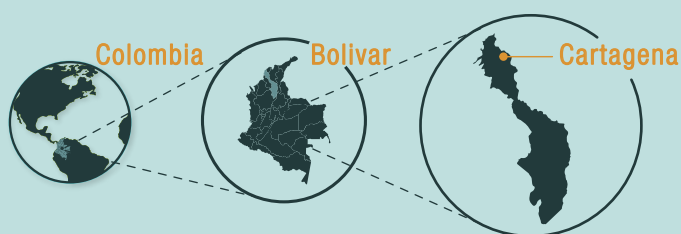


TECHNICAL AND FINANCIAL FEASIBILITY ANALYSIS OF AN ENERGY DISTRICT PROJECT

FOR THE INTERCONTINENTAL HOTEL AND
NAO SHOPPING CENTER IN CARTAGENA
DE INDIAS, COLOMBIA.



GENERAL DESCRIPTION/BASELINE SCENARIO

The Intercontinental hotel has an average demand of 220 TR for air conditioning; the cooling system installed has 1,140 TR capacity. This evidently oversized system could provide cooling for their own demand and for its neighbors. The measured efficiency of the existing plant is 1.01 kW/TR.

The NAO shopping center adjacent to the hotel requires 62 TR on average, and operates with conventional direct expansion equipment, which offers an efficiency of 1.54 kW/TR.

Additionally, within a perimeter of 300 meters, there is the Almirante hotel with a cooling demand of 150 TR – 2kW/TR, and the Zi One Luxury Hotel with 100 TR of air conditioning demand provided by direct expansion equipment.

ENERGY DISTRICT PROJECT

Energy District service end-users: Commercial premises and hotel facilities:

- Hotel Intercontinental in Bocagrande
- NAO Shopping Center
- Neighboring hotels

Energy District Application: Use of installed capacity at the Intercontinental hotel to supply chilled water for air-conditioning of spaces in the NAO shopping center. (brown-field).

Renewable Energy: Eventual use of the temperature gradient available in the bay waters to recirculate 54,000 gal/hour and aerate the “Laguito”, replacing drinking water consumption and reducing energy consumption in the project's condensation systems.

Type of Energy District project: Existing buildings (Brown-field).

Energy District Status: Technical-financial feasibility studies.

Proposed Energy District scenario: It is proposed to take advantage of the installed chilled water generation capacity at Hotel Intercontinental (2 chillers of 600TR each), adding 300 new TR equipment to ensure system reliability. In a second phase, the connection of Almirante and Zi-One would require a second 300TR chiller for a total of 1,800TR. In an optimal operating scenario, an efficiency of 0.72 kW/TR is projected.



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PROJECT BENEFITS

Energy Benefits: The potential savings in electricity consumption is 29%, or 1,887 MWh/year, which represents a reduction in electricity costs for cold production of COP \$121,567 million over 20 years (USD \$30.4 million).

Environmental Benefits: The total reduction of GHG emissions could be 4,443 tonCO₂eq/year (considering emissions from energy consumption and emissions from refrigerant leaks).

ECONOMIC INDICATORS

The Investment Project for end users has the following characteristics:

- **CAPEX:** COP \$14,955 million (USD \$3.7 million).
- **Investor NPV:** COP \$9,632 million (USD \$2.4 million).
- **Operator NPV:** COP \$3,153 million (USD \$0.8 million).
- **Hotel NPV:** COP \$10,000 million (USD \$2.5 million).

*COP: Colombian Pesos

PROJECT SWOT ANALYSIS

Strengths: Strategic location with current demand and projected growth of the sector for short-term implementation.

Weaknesses: The project is highly sensitive to the USD/COP exchange rate and the interest rate index.

Opportunities: Expansion of the outsourced cooling service to all hotels in the Bocagrande sector. (20 + Hotels).

Threats/Challenges: The implementation of the project must be carried out with the least disruption to the daily activities of the tourist area of Bocagrande. The project requires permits from local authorities for streets interventions to build the connection line between Hotel Intercontinental and Hotel Almirante, as well as environmental licenses for the eventual recirculation and re-oxygenation of the waters of the “Laguito.”

NORMATIVE FRAMEWORK

The project would be implemented through a non-regulated, private-to-private service contract, and may choose to apply the energy efficiency tax benefits to the hotel and shopping center HVAC systems.

NEXT STEPS

Project presentation to potential investors.



CONTACT INFORMATION

UNIDO Energy Districts Project in Colombia
 Mrs. Cristina Mariaca M.Sc | h.mariacaorozco@unido.org
 Mr. Ricardo Baquero M.Sc | r.baquero@unido.org

Eficiencia Energética Estratégica
 info@eficienciaenergetica.co