Denmark presents ambitious climate policies, and in order to fulfill these visions electrically driven large-scale heat pumps (HP) are often mentioned as an important technology for future district heating (DH) systems. To reach the high temperatures needed in current DH systems, the suggested HP installations become complex systems, where heat transfer between the HP cycle and the heat sink takes place at several temperature levels. In this study, the heat exchanger network (HEN) between a HP installation consisting of two serially connected two-stage ammonia HP units and a heat sink being heated from 50 °C to 80 °C was investigated. The study applied pinch analysis to estimate the highest attainable Coefficient of Performance (COP) with the given HP configuration. Based on the result of the pinch analysis, a HEN reaching the highest COP was suggested and compared with COPs obtained with three other solutions for a HEN. The result revealed an estimated highest COP of 3.46. The three other design suggestions yielded reductions in the COP of -2.3%, -2.0%, and -1.8% compared to the highest. From this, it was concluded that the HEN has an influence on the COP, and that the pinch analysis can be used to estimate the highest COP for a given HP installation. Furthermore, the COP obtained by practical installations was accordingly shown to come close to the target.