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ENHANCING CAPACITY FOR LOW EMISSION DEVELOPMENT STRATEGIES (EC-LEDs) CLEAN ENERGY PROGRAM
COOPERATIVE AGREEMENT NO. 114-A-13-00008

QUARTERLY MONITORING REPORT OF DEMONSTRATION PROJECTS AND SEAP IMPLEMENTATION

APRIL 1, 2017 – JUNE 30, 2017

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Monitoring Implementation of SEAPs and Demonstration Projects

June 2017

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS

ADB	Asian Development Bank
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
EE	Energy Efficiency
GB	Green Buildings
GeMunee	Georgian Municipal Energy Efficiency
GOG	Government of Georgia
GHG	Greenhouse gas
LEDS	Low Emission Development Strategy
SEAP	Sustainable Energy Action Plan
USAID	United States Agency for International Development
USG	United States Government
WI	Winrock International

I. EC-LEDS OVERVIEW

Georgia's Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) Clean Energy Program, funded by the United States Agency for International Development (USAID), is a four-year (October 2013 – September 2017) effort focusing on three activities: 1) Georgian Municipal Energy Efficiency (GeMunee); 2) Green Building Rating and Certification System; and 3) National EC-LEDS Working Group and Advisory Assistance. USAID awarded Winrock International (WI) a cooperative agreement to implement Georgia's EC-LEDS Clean Energy Program to support climate change mitigation by building municipal capacity in climate change mitigation measures and raising public awareness; increasing private sector investment in energy efficiency (EE) and green buildings (GB); and strengthening Government of Georgia (GOG) capacity to develop and implement a national Low Emission Development Strategy (LEDS). This report describes year four quarter two activities of the EC-LEDS Clean Energy Program covering the period April 1, 2017 through June 30, 2017.

The objectives of the EC-LEDS program are to (1) support Georgian municipalities in institutionalizing and implementing climate change mitigation measures, (2) promote and facilitate private sector investment in energy efficiency and green buildings, and (3) build the capacity of the GOG to develop and implement a national Low Emission Development Strategy in support of the United States Government (USG) EC-LEDS initiative. During the four years, the EC-LEDS Clean Energy Program is expected to reduce greenhouse gas (GHG) emissions in Georgia by at least 236,372.9 metric tons of CO₂ equivalent, facilitate up to \$14 million in private sector investments in clean energy, and lead to energy savings of up to 315 GWh (the equivalent of approximately \$22 million).

II. MONITORING OF SEAP IMPLEMENTATION

During the reporting period, EC-LEDS continued monitoring process to track impacts of the actions included in the Sustainable Energy Action Plans (SEAP) and compare estimated impacts to what is actually achieved in terms of energy savings, renewable energy production and CO₂ emissions reduction. M&E Specialist utilizes the data collection questionnaire developed in the previous reporting period, which include status of measures outlined in each particular SEAP, estimated savings, planned actions with respective explanations and comments (See Annex II: Monitoring Form of each SEAP Municipality in the previous quarterly Report of Monitoring of SEAP Implementation and Demonstration Projects). The sample data collection table per measure is enclosed as Table I below. However, monitoring forms are developed in Georgian language and the reporting is elaborated in Georgian language as well. When the data is collected, M&E Specialist summarizes the results in English and findings are reported below per each SEAP Municipality Chapter.

Noteworthy, that the whole data collection process was accompanied with constant consultations regarding the template and type of data. Overall, submitted forms still had missing information and even though, some additions were made after respective follow-ups, some cells were still left blank due to unavailability of data, particularly the data on actual GHG and energy savings and respective budgets. After analyzing collected data, it was evident, that no significant changes/improvements have been demonstrated during the reporting period and therefore, the GHG and Energy savings amount has been slightly advanced.

It should be noted, that the numbers indicated under GHG and Energy Savings columns are rough estimations based on data provided in respective SEAPs in case of full scale implementation of each measure. Considering the above-mentioned, the total GHG emission reduction from the measures which have been initiated/finalized under each municipality, will equal to 788,206.76 TCO₂ and 96,343,338.46MWh Energy will be saved by 2020.

