

**UNIT 1**

# **Energy & the environment**

**Appendix**





## 1.2 Production and consumption | Data analysis

### Discussion prompts:

What do these charts depict? What questions do they answer?

What do the charts not show? What questions do they raise?

Looking at these charts, what do you notice about how individuals, industry, and the commercial sector consume primary energy sources and electricity?

### Sources

Energy Information Administration | US energy facts; Electricity explained

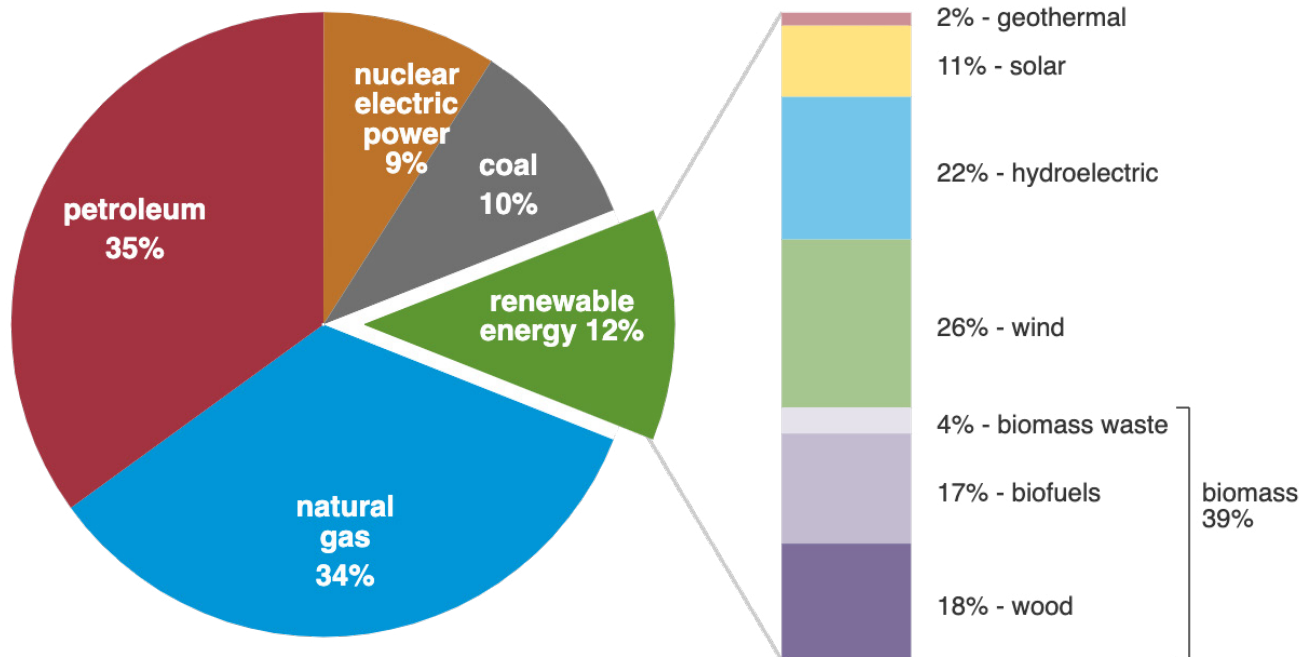
<https://www.eia.gov/energyexplained/us-energy-facts/>

<https://www.eia.gov/energyexplained/electricity/>

## U.S. primary energy consumption by energy source, 2020

total = 92.94 quadrillion  
British thermal units (Btu)

total = 11.59 quadrillion Btu



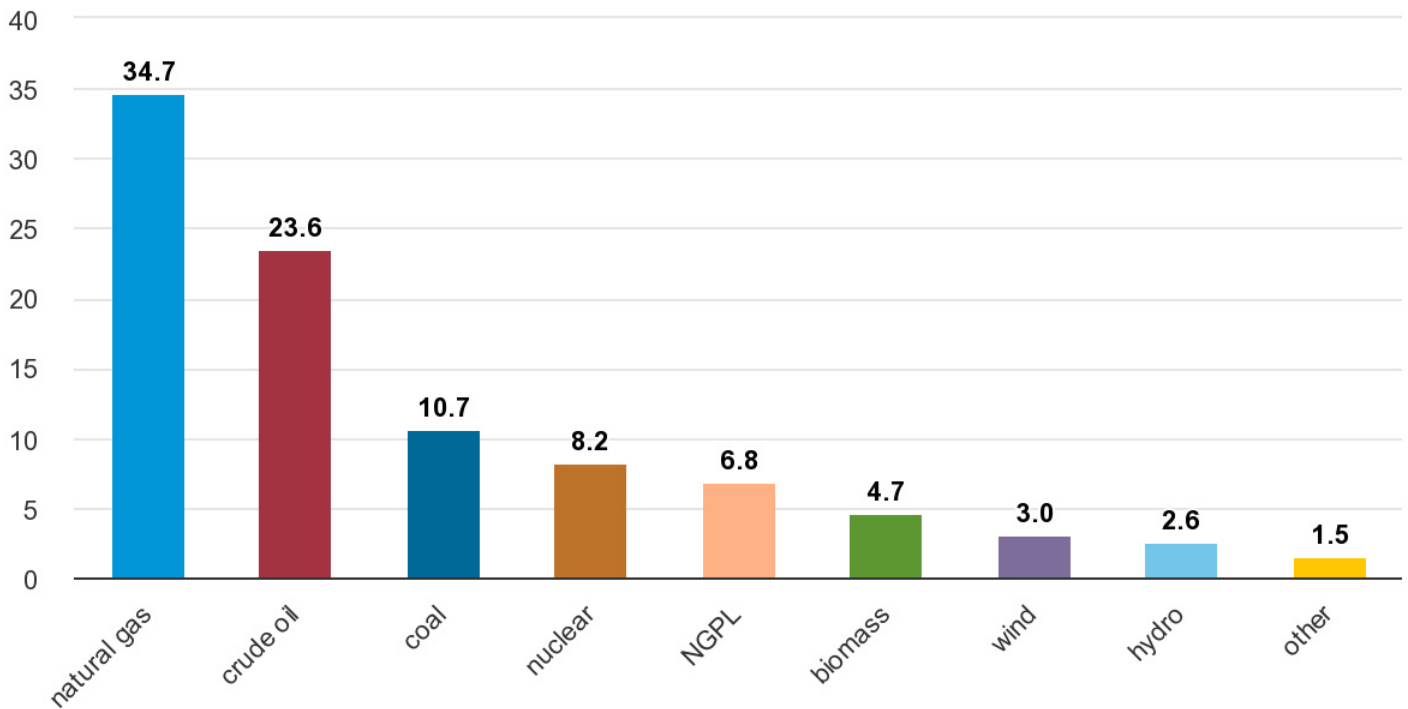
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2021, preliminary data



Note: Sum of components may not equal 100% because of independent rounding.

## U.S. primary energy production by major sources, 2020

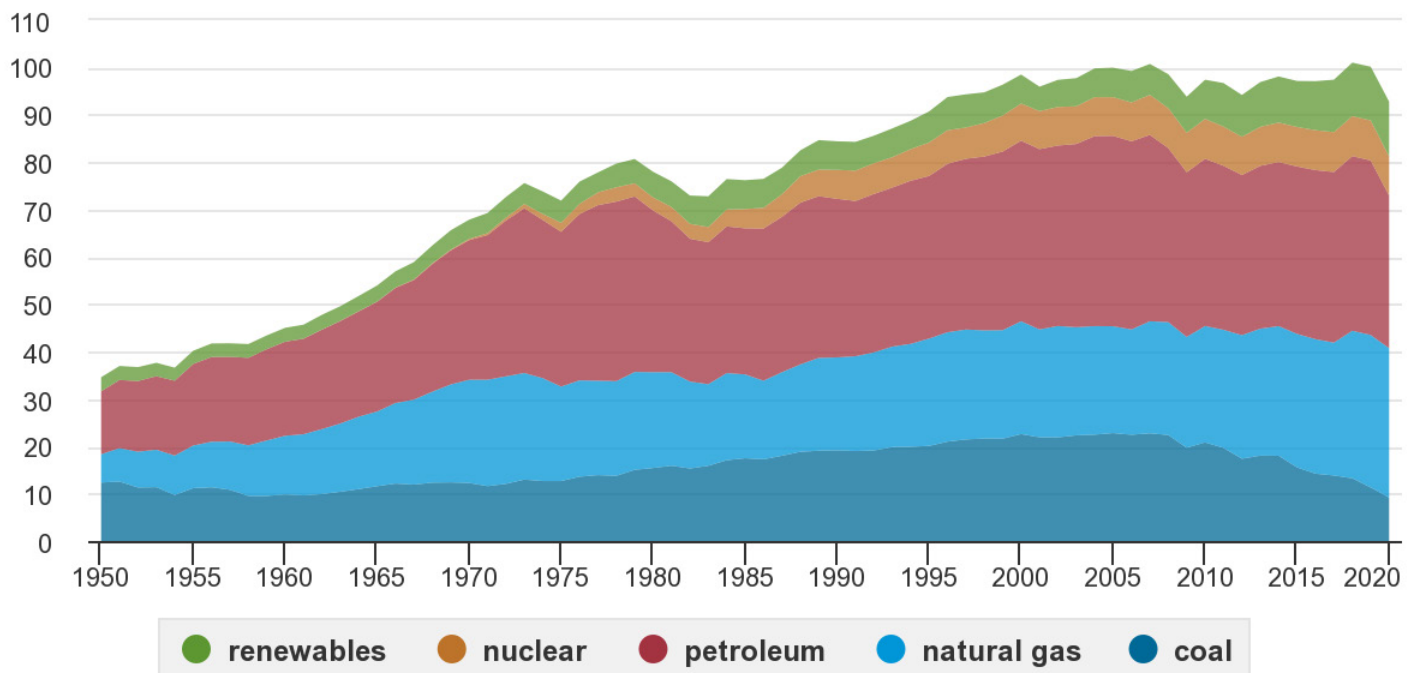
quadrillion British thermal units



Source: U.S. Energy Information Administration, *Monthly Energy Review*, April 2021, preliminary data  
 Note: NGPL is natural gas plant liquids; other is geothermal and solar; hydro is conventional hydroelectric.

