

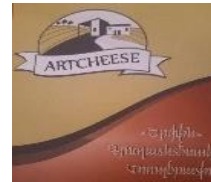


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EU4Environment Action, RECP component RECP demonstration



“Erpin” Agricultural Cooperative Dairy products, Cheese

**Business Case and Technical and financial analysis of selected RECP project:
“Name of the project (Installation of a water recirculation system)”**



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COUNTRY: Armenia

COMPANY NAME: “ERPIN” Agricultural Cooperative

SECTOR: Dairy production/food production

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Location	Areni Community, Elpin Village, 25, 1st street
Key products	Cheeses (11 types)
Number of employees	7-11
Main markets	Armenia, Russia, USA
Exportation quota (%)	35%
Year of establishment	2017
Certifications/management systems in place	HACCP-in 2020 (valid for 5years)

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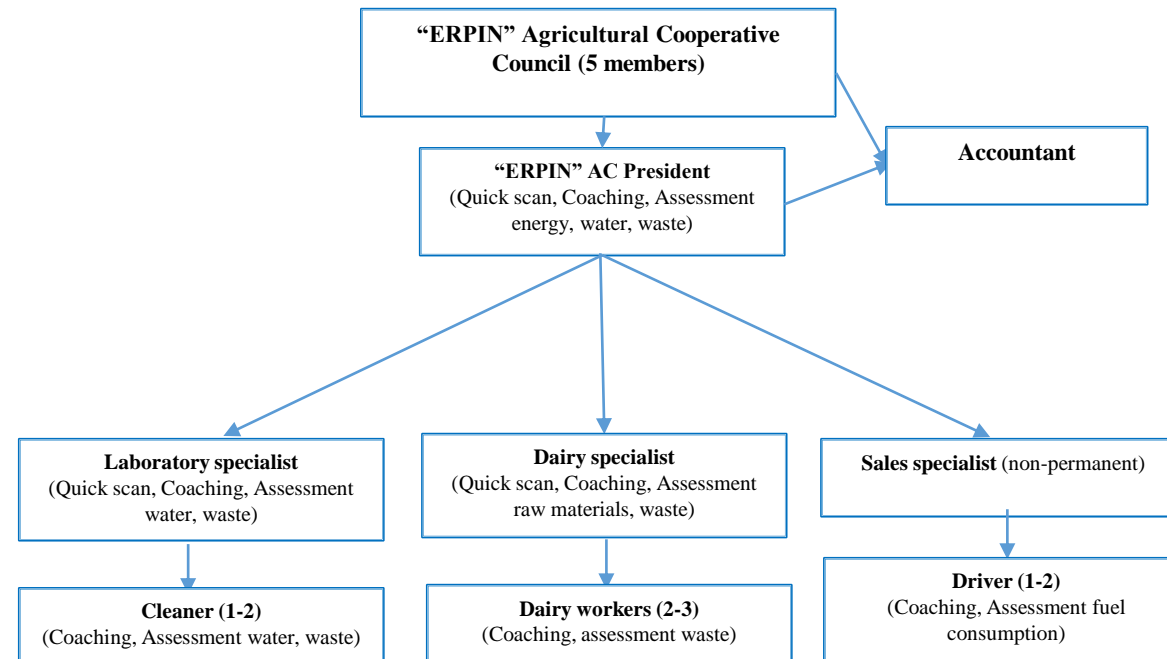


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ERPIN AC Organizational chart



