



Photo: EcoLur

REPORT: IMPLEMENTATION OF YEREVAN'S GREEN CITY ACTION PLAN

(short version)

With the support of CEE Bankwatch Network, Armenian environmental organisation EcoLur has launched a campaign to inform the public about the implementation of the Green City Action Plans (GCAPs) for Yerevan and Gyumri funded by the European Bank for Reconstruction and Development (EBRD). As part of the campaign, EcoLur has published two reports: Implementation of Yerevan’s Green City Action Plan and Implementation of Gyumri’s Green City Action Plan.¹ The reports assess the extent to which the actions, targets and objectives set out in the GCAPs have been implemented and how the environmental conditions of these cities have been affected.

1. BACKGROUND ON EBRD GREEN CITIES AND YEREVAN’S GCAP

1.1. Objectives of the EBRD Green Cities programme

In 2016, the EBRD launched its Green Cities programme. Over time, funding mobilised for Green Cities through the EBRD and its donors has increased:

- ✓ EUR 250 million in 2016
- ✓ EUR 700 million in 2018
- ✓ EUR 950 million in 2020
- ✓ EUR 2 billion in 2021²

According to the EBRD Green Cities website, the objectives of the programme are to ‘preserve the quality of environmental assets (air, water, land and biodiversity) and use these resources sustainably, mitigate and adapt to the risks of climate change [and] ensure that environmental policies and developments contribute to the social and economic well-being of residents’.³

1.2. Timeline for the EBRD’s Yerevan Green City Action Plan

In August 2016, Yerevan joined the EBRD’s Green Cities programme.

In September 2017, Yerevan City Council approved the Yerevan Green City Action Plan (GCAP)⁴ (Decision No. 21-A),⁵ which was developed by an international team of experts led by Ernst & Young and its partner companies.

¹ EcoLur, «ԿԱՆԱԶ ԶԱՂԱՔԻ ԳՈՐԾՈՂՈՒԹՅՈՒՆՆԵՐԻ ԾՐԱԳԻՐ ԳՅՈՒՄՐԻ ԶԱՂԱՔԻ ՀԱՄԱՐ» ԾՐԱԳՐԻ ՈՒՍՈՒՄՆԱԱՍԻՐՈՒԹՅՈՒՆ ՉԵԿՈՒՅՑ, EcoLur, 15 May 2023.

² European Bank for Reconstruction and Development Evaluation Department, [Green Cities programme – interim evaluation](#), European Bank for Reconstruction and Development, March 2022.

³ European Bank for Reconstruction and Development, [About Green Cities](#), European Bank for Reconstruction and Development, accessed 2023.

⁴ Ernst & Young, SEVEN, GeoTest, SWECO, [Yerevan Green City Action Plan](#), European Bank for Reconstruction and Development, 2017.

⁵ Yerevan City Council, [Decision of Yerevan City Council No. 21-A](#), Yerevan Municipality, 12 September 2017.

1.3. EBRD projects approved under Yerevan's GCAP

- The ENA - Modernisation of Distribution Network project was approved on 7 July 2017 and includes a senior corporate loan of USD 80 million to Electric Networks of Armenia (ENA). The total value of the project is USD 200 million.⁶
- The GrCF2 W2 - ENA Investment Program was approved on 14 July 2021 and includes a follow-up loan of USD 60 million to ENA. The total value of the programme is USD 148 400 000, of which USD 20 000 000 is syndicated.⁷
- The GrCF2 W2 - Yerevan Bus Project was approved on 9 November 2021 and includes a sovereign loan of EUR 20 million to the Republic of Armenia. The total value of the project is EUR 25 million.⁸

2. RESULTS OF THE IMPLEMENTATION OF YEREVAN'S GCAP

2.1. Air pollution: Yerevan Municipality's response

On 14 December 2022, EcoLur sent a letter to the Mayor of Yerevan, Hrachya Sargsyan, requesting information on the actions implemented to date as recommended in the Yerevan GCAP, including its objective to improve air quality policy, methodology and monitoring. On 22 December 2022, in a letter of response to EcoLur's inquiry, Yerevan Municipality's Department of Information confirmed the following:

- Large-scale greening is underway, with priority given to the most vulnerable areas.
- Yerevan Municipality periodically monitors existing sources of air pollution to reduce carbon dioxide (CO₂) emissions.
- To relieve traffic congestion in the capital, the Municipality is implementing a number of projects, including the construction of roads to bypass Yerevan.
- A fleet of new buses now runs on liquefied petroleum gas (LPG), with a further fleet of electric public transport vehicles planned.
- Air quality monitoring sensors were provided to the Municipality by the Asian Development Bank's Armenia Resident Mission.
- Air monitoring stations were installed at five locations in 2022 and five more stations will be installed in 2023 along with the purchase of a nitrogen dioxide analyser.
- All data from these monitoring stations will be aggregated and visualised in the form of an interactive air pollution map available on Yerevan Municipality's official website.
- According to Yerevan Municipality's observations and data from five air monitoring stations covering the period from September to October 2022, air quality indicators are within a satisfactory range.