Table 1: Data Collection Sample for Monitoring of SEAP Implementation

Measure	The Measure is being implemented or finalized						
	<input type="checkbox"/> Yes ==> (If Yes, Please fill out the next cells)	Explain implementation statuses of the measure	Start Date	End Date	Budget (GEL)	Expected Energy savings [mgw/h]	Expected GHG reduction [TCO2e]
	<input type="checkbox"/> No ==>	Implementation of the measure is planned	Expected date/period		Explain the reason		
		<input type="checkbox"/> Yes =====>					
		<input type="checkbox"/> No =====>					

III. MONITORING RESULTS PER MUNICIPALITY

A. AKHALTSIKHE MUNICIPALITY

As per submitted information, the progress has been demonstrated in transport sector. In particular, 1 km of cycling path was arranged on Akhaltsikhe Lake. Overall cost of the measure was 1,866,500.00 GEL and anticipated CO₂ emission reduction (ton) will equal to 286 TCO₂ and Energy Saving -1512 MWh by 2020. It is planned to designate special parking space in the city and frame the parking lines. The measures implemented during the reporting period envisage installation of outdoor lighting and Solar Farm on Akhaltsikhe Castle and arrangement of parking spaces.

Noteworthy, that 163 Sodium bulbs were installed in Akhaltsikhe Municipality in 2015 and 319 LED bulbs in 2016. Furthermore, the Municipality initiated the process of setting up street lighting remote control and efficient consumption system in February 2017 and it's planned to be finalized by the end of 2018.

The information is summarized into the table below:

Table 2: Measures implemented by Akhaltsikhe Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	Encouragement of cycling and walking	2016-09/2017	335,000.00	654	164
Street lighting	Set up of street lighting remote control and efficient consumption system at the territory of city of Akhaltsikhe Municipality (outdoor lighting, lighting of Akhaltsikhe Castle, Solar Farm on Akhaltsikhe Castle)	02/2017-2018	1,502,000	640	67
Parking	Arrangement of parking space	05/2017-07/2017	29,500	218	55
Total			1,866,500.00	1512	286

B. BOLNISI MUNICIPALITY

Bolnisi Municipality implemented different measures in Transport, Building, Street lighting and Greening sectors respective to Sustainable Energy Action Plans. Some of them were initiated in 2015, while others were launched in 2016 and will be finalized by 2020. More specifically, Public Municipal Transport (busses) were renewed in 2015 resulting in reduction of 41 TCO₂ by 2020 along with increasing number of mini-busses in 2016. Noteworthy, that roads were also paved, thus reducing CO₂ emissions by 19.21 TCO₂ by 2020.

As for the measures carried out in Building sector, kindergartens were upgraded in terms of energy efficiency, in particular, energy efficient lighting systems were installed and windows were replaced. Furthermore, sensor lighting system is being installed in residential buildings.

Besides share of energy efficient lighting bulbs in the street lighting is steadily increasing and it's expected to be finalized by 2020.

Greening sector measures were advanced through greening of 0.4ha Area within the city.

Overall, taking into consideration the measures that have already been initiated and/or finalized by Bolnisi municipality, CO₂ reduction will equal to 324.89 TCO₂ by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 3 below:

Table 3: Measures implemented by Bolnisi Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	PT1: Renewal of Public Municipal Transport (Busses) in Town Bolnisi	Finished in 2015			41
Transport	PT2: Increasing Number of Municipal Public Transport in Bolnisi (Mini-buses)	2015-2016			199
Transport	UP1: Rehabilitation of the Road Pavement	2016-2020	2212000		19.21
Transport	UP2: Transport Flow Management in Bolnisi Municipality	2016-2020			
Building	MB 2.2 Installation of Energy-Efficient Lighting Systems in Kindergarten Buildings	2016-2020	250		0.05

Building	MB 4.1 Replacement of Windows in Kindergartens.	2016	17250	3.7
Building	RB 1.1 Installation of Sensor Lighting in Entrances of Residential Buildings	2016-2020		23.22
Street Lighting	S1 Increase the Share of Energy-efficient Lighting Bulbs in Street Lighting Grid	2016-2020	110560	23.71
Greening	G1 Greening of 0.4ha Area within the Limits of the City	2015	5230	6,6
Greening	G2 Greening of 5ha Area around the City	2016-2020	7000	8.4
Total				324.89

C. GORI MUNICIPALITY

The analysis of collected data demonstrates, that kindergarten #16 has been upgraded with the following measures: installation of lighting system with fluorescent bulbs, insulation of building's roof, installation of solar collectors. In addition, Anna Peradze School of Arts of rehabilitated as part of Building sector measure.

