

Pre-Feasibility Study of an Alternative Heat Supply for Ukrainka City

Project Background

Name of applicant	Ukrainka City Council
Project info/Project name	Pre-Feasibility Study of an Alternative Heat Supply for Ukrainka City
Contractor	Pöyry (AFRY) Finland Oy, Energy
Project duration	August 2019 - April 2020
Contract value	EUR 49,994

Project Summary

1 Project summary

The objective of the project was to conduct a pre-feasibility study on different options for alternative heat supply sources for the City of Ukrainka. All heat energy to the city's (population app. 21,000) District Heating (DH) system is supplied by Trypilska Thermal Power Plant (TPP), which has proven an undependable heat source in the last few years due to the unreliable supply of coal. The city does not have any alternative sources of heat energy; hence it is fully dependent on TPP.

The City of Ukrainka is looking for an alternative solution for an efficient DH system (for instance a small-scale heat-only boiler plant) that would diversify the city's heat supply options and introduce renewable fuels (most likely solid biomass). The pre-feasibility study addressed a least-cost heat supply alternative and included a comparison of a realistic new heat supply with the do-nothing alternative.

The pre-feasibility study was performed by Pöyry (AFRY) Finland Oy, and the consultant introduced a concept for the development of heat supply options, carried out a financial analysis, assessed biomass availability, and described legal and regulatory issues as well as environmental, health, safety and social impacts.

2 Project conclusions

Pöyry (AFRY) Finland Oy provided the following conclusions and recommendations:

- a. While the current heat supply from TPP continues, there are no realistic alternatives that would not substantially raise the tariff for district heating.
- b. The discussions with TPP's staff during the site visit in September 2019 gave no indication that the heat supply would be cut soon; however, there is a risk that the current tariff will rise due to possible ownership changes at the plant and tightening requirements for emission reductions.
- c. It is recommended that preparations are made for the biomass boiler investment in order to be ready when the project becomes mandatory or economically viable.
- d. It is recommended that the level of the green tariff for electricity production is checked in the feasibility study phase to find out if it would make a combined heat and power option viable. Electricity production is uneconomical on this scale without subsidies.
- e. While the current heat supply continues, it is recommended to keep improving the DH network, especially to get rid of the remaining hydro elevators and tune the substations to a lower temperature level for the returning DH water. This would enable a flue gas condenser to be added to the concept to make the investment more economically viable.
- f. Since there is a statistical deficit of biomass in the region, it is advisable to secure the contracts for supply before starting the project.

4 Impact on human rights and the UN's Sustainable Development Goals

The project would have a positive impact on human rights as it aims to support improvements in infrastructure and living standards, ensuring environmental sustainability and energy security, so that all consumers, including vulnerable groups, have access to affordable, reliable and modern energy services.

The pre-feasibility study covers the following SDGs:



5 Project deviations

The project was delayed for a few months due to the late provision of initial data by the beneficiary and thus, the assignment was prolonged.

6 Lessons learnt

The main lessons learnt by the Ukrainian party were that an alternative solution for an efficient DH system is not always the least-cost option. Under the given conditions of Ukrainka's district heating and the financial model assumptions applied, the project is economically unprofitable. The beneficial impacts on the local community and the environment are minor. The project helped provide an understanding that the idea of using the alternative heat supply source is good but should not currently be implemented if it causes a significant increase in the tariffs for consumers.

However, according to the project findings, Ukrainka City can still positively influence energy security within the current heat supply system by improving the DH network, eliminating hydro elevators and tuning the substations to a lower temperature level for the returning DH water, thus improving energy efficiency on the consumer side.

Overall, such studies are necessary for cities, as they are a good way to define or confirm the local energy strategy for district heating and energy efficiency, and they should be permanent practice for local authorities.