	Germany	108564	Poland	490 251
Germany	236 321	Hungary	49530	Turkey	126 616
Turkey	54 050	Turkey	36220	Hungary	52 555
Hungary	51 656	Korea	31880	Italy	37 276
Great Britain	34 385	Italy	28890	Holland	30 319
France	32 666	Great Britain	25904	Korea	26 300
Italy	27 195	Poland	11118	Germany	22 004
Holland	20 893	Holland	10528	Great Britain	16 770
Other	28 508	Slovakia	2686	Other	17 194
		Other	3645		
2006 Total:	7 970 878	2007 Total:	19 232 851	2008 Total:	26 592 021

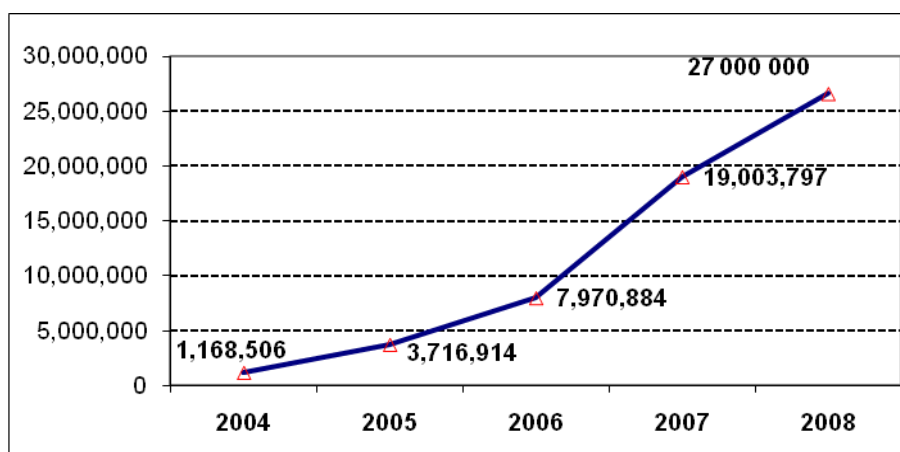


Figure 1-2: The growth in CFL imports to Ukraine is from 2004- 2008, pcs.

128. Currently 95% of energy-saving lamps are imported to the Ukrainian market, but the system to provide quality control of these imports is insufficient. In addition current standards for CFLs in Ukraine are not as high as those found in other European countries. Figure 2 shows the strong growth of imported CFLs in the Ukrainian market.

129. The local production of electric lamps from 1991 (as well as most other industries) had a tendency of decline from 1991 to 1998.. From 1998 to 2004 there was a tendency of increasing production, but from 2005 to 2008 noticeable decline in production took place. This was due to production declines at OC Iskra, and LLC "Zavod Gazorozryadnih Lamp" and in 2008 the closing of production at OC "Al'fa"). In contrast there was a growth in production by Gazotron-Lux which starting producing CFLs in 2006.

130. Since the project will run to 2015 it is feasible that advances in LED lighting technology may make LED lamps more competitive with fluorescent tube lamps and CFLs. Currently there are no LED producers in Ukraine, however, LED importers and component assemblers do exist. The project should be stay aware of LED advances and include suitable LED technology and suppliers in its project activities where possible. Figure 1-3 provides an overview of the advantages of LED tube lamp technology (T-8, T-12) compared to fluorescent tube lamps. In addition they do not require electronic or electromagnetic ballasts as part of the lighting fixture.

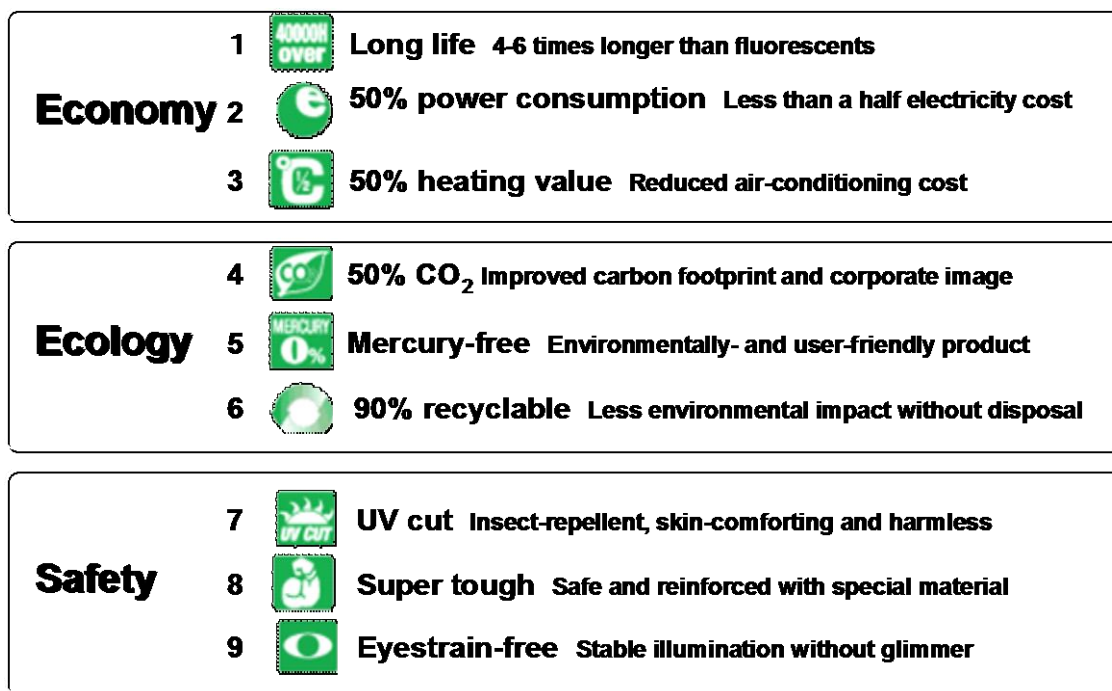


Figure 1-2: Advantages of current LED tube-lamp technology over fluorescent tube lamps (Source: Sanyo)

Annex 2: Upgrading of the Quality Control System for EE Lighting in Ukraine

131. The certification process of EEL devices needs amendments and further development. There are normative, administrative and technical sides of the problem. Normative – the procedures' on sample and testing laboratory selection for the certification agencies and the procedures' of accreditation of EEL testing facilities have to be developed and implemented. Administrative – Poltava Regional Centre of Standardization and Metrology is coordinator of Program on Laboratory testing results comparison. The following program needs enforcement because, laboratories do not approve execution of such comparison. The main problem is that the Laboratories do not have appropriate equipment for light flux tests. According to GOST 27682-88 the light flux has to be tested for all lamps containing mercury. If the tests results will be rechecked, there is a high possibility that the testing protocol will be withdrawn and, as a result, the certificate on EE lamp will be withdrawn as well. Technical – Laboratories in Ukraine do not have appropriate equipment. Hence, most of them cannot perform test of EE lamps or can perform them partly.

132. Any testing facility has to be certified by the National Accreditation Authority of Ukraine (NAAU). NAAU certifies the laboratories on the term basis.

133. *Problems:* Committees that are performing accreditation of the laboratories must include experts with specific knowledge in lighting technologies. Knowing the specifications, the experts will issue accreditation certificates to those laboratories, which are supposed to provide a full range of the tests on i.e. CFLs.

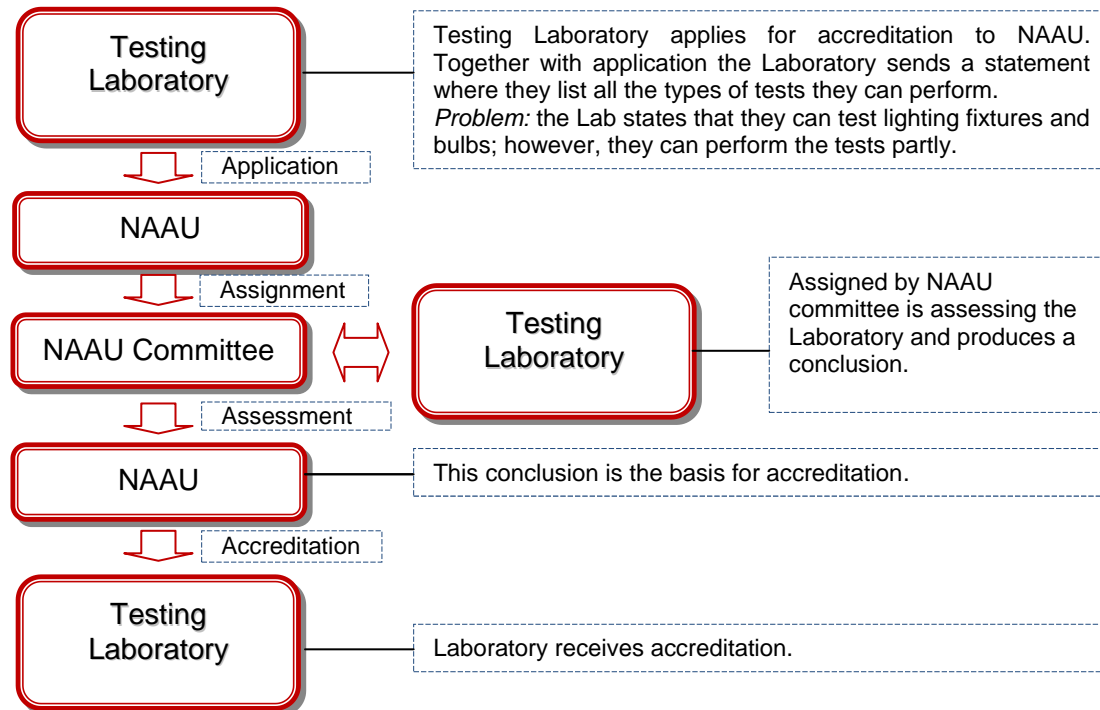


Figure 2-1: System for laboratory accreditation.

134. There are two options of EEL certification in Ukraine. The first (i) is certification of the production system. In simple words, the testing laboratory is going to producer's facility and certifies the manufacturing process. Thereafter, the laboratory issues a protocol which is the basis for the certificate issue. The second (ii) is certification of the consignment. The Certification Authority (CA) selects the sample and delivers it to the testing laboratory, after completion of the required tests, the testing laboratory issues a protocol to CA and on the basis of protocol CA issues the certificate.

135. *Problems:* Only one laboratory in Ukraine (DEHRZSTANDARD) can currently provide a full range of lighting product tests (safety, light and electric parameters, spectral and color parameters, etc.). Other laboratories have facilities and equipment that allows conducting the tests partly or not completely. Nevertheless, they are issuing protocols which allow the importation of "grey-market" CFLs.

