

ENTERPRISE BENEFITS FROM RESOURCE EFFICIENT AND CLEANER PRODUCTION

SUCCESSSES FROM AZERBAIJAN

Taking care of materials, energy, waste and emissions makes good business sense. Resource Efficient and Cleaner Production (RECP) is the way to achieve this. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste and emissions, and foster safe and responsible production. Benefits are eminent in many enterprises, regardless of sector, location or size, as demonstrated by the experiences of below companies in Azerbaijan:

- M&T LLC;
- AER LLC;
- Balakans LLC;
- Zagatala tea LLC;
- Azsunger LLC;
- Kristal LLC;
- Physical person - production of pavement tiles and road curbs.

Successes at a glance

These cases were prepared under the UNIDO RECP Demonstration Component of EU-funded “Greening Economies in the Eastern Neighbourhood” (EaP GREEN) Regional Project). The Azerbaijani companies covered here demonstrate that it makes good business sense to improve resource productivity and reduce pollution intensity.

Resource Efficient and Cleaner Production (RECP)

RECP builds upon Cleaner Production and related practices to accelerate the application of preventive environmental strategies to processes, products and services to increase efficiency and reduce risks to humans and the environment.

RECP addresses the three sustainability dimensions individually and synergistically:

- ✚ Production Efficiency: optimization of the productive use of natural resources (materials, energy and water);
- ✚ Environmental management: minimization of impacts on environment and nature through reduction of wastes and emissions; and
- ✚ Human Development: minimization of risks to people and communities and support for their development.

M&T LLC

Overview

M&T Ltd was established in 1993. Production area of the enterprise is 1440 square meter, production capacity of the enterprise is 10 tons per day and the range of products consists of over 100 sorts of sausages, delicacies and other meat products. In general 123 people were employed permanently. In enterprise the Management System is applied which is certified with ISO 9001:2000 and HACCP international standards. There is an accredited production-testing laboratory that is supplied with modern equipment.

The key benefits can be achieved by M&T LLC after continuously applying Resource Efficient and Cleaner Production (RECP) measures include the energy saving of 105000 kWh for first year (worth approximately USD 6300), improvements in working practices and a reduction of carbon dioxide emissions. RECP has led to savings of more than USD 7000 per year.

Benefits

RECP has been a useful cost- saving tool for the company and the measures offered have led to reduced waste of materials, water and energy. Implementation of RECP measures can improve the operating efficiency of the plant and has enabled the recovery of water that was previously wasted.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change(%)
Resource use		Resource productivity	
Energy use	-30	Energy productivity	43
Materials use		Materials productivity	
Water use	-25	Water productivity	33
Pollution generated		Pollution intensity	
Air emissions (global warming, CO2 eq.)	-30	Carbon intensity	-30
Waste-water	-25	Waste-water intensity	-25
Waste	-50	Waste intensity	-50
Production output			

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile - M&T Ltd

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.

Areas of improvement

The RECP options offered had a short payback time (generally just a few months to one year). Most of the offered options were low cost and were done by the staff of the companies.

Table 2: Options offered

Principal options offered	Benefits			
	Economic		Resource use	Pollution generated
	Investment (USD)	Cost- saving (USD/yr)	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emission and/or waste generation (per annum)
Dividing into 2 parts the entries of finished production storehouse ¹ Reusing the water used in cooling process	It should be clarified depending on technical solution	6300	105000 KWh energy saving per year	968 ton/year reduction of CO2 emission
The collection and handing over of cardboard, iron and polyethylene wastes generated in preliminary stage of the production processes	It should be clarified depending on technical solution	900	Re-usage (and/or selling) of cardboard, iron and polyethylene wastes that were produced during production process would make profit extra 960 manats per year. Annually in the expertise 12773 kg cardboard, 143 kg iron, 1717 kg polyethylene wastes are collected. One ton of cardboard waste is 50 manats, a ton of iron waste is 70 manats and polyethylene wastes per ton is estimated 180 manats according to the information obtained from enterprises specialized at waste processing.	