The Transport sector was progressed by various activities. More specifically, road signs were registered and arranged throughout the city, alternative route was developed, and parking spaces were designated and framed.

In addition, new seeds were planted as part of completion of forest-park planting in the eastern side of the city.

Noteworthy, that as per the information submitted by SEAP monitoring designated staff, it is planned to arrange bridges on the rivers for pedestrians and bikers in 2017-2018. For the same period of time it is intended to replace energy source with solar power.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Gori municipality, CO₂ reduction will equal to 371.29TCO₂ by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 4 below:

Table 4: Measures implemented by Gori Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Building	MB 2.1 Lighting system with fluorescent bulbs in kindergarten - N16 Kindergarten	08/2014-11/2014	1000	130.9	17.8
	MB 3.1 Insulation of Building's roof in Kindergarten - N16 Kindergarten	08/2014-11/2014	7 500	40 234	8.1
	MB 4.1 Use solar collectors in kindergarten -N16 Kindergarten	08/2014-11/2014	70000	25.2	5.09
	RB 3.1 Rehabilitation of Gori Anna Peradze School of Arts	2016	117000	223.9	62.5
Transport	UP 1.1 Describing road signs and adequate placing	2016			
	UP 1.2 Study of problematic streets in the city (usually jammed), identification of alternative routes, establishing new lines				
	UP 2.1 Improving infrastructure of walkable localities	2014-2017			
	PRT1 Setting up of parking system	2016			95
Greening	The completion of forest-park planting in the eastern side of the city – new seeds were planted	2016			182.2
Total				40,614.00	371.29

D. MTSKHETA MUNICIPALITY

Information received from Mtskheta Municipality noted, that the budget for 2016 and 2017 were reduced significantly, therefore the only progress was demonstrated in building sector through announcing a tender for purchasing 150 energy efficient bulbs for kindergartens.

To summarize, taking into consideration the measure that has already been initiated by Mtskheta municipality, CO₂ reduction will equal to 1.7 TCO₂ by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 5 below:

Table 5: Measures implemented by Mtskheta Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Building	MB 2.2 Installation of New Lighting System in the Building of Kindergarten			11	1.7

E. TELAVI MUNICIPALITY

Telavi municipality initiated implementation of measures in Transport, Building and Street Lighting sectors. Transport infrastructure was restored and developed in 2015-2016 spending 4, 666,000GEL. The works included restoration and rehabilitation of road cover, arranging the crossroad and mounting of road signs. Furthermore, bypass road was arranged and motor biking and walking has been promoted. Besides, parking space was designated in the city and parking lines were framed.

Building sector activities envisaged installation of LED bulb in kindergartens and addition of thermal Insulation to common areas of Residential Buildings.

The share of energy-efficient bulbs in street lighting is significantly increasing and it's planned to totally substitute remaining inefficient bulbs with energy efficient LED lamps by 2020.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Telavi municipality, CO₂ reduction will equal to 1063.3 TCO₂ by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 6 below:

Table 6: Measures implemented by Telavi Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	UP1. Restoration and development of transport infrastructure				
	<ul style="list-style-type: none"> Restoration and rehabilitation of road cover Arranging the crossroad Mounting of road signs 	2015-2016	4,660,000	601	138
	UP2. Arrangement of bypass road	2016-2018			
	PRT1. Promotion of motor biking and walking	2016	1,000,000	3 443	783
	PRT2. Setting up of parking system	2016	40,000	286	117
Building	MB 2.1 Lighting system with LED bulbs in kindergarten	2016	10,000	63	6.5
	RB 2.1 Add Thermal Insulation to Common Areas of Residential Buildings	2015	3000	88	18.8
Street Lighting	Total substitution to 2020 of remaining inefficient bulbs with energy efficient LED lamps.	2014-onwards	170 000		
Total				4,481.00	1063.3

F. TELAVI COMMUNITY

Telavi community provided very precise and detailed information on activities carried by Telavi Community Municipality.

