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BOOSTING CIRCULAR ECONOMY IN ARMENIA THROUGH RESOURCE EFFICIENT AND CLEANER PRODUCTION

Impacts and lessons learned from
company experiences within the
decade-long legacy of RECP
under two regional programmes
funded by the European Union



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About

Resource Efficient and Cleaner Production (RECP) allows businesses to apply integrated and continuous preventive environmental strategies to processes, products, and services to increase efficiency and reduce risks to humans and the environment. In short, RECP helps companies minimise the environmental impact of their operations and cut their resource use while raising their productivity.

With these goals in mind, an RECP Demonstration Project was established in the Republic of Armenia (hereinafter Armenia) in 2013 under the "Greening Economies in the European Union's Eastern Neighbourhood" (**EaP GREEN**) programme (2013-2017), and continued through its successor programme, the **EU4Environment Action (2019-2024)**.

Within the two programmes funded by the European Union (EU), the RECP Demonstration Project has been executed by the United Nations Industrial Development Organization (UNIDO), and supported on the ground by its National Implementing Partners. Overall, almost 100 Armenian Small and Medium-sized Enterprises (SMEs) received tailored RECP recommendations to help them improve their environmental performance, lower production costs, and boost productivity. In addition, over 30 national experts were trained on the RECP methodology. This brochure highlights the direct impacts of the RECP methodology on the Armenian SMEs part of the EaP Green and EU4Environment programmes in Armenia.

Action implemented by:

Background

The inefficient use of natural resources is a key contributor to climate change and environmental degradation, negatively impacting both economic and social well-being. With a growing need to rethink material, water, and energy use, Circular Economy (CE) principles have the potential to address the industry's negative impact on the environment by reducing resource depletion and the pollution of natural areas. This is because CE is a new way of creating value and prosperity by extending a product's lifespan through improved design and servicing, relocating waste from the end of the life cycle of products to the beginning (as raw materials). RECP is a vital component of sustainable industrial development. It encourages enterprises to use materials efficiently, extending the use of resources to maximise value, and repurposing waste from the end of the supply chain into valuable resources. Since the mid-1990s, UNIDO has supported industries in upgrading organisational practices, investing in new business models, and promoting innovative technologies and green investments. This includes programmes part of the EU's Eastern Partnership (EaP) countries (including Armenia), which aimed to preserve natural capital, enhance environmental well-being, and create opportunities for green growth.

In 2018, there were over 74,500 enterprises in Armenia, of which only 135 were classified as large businesses. The country has a fast-growing food processing sector (mainly canned food and beverages) with excellent export potential based on ecologically-friendly and "green" agri-foods. The Government has also established the necessary laws to effectively address environmental concerns, whilst SMEs are interested in and working to become greener and more sustainable. This is because the inefficient use of resources wastes money and remains a significant contributor to climate change, accelerating environmental degradation.

The RECP process

Overall, 92 companies received RECP guidance and coaching within the EaP GREEN and EU4Environment programmes. The former accounted for 55 companies (33 part of the RECP Clubs, and 22 as Demonstration Companies), whilst EU4Environment comprised 37 companies (22 within the RECP Green Clubs, and 15 Demonstration Companies). 446 RECP recommendations were identified and proposed for companies to implement, based on their specific needs, resources, capacity, and priorities. Awareness-raising activities were also conducted, and national service providers were trained. Additionally, through a consultative process, an RECP primer was developed to embed the RECP logic within SMEs.

As the implementation and adoption phases continued from EaP GREEN to EU4Environment, it became possible to evaluate the application of the recommended RECP measures. Hence, between 2020–2021, an in-depth analysis was conducted to assess the implemented results, lessons learned, and challenges faced over ten years since the introduction of RECP in the country. The EU4Environment team analysed data from 10 SMEs to identify appropriate actions to scale up the adoption of RECP measures which could potentially be promoted across the country.

