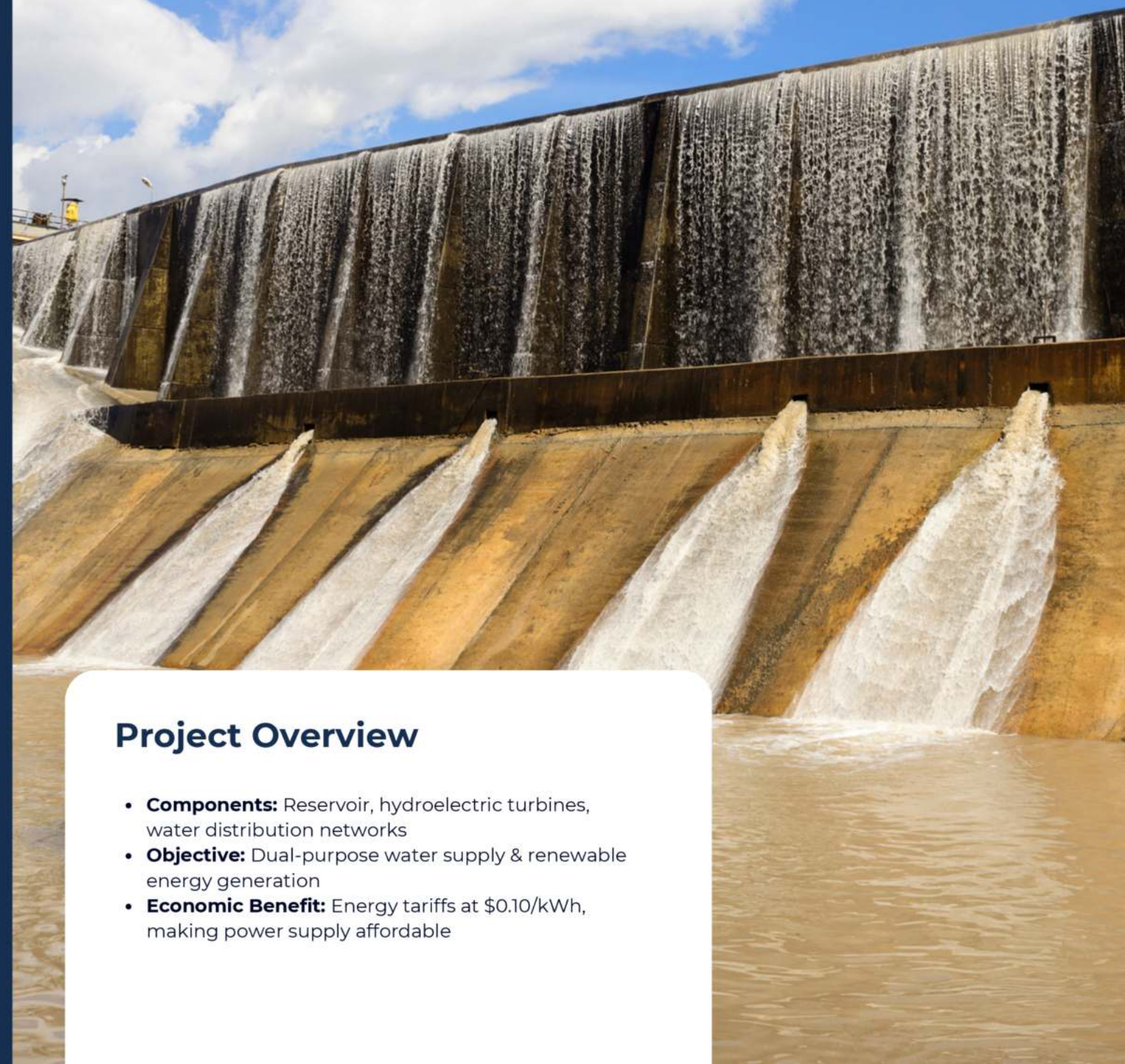




Sustainable World
Organization

► CASE STUDY

Dam for Drinking Water Feed + Hydropower Integration



Project Overview

- **Components:** Reservoir, hydroelectric turbines, water distribution networks
- **Objective:** Dual-purpose water supply & renewable energy generation
- **Economic Benefit:** Energy tariffs at \$0.10/kWh, making power supply affordable



