GREAT DECISIONS
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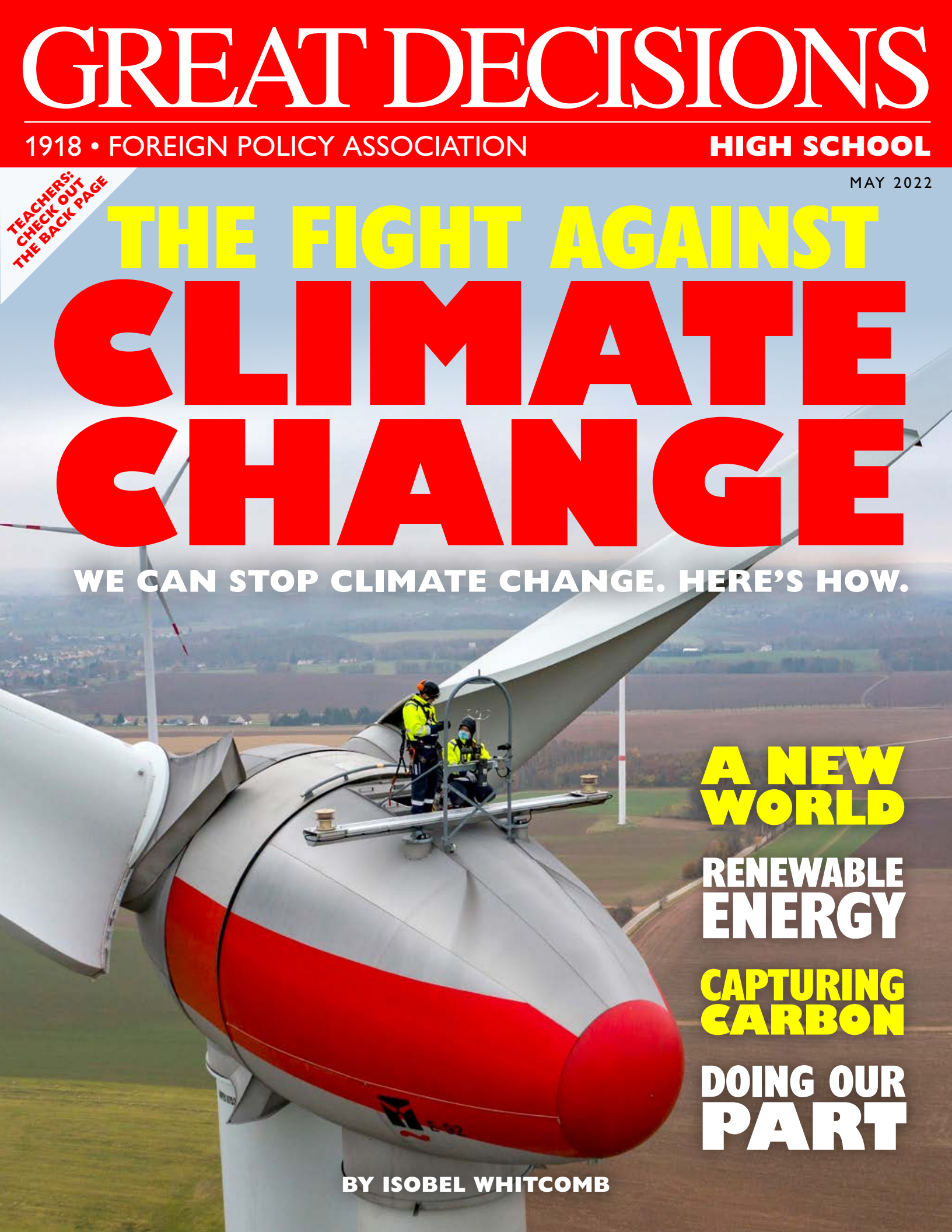
HIGH SCHOOL
MAY 2022

TEACHERS: CHECK OUT THE BACK PAGE

THE FIGHT AGAINST CLIMATE CHANGE

WE CAN STOP CLIMATE CHANGE. HERE'S HOW.



A NEW WORLD

RENEWABLE ENERGY

CAPTURING CARBON

DOING OUR PART

BY ISOBEL WHITCOMB

BEATING THE HEAT

According to the U.S. Department of Energy, more than one in seven U.S. homes will have a rooftop solar energy system by the end of the current decade.

Catastrophic tornadoes tearing through Kentucky weeks before Christmas, wildfires burning down entire towns in California, a heat dome scorching the Pacific Northwest with 120-degree temperatures—all in a single year. Welcome to a climate-changed world.

