

**ADAPTATION & MITIGATION  
BLENDED**

<b>PROJECT NAME</b>	<b>Alexandria West Wastewater Treatment Plant Extension and Upgrade<sup>1</sup></b>
<b>COUNTRY/REGION</b>	Egypt
<b>SECTOR</b>	Wastewater; climate adaptation
<b>PROJECT/INVESTMENT AMOUNT</b>	EUR 184.5m (USD 186.3 m)
<b>DEVELOPMENT PARTNER(S)/STAKEHOLDERS</b>	EIB, EU
<b>COUNTERPARTY MINISTRY/ INSTITUTION</b>	Construction Authority for Potable Water and Wastewater is the Project promoter; Arab Republic of Egypt is the client/borrower
<b>INVESTOR(S) AND FUNDERS</b>	EIB
<b>GUIDEBOOK TAXONOMY FINANCIAL SYSTEM ACTOR</b>	Bilateral, Multilateral & Development Finance Institutions
<b>PROJECT OVERALL GOAL</b>	The Project concerns the capacity increase and treatment level upgrade of the existing Alexandria West Wastewater Treatment Plant (WWTP). The upgrade of the WWTP's treatment level from primary to secondary will improve the quality of effluent from the plant and contribute to the depollution of the adjacent Lake Maryout as well as the Mediterranean Sea.
<b>PROJECT OUTCOMES</b>	Currently the average flow to Alexandria West WWTP is 409.206 m3/d with an average BOD load of 262,953kg/d. The upgraded plant will treat an average flow of 600,000 m3/day while a SOD load of 306,000kg/d will be treated to acceptable standards. The existing Alexandria WWTP, located next to Lake Maryout, which lies 3 metres below sea level, has already experienced operational difficulties due to flooding during heavy storms. Investments are required to modify the existing operational pumping station in order to make it resilient to flooding (climate adaptation). Also, for this project facilities related to the sludge methane capture and energy recovery have been considered to contribute to climate mitigation through the generation of renewable energy. The cost of the facilities corresponds to 31.4% of the overall investment cost.
<b>ALIGNMENT WITH COUNTRY IDENTIFIED CLIMATE STRATEGIES, NDCs, ETC. (IF APPLICABLE)</b>	The extension and upgrade of the Alexandria West WWTP is included as one of the top priority projects in the National Action Plan (NAP) prepared by the Government of Egypt in 2015. The Project will support the depollution of Lake Maryout and the Mediterranean Sea and potentially provide an additional source of water and thus improve the economic situation for fishery, agriculture/forestry and tourism in the area. The project is also expected to improve the health and environmental situation of the people living in the Governorate of Alexandria.
<b>CONTRIBUTION OF THE PROJECT TO THE UN SDGs</b>	<ul style="list-style-type: none"> <li>● SDG 13: Climate Action</li> <li>● SDG 6: Clean water and sanitation</li> <li>● SDG 11: Make cities inclusive, safe, resilient and sustainable</li> <li>● SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development</li> </ul>
<b>SOCIOECONOMIC IMPACT</b>	This project is derived from Egypt's National Action Plan (NAP) in the context of the Barcelona Convention for the depollution of the Mediterranean Sea. It focuses on one of the major urban centers of Egypt and is expected to contribute to improving the living

<sup>1</sup> This case was provided by the European Investment Bank (EIB) as a contribution to the Sharm El-Sheikh Guidebook for Just Financing

	<p>standards of the population, public health, environmental conditions, as well as enhance local economic activities (e.g., tourism and fisheries).</p> <p>The secure provision of clean water is a basic public service that is essential for reaching basic health standards and improving quality of life. The project targets Alexandria, a city with a rapidly increasing population, and supports economic development and social cohesion.</p>
<b>ENVIRONMENTAL IMPACT (ON CLIMATE MITIGATION AND/OR ADAPTATION)</b>	<p>The project has a strong climate action mitigation component, due to the generation of renewable energy in the form of biogas from the sludge produced from the treatment of the wastewater. The biogas will be captured and used to generate electricity for the operation of the WWTP. It is estimated that the expanded and upgraded plant will use the same amount of electricity from the grid as is currently used by the existing plant.</p> <p>In addition, investments are required to modify the existing operational pumping station in order to make it resilient to flooding. The measures include the replacement of pumps with submersible pumps and the installation of a stand-by electricity generator.</p>
<b>ENABLING ENVIRONMENT (SUPPORTING POLICIES)</b>	<p>The project is one of the priority projects identified in the Egyptian National Action Plan (NAP) in the context of the Barcelona Convention to protect the Mediterranean Sea against pollution. The project is also in line with the Alexandria Wastewater Master Plan of 2008 (and reviewed in 2011). The project will also support the Government's efforts in modernising and improving the water and sanitation sector.</p>
<b>TECHNICAL ASSISTANCE (IF PROVIDED)</b>	<p>Project preparation has been supported by the Mediterranean Hot Spots Investments Programme - Phase II (MeHSIP II), an EU-funded TA programme managed by the EIB and focusing on preparation of investment projects in the environment sector in the Southern Neighbourhood. The feasibility study was funded through the Climate Action in the Middle East and North Africa (CAMENA) envelope under the FEMIP TF, which was funded by the UK's Department for International Development (DFID). An international consulting firm was appointed to prepare a feasibility study and to identify the required investments for the expansion and upgrade of Alexandria West WWTP.</p> <p>An investment grant of up to EUR 20m from the EU's Neighbourhood Investment Platform (NIP) will co-finance the project. The NIP contribution will be required to ensure sufficient concessionality of the financing package and to provide incentives to include an energy recovery and sludge digestion component in the project scope. The energy recovery component allows the project to achieve higher economic benefits, enables the future operator to save costs during the plant's operation, and entails greenhouse gas emissions savings - the EU grant is thus characterised by significant economic, financial and environmental additionality. The grant component also has enabled the inclusion of specific loan covenants related to tariff reform and cost recovery, thus supporting the long-term sustainability of the project as well as sector reform.</p>
<b>FINANCING MODEL/APPROACH (EX: BLENDED FINANCE)</b>	<p>The project is financed by the EIB and the EU provides a guarantee.</p> <p>Sovereign Loan by EIB to the Arab Republic of Egypt in an amount of EUR 120m, with an investment grant of EUR 20m from the European Union's Neighbourhood Investment Platform (NIP). The EU provides a guarantee on the loan as well as TA for the project preparation and implementation.</p>
<b>RATIONALE FOR FINANCING MODEL/APPROACH</b>	See above
<b>FINANCIAL INSTRUMENT(S) (LOANS (COMMERCIAL/ CONCESSIONAL), EQUITY, GUARANTEE)</b>	Loans, TA and investment grants and guarantee
<b>DIAGRAM OF THE FINANCING STRUCTURE</b>	Not provided.