⁶ Project Summary Documents, [ENA - Modernisation of Distribution Network](#), *European Bank for Reconstruction and Development*, 18 May 2017.

⁷ Project Summary Documents, [GrCF2 W2 - ENA Investment Program](#), *European Bank for Reconstruction and Development*, 11 June 2021.

⁸ Project Summary Documents, [GrCF2 W2 - Yerevan Bus Project](#), *European Bank for Reconstruction and Development*, 17 February 2020.

Air pollution: EcoLur's findings

According to the Republic of Armenia's Prosecutor General's Office, increasing quantities of dust and nitrogen dioxide have been detected in Yerevan's air over the past five years.⁹

Data provided by the Hydrometeorology and Monitoring Center, a state non-commercial organisation established by the Ministry of the Environment of the Republic of Armenia, show that the concentration of dust in the air in Yerevan exceeded the maximum permissible concentration (MPC) from 2017 to 2021. Dust pollution in the Kentron, Shengavit and Nor Nork administrative regions was particularly high. Copper (Cu), nickel (Ni) and molybdenum (Mo) were identified as the metals with the highest concentrations in dust.¹⁰



Air pollution in Yerevan. Photo: EcoLur

Based on the official data described above and other information, our assessment of air pollution in Yerevan is as follows:

- ✓ Over the last five years, air pollution in Yerevan has increased, as reflected in excess MPC values for dust and nitrogen dioxide.¹¹ Concentrations of sulphur dioxide and tropospheric ozone have also increased, although they remain within MPC limits.

⁹ Prosecutor General's Office of the Republic of Armenia, [The level of atmospheric air pollution in large cities of the Republic of Armenia exceeds the permissible limit. The prosecutor's office submitted a message](#), Prosecutor General's Office of the Republic of Armenia, 29 June 2022.

¹⁰ Environmental Monitoring, [Air: Concentration distributions of sulfur and nitrogen dioxides in the air](#), Hydrometeorology and Monitoring Center (SNCO) of the Ministry of Environment of the Republic of Armenia, accessed 2020.

¹¹ Prosecutor General's Office of the Republic of Armenia, [The level of atmospheric air pollution in large cities of the Republic of Armenia exceeds the permissible limit. The prosecutor's office submitted a message](#), Prosecutor General's Office of the Republic of Armenia, 29 June 2022.

- ✓ According to experts, the number of air quality monitoring stations – both the ten stations already installed since 2022 and others that are planned – is insufficient given the complex and mountainous terrain of Yerevan, the distribution of pollution sources and the heterogeneous locations of protective green zones.
- ✓ Yerevan Municipality’s favourable assessment of air quality indicators in Yerevan contradicts data provided by the Prosecutor General’s Office and the Ministry of Environment’s Hydrometeorology and Monitoring Center. The Municipality’s findings do not correspond with the annual air pollution figures for the year 2022 provided by the Hydrometeorology and Monitoring Center.¹²

In conclusion, Yerevan Municipality has not yet reached the following mid-term air pollution reduction targets outlined in Yerevan’s GCAP:

- All national binding pollution levels, expressed in maximum permissible concentrations, will be met, ideally in line with EU limits.
- Yerevan Municipality will have developed an integrated air pollution model for the city based on current meteorological data. The model will calculate pollution levels from stationary and mobile sources, verified against air quality monitoring data, and generate an online interactive air pollution map.
- Yerevan Municipality will have implemented a regular reporting system of polluter self-monitoring data, requiring enterprises to report their own emission values at regular short intervals of 10 minutes, 20 minutes or one hour so that they can be compared with maximum permissible concentrations and air quality standards set by the EU and the World Health Organization.
- Yerevan Municipality will have established a robust stationary and mobile monitoring system to track and measure air pollution levels in the city.
- Yerevan Municipality will have developed its second GCAP, which will include targeted actions aimed at further reducing air pollution.¹³

2.2. Energy: Yerevan’s Municipality response

- Energy-saving LED lights have been fitted in yards, apartment buildings and administrative buildings in the districts of Malatia-Sebastia, Ajapnyak, Nubarashen, Erebuni and Shengavit. Solar photovoltaic panels have been installed on the roofs of a number of apartment buildings.
- In 2021, work began on the development of an energy management system for the Yerevan community with the support of the United Nations Development Programme (UNDP).

