Solar district heating and cooling: A review

Both district heating and solar collector systems have been known and implemented for many years. However, the combination of the two, with solar collectors supplying heat to the district heating network, is relatively new, and no comprehensive review of scientific publications on this topic could be found. Thus, this paper summarizes the literature available on solar district heating and presents the state of the art and real experiences in this field. Given the lack of a generally accepted convention on the classification of solar district heating systems, this paper distinguishes centralized and decentralized solar district heating as well as block heating. For the different technologies, the paper describes commonly adopted control strategies, system configurations, types of installation, and integration. Real-world examples are also given to provide a more detailed insight into how solar thermal technology can be integrated with district heating. Solar thermal technology combined with thermally driven chillers to provide cooling for cooling networks is also included in this paper. In order for a technology to spread successfully, not only technical but also economic issues need to be tackled. Hence, the paper identifies and describes different types of ownership and financing schemes currently used in this field.

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