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Abstract	:	Recently, sustainability studies have caught the attention of scientists, academicians, industrialists, and organisations as awareness regarding sustainability topics have arisen. As industrialisation increase, the chemical processing industry also increases in demand; hence the sustainability of a chemical process need to be considered when designing the process to make sure that other than being profitable, the quality of the environment is conserved, and the social well-being is taken care of. Thus, this study was conducted to simulate a steady-state ethanol process plant using Aspen HYSYS and optimise the plant by determining the optimum operating parameters. Also, this study was conducted to evaluate the sustainability of the ethanol plant using the Sustainability Evaluator (SE) tool. Both designs were simulated using Aspen HYSYS, and both have the same feed mass flow, production rate and purity to produce the ethanol. All the mass, energy balance, and costs for both processes were used as the input of the Sustainability Evaluator (SE) tools, where it was developed in Microsoft Excel and comprised of 41 metrics and indicators. Based on the results obtained, both process plants were successfully simulated, and the optimisation of the chemical processes was successfully carried out with the desired production rate and purity level. The result from the SE tool revealed that the optimised process was the most sustainable process as has it has a lower value of SUI at 0.13 compared to the initial process, which has the SUI of 0.19.