

# **An Integrated Biofuel Supply Chain to Cope with Feedstock Seasonality and Uncertainty**

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## **Abstract**

A biofuel supply chain consists of various interdependent components from feedstock resources all the way to energy demand sites. This study focuses on the design of an efficient biofuel supply chain system against seasonal variations and uncertainties of feedstock supply in an integrative manner. By integrating planning and operational decisions in a stochastic programming framework, we aim at finding an effective design strategy for biofuel supply chain that is economically viable and hedges well against a wide range of future uncertainties. A solution algorithm based on scenario decomposition is designed to overcome computational challenges involved in large-scale applications. A California case study is implemented to demonstrate the applicability of the proposed methods in evaluating the economic potential, the infrastructure needs, and the risk of wastes-based bioethanol production.