

Development of a feasibility study on the rehabilitation of the district heating system in the city of Vyshneve

Project background

Name of applicant	Communal Enterprise 'Vyshnivskteploenergo' (district heating utility in the city of Vyshneve)
Project info/Project name	Development of a feasibility study on the rehabilitation of the district heating system in the city of Vyshneve
Contractor	Planora Oy
Project duration	September 2019 - June 2020
Contract value	EUR 100,000

Project summary

1 Project summary

The objective of the project was to develop a feasibility study on the rehabilitation of the district heating system in the city of Vyshneve in the Kyiv region. The following investment measures were to be considered during the feasibility study: individual heat substations, rehabilitation of boiler plants (replacement of pumps and boilers, water treatment, automation upgrade, etc.) and other energy-efficiency measures. The final priority investment list was to be identified during the feasibility study. It was expected that Finnish expertise and technologies for district heating (DH) systems for medium-sized cities would facilitate the building of a modern DH system in Vyshneve.

The pre-feasibility study was performed by Planora Oy. Within the framework of the study, a description was produced and an assessment carried out of the current general situation of the heat supply in Vyshneve city and state of the heating systems of the housing and utility services sector. The study presents a long-term investment plan, priority investment programme (with procurement and implementation plans), financial model, and environmental and social assessment.

2 Project conclusions

The project aim was to design a priority investment programme (PIP) that would propose the optimal DH system upgrade with the highest cost and benefit ratio. Selected components of the PIP would improve critical areas of the DH system and ensure fuel, electricity and water savings, as well as better services for DH consumers. The PIP implementation would allow the company to benefit from savings in electricity costs, fuel, and CO₂ emission reductions, and consumers from reduced bills, which would not be based on norms but on actual consumption, thus incentivising consumers to save energy.

Main conclusions of the PIP:

1) The first priority of the PIP was to select consumer demand management components – installation of an individual heating substation, metering, consumer billing and consumer management. These components would ensure a reduction of energy losses, and electricity and water consumption, bringing savings for the company. A change from an open to a fully closed DH system would also help to control the DH supply more efficiently and reduce the overall O&M costs. For consumers, the benefits would be a more efficient DH supply, consumption-based billing, and improved DH and domestic hot water (DHW) temperature regimes and control over supply, and thus better heating services.

2) The second priority of the PIP was the components related to the DH supply – replacing poor pipeline sections and heat pumps, and installing SCADA- efficient and reliable booster pumps, which are critical to ensuring adequate heat supply to all parts of the city. A new SCADA is needed for efficient operation of the DH system, including control of the DH network and variable flow pumps.

3) The third priority of the PIP was the components related to generation assets – the introduction of biofuel boilers – however, the feasibility study showed that further biofuel-based generation is not feasible due to biomass availability constraints and a lack of connected consumers.

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

The project would positively impact 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 concerns the following SDGs:



4 Project deviations

The project was delayed for a few months due to the late provision of initial data by the beneficiary.

One of the anticipated PIP components 'Rehabilitation of the boilers and switch to renewable fuels' was no longer relevant because a major part of the heat energy is purchased from external sources that use renewable fuels. Thus, the PIP concentrated on network and end-use investments.

5 Lessons learnt

A feasibility study of this kind helps to analyse different development opportunities and requirements as well as benefits for the DH system. The study considered the perspectives of both consumers and heating companies, with the aim of ensuring carbon reduction, technical and economic feasibility and security of supply.

For historical reasons, DH utilities have various configurations. It is therefore complicated to predict optimal solutions in advance. Initially, the project was planned to be implemented through the Sweden-Ukraine District Heating (SUDH) programme, but the feasibility study has shown that the SUDH priorities (waste heat, interconnection and biofuel options) were not the optimal solution for the Vyshneve DH utility upgrade and thus not a priority for further funding under SUDH.

However, the Priority Investment Programme is quite promising and focuses primarily on electricity savings. It combines components that will ensure heating supply reliability as well as technical and economic feasibility. The project will seek further funding opportunities from NEFCO (outside of SUDH), EBRD, EIB and the World Bank as part of sovereign loan frameworks (through the Ministry for Communities and Territories Development).