¹² Ibid. According to the centre’s research, the concentrations of particulate matter (dust) and nitrogen dioxide in the atmospheric air increased in Yerevan from 2016 to 2021. There was also an upward trend in the average annual concentrations of particulate matter, ranging from 0.0953 to 0.1720 milligrammes per cubic metre (mg/m³), and of nitrogen dioxide, ranging from 0.0165 to 0.0284 mg/m³. In 2021, the results of observations indicated that the maximum permissible concentrations of dust were exceeded in 29 per cent of cases, while sulphur dioxide exceeded the limit in 13 per cent of cases. Nitrogen dioxide exceeded the limit in 0.4 per cent of cases and riverine ozone in 1 per cent of cases.

¹³ Ernst & Young, SEVEN, GeoTest, SWECO, [Yerevan Green City Action Plan](#), *European Bank for Reconstruction and Development*, 37-38, 2017. [Mid-term targets adapted from source for readability.]

- The EU for Yerevan Solar Community project, co-funded by the European Union and Yerevan Municipality, was approved in February 2018. The project aims to reduce energy consumption by implementing energy efficiency measures in multi-apartment buildings in Yerevan. Thus far, 97 apartment buildings have been equipped with high quality lighting. Electricity consumption in these buildings has dropped by about 77 per cent and the cost of electricity for lifts in the buildings has reduced to about 50 per cent. Solar photovoltaic panels have also been installed on roofs to cover energy consumption in the common areas of buildings. The solar and lighting systems were donated by the European Union.¹⁴

Energy efficiency and energy-saving projects implemented in Yerevan (2017–2022)

- ENA - Modernisation of Distribution Network (EBRD)¹⁵
- GrCF2 W2 - ENA Investment Program (EBRD)¹⁶
- State Support Programme for Energy-efficient Renovation Works of Apartments and Individual Residential Houses¹⁷
- EU for Yerevan Solar Community (EU)¹⁸
- Supporting Communities of Armenia to Adopt and Implement Climate Smart Solutions (UNDP)¹⁹
- De-risking and Scaling-up Investment in Energy Efficient Building Retrofits (UNDP-Green Climate Fund (GCF))²⁰
- Yerevan Street Lighting Project (EBRD)^{21,22}
- Yerevan Energy Efficiency Project (European Investment Bank, Eastern Europe Energy Efficiency and Environment Partnership (E5P), GCF via UNDP, Yerevan Municipality)^{23,24}

¹⁴ Yerevan Municipality, [Reference on “EU4Yerevan: Solar Community” program](#), Yerevan Municipality, accessed 31 May 2023.

¹⁵ Project Summary Documents, [ENA - Modernisation of Distribution Network](#), European Bank for Reconstruction and Development, 18 May 2017.

¹⁶ Project Summary Documents, [GrCF2 W2 - ENA Investment Program](#), European Bank for Reconstruction and Development, 11 June 2021.

¹⁷ Armenian Legal Information System, [ՀՀ ԿԱՌԱՎԱՐՈՒԹՅԱՆ ՈՐՈՇՈՒՄԸ ԲՆԱԿԱՐԱՆՆԵՐԻ ԵՎ ԱՆՋԱՏԱԿԱՆ ԲՆԱԿԵԼԻ ՏՆԵՐԻ ԷՆԵՐԳԱՎՐՅՈՒՄԻ ԿԵՆՏՐԱԼԻՑԻ ԿԵՆՏՐԱԿԱՆ ԱՇԽԱՏԱՆՔՆԵՐԻ ՊԵՏԱԿԱՆ ԱԶԱԿՑՈՒԹՅԱՆ ԾՐԱԳԻՐԸ ՀԱՍՏԱՏԵԼՈՒ ՄԱՍԻՆ](#), Armenian Legal Information System, 15 April 2022.

¹⁸ Development Programs, [EU for Yerevan Solar Community](#), Yerevan City Council, 2018.

¹⁹ United Nations Development Programme, [Supporting Communities of Armenia to Adopt and Implement Climate Smart Solutions](#), United Nations Development Programme, 12 April 2019.

²⁰ Ministry of Environment of the Republic of Armenia, Green Climate Fund, United Nations Development Programme, [De-risking and Scaling-up Investment in Energy Efficient Building Retrofits](#), United Nations Development Programme, 30 June 2017.

²¹ Sustainable Urban Development Investment Program, [Երևանի լուսավորության ծրագիր](#), Sustainable Urban Development Investment Program, 7 June 2019.