## U.S. primary energy consumption by major sources, 1950-2020

quadrillion British thermal units



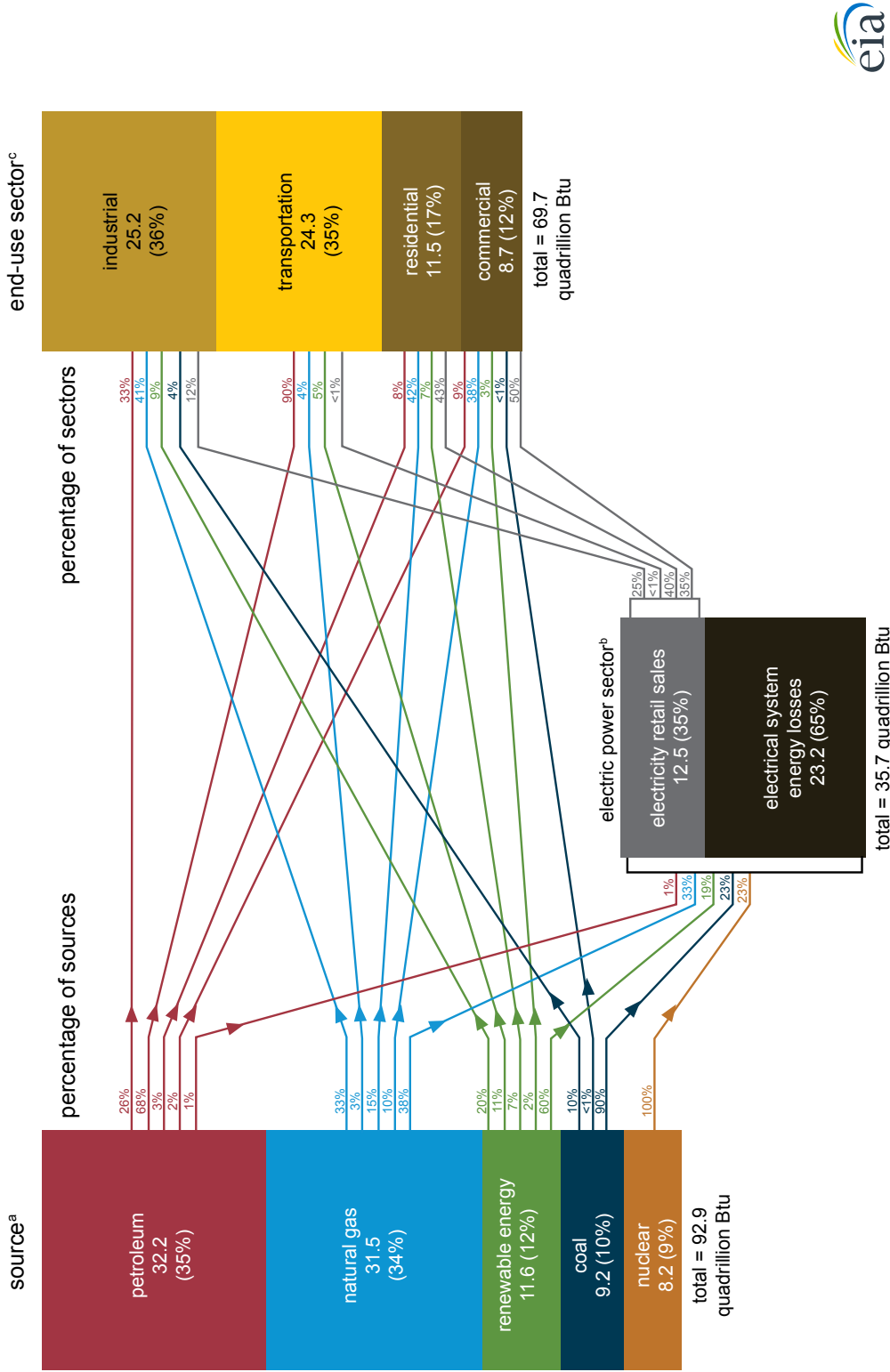
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3, April 2021, preliminary data for 2020



Note: Petroleum is petroleum products excluding biofuels, which are included in renewables.

# U.S. energy consumption by source and sector, 2020

## quadrillion British thermal units (Btu)



Sources: U.S. Energy Information Administration (EIA), *Monthly Energy Review* (April 2021), Tables 1.3 and 2.1-2.6.

Note: Sum of components may not equal total due to independent rounding. All source and end-use sector consumption data include other energy losses from energy use, not separately identified. See "Extended Chart Notes" on next page.

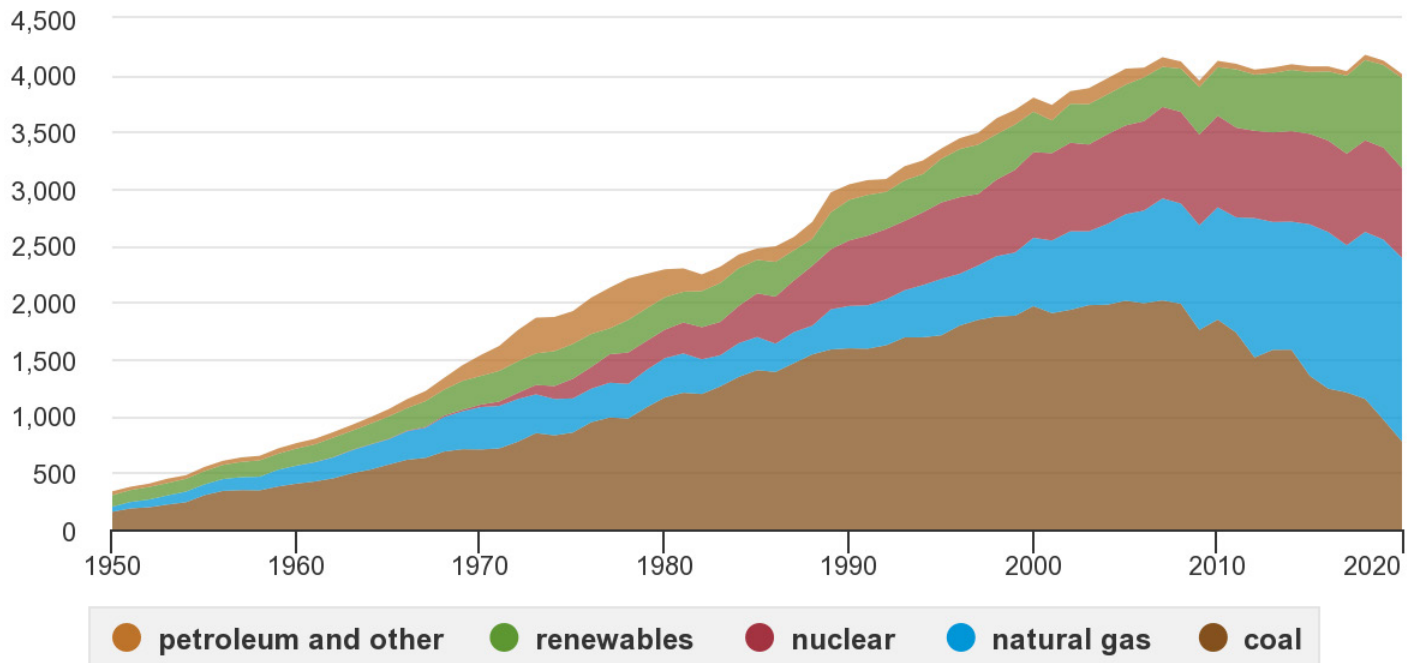
<sup>a</sup> Primary energy consumption. Each energy source is measured in different physical units and converted to common British thermal units (Btu). See EIA's *Monthly Energy Review* (MER), [Appendix A](#). Noncombustible renewable energy sources are converted to Btu using the "Fossil Fuel Equivalency Approach", see [MER Appendix E](#).

<sup>b</sup> The electric power sector includes electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Energy consumed reflects the approximate heat rates for electricity in [MER Appendix A](#). The total includes electricity net imports, not shown separately. Electrical system energy losses are calculated as the primary energy consumed by the electric power sector minus the heat content of electricity retail sales. See Note 1, "Electrical System Energy Losses," at the end of [MER Section 2](#).

<sup>c</sup> End-use sector consumption of primary energy and electricity retail sales, excluding electrical system energy losses from electricity retail sales. Industrial and commercial sectors consumption includes primary energy consumption by CHP and electricity-only plants contained within the sector.

## U.S. electricity generation by major energy source, 1950-2020

billion kilowatthours



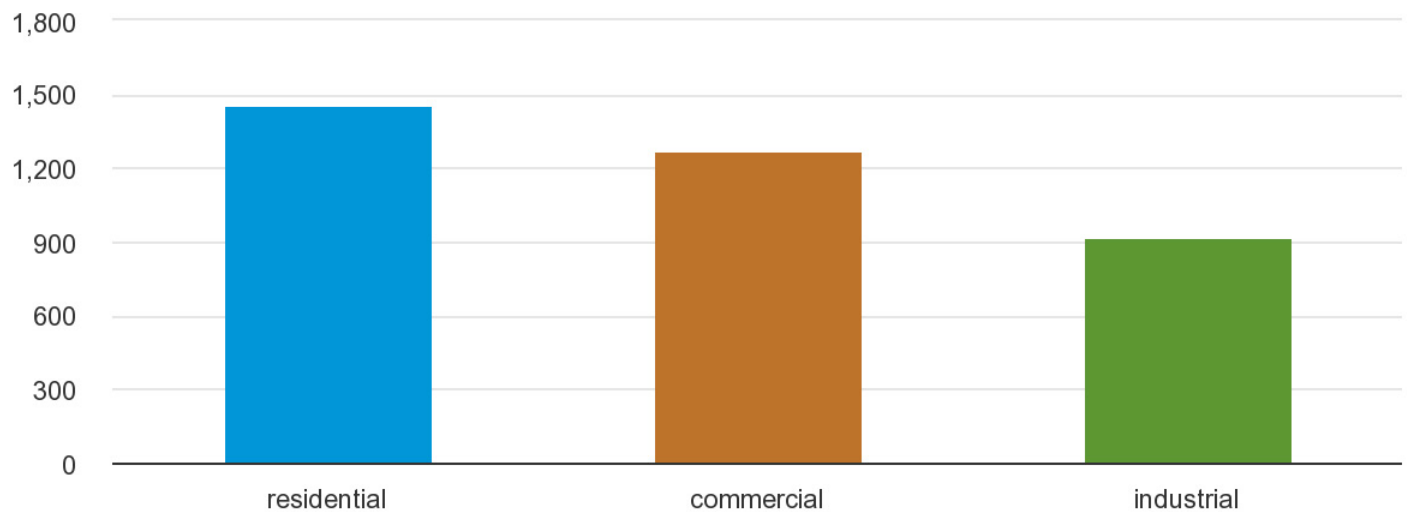
Note: Electricity generation from utility-scale facilities.



Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 7.2a, January 2021 and *Electric Power Monthly*, February 2021, preliminary data for 2020

## U.S. retail sales of electricity to major end-use sectors, 2020

billion kilowatthours

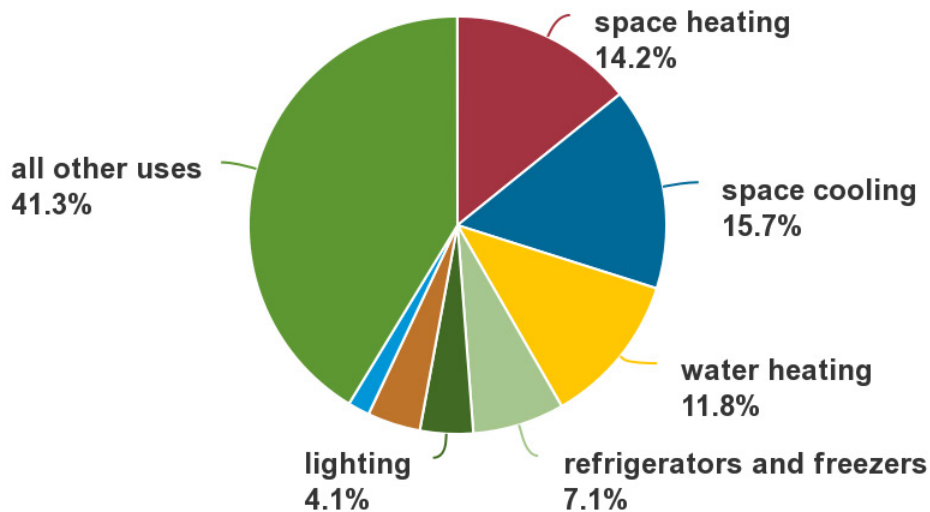


Note: Sales to transportation sector equal 6.5 billion kilowatthours.



Source: U.S. Energy Information Administration, *Electric Power Monthly*, Table 5.1, February 2021, preliminary data

## U.S. residential sector electricity consumption by major end uses, 2020



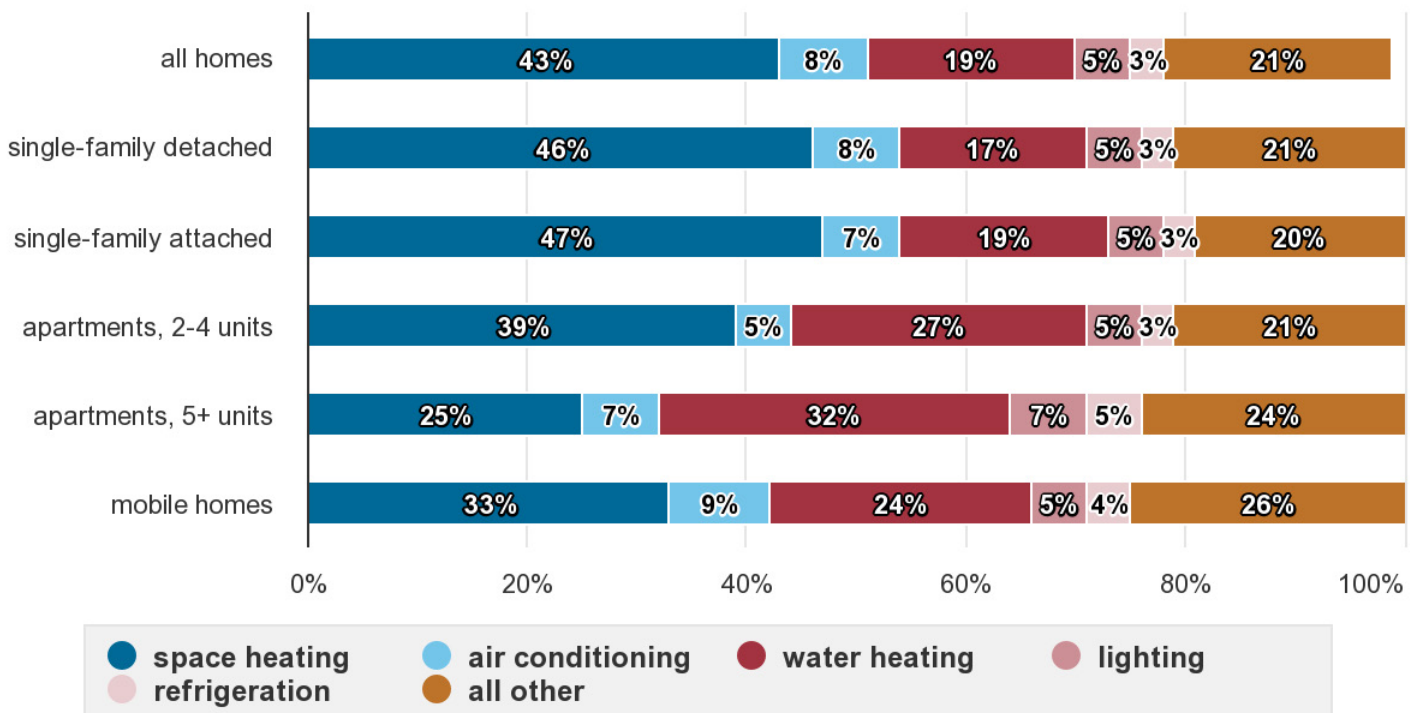
Note: Space heating includes consumption for heat and operating furnace fans and boiler pumps.

All other uses includes miscellaneous appliances, clothes washers and dryers, computers and related equipment, stoves, dishwashers, heating elements, and motors not included in other uses.



Source: U.S. Energy Information Administration, *Annual Energy Outlook, 2021*, Table 4, February 2021

## End-use consumption shares by types of U.S. homes, 2015



Note: Shares are a percentage of annual site energy consumption. Site energy consumption excludes the losses in electricity generation and delivery.



Source: U.S. Energy Information Administration, *2015 Residential Energy Consumption Survey*



## 1.2 Electrical building blocks | Building system analysis

### Instructions

Mark points of consumption on the Jones Beach Energy & Nature Center building plan (or draw a plan of the space you are analyzing on the next page). Make a list of what you observe. Don't forget to consider heating and cooling and other "background" energy consumption.

**Do devices with the largest loads consume the most electricity?**

**How might different devices' electricity consumption to change over the course of a year?**

**How does this building produce or conserve energy?**

**How does this building distribute energy?**

Look for evidence of circuits, devices that draw energy from the electrical system, and any evidence of where the system connects to a source of power.

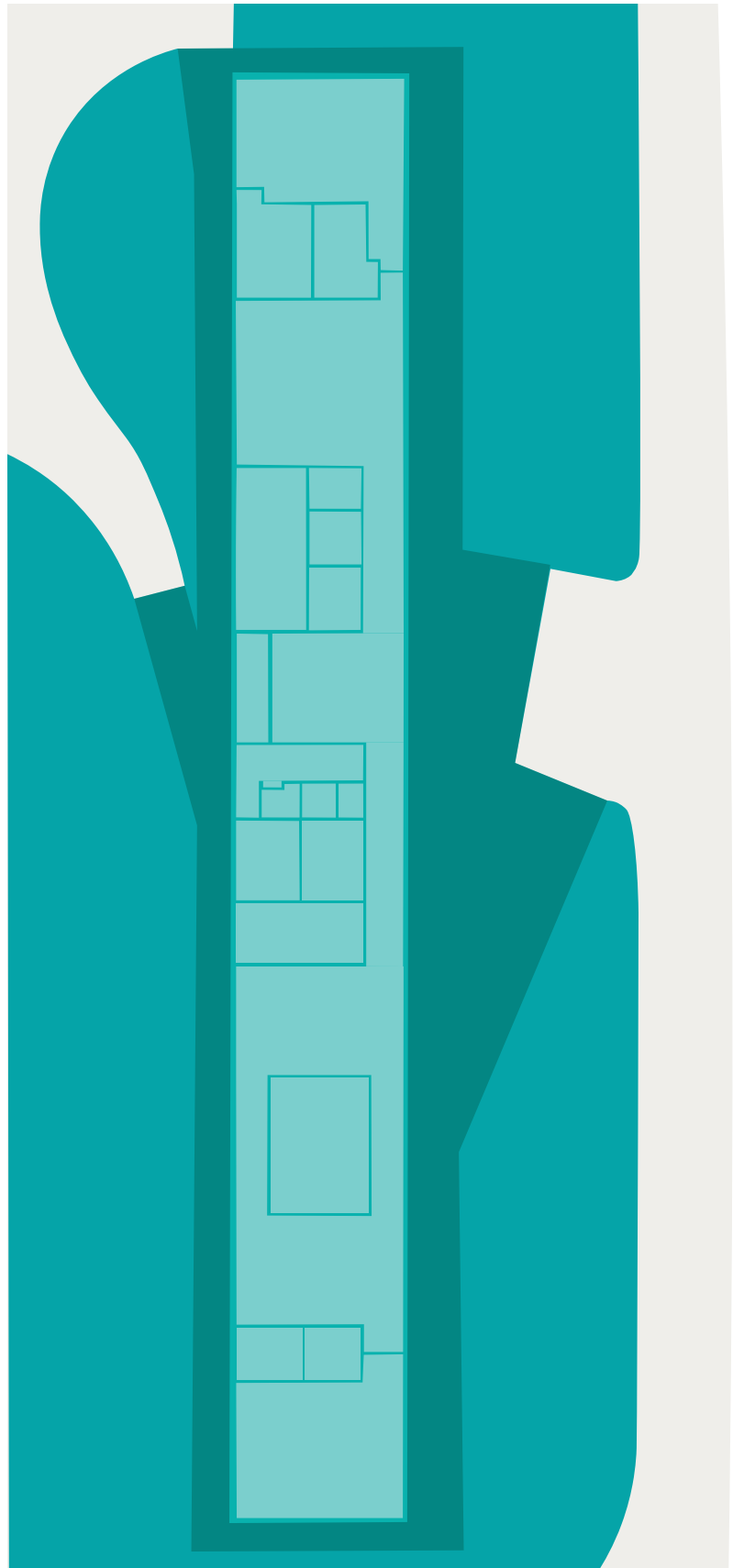
**What parts of the building's electrical system might not be visible?**

**What devices are likely to have the largest loads?**

**How might the building reduce its overall energy consumption?**

**How might it reduce its electricity consumption?**

**Which of those reductions would be the most significant?**





## 1.2 Transforming natural energy sources | Research and report

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When designing or evaluating the electrical systems we rely on in daily life, it's important to consider how efficiently the system transforms primary energy sources into electrical energy. Efficiency is generally described in terms of the percentage of energy contained in an energy source that is successfully turned into electrical current. (For instance, if a given solar panel is exposed to 1,000 watts of sunlight and produces 200 watts of electricity, it will be said to be 20 percent efficient.) But we can also consider the waste produced in the process and the energy lost in distribution when assessing a conversion technology's efficiency.