Over the past two hundred years, global temperatures have risen about 1.9° F. That might not sound like much, but just a few degrees of temperature change is enough to send Earth into climate chaos.

The rise in temperature is caused by **greenhouse gasses**, primarily carbon dioxide (CO2). These gases earned that name because just like a greenhouse, they trap heat. Human activities, primarily burning **fossil fuels** like oil and coal, release more greenhouse gases into the atmosphere. That results in **global warming**, or an average increase in temperature, which then causes freaky weather around the world.

We use fossil fuels to run cars and planes, power factories, and light up our cities. But experts warn that if we continue using fossil fuels, temperatures could increase to a catastrophic level—sea levels would overwhelm cities like New Orleans and Miami, drought and wildfires would worsen across Western states, and many cities would become furnaces.

The good news: we have the technology to stop the planet from heating up any further. Now, it's just a matter of using it.

CUTTING OUT CARBON

Coal and oil aren't the only sources of energy at our disposal. Solar panels capture energy from sunlight, wind turbines generate it from air currents, hydropower dams harvest it from raging rivers, and geothermal plants can use heat from deep within the Earth to create it. Unlike fossil fuels, these **renewable energy** sources don't rely on the constant consumption of a limited resource to deliver power—and they don't spew CO2 into the atmosphere. A climate-stable future depends on renewable energy.

Over the past fifty years, we've made some tentative steps forward in our use of renewable energy. In 2019, 11.4 percent of the energy used worldwide came from renewable sources—that's up from 7.4 percent in 2000. During that time frame, the United States more than doubled its share of energy from renewables.

We still have a long way to go—but Lindsay Anderson, an environmental engineer at Cornell University, is confident that close to 80 percent of our energy will eventually come from renewables. "Over the next three or four decades, we'll make huge strides," she said.

Already, we're building wind turbines that harvest five times as much energy as ones built just fifteen years ago. We've developed ways to store the energy we capture—a major obstacle in past efforts to grow our use of solar and wind energy. And we're phasing out appliances, like water heaters and stoves, that rely on fossil fuels.

"The final piece is getting people to participate," Anderson said. This might include opting into local renewable energy sources where possible, installing solar panels on their homes, or buying electric cars. People will also need to change the way they use energy. For example, those living in areas that rely on wind energy will need to avoid running appliances at times when the air is still. To avoid overloading the **electrical grid**, the system that delivers electricity to homes and businesses, people will need to be mindful of electricity use at times when the community is using large amounts of energy, such as on hot days when everyone has their air conditioning running. Perhaps most importantly, we'll need to change the way we get from point A to point B.

TRANSFORMING TRANSPORTATION

Transportation is the single greatest source of greenhouse gas emissions. The main culprit? Cars. U.S. cities are built around these gas-guzzling machines, but around the world, metropolitan areas are transforming to accommodate new, more sustainable forms of transportation.

Take Hamburg, Germany: In 2014, the city announced its plan to become car-free by the year 2030. To do so, it will replace roads with a network of interconnected open areas that will cover 40 percent of the city, so that people can safely and easily walk where they want to go. An added benefit: the dark pavement that encrusts cities reflects heat back into the atmosphere, making Earth even hotter. Green spaces, like those Hamburg has proposed, keep things cool. Meanwhile, Copenhagen, Denmark, has plans to introduce car-free Sundays; Oslo, Norway, removed all parking spaces from its city center; and Britain plans to ban the sale of new gas-powered cars by 2030.

THE DEBATE

SHOULD THERE BE MORE RESTRICTIONS ON FAST FASHION?

YES

- ✓ Fast fashion is a major source of trash and pollution—80 percent of all clothing ends up burned or in landfills.
- ✓ Many people already have more clothes than they need.
- ✓ People could purchase secondhand clothing instead of fast fashion.

NO

- ✗ Fast fashion makes it possible for people to look nice without spending a lot of money.
- ✗ People should be allowed to decide for themselves how much clothing they need.
- ✗ Some people don't want to wear secondhand clothing.

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In cities like Copenhagen, Denmark, an extensive network of bicycle lanes makes it easy to get around without using a car.

CLEAN CARS?

But what about electric cars? While vehicles like those made by Tesla are an important step towards a climate-stable future, it's important to consider where their electricity comes from, says Ruth Steiner, a professor of urban planning and expert in sustainable transportation at the University of Florida. Most of our electricity, after all, still comes from fossil fuels. "Some people call these 'elsewhere emissions' vehicles," Steiner said, referring to the fact that while the cars aren't directly burning fossil fuels, there's a power plant somewhere that is. Once electricity from renewables becomes more accessible, however, electric vehicles will be an important part of transportation's future, Steiner said.

Still, if we're going to avoid the worst possible effects of climate change, it won't be enough to cut our carbon emissions. We'll also need to suck CO2 out of the atmosphere. That's where carbon drawdown comes in.

DRAWING IT DOWN

Part of what makes CO2 so dangerous for our climate is its tendency to overstay its welcome. Many other gases—including water vapor and methane gas—trap much more heat. But few stick around in the atmosphere as long as CO2—between three hundred and one thousand years. In other words, we can stop the climate from warming further, but it'll take a very long time for it to return to its natural state without a little help. Luckily, we have technologies to put some of that carbon back in the ground, where it came from.

Direct air capture (DAC) is one of those technologies. DAC involves using giant fans to suck air into a filter made of a liquid or solid **solvent**. A chemical reaction causes the CO2 to essentially stick to that filter material. Next, the filters are heated to an extreme temperature, which causes them to release CO2 as gas once more. The released CO2 is then trapped in a container, dissolved into water, and injected deep into the Earth, where it reacts with the rocks underground. "You'd have to grind up that rock and heat it to 1,000 degrees to release the CO2 again," said Niall Mac Dowell, a professor of energy systems engineering at Imperial College London. In other words, it stays there for good.

But DAC isn't a get out of jail free card, Mac Dowell warns. It's expensive, costing between $250 and $600 to draw down one ton of CO2. We'll need to draw down billions of tons each year to avert the worst effects of climate change. With research and funding, the process could become much less expensive over time. Still, Mac Dowell said, "Carbon drawdown is not an alternative to **mitigation**. It's something you have to do as well."

MAKING IT HAPPEN

We have the technology. We know what to do. Next, we need the policy to make it happen. Some countries are already well on their way to a **carbon-neutral** future, in which they'll draw down the same amount of CO2 that they create. Based on the Environmental Performance Index created by researchers at Yale University, Denmark, the United Kingdom, and Romania have the lowest growth rates in greenhouse gas emissions and lowest greenhouse gas emissions per capita. Denmark has pledged to have at least half of its fuels come from renewables by 2030 and is already building an artificial island in the North Sea that will house enormous wind farms. The United Kingdom recently adopted policies that will make plane tickets more expensive for frequent fliers, require homes to be better insulated, and encourage more walking and biking.

Meanwhile, in the United States, Democrats have been pushing for a **bill** that takes an aggressive stance on climate change. In 2018, U.S. Representative Alexandria Ocasio-Cortez and U.S. Senator Edward J. Markey came up with the **Green New Deal**. This plan originally called for a 10-year effort in which the United States would move towards sourcing 100 percent of its electricity from renewable sources. The push for this bill continues to this day—its newer versions propose one trillion dollars for local governments to fund their own Green New Deal programs as well as a work program that would create 1.5 million jobs on climate-change related projects.

Some lawmakers argue that aggressive climate legislation will take jobs away from people who work in industries dependent on fossil fuels, such as coal mining and plastic manufacturing. They warn that bills like the Green New Deal will raise taxes and cost-of-living for working-class Americans, and that they threaten free market capitalism and individual liberties by imposing regulations. However, these arguments aren't entirely objective. A powerful fossil fuel **lobby**, or group of representatives paid to influence politicians to vote in favor of industry interests, has spent decades sowing misinformation about climate change. And each campaign season, the fossil fuel industry pours millions of dollars into the campaigns of politicians who have a track record of voting against environmental legislation.

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Alexandria Ocasio-Cortez

THE POWER OF INDIVIDUALS

We need systemic change to beat climate change—like investing in renewable energy, building incentives for companies to clean up their carbon emissions, and transforming our cities so that they don't revolve around cars. But individuals can make a difference too. This is especially true for middle- and upper-class people living in wealthy countries like the United States.

The wealthiest 10 percent of the world are responsible for more than half of all carbon emissions.

THE DEBATE

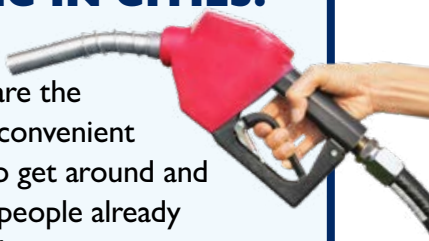
SHOULD LOCAL GOVERNMENTS WORK TO REDUCE CAR TRAFFIC IN CITIES?