136. To issue the certificate for lighting products (lamps, fixtures), CA has to have a protocol from qualified laboratory; later this protocol is the regulatory basis for the issuance of the certificate. CA is responsible for samples selection for testing and its delivery to the testing facility. The testing facility has to have equipment that allows conducting of the whole range of tests. After testing, the laboratory presents the protocol to the CA.

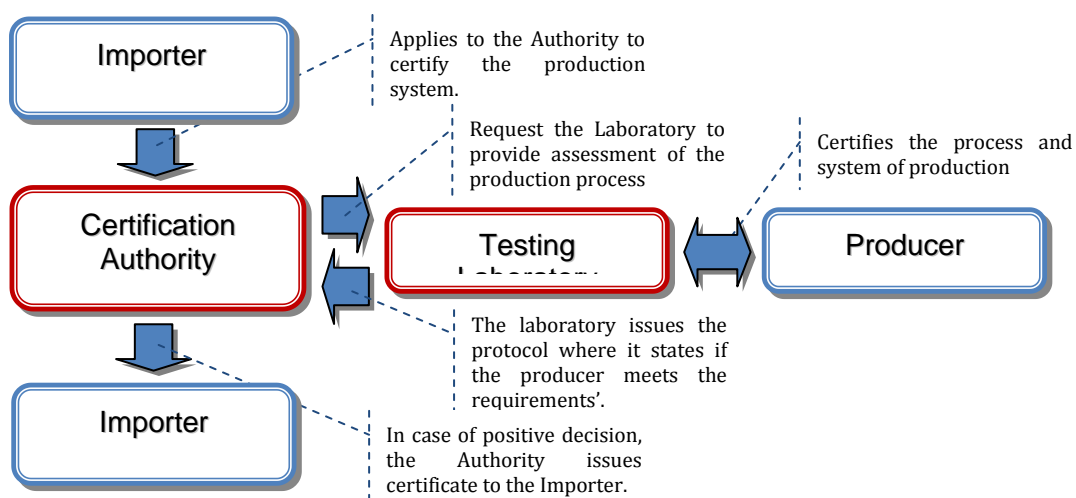


Figure 2-2: Producer certification

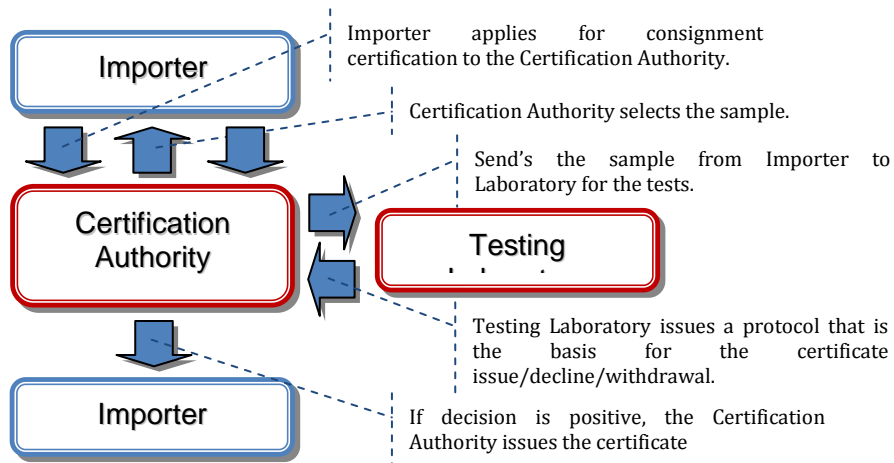


Figure 2-3: Certification of the consignment

137. The project will upgrade the testing and inspection capability of the lighting laboratory DERZHSTANDARD, and possibly one more laboratory, so that it will have modern testing equipment. The project will also promote legislative changes which will allow DERZHSTANDARD to test lighting products certified by other testing laboratories as a further quality control check.

Table 2-1: List of equipment upgrades for the test center “Poltavastandardmetrologiya” or “DEHRZSTANDARD” that is necessary for improvement of the quality assurance and testing procedures.

Types of measuring	Name of equipment	Purpose	Cost, USD
Light and electric parameters	Integrating sphere photometer	Automation of management and measuring processes (automatic control of sphere, results calculation software, modern devices of registration)	5,000
Spectral and colour parameters	Monochromator/Spectrograph	replacement of present equipment on modern	31,350
	Picoamperemeter 6485	Improved measurement of spectral characteristics	2,500
	Colorimeter 03–2102*	Improved measurement of colour temperature	2,500
Geometrical sizes	Digital trammel L=125, 250, 500, 800	replacement of present equipment	2,500
Radio frequency interference	Loop antenna	Comply with new method of tests in accordance with DSTU CISPR 15	800
	The analyzer of shot radio disturbance	Comply with new method of tests in accordance with DSTU CISPR 16–1	37,500
	Generator of electrostatic discharges	Comply with new method of tests in accordance with DSTU IES 61000–4–2	15,000
	Pliers for measuring the current strength	Comply with new method of tests in accordance with DSTU IES 61000–3–2	1,250
Total cost, USD			98,400

Annex 3: Description of Pilot EE lighting upgrades at Municipal Schools

138. The project will focus on replacing the lighting to EE technology in 50 municipal schools in 7 different Oblasts (provinces) in Ukraine. The need for better lighting solutions in public schools is severe. As part of preparatory work for this project site-visits were made to several schools in Ukraine to observe first-hand the state of the lighting inside the classrooms. Generally speaking, the current lighting for students in the classrooms often does not meet Ukrainian norms and is far from norms in other EU countries. Components are old and in need of replacement, often dating from Soviet times. Often the light fixtures and/or bulbs were broken resulting in only half-utilized lighting from the original design. Schools commonly use older Soviet manufactured type T8 & T12 lighting fixtures with electromagnetic ballasts. In schools visited by the Independent Expert (IE) typically less than half of the lamps in these fluorescent lamp fixtures were operational. Budget short-falls and lack of financing are blamed for the situation. In several instances the IE was told that parents sometimes donated light-bulbs to schools and classrooms as the school could not purchase them. As the financial crisis has severely impacted Ukraine's public finances it is not expected that this situation in Ukrainian schools will improve in the near future unless additional actions are taken by GEF and other international stakeholders. Therefore, this project will not only improve the energy efficiency of the schools but will also make a marked improvement in the quality of the lighting.

139. Energy savings and GHG reductions will depend on the technology and EE lighting solution that is chosen for each school along with the baseline situation at each school. Depending on the state of degradation of the lighting system it could hypothetically result in zero net energy savings at an individual school. However, using best practice assumptions from CDM & JI methodologies one would look to the minimum governmental lighting standards as the baseline situation. At some point in the future the schools & municipalities should be forced to provide minimum lighting standards (if they can secure the funding) and it is almost certain that they would not be able to provide the high performance EE systems that will be implemented by this project. Therefore this project will accelerate the implementation of lighting upgrades at the schools and do so with systems that provide a marked improvement in lighting for the students and teachers, while at the same time reducing electricity consumption compared to alternatives.

140. The optimal solution for effective lighting of educational institutions is the use of lighting equipment with:

- High-precision optics;
- A tubular fluorescent lamp as a light source;
- Electronic ballasts

141. Figure 3-1 illustrates singular lighting improvements in buildings and their corresponding impact on energy efficiency.

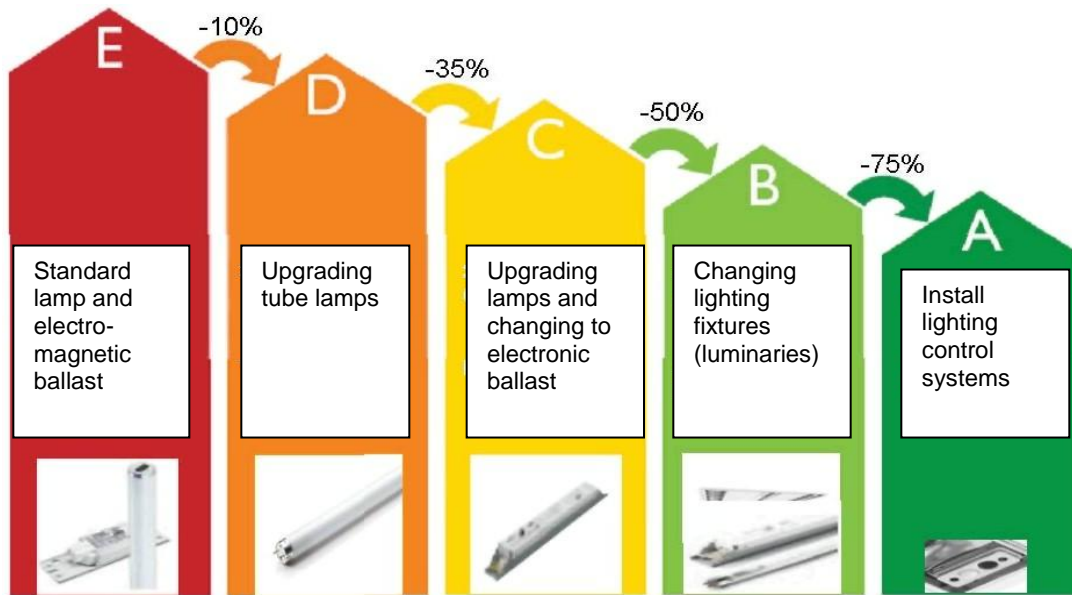


Figure 3-1: Improvements in energy efficiency at schools (source: Phillips Lighting).

142. The new lighting systems in the classrooms will:

- Increase the Color Rendering (Ra index over 80)
- Increase the Amount of Light (up to 60-70% more)
- Reduce the Stroboscopic effect
- Reduce the Glare effect (reduced by up to 70%)
- And decrease the content of harmful substances such as mercury (< 2mg)

143. According to national building norms in Ukraine there are 11 typical types of public school buildings which were built according to older Soviet design designs. The aim of the pilot project is to target the most effective schools for lighting upgrades, namely:

- Type 10 – with 33 educational classrooms and dimensioned for 1266 students.
- Type 11 – with 44 educational classrooms and dimensioned for 1688 students.

144. This is the most typical type of school built in Ukraine. In addition, according to the national building norms, Ukraine is also divided into four building regions that results a minor differences in construction and design (refer to Figure 3-1). These schools commonly use T8 or T12 type fixtures in the classrooms with older electromagnetic ballasts. The project proposes to upgrade the schools lighting systems to current European norms which are superior and more specific than current Ukrainian standards. Since 2009 EU countries have prohibited the use of electro-magnetic ballasts in public places where people stay more than 3 hours, in order to reduce eye fatigue from the stroboscopic effect these cause.

Table 3-1: European lighting standards in schools.

