Energetic and Exergetic Analysis of Low and Medium Temperature District Heating Network Integration

Li, Hongwei; Svendsen, Svend

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

Energetic and Exergetic Analysis of Low and Medium Temperature District Heating Network Integration

***Hongwei Li*[a], *Svend Svendsen*[b]**

[a]*Civil Engineering Department,*
Technical University of Denmark, Denmark
Building 118, Brovej
DK-2800 Kgs.Lyngby, Denmark
Email: hong@byg.dtu.dk

[b]*Civil Engineering Department,*
Technical University of Denmark, Denmark
Building 118, Brovej
DK-2800 Kgs.Lyngby, Denmark
Email: ss@byg.dtu.dk

Abstract

In this paper, energetic and exergetic approaches were applied to an exemplary low temperature district heating (LTDH) network with supply/return water temperature at 55°C/25 °C. The small LTDH network is annexed to a large medium temperature district heating (MTDH) network. The LTDH network can be supplied through upgrading the return water from the MTDH network with a small centralized heat pump. Alternatively, the supply and return water from the MTDH network can be mixed with a shunt at the junction point to supply the LTDH network. Comparing with the second approach, the heat pump system will reduce the amount of water supply from the MTDH network and improve the system energy conversion efficiency. Through the simulation, the system energetic and exergetic efficiencies based on the two network integration approaches were calculated and evaluated.

Keywords: *District Heating Heat Pump Exergy*