### Instructions

Research two of the following technologies that is used to convert a primary energy source into electrical energy.

**Coal-powered steam turbine generator**

**Gas-powered combustion turbine generator**

**Geothermal power plant**

**Photovoltaic solar panel**

**Hydroelectric power plant**

**Wind turbine generator**

Prepare a research report that compares the two technologies, addressing the following questions for each:

**How does the technology work to transform a primary source of energy into electricity?**

**How efficient is it, on average? What factors affect its efficiency?**

**How is the resulting electricity delivered to consumers?**

**How much energy is lost in the process?**

**What waste is produced during electricity generation and distribution using these technologies? How else do these technologies impact their immediate environment?**

**What other factors do you think should be considered when assessing this technology?**

**Where are there opportunities to improve these technologies?**

## 1.3 Energy and environmental impacts | Debate

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### Instructions

Each group of five should contain two Government Adjudicators, one Environmental Advocate, one Consumer Advocate, and one Producer Advocate. Each student should receive all the Energy Source memos but only one Council Member profile.

Designate a Council Chairperson to moderate the debate.

Read through the Energy Source Information Sheets and get familiar with the assigned Council Member profiles.

#### **What are your goals?**

#### **What do you want to avoid?**

Formulate initial proposals. Each Member should choose up to three energy sources among which the ten units of funding will be divided, then write their proposal on a piece of paper and submit it to the Chairperson.

Vote on initial proposals. Members should not vote for their own proposals, but instead choose their top two of the other members' proposals.

Debate the top three proposals. At the end of the allotted debate time, vote again.

## 1.3 Energy and environmental impacts | Debate

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### Energy Source A

Of the non-renewable energy sources, Energy Source A is one of the least energy-dense. Historically, it has been widely available within the country's borders, and was one of the first energy sources used in industry. A large infrastructure and economy developed around extracting and refining Energy Source A, both of which processes are labor-intensive. As other energy sources have become more competitive, government subsidies have kept prices low and jobs intact. At one point in time, there was a large infrastructure to distribute Energy Source A to individuals and households; now, it is almost exclusively used to generate electricity.

Extracting this energy source from natural deposits can enormously impact the environment, causing habitat loss, destabilizing terrain, and polluting the ground and water.

The process of refining this material and producing power from it at industrial facilities produces noxious gases and chemical runoff, poisoning the ground and water nearby.

Extracting, refining, and using this material to generate power can cause respiratory disease among workers and residents in nearby communities.

Using this energy source releases greenhouse gases in abundance, accelerating climate change that threatens global biodiversity, agricultural production, and human settlements.

Existing technologies that convert this energy source into electricity are 40 percent efficient.

By 2025, it will cost about \$76 per Megawatt Hour to produce electricity using this Energy Source.

### Energy Source B

This non-renewable Energy Source is more than twice as energy-dense as Energy Source A by weight, but it is much less concentrated in natural deposits, so extracting the same quantity of energy requires more effort and expense and affects larger expanses of terrain. Large amounts of Energy Source B are currently available within the country's borders, in part due to new extraction techniques that can access deposits that were previously out of reach. There is a significant existing infrastructure for treatment, storage, transportation, and distribution of Energy Source B to individual and industrial consumers.

Extraction can significantly impact the environment, triggering erosion and mudslides, as well as destroying important habitats. Chemicals also leach into the ground and water near mining sites.

Transporting Energy Source B to the end user can be risky: distribution and storage systems have been known to leak, potentially causing explosions. In thickly-settled areas, these accidents can cause direct injury and death.

Using this energy source releases some greenhouse gases, accelerating climate change that threatens global biodiversity, agricultural production, and human settlements. However, Energy Source B produces less than half as many greenhouse gas emissions as Energy Source A.

Industrial electricity generation using Energy Source D tends to be removed from points of consumption due to hazards. Extensive delivery infrastructure is therefore necessary, and energy can be lost in transit.

Existing technologies that convert Energy Source B into electricity are 50 percent efficient.

By 2025, it will cost about \$67 per Megawatt Hour to produce electricity using this Energy Source.

## **Energy Source C**

This non-renewable material is the most energy-dense material on earth, containing more than 70,000 times more energy by weight than Energy Sources A and B. This energy source is also very rare and quite dangerous. Accidents in extraction, refinement, distribution, or waste management, while uncommon, have catastrophic consequences. Explosions or systems breakdown can spread long-lasting toxic material through the air, ground, and water near mining, processing, or power-production sites, harming humans and other organisms. Even when no accidents occur, safe handling of Energy Source C requires extensive facilities and expensive equipment, and access to the material is highly regulated.

Extracting Energy Source C from the natural environment produces waste materials that linger near mining sites for decades, potentially causing disease among those who live nearby. The power-production process also produces waste materials that remain toxic for thousands of years and must be stored securely. Storage facilities must be carefully maintained over time as leaks due to structural degradation pose significant risks to nearby ecosystems and human communities.

The use of Energy Source C produces no greenhouse gas emissions directly. However, transporting and storing this material and its waste products require the use of vehicles and construction materials that have their own associated greenhouse gas emissions.

Industrial electricity generation using Energy Source D tends to be removed from points of consumption due to hazards. Extensive delivery infrastructure is therefore necessary, and energy can be lost in transit.

Existing technologies that convert this energy source into electricity are 30 percent efficient.

By 2025, it will cost about \$82 per Megawatt Hour to produce electricity using this Energy Source.

## **Energy Source D**

This energy source is one of the most widely available on Earth and exists in virtually unlimited quantities. However Energy Source D is not always available, and humans cannot control how consistently or powerfully it is available. Thus, power-supply systems depend on energy storage technologies to make Energy Source D a viable and consistent source of power. This energy source can be harnessed for industrial power production, in which case it requires a large geographical footprint. Individuals can also generate electricity from this energy source at the point of consumption, integrating the technology into existing structures, in which case it has one of the smallest footprints of any energy source.

Because this is a relatively new energy source, ramping up production will require significant funds and new appropriation of large tracts of land.

Energy Source D produces no greenhouse gas emissions directly, but energy sources that emit greenhouse gases are involved in the production and transportation of the technologies used to extract, transform, and store Energy Source D. Producing these technologies requires rare minerals, and mining them can damage important and fragile ecosystems.

Industrial electricity generation using Energy Source D tends to be removed from points of consumption due to spatial needs. Extensive delivery infrastructure is therefore necessary, and energy can be lost in transit. Electricity generated by consumers loses little electricity in transit.

Existing technologies for extracting and transforming this energy source into electricity are 25 percent efficient.

By 2025, it will cost about \$35 per Megawatt Hour to industrially produce electricity using this Energy Source; consumer-site production will cost about \$150 per Megawatt Hour for commercial consumers and \$250 per Megawatt Hour for residential consumers.



### **Energy Consumer Advocate**

Your priorities are to keep prices low, and to distribute control towards energy consumers. You do not want to have to change your consumption habits. You are concerned about service reliability and long-term availability of power. You are concerned about environmental impacts insofar as they affect human communities.

### **Energy Producer Advocate**

Your priority is to maximize profit by minimizing the cost of material extraction and delivery infrastructure. You want to keep prices low to encourage consumption, but not so low that you don't make money. You are not concerned about the environment except insofar as environmental events affect your ability to sell energy. You are concerned about reliability. You are concerned about winning allegiance from the consumer advocate to try to sway the council.

### **Environmental Advocate**

Your priority is to minimize the impacts of energy production and consumption on the environment. You are concerned about pricing insofar as it affects production and consumption choices. You are concerned about reliability insofar as it makes certain energy sources more or less attractive to consumers. You are concerned about winning allegiance from the consumer advocate to try to sway the council.

### **Government Adjudicator**

Your priority is to find a solution that works for everyone such that you are not targeted for removal by an organized interest group during the next election. You are concerned about environmental impacts insofar as they affect your constituents. You want to keep prices low to appease consumers.

### **Government Adjudicator**

Your priority is to find a solution that works for everyone such that you are not targeted for removal by an organized interest group during the next election. You are concerned about environmental impacts insofar as they affect your constituents. You want to keep prices low to appease consumers.



## 1.3 Environmental justice | Research and report

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What is the spatial relationship between of the environmental impacts of the energy system and the places people live? For low-income people and people of color, these geographies can be too closely intertwined. These groups disproportionately suffer from the environmental impacts of the energy system: potentially hazardous energy infrastructures like mines, power stations, pipelines, and highways are disproportionately sited in poor, segregated communities, exposing members of those communities to greater risk of disease and injury. Meanwhile, as global climate change accelerates, poor and marginalized communities are among the first to feel the impacts of changing weather patterns, rising sea levels, and increasing water scarcity. But how should the burden of energy consumption's environmental impacts be distributed?

