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Title: Solving Problems with Equilibrium Constraints Applied to Energy Markets

Abstract: We provide a method to obtain stationary points for mathematical and equilibrium problems with equilibrium constraints (MPECs and EPECs). The MPECs and EPECs considered have linear complementarity constraints at the lower level. Our approach is to express the MPEC and EPEC as a complementarity problem by decomposing the dual variables associated with the bilinear constraints, and using a nonlinear optimization over a polytope to find stationary points. We apply this method to the generic setting of energy markets that have operational and infrastructure decisions among many players.

Key words: