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EU4GREEN RECOVERY EAST

NATIONAL BASELINE ASSESSMENT REPORT OF WASTEWATER TREATMENT INFRASTRUCTURE

Armenia

Source: www.cambi.com/blog/wastewater-treatment

EU4Green Recovery East - Recovery through a Circular Economy and Pollution Reduction in the Eastern Partnership countries

(700002623)

Implementing partners:

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ABOUT THIS REPORT

Authors(s)

Arsha James, UNIDO

Benoit Wuatelet, UNIDO

Jean Marc Berland, OiEau

Benoît Fribourg-blanc, OiEau

Vahagn Tonoyan, Country Representative (Armenia) for EU4GRE Programme

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United Nations Industrial Development Organization (UNIDO)

Vienna International Centre

Wagramerstr. 5, P.O. Box 300,

A-1400 Vienna, Austria

Office International de l'Eau (OiEau)

21/23 rue de Madrid

75008 Paris, FRANCE

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Executive Summary

Armenia generates approximately 721.9 million m³ of wastewater annually, yet only 8% receives any form of treatment. The country operates six centralized municipal wastewater treatment plants with a combined nominal capacity of 666,528 m³/day, but actual throughput reaches only 196,024 m³/day, less than 30% of design capacity. All six facilities provide mechanical treatment only through coarse screening and, in five cases, fine screening with grit and grease removal. The Aeratsia WWTP in Yerevan treats 92% of all treated wastewater in the country, creating a critical single point of vulnerability in the system. In addition, there is community level facility which provides biological treatment for 0.13% of the total treated wastewater.

The absence of biological treatment results in minimal pollutant removal, with BOD and TSS reduction averaging only 10%. Nutrient removal is non-existent, with Total Nitrogen and Phosphorus reductions of approximately 1-2% at Aeratsia. Consequently, 154.3 million m³ (21%) of wastewater is discharged without any treatment, while 505.3 million m³ (70%) is classified as clean according to national standards despite receiving no purification. This performance falls substantially short of EU requirements for secondary and tertiary treatment.

Infrastructure deterioration compounds operational challenges. Approximately 50% of Armenia's 4,174.3 km sewerage network requires complete replacement, with over 80% of systems in Yerevan and Shirak considered obsolete. Decades of insufficient maintenance have led to severe infiltration and inflow problems, groundwater contamination through leakage, and frequent overflows during rainfall or snowmelt periods. The widespread interconnection of stormwater and municipal sewer systems, often without proper planning, exacerbates hydraulic overloading.

Industrial wastewater management presents a critical regulatory gap. Without quantitative or qualitative monitoring systems for industrial discharges, enterprises release effluents directly into municipal networks, surface waters, or groundwater without oversight. This unregulated discharge impairs WWTP performance, contaminates water resources, and poses public health risks, particularly where groundwater serves drinking or irrigation purposes.

The regulatory framework demonstrates partial alignment with EU directives through the 2002 Water Code and subsequent amendments, yet significant transposition gaps remain. Armenia lacks binding implementation timelines, comprehensive sensitive area designations, and enforceable compliance mechanisms comparable to EU standards. The institutional landscape is fragmented across multiple ministries and agencies, with unclear coordination mechanisms and limited enforcement capacity. Veolia Djur CJSC serves 73% of the population across 373 settlements but operates wastewater systems in only 74 of 80 settlements with infrastructure, while many Local Self-Government Bodies lack technical and financial capacity for effective service delivery.

Sanitation coverage varies dramatically between urban and rural areas. While 96% of urban residents access improved sanitation, 51% of the rural population relies on unimproved facilities. Of 930 territorial units, approximately 830 lack sewerage services entirely. Many on-site systems discharge directly to surface or groundwater bodies without treatment, creating environmental and health hazards.

Given these conditions, meaningful opportunities for energy efficiency improvements, sludge valorization, or biogas production are currently unavailable. The specific energy consumption of existing WWTPs (all below 0.1 kWh/m³) reflects the simplicity of mechanical treatment rather

than optimization potential. Priority interventions must focus on rehabilitating collection networks and introducing biological treatment processes before advanced resource recovery becomes feasible.

The report recommends redirecting EU4GRE programme efforts toward comprehensive capacity building, targeting decision-makers, municipal engineers, and policy-makers rather than plant operators. Key priorities include strengthening technical competencies, supporting alignment with EU UWWTD requirements, conducting training needs assessments, and empowering stakeholders to develop fundable project proposals for treatment system upgrades. Regulatory reform should adopt a phased approach, prioritizing organic matter and nutrient removal for larger agglomerations while establishing frameworks for future energy recovery and micropollutant removal.

Sustainable sector transformation requires coordinated action across infrastructure modernization, institutional strengthening, regulatory harmonization, and financial mechanisms that ensure cost recovery while maintaining affordability. The baseline established under EU4GRE programme provides the evidence foundation for targeted interventions that will build Armenia's capacity to achieve climate-resilient, energy-efficient wastewater management aligned with EU standards.