ENERGY & POWER GROUP SEMINAR
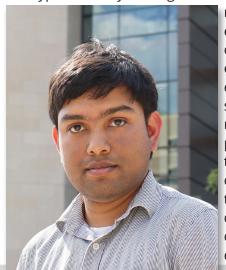
Behavior of Large Cryptocurrency-Mining Firms in Electricity Markets: A Texas Econometric Analysis

Abstract

As cryptocurrency mining firms increasingly become key players providing flexibility in ERCOT electricity markets, understanding the reasons behind their responses to various external factors is crucial. In this seminar, we will examine the behavior of large cryptocurrency-mining firms in Texas, specifically how their electricity consumption is influenced by factors like cryptocurrency conversion rates, electricity prices, and weather conditions. Our analysis shows that short-term cryptocurrency prices have minimal impact on mining electricity consumption. Instead, temperature and electricity prices are the primary drivers, with firms adjusting their usage to avoid transmission and distribution (T&D) costs—commonly known as 4CP charges—during the summer. To gain deeper insights, we developed two autoregressive models with exogenous variables: one for summer demand and another for non-summer months. Our findings highlight the critical role of leveraging the flexibility of these large-scale cryptocurrency datacenters to enhance grid reliability.

Subir Majumder
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Friday, September 6
11:30 am
241 ZACH

Biography

Dr. Subir Majumder specializes in data-driven methods and developing electricity market mechanisms to enhance power grid resiliency, particularly in the face of increasing renewable energy integration and climate change. He is currently serving as a TEES Senior Research Engineer in the Department of Electrical and Computer Engineering at Texas A&M University. Dr. Majumder earned his Ph.D. through a joint program between the Indian Institute of Technology Bombay and the University of Wollongong. He also holds an M.Tech. in Energy Systems Engineering from IIT Bombay and a B.Tech. in Electrical Engineering from West Bengal University of Technology. Prior to his role at Texas A&M, he held positions at Washington State University and West Virginia University. Dr. Majumder's work has been recognized with several awards, including the POSOCO Power System Award. He is an active IEEE PES member and currently serves on the IEEE Working Group on Natural Disaster Mitigation Methods and Operation Technology.