COLLEGE OF ENGINEERING, COMPUTER SCIENCE, & TECHNOLOGY

Seminar in Interdisciplinary STEM Research

Friday, April 12th - 11:00-11:50 AM

Location: https://calstatela.zoom.us/j/6858339692

HOSTED BY CREST CATSUS



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Bio: Grant Aguinaldo is a research scientist at Binghamton University where he focuses on the development of macro energy system models to better understand the role of hydrogen in a deeply decarbonized energy system.

Optimizing Renewable Hydrogen Production: A Spatiotemporal Approach for Site Selection, and Integration into Existing Energy Infrastructure

Abstract: The rising threat of climate change necessitates deep decarbonization throughout the entire energy system. This presentation introduces an integrated decision support framework focused on siting solar hydrogen production facilities. Our framework considers techno-economic details (e.g., electrolyzer efficiencies, capital, and fixed operating costs, etc.), the proximity to existing infrastructure (e.g., natural gas compressor stations, electric substations), the proximity to facilities that are difficult to decarbonize (i.e., "hard to abate"), the quality of solar resources, and land-use considerations. We will also present initial findings from applying this framework in a case study, analyzing more than 35,000 potential sites in the continental United States for solar hydrogen plant development. Finally, we will present work towards identifying near-optimal locations for solar hydrogen plants that may meet certain criteria and that may not be factored into the framework but exist for the individual project developer. In summary, the primary benefit of the decision support framework lies in its ability to rapidly sift through numerous potential sites, which can lead to more in-depth analysis and evaluation in later stages of feasibility studies, thereby accelerating the transition towards a more sustainable and decarbonized energy future.

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