### Instructions

Read and summarize the two attached articles.

**What problem does each article describe? Who or what is responsible? Who is most affected? Who avoids being affected?**

**How are the stories similar? How are they different?**

**Where do you locate injustice in each story?**

Then, reflect:

**What is your definition of “environmental justice”? How should an environmentally just society should be organized, and why is environmental justice important?**

**What stands in the way of environmental justice in your community and society at large? What can you do to help bring about environmental justice?**

### Sources

“Postcard From Thermal: Surviving the Climate Gap in Eastern Coachella Valley,” Elizabeth Weil and Mauricio Rodríguez Pons, *ProPublica*, August 17, 2021. Also available online

[propublica.org/article/postcard-from-thermal-surviving-the-climate-gap-in-eastern-coachella-valley](https://propublica.org/article/postcard-from-thermal-surviving-the-climate-gap-in-eastern-coachella-valley)

“As Houston plots a sustainable path forward, it’s leaving this neighborhood behind,” Raj Mankad, *Grist*. Also available online

[texastribune.org/2017/08/23/houston-plots-sustainable-path-forward-its-leaving-neighborhood-behind/](https://texastribune.org/2017/08/23/houston-plots-sustainable-path-forward-its-leaving-neighborhood-behind/)

## As Houston plots a sustainable path forward, it's leaving this neighborhood behind

**RAJ MANKAD, GRIST AUG. 23, 2017**

Juan Parras gives one hell of a tour of Houston's east side. He's charming and funny. Wearing a beret, he strikes an old-world look, like he might lead you to a cafe on a plaza. He doesn't charge a fee for his services. After all, you're on a "toxic tour," and Parras is on a mission.

Parras grew up in 1950s West Texas. He remembers segregated schools, the restaurants that wouldn't serve him, the unpaved roads, and the people who lived closest to the local refinery. Those experiences led him to a career as a social justice advocate. The resident of Houston's heavily industrial east side has worked in a city housing department, for a union, for a law clinic, and on a campaign that stopped a PVC factory from being built in Louisiana's "Cancer Alley."

For the last decade, he has served as executive director of Texas Environmental Justice Advocacy Services (better known as t.e.j.a.s.). Part of his work is leading tours past the heaping piles of scrap metal along Houston's Buffalo Bayou and by Cesar Chavez High School, which opened in 2000 within a quarter-mile of three large petrochemical plants.

Parras can go all day, up and down the Houston Ship Channel to Denver Harbor and neighborhoods like Galena Park, Baytown, and Pasadena. Surely you've read about the Keystone XL pipeline and other controversial proposed projects that would carry oil from the Canadian tar sands to Gulf Coast refineries? Parras can show you where many of them would end.

The toxic tour sometimes concludes in the neighborhood of Manchester, a six-square-mile grid of streets where the petrochemical industry towers directly over small homes. Where, according to EPA databases, Valero Refining can produce up to 160,000 barrels a day of gasoline and other fuels. Where the Ship Channel Bridge, one of the busiest stretches of Interstate 610, carries tens of thousands of vehicles per day (along with their emissions) directly over homes. And where about 4,000 people live – more than 95 percent of whom are people of color, and 90 percent low income.

The cancer risk for residents of Manchester and the neighboring community of Harrisburg is 22 percent higher than for the overall Houston urban area, according to a recent report from the Union of Concerned Scientists and t.e.j.a.s. While the city works to overcome its image as a dirty oil town, these neighborhoods remain solidly dominated by the petrochemical industry. And despite the work of Parras and his team, the environmental and health issues that Manchester's residents face are not gaining enough political traction to garner real change.

"Environmental justice issues become all too easy to grasp when you take people into neighborhoods," Parras said when the Sierra Club awarded him its 2015 Robert Bullard Environmental Justice Award. So Parras gives the toxic tour over and over again, hoping that, eventually, people will listen.

In 2016, Houston was lauded for its "green transformation." The D.C.-based nonprofit Cultural Landscape Foundation brought visitors from around the country to study new investments in the city's parks, as well as an 150-mile network of trails along its bayous. Long the whipping boy of the urban-planning world, the fourth-largest U.S. city will soon have half a dozen signature parks designed by internationally known firms.

Yet Houston's attempts to appear greener have thrown longstanding inequities into sharper contrast. Two-bedroom apartments in a downtown highrise overlooking Discovery Green park rent for more than \$4,000. Seven miles east, chemical storage tanks dot the landscape around Hartman Park in Manchester, where nearly 40 percent of residents live in poverty.

Beyond financial disparities, the region's signature industry inflicts a staggeringly disproportionate burden on east-side residents. According to the Union of Concerned Scientists' report, the airborne concentration of 1,3-butadiene, which causes cancer and a host of neurological issues, is more than 150 times greater in Manchester and Harrisburg than in West Oaks and Eldridge, relatively affluent neighborhoods on Houston's

west side.

Adrian Shelley, director of Texas' outpost of the watchdog group Public Citizen, describes Manchester and the neighborhoods that abut it as sacrificial lambs, where the situation is “unjust, offensive, cruel, racist, ridiculous, tragic, and costing lives.”

Juan Flores has lived in Galena Park, right across Buffalo Bayou from Manchester, since the age of four. One of his earliest memories, as a kindergartner, was “seeing all this white stuff on the cars” and thinking it was snow – a rare occurrence in Houston. He played in it until his mom yelled out, “Hijo, no! We don't know what it is!”

When he would play with friends over in Manchester, he remembers smells that “were so unbearable you had to go inside.”

“Most of the people who live in the area, like my dad, work in the industry,” Flores says. “We are aware of the dangers. We can smell the chemicals.”

He recalls “his first explosion,” which happened in the nearby Pasadena neighborhood in 1989, when Flores was in sixth grade. He remembers seeing “a big mushroom cloud.” The so-called Phillips disaster – which was actually multiple explosions at the Houston Chemical Complex owned by the energy company Phillips 66 – broke the windows of his school. Twenty-three Phillips 66 employees were killed and 314 people were injured.

Flores was a member of the Galena Park city council from 2014 to 2016. He helped get an ordinance passed that limits the time trucks can idle on city streets, a substantial source of air pollution along the Ship Channel. The neighboring Jacinto City community adopted the policy, too.

According to Flores, truck drivers were at first upset with the new regulation. But he helped them understand the impact of running engines on the neighboring communities. “I told them, ‘Guys, it is your own kids,’” he says.

Local advocates say the only remedy for really helping the people trapped in Manchester and its toxic surrounding areas would involve a public buyout of their homes for the full cost of rebuilding their houses. (Market prices for Manchester-area homes are depressed by their hazardous neighbors). But even if residents were suddenly able to move to more pristine surroundings, Shelly says, doing so would disperse an entire community.

Meanwhile, it's tough to argue that Houston – despite its new park-building boom – isn't prioritizing industry over the health of its vulnerable communities. In May, Houston agreed to sell Valero several Manchester streets near its refinery for \$1.4 million. The energy company will expand its footprint, adding auxiliary buildings and more parking for the facility.

In recent years, according to Parras, Valero has bought out some residents in a piecemeal approach. (Valero did not respond to requests to comment for this story.) But he still didn't see the deal coming.

“I found out about the sale of the streets through the newspaper,” says Parras, who was taken aback after reading a Houston Chronicle article. “We are ignored.”

The communications director for Houston Mayor Sylvester Turner said the city has made strides to reduce pollution and monitor potentially harmful substances coming out of industries.

“The long-ago history of Houston has changed,” said Alan Bernstein, the communications director. “If you look at the most recent history ... you will find across-the-board improvements.”

“Does Houston have poor neighborhoods and rich neighborhoods? Yes, as do all other cities,” Bernstein added. “But currently Houston is blessed with having a government and a mayor who [are] focused on how to make opportunity and quality of life available to everyone as equally as possible.”

Policy that would help Houston control its pollution problem is tough to enact in a town dominated by the petrochemical industry. In 2005, a Chronicle investigation on industry-reported emissions spurred then-Houston Mayor Bill White to approach companies about voluntarily reducing air pollution – 1,3-butadiene, in particular.

In Manchester, Valero took the step of placing a sophisticated air monitor at its facility's fence line. Citywide, the impact of White's entreaties on emissions appears to have been inconsequential, and the effort likely cost him in his subsequent campaign for governor.

City-led initiatives are consistently challenged in courts by the Business Coalition for Clean Air, an industry-lobbying group that represents ExxonMobil and others. Last year, it convinced the Texas Supreme Court to strike down Houston's Clean Air Ordinance, which was adopted during White's administration.

The court ruled that the city does not have authority to enforce clean air regulations. During the last legislative session and the current special session, state politicians have put forward a range of bills using that and other pro-industry precedents to undermine the city's ability to police environmental issues. Lawmakers have attacked tree-preservation ordinances, fracking bans, and policies to reduce single-use plastic bags.

A 2016 report by the Sierra Club, Public Citizen, and Texans for Public Justice found that the three state oil and gas regulators raised \$11 million in recent years, 60 percent of which came from the industries they're charged with monitoring. A 2017 report by the Environmental Integrity Project found that Texas penalizes only 3 percent of the illegal pollution releases reported by companies.

"In a different political environment, self-reported violations or reports of air-emission events would result in fines of \$25,000 per day," Shelley says. "But it is not done, even though the authority is there under the law."

A Valero refinery sits directly across the street from the entrance to Hartman Park in Manchester, in east Houston. Courtesy of Yvette Arellano.

A Valero refinery sits directly across the street from the entrance to Hartman Park in Manchester, in east Houston. Courtesy of Yvette Arellano. t.e.j.a.s. & Union of Concerned Scientist Center for Science and Democracy

T.e.j.a.s. argues that the state should require chemical facilities to use safer substances, update their technologies, continuously monitor and report emissions, and avoid the construction of new facilities near homes and schools.

But Bakeyah Nelson, the executive director of Air Alliance Houston, says that putting such changes into effect "is tied to civic engagement and voting." A real shift will happen, she explains, only when "elected officials reflect what the population looks like and vote in a way that is consistent with what people want, which is protection from environmental toxins."