Modern European lighting standards	Lux
Classrooms for classes at night	500
Lecture Halls	500
Classrooms for applied studies/reading	750
Other Classrooms	300

145. The rough cost estimate of for upgrading a typical school would be:

Table 3-2: Estimates for school lighting renovations.

Task	Cost Estimate (USD)
On-site Energy auditing	1,500
Engineering Design	12,000
Cost of equipment and materials	50,000
Cost of installation, commissioning and general building works	30,000
Project Management (preparation of tender documents, advertising in mass media, etc.)	10,000
Total for "typical" school building:	USD 94,500

146. In order to select participating municipalities an open, transparent, and competitive process will to be managed by the project. In addition, the 7 municipalities will be selected so as to represent the different climatic regions located in Ukraine as shown in Figure 3-1 below. Some of the selection criteria will be related to previous experience and capacity with energy-efficiency projects or programs in the city, ability to provide or secure co-financing to support the activities, synergies with new EE projects in municipal buildings, local capacity to support the project, etc.

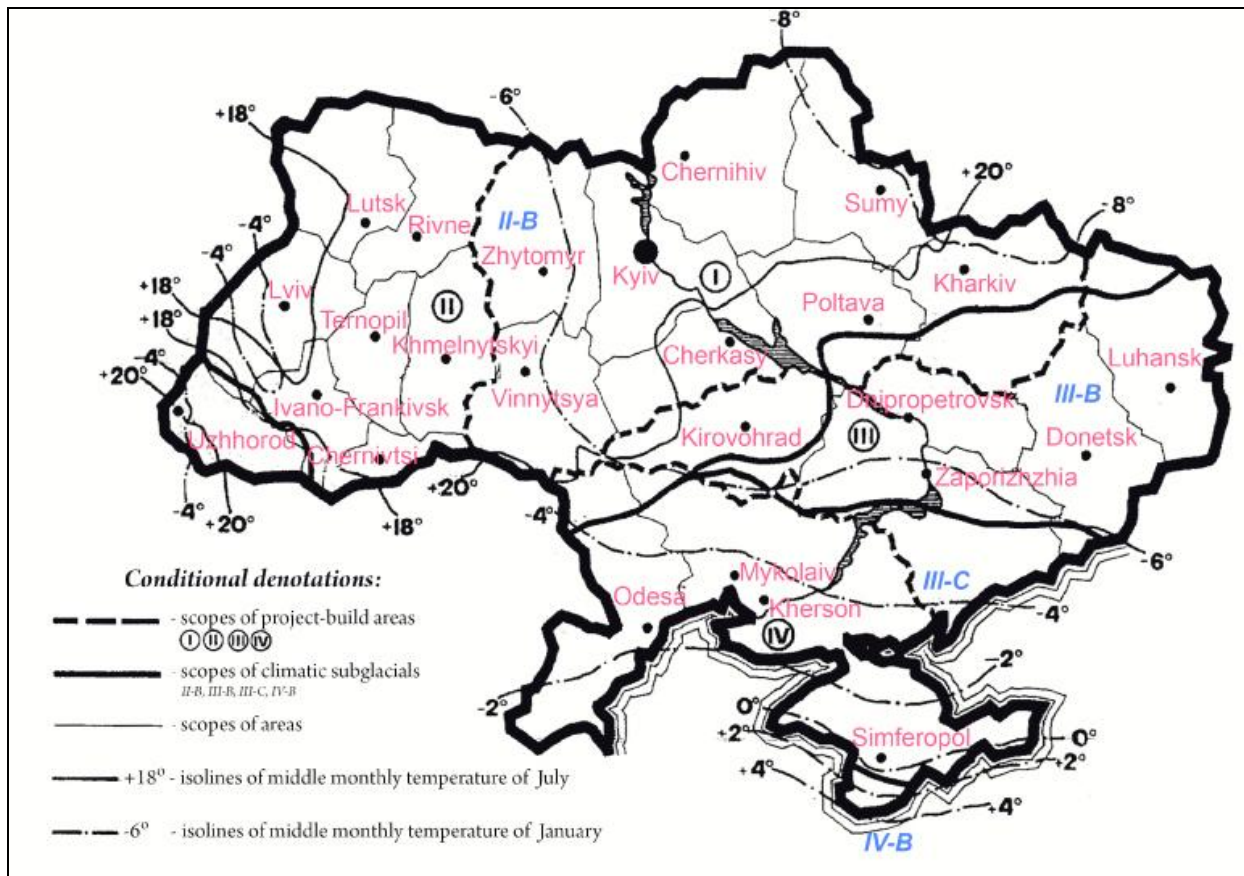


Figure 3-2: Major classifications of the climatic regions of Ukraine.

Previous experience and results at Ukrainian Schools

147. Project SPARE Ukraine, together with technical support of Philips Lighting, conducted the modernization of lighting in one of the Kherson region schools. The results were a 60% energy saving, the amount of light (on the surface of school desk) increased more than two times or 220%. Color rendering improved from Ra=55 to Ra=85 in other words rose 55%. The stroboscopic effect was removed from the classrooms (working frequency 40.000 Hertz instead of 100 Hertz). Blindness factor rose from 0,19 to 0,90 (a 450% improvement). The mercury content in a lamp decreased by 6000% (1,4 mg instead 85 mg). All in all, this was a large improvement for the students and the upgrades were less than what is planned for this project.

Global Benefits

148. According to local expert estimates, a typical school of 500 students participating in the pilot project would save approximately 1500 tons of CO₂ during the first 5 years of the project operation. As the budget allows for the rehabilitation of about 50 schools the direct CO₂ reductions from the pilot projects in 7 municipalities will directly reduce around 75,000 tons of CO₂ during the first five years of operation (depending on the implementation schedule). Spin-off effects in each municipality, as well as the roll-out of these projects in another 20 municipalities, will add to the global, national, and local environmental benefits.

Annex 4: Description of Program to Increase EE Lighting Penetration in Residential Sector

149. In the current context of Ukraine, it is difficult to duplicate some international best practice to use electricity utilities as the main drivers to transform the market. Leasing CFLs appears to be impossible due to Soviet legacies. There are several reasons for this situation.

150. The electricity companies are not interested in saving electricity, in fact, Ukraine currently has a surplus of electricity and is a net exporter. In the case of Ukraine, their stated energy strategy to 2030 is to increase the supply-side but now that there is a new government in place things could change and the project should be ready to take advantage of such a situation. However, the primary reason it is difficult to setup a typical CFL leasing program is that the electricity bill is not managed by the electric utility or grid operator. Rather it is managed by a group that sends a bill to the buildings in their region of operation for heat, electricity, and water. These groups go back to the Soviet times and there are literally hundreds of them in Kiev alone. So there is no central billing authority to cooperate with for leasing, subsidies, or other financial programs etc.

System for promoting EE Lighting for Consumers in Residential Sector of Ukraine

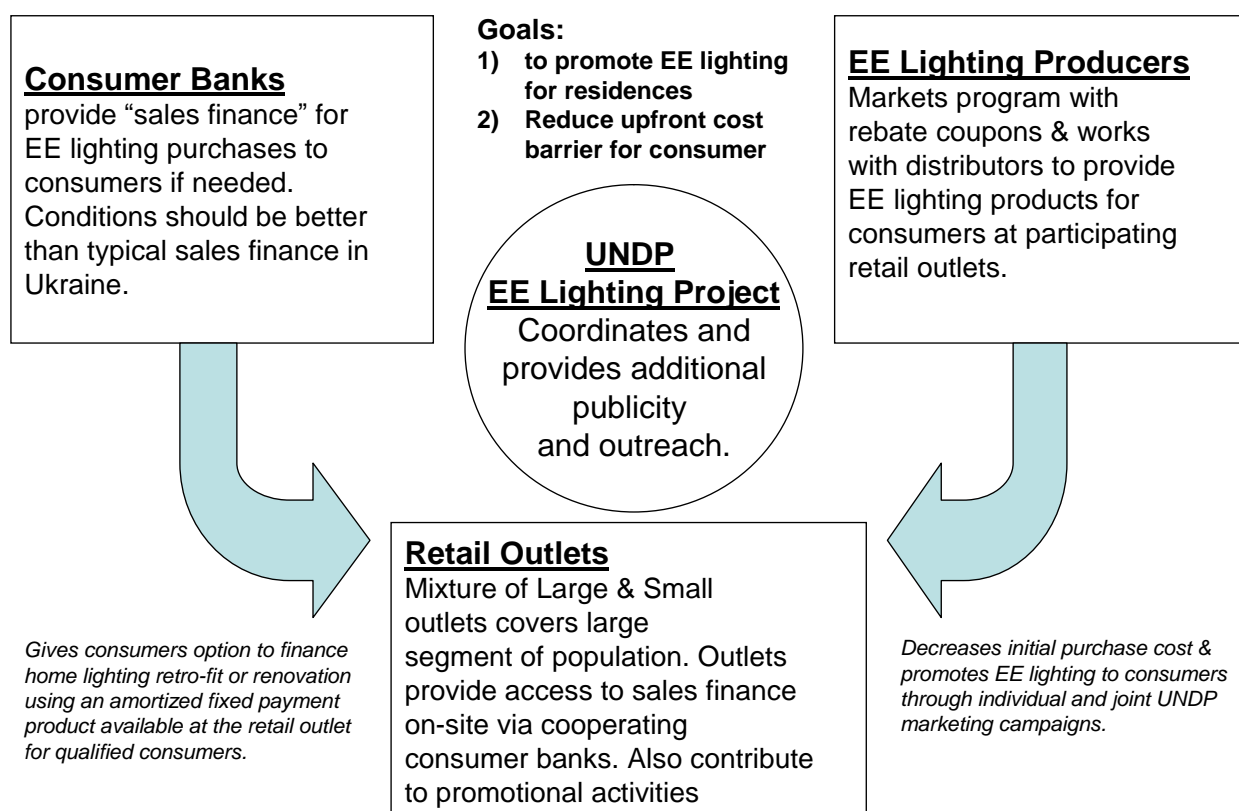


Figure 4-1: Overview of the different actors in EE lighting residential campaign and program.

151. Therefore the project has decided to work with efficient lighting equipment producers and retailers to increase the supply of EE lighting products to the residential sector. Currently

Ukraine has a very short history and limited availability of consumer credit, credit cards, and other mechanisms for financing consumer purchases. Generally speaking, Ukraine is very much a cash-based society compared to Western Europe or the USA. Furthermore, legacies and structures from the Soviet era still plague the way the energy sector is organized in Ukraine. In some countries GEF ELI projects have cooperated with electricity producers and/or electricity grid operators. This is not seen as a feasible approach in Ukraine as mentioned previously. Instead, this project shall cooperate with existing organizations in the retail chain to promote EE lighting solutions which can provide access to consumer credit for the renovation or retrofit of lighting in residences.