The recommended RECP measures achieved the following annual resource savings under the EaP GREEN programme:

- Total investment of 1,229,400 EUR
- Total cost savings of 336,004 EUR per year
- Total electricity savings of 8,032,308 kWh per year
- Total water savings of 10,120 m³ per year
- Total materials savings of 361 tonnes per year
- Total waste reduction of 107 tonnes per year
- Total reduction of 2,086 tonnes of CO₂-eq emissions per year

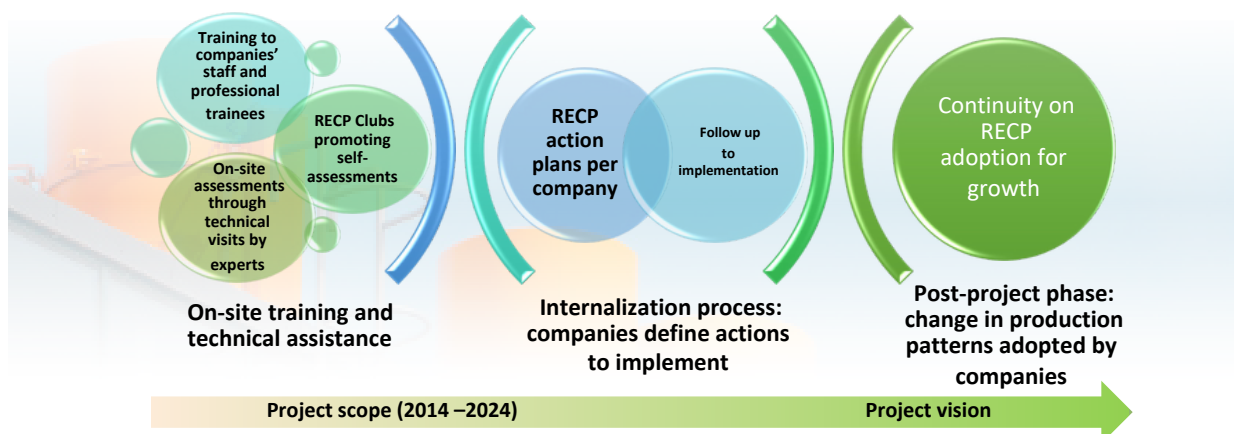
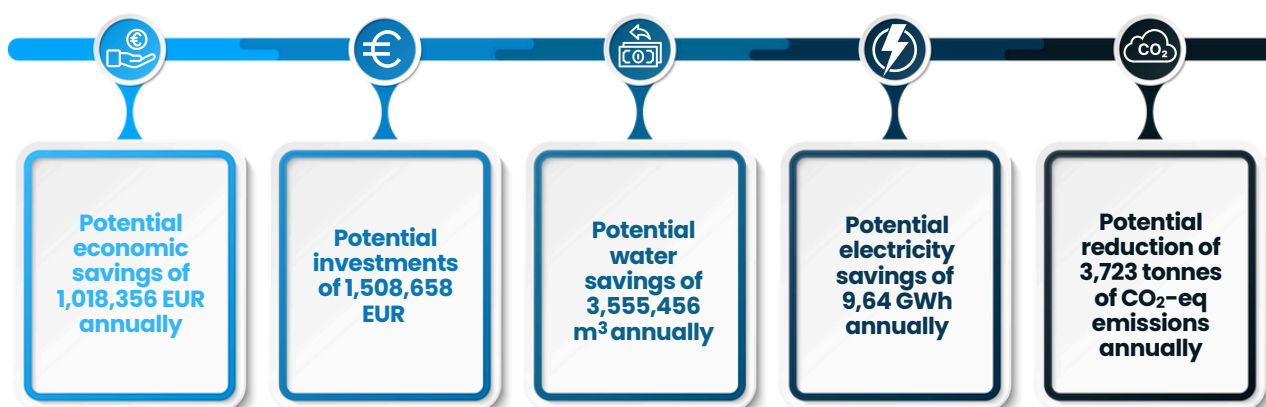


Fig. 1. The RECP promotion process conducted by UNIDO

Figure 1 illustrates the instruments used during the EaP GREEN and EU4Environment programmes, leading to resource efficiency interventions in the 32 monitored Armenian companies. As part of both programmes, and in collaboration with the participating companies, the RECP national experts identified 180 RECP recommendations.