Last year, former Harris County Sheriff Adrian Garcia, a Mexican-American running on a platform that included environmental justice issues, challenged incumbent Gene Green, who has represented Texas' 29th district, which includes Manchester, since 1993. Despite the district having a population that is 76 percent Hispanic origin, local and national Latino leaders backed Green, praising his consistent stand on immigration issues.

Green retained his seat with a message that voters were more concerned about the jobs that industry brings than curtailing its unchecked growth.

According to the Air Alliance's Nelson, that economy-versus-environment framing is a false dichotomy. She says that greater regulation at a national level has coincided with continued economic growth and helped spur technological innovation.

Countering industry's hold on the region would involve raising awareness among locals that they don't have to choose between their health and their livelihoods, Nelson says. But the very fact that people choose to live in places like Manchester, which has been heavily industrialized since the 1970s, points to fundamental problems with access to safe, healthy, affordable housing, she adds.

"People need living wages so they don't have to purchase homes that put their health at risk," Nelson explains. "It is about environmental, health, and economic justice. All of those things are tied together."

Houston-based and other Texas nonprofits – like Air Alliance Houston and Environment Texas – have recently banded together to try to bring the air quality around so-called fenceline communities (meaning they border the fences surrounding industrial facilities) into the public consciousness.

"Through storytelling and good science, we are informing people that we need better air for a healthier and prosperous Houston," says Matthew Tresaugue, who manages the newly formed Houston Air Quality Media Initiative. The strategy includes amplifying the voices of residents, like Bianca Ibarra, a recent graduate of Galena Park High School, whose video PSA won a competition held by the media initiative and sponsored by the Environmental Defense Fund.

The collaborative effort is funded by the Houston Endowment, a charitable organization that gives out \$80 million in grants yearly to local nonprofits. (Though the Endowment has fewer direct ties to oil and gas wealth than other local foundations, it's previous president, Larry Faulkner, sat on the board of ExxonMobil while at the organization.)

Tresaugue stresses the need to move people to take action and put pressure on policymakers by connecting people in areas far from the Ship Channel to the challenges faced by residents of communities like Manchester, Harrisburg, Galena Park, Baytown, and Pasadena.

That's something Juan Parras has been doing for years now. And while the new initiative gets its feet under it, he'll continue his tours, giving them to anyone from students to fellow activists to public officials. That way, people can see and smell and reckon with what Manchester's residents live with every day.

"This is considered the capital of the industry for gas and oil," Parras says. "We learn that on a daily basis."

Environment

## Postcard From Thermal: Surviving the Climate Gap in Eastern Coachella Valley

In the climate crisis, it's possible to live in the same place but inhabit different worlds.

by Elizabeth Weil and Mauricio Rodríguez Pons

Aug. 17, 5 a.m. EDT



[Leer en español.](#)

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The first thing to know about Thermal, California, is: It's really damn hot. Already, at this early date in our planetary crisis, 139 days a year are over 95 degrees Fahrenheit in Thermal. Over the next 30 years, temperatures will rise 4 to 5 degrees more, and by the end of the century, more than half the year there will be hotter than 95 and nearly a quarter will be hotter than 112.

The second thing to know about Thermal, California, is: It's a cartoonishly horrible expression of a moral and practical issue that exists, at some level, in every society on earth. The climate crisis is an inequality magnifier. The heat and the hurricanes, the flooding and the wildfire smoke, slam down with full force on the disadvantaged. Meanwhile, the more privileged remain comparatively safe, protected by money and power. That difference in suffering is known as the climate gap, defined by researchers in a [foundational paper](#) on the subject as “the disproportionate and unequal impact the climate crisis has on people of color and the poor.”

All over California — all over the United States — such gaps are increasingly evident. People of color, the poor and the undocumented live in hotter places. Latino workers labor outside more and are more likely to lack potable water. There are often substantial temperature differences

between more and less affluent parts of the same cities. A study of 20 urban areas in the American southwest revealed a 4-degree Fahrenheit gap between the poorest 10% of neighborhoods and the wealthiest 10% of neighborhoods in the same towns. The same pattern held when comparing white neighborhoods and Latino neighborhoods. Among the states studied, the so-called thermal inequalities in California were the worst. And within California, Palm Springs, just 30 minutes from Thermal, and Inland Empire, the next-closest urban area, showed the worst differences of all: 6 to 7 degrees.

To understand how the climate gap was playing out in California, we decided to take a close look at the Coachella Valley, a 45-mile stretch of desert along the San Andreas fault that contains some of the state's famously fertile agricultural land and some of California's most renowned playgrounds for the rich.

On the west side, the Palm Springs side, are money-green golf courses, misters spraying from palm trees, wide, gorgeously paved roads, and a concert series called Splash House that features a poolside stage.

On the east side, the Thermal side, is a gray-green checkerboard of fallow and irrigated fields of grapes, bell peppers and golf-course turf, plus stands of date palms. Interspersed are sun-bleached trailers, homes for the people who work those fields and clean the pools and hotel rooms farther west.

The climate gap that defines the Coachella Valley is even more stark within Thermal itself.

The unincorporated community's full-time residents are 99% Latino and 78% immigrant noncitizens. Between March and May 2021, more households per capita received rental assistance in Thermal than in any other city or unincorporated community in Riverside County.

A community organizer named Lesly Figueroa took us on a tour of the mobile home parks — Polancos, as they're called around here. The unpaved roads turned to mud-sludge in the rain. Roofs ripped off in high winds. Overloaded improvised electrical systems ignited in the heat. And when those circuits blew, so did the running water, as most of the parks relied on small private wells, and those wells required electrical pumps.

But there's another Thermal, one where part-time residents keep their second (or third, or fourth) homes. These are the sorts of people who refuse to knuckle under to the natural world, instead bending it to their desires. This is the Thermal of the Desert International Horse Park, the Thermal of The Thermal Club, "an all-inclusive private destination for the distinguished motorsport enthusiast." It is also soon to be the Thermal of the Thermal Beach Club, which will feature an artificial 20-acre surf lagoon with custom waves, created by PerfectSwell wave technology.

Historically, the answer to the question of how to live and develop equitably in Thermal, as in the rest of the Coachella Valley, has been that luxury development will make all boats rise. Wealthy tourists, retirees and vacation-home owners will bring in jobs and tax revenue, and, like the sprinklers at resorts, green the whole place up.

But that's not at all what has happened so far.

As University of Southern California professor Juan De Lara, who grew up in Thermal and studies the region, put it: “We know trickle-down economics doesn’t work.”

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One evening this past March, on the east side of Thermal, out by Avenue 70, Pedro Nicolas, 33, stood in flip-flops and basketball shorts on his mobile home’s rotting plywood roof, through which his air conditioning, which he really couldn’t afford, leaked out all spring, summer and fall.

Oasis Mobile Home Park, where he lived, subsisted on the kind of infrastructure that makes the climate crisis kaleidoscopically worse. The water that poured out of the faucet ran yellow or milky white or brown; it smelled of sewage and was laced with arsenic. The park wasn’t hooked up to the municipal water system. The electrical system regularly failed and tenants said the landlord charged them an extra 7 cents, on top of the power company’s rate, for every kilowatt hour they used. The dust from the unpaved desert roads was biblically horrible. This, combined with the ozone, made worse by the heat, and the pesticides from the nearby fields, led to a noxious, inflammatory cocktail that swirled deep in Nicolas’ family’s lungs.

Oasis’ approximately 60 acres held about 240 mobile homes (nobody had a firm count, as they arrived and disintegrated on a regular basis) and well over 1,000 residents (nobody had a firm count on that, either). Dogs, hooked on bungee cords, barked behind wire fences. Behind those dogs sat grills and bikes and busted washing machines, the regular detritus of life, along with car-sized mounds of one-gallon plastic water bottles. Lideres Campesinas, a network of women farmworkers, regularly dropped off cases of water. The empties then accumulated waiting to be recycled, held together with twine.

In 2006, Nicolas had hired a coyote to smuggle him from Mexico to the U.S., where he moved in with his brother in Thermal. Many others from his indigenous Mexican Purhépecha community in Michoacán lived there. A year later, Nicolas returned for Maria de Jesus Diego Bautista, now his wife, whom he’d met when he was 11 and she was 14. “This is the north?” she said when she arrived. The dozens of familiar faces comforted her, particularly as she and Nicolas were, and are, undocumented. But the trailer park in Thermal? “I didn’t think it was so ugly here,” she said.

Starting at age 9, Nicolas had dreamed of building a house, with separate bedrooms for each of his children and enough space outside for horses and for Nicolas to “walk around there and say, ‘This is mine.’” But in Mexico he’d worked for nine years — carrying wood, building strawberry boxes, selling mobile phones — and could only afford to lay one corner of the foundation. The mobile home in Oasis had three bedrooms: one painted pink for Cinthia, 10, one painted dark purple for Erik, 11, and the third for Pedro and Maria. But the holes in the ceiling over that third bedroom were just too big, so Pedro and Maria slept on a stack of fleece blankets on the living room rug.

When Nicolas arrived in California, he started working in the fields for \$7 an hour. After 15 years, he makes \$14 an hour. Every day he works, no matter how hot, he layers up to protect himself from pesticides and the



sun, driving out of Oasis Mobile Home Park into that gray-green checkerboard to plant, pick or pack strawberries or cauliflower or broccoli or carrots. The total crop value in the Coachella Valley dropped approximately 20% between 2015 and 2019, according to figures from the local water district. Much of that is due to growers moving operations to Mexico for cheaper labor — one strategy for keeping overhead low enough to continue selling quarts of strawberries at grocery stores for \$3.99. But the climate doesn't help. The valley is not just "sort of at the hot edge of agriculture," said Ray Anderson, a research soil scientist in the USDA's Agricultural Water Efficiency and Salinity Research Unit in Riverside, California. "In the summer it can be the hottest agricultural region on Earth."

Kneeling on the soil without pads burnt Nicolas' knees. If he picked by headlamp at night, there were snakes. In recent years, Nicolas started noticing his age, feeling too wiped out by work to return home and immediately play with his kids. He needed to nap. "It's not so much the sun — the humidity makes you drown," he said. "You're sweating and sweating and cannot breathe." California requires growers to provide more heat protections for farm workers than any other state, but, as Nicolas noted, the law as practiced in the field is not the law on the books. "People pass out from dehydration all the time."