¹ 1 Finished product storehouse is 75 m² and there is 2 cooling systems (flyuger) in that building. Depending of season the loading of storehouse can be different, but cooling systems are able to cool the whole storehouse. In examination period it was observed that the storehouse is loaded 10-15%. At the same time, electricity consumption rises because the doors of storehouse systems are opened and closed frequently and in order to get constant temperature such kind of need emerges. If we take into account that the cooling system of storehouse works with its full capacity during whole day it means that if we divide it into parts it will help to save energy. Annually the electricity energy consumption of the storehouse is 350 thousand kWh or 21000 manats according to preliminary calculations. If we take into account seasonal factors and effective usage of storehouse we can save 30 % or 6300 manats per year

<p>Reusing the water used in cooling process</p>	<p>It should be clarified depending on technical solution</p>	<p>10500</p>	<p>It was determined that over 40 tons of water is used daily in cooling process. This indication is averagely 8400 tons or 10920 manats annually. According to the results of analysis it was determined that cleaning process of waste water generated in meat and meat products is very difficult procedure. However, as a result of investigations it was revealed that some companies can present their services. The implementation of proposed measures in this field the usage of vast amount of water for cleaning, cooling and other purposes (except for drinking purpose, because cleaning and purifying process of water for drinking purpose is very expensive) is crucial in economic and environmental terms.</p>	
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Approach taken

The Management of the company has shown a great interest in the measures that have been offered and are committed to implement further approaches aimed at improving the company's environmental performance without diminishing the quality of its products and the productivity of the company.

Business case

Besides the savings mentioned above, working conditions have improved and commitment to continuously improve the company's environmental performance has been ensured.



AER LLC

Overview

AER LLC was registered in 1998, started production of ice-cream and related products in 2003, and total area of production is 1500 sq m. Placed in Baku Company`s total area of production is 1500 sq m. Production is seasonable. The company bought the modern technology “Straight Line 600” production line from Danish company of “Tetra Pak Hoyer” in 2003. The production line was produced in Italy and this technology is being managed by robots. The equipment can produce goods in different assortments as: Waffle glass, Sandwich, Choc-ice with stick, Roll cake, Batons, Lakomka, Without stick, Family ice-cream, Krimankas, Weight - ice-cream, Cakes, Briquette. It is possible to produce 3-7 kinds of ice-cream in the each assortment. The production strength of equipment is 5000-9000 depending on kind of ice-cream in an hour. It was installed OLV Universal ice-cream production line in 2006. Though, the main skeleton of line mechanical part was produced in Baltic the modern packing part was imported from Ukraine the frozen part was gathered accordance to modern European standards. Besides making additional to the line and installing OLV Universal equipment give chance to multiply the function of the equipment and to produce briquette. Produced from OLV: Plombir, Creamy, Briquette line (Spark). Produced from Straight Line: Batons, Sandwich, Choc-ice with stick, Roll, Slito, Weight ice-creams.

Benefits

The key benefits can be achieved by AER after continuously applying Resource Efficient and Cleaner Production (RECP) measures will include the additional 10% reduction of ice cream per year (worth approximately USD 1,270), improvements in working practices and a reduction of electricity caving in 12% in Tetra Pak Hoyer equipment. RECP can lead to savings approximately USD 4,000 per year.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change (%)
Resource use		Resource productivity	
Energy use	-3	Energy productivity	5
Materials use	0	Materials productivity	2
Water use	-20	Water productivity	27
Pollution generated		Pollution intensity	
Air emissions (global warming, CO2 eq.)	-3	Carbon intensity	-5
Waste-water	-20	Waste-water intensity	-21
Waste		Waste intensity	
Production output	2		

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile – AER LLC

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.

Areas of improvement

The RECP options offered had a short payback time (generally just a few months to one year). Most of the offered options were low cost and were done by the staff of the company.