²² Project Summary Documents, [Yerevan Street Lighting Project](#), European Bank for Reconstruction and Development, 6 March 2015.

²³ Sustainable Urban Development Investment Program, [Yerevan Energy Efficiency Project](#), Sustainable Urban Development Investment Program, accessed March 2023.

²⁴ Project Summary Sheet, [Yerevan Energy Efficiency](#), European Investment Bank, 26 January 2017.

Greenhouse gas reductions in Yerevan as result of these projects:

- Over 4,000 tonnes of greenhouse gases reduced as a result of upgrades to the city's lighting system.
- Over 2,500 tonnes of annual emissions reduced as a result of thermal modernisation and energy-saving measures implemented in 97 apartment buildings, as well as pre-schools, community organisations and two of Yerevan Municipality's administrative buildings.
- 823.5 kilogrammes of CO₂ emissions reduced as a result of waste sorting and recycling.
- 176,959 tonnes in greenhouse gases reduced as a result of biogas collection at Nubarashen dump site and the burning of toxic gases at the nearby incineration plant.
- 2,939 tonnes in CO₂ emissions expected to be reduced with the implementation of the GrCF2 W2 - Yerevan Bus Project.

Energy: EcoLur's assessment

- ✓ The EBRD-financed Yerevan Street Lighting Project, which was approved by the Bank in May 2015, has faced obstacles during its implementation. The project aimed to install remote-controlled LED lighting systems for energy-saving night lighting on 28 streets in Yerevan. However, the new lighting systems have been installed in only 6 streets thus far. According to Yerevan Municipality's development programme implementation reports for 2017 to 2022,²⁵ the duration of these works was extended after the issues with implementation were identified.
- ✓ In the case of the EU for Yerevan Solar Community project, Yerevan Municipality claims photovoltaic systems have been installed on the roofs of 97 apartment buildings.
- ✓ Greenhouse gases have been reduced as a result of the programmes implemented by Yerevan Municipality. At the same time, Yerevan Municipality's 2023 Development Programme states that CO₂ emissions have increased by about 10-fold (the precise timespan for this increase was not provided). The programme contains no data on greenhouse gases.²⁶
- ✓ The Green Urban Lighting project, financed by the Global Environmental Facility with co-financing from UNDP and the Armenian government, was launched in January 2014. As part of the project, Yerevan Municipality established Yerkaghluy, a closed joint-stock company responsible for the management and maintenance of street lighting systems in Yerevan. Through a dedicated energy efficiency circulating fund, the company allocates resources for the installation of energy-efficient lighting infrastructure in the city. This fund provides the financial stability needed to ensure the implementation of energy-saving and energy-efficient projects over the long term.
- ✓ The results of these programmes generally indicate that energy saving, one of the main objectives of Yerevan's GCAP, is being implemented in the capital.

²⁵ Yerevan Municipality, [Հարգազման ծրագրեր](#), *Yerevan Municipality*, accessed 31 May 2023.

²⁶ Yerevan City Council, [Երևանի քաղաքազման 2023թ. ծրագիր](#), *Yerevan City Council*, 17, 27 December 2022.

2.3. Waste management: Yerevan Municipality's response

- Management of the biogas collection and burning plant at the Nubarashen solid waste dump site was handed over to the Yerevan New Urban Landfill closed joint stock company with the right to use it free of charge.
- However, due to lower-than-expected levels of methane gas extracted from the Nubarashen landfill, a decision was taken not to proceed with electricity production from the gas collected as originally planned.
- A tender for the closure of the existing dump sites at Nubarashen and Ajapnyak and the construction of a new sanitary landfill site at Nubarashen was cancelled on 1 September 2022. Currently, a feasibility study is being conducted to determine the format and criteria for a new tender to be announced in the future.²⁷
- The possibility of constructing a waste sorting and recycling plant in Yerevan through a public-private partnership is outlined in Yerevan's GCAP. However, this project will not be considered until after the construction of the new sanitary landfill.
- Yerevan's GCAP includes a short-term action to develop a ten-year waste management plan for the city. However, the Mayor of Yerevan did not provide a response regarding this action. Additionally, there is no information on this action in Yerevan Municipality's development programme implementation reports for 2017 to 2022.



Nubarashen landfill. Photo: EcoLur

Waste sorting

- In 2021, Yerevan Municipality launched a waste-sorting campaign through the state-owned Greening and Environmental Protection organisation.
- In 2021 and 2022, the organisation's waste sorting department collected and handed over 1,350 tonnes of waste (plastic, paper and glass) to recyclers, representing a reduction of

²⁷ Project Summary Documents, [Yerevan Solid Waste Project](#), *European Bank for Reconstruction and Development*, 31 July 2015.