Nicolas usually made about \$300 a week. Two weeks' pay a month went to food, \$475 went to rent, \$50 to gas, and the remaining \$75 was for utilities, though this was laughably far from enough. In the summer, Nicolas' monthly utility bills reached \$300. He worked as many hours as he could, but July and August were slow. Trying to stay cool felt hopeless. His front door didn't really close. The window air conditioning units didn't really fit. The mobile home had never had insulation. His whole family slept in the hallway that ran through the center of the trailer, as that was the coolest place. A couple summers ago Nicolas bought a generator, which he couldn't really afford, to power the air conditioning, which he couldn't really afford. But he also couldn't really afford to drive around for two, three, four hours at a stretch to keep his family cool by running the air conditioning in his car.

To try to fill the hole in their budget, Bautista did piecework, embroidering and sewing sequins on dresses. She used to work in the fields, too, but now stayed home to take care of their son, who had autism and was often frustrated by his inability to communicate. Fixing the roof of the mobile home was not an option. They purchased their home for \$2,000. One contractor quoted Nicolas \$18,000 for repairs. Another said \$15,000. "Do I look like a guy who has \$15,000?" he said.

How mobile homes like Nicolas' are going to fare in the climate crisis is "quite frankly, not the sexiest to academics," according to Greg Pierce, co-director of the Luskin Center for Innovation at UCLA. But there's wide consensus that the issue is understudied and that residents of older manufactured housing (the preferred term) are at grave risk. In California, mobile homes are disproportionately located in the hottest census tracts. Due to a lack of "walling integrity" — i.e., holes and lack of insulation — people living in such housing spend twice as much of their income on cooling. Mobile homes built before 1976, when the Department of Housing

and Urban Development updated building and safety standards, are especially vulnerable. Their aluminum wiring may catch fire. The tar that holds old metal roofs together sometimes melts. In Maricopa County, Arizona, mobile homes account for only 4.9% of the housing stock but 27.5% of indoor heat-related deaths.

“Every year in the summer we’re on high alert,” Mike Walsh, deputy director at the Housing Authority of the County of Riverside, told us. The power fails in the mobile home parks and with it go the fans, air conditioners and swamp coolers. He’s got generators on hand, and hotel room vouchers, but he still worries all the time as the need far exceeds his resources.

As parts of the country get hotter and drier, arsenic exposure is becoming more common. In a paper published this year, the United States Geological Survey estimated that the number of Americans in the contiguous United States who will be exposed to elevated arsenic levels from private wells in the next drought will increase from 2.7 million to 4.1 million. Chronic arsenic exposure is associated with cancer and an array of other health problems. Some of the increased arsenic exposure happens when wells run dry and communities need to find new water supplies and, in the process, they encounter the naturally occurring arsenic that’s always been in the ground. In other communities, like California’s Central Valley, overpumping of groundwater is “causing the aquifer to compress like a sponge,” as UC Riverside soil geochemist Sam Ying put it, and this can lead to higher arsenic concentrations in groundwater. “I don’t think we know exactly what’s happening in the Coachella Valley yet,” Ying said.

In September 2020, the Environmental Protection Agency issued an emergency order to Oasis Mobile Home Park because of arsenic levels of 78 to 90 parts per billion in the drinking water, far over the legal limit of 10 ppb. This was not news. The EPA had found arsenic problems in 2019 as well. This time, the park’s primary well had failed. The arsenic concentrations in the water from the backup well were higher and required additional treatment.

So the EPA required the Oasis Mobile Home Park’s landlord to supply each resident with one gallon of water per day. He started doing so.

Three days later, he gave notice that rent would be increased by \$100 a month.

Nicolas hit his limit. He didn’t have a lot of levers to pull to improve his situation. But after Lesly Figueroa and a colleague of hers from Leadership Counsel for Justice and Accountability, a nonprofit that focuses on poor, rural California, started meeting with Oasis residents, he signed on as the lead plaintiff in a lawsuit against his landlord, Scott Lawson, and the landlord’s daughter, Sabrina Lawson, that alleged a litany of “unsafe and unhealthy living conditions.” (Scott Lawson has since died and Sabrina Lawson has not responded to the complaint.)

“The weather is crazy, the weather is going crazy,” he said. “We can’t go on living like this. It’s not sustainable. I don’t think we can endure it.”

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In front of The Thermal Club — and in front of The Thermal Club only — is a gorgeous sidewalk, a perfect river of perfect cement, landscaped with bougainvillea, flashing silver in the light. This sidewalk connects to nothing. No one appears to walk on it. Behind that sidewalk is a wall about 18 feet high, and behind that wall is a 424-acre shrine to fossil fuel: over five miles of racetrack, folded in on itself like entrails, on which the extremely wealthy race extremely expensive automobiles; 60 villas, which average 8,000 square feet and \$4.5 million; and a climate-controlled garage called the Vault, where cars reside in far more comfort than the residents of the Oasis Mobile Home Park. The wall, according to building permits, is designed to keep in the engine noise from race cars like McLarens and Lamborghinis. But across the street from the wall are a clutch of trailers desiccating like carrion. And who wants to see that?

The Thermal Club sits less than five miles from Oasis Mobile Home Park and is owned by Tim and Twanna Rogers, who, according to public records, also own a home in a lovely coastal community south of Los Angeles. When the Rogerses started building The Thermal Club, in 2012, their LLC, Thermal Operating Company, filed a trademark for the phrase “private pavement.” This was not just a selling point. It seems to be *the* selling point, suggesting that inside the walls is a whole world, with its own special infrastructure, just for you. The Club describes itself as “A PRIVATE COMMUNITY MADE UP OF A SELECT FEW OF THE MOST DRIVEN AND PASSIONATE HUMANS ON EARTH.” (Caps theirs.) Swimming pools, a spa, copious shade, top-notch “trackside professionals” to “inspect and ensure your experience is impeccable,” a restaurant with signature cocktails and an “in-house French pastry chef.” You’re not *really* in Thermal, you’re just here.

Hoping to talk about the climate gap and Thermal in general, we called Tim Rogers repeatedly. We emailed him repeatedly. We reached out to everybody we could find who worked at The Thermal Club. No luck. Finally, one day Rogers picked up the phone and said politely but very firmly, no way was he going to talk to us. (Later, when we reached out to Rogers again with detailed queries to fact check this article, he wrote back one line: “The information you have is not accurate.” When we then wrote back to ask him to please correct those inaccuracies, he did not answer.) So to peek inside The Thermal Club, one of us signed up for a driving class. (We’re climate reporters — we know.) This got us behind the wall but didn’t grant us access to the kingdom’s inner sanctum, which is protected by another gate. We can report that driving around in circles really fast is fun if you don’t think at all about the externalized costs. Also, when it’s really hot, you’ll destroy your tires if you ask them to do two hard things at once, like turn and brake.

Rogers, who is 68 and looks like he could play a U.S. president on 1990s TV, told a reporter from Autocar in February 2020 that he and Twanna had built this club because “we belonged to several country clubs, and they’re beautiful, with a golf course around you, nice homes, and a common interest with the people near you. But we have maybe 125 of those in the Coachella Valley, and not everyone golfs.” In 2018 he told The Desert Sun that he originally thought they’d invest \$30 million in the project but had spent \$150 million by that point.

The Rogerses made their fortune selling gas to 7-Elevens and founding Tower Energy, a privately held company that has its own chain of gas stations-slash-convenience stores, which reports “over \$5 billion in revenue yearly,” according to the business’s LinkedIn page. The couple has a history of opposing California’s efforts to throttle down greenhouse gases, including contributing \$200,000 from their company to an unsuccessful 2010 ballot measure to suspend an emissions-reduction target.

To become a Thermal Club member, you need to pay your \$125,000 membership fee (plus monthly dues), though that is just the start. You also need to buy a plot of land (one lot sold this year for \$1.7 million) and then build yourself a villa on it. Or you can purchase a spec home. As noted in the plan governing the development, almost all of these villas are not primary residences. Instead, they are “racetrack recreational units,” accessible 24 hours a day, 7 days a week, but, by definition, vacation homes that no one can legally live in full time. The promotional videos are homages to excess. Picture yourself and your incredibly rich, incredibly good-looking partner pulling into your 10-car garage, caressing your vehicles, looking meaningfully at each other, driving your Porsche over to the clubhouse for dinner, having amazing sex (mercifully, this is only implied in the video), waking up shirtless and stepping into your fireproof jumpsuit, and heading down to the track, where, after you drive, a pro will talk you through the finer points of your performance in the glorious shade. (Honestly, we can’t truly do the videos justice; you should just watch.) One member recently bought multiple lots, Rogers said in a recent interview: space to build a 37,000 square-foot home, plus two lots across the street to prevent someone else from blocking his view. California’s Health and Safety Code section 43001 exempts “racing vehicles” from emission standards. Section 39048 defines a racing vehicle as “a competition vehicle not used on public highways.” Welcome to private pavement.

A sort of sister project is in the works, Thermal Beach Club, on the same large chunk of land in Thermal known as Kohl Ranch. Thermal Beach Club, like the racetrack, will allow members to “reign over the water in your private paradise” — not just private pavement but a whole bespoke climate. Private water patterns to create a lake. Private temperatures, too — the lagoon plus landscaping depicted in mockup photos would create significant cooling, experts say. This is one of four planned wave parks in the Coachella Valley. In the nearby town of La Quinta, surf legend Kelly Slater is hoping to build the Kelly Slater Surf Resort at Coral Mountain, backed by Charles Schwab’s son’s money. The property was originally approved for a golf resort. But who wants to play golf when it’s 120 degrees?

The moment you exit The Thermal Club, you’re back in front of the desiccating trailers, back on the sidewalk to nowhere, back among the fields where your neighbors, who are not really your neighbors, labor to feed the nation off some of the hottest farmland on earth.

But then it’s off to the coast or wherever you choose. “We’re kind of living the dream,” Twanna Rogers said of this buttressed world she built to a member of the automotive press as she drove him around the track for a

video interview in December 2017. “Wouldn’t you be living the dream if you had this?”

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The best definition of the climate gap we’ve heard is from Heather McTeer Toney, the former mayor of Greenville, Mississippi, in testimony earlier this year before the U.S. House Select Committee on the Climate Crisis. “We’re all in the storm, but we’re not in the same boat,” she said. “Some of us are in rowboats while others are in yachts. Some of us are sitting on aircraft carriers while others are just bobbing along on a floatie.”

