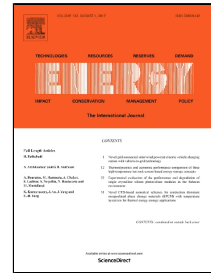


Accepted Manuscript

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PII: S0360-5442(17)31205-7
DOI: 10.1016/j.energy.2017.07.030
Reference: EGY 11218
To appear in: *Energy*
Received Date: 23 August 2016
Revised Date: 11 April 2017
Accepted Date: 07 July 2017

Please cite this article as: Fangtian Sun, Jinzi Zhao, Lin Fu, Jian Sun, Shigang Zhang, New district heating system based on natural gas-fired boilers with absorption heat exchangers, *Energy* (2017), doi: 10.1016/j.energy.2017.07.030

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1 **New district heating system based on natural gas-fired** 2 **boilers with absorption heat exchangers**

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7 **Abstract**

8 Current district heating systems based on natural gas-fired boilers have lower
9 primary energy efficiency due to its higher-temperature exhaust flue gas, and it cannot
10 meet high-density heat load demand by the existing primary heating network. A new
11 district heating system based on natural gas-fired boilers with absorption heat
12 exchangers is presented to increase its primary energy efficiency and meet high-
13 density heat load demand. In this new district heating system, absorption heat
14 exchangers installed in heating substations could greatly decrease return water
15 temperature of the primary heating network. The lower temperature return water
16 could be used to cool exhaust flue gas and increase heat transmission capacity of the
17 existing primary heating network. This new district heating system was analyzed by
18 thermodynamics and economics. Results show that its primary energy efficiency and
19 heat transmission capacity of the primary heating network are increased by about 11%
20 and 47% respectively. when the heat transmission distance of the primary heating
21 network is over 2.6 km, the new district heating system has better thermodynamic
22 performance, economic benefit and environmental benefit, therefore, it would be a

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