### Executive Summary

The Project concerns the capacity increase and treatment level upgrade of the existing Alexandria West Wastewater Treatment Plant (WWTP) in the city of Alexandria in Egypt. The WWTP was constructed in the early 1990s and up to this day operates only at primary treatment level. Over the years, this has led to high levels of pollution in the adjacent Lake Maryout as well as El-Mex Bay and, ultimately, the Mediterranean Sea.

Considering the current environmental situation in Lake Maryout as well as given the Egyptian national standards for wastewater treatment, a higher level of treatment is necessary. In addition, the WWTP is nearing its design capacity of 462,000 m<sup>3</sup>/day due the population growth in the plant's catchment area. An extension of the plant's design capacity to 600,000 m<sup>3</sup>/day is necessary to service the needs of the catchment area until 2050. The Project will thus increase the plant's design capacity and will upgrade the level of treatment of the Alexandria West WWTP to secondary (biological) treatment.

The Project will also include sludge treatment and digestion to allow for bio-energy generation. The energy generated by the sludge digestion will recover about 80% of the power consumption needed for the plant's operation and thus contribute to the financial sustainability of the project. The sludge digestion will also entail important greenhouse gas (GHG) emission reductions, thus ensuring that the project makes a significant contribution to climate change mitigation.

It is foreseen that through this project the following results will be achieved:

- Upgrade of the Alexandria West WWTP's treatment level from primary to secondary treatment;
- Increase of the treatment capacity of the WWTP from 462,000 m<sup>3</sup>/day to 600,000 m<sup>3</sup>/day;
- Ensuring that wastewater is treated to acceptable levels for the population in the plant's catchment area up until the year 2050;
- Overall generated energy at the WWTP through the digester provides approximately 80% of the energy required to operate the WWTP;
- Up to 1 500 000 persons will benefit from improved sanitation services;
- Improved quality of surface water in Lake Maryout, El Mex Bay and the Mediterranean Sea;
- Climate change mitigation through avoided GHG emissions and renewable energy generation;
- Climate change adaptation through measures to make the WWTP more resilient to flooding;
- Positive economic externalities through the improvement of the economic situation for fishery and tourism in the area and avoided public health costs.

## Analysis

<p><b>WHAT MADE THIS PROJECT SUCCESSFUL?</b></p>	<p>The combination of sovereign loan, investment grant, guarantee and TA, as well as close collaboration between the relevant national ministry and the financier facilitated the project and the provision of clean water as a public service.</p> <p>The NIP programme investment grants serve to mobilise investment from DFIs/ MDBs in the EU, such as, in this case, the EIB.</p> <p>On a regional scale, this project will support the depollution of Lake Maryout and the Mediterranean Sea. The secondary treatment capacity will potentially provide an additional source of water and thus improve the economic situation in the area. This project will also improve the health and environmental situation of the people living in the Governorate of Alexandria.</p>
<p><b>TO WHAT EXTENT IS THIS MODEL SCALABLE?</b></p>	<p>The project is scalable as need for sustainable water treatment and infrastructure will increase in growing urban areas.</p>
<p><b>WHAT ARE THE NECESSARY CONDITIONS TO MAKE IT REPLICABLE IN OTHER COUNTRIES/REGIONS?</b></p>	<p>This project was facilitated with an investment grant from the EU Neighbourhood Investment Platform, to leverage the EIB loan. Only EU partner countries covered by the neighbourhood policy are eligible for this type of financing. However, the broad structure is replicable given the presence of organizations able to provide the necessary grants and concessional finance. The EIB requires a guarantee to lend outside of the EU.</p>
<p><b>CONSTRAINTS/DRAWBACKS OF FINANCING MODEL</b></p>	<p>Required EU guarantee de-risk the project for the EIB sovereign loan. If inappropriately applied, there is a risk of crowding out private investors with cheap concessional capital. However, this model can be helpful for improvements with high social but low financial benefits.</p>
<p><b>LESSONS LEARNT</b></p>	<ul style="list-style-type: none"> <li>● As the project is still in implementation it is difficult to draw out definitive lessons learnt, but it is clear that:             <ul style="list-style-type: none"> <li>○ Embedding technical assistance for project preparation in the financing package is effective</li> <li>○ Aligning climate goals and national development goals is essential.</li> <li>○ Projects can have mutually beneficial outcomes for lender and borrower and strong alignment of interests. National development priorities and</li> </ul> </li> </ul>

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positive trans-national impacts and public goods (protecting the Mediterranean),

