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Project Title.

Microgrid Mastermind: The Quest for Reliable Electricity

Abstract.

Energy literate citizens will make better energy consumers, voters, and board members. The electric grid is a complex system. Many youth and adults have erroneous mental models of how the grid functions. We propose to design, pilot, and teach a hands-on cooperative classroom game designed to equip students with an understanding of how the electric grid is built to provide 24/7 reliability.

Educational games provide a scaffold for non-experts to interact with scientific models and engage both expert and non-expert players in exploring and experimenting with management solutions in a game-based environmental situation (den Haan et al., 2020).

The classroom scale microgrid demonstration game will consist of supporting curriculum and a low-cost kit enabling access for teachers and schools. The game will include various types of generation (including both renewable and non-renewable sources), loads, load controls, and storage. The microgrid game will be subjected to climactic and weather scenarios impacting reliability. Students will work together to build a grid which is reliable and achieves sustainability goals. Student learning outcomes will be assessed to improve the effectiveness of the game in meeting learning objectives.