Table 2: Options offered

Principal options offered	Benefits			
	Economic		Resource use	Pollution generated
	Investment (USD)	Cost-saving (USD/yr)	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emission and/or waste generation (per annum)
Changing of temperature regime in Tetra Pak Hoyer equipment	Low cost	1000	Electricity saving	
Installation of sensor-lights in production sites	Low cost	930	Electricity saving	
Installation of metal layer in OLV Universal equipment	Low cost	970	Reduction of ice cream waste	
Installation of "hand held Bidet" for decreasing of waste water.	Low cost	80	Water saving	

Approach taken

The Management of the company has shown a great interest in the measures that have been offered and are committed to implement further approaches aimed at improving the company's environmental performance without diminishing the quality of its products and the productivity of the company.

Business case

Besides the savings mentioned above, working conditions have improved and commitment to continuously improve the company's environmental performance has been ensured.



Balacans LLC

Overview

Balacans LLC is located in the city of Balakan. The manufacturing factory was founded in 1969 and today the Balacans LLC is a dynamically developing company with a complex industrial structure.

Balacans Company manufactures a number of compotes: blackberry, plum, cornel, hawthorn, peach, grape, feijoa as well as fruit mixes out of feijoa and hawthorn, feijoa and apple, feijoa and quince, apple and hawthorn, quince and hawthorn, quince & pomegranate, apple & pomegranate.

The key benefits achieved by Balacans after continuously applying Resource Efficient and Cleaner Production (RECP) measures will include the efficient use of wastes with amount of 26,4 tons (worth approximately USD 11,000), improvements in working practices and a reduction of water and electric energy use. RECP will lead to savings of more than USD 13,000 per year.

Benefits

RECP will be a great cost- saving tool for the company and the measures implementing will lead to efficient use of waste of materials and energy. RECP will improve the operating efficiency of the plant, improved product quality and will enable the recovery of some of the materials that were previously wasted.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change (%)
Resource Use		Resource Productivity	
Energy Use	-5	Energy Productivity	5
Materials Use		Materials Productivity	
Water Use	-27	Water Productivity	38
Pollution generated		Pollution Intensity	
Air Emissions (global warming, CO2 eq.)	-5	Carbon Intensity	-5
Waste-Water	-27	Waste-Water Intensity	-27
Waste	-73	Waste Intensity	-73
Product Output	0		

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease

RECP Profile - Balacans” LLC

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.

Areas of improvement

“Balacans” LLC could organize the sale of waste and thereby make optimal use of waste, and reduce transportation costs and disposal costs by transferring the right to transportation of waste from the territory to the buyer. Also waste water generation could be reduced by 27% and water use also by 27%. The RECP options implementing will have a short payback time. Most of the implemented options are low cost and could be organized by the staff of the company.

Table 2: Options implemented

Principal options implemented	Benefits			
	Economic		Resource use	Pollution generated
	Investment (USD)	Cost-saving (USD/year)	Reduction in energy use, water use and/or materials use (per annum)	Reduction in waste water and/or waste generation (per annum)
Reconstructing and reinstalling of lighting elements in the main production area	500	500	Reduction of energy use by 5%	
Organizing of fruit parts selling resulting as wastes in the production process and saving of transportation and utilization costs needed for waste disposal	N/A	11000-12000	Reduction in financial resources use, needed for transportation and utilization of wastes	Efficient use of wastes
Application of the monitoring system and control system of measures on resource efficiency	500	500-1000	Reduction of water use by 27%	Reduction in wastewater by 27%

Approach taken

The Management of the company has shown a great interest in the measures that have been offered and are committed to implement further approaches aimed at improving the company’s environmental performance without diminishing the quality of its products and the productivity of the company.

Business case

Besides the savings mentioned above, working conditions will be improved and commitment to continuously improve the company’s environmental performance is ensured.