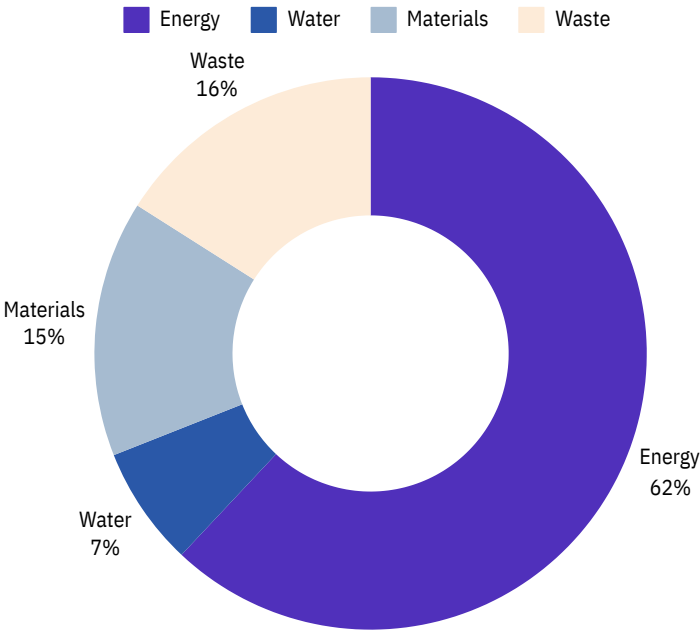
EU4Environment monitoring results

32 companies have between 15 to 135 employees, and represent a variety of sectors (bakeries, beverages, preserved food, batteries, construction materials, plastic production, freshwater aquaculture, paper recycling, furniture production, dairy products and probiotics, apparel, and many others). Notably, in addition to the significant savings in water and energy, the implementation of RECP measures can potentially enhance the companies' profitability through tangible cost savings:



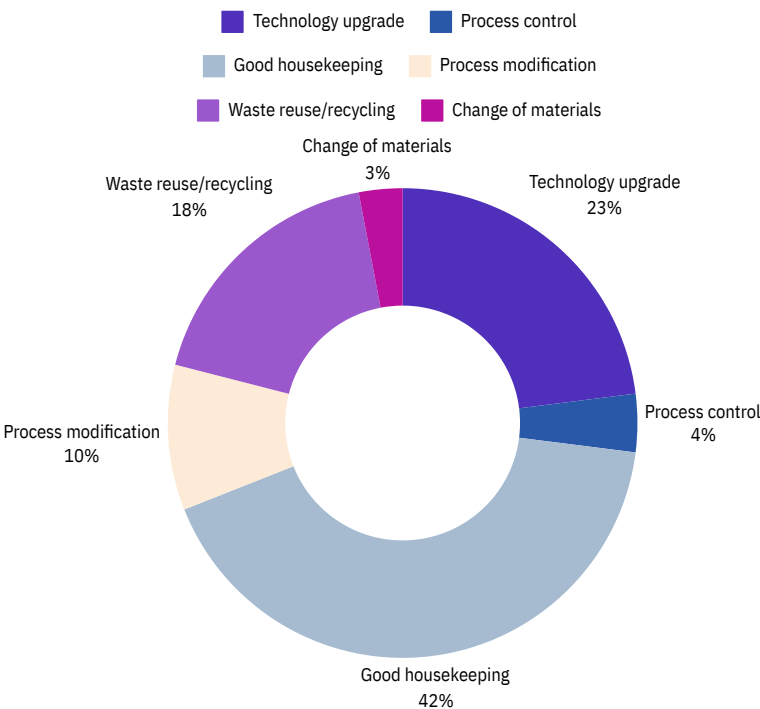
Over 60% of the RECP recommendations were related to energy efficiency. This focus can be explained by the high cost of electricity over the period, and the entailed risks in supply, all whilst considering the technical background of the national RECP experts. Steps to decarbonise the electric energy supply were undertaken by installing photovoltaic (PV) solar plants. Additionally, circular approaches were introduced by using by-products and investing in means to recycle water (mainly in the food industry). Although the companies were also adopting new technologies or modifying equipment, the investment levels in these areas remain small.

