

IMATRAN LÄMPÖ DH III (Twinning Digitalisation demo and Boiler analysis)

Project Background

Name of Applicant	Imatran Lämpö OY, Beneficiary: Vinnitsyamiskteploenergo
Project Info/Project Name	IMATRAN LÄMPÖ DH III (Twinning, Digitalisation demo and Boiler analysis)
Contractor	Imatran Lämpö OY
Project Duration	November 2021 – March 2023
Contract Value	€ 65,000.00

Project Summary

- 1 Project Summary**

The objective of the project was to transfer knowledge between two district heating companies and test KPA Unicon Oy's (Finnish boiler manufacturing company) cloud-based Digitalisation demo/software. The project addressed digitalisation of maintenance functions and fuel procurement.

The project scope included:

 1. Description and comparison of the working environment and maintenance and fuel procurement functions of Vinnitsyamiskteploenergo (the Beneficiary) and Imatran Lämpö
 2. Twinning sessions: two in Finland
 3. Digitalisation demo preparation and implementation
 4. Boiler analysis consultation with analysis report

- 2 Project Conclusions**

During the project, the biofuel market conditions and procurement systems in Finland and Ukraine were analysed and compared. Industrial scale use of biofuels has only begun in recent years in Ukraine; on the other hand, in Finland it has been common practice for a long time. Procurement of solid fuels for the Finnish energy industry is digitalised and organised systematically. Biofuels have only been deployed during the last five years in Vinnytsia.

Twinning: The main topics of knowledge transfer were maintenance functions and procedures for solid fuel purchase. This project gave both twinning companies new ideas for how to improve O&M functions, especially considering the major changes in the energy markets of Ukraine and Finland due to the war in Ukraine commenced by Russia.

Digitalisation demo: KPA Unicon Oy presented a cloud-based reporting system for both O&M and fuel purchasing functions. The pilot case covering the fuel procurement Digitalisation demo, including the reporting system for biofuel purchasing, was implemented by KPA Unicon for Vinnitsyamiskteploenergo.

Boiler analysis: Based on the data submitted by Vinnitsyamiskteploenergo and on the professional discussions held during the second twinning session of the Ukrainian delegation in Imatra, the experts of KPA Unicon conducted a study on the biofuel-fired boiler at the boiler plant in Vinnytsia. The study included an analysis of major problems in the boiler's operation and recommendations for potential quick, retrofit measures to improve the performance of the boiler (which would allow it to burn biomass with a higher moisture content). The boiler analysis showed that there is no need to make any technical modifications to the boiler itself or the grate to facilitate the use of low-quality fuels, and that the desired results might be possible with minor modifications to the fuel feeding system. Three alternatives have been developed based on factors such as investment cost estimates, long-term reliability and functionality of using low-quality fuel and availability of local components and installation capabilities.

- 3 Impact on Human Rights and the project's Sustainable Development Goals (SDGs)**

The project and related visits will have a positive impact on human rights by providing more efficient DH operations in Vinnytsia, which will consequently improve infrastructure and living standards, ensuring environmental sustainability and energy security.

Overall, the project had a positive impact on the following SDGs:



4 Project Deviations

The project was temporarily suspended in March 2022 because of Russia’s military attack on Ukraine. At Vinnitsyamiskteploenergo’s request and accounting for major changes in circumstances, the project was continued in September 2022 with an amended scope.

The fuel sourcing situation was completely changed due to the Russian attack, both in Ukraine and Finland. The boiler modification analysis was added to the project to meet the new challenges in Ukraine.

5 Project Lessons Learnt

Lessons learnt

Biofuel procurement: As of 2021, Imatran Lämpö demonstrates better fuel procurement efficiency and cost-effectiveness compared to Vinnitsyamiskteploenergo. This advantage is attributed to Finland’s robust forestry infrastructure and traditions, resulting in more affordable wood and peat biofuels. Notably, while Ukraine experiences similar biofuel and natural gas prices, Finland has a significant price disparity in favour of wood fuels. Both companies consider natural gas a viable alternative to biofuels. However, Imatran Lämpö’s fuel sourcing underwent a transformation in early 2022 due to the Russian invasion in Ukraine, prompting a shift from Russian imports to domestically sourced wood materials. This transition coincided with heightened market demand and subsequently increased costs for forest energy. On the other hand, Vinnitsyamiskteploenergo places greater emphasis on biofuel boilers as Ukraine scales back its reliance on subsidised natural gas.

Digitalisation demo: Even though the biofuel markets in Finland and Ukraine are quite different, it was noticed that KPA Unicon’s PlantSys digital platform was suitable for different demands. Some of development needs were identified and realised. In many ways this project was an example of successful twinning, as it provided significant insights into the differences between the Finnish and Ukrainian markets.

Benefits of the project

Vinnitsyamiskteploenergo became acquainted with heat production technologies that are new to Ukraine but have been proven in Finland, like Flue Gas Condensers that enable highly efficient combustion of low-quality bioenergy and new ways to conduct DH operations and customer relations.

The Digitalisation demo is scalable for companies of different sizes. The reported requirements of the Digitalisation demo can be used as a source of information for future projects. Consequently, the outcome, results and practices of the project and can be multiplied and applied in future projects.

Experts at Imatran Lämpö Oy gained new experience and benefited from outside expert views of their operations. Imatran Lämpö Oy received encouraging opinions on O&M and particularly on fuel handling processes, which are efficiently managed. However, due to sanctions imposed as a result of the war, the import of fuel from Russia was stopped, resulting in a significant change to the entire Finnish wood market (inc. bioenergy) as well as Imatran Lämpö’s procurement and biofuel handling processes. The working experience of Vinnitsyamiskteploenergo in tight biofuel markets with several different sources of and contracts for biofuel has been interesting and valuable for Imatran Lämpö with regard to developing actions in new circumstances.

The project also showed how global conflict can drive fuel and energy markets in Finland.

Effectiveness of the project

The project was implemented successfully and the project deliverables complied with the set targets and FUTF objectives, including promoting cooperation between Finland and Ukraine and identifying opportunities for projects.