Zagatala Tea LLC

Overview

The Zagatala tea production company was founded in 2004, whereas the factory, based on which it was founded, was established in 1948. The equipment (withering machine, roller, dryer and etc.) was produced in Georgia (country).

The company produces black tea. The production capacity is 8-10 tons/year of finished products. Four tons of fresh tea leaves, 1 ton of residual fuel oil, 800 l of water and 1000 KWh of electricity are required for production of 1 ton of black tea. The technological process of tea manufacture includes plucking of fresh tea leaves, withering, rolling, “green” grading, fermentation, drying and grading (sifting).

Benefits

The key benefits can be achieved by the company after continuously applying Resource Efficient and Cleaner Production (RECP) measures will include the additional 10-15% economy.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change(%)
Resource use		Resource productivity	
Energy use	-12	Energy productivity	14
Materials use	-1	Materials productivity	1
Water use	-10	Water productivity	11
Pollution generated		Pollution intensity	
Air emissions (global warming, CO2 eq.)	-12	Carbon intensity	-12
Waste-water	-10	Waste-water intensity	-10
Waste		Waste intensity	
Production output	0		

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile - Zagatala Tea LLC

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.

Areas of improvement

The RECP options offered had a short payback time (generally just a few months to one year). Most of the offered options were low cost and were done by the staff of the company.

Table 2: Options offered

Principal options offered	Benefits			
	Economic		Resource use	Pollution generated
	Investment (USD)	Cost-saving (USD/yr)	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emission and/or waste generation (per annum)
Insulation of pipes	Low cost	100	Saving of residual fuel oil	
Fencing the withering machines from the rest space	Low cost	500	Saving on heating	
Effective use of sunlight	Low cost	350	Saving on heating	
Reuse the water in the fermentation	Low cost	360	Water saving	

Approach taken

The Management of the company has shown a great interest in the measures that have been offered and are committed to implement further approaches aimed at improving the company's environmental performance without diminishing the quality of its products and the productivity of the company.

Business case

Besides the savings mentioned above, working conditions have improved and commitment to continuously improve the company's environmental performance has been ensured.



Azersunger LLC

Overview

Azersunger LLC is located in the city of Sumgait. This company was founded in 2000. Azersunger LLC produces foam rubber (porolon). Azersunger LLC has an area of 2 ha and 1 ha of this area is under the main office. "Azersunger" LLC employs 29 people, 23 of them are permanent employee. 13 of these permanent staff are engaged in the production of porolon. This porolon is used in production of furniture, orthopedic mattresses and other products. The company has the highest demand for electricity(174,067 kWh / year). There is no needed for water and gas in production.

Benefits

The key benefits can be achieved by the company after continuously applying Resource Efficient and Cleaner Production (RECP) measures will include the additional 5,3% energy saving.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change (%)
Resource Use		Resource Productivity	
Energy Use	-5	Energy Productivity	7
Materials Use		Materials Productivity	
Water Use		Water Productivity	
Pollution generated		Pollution Intensity	
Air Emissions (global warming, CO2 eq.)	-5	Carbon Intensity	-6
Waste-Water		Waste-Water Intensity	
Waste	-76	Waste Intensity	-76
Product Output	0		

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile -Azersunger LLC

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases

Areas of improvement

As a result of the evaluation at "Azersunger" LLC recommendations were prepared for more effective use of the workforce and presented to the administration of the company. These recommendations offer to significantly reduce the losses from 46 tons to 10.4 tons. As a result of this work they can save of 9256 kWh of energy used in production. This means to save up to 555.6 manats. The RECP options implementing will have a short payback time. Most of the implemented options are low cost and could be organized by the staff of the company.

Business case

Besides the savings mentioned above, working conditions will be improved and commitment to continuously improve the company's environmental performance is ensured.