Distribution of the implemented RECP options, based on environmental categories



The main RECP measures revolved around good housekeeping measures (42%), technology upgrade/adoption or equipment modification (23%), and process modification (18%).

Distribution of the suggested RECP options, based on six categories



A series of 32 RECP business cases (or success stories) were developed between 2023-2024, showcasing the Armenian SMEs utilising the RECP methodology.

These cases present detailed insights into the companies, their internal production processes, recommendations, and implementation strategies. For more information, please scan the QR code.



RECP success stories



The companies implemented the 84 RECP options, . Although in response to rising electricity costs, the monitored companies chose to prioritise energy efficiency within their RECP action plans, there is also a significant potential to increase material efficiency, recycling, and to generate marketable by-products, stimulating this way the introduction of CE in areas that have hitherto been neglected.

Overall, the surveyed enterprises demonstrated a solid understanding of the role, purpose, and benefits of the RECP methodology at the senior management level.

A few enterprises retained their original RECP-trained teams, while most companies experienced rapid staff turnover. This highlights a clear need for continuous hands-on training and awareness-raising activities to ensure that the lessons learned on RECP are consistently understood and applied as a part of business strategy.

Learning from our partner’s experiences

The existing pool of experts at REC Caucasus include the professional network already established within the organisation. This should be further supported. The skills of the existing experts should be continuously expanded on key types of knowledge (managerial, technical, and CE principles and practices). Moreover, tools and measurement equipment should be made available by the programmes in which REC Caucasus operates, and should be provided to the RECP experts to ensure the feasibility of conducting quick assessments and the application of circular strategies.

Examples should also be provided, including study tours to Europe to help the experts become familiar and confident in developing recommendations for the national enterprises. This should be in line with the established expectations in terms of the Environmental Social Governance (ESG) indicators for banks and the regulatory taxonomy for the green and sustainable development of industries in the country.

The way forward

Our experience

The experience in Armenia shows that international cooperation programmes have been pivotal over the past decade in generating knowledge and demand for services in industries to support the uptake of RECP and CE (which were previously inexistent).

Entrepreneurs have shown an increased interest in participating in programmes that provide training and technical assistance for their industrial plants and enterprises. They are also motivated by the expected benefits and the successful experiences within the RECP demonstration companies.

The important next steps worth considering are:

- Strengthening the capacity of RECP/CE service providers (like RECC)
- Strengthening the RECP/CE eco-system by actively involving stakeholders
- Embedding RECP/CE in higher education programmes
- Piloting feasible technological investments
- Strengthening capacity for financing and green credit mechanisms
- Supporting locally made technology

These steps are crucial for further enhancing the local environment for RECP adoption in Armenian SMEs.

Recommendations

Raising awareness of RECP and CE opportunities

It is crucial to promote the connection between RECP adoption and opportunities for accelerating growth in SMEs and their transition to CE. The development of green markets, recycling initiatives, green product design, and other strategies rooted in the continuous adoption of RECP should continue in Armenia. To build a self-stabilising eco-system, more stakeholders can be actively involved. This may include industry associations, governmental bodies, non-profit organisations, women entrepreneurs, and members of academia. Forums for collaborative discussions and knowledge-sharing among stakeholders are also needed. To enhance outreach to SME, a diverse plethora of intermediaries can be utilised (including sector-related business associations, local governments, and financial service providers).

Repeated, targeted awareness campaigns can further help educate businesses, regulatory bodies, and the public on the benefits and importance of RECP/CE, creating a culture of environmental responsibility. This way, RECP and CE principles can be consciously integrated, aligning them with broader environmental perspectives which lead to a holistic and sustainable approach. Continuous marketing through various channels (including existing materials, videos, and online platforms) should also be used to reach a diverse audience. Targeted events (like business lunches or functions) should be organised to engage directly with industry management and entrepreneurs. Messages should be tailored to resonate with different sectors and company sizes. This should be complemented by continuous financial resources allocated for marketing and communication efforts to ensure ongoing visibility and support for RECP/CE initiatives. Overall, as an economic strategy, it is essential to emphasise the CE practices implemented thanks to the RECP methodology.

