ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Resource Efficient and Cleaner Production & Eco-innovation for small and medium Enterprises

INFORMATION MEETING-TRAINING WITH TRAINEE PROFESSIONALS

RECP Training Modules

K.Barjadze & N.Kevkhishvili
Project Technical Experts

22 October 2020
Tbilisi, Georgia

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Aim of RECP Training

Increase knowledge on Resource Efficiency & Cleaner Production (RECP) among trainee professionals through provided training;

Share experiences- Demonstration company staff and professional trainees will carry out the RECP assessment, which includes **resource efficiency**, **energy efficiency**, **financial** and **ecological benefit assessments** studied/reinforced during the training program

ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Training Modules

Module 1	Introduction to RECP
Module 2	RECP working method
Module 3	Team and motivation
Module 4	Baseline and indicators
Module 5	Initial assessment
Module 6	Detailed assessment
Module 7	Materials and waste
Module 8	Water
Module 9	Energy efficiency
Module 10	Chemicals
Module 11	Feasibility and financing
Module 12	Management system

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Training Plan

Day	1	2	3	4	5	6
9:00	Registration	From 8:30 repetition	From 8:30 repetition	Registration	Transport to company, welcome, introduction by management	
10:30	Welcome, introduction of participants, M1	M3, E3	M5 including report and documentation	Repetition, M8, E8	Company walkthrough	Repetition, questions and answers, additional input on mass and energy balances,
10:45					Including small demonstrations and quick measurements (company permitting)	
12:15	M1, E1	E3 Brainstorming (several key units)	M6 including report and documentation	M10, E10	Return from company	M12
13:00						
14:30	M2	M4	M7, E7	M11, E11	Evaluation of walkthrough: flowchart, assessment of wastes, root cause,	Test
14:45						
16:00	E2: Central steps of RECP method (flowchart, root cause)	E4 including demo of tool and link to reporting	M9, E9	preparation for walkthrough: introduction to company, groups, report format,	Data, root cause, options, report, presentation	Evaluation, next steps

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Success Stories:

The UNIDO Resources Efficient and Cleaner Production (RECP) Demonstration Project under EU EaP Green Programme (2014-2017)

"DEVIS PURI"

The bakery LTD "Devis Puri" located in Tbilisi city works everyday 24 hours and producing 8 types of bread:

1. Ukrainuli
2. Borodinuli
3. Tetri
4. Rukhi
5. Khala
6. Hotdogis Puri
7. Dieturi
8. Diabeturi




Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

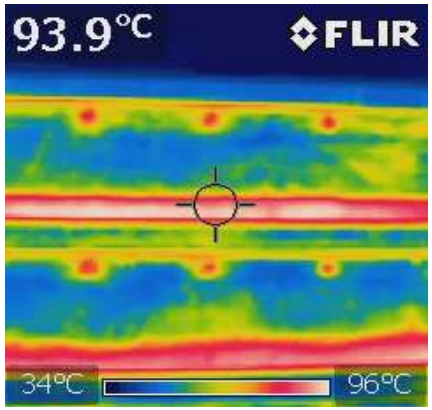
ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"DEVIS PURI"

Company for baking is using old inefficient stoves (made in Turkey).

Heat losses from the stove are provided on the thermal picture by red and white colors.



Action implemented by:
OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"DEVIS PURI"

Annual energy consumption

No.	A Energy types	B Quantity	C Unit	D Conversion into kWh	E Consumption in kWh ; MJ/yr
1	Electricity	45	MW/yr	45 000	45 000
2	Natural Gas	72 000	m^3	705 600	2 540 160
	Total				**2 585 160**

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"DEVIS PURI"

Annual material usage

No.	A Inputs of materials	B Quantity per annum	C Unit	D Conversion factor	E Material in tons/yr
1	Flour	1,25	tonnes/day	365	456,25
2	Yeast	18,75	kg/day	365	6,843
3	Salt	25	kg/day	365	9,125
4	Oil	7	L/day	365	2,555
5	Sugar	15	kg/day	365	5,475
6	Packing material	1	roll/day	365	365
7	Sesame seeds	3	kg/day	365	1,095
8	Coriander	5	kg/day	365	1,825
9	Rye malt	4	kg/day	365	1,460
10	Lubricants	1	L/day	365	365

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"DEVIS PURI"

The source of the water is municipal water supply system.

Annual water usage:

No.	A Water consumer	B Quantity	C Unit	D Conversion factor	E Water in kl or m3 /yr
1	Preparing of dough	1,5	m^3/day	365	547,5
2	Cleaning of workshop	0,7	m^3/day	365	255,5
3	Cleaning of boxes and equipment	0.5	m^3/day	365	182,5
4	Create humidity in bakery	0,5	m^3/day	365	182,5
5	Bathroom and wet places	0,3	m^3/day	365	109.5
	Total				**1277,5**

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"DEVIS PURI"

Approximate annual output of final products

No.	Product or service / purpose	Quantity per yr	Unit
1	"Ukrainuli"	156420	piece
2	"Borodinuli"	211176	piece
3	"Tetri"	336732	piece
4	"Rukhi"	189420	piece
5	"Khala"	604548	piece
6	"Hotdogis Puri"	27084	piece
7	"Dieturi"	20376	piece
8	"Diabeturi"	11112	piece
	Total	**1556868**	piece

