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SCIENTIFIC & RESEARCH PROJECTS

Project No.: 01 **Year: 2019**

Project Field: Total Site

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Project Title:

Total Site Heat Integration Considering Optimum Pressure Drops

Abstract:

In this study, a new methodology is developed for Total Site Minimum Energy Requirement (MER) targeting, in which optimum stream pressure drops (ΔP_s) are considered for each individual process. To validate the accuracy of the methodology, two Total Site (TS) systems comprising processes A and B and processes C and D are selected and evaluated using two different approaches; I) considering streams' assumed heat transfer coefficient (conventional method) and II) considering streams' allowable ΔP_s . In the second approach, the possibility of pumps/compressors replacement is first investigated for each individual process, through exploring a 3-way trade-off between energy consumption, area requirement and hydraulic system. The resulting data are then used to construct a Total Site profiles (TSPs) for MER targeting. These profiles depict that the hot and cold utility values, when ΔP_s are optimized, are much less than those obtained in conventional method using assumed coefficients. Moreover, the TS energy targets that are estimated in this method are more realistic and compatible with the results of detailed design stage.