Educational initiatives

Future programmes can support the development of a RECP/CE course and textbooks for universities. However, these efforts should be permanently integrated into both the academic and vocational training sectors. Especially in food processing and construction, there is a high potential for RECP and CE, and targeted training, preconceived tools, and recommendations could increase the RECP outreach and application. To reach out to the numerous enterprises, a blend of in-person trainings and web-based trainings should be developed, in synergy with the other EaP-countries.

Capacity building

The following measures are recommended to encourage wider adoption of RECP in Armenian companies:

Extended national capacity via continuous education and training: integrating the RECP methodology into academic and vocational programmes in Armenia to enhance the companies' access to qualified professionals capable of implementing RECP projects

More involvement in monitoring, follow-up procedures, and certification applications: necessary to embed RECP into the core strategies of businesses

Introducing environmental management system: to form a stable base for continuation in spite of the frequent changes in technical staff disrupting the implementation schedule of RECP measures

Continuous support of companies: to help them in implementing the RECP methodology, despite the changes in top management or ownership

Investing in incentive mechanisms

To embed RECP in company management systems, various incentive mechanisms such as recognitions, awards, national and international certifications should be developed. These incentives have the potential to provide platforms for companies to innovate and encourage them to integrate RECP into their management practices. This requires advanced cooperation models between consultancy and service providers to ensure the continuous training of industry staff (such as the institutionalising RECP Clubs or comparable capacity-building programmes and strengthening the capacity of RECP service providers).

Piloting feasible technological investments

Entrepreneurs can be encouraged to prepare more ambitious RECP action plans by preselecting technologies, and providing recommendations to invest in RECP pilot projects which demonstrate the profitability and risk management of RECP.

Supporting locally made technology

There should be support for investing in educational programmes and technology-related start-ups to provide appropriate, adapted, and cost-effective advanced equipment along with support for innovation in local machinery and information technology (IT) industries. This would mean a more efficient and cost-effective national technology market.

Strengthening financing and green credit tools

While the need for green credits has been recognised for several years, bridging the gap between supply and demand requires strengthening. This is why green credit mechanisms need to be tailored to the SME context. Additionally, SMEs often lack the capacity to enhance their creditworthiness and effectively present business plans for RECP/CE investments. Other incentive mechanisms, such as non-refundable grants, guarantee funds, start-up funding, and technology development funds, should be made available to reduce risks and costs for SMEs. Communication between banks and SMEs can be improved by investing in accounting, financial analysis, and relations to ESG and green taxonomy.

THE EAP GREEN ALUMNI COMPANIES - monitored in 2022-2024

- | | | |
|--|---|---|
| 1 ELBAT CJSC
batteries and accumulators | 5 Sam Har LLC
food and beverages | 8 Lusia Food
food production |
| 2 Arminashogh LLC
food production | 6 KAVASHEN LLC
slate production | 9 ROZFROOD LLC
food production |
| 3 ARARAT-CHANSIN LLC
Road constructions | 7 GALIK LLC
limestone production | 10 Ashtarak Dzoo
food production |
| 4 Lukashin Agricultural Association CC
consumer cooperative | | |

THE RECP DEMONSTRATION COMPANIES (ASSESSED UNDER EU4E)

- | | | |
|--|--|---|
| 1 MAGNON OJSC
structural metal | 6 JULIANNA LLC
furniture production | 11 UNIGROUP LLC
plastic production |
| 2 SEVANI ISHKHAN-2 CJSC
fish farm | 7 KARA YEV KAREN LLC
dairy production | 12 BNAKAT LLC
dairy production |
| 3 SEVAN AQUA CJSC
fish farm | 8 M. SISAKYAN LTD
textile production | 13 SIS ALP LTD
dairy production |
| 4 VAZGEN ABGARYAN LLC
paper production | 9 GOS CJSC
fish farm | 14 SNEKARM LLC
food production |
| 5 GREEN AGE GREENHOUSE CHARENTSAVAN
food production | 10 LILIT DERDZYAN (HAYKH PLAST) PE
dairy production | 15 ERPIN AGRICULTURAL COOPERATIVE
dairy production |