Action implemented by:
OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

COSTS AND BENEFITS OF THE PROPOSED MEASURES

MEASURES	FINANCIAL			ENVIRONMENTAL	
	Investments [€]	Savings [€/y]	Payback [y]	Energy [kWh/y]	Material [Units/y]
1. Replacement of old inefficient stoves with new energy efficient ones	20,000	4,896	4.1	126,864	25T
2. Thermal insulation of rotary and stone ovens	380	146	2.6	3,215	365 m^3 (NG)
3. Repairing the exhaust outlet pipes	100	n/a	n/a		Workers health and safety, ecological benefits
4. Replacement of old rollers of the carts with new ones	200	n/a	n/a		Quality of food improved
5. Replacement of incandescent bulbs with energy efficient (CFL, LED) bulbs	500	210	2.4	2,925	0.2 T
6. Repair of workshop place and storage area	3,000	n/a	n/a		Sanitary conditions, food safety
7. Lowering workshop ceiling	2,100	n/a	n/a		Improving of workshop area conditions, energy saving
8.Modification of cleaning processes	n/a	n/a	n/a		Material saving, ecological benefits
TOTAL	26280	5252		See above	See above

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Success Stories:

The UNIDO Resources Efficient and Cleaner Production (RECP)
Demonstration Project under EU EaP Green Programme (2014-2017)

Ltd "QB Construction"

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

-- Foam-concrete Block factory "QB Construction"

-- Located in Tbilisi

-- Production of two types of blocks

60x30x20cm

60x30x10cm

Action implemented by:
OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

"QB Construction"
Technological Process

- Loading
- Mixing
- Moulding
- Drying
- Cutting
- Storing

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

"QB Construction"

Annual material usage

No.	A Inputs of materials	B Quantity per annum	C Unit	D Conversion factor	E Material in tons/yr
1	Cement	9	tonnes/day	300	2700
2	Sand	7	tonnes/day	300	2100
3	Foamier	40	L/day	300	12

"QB Construction"

The source of the water is Artesian well

Annual water usage:

No.	A Water source	B Quantity	C Unit	D Conversion factor	E Water in kl or m3 /yr
1	**Artesian well**	**6**	**m^3/day**	**300**	**1800**

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Main Problems:

- Losses of raw materials in the production process (Breakage of blocks and losses during cutting);
- Existence of excessive amount of dust in the enterprise

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

COSTS AND BENEFITS OF THE PROPOSED MEASURES

MEASURES	FINANCIAL			ENVIRONMENTAL	
	Investments [€]	Savings [€/y]	Payback [y]	Energy [kWh/y]	Material [Units/y]
1. Reusing the cracked blocks, foam-concrete debris and dust generated during slicing in the production process	7,000	6,942	1	792	320 T
2. Clean the workshop area with a vacuum cleaner and reuse the dust	2,700	1,375	1.3	n/a	124 T sand
3. Cover the transportation ribbon with a wind-shield and reuse it	170	583	0.3	n/a	10.3 T sand and cement
4.Use black sand instead of yellow sand	0	12,600	n/a	n/a	1,050 T
5.Replacement of hazardous lubricants	0	0	n/a	n/a	Decreasing of soil pollutions, reducing the fire/explosion risks
6.Repairthe electric panel	n/a	0	n/a	n/a	Improve energy efficiency and security
TOTAL	9,870	21,500		n/a	See above

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Pre-selected Demonstration New Companies

#	Name	Sector	Location	Status
1	SE Gocha Ghaghashvili	Milk processing	Kakheti, Telavi, kurdgelauri	Visited
2	SE Irma Datukishvili	Cannery	Kakheti, Akhmeta	Rejected
3	Lamazo Ltd	Milk processing	Kakheti, Kvareli	Visited
4	SE Ramaz Khachirashvili	corns and nut dryers	Kakheti, Shilda	Rejected
5	Gia Janishvili	Milk processing	Kakheti, Vakiri	Visited
6	SE Marian Ghvedashvili	Semi-finished products, wine	Kakheti, Dedoplistskaro	Visited
7	Jimsher Khatiashvili	Milk processing	Kakheti, Samreklo	Visited
8	Titani Ltd	Packaging industry	Kutaisi, Automsheneblebis 88	Visited
9	SE Mariam/ Givi Enukidze	Greenhouse	Kakheti, Lagodekhi	Visited
10	SE Givi Tsikarashvili	Asphalt, concrete	Kakheti, Kabal	Visited
11	LTD “Geo-Organic”	Drying of fruits	Kakheti, Sagarejo	Visited
12	Biodiesel Georgia	Biodisel production	Tbilisi, #15 kindzmarauli	Visited
13	Georgian Product	cheese processing	Tetritskaro	Auxiliary
14	Kobuleti Juice Concentrate	food production	Adjara, Kobuleti	Auxiliary

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Team

- Project National Coordinator – George Abulashvili, g_abul@eecgeo.org, 599974003
- Technical Expert- Nodar Kevkishvili nodar_ke@yahoo.com, 597120332
- Technical Expert – Konstantine Barjadze k_barj@eecgeo.org, 599418008
- RECP Club Facilitator –Nikoloz Javshanashvili, nickjavshanashvili@yahoo.com, 598116101
- Communication Expert – Liana Gharibashvili, l_gari@eecgeo.org, 599548782
- Project Assistant – Elene Ghvinianidze, e_gvin@eecgeo.org, 599068025
- Project Administrator – Manana Dadiani, m_dadi@eecgeo.org , 599531350
- Accountant – Shorena Labadze, s_laba@eecgeo.org, 555525260

www.recp.ge

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP

ევროკავშირი
საქართველოსთვის
The European Union for Georgia

EU4Environment
Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine

Thank You!

NIP - Energy Efficiency Centre Georgia
TBILISI 0160, GEORGIA
19 D.Gamrekeli str. VI Floor
Tel: +995322242540, +995322242541
Fax: +995322242542
Email: eecgeo@eecgeo.org
Web: www.eecgeo.org

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment | UNIDO | WORLD BANK GROUP