Sustainable World
Organization

www.sustainableworldorganization.com

Financial Feasibility

Parameter	Value (USD)
Proposed Tariffs	\$0.10/kWh, indexed increase post-10 years
CAPEX	\$1B - \$2.5B
OPEX	\$30M - \$75M/year
10-Year ROI	~16.5%
20-Year ROI	~32.7%
Breakeven Period	~6-7 years

Revenue Projections & IRR
Assuming fixed tariffs at USD 0.10/kWh

Capacity	Annual Power Output (MWh)	Annual Revenue (@ \$0.10/kWh)
1GW Hydro	3.94M	\$394M
2.5GW Hydro	9.85M	\$985M

Case Study: Goubassi Hydroelectric Dam Project

https://africa-energy-portal.org/news/senegal-mali-cmec-build-goubassi-hydroelectric-dam



The Goubassi Hydroelectric Dam Project on the Falemé River, led by China Machinery Engineering Corporation (CMEC), is a significant example of how hydropower projects can be designed to integrate multiple benefits, including electricity generation, water storage, and socioeconomic development. Below is a detailed breakdown of the project based on the information provided:

Project Overview

- Location:** Falemé River, along the Senegal-Mali border.
- Project Value:** Approximately €243 million.
- Scope:** Construction of an 18 MW hydroelectric dam with additional benefits for water storage, agriculture, navigation, and drinking water supply.

Key Features of the Project

Hydropower Generation:

- The dam will have a capacity of 18 MW, contributing to improved electricity access in both Senegal and Mali.
- Hydropower is a renewable energy source, aligning with global sustainability goals and reducing reliance on fossil fuels.

Water Storage and Management:

- The dam will store approximately 2.1 billion cubic meters of water, ensuring a stable water level in the Senegal River.
- This water storage capacity supports multiple uses, including:
 - Agriculture: Providing irrigation water for farming activities, enhancing food security in the region.
 - Navigation: Maintaining water levels to facilitate river transport and trade.
 - Drinking Water Supply: Ensuring a reliable source of clean water for local communities.

Socioeconomic Benefits:

- The project is expected to create over 10,000 local jobs during its implementation phase, providing employment opportunities and boosting the local economy.
- Improved access to electricity and water will enhance the quality of life for communities in the region.

Environmental and Social Considerations:

- The project likely underwent a comprehensive Environmental Impact Assessment (EIA) to address potential environmental and social impacts, such as:
 - Displacement of local communities.
 - Effects on river ecosystems and biodiversity.
 - Mitigation measures to ensure sustainable water and land use.

EPC (CMEC) Role

- As the lead contractor, CMEC is responsible for the design, procurement, and construction (EPC) of the dam.
- CMEC's expertise in large-scale infrastructure projects, particularly in the renewable energy sector, ensures the project is delivered efficiently and to international standards.
- The project aligns with CMEC's broader strategy of supporting sustainable development and infrastructure projects in Africa, often under frameworks like China's Belt and Road Initiative (BRI).

Broader Implications

Regional Development:

- The Goubassi Hydroelectric Dam Project contributes to regional integration by benefiting both Senegal and Mali, fostering cross-border cooperation.
- It supports the Senegal River Basin Development Organization (OMVS), which aims to manage shared water resources for mutual benefit.

Renewable Energy and Climate Goals:

- The project aligns with global efforts to promote renewable energy and combat climate change by reducing greenhouse gas emissions.
- It also supports the energy transition goals of Senegal and Mali, which are investing in renewable energy to meet growing electricity demand.

Water-Energy-Food Nexus:

- The project exemplifies the water-energy-food nexus, where infrastructure development addresses multiple interconnected challenges, including energy access, water security, and food production.

Challenges and Considerations

- Environmental Impact:** While the project offers significant benefits, it may also pose environmental challenges, such as altering river ecosystems and affecting downstream water availability.
- Social Impact:** The displacement of local communities and changes in land use must be managed carefully, with adequate compensation and resettlement plans.
- Financial Sustainability:** Ensuring the project's long-term financial viability and maintenance is critical for its success.

Conclusion

The Goubassi Hydroelectric Dam Project is a prime example of how hydropower infrastructure can be designed to deliver multiple benefits, including renewable energy generation, water storage, and socioeconomic development. CMEC's involvement highlights its capability to execute complex, multi-purpose projects that align with sustainable development goals. By addressing environmental and social challenges, the project has the potential to significantly improve the quality of life for communities in Senegal and Mali while contributing to regional development and climate resilience.