152. The characteristics for success of such a program can be summarized as allowing easy entry for the consumer through:

- Wide & clear publicity
- Wide availability (large number of participating shops)
- Low payment upfront (rebates plus availability of sales finance)

153. This will be established by cooperating with three groups and having them participate in the project:

1. EE lighting equipment manufacturers, including lighting fixture manufacturers
2. Large retail chains and smaller individually owned retail outlets throughout Ukraine.
3. Consumer banks which offer sales finance to consumers at participating retail outlets.

154. Several EE lighting equipment manufacturers (Phillips, Osram, Gazotron-Lux, etc.) are interested in participating and would promote the scheme by issuing equipment rebate coupons to consumers with instructions on which retail outlets are participating in the promotion. UNDP may assist with the marketing efforts at different stages and in different forums. These coupons can be distributed with in consumer's electricity bills utilizing a current system that some retail advertisers have established in large cities in Ukraine. In such a manner the timing of the message/offer will be optimal.



Figure 4-2: Example of a discount coupon from Osram that was distributed recently by mail with the residential utility bills in Kiev, Ukraine. Two retail outlets, Epicenter and Metro, are part of the campaign.

155. Participating retail outlets will honor the coupons and provide (with cooperating consumer banks) the option for qualified customers to finance the purchase of EE lighting equipment through a consumer “sales finance” agreement. This loan is amortized over a fixed period of time with a fixed payment schedule. The exact terms need to be defined but most likely a modest initial payment will be required by consumers. The energy and cost-savings from using the EE lighting equipment should refund to the consumer the cost of the purchase plus financing (depending upon the equipment, etc.). Ideally the consumer will receive a net financial benefit in long-term cost-savings and improved lighting performance during the lifetime of the products. Such consumer finance products are available in Ukraine at many retail outlets and the typical size of the loan is around \$200 to \$300, which is enough to purchase EE lighting products for average homes.

156. One such consumer bank in Ukraine, Platinum Bank, provides its consumer loan products via a network of 600 small to medium size retail shops around Ukraine. Leveraging this network will allow the promotion of the program and outreach to a much larger audience than if the project only cooperates with large retail chains. Cooperation between the EE lighting manufacturers, Platinum Bank, wholesale distributors, and the retail outlets will be necessary ensure a supply of (possibly new) products to these stores and to their shoppers.

157. In addition it is envisaged that the project will cooperate with at least one other large retail chain that has the suitable profile (e.g. home improvement products) and provides consumer finance solutions for its customers. For example, Eldorado and Foxtrot are such retail outlets in the Ukrainian market.

Dissemination Target for EE Lighting Products

158. At the PIF stage an original goal of the project was to disseminate 40 million CFLs, based on previous GEF project designs that focused on CFLs almost exclusively for the residential sector. This project has a wider scope in terms of the EE technology that is being promoted by the project partners within the residential lighting component. As a market-based approach is being employed residential consumers have the ability to choose the best EE lighting solutions (fixtures, bulbs, etc.) for their specific circumstances and budget. This approach also avoids technology “lock-in” in case, for example, LED technology improves during the 5 years of the project it prove to be worthwhile to promote both CFL and LED technologies. The approach of the project will need to be flexible in this regard.

159. The modeling and estimation of the environmental benefits of the project is done using idealized cases with “average” incandescent bulbs being replaced by “average” CFLs to provide similar lighting quality. The model projects, based growth curves from classical technology diffusion theory, the number of incandescent bulbs being replaced by equivalent CFLs over time, which provides a quantitative number upon which a dissemination target could be selected, e.g. 40 million CFLs. However, the reality will be more complex and as mentioned above, the project will not focus on CFLs exclusively. The quantitative target for the project (2011 – 2015) will be therefore be **40 million EE lighting products**, including fixtures. This is considered reasonable based upon the modeling numbers (i.e. an estimated reduction in 4.6 million MWh of electricity consumption) and it is possible to monitor together with project partners.

160. Proper monitoring of project performance during the project lifetime is critical and this has been designed into the project, for example, the project will employ a full-time monitoring specialist who will work with the project partners to collect and analyze market and project data.

Annex 5: CFL and Fluorescent Tube Lamp recycling in Ukraine

161. CFL lamps are harmful to the environment because of mercury content and belong to the second class of hazardous waste; as a result, CFLs require special handling, storage and disposal. The handling, storage and disposal in Ukraine are regulated by procedures that were developed in USSR (1968)⁹. While CFL recycling is focused upon in the following discussion, the project also intends to include recycling of fluorescent tube lamps (TLF) in the recycling system since they contain even more mercury than a CFL.

162. The producer responsibility principle is not implemented in Ukraine. The cost of recycling of one light bulb in Ukraine varies from USD 0.12 to 0.40. It is not that expensive compared to the CFL/TLF price, however, this cost is not included in the end price of the product. As a result the question is raised, who is responsible for the recycling.

163. There are a number of common and specific problems for households and organizations. Starting with business, the process of recycling is working well but unfortunately is not properly controlled by authorities. According to Law of Ukraine "Regarding waste"¹⁰ from March 5 1998, businesses have to recycle used CFL/TLFs. The business pays to the recycling company that has the appropriate license. The recycling company is responsible for transportation, storage and disposal. They are collecting lamps from the site with their own vehicle, store it in appropriate facilities and later dispose of it. After disposal they issue a note of evidence to the organization or business. However, there is a problem with control. In practice, some of the companies pay to the recycling companies only for evidence notes and, at the end of the day, waste CFL/TLFs are disappearing in the landfills with regular waste.

164. On the other hand, there is a much larger problem with waste CFL/TLF recycling from households. After CFL/TLF is depleted, it is classified as a harmful mercury containing material. As for today the processes for the handling of such waste for the residential population are not developed. Moreover, recent survey show that a large segment of the population is not aware about the mercury content in the CFL/TLFs¹¹. In addition, they are not able to return to the producer because there are no collection points. Likewise, they cannot return to the retailer because retailers do not have the special storage facilities required by law. Another problem is that the recycling companies do not want to work with the residential population because it is not economically viable to collect CFL/TLFs directly from homes; on the other hand population will not deliver it to the recycling sites or pay for it through bank transfers. Please see Figure 5-1.

⁹ Instruction on procedure of sale, buying, storage, and transportation of poisonous materials, <http://www.knukim-edu.kiev.ua/download/ZakonySSSR/data03/tex15266.htm>

¹⁰ <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=187%2F98-%E2%F0>

¹¹ Tatiana Mamalyga (2009) http://dialogs.org.ua/ua/issue_full.php?m_id=14619

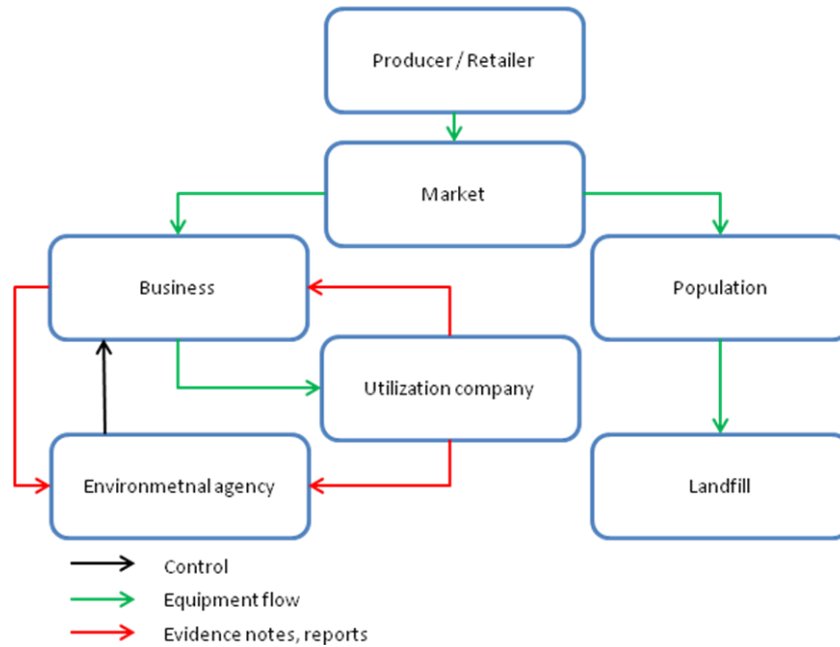


Figure 5-1. The life cycle CFL/TLF flow.

165. On the following figure the life cycle of CFL/TLF on Ukrainian market is presented. As it is shown on the figure, the product is placed on the market by manufacturers and retailers (generally importers). Also the figure presents the flow of the products at its life end stage. Green arrows show the equipment (CFL/TLFs) flow, red arrows show the flow of evidence notes and reports. At last, the black arrow shows the flow of control from authorities.

166. It has to be noted that Ukraine becomes energy saving without ensured procedure of CFL/TLF recycling. It is well known fact that there is a sign on packages of energy efficient lamps that clearly states that after using it people do not have to treat it as regular waste. However, appropriate procedures are not settled by local authorities and CFL/TLFs are buried in the landfills causing land contamination.

167. As a result the producer responsibility principle has to be implemented in Ukraine together with viable waste management scheme. The compliance scheme is one of the waste management market-based instruments that are implemented in the EU. It is proposed to implement CFL/TLF waste-management scheme in Ukraine similar to that shown in Figure 5-2.

168. It is well known fact that the private sector is one of the drivers who give signals to the government about what has to be implemented and which benefits the society will receive. For instance, CFL/TLF Compliance scheme can be negotiated with Environmental Agency and/or municipality for the creation of a special delivery network for the CFL/TLFs. As for today, delivery of the CFL/TLFs is prohibited by post and other services. On the other hand, regulation on new products delivery has much lower restrictions. As a result, it is proposed to create a network of two-way (i.e. push-return) track delivery of CFL/TLF products. Generally speaking, it is proposed to merge used CFL/TLF delivery stream with new products delivery. The economy of scale is not that great but following regulation will provide safe delivery products that contain hazardous materials.

