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Optimal self-unit commitment with shared asset ownership under realistic taxation in the current decarbonization framework

J. García González; P. Linares Llamas; P. Otaola Arca

Abstract-

**Energy, greenhouse gas emissions, or water taxes, are present in many geographical region, in the case of price makers. In this paper, we present a novel formulation that models the individual market income of each unit using the binary-expansion technique to address the case of a price-maker agent. Unlike existing state-of-the-art formulations, our approach successfully accounts for differentiated income taxes per technology or geographical region and accurate market revenues of shared generators. The proposed model enables evaluating the rational behavior of a generation company confronting a complex yet realistic decision problem, under different types of taxes related to decarbonization or resource conservation policies. The case study incorporates the impact of the installation of **

Index Terms- Electricity market; Tax scheme; Shared ownership; Profit maximization; Self-unit commitment (self-UC); Carbon Capture and Sequestration (CCS)

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