Large-scale solar district heating plants in Danish smart thermal grid: Developments and recent trends - DTU Orbit (14/10/2019)

Large-scale solar district heating plants in Danish smart thermal grid: Developments and recent trends

Large solar collector fields are very popular in district heating system in Denmark, even though the solar radiation source is not favorable at high latitudes compared to many other regions. Business models for large solar heating plants in Denmark has attracted much attention worldwide. Denmark is not only the biggest country in both total installed capacities and numbers of large solar district heating plants, but also is the first and only country with commercial market-driven solar district heating plants. By the end of 2017, more than 1.3 million m2 solar district heating plants are in operation in Denmark. Furthermore, more than 70% of the large solar district heating plants worldwide are constructed in Denmark. Based on the case of Denmark, this study reviews the development of large solar district heating plants in Denmark since 2006. Success factors for Danish experiences was summarized and discussed. Novel design concepts of large solar district heating plants are also addressed to clarify the future development trend. Potential integration of large solar district heating plants with other renewable energy technologies are discussed. This paper can provide references to potential countries that want to exploit the market for solar district heating plants. Policy-makers can evaluate the advantages and disadvantages of solar district heating systems in the national energy planning level based on the know-how and experiences from Denmark.

General information
Publication status: Published
Organisations: Energy and Services, Department of Civil Engineering, University of Reading, China Academy of Building Research
Corresponding author: Fan, J.
Contributors: Tian, Z., Zhang, S., Deng, J., Fan, J., Huang, J., Kong, W., Perers, B., Furbo, S.
Pages: 67-80
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Energy Conversion and Management
Volume: 189
ISSN (Print): 0196-8904
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
Keywords: Success factors, Large-scale solar district heating plants, Research & Development, Denmark
DOI's:
10.1016/j.enconman.2019.03.071
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review