UNIVERSITY OF BRESCIA
DEPARTMENT OF ECONOMICS AND MANAGEMENT

SEMINAR

Optimal medium-term electricity procurement for cement producers considering flexible consumption

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Given the current economic and energy situation, it becomes imperative for significant electricity consumers to carefully assess their electricity procurement strategies. This research aims to identify the most effective approach to acquiring electricity for cement producers, taking into account their participation in the electricity pool, power-purchase agreements, and the potential integration of a photovoltaic self-production unit and a battery storage system. To achieve this objective, we model the electricity consumption flexibility of cement producers, encompassing all production processes associated with cement and clinker manufacturing. This modeling leads to the formulation of a mid-term decision-making problem under uncertainty, which is addressed using a two-stage risk-averse stochastic programming framework. To enhance computational efficiency, the planning horizon is defined by a set of representative periods obtained through a clustering procedure based on chronological time periods. To validate the practicality of the proposed approach, we conduct a case study featuring a real-world cement producer, actual energy pool prices, and data related to renewable energy production.

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