YES

- ✓ Gas-powered cars are among the largest contributors to climate change.
- ✓ Car accidents kill tens of thousands of people each year in the U.S. alone.
- ✓ Short trips within cities can be completed using bicycles and public transportation.

NO

- ✗ Cars are the most convenient way to get around and most people already own them.
- ✗ Electric vehicles will help cut down on pollution.
- ✗ It's not convenient or possible for some people to ride bicycles or take public transportation.



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As gas prices surged in 2022 due to global inflation and a war in Ukraine, more people began seeking alternate means of transportation.

THE DEBATE

SHOULD INDIVIDUALS BE RESPONSIBLE FOR DECREASING CARBON EMISSIONS?

YES

- ✓ Each person should be responsible for their own carbon footprint.
- ✓ The wealthiest 10 percent of the world are responsible for half of carbon emissions.
- ✓ Changes in lifestyle can put a real dent in carbon emissions. Buying an electric car or halving the trash a household produces each saves 1 ton of CO2 per year. The average household emits 16 tons per year.

NO

- ✗ The concept of a personal carbon footprint was popularized by oil giant BP in a 2005 advertising campaign, apparently to shift blame away from corporations.
- ✗ Even at the height of the coronavirus pandemic, with many people stuck at home, carbon emissions only fell 17 percent.
- ✗ For many people, it's impossible to make low-carbon lifestyle changes. For example, their city might not have infrastructure for bicycling or clean electricity.

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Some activists criticize an approach to climate change that emphasizes individual action, arguing that the approach distracts from the role that major polluters play in climate change. After all, just one hundred companies are responsible for 71 percent of greenhouse gas emissions. And it's unfair to place the burden on lower-income people who may not have access to the resources they need to decrease their carbon emissions, especially when they contribute relatively little to the problem at hand. Still, systemic changes take a long time, and if you have the resources, there are specific individual changes that have been shown to make a real difference. Why not start now?

WHAT *YOU* CAN DO

Sure, one person's decision to go vegan won't put a dent in our global carbon emissions. But individual action can actually lead to the systemic change we need to stop the climate emergency. When individuals make lifestyle changes, it tends to inspire others to do the same. When enough people join in, it sends a clear signal to policymakers that voters are ready for action. Here's what you can do to be a part of that movement.

- **Walk or bike to school.** Scientists analyzed the impact of behavioral changes on carbon emissions, and they found that going car-free packed the biggest punch. Making your commute to school carbon-free is a good place to start. If that's not possible for you, think about taking public transportation or carpooling with friends.

- **Be mindful about activities.** In a similar vein, think about your commute to after-school activities. If it's an option for you, consider choosing activities that allow you to walk, bike, or take public transit over activities that require a long drive.
- **Purchase** used or recycled products instead of new ones wherever possible. Avoid products with lots of packaging, and use your own reusable containers when you can.
- **Eat less meat.** Scientists have found that going vegan is among the top three most impactful behavioral changes a person can make. But, good news, you don't have to completely ditch animal products to put a dent in your carbon footprint. Any reduction of meat and other animals products will help. (A vegan diet has about half the carbon imprint of a vegetarian diet.)
- **Use your voice.** Youth-led organizations like Fridays for Future and the Sunrise Movement have drawn the public's attention to the climate crisis and popularized climate-friendly policies. You can find a map of upcoming actions on the Fridays for Future website or go online to join a local Sunrise Movement chapter.
- **Research your own carbon footprint:** Explore the University of California, Berkeley's CoolClimate Calculator, which helps you calculate your own carbon footprint—and the potential impact of lifestyle changes.

YOUTH MAKING A DIFFERENCE

Xiye Bastida

John Lamparski/Getty Image

When she was thirteen years old, climate change forced Xiye Bastida out of her hometown of San Pedro Tultepec, Mexico. In 2015, after five years of extreme drought, record rainfall flooded the town. After moving to New York City, Bastida made it her mission to make policy-makers care about climate change. Inspired by Swedish activist Greta Thunberg, who skipped school to sit outside her country's parliament every day for three weeks leading up to an election, Bastida rallied 300,000 teens in New York City to join the metropolis's newly established chapter of Fridays for Future, a youth climate advocacy organization. Bastida led the city's youth in skipping school every Friday as part of a weekly climate strike.