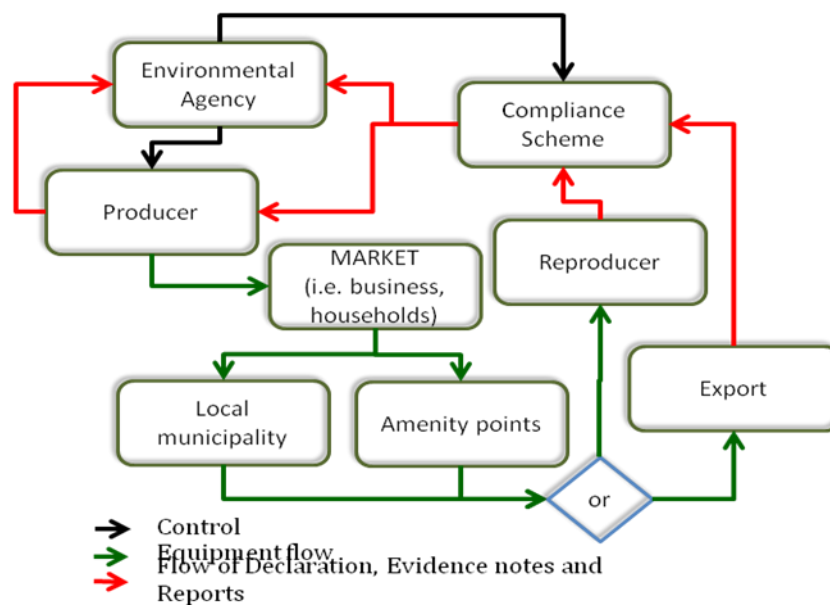


Figure 5-2. Proposed compliance scheme

169. Figure 5-2 shows a flow of the CFL/TLFs during their lifetime, flow of the declarations and the evidence notes between Authorized Treatment Facilities, Compliance Scheme and the Producer. The Environmental Agency has a control function in this model monitoring the work of compliance schemes and producers.

170. In general, the CFL/TLF supply chain model uses a distributor or a reseller to sell the products to the end customer and more frequently than not CFL/TLF products include parts from the different manufacturers. As a result, most of the companies just assemble the product and allocate it on the market with their own brand. Consequentially, it is very complicated to track the responsibility. In addition, as producers sell their products in different countries whose markets are regulated by national specific regulations, under local legislation producers cannot be considered as the producers anymore. The company considered to be a producer is merely a distributor who moves the products from the producer to the customer. Taking these factors into account it is proposed to implement Distributor Takeback Schemes in Ukraine for the retailers which have to establish networks with Designated Collection Facilities.

171. Producers are obliged to register within approved by Environmental Agency Compliance Scheme. A system for calculating producer responsibility is based on the producer's market share. Authorized Treatment Facilities has to provide evidence to producers on the amount of CFL/TLF received for treatment. At the end of the year producers are meeting their obligation through settled "Exchange" system.

172. The Following system is the competitive clearing house system for DTS what is a national framework in which multiple participants (producers', recyclers and waste organizations') can provide services. The government has to ensure that there is a register of the producers'; the allocation mechanisms and the reporting system are in place.

173. Producer Compliance Schemes manage the collection, treatment and reprocessing of deposited waste CFL/TLFs in partnership with Designated Collection Facilities, and arrange to meet recovery and recycling targets for their members. Local Authorities ensure the collection of CFL/TLF's from their sites knowing that, if sites are not cleared by producer compliance schemes, they will be able to recover their costs through the "Exchange" system

174. SMEs are able to join a compliance scheme through the fair fee structure, which reflects the market share or size of each company. Distributors and producers will be free to agree, through their supply chain negotiations, how the cost of handling historical waste CFL/TLFs may be displayed and the most appropriate method.

Annex 6: Estimation of GHG Emission Reductions

175. GHG emissions reductions attributed to the proposed project were estimated based on the guidelines provided in the *Manual for calculating GHG benefits of GEF projects, 2005* (further referred to as “the Manual”), for energy efficiency (OP5) projects. Emission reduction effects are therefore divided into direct, direct post-project and indirect. Direct are those achieved by GEF investments within the project supervised period of time; direct post project effects result from investments supported by GEF-sponsored financial mechanisms active after the project; and finally indirect emission reductions occur through market facilitation and development by capacity building, awareness improvements, barriers removal and creating enabling environments. Direct and indirect GHG reduction effects are not summed up and are reported separately because “their estimates are fundamentally different in their accuracy and degree of certainty”, as the Manual states.

Direct emission reductions

176. Direct emission reductions are estimated by multiplying energy savings of the project by the corresponding emission factor. The implementation of the project will result in the decrease of electricity consumption in municipal and residential sectors due to the expansion of efficient lighting technologies and the phase-out of inefficient lighting. For electricity emission factor the Global Carbon B.V. “Standardized emission factors for Ukrainian electricity grid” were used (see Annex 2), which is the common practice for Ukrainian JI projects obliged to deliver high levels of accuracy and conservativeness.

177. According to the Manual, for market transformation energy efficiency projects GHG emission reduction effects are estimated based on overall sector-wide CO₂ intensity of a particular market. The cumulative emission reduction of the GEF intervention therefore is the difference in the emission paths of the baseline and project scenarios.

178. The baseline is determined by analyzing the overall market situation prior to the project and modeling its development based on business-as-usual assumptions.

Baseline electricity consumption

179. Nuclear and thermal coal-fired facilities dominate the electricity production in Ukraine. In addition losses are high in the electricity distribution grid which combines to give Ukraine a high CO₂ emission factor per MWh of produced electricity 1.031 tons CO₂/MWh¹². The baseline situation for electricity demand and production in Ukraine is projected to increase (as stated in the “Energy strategy of Ukraine to 2030”) together with a decrease in incandescent bulb usage as electricity tariffs rise and energy efficient alternatives continue to gain market-share.

180. Currently CFLs represent approximately 2% of the installed lighting in Ukraine and the growth is 10-55% increase year on year in recent times. Therefore baseline CFL penetration is expected to increase gradually over the project lifetime (2010 – 2015).

¹² The grid factor developed and approved for JI projects in Ukraine is currently lower (0,896 tons CO₂/MWh) than the 1.031 tons CO₂/MWh used in other national publications. For the baseline and project estimates we use the lower figure to be conservative.

Electricity consumption for lighting in the residential sector

181. There are no official statistics or reliable national studies on electricity consumptions for lighting in Ukraine. That is why several approaches were combined to provide a best estimate of electricity consumption for lighting purposes in residential buildings in Ukraine.

The first approach is based on the residential properties data presented in Table 6 below and the following conservative assumptions:

- the amount of bulbs in one room households was considered as 5, two rooms households – 7, three rooms households – 9 and four rooms and more households – 11;
- the power consumption capacity of the incandescent lamp was considered as 100W;
- average yearly utilization of the installed power for lighting was assumed to 550 hours (about 1,5 hours per day).

Table 6-13: Residential properties data in millions of apartments and houses. (Source: State Committee of Statistics)

Residential properties	2002	2003	2004	2005	2006	2007	2008
One room	3692	3702	3699	3697	3688	3693	3705
Two rooms	7098	7106	7118	7132	7112	7127	7145
Three rooms	6303	6303	6308	6331	6313	6339	6352
Four rooms and more	1930	1938	1950	1967	1987	2006	2025

182. The second approach is based on the area of residential properties in Ukraine presented in Table 7 below and the following conservative assumptions:

- lighting norm for residential buildings is 150 lx;
- average annual period of time for ensuring lighting norm by artificial lighting was assumed to 550 hours (about 1,5 hours per day);
- the power consumption capacity of the incandescent lamp was considered as 100W;
- lighting efficiency of the incandescent lamp was considered as 12 lm/Wt.

Table 6-14: Residential data for interior area of homes. (Source: State Committee of Statistics)

Residential properties	2002	2003	2004	2005	2006	2007	2008
Residential properties, million m ²	1031,7	1035,7	1040,0	1046,4	1049,2	1057,6	1066,6

183. The results of calculations by both approaches are presented in Figure 6-1.

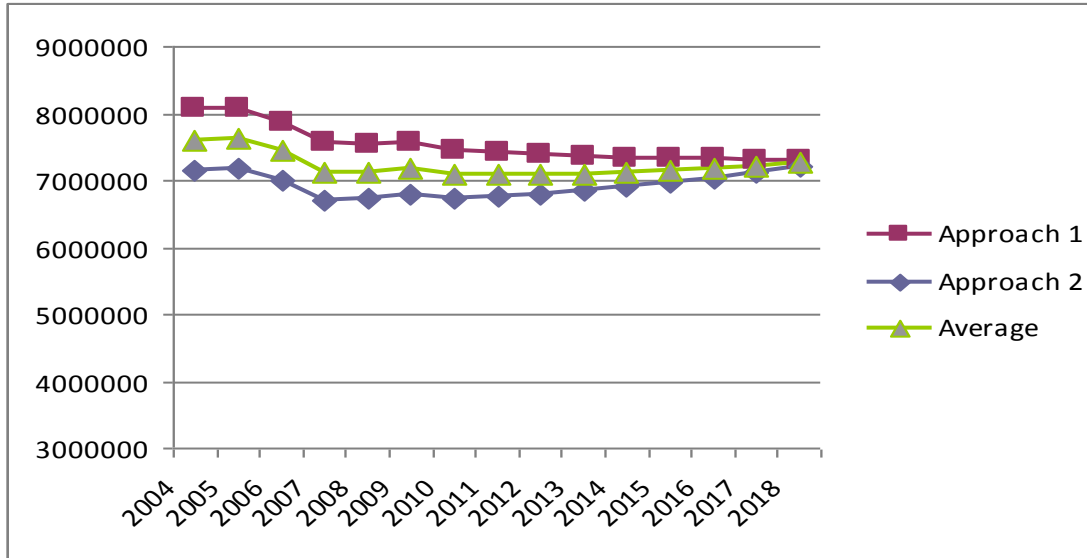


Figure 6-8: Estimates of the baseline residential electricity consumption in Ukraine in MWh during the project lifetime.

184. The assumption can also be cross-checked with the existing expert estimates that electricity consumption for lighting purposes corresponds to 30% of overall electricity consumption for the residential sector in Ukraine. Electricity consumption of the residential sector in Ukraine has grown from 21.8 TWh to 31.3 TWh during the period 2002-2008 and the average 30% during this period corresponds to 7.8 TWh. This is in line with the modeled average estimates for lighting electricity consumption in Ukraine during the period 2002-2008.

185. Using the average estimate for electricity consumption one can estimate the baseline CO₂ emissions for the residential sector (Figure 3). It is estimated that CO₂ emissions will grow unless actions are taken to speed up the penetration of EE lighting technology in the residential sector by this project.