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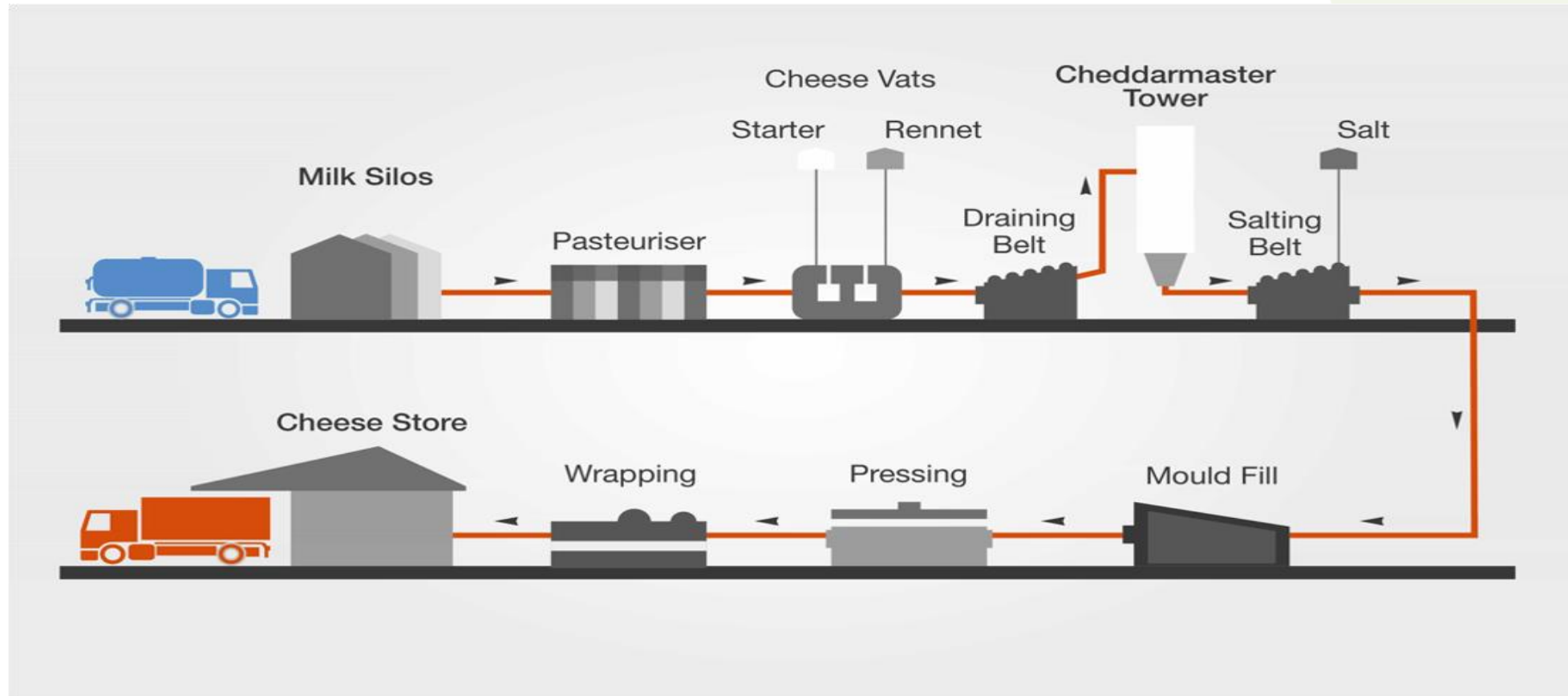


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ERPIN AC Cheese production Process





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RECP Recommendations

The company major environmental/RECP issues are:

- huge amount production of wastewater (around 120,000 m³/year) and Cheese production residuals/wastes (whey/serum 450 ton/year, cheese pieces – 200kg/year) which are collected at precipitation basins and not recycled or partially reused (5%) as animal food.
- Also, small quantity of plastic wastes is generated (1,5 m³/year pressed wastes), which are collected and accumulated in place or removed by household solid waste services.
- As well, “ERPIN” AC have been interested in introducing renewable energy sources (solar) and energy efficiency in its production processes replacing cylinder gas used for milk pasteurization and other processes of cheese production in order to apply product cost minimization and organize environmentally friendly production (GHG emission reduction, resource efficiency, waste minimization).

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The Management and staff of the company have been and is very interested in the RECP methodology and welcome to accept them in the Cheese and dairy production process. AC is more interested in the following topics:

- Production wastewater minimization and recycling: treatment and reuse of treated wastewater for irrigation purposes, as the AC own also agricultural land (around 3ha) plots where irrigation water need is high specially in summertime.
- Energy efficiency: using solar PV energy for water heating, pasteurization and other production process purposes to replace high value cylindric gas use and high electric bills for pasteurization and water heating processes.
- Production residuals/wastes (whey/serum) based new production as protein powder) and/or recycling as animal composted/dry food.
- Minimizing water, energy consumption in the production process, restructuration of working chain, as well as
- get International Certifications like ISO 14001, 9001, 2200 etc.

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Key RECP Benefits

- Cost saving of around 22,000 EUR/year, Reduction of 400 tons/year of Cheese production residuals/wastes (whey/serum)
- 120,000 m³/year of wastewater treatment and recycling.
- Electricity use reduction 100% of the total consumption from RA Network.
- Emission reduction of 21,6 tons of CO₂-eq /year.
- High value new products (dry animal bio-food and protein powder) will be produced, with new markets involvement (with additional benefits of the company to be calculated)

