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*Modeling the diffusion process of a second generation biofuel: an agent-based simulation approach*

Second generation biofuels are widely considered to be a promising alternative to non-renewable fossil energy sources. Although these high-quality fuels will not completely replace conventional fuels (e.g., due to the limited availability of biomass), they can contribute to reducing emissions and strengthening a country's energy autonomy. In Austria, a team of researchers at the Vienna University of Technology is developing a biomass-to-liquid process for the production of corresponding biofuels. Once they have succeeded, the market introduction of the novel fuels will require substantial investments.

Here, our agent-based simulation approach comes into play. It aims at gaining a better understanding of potential market diffusion patterns as well as at supporting entrepreneurs in evaluating different targeting, timing, and pricing strategies. While individual consumers are modeled as agents embedded in a geographically dispersed social network through which they exchange information, we have also considered heterogeneous consumer preferences, word-of-mouth effects, and first-hand personal experiences which are particularly relevant for repurchase decisions. In order to derive parameters for the simulation runs we conducted an empirical study on the Austrian market. In our talk, we motivate our approach, provide an overview of the underlying mathematical model, describe its implementation and parameterization, and discuss simulation results for various scenarios.