To improve the coefficient of performance (COP) of ejector refrigeration cycle (ERC), a novel ejector heat pump integrated with organic Rankine cycle combined cooling, heating and power system (ORC–CCHP) using zeotropic mixtures is established in this study.The comparative analysis of basic ORCs, ORC with post ejector, ORC with ejector heat pump, ORC combined with ejector (EORC) is carried out.The ejector heat pump integrated with ORC–CCHP system is thermodynamically feasible and economically attractive, thanks to optimized system parameters and optimum compositions of zeotropic mixture, giving support of new applications of ERC coupled with positive and reverse Carnot cycles.