THE RECP CLUBS COMPANIES

- | | | |
|---|--|---|
| 1 HOVIK PAPIKYAN - BEEGinning PE
food production | 8. Armen Hambardzumyan PE
honey production | 16. Nook
food production |
| 2 GOHAR HARUTYUNYAN PE - TOO2P
paper recycling | 9. Vardeni LLC
food and flowers production | 17. Sanata
food production |
| 3 BRGHATIK - NOR HATIK LLC
food production | 10. 3rd Nature
installation of PV panels | 18. Gohar Papiyan PE
food production |
| 4 Mur-Har LLC
food production | 11. Ararat Poghosyan PE
food production | 19. Ecochrer
food processing |
| 5 ECOLOLIK PE
food production | 12. Zuig Aghbyur
food production | 20. Jraghatspanyan Winery
wine production |
| 6 Karmir Katar PE
food production | 13. On the bank of Araks
hotel services | 21. Igdir Land
food processing |
| 7 Sun Cheers LLC
food production | 14. Noravan Greenhouse
food production | 22. Susanna Matinyan
food processing |
| | 15. Sonya Ghazaryan PE
food processing | |



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Testimonials

“ Our company was facing challenges due to the excessive use of electricity, as well as a lack of thermal insulation and heating issues (especially during winter). Thanks to the EU4Environment RECP component, we learned to systematically improve energy efficiency and invest in the safety and well-being of our employees. As the company plans to attain the needed international certifications to be eligible to export its output outside Armenia (and hence, increase the production capacity), the RECP Project has inspired us to come up with new ideas regarding the future implementation of RECP measures, said the CEO of “MAGNON” OJSC, Ms. Astghik Hovsepyan.

“ We were struggling with high energy costs and wastewater management issues. Thanks to the EU4Environment RECP component, we learned how to take advantage of the sources of renewable energy and gain energy independence, thus, eliminating the costs for diesel fuel, natural gas, and electricity from the grid. As our company plans to invest in new ways to use waste serum from the current production and develop new products, the RECP project has inspired us to come up with new solutions and to keep implementing RECP measures, said the director of “SIS ALP” LTD DAIRY PRODUCTION, Mr. Husik Stepanyan.

“ We wanted to address the low efficiency of producing adhesive tape and check the breakdown of the equipment due to the inefficient removal of the adhesive. Thanks to the EU4Environment RECP component, we learned how to rationally use the resources available at hand, and, as a result, increase resource efficiency. As we plan to increase sales and continue optimizing the production processes, the RECP project has inspired us to come up with new ideas for the future, said a member of staff from “UNIGROUP” LLC.

“ Once we implement all RECP recommendations, our company will benefit from ensuring the necessary comfort and stable microclimate for our bees. So far, we are expecting economic savings of up to 40-60% by reducing the amount of energy required for heating, said a member of staff from “Hovik Papikyan – BEEGAINING” PE.

“ Our company was struggling to manage the excess wastewater generated from the production processes, as well as the high energy costs due to the inefficient use of resources and equipment. Thanks to the RECP Green Clubs, we learned how to use resources rationally and we can now plan to introduce new products in the nearby future, said the CEO of “Mur Har” LLC, Mr. Armen Muradyan.

About

Funded by the European Union, the EU4Environment Action aims to help the Eastern Partnership (EaP) countries preserve and better use the natural capital, increase people's environmental well-being, and stimulate a greener economic growth in the EU's Eastern Partnership countries. Its initiatives help deliver policy and legislative changes, make planning and investment greener, and stimulate the uptake of innovative technologies by adopting new business models and creating green jobs.

The Action involves five implementing organizations – OECD, UNECE, UNEP, UNIDO, and the World Bank Group – that focus on producing tangible results in line with the goals, priorities, and the overall cooperation targets defined by the Partner countries. UNIDO, under Result 2 Circular Economy and New Growth Opportunities, manages the outputs 2.1 ‘Resource Efficient and Cleaner Production and eco-innovation among SMEs are scaled up’, and 2.2 ‘Concepts and tools of the EU Single Market for Green Products initiative are introduced and promoted’. For more information, please visit: www.eu4environment.org

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