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Through several years of research, **Dorte Skaarup Østergaard** has specialized in district heating with focus on how to reduce district heating temperatures. Her main field of interest is heating consumption in buildings and building installations for low-temperature district heating.

Combined district heating and cooling – which solutions are available and are they applicable in a Danish context?

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An overview of possible designs of a combined district heating and cooling system in Denmark is presented incl. a discussion of whether such systems are feasible in Denmark today. The presentation is based on the results obtained in the KOHESYS project which aims at analyzing the technical and economic feasibility of supplying heating and cooling to a new built area in Køge (Denmark). The area is to be developed during the next years and will include a few large office/service buildings and a residential area with row houses and apartment buildings. It is a groundwater sensitive area and it is located close to a wastewater heat source and an existing district heating network. Based on this setting, some of the main questions that the project team try to answer are: Is there a demand for comfort cooling in new built dwellings in Denmark? If so, is the cooling demand large enough to make it feasible to include district cooling or recover the excess heat from cooling services? Which technical in-house installations are necessary to supply the end-users with both heating and cooling, and how does these affect the requirements for the district heating and cooling network? Are the necessary technical solutions, such as relevant heat pumps, available today? Lastly, is the concept feasible compared to a more traditional district heating solution? The questions are answered through building simulations, assessment of technical installations, and an overall feasibility study.

Keywords: Cold district heating, ambient-temperature district heating and cooling, 5th generation district heating, low-temperature district heating, cooling demands, heat pumps