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► CASE STUDY

Wastewater Processing Facility



Project Overview

- **Components:** Sewage treatment plants, sludge processing, recycling systems
- **Objective:** Reduce water pollution and improve sanitation



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Financial Feasibility (Considering Affordability & Government Resale Model)

Parameter	Value (PGK)	Value (USD) (1 PGK ≈ 0.27 USD)
Current PNG Sewage Tariffs (2023)	Band-1: K1.00/m³	\$0.27/m³
Proposed Wholesale Tariffs (Govt. Buys from Investor)	Year 1-5: K0.90/m³ Year 6-10: K1.00/m³ Year 11-20: K1.20/m³	Year 1-5: \$0.24/m³ Year 6-10: \$0.27/m³ Year 11-20: \$0.32/m³
Proposed Retail Tariffs (Govt. Resells to Public)	Year 1-5: K1.00/m³ Year 6-10: K1.20/m³ Year 11-20: K1.60/m³	Year 1-5: \$0.27/m³ Year 6-10: \$0.32/m³ Year 11-20: \$0.43/m³
Estimated Revenue (Wholesale - Investor to Govt.)	Year 1-10: K28M - K55M/year	Year 1-10: ~\$7.56M - \$14.85M/year
Estimated Revenue (Retail - Govt. Resale to Public)	Year 1-10: K32M - K65M/year	Year 1-10: ~\$8.64M - \$17.55M/year
CAPEX (Capital Expenditure)	K400M - K1B	\$108M - \$270M
OPEX (Operational Expenditure per year)	K20M - K80M/year	\$5.4M - \$21.6M/year
10-Year ROI (Investor Returns on Wholesale Pricing)	~9.5%	~9.5%
20-Year ROI	~21%	~21%
Breakeven Period	~9-10 years	~9-10 years
IRR (Internal Rate of Return)	~8.5% - 11.0% over 20 years	~8.5% - 11.0%

Rationale:

Lower Wholesale Prices for the PNG Government:

- Investor sells sewage services at K0.90 - K1.20/m³ to allow the government to resell at a margin while keeping public rates low.
- This ensures the government buys at a cheaper rate than the current K1.00/m³ residential tariff.

Affordable Retail Pricing for PNG Public:

- The government resells at K1.00 - K1.60/m³ to cover costs while ensuring affordability.
- Pricing gradually increases over time to reflect inflation and operational cost growth.

This modelling ensures the financial model aligns with the actual PNG sewage tariff structure while maintaining feasibility for investment and government resale affordability.



Case Study: Belgrade Central Wastewater Treatment Plant

<https://smartwatermagazine.com/news/smart-water-magazine/chinas-cmec-build-eu771-million-wastewater-treatment-unit-serbia> <https://balkangreenenergynews.com/chinas-cmec-to-make-main-belgrade-wastewater-treatment-unit-sewage/>



- Location:** Belgrade, Serbia
- Project Value:** Approximately €771 million
- EPC Contractor:** China Machinery Engineering Corporation (CMEC)
- Scope:** The project involves the development of a comprehensive sewerage system, including the construction of a central wastewater treatment facility. This initiative aims to eliminate 80% of the wastewater currently discharged into the Sava and Danube rivers, significantly improving the environmental conditions of these waterways. The new plant is designed to serve approximately 1.5 million residents, addressing the needs of the one-third of Belgrade's population that previously lacked access to a proper sewage system.

This project is a cornerstone in Belgrade's efforts to modernize its infrastructure and aligns with broader environmental objectives to reduce pollution in major European rivers.

Water Usage and Sewerage Disposal

This Schedule relates to the maximum Water and Sewerage rates for all Water Supply and Sewerage Services supplied by Water PNG. Subject to the above Conditions for Tariff Approval, the maximum prices which may be charged by Water PNG in respect of any accounts issued on or after 1st January 2023 (other than arrears which may only be charged at the maximum prices prevailing when those charges were incurred) are as follows:-

SCHEDULE 1		
	Services	Tariff
1.0	Water Supply	
1.1	0.1 to 30 Kilolitres (Band 1)	K1.45 per kilolitre
1.2	Above 30 Kilolitres	Water PNG can charge any price, along any categories so long as the average prices charged does not exceed the maximum average price of K4.16 per kilolitre
2.0	Sewerage	
2.1	0.1 to 30 Kilolitres (Band 1)	K1.00 per kilolitre
2. 2	Above 30 Kilolitres	Water PNG can charge any price, along any categories so long as average prices charged does not exceed the maximum average price of K3.12 per kilolitre

Miscellaneous Services & Charges

This relates to the Miscellaneous services which include, reconnections, standby, head works and trade wastes relating to water and sewerage services. Water PNG can charge any price on its miscellaneous services so long as the average prices do not exceed the maximum average price of K4.16 for water-related service and K3.12 for sewerage-related services.

Source:Gazette-No-G8-of-2023-Water-Sewerage-Services-Prices-Order-2023-WATER-PNG-LIMITED <https://iccc.gov.pg/wp-content/uploads/2023/08/Gazette-No-G8-of-2023-Water-Sewerage-Services-Prices-Order-2023-WATER-PNG-LIMITED.pdf?>
1 kL=1 m3=1,000 liters (L)