Road rehabilitation works were quite active during 2016 and it's planned to be continued in 2017 costing 6,063,748.00GEL. In particular, 14600 sq.m road was paved in the village Vardisubani, 5740 sq.m road was paved in the village Akura, 4250 sq.m- Busheti, 8175 sq.m –Kondoli, 6220 sq.m –Kurdghelauri, 3500 sq.m – Ruispiri, 6680 sq.m-Tsinandali, 3720 sq.m – Vanta, 732sq.m – new School in Busheti, 1530 sq.m – near School in Ikalto, 850 sq.m- Khodasheni, 950 sq.m- Vardisubani, 3030 sq.m – Karajali, 1700 sq.m- Kondoli, 630 sq.m- Kurdghelauri, 1864 sq.m- Shalauri.

Municipal buildings were upgraded. More specifically, new kindergarten was built (700 sq.m) and thermally insulated in the village Pshaveli. Energy-efficient Lighting Systems were installed in Tsinandeli and Pshaveli kindergartens. In addition, solar collectors were applied in 9 kindergartens in addition with newly built one in Pshavaeli.

Some of the measures in Residential building sector were launched and implemented. Infiltration from windows of typical private houses were reduced (80 houses, average 10sq.m each) and 120 high-efficiency firewood stoves were purchased/installed. Furthermore, in the villages of Ikalto, Saniore and Artana unsustainably produced biomass (Firewood) was substituted with Natural Gas.

Besides the aforementioned, additional 104 units of the new LED (70W) lighting fixtures were installed in 2016 in the villages of Ruispiri (13 units), Karajala (75 units) and Kurghelauri (16 units). Moreover, during the reporting period, 1150 units of 50W LED bulbs were purchased.

The system of separation of paper, glass and plastics fractions from solid household waste for further utilization was installed in 5 pilot villages and it's planned to include all villages by 2019.

Noteworthy, that it is budgeted for 2018 to arrange public transportation in Telavi Community.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Telavi Community municipality, CO₂ reduction will equal to 19,856.72 TCO₂ and 8415.36MWh Energy will be saved by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 7 below

Table 7: Measures implemented by Telavi Community

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	UP1: Rehabilitation of the Road Pavement	2016-2017	6,063,748.00		1 519
Building	MB 1.2 Thermal Insulation of Attic in Municipal Building	2016	7000	1083.33	455.00
	MB 2.2 Installation of Energy-efficient Lighting System in Kindergarten	2016	12450	14.42	1.50
	MB 3.1 Application of Solar Collectors in Community Telavi Kindergartens	2016-2017	140 000	237.33	47.94
	RB2.2 Reduction of Infiltration from Windows of Typical Private Houses	2015-2016	40 000	4 190.48	1 760.00
	RB 3.2. - Application of High Efficiency Firewood Stoves in Private Houses	2015-2030	36000	2 560	3073
	RB 4.1 Substitution of Unsustainably Produced Biomass (Firewood) with Natural Gas	2015-2030	150000		12 901.00
Street Lighting	S2- It is planned in 2017 to install additional 100units of the new LED (70W) lighting fixtures	2016-2017	183683	329.8	34.28
Waste	W1: Separation of Paper, Glass and Plastics Fractions from Solid Household Waste for further Utilization	2016			65
Total				8415.36	19,856.72

G. ZUGDIDI MUNICIPALITY

Zugdidi Municipality implemented various measures to ensure improvement and promotion of public transport service. In particular, 4 out of total 22 bust stops were constructed and installed, internal transport routes were defined. Additionally pavements were arranged in the city and biking route was framed.

Zugdidi municipality elaborated parking policy during the reporting period and it is planned to announce tender for leasing in the nearest future.

Noteworthy, that heating system on bio-waste pellets was installed at Kindergarten #16, which enabled to save up to 65% of energy. 152 LED bulbs were arranged on Aghmashenebeli Street, 1228 LED energy-efficient bulbs were installed on 70 streets.

Government also emphasizes high importance of registering energy-consumption of municipal buildings, therefore an energy database of kindergartens, schools and some other municipal buildings has already been developed.

Likewise, residential buildings were upgraded through installation of energy-efficient bulbs on 18th yard. Thermal insulation was added to 8 residential buildings and 1 was roofed. 10 IDP Settlements were thermally insulated.

Besides the aforementioned, the municipality actively promotes energy-efficiency concept via organizing bike tours and open concerts in respect of energy-efficiency days. During the reporting period, the organization “Energy Efficiency Center” conducted training on “Energy Audit and Certification” along with awareness raising campaign on energy efficiency of buildings.

