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# SOLAR PHOTOVOLTAICS IN DISTRICT HEATING AND COOLING SECTOR: AN OVERVIEW

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**Abstract** – With the prevalent energy scenario and climate changes, decarbonising energy sector has become the need of the hour. An environmentally friendly way is the utilisation of solar energy, which mainly involves the deployment of photovoltaic (PV) panels and/or solar thermal collectors. Unlike electricity generation, the application of photovoltaics in the district heating & cooling (DHC) sector is relatively new. Also, this energy route is not fully explored by scientific community. This paper aims to provide an overview of the photovoltaic application in district heating & cooling sector. At first, the utilisation of solar energy in the DHC sector is briefly described. Then relevant literature in PVDHC is reviewed. It was understood that different topologies are in place for solar energy integration in the DHC system. These topologies vary in terms of the chosen technology, energy storage, system configuration (centralized/distributed) and components. It was found that the research database on the studied topic needs enhancement, with a special focus on PV cooling. From the literature survey, it is deduced that solar PV could play a significant role in future DHC systems due to the possible combination with other energy sources or electric grid or storage technology. Based on the SWOT analysis, it is concluded that there is an enormous opportunity for PV integration in the DHC sector. However, adequate techno-economic support is required to overcome threats and weaknesses. This study is expected to be beneficial to policymakers, researchers and other stakeholders in district energy market.

**Keywords** – *District cooling; district heating; heat pumps; photovoltaics; solar heating*