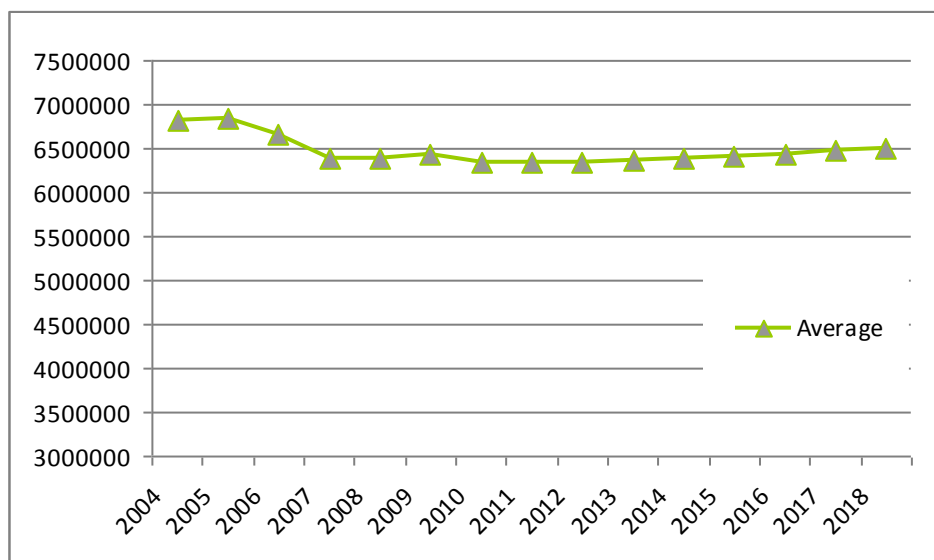


Figure 6-9: Estimated baseline emissions of tons CO2 from the residential lighting in Ukraine.

Electricity consumption for lighting in the municipal sector

186. There is no official data on electricity consumption for lighting for the municipal sector in Ukraine. The estimation of electricity consumption for lighting in the municipal sector has been made based on the approved norms of electricity consumption for public sector buildings and on incomplete (i.e. incomplete geographic coverage) statistical data for educational and healthcare institutions, cultural clubs and camps. Some simplifying assumptions had to be made in order to extrapolate the available data for all of Ukraine, and the share of electricity consumption for lighting was assumed as 30% in line with the data for residential sector. Table 8 shows the available results for previous years.

Table 6-15: Electricity consumption by municipal sector buildings, MWh

Year	Educational Institutions	Healthcare institutions	Camps and Resthouses	Cultural Associations/ Clubs	Total	Electricity consumption for lighting
2000	2 917 868	1 922 000	528 000	1 431 000	6 798 868	2 039 660
2001	2 952 660	1 918 500	518 000	1 404 500	6 793 660	2 038 098
2002	2 962 508	1 913 300	530 000	1 378 000	6 783 808	2 035 142
2003	2 964 680	1 882 000	526 000	1 351 500	6 724 180	2 017 254
2004	2 961 773	1 859 050	549 000	1 351 500	6 721 323	2 016 397
2005	2 944 593	1 833 350	534 000	1 325 000	6 636 943	1 991 083
2006	2 906 025	1 839 550	526 000	1 298 500	6 570 075	1 971 023
2007	2 850 970	1 810 200	514 000	1 272 000	6 447 170	1 934 151
2008	2 766 183	1 798 500	503 000	1 272 000	6 339 683	1 901 905

187. The CMU Order #1567-r “Regarding the implementation of measures to reduce electricity consumption by state financed organizations” requires that from November 1, 2008 state executive authorities should the replace incandescent bulbs with energy efficient light bulbs in state-financed organizations. (The exception being that there are no stockpiles of incandescent bulbs that have been bought earlier.) This order was supposed to switch state financed organizations during the period 2008-2009 to energy efficient lighting. However, due to inefficient execution of governmental programs and lack of adequate legal responsibility regarding inefficient energy usage the process of substitution of incandescent bulbs is still ongoing and could be significantly improved. Based on sparse, incomplete data obtained by the local experts there appears to be large differences between the municipalities in complying with this order (e.g. between 10 - 60%). Without official data to rely on the team conservatively assumed a current compliance rate of 25%, i.e. 25% of ILBs have been replaced with CFLs in the municipal sector.

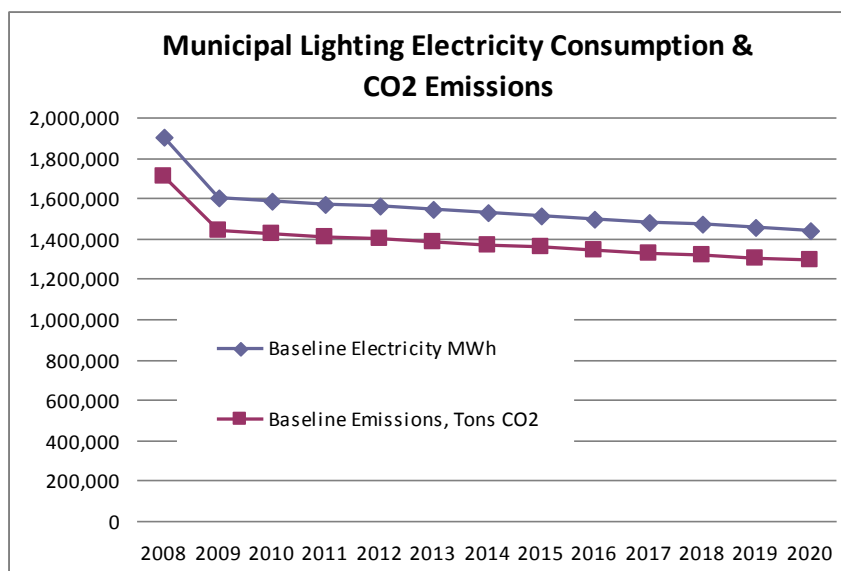


Figure 6-10: Baseline estimates for electricity consumption due to lighting in the municipal sector and the corresponding CO2 emissions.

Direct GHG emission reduction effects

188. As the objective of the proposed project is market transformation and the main activities are focused on legislation development, capacity building, awareness raising and barriers removal, the project execution will start up the processes which will yield GHG emission reductions long after the end of the project supervised period of time. These processes are similar over 2010-2015 and later. Therefore, direct emission reductions and direct post-project emission reductions are estimated together. It is assumed that project enabled investments after the end of project implementation period will act at least till 2020. In the following sections the results achieved by 2015 are considered to be the project’s direct reductions, whereas the same figures for 2016-2020 are attributed to direct post-project GHG reduction benefits.

189. In the absence of the project, under the business-as-usual baseline, it is reasonable to assume that improved laws and regulations promoting EE lighting would not be drafted in the near term that the capacity of lighting testing labs would remain insufficient, and that municipalities would not receive the capacity building on the benefits and use of EE technologies. Currently, Ukraine has had limited success in promoting EE lighting as an effective policy and institutional instrument for achieving the country's energy saving objectives.

190. Ukraine will no doubt benefit from the global drive towards more efficient lighting but, in the absence of this project, the benefits for Ukraine will be limited to a slight increase in the volume and performance of imported products. With the project, however, Ukraine will develop both demand and supply of efficient lighting equipment and in parallel transform the market.

191. The project comes at an opportune time as there is strong government will to increase energy-efficiency yet there is no specific effort focused on EE lighting. The project will bring together the human and financial resources necessary to draft laws and regulations supporting EE lighting that can then feed into the wider national action on energy-efficiency, and to implement pilot projects to demonstrate the benefits of EE lighting in the residential and municipal sector.

192. Figure 2 shows the baseline for electricity consumption from incandescent lamps in the residential sector, which is the primary bulb type that this project plans to replace and phase-out through pilot projects and policy measures. We estimate that actions to promote EE lighting by this project could effectively double the growth of CFL penetration, i.e. increase the annual growth rate to 25% year on year during the project period. Such growth could be reasonably obtained if all the actions of the project operate in parallel. This would result in emissions profiles for the baseline and project case as shown in Figure 5. So by replacing the IL technology to CFLs the project would contribute a net CO2 reduction over its lifetime of 4.15 million tons of CO2 from 2011 to 2015 from direct electricity reduction in the residential sector.

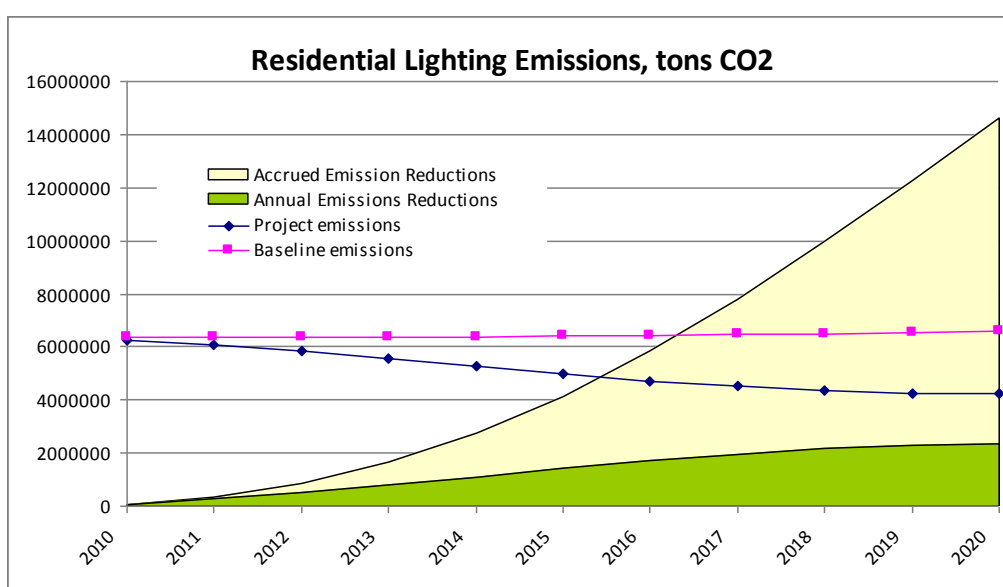


Figure 6-11: Baseline and project emissions of CO2 in the residential sector from lighting.

193. While the project will implement municipal demonstration projects in at least 7 progressive municipalities, it will target all municipalities through all of the project components to increase the usage of EE lighting projects, and to increase compliance with CMU Order #1337-r. In addition, a replicable financing mechanism aims to be established with financial institutions that are project partners for financing municipal EE lighting projects during and after the project.

194. Therefore for the municipal sector the project goal is 100% compliance with CMU Order #1337-r by 2020, i.e. 100% replacement of municipal ILBs with EE lighting products. The share of energy efficient light bulbs in the municipal sector buildings was assumed as 25% for the baseline in 2010. This figure increases at a faster rate due to project activities aimed at improving compliance and giving municipalities access to financing for large EE lighting renovations. Therefore by the end of 2015 the compliance rate is 63%, and 100% by 2020 respectively. The estimated results are shown in Figure 6.

