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Title: Synthetic Data Generation on Interdependent Food-Energy Systems

Abstract: The regional nature of infrastructure discrepancies of critical interdependent sectors, such as the food and energy systems, requires from modelers to extend their analysis to a level of detail that is often more granular than the available data. We pose the problem of generating candidate values for the required data and bounds on them as a Mathematical Program with Equilibrium Constraints and we propose a 2-stage decomposition of the process that significantly reduces computational time. In the first stage the submodules are individually calibrated and in the second stage the data at the interdependencies are reconciled. We test our method by linking a US food model with an energy module.

Key words: data generation, multilevel optimization, food, energy, interdependencies