823.5 kilogrammes of CO₂ emissions. In the spring of 2023, the organisation plans to install waste bins for aluminium waste.

Waste management: EcoLur's assessment

- ✓ Yerevan Municipality has still not constructed the long-awaited new sanitary landfill, which must comply with EU standards as outlined in Yerevan's GCAP, nor has it implemented a waste processing plant as planned.
- ✓ Yerevan Municipality has initiated measures to improve waste sorting and recycling. It has also made some attempts to promote a culture of waste sorting among Yerevan residents. However, based on Yerevan Municipality's online map,²⁸ there are only 120 waste sorting bins across all the administrative regions in Yerevan. Waste bins for sorting paper and plastic have been installed in Yerevan schools, but these measures are not comprehensive and do not cover the entire city.
- ✓ Yerevan Municipality's development programme implementation reports for 2017 to 2022 do not contain any information on measures taken to achieve the 2025 mid-term targets specified in Yerevan's GCAP. These targets include an integrated sorting and recycling system; a publicly available database of municipal solid waste generated, treated and disposed in accordance with the national waste coding system; and the development of a ten-year waste management plan. There is also no information on the Green City Awareness Centre, a recommended short-term action under the GCAP.

2.4. Transport: Yerevan Municipality's response

- To relieve traffic congestion in the capital, Yerevan Municipality is undertaking a number of projects involving the construction of roads to bypass the city.
- Electric public transport is being added to promote sustainable public transportation.
- Electric vehicle charging infrastructure is also being developed.

Yerevan Bus Project

- Since 2021, Yerevan Municipality has been implementing the EBRD's GrCF2 W2 - Yerevan Bus Project, co-financed by a sovereign loan of EUR 20 million and an investment grant of EUR 5 million from E5P.
- The loan will be used to finance the acquisition of 100 modern, 12-metre-long, low-floor, compressed natural gas (CNG) buses for Yerevan.

Transport: EcoLur's assessment

- ✓ There is still no unified electronic ticketing system in Yerevan. However, steps are being taken to address this issue.
- ✓ Yerevan is set to put into service a new fleet of large buses, which will replenish the city's rolling stock by approximately 45 per cent.

²⁸ Greening and Environmental Protection, [ewpunting](#), *Greening and Environmental Protection*, accessed March 2023.

- ✓ Steps are being taken to transition toward electric public transportation following the examples set by other EBRD Green Cities such as Sofia and Samarkand, which are adding electric buses to their fleets. It should be noted that the acquisition of the CNG-fuelled bus fleet should not be viewed as a positive development. Gas-powered buses not only contribute to air pollution but also exacerbate Armenia's heavy dependence on gas imports from Russia. By investing in buses that run on gas, the country will become even more reliant on fossil gas imports and leave it vulnerable to fluctuations in fuel prices.
- ✓ Overcrowding on public transport in the capital remains a problem. Chronic traffic congestion is common due to increasing car ownership and lack of parking spaces.
- ✓ There is a lack of designated lanes for bicycles and electric scooters. Cyclists and riders are forced to commute on busy roads and pedestrianised streets, increasing the risk of accidents.

2.5. Green areas: Yerevan Municipality's response

- One of the objectives in Yerevan's GCAP is to increase the ratio of open green areas per capita to over 8.5 square metres by 2018, and to over 10 square meters by 2030. The ultimate objective is to allocate 17 square metres per capita, a target previously set under the 2006 Yerevan Master Plan.
- Green areas in Yerevan have not increased since 2015. Yerevan's green areas officially comprise around 6,760 hectares, representing 30 per cent of the total area of the city. Public green areas amount to 860 hectares.
- For each resident in the Kentron administrative district, 3 square metres of green space is available.
- The Armenian government has allocated AMD 200 million (EUR 484 000) for a nationwide tree planting project, including areas in Yerevan.
According to Yerevan Municipality, forest lands within the city of Yerevan cover an area of 871 hectares. These lands fall under the jurisdiction of Hrazdan Forestry, a branch of Hayantar (ArmForest) SNCO, Armenia's national forestry administrator.

Green areas: EcoLur's assessment

- ✓ Yerevan Municipality has not yet reached the green area per capita target for 2022 set in the GCAP.
- ✓ Yerevan has lost a significant amount of its green areas and currently has insufficient open spaces for large-scale afforestation.
- ✓ Forest land is being developed to compensate for the infeasibility of forest restoration in the capital.