Lessons learnt from the Lviv case

The Lviv case demonstrates that district heating transformation in Ukraine must be treated simultaneously as a decarbonisation, resilience, and investment-readiness task. Under war-related disruptions, the technical priority is not only to reduce natural gas use, but also to maintain continuity of heat supply, secure backup options, and prepare measures that can realistically be financed and implemented. This requires a pragmatic balance between long-term renewable and waste-heat integration and short-term operational reliability.

A key lesson is that **early alignment between technical modelling and investment-planning requirements is essential**. Ukraine's public investment reform requires preliminary investment-feasibility documentation; therefore, modelling outputs must be structured not only as energy balances, but also as decision-support inputs for financing discussions. The energyPRO of a small decentralised communal network assessment showed that even this can serve as a practical demonstrator for scenario comparison, financial pre-assessment, and later replication across similar Lviv boiler-house networks.

The case also confirms **the importance of clear data protocols and operator validation**. When hourly heat-demand data or detailed unit characteristics are incomplete, realistic synthetic profiles and engineering assumptions can support early analysis. However, reliable conclusions require confirmation of plant efficiencies, partial-load behaviour, seasonal operating modes, maintenance periods, heat-pump limits, CHP constraints, and tariff assumptions. For follower cases, a structured data-request template and early clarification of modelling boundary conditions should be used from the beginning.

Another lesson is that **source identification must remain portfolio-based**. Geothermal heat, wastewater/sewer heat, biomass, biogas/biofuel, RDF, solar thermal, heat pumps, and central-network connection options should be screened against local constraints such as temperature level, distance to network, available space, electricity security, emissions requirements, licensing, and financing feasibility. No single source should be promoted without testing system integration, operational role, and economic implications.