Retrofit of the heat exchanger network (HEN) of the olefin production plant

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Olefin plant is one of the most energy-consuming processes among petrochemical industries and it is regarded as a major source of GHG emission. In this study, retrofitting the heat exchanger network is conducted to use the energy economically in the olefin production process. To understand the current heat exchanger network, pinch analysis is done by using Aspen Energy Analyzer with the data extracted from the real process. Several streams which have waste heat energy are found and their possibility of substituting the current utility consumption is evaluated. Through the analysis, remnant heat of the quench oil stream can be used to heat the cold stream which is originally heated by steam utility. The trade-off between the reduced operating cost of the utilities and the additional capital cost of the heat exchangers is calculated and the alternative HEN is proposed with the payback period less than one year.