

Techno-Economic Evaluation of Amine Sweetening Unit for Different Scenarios

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ABSTRACT

Nowadays, in an environment where technology is constantly developing and competition is intense, especially in refinery, petrochemical and gas processing plant projects, project leaders and project stakeholders need to perform a three-way integrated analysis not only with operations and cost calculations but also with environmental impact. Project assessments, including carbon footprint and environmental impacts, are now seen as the only real way to reach true economic feasibility tables for projects and processes in the long run. In this context, techno-economic evaluations simulate the technological, economic and environmental impacts of the processes and provide the most realistic cash flow and financial statements. Technoeconomic evaluations reveal the long-term competitive strength of processes and technologies, making it easier for project leaders to make decisions. In this study, techno-economic analysis of amine sweetening units used in the purification of H₂S and CO₂ contaminated gases in refinery and petrochemical plants is explained with a case study. Amine sweetening units are important units for reducing carbon footprint for refineries, petrochemicals and gas processing plants. However, these units (if not required by environmental regulations) are not preferred because of their high energy and raw material requirements. In this context, how an amine sweetening process can be economically feasible in many different technological and operational scenarios has been studied and the most effective process can be selected by comparing energy + raw material consumption, operation and maintenance costs and fixed costs of the process. Thus, in an exemplary application, techno-economic analysis of the amine sweetening unit with the obtained concrete data was made and it was facilitated in deciding the installation of these units.

KEYWORDS (3 to 5 key words) Amine sweetening units; decisions on projects; purification of H₂S and CO₂ techno-economic analysis

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