An Optimization Approach for Integrating Planning and CO_2 Emission Reduction in the Petroleum Refining Industry

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The petroleum refining industry plays a very important role in international economics and in our daily life. The world refining capacity has increased rapidly during the past decade, and this makes operation planning, scheduling, and general optimization become important tools for the refinery industry. However, environmental regulations and risks of climate change are pressuring the refinery industry to minimize its greenhouse gas emissions.

In this research, a mixed-integer nonlinear programming (MINLP) model is proposed for the production planning of refinery processes to achieve maximum operational profit while reducing CO2 emissions to a given target through the use of different CO2 mitigation options.