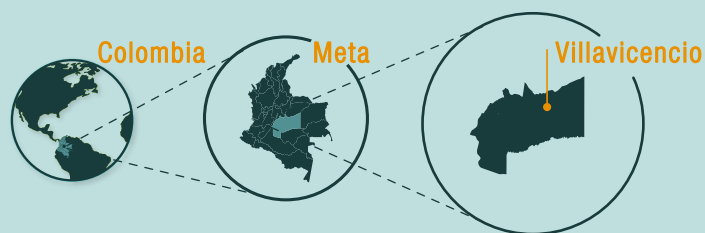


TECHNICAL AND FINANCIAL FEASIBILITY ANALYSIS OF AN ENERGY DISTRICT PROJECT

IN THE FACILITIES OF CLÍNICA PRIMAVERA IN VILLAVICENCIO, COLOMBIA



GENERAL DESCRIPTION/BASELINE SCENARIO

Clínica Primavera operates its own HVAC equipment, to supply a peak demand of 206 TR. The system is composed by two chillers providing 146 TR, and additional 70 TR produced by direct expansion equipment (mini splits).

The current efficiency of cold production for space conditioning is 1.23 kW/TR.

COOLING AS AN OUTSOURCED SERVICE SOLUTION FOR THE SUPPLY OF AIR CONDITIONING

Energy District Designer and Operator: Llanogas.

Energy District service end-users: Clínica Primavera.

Energy District Application: Connection of Clínica Primavera to the Potenza cooling plant for the outsourcing of the chilled water supply service for air conditioning.

Type of Energy District project: Connection to urban cooling network (extramural) of existing building (brown-field).

Renewable Energy: Groundwater as a substitute for cooling towers in the Potenza cooling plant.

Energy District Status: Potenza's cooling-plant in operation. And Llanogas/Potenza's commercial proposal for Clínica Primavera, in preparation.

Proposed Energy District scenario: The Cooling as a Service (CaaS) proposal to supply chilled water from ED-Potenza to Clínica Primavera involves replacing Primavera's old chillers with a connection to the chilled water circuit produced at ED-Potenza 200m away, with an overall efficiency of 1.02 kW/TR, including pumping system. The primary energy source at ED-Potenza is natural gas, used for cogeneration of electricity and heat, which is used in an absorption machine to improve the overall efficiency of the system.



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PROJECT BENEFITS

Energy Benefits: The savings in electricity consumption would be 17.3%, or 208,979 kWh/year.

Environmental Benefits: Total GHG emissions reduction would be 26 tonCO₂eq/year (considering emissions from energy consumption and emissions from refrigerant leakage including cooling plant and end users).

ECONOMIC INDICATORS

CAPEX for the developer:

The investment for the retrofit of Clínica Primavera is USD \$878,383, including equipment, civil, mechanical and electrical works.

The IRR of the project at 20 years for the investor is 30.3% with a NPV of USD \$1,328,424 and a simple 3-year payback period.

The Financial Project for end users has the following characteristics:

- 76% reduction in electricity costs for cold production for Clínica Primavera, equivalent to USD \$155,527 /year.
- The clinic's investment is USD \$128,252, which, over 20 years, generates 11.7% of financial savings for the clinic, with a NPV of USD \$338,364.

PROJECT SWOT ANALYSIS

Strengths: The current cold production equipment is highly inefficient due to its age of use and control system settings. This allows us to offer the clinic great savings, which in turn maximizes the operating efficiency of the current Potenza plant.

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

Opportunities: The replacement of the Primavera Clinic equipment would be ED-Potenza's second client, and the first client located outside the perimeter of the Potenza real estate project, thus being a referent at municipal, regional, and national level.

Threats/Challenges: The implementation of the project must be carried out with the least disruption to the clinic's daily activities. The project requires permits from local authorities to make street interventions and build the connection line between Potenza and Clínica Primavera.

NORMATIVE FRAMEWORK

The project would materialize through an unregulated, private-to-private service contract, and may opt for the national government energy efficiency benefits applied to the clinic's HVAC systems.

NEXT STEPS

Presentation of service proposal by Llanogas, negotiation and finalization of the contract between Llanogas-Potenza and Clínica Primavera.



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