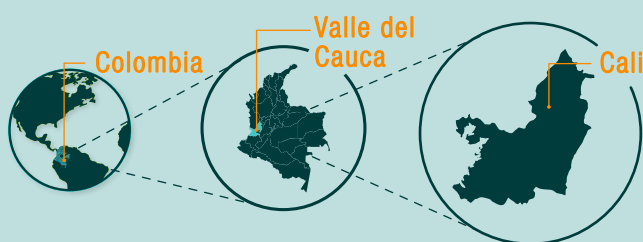


TECHNICAL AND FINANCIAL FEASIBILITY ANALYSIS OF AN ENERGY DISTRICT PROJECT

FOR AN HOSPITAL CAMPUS AND AN INDUSTRIAL
FACILITY IN SOUTHERN CALI, COLOMBIA



Energy District Application: Solution for the implementation of a centralized chilled water plant to supply 7 buildings of Fundación Valle de Lili, and interconnection for cold supply as an outsourced service to the industrial Femsa plant in southern Cali.

BASELINE SCENARIO/GENERAL DESCRIPTION

The aggregate cooling demand of Fundación Valle de Lili (FVdL), FEMSA and Jumbo Store is 220,095 TRh/week, which operates with efficiencies of 0.85 kW/TR, 1.15 kW/TR and 1.16 kW/TR respectively.

IMPLEMENTATION OF CENTRALIZED COLD GENERATION SYSTEM

Energy District Developer: Gases de Occidente.

Energy District service end-users: Hospital facilities and food industry:

- Fundación Clínica Valle de Lili (FVdL).
- Femsa.

Renewable Energy: 2,875 kWp of Solar PV will be necessary to offset emissions from gas cogeneration system, and chilled water storage tank.

Type of Energy District project: Cooling as a Service solution in existing buildings (brown-field).

Energy District Status: Basic engineering presented to FVdL and Femsa. Gases de Occidente staff is preparing a technical-commercial proposal for potential clients.

Proposed Energy District scenario: The project proposes two complementary solutions. Operating a 2 MW electric cogeneration plant, 1,170 TR electric chillers and 540 TR in absorption chillers, for a total installed capacity of 1,710 TR and a 2,500 TRh chilled-water storage tank.

In a first stage, the electric power and cooling demand of Fundación Valle de Lili (FVdL), Femsa and, eventually a Jumbo store as a possible third customer, is supplied.

The proposed chilled water plant would operate with an efficiency of 0.7 kW/TR.

PROJECT BENEFITS

Energy Benefits: 50% reduction in electric energy consumption.

Environmental Benefits: The total reduction of GHG emissions could be 130 tonCO₂eq/year (considering emissions from energy consumption and emissions from refrigerant leaks).

ECONOMIC INDICATORS

The financial project for end users has the following characteristics:

- Total CAPEX for implementation: COP \$49,500 million (USD \$12 million)
- OPEX: COP \$6,300 million/year (USD \$1.5 million/year)

The IRR of the project is 11%, with a NPV of COP \$416 million (USD \$104,000) and a simple payback period of 20 years.

*COP: Colombian pesos

PROJECT SWOT ANALYSIS

Strengths: The project takes advantage of the constantly growing dynamics of FvDL's operations, whose CAPEX and OPEX costs could benefit from the existence of a cooling district. Currently, both companies are customers of Gases de Occidente.

Weaknesses: The project uses natural gas as its primary energy source. This presents great opportunities in energy efficiency that reduce operating costs, but it generates GHG emissions, which must be offset by installing photovoltaic capacity in a remote location, or by purchasing "clean" energy certificates.

Opportunities: The calculated profitability of the project can be substantially improved through a progressive/phased implementation and the search for additional clients.

Threats/Challenges: The implementation of the project requires permits from Urban Planning, and must be carried out with the least disruption to the daily activities of the clinic and the production process at Femsa. The implementation of the PV system results in a high CAPEX. The location of the district's chilled water plant requires additional studies.

NORMATIVE FRAMEWORK

The project is eligible to apply for tax benefits under the law for energy efficiency projects.

NEXT STEPS

Preparation by Gases de Occidente of individual offers to clinic and industry, and support for negotiation and closing of contracts.



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

BT Consultores
Mr. Andrés Velasquez
aavelasquez@bt-consultores.com