As for the activities carried out in Street Lighting sector, they envisage installation of 1228 LED bulbs on 70 street of Zugdidi. It's planned to install 3767 energy-efficient bulbs by 2020. In addition, Automated Outdoor Lighting Management System (AOLMS) is being arranged. At this stage, 24 transformers (about 120 streets) are already connected with AOLMS.

It is significant, that 5mln GEL have been allocated for restoration of 1 ha of Zugdidi botanical garden in 2017-2019.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Zugdidi municipality, CO₂ reduction will equal to 1985.46 TCO₂ and 27,448.40 MWh Energy will be saved by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 8 below:

Table 8: Measures implemented by Zugdidi Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	PT1: Public Transport Service Improvement & Promotion: Service Fleet Development for the City Municipal Transport; Construct bus stops for pedestrians; Install electronic display board; Optimize and improve internal transport routes ; Take measures to reduce overcrowding .	2016-2017	200 000	7 570	1 900
Building	MB1.1 Use bio-waste pellets	2016	85000	67	13.6
	MB 2.1 Install Energy-efficient bulbs in kindergartens	2016	981257	1.4	0.19
	MB5. Education/awareness raising on energy efficiency	2016			
	MB 6.2 Energy Database Development of Municipal Buildings	2013-2016			
	RB1.1 Install Energy-efficient Bulbs in Common Areas of Residential Buildings	2017	984 238	20	1.84
	RB2.1 Add Thermal Insulation to Common Areas of Residential Buildings Entrances	2016-2017	103 000	250	50.5
	RB 3.1 Develop Bio Waste Operating Highly-Efficient Generators for Typical Two-Storey Private Houses	2015-2016	88 500	17 880	
	RB 4.1 Trainings on energy efficiency in buildings for various target groups & mass media and energy efficiency information campaign	2017			
Street Lighting	Outdoor lighting poles fully equipped by energy-efficient bulbs (installation of 3767 energy-efficient bulbs by 2020)	2016		1660	0.226
	Automated Outdoor Lighting Management System (AOLMS).				

Greening	31. Restoration of Zugdidi Botanical Garden	2017-2019		19.1
Total			27,448.40	1985.46

H. KUTAISI MUNICIPALITY

As per information provided by Kutaisi Municipality, distance monitoring GPS/GSM system was developed and launched for public transport in 2015-2016. Recently, 195 units of mini-buses have GPS tracker. The service is provided by the company “I GPS”.

Activities were also implemented to upgrade residential buildings in terms of energy-efficiency. More specifically, under the measure heating common spaces and entrances of 9-storey Residential Buildings, windows and doors have been changed.

In the framework of local budget program, more than 300 socially vulnerable families utilized the benefit of having new roofing and thermal insulation. The program continues in 2017 as well.

Modernization of the Kutaisi street lighting system is undergoing.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Kutaisi municipality, CO₂ reduction will equal to 8208.4TCO₂ and 37,901MWh Energy will be saved by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 9 below:

Table 9: Measures implemented by Kutaisi Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	T1.3. Develop an automated Urban Transport Management System in Kutaisi	2015-2016	55824	34,054	7968
Building	RB 2.1 Heating Common Spaces and Entrances of 9-storey Residential Building	01.05.2017-31.10.2017	375000	950	191.9

	RB 3.2 Roofing and Thermal Insulation Program for 41 Socially protected Families	01.04.2017-30.11.2017	350000	240	48.5
Public Lighting	PL1. Modernization of the Kutaisi street lighting system	2016-2016	818,361	2657	
Total				37,901	8208.4

I. TBILISI MUNICIPALITY

Tbilisi Municipality carries out diverse set of activities to ensure implementation of measures outlined in Sustainable Energy Action Plan. More specifically, 143 environmentally cleaner-fuel-buses were imported from Europe and out of them 40 are already operating. In order to ensure priority pass for public transport, “bus lanes” were framed on several streets. Moreover, 700 bus stops were arranged. As for bus arrival electronic registry, 1200 of them are already functional. Noteworthy, that during the reporting period, 300.000 Euros were allocated from Tbilisi Municipality Budget and 500.000Euros from EBRD to research bus network reorganization and it will be conducted during July, 2017.

Recently, construction and installation works of Metro Station “University” is planned in summer 2017.

As for encouragement of cable-car functioning, “Rike-Narikala” cable route has been functioning since 2012. From October, 2016 “Chavchavadze-Kus-Tba” route has been reopened. It is planned to add a route “Rustaveli-Mtsatsminda Park” by the end of 2017. Moreover, Czech Government is funding technical-economic analysis of new routes of cable-cars.