Varshini Prakash

Varshini Prakash (right) became involved with the climate movement at the University of Massachusetts at Amherst, where she went to school. There, she led the university's **divestment** movement, demanding that the school remove its stocks, bonds, and other investments from fossil fuel companies. In 2016, it became the first major public university to divest from fossil fuels.

Her activism didn't end there. Under her leadership, the Sunrise Movement, a youth-led activist organization, popped onto center stage in 2018 when two hundred activists staged a sit-in inside the office of Nancy Pelosi, incoming Speaker of the House of Representatives. There, they demanded a Green New Deal—popularizing the proposed legislation.

Bea Dolores

Bea Dolores lives on the frontlines of climate change. In 2020, when international climate conference COP26 was postponed, she and other youth activists staged their own climate conference, which they called MockCOP. Over YouTube and Zoom, more than 350 youth delegates from 150 countries met with scientists and policy-makers, gave speeches, and developed a climate treaty, which they sent to delegates attending the 2021 COP26.

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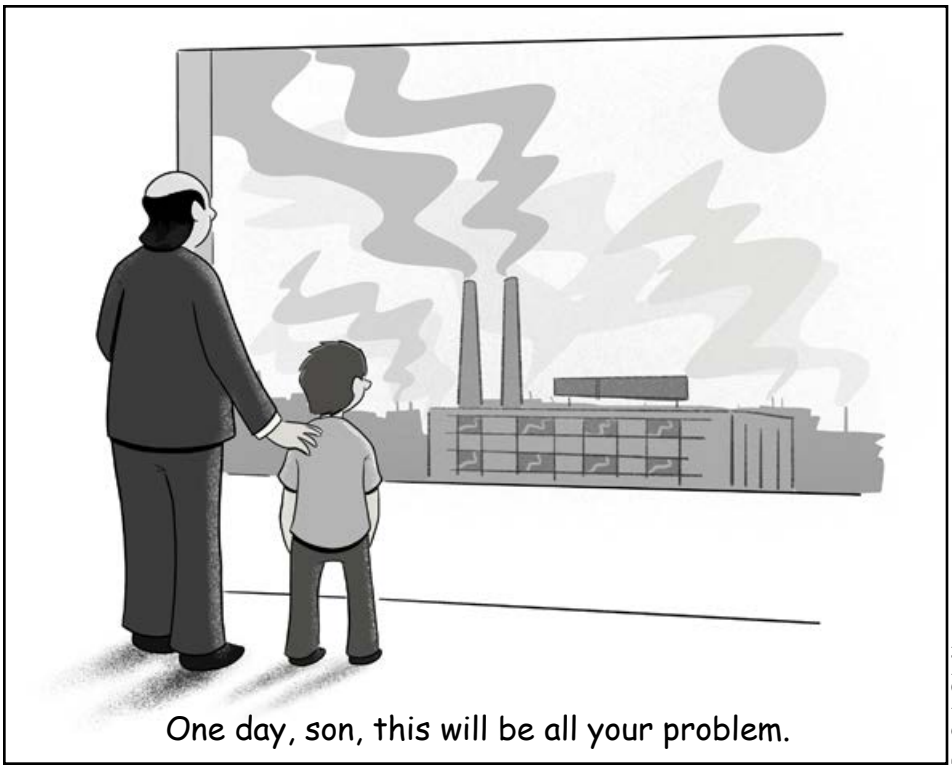
THE BACK PAGE



Pan Cooke@thefakepan

INHERITING THE FUTURE

1. What is this cartoon saying about the climate crisis? Why do or don't you agree?
2. How do your thoughts and opinions about climate change differ from those of the adults in your life? Why do you think older and younger people might have different perspectives on this issue?
3. How do you think younger generations will do things differently than their parents and grandparents when it comes to pollution and the environment?

NOW IT'S YOUR TURN TO MAKE GREAT DECISIONS

1. What regulations would you suggest to help address climate issues in the fast fashion, meat, or transportation industries?
2. What might motivate large companies to take stronger action to reduce their use of fossil fuels?
3. **YOUR STORY:** How often do you think about climate change? In what ways has it impacted your life?

KEY WORDS & TERMS

bill
carbon neutral
direct air capture
divestment
electrical grid
fossil fuels
global warming
Green New Deal
greenhouse gases
lobby
mitigation
renewable energy
solvent

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Thanks for Reading!
We'll be back in fall with all-new topics for the new school year. In the meantime, let us know what you thought of this year's topics.

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