

An energy-aware lot-sizing and sequencing problem with incentives

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Abstract: Motivated by the energy management challenges faced by industrial firms, we propose a method to reduce production costs by including the price of electricity in a multiple machine, multiple product lot-sizing problem. When electric utilities face power consumption peaks, they ask electricity-consuming firms to curtail their electric load, rewarding the firms with incentives if they comply with the curtailment requests. Clearly, these incentives are necessary to motivate firms to consider complying with the load curtailment request. After formulating an initial deterministic model, we describe a two-stage stochastic formulation to cover the case wherein the decision maker wants to satisfy any curtailment request. After implementing a scenario reduction method to manage the number of scenarios corresponding to curtailment requests, our initial computational studies suggest that the cost savings potential of our approach can be up to 10%.

Bio: *Dr. Scott J. Mason* is the Fluor Endowed Chair in Supply Chain Optimization and Logistics and a Professor of Industrial Engineering at Clemson University. As Chair of the SmartState Center of Economic Excellence in Supply Chain Optimization and Logistics, Dr. Mason is responsible for developing and maintaining active research relationships with both private and public-sector organizations to foster economic development, increased efficiencies, and job creation in the state of South Carolina. Prior to joining Clemson, Dr. Mason spent 10 years in the Department of Industrial Engineering at the University of Arkansas. Dr. Mason's research team uses operations research techniques to model and analyze large-scale supply chain, logistics, manufacturing, and energy systems, with expertise in developing and implementing optimization- and heuristic-based decision support systems. He received his PhD in Industrial Engineering from Arizona State University after earning BS and MS degrees from The University of Texas at Austin. He is a Fellow of the Institute of Industrial and Systems Engineers (IISE), a member of INFORMS, and currently is on sabbatical leave at Amazon.com in Seattle where he serves as a Principal Research Scientist.

Tuesday, January 30, 2018
1:30 – 2:20 p.m.
MEB 235