Additionally, Tbilisi Municipality is annually involved in EU initiative “Sustainable Energy Week”, which envisages awareness raising campaigns in light of energy-efficiency.

Furthermore, Tbilisi Municipality held couple of meetings with distribution companies in order to recommend and propose organized schedule of distribution car movements. As a result of the meeting, movement limits for distribution car were set in high-traffic hours on central streets of Tbilisi.

With financial support of Asian Development Bank (ADB), the research is being conducted on the ways of enhancement energy efficiency of Tbilisi Metro. The study is planned to be finalized by Septmeber, 2017.

Noteworthy, that totally 164 traffic lights are connected with Traffic light Management Center. It’s planned to hook up additional 23 traffic lights in 2017.

It is significant, that first electric-mobile-car charging station was arranged near Turtle-Lake. It’s planned to expand the locations along with custom tax and parking fee exemption for this particular type of cars. In

addition, during the reporting period, parking strategy has been elaborated by MOTT MACDONALD, which envisages ways of effective management of parking.

In the framework of Renovation of Tbilisi City Hall serving cars fleet, 198 cars were replaced at Mayor's auto park.

LLC "Auto service Group" implements Application of LED lanterns in the street lighting. 16 locations have already been upgraded.

Tbilisi Municipality launched working process on Green City Action Plan, which is planned to be ready in 2017. As for display projects, Tbilisi Municipality intends to retrofit 10 buildings into green buildings.

In addition, Sustainable Energy Information Center was opened at Tbilisi Mayor's Office, which will improve access of Tbilisi inhabitants to information regarding energy-efficiency measures and energy-efficient products available on Georgian market.

To summarize, taking into consideration the measures that have already been initiated and/or finalized by Tbilisi municipality, CO₂ reduction will equal to 756,109TCO₂ and 96,222,955.70 MWh Energy will be reduced by 2020.

Specific measures with respective start/end dates, budget, and expected savings are outlined in Table 10 below:

Table 10: Measures implemented by Tbilisi Municipality

Sectors and activity areas	Main measures in separate sectors	Dates of start and ending	Cost (GEL)	Expected energy saving (MWh) by 2020	Anticipated CO ₂ emission reduction (ton) by 2020
Transport	PT1: Renovation of bus fleet and its conversion to environmentally cleaner fuel	25.09.2016-20.06.2017	90.000.000		15,000
	PT2: Arrangement of public transport special transit lines and planning of routes	10.2016-07/2017-2018	2,187,280.00		124,500
	PT3: Information campaign on public transport popularization and other ways of improving services	2011-2012	2.500.000		47300
	PT4: Opening of the subway station "University"	01.05.2015-01.07.2015	83.000.000		20800

	PT5: Energy efficient lighting	02/2017-09/2017			
	PT6: Encouragement of cable-car and other electric transport development	01.04.2016-06.2017	1.100.000 20.000.000 82.023.00	3700	920
	PRT4: Programs on behavioral changes		10000		
	PRT5: Study of commercial vehicles movement and imposition of regulations			74200	19700
	PRT6:Traffic lights control center	2010	15.000.000	140200	95600
	PRT7– Encouragement of low emission cars	2016-onwards			
	MF1: Renovation of Tbilisi City Hall serving cars fleet	2011	3 100 963	4 832	1 276
Building	RB3. The public awareness raising and behavioral changes campaigns	22.04.2016	funded by EU	96000000	10.5
Street Lighting	S2: Application of LED lanterns in the street lighting			23.7	2420
Waist	W1: Methane collection and flaring from 2017 using existing biogas collectors at the Norio operating landfill	06.03.2015-12.31.2017	7.769.518		422270
Greening	G2. Provision of sustainable management of city green cover and toughening of regulations				6312.5

Urban Planning	UP1. The development and implementation of Tbilisi Land-use General Plan	15.10.2015-30.04.2017	000	
Display Buildings	DP1. The display buildings			
Total			232,870,061.00	96,222,955.70 756,109

IV. MONITORING OF DEMONSTRATION PROJECTS

During year four, EC-LEDS launched monitoring process of demonstration projects implemented during years two and three. In particular, standard data collection/monitoring template was elaborated (See Annex I of the previous quarterly report). The questionnaire envisages information on current project status, revealed challenges, and additional jobs created, estimated savings and scalability/replicability of project idea.

