

A Narrative on Learning and Monte Carlo Simulation to Confirm the Likelihood of a Cost-Effective Transition to Decarbonized Ethanol Resources

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This research paper was commissioned by the EFI Foundation and represents the views and conclusions of the author(s).

The purpose of this commissioned analysis was to test the reasonableness of the cost estimates for the various ethanol decarbonization measures in the report, which were drawn largely from desktop research. The cost estimates were benchmarked using established statistical methodologies for Bayesian Inference, including learning rates and Monte Carlo simulations. The statistical analysis generally supported the reasonableness of the reported cost estimates.

The EFI Foundation has not endorsed or approved the statements and conclusions contained in these documents but will be sharing this work as part of the project process.

Abstract

This document explores the application of Bayesian inference and Monte Carlo simulations to evaluate the cost-effectiveness and likelihood of decarbonizing ethanol. It highlights the effects of learning and the economic benefits of reducing greenhouse gas emissions through ethanol use. The analysis uses experience curves to estimate the scale of possible cost reductions in ethanol production over time, while Monte Carlo simulations provide a range of potential outcomes for future costs. The findings suggest decarbonizing ethanol can lead to lower costs and significant environmental and economic benefits.