

Can a Garage Become a Power Plant?



Built from *The Battery in Your Basement: How Ordinary Homes Became Power Plants* by David Lee, Sustainability Editor

Grades 4–8 · About 45 minutes · ★ everyone · ★★ older readers

Name _____

Date _____

1. Before You Read

★ When you hear the words "power plant," what do you picture? Describe it or draw it.

★ What time of day do you think your family uses the most electricity? Why?

2. The Short Version

Read this first. Older readers: read the full article too.

When people hear "power plant," they picture a giant building with smokestacks. But the power plant of the future might be a white box on a garage wall: a **home battery**.

Here is the tricky rule of the electric grid: the power being made must match the power being used at every moment. The hardest time is early evening. People come home, turn on the air conditioning and start cooking, just as solar power fades with the daylight. To catch that rush, grid operators have usually turned on "peaker" plants. These are expensive, usually gas-burning plants that sit unused most of the year. Everyone helps pay for them on their monthly bill.

One home battery stores cheap solar power from the afternoon and keeps the lights on during a power outage. But when software links thousands of them together, they can all send power back to the grid at once. This is called a **virtual power plant**. Families who join usually get paid.

This helps the climate. Peaker plants are among the dirtiest and most expensive sources of power, so every one that stays off saves both money and pollution.

There is fine print. Families who can afford solar panels and a battery mostly own their homes and have extra money, so renters and lower-income families could be left out. People also have to trust a company to make decisions about the battery in their garage.

3. Word Bank

Word	What it means
grid	the big network of power plants and wires that brings electricity to homes
demand	how much of something people want or use at one time
peaker plant	a power plant that sits unused most of the time and turns on only when people use the most power
virtual power plant	many small batteries linked by software so they work together like one big power plant
emissions	pollution that goes into the air, like smoke from burning gas

★ Use **grid** in a sentence of your own.

4. Check Your Understanding

★ 1. What is the "strange rule" at the heart of the electric grid? Answer in one sentence.

★ 2. According to the article, when are the hardest hours of the day for the grid?

☐ early morning ☐ noon ☐ early evening ☐ midnight

★ 3. Name two things one home battery can do for a family on its own.

★ 4. How can a home battery turn into "a tiny business" for a family?

★★ 5. The author says the name "virtual power plant" is "only half right." Which part of the name is right, and which part is not? Explain.

5. David's Audit

David has one rule for every new technology: audit it. He asks three questions: *Who builds it? Who pays for it? And who gets left off it?* Fill in the audit for home batteries linked into a virtual power plant.

	Your answer
Who builds it? Who owns the batteries, and what links them together?	
Who pays for it? Who pays for the batteries, and who gets paid?	
Who gets left off it? Which families might miss out, and what happens to them?	

6. Think Deeper

★ David writes that the grid is becoming "less like a broadcast and more like a conversation." What does he mean? Think about which way electricity used to flow, and which way it can flow now.

★★ A virtual power plant means a company makes decisions about equipment in your family's garage. What rules would make a family feel safe joining? What might make them quit?

7. Write Your Report

Write a short report answering this question: **Should power companies pay families to share their home batteries with the grid?**

- **My answer:**
- **Reason 1 (from the article):**
- **Reason 2 (from the article):**
- **One thing the other side would say:**
- **My conclusion:**

For Teachers and Parents: Answer Key

Word bank sentence: Answers vary; check that the student uses grid to mean the network that delivers electricity.

1. The amount of electricity being made (supply) has to match the amount being used (demand) at every instant.
2. Early evening.
3. It stores cheap solar power from the afternoon, and it keeps the lights on during a power outage.
4. Families who join a virtual power plant usually get paid for letting their battery send power to the grid, so the battery stops being only a cost and starts earning money.
5. The "power" part is right, because the electricity is real. The "virtual" part describes the plant: there is no single big building. The plant is the coordination, with many small batteries in many places working together like one machine.

Audit (sample answers): Who builds it: homeowners who install solar panels and batteries, plus the software that links thousands of batteries together and the utility that sends the signal. Who pays: homeowners pay for the panels and batteries; households that join usually get paid; everyone already pays for peaker plants on their monthly bill. Who gets left off: renters and lower-income families, who may not afford batteries and could be left buying peak-priced power. The article mentions fixes some programs are trying: leasing, batteries built into apartment buildings, and utility-owned batteries placed in ordinary homes.

Think deeper: Open answers. For the first question, strong answers explain that electricity used to flow one way, from the giant plant down to homes, but now homes can send power back up, so many small participants take part. For the second, strong answers mention clear rules and the homeowner staying in charge; families might quit if they felt their battery was drained by someone else on the wrong night.

Report: Look for a clear answer, two reasons taken from the article (for example: fewer dirty, expensive peaker plants; saves money and emissions; helps solar power by fixing timing), a fair statement of the other side (for example: it may leave out renters and lower-income families, or people may not trust a company controlling their battery), and a conclusion that matches the answer.