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Main actions	Economic key figures			Resource saving			
	Investment (EUR)¹	Saving (EUR/year)	PBP (Yr)	Water (m3/year)/ %	Material (ton/year)/ %	Electricity (kWh/year)/ %	Fuel (m3/year)/ %
<i>Energy management</i>	35,000	26,500 (23,000 gas, 3,500 electricity)		-	18,000m3 gas/15t(t)	95	100
<i>Wastewater management</i>	22,000	10,000 (2,000-technical water, 3,000euros-irrigation water, 5,000 euros-from orchard)		110,000	-	-	-
<i>Production residuals (serum/whey)</i>	20,000	17,000			425	-	-
<i>Total</i>	77,000	53,500		110,00	440	95	100

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Total pollution reduction	
Reduction of waste (ton/year)	450
Total CO2eq (ton/year)	21,6
Reduction of wastewater (m3/year)	110,000
Production wastes (serum) (ton/yr)	425

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- RESP solution applied

RECP specialists proposed 3 options for the installation of PV stations with different capacities and prices. During the monitoring visit, it was found out that a 21 kW power station has already been installed, with an investment of about 7 million drams from own funds. Currently, it not only provides electricity for Yerpín AC, but also provides a surplus, the sale of which generates a monthly income of about 8,000 drams.

It is possible to increase the capacity of the PV plant to 30 kW by making an investment of about 3 million drams. It can increase the monthly income to 25,000-30,000 drams. In other words, about 204,000 drams more income per year. In this case, the buyback period will be 14 years, which is not very appropriate from the point of view of conducting business. However, given the cooperative's future expansion plans, the additional investment may be financially sound and appropriate.

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• Result/Benefits of applied RESP solution

The annual costs of electricity, gas and diesel were calculated and amounted to approximately €28,600 per year. In other words, by making an investment of around €15,700, that cost has been reduced.

- This directly affect the cost of the product, which will provide more income on the one hand, and a more stable competitive position on the market on the other hand
- Installed PV panels provides a surplus of energy, the sale of which generates a monthly income of about 8,000 drams.
- Plus emission reduction of 21,6 tons of CO2-eq /year.



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- RECP solution suggested to apply

1. Currently, the Company uses about 120,000 m³ of water per year, about 40% of which is used in the pasteurization process. All of this eventually ends up in sewage, which then flows into the river. RECP experts recommended to use the water for drip irrigation. A calculation was made for that.

- The required investment for 1 ha mulberry garden with drip irrigation system is about 4.7-4.8 million drams or 10,400-10,600 euros.
- started from 3rd year, the revenue from the sale of mulberries will be about 25 million drams or 56,500 euros, and in the future it will be higher. That is, by making an investment of about 4.7-4.8 million drams or 10,400-10,600 euros for 1 ha, and involving more than half of it in the form of a loan with a very low interest rate, from the 3rd year you can get about 25 million drams or about 56,500 euros.

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- RESP solution suggested to apply

2. It is possible to obtain dry and semi-dry fodder as a result of the processing of whey resulting from the processing of milk for cheese production. For this, it is necessary to purchase additional capital assets (to be calculated).

- Thus, from the given data, it is possible to obtain 25 tons of dry and 75 tons of semi-dry fodder from 450 tons of whey, from the sale of which it is possible to receive about 16,750 thousand AMD or 37,000 euros.

- It is also possible to purchase serum from other places to expand production. For this, it is necessary to have a tank truck with a capacity of 4.5-5 tons (about 10 million investments are needed to purchase a JACK brand car), a 5-10-ton separator device (the average price of a Greek or Italian-made device is about 12 million AMD). In that case, it is possible to think about the production of other products as well (for example, butter: from 100 tons of milk, about 4.2 tons of butter can be obtained).

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- Impact indicators

Indicator concept	Unit	Before the RECP project (baseline)	After the RECP project (expected)	Annual production (or value of reference)	Total improvement (indicate units)
Operational					
Economic	Water waste	1000 EUR	0 EUR		1000 EUR
	Whey processing	0 EUR	37000 EUR		37000 EUR
Environmental	Water usage (disposal into sewage after use)	120000 m3	0		Sparing use of water resources

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Testimonies

“We discovered RECP solutions and identified benefits of waste minimisation and waste recycling in order to extend our production, products and markets using the Circular Economy and RECP principals/approaches as main attitude of our Cooperation. The final results of RECP solutions are not yet acquired, but still that capacity and knowledge are in place already and will gave its outcomes in coming years”

Artur Nazaryan, President of “ERPIN” AC

«The participation of our AC in the Project itself is right way for further green development, at the same time the Project shall extend its activities with additional funds and means to support final RECP and Circular Economy achievements/results by “ERPIN” AC and other Enterprises. »

Artur Nazaryan, President of “ERPIN” AC

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