The optimal integration of booster heat pumps in ultra low temperature district heating (ULTDH) was investigated and compared to the performance of low temperature district heating. Two possible heat production technologies for the DH networks were analysed, namely extraction combined heat and power (CHP) and central heat pumps (HPs). The analysis focussed on the characteristic heat demands of newly build multi-story buildings and the results were based on the ratio of the individual demands compared to the total. It was found that the optimal return temperature was dependent on the forward temperature and the heat consumption profile. For reference conditions, the optimal return of ULTDH varies between 21 °C and 27 °C. When using a central HP to supply the DH system, the resulting coefficient of system performance (COSP) was in the range of 3.9 (-) to 4.7 (-) for equipment with realistic component efficiencies and effectiveness, when including the relevant parameters such as DH system pressure and heat losses. By using ULTDH with booster HPs, performance improvements of 12% for the reference calculations case were found, if the system was supplied by central HPs. Opposite results were found for extraction CHP, were ULTDH with booster HPs resulted in decreasing COSP of 20%.