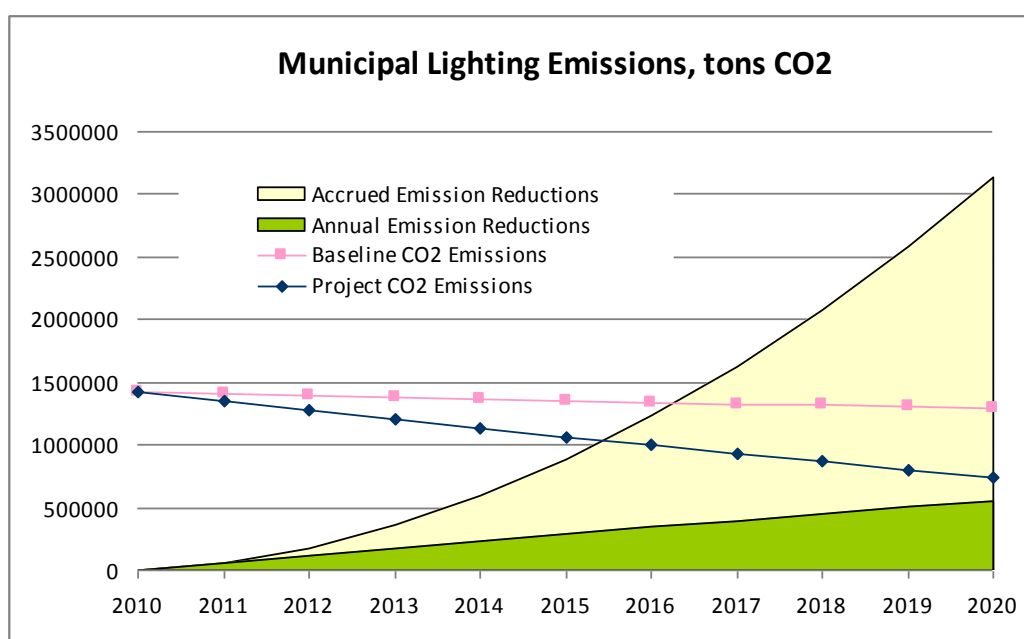


Figure 6-12: Estimates for lighting emissions and emission reductions in the municipal sector due to project activities.

195. The projected CO2 reductions due to the project activities by 2015 is estimated to be 4.15 million tons, and 0.9 million tons, for the residential and municipal sectors, respectively. Taking into account the project costs shown in **Table 11** below one can quickly estimate the CO2 abatement cost to 2015 to be USD 6.13 per ton of CO2 reduced. The corresponding GEF incremental cost would be approximately USD 1.28 per ton of CO2 reduced. These abatement costs compare favourably with similar GEF projects in other countries.

196. National benefits will be many, including an improved local environment (reductions in SOx, NOx, and particulate emissions), long-term savings for consumers, and a better balance of payments for electricity producers and the state, which subsidizes residential electricity costs.

Indirect emission reductions

In line with the Manual, indirect GHG reduction impacts are to be estimated applying two approaches: “bottom-up” and “top-down”. Bottom-up approach accounts for the expert judgements on the effectiveness of replications of the investment, whereas top-down approach estimates combined technical and economic potential of a particular technology in the project host country within next 10 years after the project and then multiplies it by GEF causality factor, designed to reflect how much of that savings can be attributed to the GEF intervention. The results are presented as a range of possible indirect GHG reduction effects with results from applying bottom-up and top-down approaches serving as lower and upper limits respectively.

Bottom-up approach:

Emissions saved with investments after the project are calculated as a sum of emission reductions over the period 2015-2025. No replication factor was applied as dominating number of the project outputs ones achieved would not be reasonable to replicate (e.g. legislation adoption, standards introduction etc.). Replicable projects are accounted for in the overall EE lighting share growth assumed under the project scenario.

Top-down approach:

It stipulates that all the IL lamps are phased out by EE lamps. Emission reductions are summed up during 2015-2025. Level 4 GEF impact and causality is assumed: Level 4 = “dominating”, GEF causality = 80%.

Overall GHG emission reduction benefits

Thus, the execution of the proposed project will lead to the following GHG emission reduction effects:

Direct emission reductions over the period 2010-2015 are: 0.9 million tons of CO_{2e} annually or in cumulative figures (assuming the project starts in late 2010): 5.0 million tons of CO_{2e}.

Direct post-project emission reductions over the period 2015-2020 are: 2.6 million tons of CO_{2e} annually or in cumulative figures: 17.8 million tons of CO_{2e}.

Indirect emission reductions within 10 years after the project implementation lie in the range: 18.9 – 22.5 million tons of CO_{2e}.

Annex 7: Terms of reference for key project staff

<i>Position/Title</i>	<i>US\$/ person week</i>	<i>Estimated person weeks</i>	<i>Prerequisites & Tasks to be performed</i>
FOR PROJECT MANAGEMENT			
Local Consultants			
Project Manager	600	255	<ul style="list-style-type: none"> • Experience with successfully managing and replicating large-scale projects in Ukraine • Experience with structuring project finance solutions with international organizations • Experience with climate change and/or energy-efficiency policies • Assume operational management of the project according to the project document and policies and procedures for nationally executed projects; • Prepare ToR for all project personnel and consultants to be recruited to assist in the implementation of the project; • Prepare and update project work plans, and submit these for clearance to the National Executing Agency and UNDP CO; • Assume direct responsibility for managing the project budget, ensuring that: <ul style="list-style-type: none"> ➢ Project funds are made available when needed and disbursed properly; ➢ Accounting records and supporting documents are kept; ➢ Required financial reports are prepared; ➢ Financial operations of the project are transparent and stand up to audit at any time; • Ensuring that financial procedures and regulations for NEX projects are applied; • International and National consultants are hired and are delivering their outputs on schedule; • Supervise the project staff and local or international experts/consultants working for the project; • Coordinate project implementation with projects and activities carried out by project partners and stakeholders, build partnerships and leverage resources, and • Report to the NEX Agency and UNDP Country Office on a regular basis.
Project assistant	250	255	<ul style="list-style-type: none"> • Provide necessary assistance in the operational management of the project according to the project document and the NEX procedures; • Draft correspondence on administrative and program matters pertaining to the Project Office responsibilities; • Undertake all preparation work for procurement of office equipment, stationeries and support facilities as required; • Undertake preparation for project events, including workshops, meetings (monthly, quarterly and annual), study tours, trainings, etc. This also includes preparation of background materials for use in discussions and briefing sessions on project matter; • Logistical arrangements. This includes visa, transportation, hotel bookings for project staff, consultants and invited guests coming for project activities; • Assist in preparation of project work plan and reports; • Prepare regular list of events for sharing of information within project staff and outside;

Position/Title	US\$/ person week	Estimated person weeks	Prerequisites & Tasks to be performed
			<ul style="list-style-type: none"> Assist with project communication activities, including publications; Assist with preparation of TORs and contracts for consultants/experts for project activities; Calculate and prepare staff time records.
Operation and Finance Specialist	400	255	<p>Planning</p> <ul style="list-style-type: none"> Prepare quarterly advance requests to get advance funds from UNDP in the format applicable; Assist the PM and NPD in project budget monitoring and project budget revision. <p>Accounting/ Reporting</p> <ul style="list-style-type: none"> Set up an accounting system, including reporting forms and filing system for the project, in accordance with the project document and the NEX procedures; Prepare project financial reports and submit to PM and NPD for clearance and furnish to UNDP as required. Reconcile all balance sheet accounts and keep a file of all completed reconciliation. <p>Control</p> <ul style="list-style-type: none"> Check and ensure that all expenditures of the project are in accordance with NEX procedures. This includes ensuring that receipts are obtained for all payments; Check budget lines to ensure that all transactions are correctly booked to the correct budget lines; Ensure documentation relating to payments are duly approved by the NPD; To continuously improve system & procedures to enhance internal controls are satisfy audit requirements. <p>Inventory Register</p> <ul style="list-style-type: none"> Maintain a proper inventory of project assets register, including numbering, recording, and reporting; Maintain the inventory file to support purchases of all equipment/assets.

FOR TECHNICAL ASSISTANCE

Component 1: Prepare and set-up national policy framework to promote EE lighting

LOCAL CONSULTANTS

Policy expert (TTL) Leader	500	255	<p>He/she will undertake the following activities:</p> <ul style="list-style-type: none"> Support EEL policy development, lead and coordinate national technical team (working group) on national laws and policies; directly contribute to the design of policies and regulations Facilitate establishment of the project; draft TORs for project; communicate with potential participants and stakeholders Ensure active engagement of stakeholders and effective and efficient meetings of the project
Expert on Standards (TTL)	500	150	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> Compile technical and regulatory information on the energy efficient lighting standards Participate and directly contribute to design and development of Energy Efficient Lighting standards and enforcement mechanisms Review all drafts of proposed standards, and make recommendations for further developments/revisions

Position/Title	US\$/ person week	Estimated person weeks	Prerequisites & Tasks to be performed
			<ul style="list-style-type: none"> Lead and coordinate national technical team (working group) on the development of EEL standards; design terms of references for technical standards design; leverage partnerships with relevant organizations, deliver technical reports on EEL standards to the project.
National Expert on the Incandescent “Phase-out” program	500	150	<p>The experts will undertake the following activities</p> <ul style="list-style-type: none"> Conduct of a thorough review of all available market demand forecasts, both national and international, for demand for GLS and EELs over a 3, 5 and 10 year period. Use information about international phase-out programs and then prepare phase-out roadmap Follow the enforcement and implementation the phase-out measures Evaluate the impact of the phase-out measures.
Short-term local consultants	600	154	Short-term consultants will be engaged on the ad-hoc basis to provide a high-level technical advice to project, national and regional authorities and stakeholders. Indicative list and detailed TORs for the consultants will be development by the project team (PM, TTLs) in the course of the project implementation.