Noteworthy, that information collection stage from 10 demonstration projects was challenging due to unavailability of data *and* difficulty of counting GHG and energy savings as actual reductions are now being happening or will be even visible in a longer term period. Moreover, no data was provided during this reporting period, therefore the table below summarizes GHG and Energy saving figures as of previous reporting period.

It is significant, that total energy saving for the previous reporting period equaled to 364.7 MWh and GHG emissions were reduced by 29.7 TCO₂. Noteworthy, that along with implementation of energy-efficient measures, 23 temporary and 17 permanent jobs were created.

Detailed savings and current status of each demonstration project are described in Table II below.

Table II: Monitoring Results of Demonstration Projects

Name of Demonstration Project	Location	Reporting Period	Actual Energy Savings (MWH)	Actual GHG reduction (TCO ₂)	Additional jobs created	Comments
Low Emissions for Sports – Torpedo Kutaisi against CO ₂ emissions	Kutaisi	Q3, 2016	30.74	3.4		After project implementation, the stadium became fully utilized, thus increasing electricity and heating costs due to full-scale load of the building. In particular, due to improvement of living conditions, the athletes started to stay overnight at the facility. However, Energy savings and GHG reductions were still visible
		Q4, 2016	3.7	0.7		
Heat for Elderly- Energy Efficient measures at Elderly House of Tbilisi	Tbilisi	Q2, 2016	90	12.3		Before project implementation, the facility had no central heating and electric heater were used in the rooms. It is proposed by sub-grantee to calculate Energy and GHG savings based on baseline year (when there was no comfort at the Elderly House) and not the same reporting period of the previous year. Due to the fact, that after improvement of living conditions, the heating costs raised, however it's into direct correlation with availability of warmth in the building.
		Q3, 2016	21	2.9		
Brighter City - Installation of energy-efficient LED bulbs	Zugdidi	Q4, 2016	21.70		1 (male)	The project was implemented in full scale. Besides Winrock's funding, Zugdidi Municipality added its own financial resources and in total 1228 LED bulbs were installed on 70 streets of Zugdidi

Rehabilitation of Kindergarten in the Village Pshaveli	Telavi Community	Q2, 2017	34.50	6.90	Temporary Jobs -22 males; Permanent Jobs 15 females, 2 males	The project status is Work in Progress. Tender for water supply system installation is now announced. Besides funding from Winrock, sub-grantee also received grant from Global Environment Facility (GEF) in the amount of 50,000USD for installation of thermal insulation and heating system on bio-pellets. .
Arranging solar farm	Bolnisi	Q2, 2017	23.10	3.6		The project was implemented in full scale without any constraints
Heidelberg Cement Georgia CM3 Research and Renovation (Rustavi)	Rustavi	Q2, 2017	140.00			Recently the mill operates based on market demand. In case of utilizing its full capacity, the annual energy saving will be 800MWH

Alternative source	energy	Telavi	Q2, 2017	As energy central started operations on January 26, 2017, the quarterly energy saving has not been calculated yet
Total			364.7	29.8
23 temporary, and 17 permanent				

V. DATA COLLECTION CHALLENGES

Due to the elections held in October 2016, the composition of government employees changed, among them designated focal points in SEAP municipalities have been either substituted or altered. Appointment of new staff, who are aware of Sustainable Energy Action Plans and its content, was challenging. EC-LEDS has been actively communicating with newly-designated government employees, however, data collection for monitoring purposes of both, demonstration projects and SEAP implementation, was still tough. Therefore, the first quarter of Year 4 was mostly dedicated to building relationship and linkages with new governmental authorities and at the end of the Quarter I, all contact persons were identified and questionnaires were communicated for piloting.

Once the designated staff from SEAP municipalities received the files in order to fill out the template, they were followed up with phone calls and e-mails regarding timely submission of the forms. However, the data collection process demonstrated, that information at the municipalities is very scattered and it takes a lot of effort to get compiled data.

In addition, one of the challenges revealed during data collection process was inaccuracy and incompleteness of submitted information, both in case of SEAP monitoring and Demonstration projects' monitoring forms. Having cleaned the data, it turned out, that big share of records were insufficient and had missing cells. After intensive interaction with submitters, the gaps were filled, however part of information could not be collected due to unavailability of data.