Kristal LLC

Overview

Kristal LLC is situated in Jalilabad city. The company has an area of 2 ha and 1 ha of this area is under the main office. The analyzed company produces pickled cucumbers and tomatoes. Kristal LLC employs 30 people, 15 of them are permanent employees. 13 of these permanent staff are engaged in the production of pickled cucumbers and tomatoes. The company has the highest demand for black oil (250 kg a day). There is need for electricity and water in production. For whole production cycle in a year Kristal LLC uses up to 15 ton black oil.

Benefits

Totally "Kristal" LLC can save up USD 1110. The key benefits can be achieved by the company after continuously applying Resource Efficient and Cleaner Production (RECP) measures will include the additional 8-9% economy.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change(%)
Resource use		Resource productivity	
Energy use	0	Energy productivity	0
Materials use	-5	Materials productivity	5
Water use	-40	Water productivity	67
Pollution generated		Pollution intensity	
Air emissions (global warming, CO2 eq.)	0	Carbon intensity	0
Waste-water	-40	Waste-water intensity	-40
Waste	-52	Waste intensity	-52
Production output	0		

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile - Kristall LLC

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases

Areas of improvement

Most of the offered options were low cost and were done by the staff of the company

Table 2: Options offered

Principal options offered	Benefits				
	Economic		Resource use		Pollution generated
	Investment (USD)	Cost Saving (USD/yr)	Reductions in energy use, water use and/or materials use (per annum)		Reductions in waste water, air emission and/or waste generation (per annum)
Setting the gas pressure regulating facility	400	450	Saving of fuel oil residual		15 ton black oil
Isolation of steam pipes	200	270	Saving on heating	3 ton black oil	
Repair water pipes and reduction of water consumption	200	60	Saving on heating		600 ton water
Job training		400/600	Water saving		3 ton raw material

Areas of improvement

The Management of the company has shown a great interest in the measures that have been offered and are committed to implement further approaches aimed at improving the company's environmental performance without diminishing the quality of its products and the productivity of the company.

Business case

Besides the savings mentioned above, working conditions have improved and commitment to continuously improve the company's environmental performance has been ensured.



PHYSICAL PERSON

(Production of pavement tiles and road curbs)

Overview

The described company engaged in production of construction materials - pavement tiles and road curbs. The production capacity of the enterprise is 1500 m² pavement tiles per month and 500 pagon meters (p.m) road curbs. Because of increase in demand for tiles at markets the tile production is 1200-1500 m² and the curb production is 500 p.m, in winter months this indicator is 1000-1200 m². Monthly electricity consumption is nearly 6000 kWh and water consumption is 15 m³.

Benefits

RECP has been a useful cost-saving tool for the company and the measures offered have led to reduced waste of materials, water and energy.

Table 1: Results at a glance

Absolute Indicator	Change (%)	Relative Indicator	Change (%)
Resource use		Resource productivity	
Energy use	-42	Energy productivity	71
Materials use	-4	Materials productivity	4
Water use	0	Water productivity	0
Pollution generated		Pollution intensity	
Air emissions (global warming, CO2 eq.)	-42	Carbon intensity	-42
Waste-water	-17	Waste-water intensity	-17
Waste	-50	Waste intensity	-50
Production output			

Note: The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

RECP Profile - Physical person

Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in % compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.

Areas of improvement

The RECP options offered had a short payback time (generally just a few months to one year). Most of the offered options were low cost and were done by the staff of the company

Table 2: Options offered

Principal options offered	Benefits			
	Economic		Resource use	Pollution generated
	Investment (USD)	Cost- Saving (USD/yr)	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emission and/or waste generation (per annum)
Reusage of loss that generated in production process (3-5%)	Low cost	1350 (with 3%)	270 m ²	
Using gas for getting heat with a condition to obey safety measures	500-800	960	30000 kwh energy saving	

Approach taken

The Management of the company has shown interest in the measures that have been offered. Implementation of RECP measures can give economic benefits: USD 2200 per year and environmental benefits.

Business case

Besides the savings mentioned above, working conditions have improved and commitment to continuously improve the company's environmental performance has been ensured.