Component 1: Prepare and set-up national policy framework to promote EE lighting

INTERNATIONAL CONSULTANTS

International Advisor on Lighting Standards	3,000	13	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> Collect and compile information about international policies and standard systems for lighting equipment Information sharing on best practices and experience from Europe, the Americas and Asia of similar current and proposed standards, test methodologies and enforcement strategies Review of drafts of proposed standards, including seeking international critical review, and making recommendations for further developments/revisions Assist national project team and national experts in designing national lighting standards, including energy performance and product quality standards Advise national project team, experts and stakeholders on establishing new policies and enforcement mechanisms to promote efficient lighting Design, development and deliver training to national stakeholders including: (a) overall scope of the training program, areas the training should cover and specification of specific content; and, (b) review of draft training materials; (c) attend pilot training courses to provide detailed review and recommendations for revision. Assistance in the dissemination of any new standards, testing or enforcement requirements to key stakeholders in other countries.
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<i>Position/Title</i>	<i>US\$/ person week</i>	<i>Estimated person weeks</i>	<i>Prerequisites & Tasks to be performed</i>
Component 2: Improved QA/QC framework for EE lighting market			
LOCAL CONSULTANTS			
QA/QC Leader (TTL)	500	255	<p>He/she will undertake the following activities:</p> <ul style="list-style-type: none"> • Manage the activities related to QA/QC improvements in Ukraine, lead and coordinate national technical team (working group) on national laws and policies; directly contribute to the design of policies and regulations • Facilitate establishment of the project; draft TORs for project; communicate with potential participants and stakeholders • Ensure active engagement of stakeholders and effective and efficient meetings of the project
Expert on Capacity Building for testing labs	500	100	<p>The experts will undertake the following activities</p> <ul style="list-style-type: none"> • Evaluate the needs for training for testing laboratory staff • Manage the equipment improvements for the laboratories • Establish a list of the existing testing laboratories in the country • Elaborate a training curriculum for testing laboratory staff • Deliver training covering various technological, technical, legal, methodological aspects. • Assist the Component 1 team with lobbying efforts for QA/QC changes
Short-term local consultants	600	295	<p>Short-term consultants will be engaged on the ad-hoc basis to provide a high-level technical advice to project, national and regional authorities and stakeholders. Indicative list and detailed TORs for the consultants will be developed by the project team (PM, TTLs) in the course of the project implementation.</p>
Component 2: Improved QA/QC framework for EE lighting market			
INTERNATIONAL CONSULTANTS			
International Expert on "Incandescent Phase-out" program, lighting technologies and training	3,000	30	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Collect and compile information about international phase-out programs • Assist National Expert on Phase-out activities • Design and development of training materials including: (a) overall scope of the training program, areas the training should cover and specification of specific content; and, (b) review of draft training materials • Assist with the development of training for impacted companies • Training program review including review of outline training programs, schedules and proposed target audiences • Attendance at pilot training courses to provide detailed review and recommendations for revision prior to training roll out.

Position/Title	US\$/ person week	Estimated person weeks	Prerequisites & Tasks to be performed
Component 3: Efficient lighting demonstration in municipal educational sector			
LOCAL CONSULTANTS			
Municipal Pilot Project Coordinator	500	255	<ul style="list-style-type: none"> • A strong background in project management and project finance • Experience working with Ukrainian municipal governments <p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Technical advice on the design of the pilot projects; selection of pilot buildings, direct input to the design and review of technical project documentation • Day-to-day Management of sub-contractors for demonstrator implementation • Planning of demonstrator implementation • Follow-up the installation demonstrator and validation of each implementation step • Follow-up of the maintenance of demonstrators • Interaction with institutional stakeholders concerned by the demonstrator • Prepare and follow-up replication plans.
Expert on Monitoring of energy consumption and GHG emissions	500	200	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Estimation of energy savings and forecasts for the 5-year period after the project • Establishment of a methodology for energy saving measurements in situ • Assist with project implementation and sub-contractor management • Follow-up the implementation of energy measurements and conduct measurement campaigns • Collection all information for establishing a reliable GHG emission evaluation • Assessment of the overall likely environmental impact of EEL retrofitting.
Short-term local consultants	600	88	Short-term consultants will be engaged on the ad-hoc basis to provide a high-level technical advice to project, national and regional authorities and stakeholders. Indicative list and detailed TORs for the consultants will be development by the project team (PM, TTLs) in the course of the project implementation.
Component 3: Efficient lighting demonstration in municipal educational sector			
INTERNATIONAL CONSULTANTS			
International Expert on Project Finance for Small-scale Energy Efficiency Projects	3000	33	<p>He/she will undertake the following activities in collaboration with the local experts</p> <ul style="list-style-type: none"> • Assist with structuring the project-finance solutions for the municipal pilot projects • Assist with establishing relationships between the project and possible partner organizations that provide specialized EE project funding/financing • Work with partner organizations (World Bank, NEFCO, etc.) to establish a finance window within existing EE funds and programs • Establish a system and procedure for producing “bankable” projects to submit to the EE funds and programs • Work with municipal partners to negotiate possible finance terms and structures to promote implementation and replication of the pilot projects

<i>Position/Title</i>	<i>US\$/ person week</i>	<i>Estimated person weeks</i>	<i>Prerequisites & Tasks to be performed</i>
Component 4: Improve EE Lighting product penetration in the Residential Sector			
LOCAL CONSULTANTS			
Residential Lighting Team Leader	500	255	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Technical advice on the design of the pilot projects; selection of pilot buildings, direct input to the design and review of technical project documentation • Day-to-day management of sub-contractors for demonstration • Planning of demonstration implementation • Follow-up the installation demonstrator and validation of each implementation step • Follow-up of the maintenance of demonstrators • Interaction with institutional stakeholders concerned by the demonstrator • Prepare and follow-up replication plans.
EE Lighting Marketing Specialist	500	255	<ul style="list-style-type: none"> • Be responsible for the marketing of the project/program to consumers • Design marketing programmes in cooperation with project partners and stakeholders • Develop the baseline household surveys in collaboration with international experts and marketing sub-contractors • Follow-up the project implementation with subsequent surveys to measure consumer awareness and EE lighting penetration to Ukrainian households
Specialist for Consumer Product Disposal & Recycling	500	200	<ul style="list-style-type: none"> • Assess current situation and problems associated with CFL/TLF disposal and recycling in Ukraine • Work with other project members to design better regulations and disposal CFL/TLF system for consumers and municipalities • Design a replicable system/program for improved recycling of CFL/TLFs • Establish CFL/TLF recycling pilot-projects in Ukraine working with project partners and stakeholders
Monitoring and Reporting Specialist	500	200	<ul style="list-style-type: none"> • Ensures proper monitoring of project impact and results in line with established project targets and indicators including monitoring of sales (as well as import & local manufacturing); • Monitors and provides an assessment of the project activity; • Ensures proper documentation and reporting. In this regard, prepares monthly, quarterly and annual project reports, publication serials and information/communication materials; • Provides through progress reporting continuous analysis of the achievements, facilitates project reviews, evaluation and audits.
Short-term local consultants	760	125	<p>Short-term consultants will be engaged on the ad-hoc basis to provide a high-level technical advice to project, national and regional authorities and stakeholders. Indicative list and detailed TORs for the consultants will be development by the project team (PM, TTLs) in the course of the project implementation.</p>
Component 4: Improve EE Lighting product penetration in the Residential Sector			
INTERNATIONAL CONSULTANTS			

Position/Title	US\$/ person week	Estimated person weeks	Prerequisites & Tasks to be performed
International Expert on Monitoring of Residential Energy Savings and GHG emissions	3000	15	<p>He/she will undertake the following activities in collaboration with the local experts:</p> <ul style="list-style-type: none"> • Assist with the estimation of energy savings and elaboration forecast for the 5-year period after the project • Establishment of a methodology for estimating energy savings in the residential sector • Assist the local team in designing the baseline survey of residential EE lighting usage • Develop the monitoring protocol which the project will use to estimate residential energy-savings, environmental impact, and GHG emission reductions
International Expert on Consumer Marketing of EE Lighting Products	3000	18	<p>He/she will undertake the following activities in collaboration with the local experts</p> <ul style="list-style-type: none"> • Advice on the design of the pilot projects and marketing activities <p>He/she will undertake the following activities in collaboration with the local experts:</p> <ul style="list-style-type: none"> • Assistance with planning of the marketing surveys • Advice on best practices from other regions which may be modified for the Ukrainian context • Cooperate with EE lighting manufacturers which are project partners to plan promotional activities and obtain their support
International Expert on CFL Collection, Disposal & Recycling	3000	20	<p>He/she will undertake the following activities in collaboration with the local experts:</p> <ul style="list-style-type: none"> • Assess current situation and problems associated with CFL disposal and recycling in Ukraine • Provide best practice examples from other countries and regions which may be suitable, if modified, for Ukraine • Work with other project members to design better regulations and disposal CFL system for consumers and municipalities • Design a replicable system/program for improved recycling of CFLs <p>Establish CFL recycling pilot-projects in Ukraine working with project partners and stakeholders</p>

Component 5: Replication and Dissemination of the Project Results

NATIONAL CONSULTANTS

Replication & Dissemination Team Leader	500	255	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Day-to-day management of sub-contractors • Follow-up of the maintenance of demonstrators • Interaction with institutional and project stakeholders • Prepare and follow-up replication plans for the main project components • Manage the development distribution of promotional material for the project • Manage the creation and updating of the project website
Short-term local consultants	600	146	<p>Short-term consultants will be engaged on the ad-hoc basis to provide a high-level technical advice to project, national and regional authorities and stakeholders. Indicative list and detailed TORs for the consultants will be development by the project team (PM, TTLs) in the course of the project implementation.</p>

Component 5: Replication and Dissemination of the Project Results

<i>Position/Title</i>	<i>US\$/ person week</i>	<i>Estimated person weeks</i>	<i>Prerequisites & Tasks to be performed</i>
INTERNATIONAL CONSULTANTS			
International Expert on alternative financing for Energy Efficiency activities	3000	26	<p>He/she will undertake the following activities</p> <ul style="list-style-type: none"> • Initially work with the project team to analyze possibilities for carbon finance (and other alternative funding) for the pilot projects • Develop training programme for municipalities for small-scale EE project finance • Conduct workshops at municipalities throughout Ukraine

SIGNATURE PAGE

Country: Ukraine

UNDAF Outcome (s)/Indicator (s): *Link to UNDAF Outcome. If no UNDAF leave blank.*

UNDAF outcome #4: By 2010, poverty reduced by 50% through equitable, area-based economic growth and targeted provision of inclusive social services

CPAP Outcome (s)/Indicator (s): Sustainable development policies and practices make the difference.

Indicator: Decline in green(house) gas/carbon dioxide emission.

CPAP Output (s)/Indicator (s):

Institutional capacities and capabilities of municipalities strengthened through improved policies and practices related to energy services and environment.

Indicator: Number of municipalities engaged in energy saving and sustainable practices

Executing Entity/Implementing Partner The Ministry of Environmental Protection of Ukraine

Implementing entity/Responsible Partner

UNDP

Program Period:	2010-2015	Total resources required	31,000,000
Atlas Award ID:	__00060792__	Total allocated resources:	31,000,000
Project ID:	__00076692__	• Regular	_____
PIMS #	__4175__	• Other:	
Start date:	__1/12/2010__	○ GEF	6,500,000
End Date	_____	○ Government	19,375,000
Management Arrangements	__NIM__	○ In-kind (Gov-ment)	1,600,000
PAC Meeting Date	_____	○ Private Sector	3,275,000
		○ UNDP	250 000

Agreed by (Government):

NAME SIGNATURE Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

NAME SIGNATURE Date/Month/Year

Agreed by (UNDP):

NAME SIGNATURE Date/Month/Year