Everywhere, every day, in and around Thermal, you can see this on display.

Elected officials for District 4 in Riverside County, which encompasses Thermal, are not blind to the climate crevasse in front of them. Steven Hernandez, chief of staff to District Supervisor Manuel Perez, argues that much of it is quite deliberate. “We know, in this valley, that certain areas developed before others on purpose. It was done on purpose,” Hernandez said. The intent was to keep the west valley glinting and elegant and the east valley agricultural and cheap, a low-budget bedroom community for farmworkers and service workers who commute west to cook, garden and clean.

In the past eight years, Riverside County has only issued permits for 4.2% of the low-income housing that the state of California determined it needed to build, and for 4.9% of the very-low-income housing. Hernandez blames former Gov. Jerry Brown for, in 2011, ending California’s redevelopment program, a key funding source for such projects. “They took away water investment. Sewer investment. Money to bring in parks. Dunzo. Done. They replaced it with statewide competitive grants that are tailored to urban communities.” These grants — some of which are derived from cap-and-trade money — do tend to encourage good climate policy: denser housing in walkable communities with more urban greening. Some of this grant money is explicitly set aside for climate-focused rural projects. Still, it’s left some officials in rural communities like Thermal, which already lacked infrastructure and housing, claiming they feel even more stressed for funds than before.

This compounds a history of neglect. There’s never been adequate housing for farmworkers, who, on average, earn between \$15,000 and \$17,499 a year. “Across the state, from Kern County to farmworker communities in the Central Coast, low-income and communities of color are on the front lines of the accelerating climate crisis,” said Neena Mohan, climate justice program manager for the California Environmental Justice Alliance. Of the \$5.7 billion in proposed climate resiliency funding in the 2021-22 California state budget, the North Coast region (one of the whitest regions in the state) will receive \$1,124 per capita in investments. The Inland Deserts will receive \$443 per capita; the San Joaquin Valley, \$199.

“Race and racism are inescapable components of what’s going on out there. And until that’s recognized and addressed on a governmental level, the problems will persist,” Coachella City Councilmember Megan Beaman Jacinto said. Poor communities of color have been neglected and pushed to the margins — in Thermal, that happened in part because the county

tagged residents of old mobile homes and mobile home parks for code violations they couldn't afford to fix. Riverside County's pattern of more frequently tagging mobile homes owned by Latino families resulted, in 2000, in the settlement with HUD of a discrimination case for \$21 million, some of which went to the county to build community projects and low-income housing, and some of which went directly to 24 farmworker families. The enforcement pattern also led members of the local Torres Martinez tribe to create parks for these unpermitted, unfixable mobile homes on tribal lands where the county and state lacked enforcement power. (The tribe did not respond to requests for comment.) "The county created this problem and also needs to solve it," Beaman Jacinto continued. "You can't ignore the fact that the communities that receive no investment — and who don't have drinking water, and who don't have sewer infrastructure, and who are living in uninhabitable mobile homes and in other dwelling units that are unpermitted — are nonwhite communities."

Understanding that developers and landlords were unlikely to pay for needed infrastructure in poorer, more rural parts of Riverside County, the Coachella Valley Water District mapped out communities served by private wells and created a plan to start hooking them up to safe water. The map itself was far from complete, as it did not include the many unpermitted parks. Still, the district doesn't have the money to execute even that limited plan. "It's good to have it in a concept," said Castulo Estrada, the CVWD's first Latino board member. But while CVWD has secured \$15 million in grant funding, the district cannot use ratepayer revenue to fund new connections.

The Riverside County Board of Supervisors meeting at which they'd vote to approve or reject The Thermal Beach Club, in October 2020, felt like a fight for the soul of the town. Midway through the 4-hour-and-43-minute saga, a Thermal Beach Club representative in a nice black suit stood up with a tsunami of material to make his case. Thermal Beach Club had agreed to raise its donation to the town of Thermal from \$1,000 to \$2,300 per residential unit sold, meaning it would donate \$750,000 to a community fund that could be used for water hookups. (After The Thermal Club was approved, the Rogerses donated land in nearby Coachella for a health center and placed money in a community fund for Thermal to build a public park.) Thermal Beach Club also promised to support the strangely extant surf club at Desert Mirage High School. Plus, he said, they'd be open to amending the Kohl Ranch Specific Plan to provide a contribution to affordable housing, including donating land.

But when Perez, the district supervisor, opened up the hearing to community testimony, volleys started to fly across the climate gap. From the haves to the have-nots, the argument in favor of approving the Thermal Beach Club amounted to: You need our money. A former four-term mayor of Coachella stood up and read a list of county agencies and how much each would benefit if the club got built.

From the have-nots to the haves, the argument was: We do not want to be rescued by the rich. We want to matter ourselves.

“With the Thermal Beach Club, we can add another place our people can’t afford to enter,” one young person said, reading a message for their uncle. Their family had lived here for generations and heard this story before. “Our people work in hospitals where they can’t afford to be treated. They work in restaurants where they can’t afford to eat. Work in hotels where they can’t afford to stay. And we’re being convinced of better jobs and higher pay when we know that time and time again, these promises and these possibilities never come to fruition.” The have-nots also expressed concern about gentrification — developments for the more affluent continuing their west-to-east march, pushing the full-time community there now farther away from infrastructure, including hospitals, and closer to toxic dust near the Salton Sea.

The first step toward narrowing the climate gap here is maddeningly simple and elusive. A few years ago, Lift to Rise, a nonprofit founded in 2018 to address the overwhelming forces aligned against poor people in the Coachella Valley, partnered with a project at the USC Price Center for Social Innovation to gather and map demographic data so that government officials and others could create better policy. What’s needed in Thermal? Better housing, of course, but at an even more basic level, eastern Coachella Valley residents need more money. Otherwise, there’s no way to make the math work. “Pay your people more” — that’s Lift to Rise CEO Heather Vaikona’s first message for the region’s haves. “Everyone who lives here needs to recognize the ways that they benefit from labor that is not paid enough.”

Meanwhile, of course, the growers are feeling squeezed by competition from Mexico, where labor costs are far lower. “Are people willing to pay more for food? They’re not,” said Rachael Johnson, executive director of the Riverside County Farm Bureau. “How are you going to pay more for your labor if people are not willing to pay more in grocery stores?”

Shortly before the vote on the Thermal Beach Club, Supervisor Kevin Jeffries, from Riverside’s 1st District, which includes several low-income rural communities on the western edge of the county, addressed Perez and the room. He’d heard the have-nots, and you could hear in his voice that he sympathized with those who’d testified to the fundamental indignity they felt was inherent in the county approving a surf park while failing to provide basic infrastructure for the neediest. But he knew there was not a better way. “I have three or four, maybe five unincorporated disadvantaged communities” in my district, he said. “I live in one of them. ... We’re really struggling with infrastructure.” He knew the true burden rested entirely on the government’s shoulders, not the private sector. “It’s our problem, and the county government just doesn’t have the revenue stream.” As he saw it, the only way to fund that infrastructure was to allow private development.

“It’s not pretty,” said Jeffries. “But I gotta tell you right now, ... I’ll take you in a heartbeat to help get some streets paved, some water lines in, some sewer lines in, because we don’t have them in parts of the community ... and there’s none in sight.”

The Riverside County Board of Supervisors voted to approve The Thermal Beach Club 5-0.

So how, in this landscape, across this wide divide, do we fix the climate gap?

The scope of this question tongue-ties even experts in the field. “In addition to overhauling our entire system?” asked Mijin Cha, assistant professor of urban and environmental policy at Occidental College.

“Climate to me is really about ecology, right?” said De Lara, the professor who specializes in geography. “Access to water in the eastern Coachella Valley cannot be separated out from development and cannot be separated out from issues of growth and the right to clean and potable water.”

For Nicolas, none of this was an abstraction. He remained determined to improve his family’s living conditions.

As he moved forward with the lawsuit against his landlord, he also applied, again, for a new, publicly subsidized mobile home at a park in Thermal called Mountain View Estates. This facility had been built by Riverside County in partnership with a private developer in response to a lawsuit filed in 2007 over Duroville, the mobile home park where Nicolas lived with his brother when he first arrived in California. Mountain View Estates was paved and irrigated, as per permitted plans, and the electricity to the units was properly metered, and the units themselves were new, with central air conditioning, to efficiently keep cool.

On March 25, 2021, the county called: Nicolas had finally been approved.

Was this related to the lawsuit? The journalists in his living room? Did it matter?

When Nicolas told Bautista about the new mobile home, she just repeated their new unit number twice — “228, 228” — and allowed herself a small smile.

“That’s all?” Nicolas asked.

“That’s all,” Bautista said. She’s been living here too long to let down her guard so soon.

Over the next few months, other Oasis Mobile Home Park residents received good news: Local residents, advocates and an assemblyman successfully lobbied the California legislature to allot \$30 million of the state’s 2021-22 state budget for their relocation.

This was a victory, though it would likely take years to carry out, and the gap still yawned wide. Summer was coming, with 117-degree days that Nicolas would spend bent at the waist, picking peppers in the fields. Friends from Oasis Mobile Home Park sent their kids to nap in Nicolas’ living room. The climate wasn’t any better at Mountain View Estates, but the human defenses against it were. How long would the protections of his new home be enough? Nicolas knew the meter was running. The solution he’d found for his family was nothing compared to the Vault for the race cars at The Thermal Club.

#### **CORRECTION**

*Aug. 18, 2021: This story originally misstated the location of the indigenous Mexican Purhépecha community. It is in Michoacán, not outside it.*



Mollie Simon contributed reporting.

**Filed under —**  
Environment

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**Elizabeth Weil**

Elizabeth Weil is a reporter at ProPublica.

✉ [liz.weil@propublica.org](mailto:liz.weil@propublica.org)   [🐦 @lizweil](https://twitter.com/lizweil)

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**Mauricio Rodríguez Pons**

Mauricio Rodríguez Pons is a visual journalist.

✉ [mauricio.rodriguezpons@propublica.org](mailto:mauricio.rodriguezpons@propublica.org)