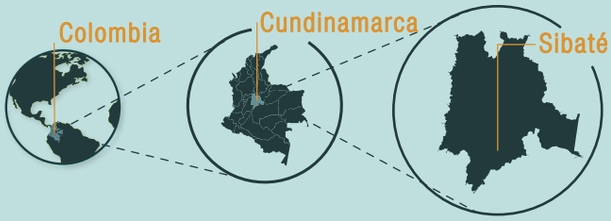
TECHNICAL AND FINANCIAL FEASIBILITY ANALYSIS OF AN ENERGY DISTRICT PROJECT

FOR THE ASOMUÑA INDUSTRIAL AREA IN SIBATÉ, CUNDINAMARCA, COLOMBIA

DISTRITOS TÉRMICOS
COLOMBIA



GENERAL DESCRIPTION/BASELINE SCENARIO

The industrial association of Asomuña gathers a large number of closely located manufacturing industrial facilities, which currently use natural gas as their primary energy source for operating furnaces and boilers, and even coal and fuel-oil for some specific applications.

The District Heating Interconnection project envisages the use of biomass collected by ENEL during the pruning and felling of trees in Bogotá (19,200 tons/year), which is currently disposed as waste.

Baseline energy consumption: 118,500 GJ/month of natural gas and other fossil fuels.

ENERGY DISTRICT SOLUTION FOR INDUSTRIAL AREA

Energy District designer: TECSOL S.A

Energy District developer and operator: ENEL Colombia.

Energy Districts service end-users: Association of Entrepreneurs of Sibaté, Soacha and the south of Bogotá - Asomuña (companies selling surplus such as Proalco and Diaco, and companies using energy from the district such as, Eternit, Proalco, Pavcol and Limor).

Energy District Application: Centralized generation, waste heat recovery and distribution for industrial applications.

Renewable Energy: Use of urban biomass, today treated as waste without valorization.

Type of Energy District project: District heating solution for existing industrial facilities (Brown-field).

Energy District Status: The project is currently under analysis by ENEL- Colombia.

Proposed Energy District scenario: Waste heat recovery from a steel plant (Diaco and Proalco), complemented with the utilization of residual biomass, to be used as energy source for thermal oil heating at 300°C and hot air for users with medium-temperature heat requirements.

The energy district must provide 466 GJ/day of aggregated demand distributed among 4 users.

Heat distribution network: 5 km to the most remote user.

After characterizing the energy consumption of near-by potential users, it is proposed to take advantage of the significant amount and good quality waste-heat available in one of them to substitute fossil fuels currently used by other neighbors and leaving the use of biomass as a supplementary energy source for peak demand events or eventual interruptions in the natural gas supply.

The Project would allow the current combustion boilers to be replaced as a heat source in the 4 users, with the surplus heat recovered from two companies, and the use of residual biomass.

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PROJECT BENEFITS

Energy Benefits: The expected energy savings could be 9.4% - 11,150 GJ/month.

Environmental Benefits: The expected GHG emissions savings could be 9,500 tonCO2eq/yr.

ECONOMIC INDICATORS

- Total CAPEX: USD $2.7 million for the district heating plant and USD $1.2 million for the end-users retrofitting.
- NPV: USD $3.24 million for the district heat plant and USD $2.3 million for the district heat users.
- IRR: 20%-6% for the district heat plant and 25%-51% for the district heat users.
- Cost reduction in heat supply for users: 10% equivalent to COP $819 million/yr (USD $204,750/yr). The current cost of heat supply is approx COP $7,373 million/yr (USD $1,8 million/yr).

*COP: Colombian Pesos

PROJECT SWOT ANALYSIS

Strengths: Asomuña's leadership is in place to gather potential users and share the project's benefits.

Weaknesses: ENEL-Colombia, as the beneficiary of the study, has not yet decided to start the negotiation process with the prospective district users.

Opportunities: The study reveals financial and technical feasibility, which may be of interest to other developers or promoters of this infrastructure (natural gas utilities).

Threats/Challenges: Perfecting a service-fee structure and distribution of benefits that is attractive yet fair for both generators and users, as the project depends on a couple of key actors that will be even more profitable with the participation of key smaller users.

NORMATIVE FRAMEWORK

The users of ED Muña project are located along a national primary road. This implies the need for permits and easements for the construction of the distribution network. However, Asomuña has registered as an "Energy Community," complying with the new regulations issued by the national government, which should facilitate the permitting process. During the study, the municipal mayor's office was involved and was informed about the benefits of the energy solution and its contributions to territorial development.

NEXT STEPS

Encouraging ENEL to include the project in their upcoming business expansion plan.

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