

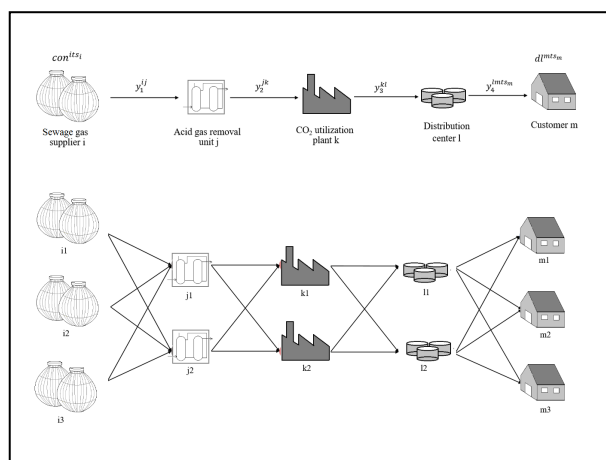
Stochastic Supply-Chain Optimization

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This study is the supply-chain design of carbon dioxide (CO₂)-utilization product where its feedstock is sewage gas containing mostly methane and CO₂. This supply chain starts from the suppliers sending sewage gas of different CO₂ compositions to the acid gas removal units (AGRUs) for CO₂ removal. After that, CO₂ is sent to CO₂-utilization plants to produce products stored at the distribution centers (DCs) and sent to customers later. During thirty days, the uncertainties occur in the sewage-gas composition and the customer demand. The optimization is applied to find the optimal mass flow rate with maximum expected profit. Both optimal supply chains from stochastic and deterministic models are validated with ten sets of thirty daily random data. The results show that the optimal supply chain from stochastic model mostly gives higher profit.

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Illustrative example of supply chain from sewage-gas suppliers to customers

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