IEA DHC Annex XIV

FAST DHC – Feasibility Assessment Tool for DHC

KEY MESSAGES

1. Addressing the DHC debate: centralised 4GDH vs TSNs

Thermal source networks (TSNs) have been recently introduced as a subclass of 4th generation district heating (4GDH) systems. TSNs integrate consumer-side heat pumps (HPs), transforming district heating and cooling (DHC) networks into a collective heat source and sink for connected buildings. The differences between conventional 4GDH and TSN configurations have led to a fundamental debate within the international DHC community over the role, applicability and advantages of TSNs.

2. Providing an evidence-based comparison tool for pre-feasibility assessments of low-temperature DHC projects

With the aim of supporting early-stage decision making, the FAST DHC tool provides a transparent, consistent and practical framework for evaluating DHC solutions under diverse urban climatic and infrastructure conditions. It enables a rapid yet robust assessment of three distinct system configurations: 4GDH, TSN and individual HP-based systems. Unlike simulation tools that require detailed hourly data, it uses component-based techno-economic modelling on a seasonal resolution and country-specific defaults derived from validated datasets to inform calculations.

3. Validation with diverse case studies highlights the capabilities of the FAST DHC tool

Validation across four diverse feasibility case studies, including 4GDH and TSNs, demonstrated the tool's high applicability, particularly in urban settings, where it was able to successfully reproduce levelised costs estimates within an acceptable 20% deviation of the original case study values. These findings confirmed that the FAST DHC methodology is generally suitable for low-temperature DHC evaluations in city contexts. However, the case study analyses also indicated scope for future work, notably refining HP sizing at building level, testing with alternative network and storage sizing calculations, as well as further validating the tool with case studies involving larger cooling demands and sparse, rural environments.

More details on the project are available on www.iea-dhc.org.