

# SMART GRID BALANCING CHALLENGE



## KEYWORDS

smart grid

electrical engineering

renewable integration

grid balancing

energy management

Smart grid engineers and grid operators manage complex electrical systems that supply power to homes, schools, and businesses. Unlike old power grids, smart grids use computers and sensors to balance energy supply from different sources like solar, wind, and traditional power plants. They make sure the lights stay on even when demand changes or when weather affects renewable energy. Workers in this field use data to optimize energy flow and integrate clean energy into the grid. Green jobs in smart grid management help modernize energy systems so they work more efficiently and reliably while supporting a cleaner, renewable-powered future.

## AGE RANGE

9-11 years

## GROUP ACTIVITY

(5-6 students)

## DURATION

35 minutes

## MATERIALS

- Simple electrical circuits
- LED lights
- Switches
- Batteries
- Demand cards
- Supply cards
- Monitoring sheets



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## PROCEDURE

1. Set up electrical circuit representing power grid
2. Each student controls different energy sources (switches)
3. Draw demand cards showing community energy needs
4. Work together to balance supply and demand
5. Record successful and unsuccessful balancing attempts
6. Discuss challenges of managing real electrical grids

## INSTRUCTIONAL GUIDELINES FOR FACILITATOR

- Supervise electrical connections for safety
- Explain energy supply and demand concepts simply
- Create realistic scenarios with variable energy needs
- Connect to electrical engineering and grid operator careers



## LEARNING OUTCOMES

- Understand electrical grid management basics
- Learn about electrical engineering careers
- Practice teamwork and problem-solving under constraints

## EXTENSION SUGGESTIONS

- Research how electrical grids work
- Monitor home electricity usage patterns
- Learn about energy storage technologies

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