# Using Advanced Process Modelling and Digital Twin solutions to generate value for bioethanol plants

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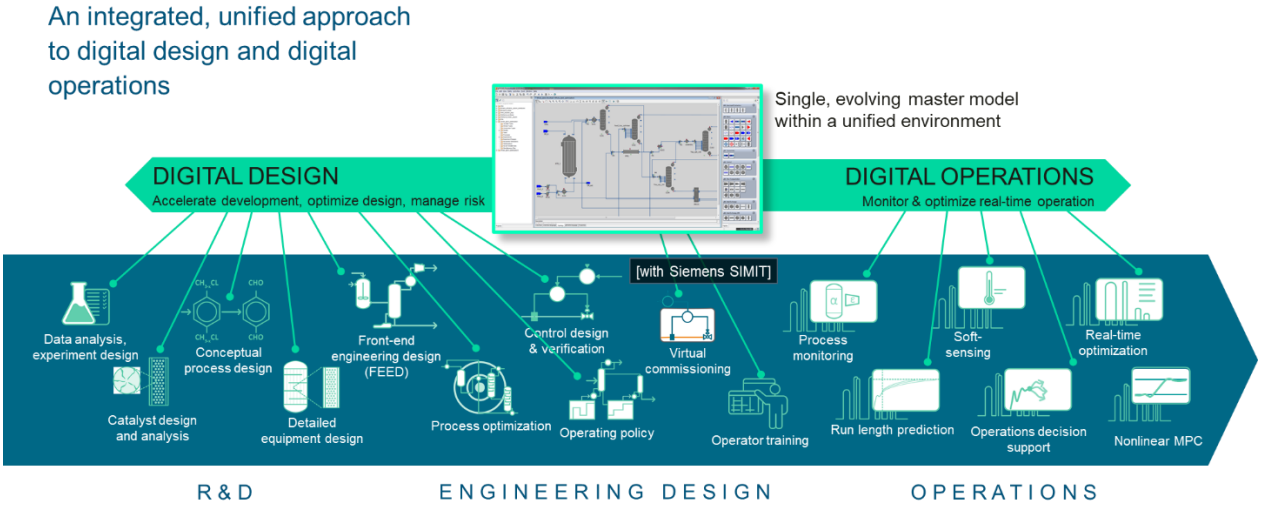
Biofuels, renewable energy sources derived from organic material such as corn, are increasingly viewed as a cleaner, cheaper, more efficient alternative to traditional fossil fuels. Therefore, the corn and sugarcane-based ethanol biofuels industry is continuously growing to meet this demand for advanced biofuel products. Siemens Process Systems Engineering (SPSE) is the world's foremost provider of Advanced Process Modelling (APM) software and services to the process industries supporting digital design and digital operations. Companies apply advanced process models to explore the process decision space rapidly and effectively in order to reduce uncertainty and make better, faster, and safer formulation, process and product design, and operating decisions.




Bioethanol producers can face challenges at different stages of a plant's life cycle.These include: (a) optimize energy intensification and infer the impact of different enzymes from different fermentation suppliers during greenfield projects; (b) uncertainty when upscaling from pilot to full-scale commercial plant; (c) lack of reliable online measurements (ex: online control done via product viscosity samples); (d) identifying optimal fermentation recipes with limited experimentation; (e) how to train and familiarise newly hired engineers with the control system; (f) how to optimize production, in real-time, based on market demand for different products (ethanol, DDGS, etc.) and biomass feed availability.

This presentation will demonstrate how SPSE's Digital Twin solutions can address these challenges using its gPROMS rigorous modelling and advanced optimization capabilities. We will also showcase the application of other Siemens-owned solutions (such as SIMIT for Operator Training applications) in this process.