

Can Staying Cool Heat Up the Planet?



Built from *The Air Conditioner Paradox* by David Lee, Sustainability Editor

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

Name _____

Date _____

1. Before You Read

★ How do you and your family stay cool on a very hot day? List as many ways as you can.

★ A "paradox" is something that seems to work against itself. Can you think of a way that fixing a problem could make the same problem worse?

2. The Short Version

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

A **paradox** is something that seems to work against itself. This article is about one you can plug into the wall: the air conditioner.

For about a hundred years, many people in Europe thought air conditioning was something they did not need. Now summers there are getting hotter, and people are buying air conditioners by the million. Heat waves are dangerous, especially for older, sick and poor people, and air conditioning is the best tool for keeping people safe in a bad one.

Here is the catch. Air conditioners use lots of electricity on the hottest afternoons, and in much of the world that electricity still comes from burning fossil fuels. The cooling chemicals inside, called refrigerants, also warm the planet if they leak. So David describes a **loop**: warming leads to more cooling, and cooling, the way it is powered today, leads to more warming.

David says nobody is the villain. A grandmother buying a cooling unit is making a sensible choice. This is a system problem, and he sees four ways out. Better machines: the best ones give several times more cooling for the same power as the cheap ones.

Timing: cooling is needed most on sunny afternoons, just when solar panels make the most power. Buildings: shade trees, thick

walls, breezes and white roofs cool a neighborhood for free. Honesty: cooling should be planned as a basic need, like heating and clean water.

3. Word Bank

Word	What it means
paradox	something that seems to work against itself, like a cure that also makes the sickness worse
refrigerant	the special chemical inside an air conditioner that carries heat away; it warms the planet if it leaks out
efficiency	how much useful work a machine does for the energy it uses
infrastructure	the basic things a whole community needs and shares, like roads, water pipes and power lines
adaptation	changing the way you live to handle new conditions, like a hotter climate

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

4. Check Your Understanding

★ 1. Why are people in Europe buying air conditioners by the million? Answer in one sentence.

★ 2. According to the article, about how much of the world's electricity already goes to cooling?

☐ almost none ☐ about a tenth ☐ about half ☐ almost all

★ 3. Name two ways air conditioners can add to the warming of the planet.

★ 4. Why does the author say air conditioning and solar power make a natural pair?

★★ 5. The author writes, "Cheap to buy means expensive to run." What does he mean, and why does it matter for families who are buying their first air conditioner?

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 air conditioning in a warming world.

	Your answer
Who builds it? Who makes the machines, and who can decide which machines end up on the shelf?	
Who pays for it? Who pays to buy an air conditioner, and who pays to run it?	
Who gets left off it? Which families might end up with the worst machines, or none at all, and what could help them?	

6. Think Deeper

★ David writes that "the cheapest cooling is still the cooling a shade tree does for free." What does he mean? Name one other way a building or a street could stay cooler without an air conditioner.

For Teachers and Parents: Answer Key

Word bank sentence: Answers vary; check that the student uses efficiency to mean how much useful work something does for the energy it uses.

1. Heat waves are getting worse, and air conditioning is the most effective way to keep people safe in a severe heat wave.
2. About a tenth.
3. Air conditioners use lots of electricity, and in much of the world that electricity still comes from fossil fuels. Also, the refrigerants inside them are strong greenhouse gases when they leak.
4. Cooling is needed most in the afternoon, and solar panels also make the most power in the afternoon. The same sun that causes the need for cooling can help power it, with batteries helping in the early evening.
5. Cheap air conditioners cost less at the store but use much more electricity for the same cooling, so families pay more later on their electricity bills. The cheap, inefficient machines are the ones most likely to be bought in places where price matters most, so the families with the least money can end up paying the most to stay cool, and the extra electricity adds to warming.

Audit (sample answers): Who builds it: companies that make the machines; governments can shape which machines are sold through efficiency standards, labeling and bulk buying; architects, city planners and heat officers shape the buildings and streets. Who pays: families pay to buy the units and then pay to run them on their electricity bills; cheap units cost less up front but more over time. Who gets left off: households least able to afford the good machines, and the older, sick and poor people who are most at risk in heat waves. The article suggests public cooling centers, efficiency help aimed at those households, and cooler streets with trees and reflective surfaces.

Think deeper: Open answers. For the first question, strong answers explain that trees give shade at no cost and without using electricity, so cooling can start with nature and design before any machine turns on; other ways from the article include thick walls, cross-breezes, white roofs and reflective surfaces. For the second, strong answers might include opening public cooling centers, planting street trees, helping families get efficient air conditioners, or making sure the power grid is ready for hot summers.

Report: Look for a clear answer, two reasons taken from the article (for example: heat waves are dangerous, especially for older, sick and poor people; air conditioning saves lives; cooling centers and efficiency help can protect families who cannot afford good machines), a fair statement of the other side (for example: more cooling uses more electricity and can add to warming, or planning costs money), and a conclusion that matches the answer.